



2Excel Aviation Ltd

OPERATIONS MANUAL

Air Operator's Certificate No. GB 2299

PART A

Operations

Part A Title – A001

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2Excel Aviation Ltd Operations Manual - Part A

Amendment Record

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Section 0

Administration, Control and Application of the 2Excel Aviation Limited Operations Manual

0.1 Application of the Operations Manual

0.1.0 Introduction. 2Excel Aviation Limited (the Company, trading as 2Excel) is an A-to-B Commercial Air Transport (CAT), commercial Specialised Operations (SPO) and Public Transport (PT) and State operation, flying Boeing 737s, Boeing 727s, King Airs, Navajos and Extra 300s. 2Excel incorporates: an aerobatic display team that carries passengers on close formation aerobatic experience flights known as The Blades which also provides advanced flying training; a [Capabilities Development \(CapDev\) division](#) conducting research, development and a test and evaluation capability; a [Special Missions division providing contract-air services](#), the operational delivery service for T2 Aviation Ltd (a Company which 2Excel part-owns) which provides a global large-jet aerial dispersant capability in case of oil spills, and a freight service, using the Boeing 727 platform, [and fixed wing surveillance and SAR services to the MCA](#) and; a [Charter division providing commercial airline and aircraft management service called BroadSword](#).

0.1.1 Operational Activities. 2Excel is an aviation-based business that provides:

- a. Aerobatic formation flying displays for public and private events.
- b. Corporate entertainment events for fare paying passengers.
- c. Leadership development and team-building training for fare paying passengers.
- d. Advanced flying instruction.
- e. Research, development, test and evaluation services for the defence industrial base, the Government and other companies and agencies.
- f. Air-land integration training and surveillance services.
- g. Carriage of passengers from A-to-A and A-to-B.
- h. Management of privately owned aircraft.
- i. Aerial dispersant delivery.
- j. Air freight services.
- k. Test flying.
- l. Aircrew training.

0.1.2 Overarching Regulations. The Company Operations Manual is issued in accordance with EC Regulation 2018/1139 on common rules in the field of civil aviation, EC Regulation No 965/2012 laying down technical requirements and administrative procedures related to air operations, the associated Annexes and EASA Implementing Rules and the various National regulations enshrined in the UK Civil Aviation Authority's Air Navigation Order (ANO) and

'CAP' documents. Where the Company wishes to use an alternative means of compliance (AMoC) to the acceptable means of compliance (AMC) adopted by EASA it is to provide its competent authority with a full description of the AMoC and relevant risk assessments to demonstrate that the EASA-IRs are met to an equivalent level of safety. It is to receive the Competent Authority's approval prior to implementing it. This Operations Manual complies with, the regulations, restrictions and alleviations authorised by the State of Registration and, the terms and conditions of the Company's Air Operator's Certificate (AOC) and its Part-SPO declarations. This Operations Manual codifies how the Company complies with those regulations and is for the use and guidance of all Company operating staff who are to ensure that all Commercial Air Transport (CAT), Public Transport (PT), Specialised Operations (SPO) **Non Commercial Complex (NCC)**, **Non Commercial Other than Complex (NCO)** and State flights are conducted in accordance with its policies and requirements.

0.1.3 Passenger Definitions. The overarching regulation that details the passenger definitions pertinent to Company operations is the Air Navigation Order (ANO) at Part 1, Chapter 1&2, Articles 6-16, under which any person not flying as Aircraft Captain or crew, who is not a Company director, employee or a member of the CAA is deemed to be a passenger. For some of the activities in the Company's scope of work, 'operating staff,' who may not be Company staff but may operate the aircraft 'mission systems' as Task Specialists. They may need to be flown in ways that are beyond the scope of the main body (Parts A-D) of this Operations Manual as Task Specialists and / or 'permitted passengers' as defined in the ANO. Permitted passengers shall be known as CAA-agreed passengers and include:

- a. Police officers;
- b. Employees of the police in the course of their duties;
- c. Medical attendants;
- d. Holders of a current pilot's licence, who intend to act as a member of a flight crew of an aircraft carrying out Special Flight Operations (SFOs);
- e. CAA Flight Ops Inspectors (FOIs);
- f. Home Office Police Aviation Advisers;
- g. Employees of the Fire and Rescue Authority (under the Fire and Rescue Services Act 2004) in the course of their duties;
- h. Officers of Her Majesty's Revenue and Customs in the course of their duties;
- i. Employees of the Ministry of Defence in the course of their duties;
- j. Such other persons being carried for purposes connected with police operations as may be permitted in writing by the Authority.

CAA-agreed passengers will be flown under the terms of the main body of this Manual except where other activities are permitted under the procedures detailed in Part S of this Manual or the Leading Edge Flight Test Operations Manual (LE FTOM).

0.1.4 Regulatory Frameworks Pertinent to Company Operations. This Operations Manual is to be used for CAT, SPO, PT, NCC, **NCO** and State operations.

0.1.4.1 Commercial Air Transport (CAT). Under the Company's EASA AOC, passengers and freight may be carried from A-to-A and from A-to-B under CAT. Under EASA IRs, CAT operations are defined as aircraft operations involving the transport of passengers or cargo

for remuneration or hire from A-to-B and passenger sightseeing flights from A-to-A. These operations are to be flown in accordance with Parts A-E of this Manual.

- 0.1.4.2 Specialised Operations (SPO).** Other types of flights conducted for hire or reward conducted by the Company are known as SPO and are governed by Part SPO. These activities include (amongst others) agricultural and aerial photography flights, aerobatic and special event flights, oil spill work, survey operations, pollution control activity and scientific research flights. SPOs are to be conducted in accordance with this Operations Manual including Part S where appropriate ([dependant on contract and tasking agency](#)) and any special procedures promulgated by business units for the particular activity.
- 0.1.4.3 Public Transport (PT).** Some activities conducted by the Company do not fall under CAT or Part SPO legislation. Therefore, for those operations, 2Excel will use the commercial PT rules enshrined in the ANO under its National AOC (which has the same AOC number as its EASA AOC). To do so, once again, personnel are to comply with this Operations Manual which is itself compliant with EASA IR's.
- 0.1.4.4 State Activities.** Sometimes, the Company's operations may count as State activities and, as such, may sit outside the definitions of both CAT, SPO and PT. 2Excel also conducts its State activities in accordance with the procedures in this Manual occasionally benefitting from its ability to use some of the exemptions granted by the relevant National Authority.
- 0.1.4.5 Displays and Private (Non-Commercial – NCC/NCO) Flying.** Some of 2Excel's activities sit outside the CAT, SPO, PT and State regulatory frameworks. For example, The Blades fly their displays under the rules of CAP 403; BroadSword can fly its aircraft owners 'privately' and; Company aircraft fly on internal Company activities. While many of the procedures are common, this Manual does not cover display flying, flying instruction or test flying each of which are governed by the regulations and Company policies specific to those activities enshrined in separate bespoke Company manuals and operating procedures.
- 0.1.4.6 Maintenance Standards.** Notwithstanding which type of flying operations shall be conducted, all Company aircraft maintenance will be conducted in accordance with the CAT compliant engineering procedures detailed the Company's Continuing Airworthiness Management Exposition (CAME).
- 0.1.4.7 Flight Time Limitations.** Moreover, because Company aircrew may be called upon to conduct CAT or PT at any time, their working hours shall be governed by the Company's relevant Flight Time Limitations (FTL) Scheme (enshrined in Section 7 of this Part of this OM).
- 0.1.5 Application of the Regulatory Framework to Specific Operational Activities.** The Company's operational activities shall be conducted under the regulatory frameworks detailed at Table 0.1 below. Many of the Company's operational activities may be conducted under more than one framework depending primarily on the status of any passengers carried (be that a CAA-agreed passenger; a commercial passenger; a private passenger or aircraft owner or; the fact there is no passenger on board).

0.1.6 Test Flying. Test flying which, pending the introduction of a new Flight Test regulatory framework proposed to be introduced by EASA, may be: PT; private flying; specialised operations or; operations under permit to fly (P2F). Owing to the National Authority no longer having the organic capability to assess/administer Flight Test and, pending alternative Flight Test Qualified Entities being approved by EASA, 2Excel manages its Flight Test Activities using the regulatory framework provided by EU Regulation 748/2012 amended by EU 2016/5, which are enshrined in the Company's LE FTOM. For certain design changes, Test Flying may also be governed by Part 21 Subpart J Approved Design Organisations (DOAs) that have the appropriate scope and approvals.

0.1.7 Transferring Regulatory Framework during a Flight. It may be necessary, or desired, to transfer between regulatory frameworks during a flight. This is permitted. [For example, a Coastguard tasked King Air may be operating under Part-SPO for a routine surveillance mission but be re-tasked airborne to a RESCUE callsign and consequent State operation.](#) However, Aircraft Captains should attempt to use the highest relevant regulatory framework for their flight. Changes between frameworks should only be made consciously, for operational reasons, and are to be recorded on the PLOG or, if necessary, the voyage report.

Ser	Operational Activity	Classification	Framework
a	(Formation aerobatic) flying displays	Display, NCO	EASA Part NCO ANO* + CAP 403
b	Flypasts	Flypast, NCO	EASA Part NCO ANO*
c	Corporate entertainment and leadership training events	SPO	EASA Part SPO
d	Advanced flying instruction	Training	Part NCC/NCO Relevant ATO
e	Research, development, test and evaluation services	SPO or State or Permit to Fly	EASA Part SPO + LE FTOM LE FTOM + Part S Part 21 Subparts J
f	Test Flying and Functional Check Flying	Private or SPO MCF or Permit to Fly	EASA Part NCC/NCO EASA Part SPO ANO* Part 21 Subparts J
g	Air-land integration training services	SPO or State	EASA Part SPO National AOC + Part S
h	Survey and surveillance services	SPO or PT or State	EASA Part SPO National AOC + Part S
i	Carriage of passengers from A-to-A and A-to-B (including positioning)	CAT or State	EASA Part CAT National AOC + Part S
j	Carriage of aircraft owners and their guests (including Company transit flying)	CAT or Private	EASA Part CAT EASA Part NCC/NCO
k	Aerial dispersant spray delivery	SPO	EASA Part SPO*
l	Air freight services	CAT or State	EASA Part CAT National AOC + Part S
m	Demonstration flights	SPO or State	EASA Part SPO* National AOC + Part S
n	Training	Training	Part NCC/NCO Relevant ATO
o	Ferry Flights	Private Permit to Fly	Part NCC/NCO* CAA/145/DOA Approval

Note

* Or relevant regulations of the appropriate Nation State.

Table 0.1. Regulatory Frameworks Applicable to 2Excel's Operational Activities

0.2.0 The Manual. The Operations Manual is broadly sub-divided into the following Parts, supplemented by publications such as each Aeroplane Flight Manual (AFM) / Pilot's Operating Handbook (POH) and commercially produced maps, route and airways charts. Because the Company operates in niche areas of aviation, the Company has subordinate manuals, produced by its individual business units and supporting structures, to provide advice to staff on how to best deliver specific operational tasks, and provide the procedures mandated for Part SPO activities and its higher order control functions, (e.g. Company Standard Operating Procedures (SOPs); the **MST** or UKCS Mission Operating Procedures (MOPs); the Compliance Monitoring Manual (CMM), the Safety Manual, CapDev Trials Instructions and the Leading Edge Flight Test Operations Manual (LE FTOM)). Where the Company needs to demonstrate its compliance with overarching regulations to the Authority, its procedures are enshrined in this Operations Manual which is divided into the following sections. By dint of its nature, Part S has restricted circulation and, therefore, is only seen by those that need to know its contents.

- Part A** General / Basic Information Requirements and Operations.
- Part B** Operating Procedures and Requirements (using aircraft-specific technical publications and checklists).
- Part C** Specific Instructions and Information for Routes and Operating Areas.
- Part D** Training
- Part E** Cabin Operations Manual
- Part S** Special Flight Operations

0.2.1 Abbreviations. Specific terms are defined at the beginning of the sections to which they are appropriate. The first time an abbreviation is used it is explained in full.

0.2.2 Pro-nouns. For brevity the pronoun 'he' is used throughout Parts A, B, C, D, E and S. Where appropriate, the pronoun 'she' should be inferred or assumed.

0.3 Amendment and Revision of the Operations Manual

0.3.1 This Operations Manual is issued on the authority of the Company. The Accountable Manager will authorise amendments to the Manual although functional control of the amendment process is delegated to the Company officers responsible for the subordinate parts outlined in Table 0.2.

	Functional Responsibility	Configuration Control	Incorporation Responsibility
Part A	Director of Flight Operations	Accountable Mgr	Manual Holder
Part B	Director of Flight Operations	Accountable Mgr	Manual Holder
Part C	Director of Flight Operations	Accountable Mgr	Manual Holder
Part D	Director of Flight Operations	Accountable Mgr	Manual Holder
Part E	Director of Flight Operations	Accountable Mgr	Manual Holder
Part S	Director of Flight Operations	Accountable Mgr	Manual Holder
CAME	Continuing Airworthiness Manager	Accountable Mgr	Manual Holder

Table 0.2. Amendment and Revision Responsibilities

Any proposed amendment should be forwarded through the [Director of Flight Operations](#). Once approved by the Accountable Manager, the proposal will be forwarded to the Authority using the [standard CAA NPA form SRG 1832](#). Once the changes are either accepted or approved by the Authority, the Accountable Manager will issue the Amendment List which, subsequently, shall be distributed and controlled by the Company's Compliance Monitoring Manager. All amendments will be incorporated by replacement pages; manuscript amendments are not permitted except in situations requiring immediate amendment or revision in the interests of safety. Revision pages will be annotated to show the date of issue (and date of effect if different); the Amendment List number and the portion of the text which has been revised as indicated in blue. Each amendment will be accompanied by a revised list of effective pages with their dates of issue. The Amendment List Record at the front of each Manual will show the current amendment state of that Manual. The revision state of each page is shown at the left-hand side of the footer. The Manual holders detailed at sub-section 0.2.2 Table 0.3 below are to incorporate the changes and certify the same by returning the document transmittal sheet to the Compliance Department.

0.3.2 The Parts of the Company Operations Manual that are relevant to the duties of the crew are to be available to the crew at pre-flight briefing. To provide universal exposure to all personnel across the breadth of the company the Operations Manual is replicated in both hard and electronic copy format including one copy lodged with the Authority. Manual holders are listed in Table 0.3 below. It is the responsibility of the Manual holders to incorporate issued amendments in their copy of the Manual and (subsequently but immediately) to return the signed Certificate of Incorporation to the Company.

Hard Copies			
Copy No	Holder	Location	Parts Held
01	Accountable Mgr	Sywell, Hall Farm 2	A, B (all parts), C, D, E, S, CAME
02	DFO	Doncaster Hangar 3	A, B (all parts), C, D, E, S
03	CM Manager	Sywell, Hall Farm 2	A, B (all parts), C, D, E, S, CAME
04	Despatch Room	Sywell, Tiger House	A, B (all parts), C, D, S
05	Operations Room	Doncaster Hangar 3	A, B (all parts), C, D, E, S,
06	ATO Office	Doncaster Hangar 3	A, B (all parts), C, D, E, S,
Electronic Copies			
Copy No	Holder	Location of Copy	Parts Held
E1	DFO	2Excel Server	A, B (all parts), C, D, E, S, CAME
E2	DFO	Centrik	A, B (all parts), C, D, E, S, CAME
E3	G-OFFO	Memory Stick in Aircraft	A, B (Extra 300), C, D
E4	G-ZEXL	Memory Stick in Aircraft	A, B (Extra 300), C, D
E5	G-ZXCL	Memory Stick in Aircraft	A, B (Extra 300), C, D
E6	G-ZXEL	Memory Stick in Aircraft	A, B (Extra 300), C, D
E7	G-ZXLL	Memory Stick in Aircraft	A, B (Extra 300), C, D
-	All Aircraft in Fleet	Centrik via EFB	A, B (all parts), C, D, E, S, CAME

Table 0.3. 2Excel Aviation Ltd – Operations Manual Holders

- 0.3.3 Staff Instructions and Crew Notices.** Details of revisions which may be urgently required in the interests of Flight Safety or which are supplementary to the Operations Manual will be promulgated as Staff Instructions (SIs), Flight Crew Notices (FCNs), Cabin Crew Notices (CCNs) or [Training Notices \(TNs\)](#). SIs are for ground and support staff; FCNs and CCNs are for flight/cabin crew, [TNs are for training staff](#). Authorised for issue by the [Director of Flight Operations](#), SIs, FCNs, CCNs and [TNs](#) will be promulgated by use of the Notices section within the Documents module of Centrik. Those revisions or instructions of a temporary nature will be cancelled as soon as they are no longer relevant, unless they have been promulgated with an expiry date on issue; those of long-term application will be incorporated into the Manual when it is next amended.
- 0.3.4 Amendment.** All intended amendments and revisions to the Manual must be supplied to the Authority at least 28 days in advance of the effective date. When the amendment/revision concerns any part of the Operations Manual, which must be approved by means of the Operations Approval document, this approval must be obtained before the amendment or revision becomes effective. When immediate amendment or revisions are required in the interest of Flight Safety, they may be published and implemented immediately, provided that application for approval has been made.
- 0.3.5 Access.** Operations personnel and crew must have easy access to a copy of each part of the Operations Manual which is relevant to their duties and as are relevant for personal study.
- 0.3.6 Extracts from the Operations Manual.** The Operations Manual is a controlled document. Any formal extracts from the Operations Manual are to be registered and controlled by the Compliance Department. Use of extracted material for reference that is not subject to amendment could lead to out of date text being read as current direction. Therefore, whenever extracted material is used in this manner it is to be clearly marked with the relevant AL state and that it is “not subject to amendment.” In addition, it should be disposed of when no longer required.

Section 1

Organisation and Responsibilities

1.0 The Operator. The Operator is 2Excel Aviation Limited, and the Company's principle place of business, within which the principle financial functions and operational control of activities are exercised, is in the United Kingdom. As such the competent authority designated is the UK CAA.

2Excel Aviation Limited
The Tiger House
Sywell Aerodrome
Sywell
Northampton NN6 0BN

1.0.1 Air Operator's Certificate Region. The Company operates primarily in the UK but has a global capability and deploys the aircraft, pilots and appropriate support services to suitable facilities worldwide in accordance with the laws of and permissions of the host Nation state. Where a deployment requires Company aircraft to be dismantled, shipped and reassembled, normally the Company will advise the assigned Authority Flight Operations Inspector at least 30 days before deployment. All Company aircraft are restricted to the appropriate areas as defined below, or those specified in the Aircraft Manufacturer's AFM if these are more limiting.

a. **Extra 300 Operations.** Company Extra 300 A-A Part-SPO Operations are cleared world-wide from deployed locations. A-B operations are cleared throughout Europe and the Saudi Arabian Peninsular to west of the Urals and the Persian Gulf, to the east of the Atlantic seaboard to the northern extremities of Norway and to north of the Sahara Desert. This area of operation is bounded by rhumb lines between the following points (read in columns):

N70	E60
N15	E60
N15	E40
N30	E20
N30	W12
N70	W12
N70	E60



- b. **B727 Aircraft Operations.** Company B727 Operations are cleared world-wide between 72°N and 66.34°S (The Antarctic Circle).
- c. **B737 Aircraft Operations.** Company B737 Operations are cleared world-wide between 73°N and 60°S
- d. **Other Multi-Engined Aircraft Operations.** Other Company multi-engined CAT Operations are cleared throughout Europe and the Saudi Arabian Peninsula to west of the Urals and the Persian Gulf, and throughout the north and central landmass of the African continent. This area of operation is bounded by rhumb lines between the following points (read in columns):

N72	E60
N15	E60
S05	E40
N04	W20
N72	W25



1.0.2 Variation to the AOC. In order to request permission to vary its Commercial Air Transport operations under its AOC, the Company will request a Variation to the AOC at least 30 days before its requested varied operations commence. Such variations include any changes to the scope of the AOC or operations specifications or changes to any elements of the Company management system and are detailed in GM3 ORO.GEN.130 (b).

1.0.3 Aircraft. The aircraft operated by the Company under **Part-CAT**, **Part CAT/SPO**, **Part-SPO Only**, **Part NCO** and the National AOC* are:

EA300 G-ZXCL*	PA31 G-RHYM*	PA31 G-UKCS	BE20 G-IMEA*
EA300 G-ZXEL*	PA31 G-BEZL*	PA31 G-OUCP	BE20 G-IASM*
EA300 G-ZEXL*	PA31 G-BPYR*	B722 G-OSRA*	BE20 G-WCCP*
EA300 G-ZXLL*	PA31 G-UMMI*	B722 G-OSRB*	BE20 G-CIFE*
EA300 G-OFFO*	PA31 G-SCIR	B733 G-TGPG	BE20 G-JASS*
	PA31 G-SCTR	B733 G-SWRD	BE20 G-HMGA
	PA31 G-SCMR		BE20 G-HMGB

Note: EA300 display flying is conducted under Part-NCO.

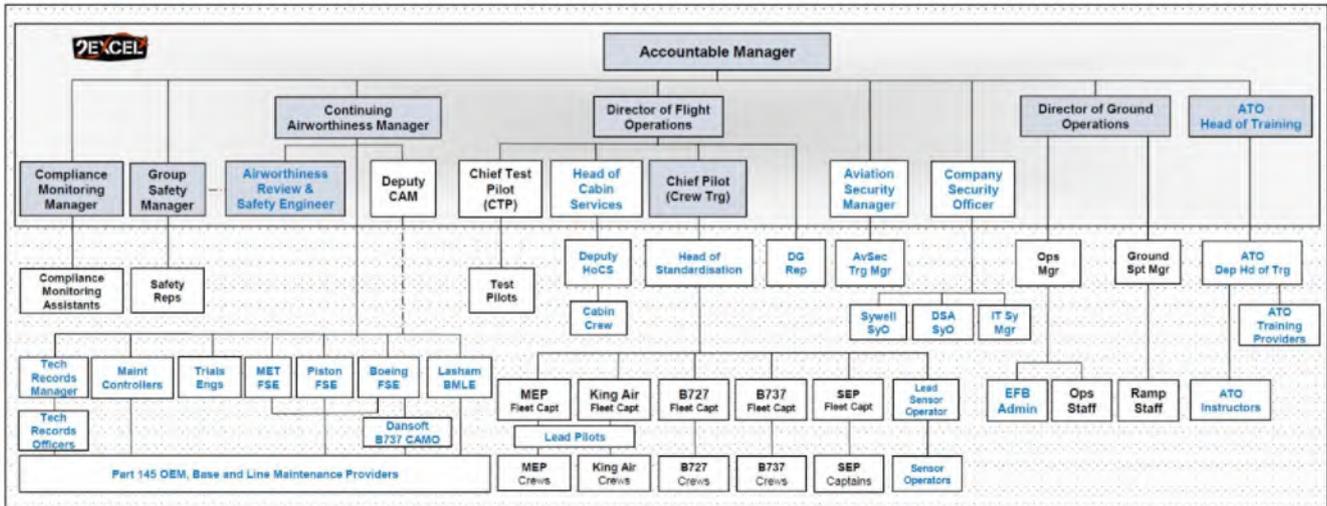
And additional leased aircraft that comply with the regulations stipulated in ORS4 Doc 1285 Leasing Agreements (or updated issue), AMC1 ORO.AOC.110 Leasing Agreements and the Company's Maintenance Plans.

1.0.4 Laws, Regulations and Procedures. All employees must comply with the laws, regulations and procedures of those States in which the Company's operations are conducted and which are pertinent to their duties and with ORO.GEN.110 and with the subordinate

regulations that are laid out in this Manual. Where a conflict arises, employees are to obey the most restrictive regulation.

1.0.5 Language. The language used by the Company is English.

1.1 Organisational Structure



Legend: Form 4 Holder Management Group of Persons Wider Group of Persons

1.2 Operational Appointments and Nominated Persons (ORO.AOC.135)

Accountable Manager	Captain <input type="text" value="Name"/> OBE DFC MA BSc Personal Data Personal Data:820 Personal Data:412
Director of Ground Operations (EASA Ground Operations)	Mr <input type="text" value="Name"/> Personal Data Personal Data:180
Director of Flight Operations (EASA Flight Operations)	Captain <input type="text" value="Name"/> Personal Data Personal Data:293
Chief Pilot (EASA Crew Training)	Captain <input type="text" value="Name"/> Personal Data Personal Data:155
Continuing Airworthiness Manager (EASA CAW)	Mr <input type="text" value="Name"/> Personal Data Personal Data:829
Compliance Monitoring Manager	Mr <input type="text" value="Name"/> Personal Data Personal Data:055
Group Safety Manager	Mr <input type="text" value="Name"/> Personal Data Personal Data:483

1.3 Responsibilities and Duties of Operations Management Personnel. All nominated personnel are responsible for ensuring that compliance is maintained with the applicable requirements within their specific area of responsibility.

1.3.1 Accountable Manager. The Accountable Manager, and in his absence the Director of Flight Operations (DFO), is responsible for:

- a. The safe and professional conduct of 2Excel's Operations in accordance with the applicable requirements, through the establishment, maintenance and content of an effective management system (enshrined in the Company's Operations Manual suite and supporting process manuals);
- b. Provision of appropriate resource to achieve the Company's strategic plan.
- c. Oversight of the Management Board functions that provide for financial stability and prioritisation and allocation of resource.
- d. Control and supervision of the flight, ground, compliance, safety and maintenance departments;
- e. Those items listed in Section 2 Para 2.1.2.

1.3.2 Director of Ground Operations

1.3.2.1 The **Director of Ground Operations** is responsible to the Accountable Manager for the efficient administration of the Operations Department in all aspects and, through their subordinates, for all Company ground operations, including the organisation, efficiency, welfare and discipline of Company Operations staff and providing leadership and training where appropriate to meet current or future business requirements. Day-to-day supervision of the Operations function and the continued development of aviation service delivery including:

- a. Scheduling operational commitments;
- b. Control of aircrew rostering and Flight Time Limitations scheme;
- c. Supervision of the ground support departments, encompassing Flight Operations Office staff and Ramp staff;
- d. Development and Maintenance of the Operations SOPs;
- e. Oversight of Company Ground Personnel Aviation Security Requirements;
- f. Content and maintenance of the Ground Operations Manual (GOM);
- g. Oversight and monitoring of ground handling agents;
- h. Preservation of Returned Flight Documentation;
- i. Post-Incident Response plan;
- j. Supervision of the Ground Support Manager;
- k. Submission of required monthly flying returns to the CAA.

1.3.2.2 Operations Manager. The Operations Manager is responsible to the **Director of Ground Operations** for the day-to-day supervision of the Operations function and the continued development of aviation service delivery.

1.3.2.3 Unit Executive Officers. Where the Company is engaged in tasking together with other agencies, authorities or in some cases, customers, the tasked organisation (which would

normally be [CapDev](#) or [Special Missions](#)) may be integrated fully into the organisation of the customer as part of an 'agile mission group.' Where the contracted task gives the customer a measure of operational control over the Company's flying operations, which is usually because the customer drives the tasking (which is normal business for [CapDev](#) and [Special Missions](#)), the customer may appoint a Unit Executive Officer (UEO). While the Company retains operational command over all its assets through the [Director of Ground Operations](#), operational control may be delegated to the UEO. Some agencies may term these UEOs as Flight Operations Managers (FOM). The specific responsibilities of UEOs vary according to the measure of integration and the contracted tasks; worked examples are detailed in Part 5 to this Operations Manual.

1.3.2.4 2Excel Account Managers. In cases where the Company is externally tasked as a matter of course, in order for the Company's operations to remain agile, a '2Excel Account Manager will be allocated to manage the customer's account on behalf of the Accountable Manager. The Account Handler will usually be a functional Head of Department but may be a Detachment Commander or a Trial Management Officer with specific terms of reference appropriate to the contract on which he is engaged. Subordinate processes may reside in Part 5 Section 1 for long-term partnerships while for short-term contracts, they may be held as locally agreed processes or as SOPs.

1.3.3 Director of Flight Operations. The Director of Flight Operations (DFO), and in his absence the Chief Pilot, is responsible to the Accountable Manager for the following:

- a. Ensuring that Flight Operations resources are sufficient to meet the demands of the operation;
- b. Ensuring safe flight operations through establishment and implementation of operational policy, standards, procedures and safety and risk mitigation;
- c. In conjunction with the Chief Pilot, establishment and management of crew training policies, training standards and training procedures;
- d. In conjunction with the Head of Cabin Services, establishment of policy and procedures to provide a safe, consistent and customer focused service during flying operations;
- e. Operational compliance with current regulations and legislation, establishing a close and effective relationship with both the Safety and Compliance departments;
- f. Chairing the Flight Crew Manning Committee;
- g. Discipline and supervision of flying staff;
- h. Supervision of the Company's Flight Time Limitation Scheme;
- i. Content and maintenance of the Company's Operations Manual;
- j. Issue of Staff Instructions, Cabin Crew Notices and Flight Crew Notices;
- k. Overall approval for operations into all required airspace and airfields.

1.3.4 Chief Pilot. The Chief Pilot is responsible to the DFO for:

- a. Provision of training resources in order to meet the current and future demands of the operation;
- b. Monitoring aircrew currencies and licence validities;

- c. Control **and approval** of the aircrew training and testing scheme, including definition of applicable standards;
- d. Ensuring all required records of training are maintained;
- e. Reviewing external training suppliers to ensure suitability, quality and ongoing compliance;
- f. Maintaining Company training material and manuals including OM D;
- g. Implementation of Standard Operating Procedures and operational standards on all fleets;
- h. Monitoring of validity of mass and balance, performance and airfield data provided by Company planning systems;
- i. Selection of Fleet training staff;
- j. Processing of submitted discretion reports and reporting trends to the DFO;
- k. Effective management of the Fleet Captains and Lead Pilots;
- l. Submission of required training returns to the CAA.

1.3.5 Head of Standardisation. The Head of Standards is responsible to the CP for:

- a. The supervision of Company training staff – instructors, examiners and line training Captains, in order to maintain training standards;
- b. Ensuring crew members are maintaining the required Company standards of performance, appearance, preparation, presentation and aircraft husbandry;
- c. Conducting regular training standardisation meetings/working groups with training staff;
- d. Reviewing the contents of applicable training manuals and material, including checklists and aircraft manuals, proposing changes if required.

1.3.6 Fleet Captains. Fleet Captains assist the Chief Pilot with his duties, deputising for him in the aircraft fleets. Their responsibilities mirror items a-i of the Chief Pilot's responsibilities. Due to the diverse range of operational activity within the Navajo and King Air Fleets each area of business also has a Lead Pilot, within each area of activity these Lead Pilots conduct the duties that would be provided by a Fleet Captain. While the Fleet Captains will provide specialist expertise for their aircraft type, overall responsibility is retained by the Chief Pilot.

1.3.7 Chief Test/Trial Pilot (CTP). Company Test flying is conducted under the relevant Design Organisation Approvals (DOA) set out in the Leading Edge Flight Test Ops Manual (LE FTOM) section of the Leading-Edge DOA Handbook, under the appropriate Flight Test Category 1-4. Flight Test safety and risk management is managed under DOA processes through the DOA Head of Flight Test. **CapDev Trials** liaise closely with Leading Edge and where appropriate, provide current and qualified test pilots for Leading Edge DOA Flight Test requirements. Company Trials Flying is separate from Test Flying and is conducted under this Ops Manual under Part SPO. The Chief Test Pilot and the Chief Trial Pilot may be two separate people. For Trial Flying operations, and in addition to be ready to support Leading Edge Flight Test, the CTP is responsible to the DFO for:

- a. Maintaining Trial Flying standards;

- b. Ensuring the safe and professional conduct of Trial Flying operations carried out by **CapDev**;
- c. Maintaining TP accreditation (under Part FCL);
- d. Maintaining Flight Test Engineer (FTE) accreditation (under Part 21);
- e. Categorising **CapDev** operations so that only appropriately qualified crew conduct relevant flights;
- f. Maintaining the **CapDev** Flight Test and Trial Flight qualification requirements;
- g. Ensuring that **CapDev** TPs, Trials Pilots (TrPs), FTEs, Flight Test Observers (FTOs) and Trial Management Officers (TMOs) are current and qualified to undertake their flying tasks;
- h. Chairing pre- Flight Test Safety Review Board (SRB) to review Threat / Hazard Assessment (THA) for any Flight Test or Trials Flying where the risk has been assessed as MEDIUM or HIGH;
- i. Authorizing Trials Flights where the THA is assessed as HIGH or greater;
- j. Maintaining a list of suitable pilots nominated to conduct MCF.
- k. Liaise and advise the CAMO on MCF profiles and Threat/Hazard Assessment.

1.3.8 The Continuing Airworthiness Manager. The Continuing Airworthiness Manager (CAM) is the nominated post holder for maintenance. The CAM will work full time. He will, in consultation and agreement with his deputy, the Fleet Managers, Maintenance Coordinators and ARC signatories for each fleet of aircraft, ensure that all maintenance is carried out on time and to an approved standard. He will liaise with the Fleet Managers, Maintenance Coordinators and the Authority to ensure that the Company's responsibilities in the engineering support areas can be met. His detailed responsibilities are described in the 2Excel Continuous Airworthiness Management Exposition. In short, the CAM is responsible for determining what maintenance is required, when it has to be performed and by whom and to what standard, in order to ensure the continued airworthiness of the aircraft being operated.

1.3.9 Deputy CAM. The Deputy CAM shall support the CAM across the breadth and depth of the CAM's responsibilities.

1.3.10 Fleet Managers. The Fleet Managers will assist the CAM in the discharge of his responsibilities. The persons holding these posts will be Company employees. They have responsibility, in association with the CAM, for ensuring that all maintenance on their fleet aircraft is carried out on time and to an approved standard, and that they monitor all technical records to ensure that they are accurate. The Fleet Manager's main role is managing the day-to-day engineering and husbandry of his fleet in order that the business units can achieve their tasks efficiently and legally.

1.3.11 Airworthiness Review Certificate (ARC) Signatories. ARC signatories are responsible for assessing maintaining continuous Airworthiness Review certification for all Company aircraft for which they have responsibility under the requirements of the Company's AOC.

1.3.12 Electronic Flight Bag (EFB) System Administrator. The EFB System Administrator is Responsible for:

- a. All EFB applications installed, and for providing support to the EFB users regarding these applications.
- b. Checking potential security issues associated with the applications installed.
- c. Hardware and software configuration management of the EFBs, and in particular ensuring no unauthorised software is installed
- d. Ensuring that only valid versions of the application software and current data packages are installed on the EFB system.
- e. Ensuring the integrity of the data packages used by the applications installed.
- f. Ensuring that systems are in place such that all EFBs are charged and updated prior to outbound flight from a Home Base.
- g. Ensuring compatibility when new IOS and App updates are released prior to Company iPads being updated.
- h. Advising on Normal and Non-Normal Operating Procedures contained in the Operation Manuals.
- i. Ensuring arrangements to enable continuity of EFB management in their absence including delegating Local Administrators.

1.3.12.1 EFB Local Administrator. The EFB Local Administrator is Responsible for:

- a. Ensuring that all EFBs are charged and updated prior to outbound flight from Home Base
- b. Issue and Receipt of Company EFBs
- c. Overall responsibility for EFBs in the local base
- d. Updating IOS on instructions from the EFB System Administrator
- e. Reporting defects to the System Administrator

1.3.13 Compliance Monitoring Manager. Answering directly to the Accountable Manager, the Compliance Monitoring Manager (CMM) will be responsible for the overall management of the Company Compliance System. The Compliance System and the CMM detailed responsibilities are described in more detail at Section 3 of this Manual and, more specifically, in the Company's Compliance Manual, which the CMM owns.

- a. To establish and maintain an independent CMS which ensures that Company activities are monitored for compliance with the applicable regulatory requirements, and any additional requirements as established by the operator, and that these activities are being carried out properly under the supervision of the relevant HoD.
- b. To implement an internal CAP and ensuring it is properly maintained, continually reviewed and improved.
- c. To ensure that any observed non-compliances or unacceptable standards are brought to the attention of the individual concerned, for rectification within a specified timescale.
- d. To maintain and monitor a system for the reporting and control of non-conformances.
- e. To carry out compliance audits.
- f. To ensure full records of such compliance audits are available in a format that is acceptable to the relevant Competent Authority.

- g. To appoint independent internal or external auditors as required and to control the approval of certifying and audit personnel, including training and qualification procedures.
- h. Ensuring that external personnel used to perform compliance audits or inspections have relevant knowledge, background and experience as appropriate to the activities being audited or inspected, including knowledge of and experience in compliance monitoring.
- i. Ensuring that any such audits or inspections undertaken by external personnel are performed under the CMM's direction.
- j. To ensure that systems are in place for the qualification and control of any specialised activities (e.g. CAMO auths etc).
- k. To monitor the amendment of the Company's Manuals and Expositions, including any associated Procedures Manuals, and to submit such amendments to the relevant owner for their approval.
- l. To ensure that all CMS documentation is controlled and of a standard which reflects current requirements and best practice.
- m. To liaise with the Regulators in order to ensure compliance with all specified requirements.
- n. To ensure that Root Cause Analysis, Immediate Actions and Root Cause correction action required, as a result of external or internal audits and to verify that those actions taken by the manager responsible in response to any finding of non-compliance, is in accordance with established procedures.
- o. Evaluate the effectiveness of Root Cause Analysis, Immediate Actions taken and Root Cause Correction actions through the follow up process.
- p. Provide the Management Group of Persons with an independent assessment of Root Cause Analysis and CMS performance.
- q. To provide the Accountable Manager with all necessary information to enable him to respond to the Regulatory Authorities in respect of compliance matters.
- r. To provide the Accountable Manager feedback of all audit findings.
- s. To promote customer and supplier feedback throughout 2Excel.

1.3.14 Group Safety Manager. The Group Safety Manager will be responsible for running the Company's Safety Management System (SMS) which is detailed at Section 3. In particular he will continue to develop the Company's SMS and maintain functional control of the Company's Flight Safety systems and processes, and coordinate action from incident and accident reports.

1.3.15 Facilities Manager. The Facilities Manager is responsible to the [Business Support Manager](#) for the following:

- a. The daily management of Company establishments, facilities and installed equipment, including their maintenance schedules and associated record keeping.
- b. Ensuring the adequacy of facility monitoring provisions.
- c. The administration of security, fire and communication systems.
- d. The organisation, management, administration and oversight of any and all Contractors engaged in the Company's facilities modification and maintenance.

- e. Liaison with relevant airport authorities regarding any facilities based Company requirements.
- f. Management of facility support and maintenance contracts.
- g. Ensuring facilities remain compliant with Company Health and Safety and Environmental Policy.
- h. Facilities based Risk Assessments.
- i. Management of Company crew houses.
- j. Responsible for Security within the hangar & Issuing of company passes and dealing with airport airside & crew passes.

1.3.16 Ground Support Manager. The Ground Support Manager is responsible to the [Director of Ground Operations](#) for the following:

- a. Overall responsibility and supervision of ramp staff, equipment, training and procedures at Doncaster & Sywell.
- b. Ensure Ground Support SOPs / Training / Centrik are up to date and fit for purpose, monitoring for any changes in publications or organisational requirements.
- c. Day to day rostering of ramp staff and responsibility for running zero hour's staff and submission of timesheets.
- d. Oversight of GSE serviceability and maintenance
- e. SMS Rep for Ground Support.

1.3.17 Head of Cabin Services. The HoCS is responsible to the [Director of Flight Operations](#) for:

- a. The amendment and updating of the Cabin Crew Operations Manual to ensure compliance with statutory regulations and Company requirements. Alongside this, the development of 2Excel's Cabin Crew standard operating procedures, created to guide the cabin crew in the completion of their duties and improve overall safety on board.
- b. The amendment of the cabin crew elements of the OM Part D Training Manual to ensure compliance with statutory regulations and Company requirements and to improve cabin crew training standards.
- c. The implementation and oversight of all cabin crew in-flight training and testing procedures ensuring the highest standards of safety on board all 2Excel Broadsword flights. This includes certifying the satisfactory completion of all checks and tests performed on cabin crew and maintaining accurate training records for each cabin crew member.
- d. The recruitment and selection of Broadsword VIP cabin crew, Senior Cabin Crew and Ground Training Instructors and Line Trainers.
- e. The discipline, competency and management on a day to day basis of the Cabin Services Department in the fulfilment of their duties. This includes the Deputy Head of Cabin Services, Inflight Catering Coordinator, Service Delivery Officer and all 2Excel Cabin Crew members.

- f. To be accountable to the CAA and internal auditors for the compliance of the cabin services department and responding to findings and observations promptly and proactively.
- g. To be responsible for the service standards and delivery on board all 2Excel Broadsword B737 flights. Management of the Catering Team in the development of Broadsword B737 service standards, standard product and branding, ensuring a VIP experience is delivered on all flights.
- h. Promotion of the Broadsword cabin service delivery during meetings with clients and brokers.
- i. Ad hoc flying as a Senior Cabin Crew member and completion of cabin crew in flight check flights.
- j. Making recommendations to the Broadsword Head of Large Aircraft with regard to uniform, service delivery, cost savings and safety on board.

1.3.18 Deputy Head of Cabin Services. The DHoCS reports to the Head of Cabin Services and assists them in their duties. Their responsibilities include the following:

- a. Assisting the Head of Cabin Services in making amendments and updating the cabin crew operations manual and training manual as required.
- b. Assisting in the creation and development of 2Excel's Cabin Crew standard operating procedures and workplace procedures.
- c. Participating in the recruitment and selection of Broadsword VIP cabin crew, Senior Cabin Crew and Ground Instructors and Line Trainers.
- d. Responsible to the Head of Cabin Services for the training and development of new SCCMS, Line Trainers and Ground Instructors.
- e. The creation and ongoing development of training syllabi and course material for all 2Excel Cabin Crew training courses. Ensuring the training delivered remains compliant with the Company training manual in accordance with EASA.
- f. In conjunction with the Crew Training Planner, the management, organisation and delivery of 2Excel cabin crew training courses.
- g. Daily administrative tasks within the cabin services department.
- h. The disciplining and competency of cabin crew within the department as directed by the Head of Cabin Services.
- i. Daily monitoring and actioning of cabin crew flight reports, ensuring all feedback is acted upon promptly, recorded and communicated to the relevant departments for continued improvement in the Broadsword service delivery.
- j. Assisting in the day to day management of the cabin services department and catering team. This includes deputising for the Head of Cabin Services as required.
- k. Ad hoc flying as a Senior Cabin Crew member and completion of cabin crew check flights

1.4 Authority, Duties and Responsibilities of Aircraft Captains. The status of Aircraft Captain for CAT Operations will be conferred on a pilot once he has complied with the licensing, experience, recency and testing requirements of this Manual. Aircraft captains shall be responsible to the Director of Flight Operations through the Chief Pilot for the safe and efficient operation of the aircraft under their command and the safety of the aircraft occupants **from the moment the aircraft is first ready to move for the purpose of taxiing prior to take-off, until the moment it finally comes to rest at the end of the flight and the engine(s) used as primary propulsion unit(s) is(are) shut down.** For CAT flights the pilot in command is also termed the Commander. Aircraft Captains shall:

- a. Have final and sole authority for the operation of the aircraft during all stages of a flight and shall give absolute precedence to safety in setting priorities and making decisions, but do so with regard for economy, passenger comfort and the flight schedule.
- b. Be familiar with relevant national and international air legislation and agreed aviation practices and procedures as well as the contents of this Manual.
- c. Have authority to give all commands deemed necessary to ensure the safety of the aircraft and of the people carried in it. All persons carried on the aircraft shall obey all lawful commands given by him.
- d. Have authority to refuse flight of or return to base with, any passenger who, in his opinion, may represent a potential hazard to the safety of the aircraft.
- e. Ensure that all passengers have been fully briefed on relevant safety procedures, methods of escape and safety equipment carried on board the aircraft **and be satisfied that relevant emergency equipment remains easily accessible for immediate use.**
- f. Ensure that this Manual, operational procedures and aircraft checklists are fully complied with.
- g. **Not allow a person to be carried in the aircraft who appears to be under the influence of alcohol or drugs to the extent that the safety of the aircraft or its occupants is likely to be endangered.**
- h. **Have the right to refuse transportation of inadmissible passengers, deportees or persons in custody if their carriage increases the risk to the safety of the aircraft or its occupants.**
- i. Ensure that the weather forecast and reports for the proposed operating area and flight duration indicate that the sortie may be conducted without infringing the Company's operating minima.
- j. Take all reasonable steps to ensure that the aircraft and any required equipment, is serviceable prior to commencing the flight.
- k. Decide whether or not to accept and aircraft with unserviceabilities allowed by the Minimum Equipment List (MEL).
- l. In the absence of a qualified Company or sub-contracted engineer, ensure that aircraft refuelling is supervised with particular attention being paid to:
 1. The correct grade and amount of fuel and oil;
 2. Fuel water checks;
 3. Fire safety precautions;

4. Checking filler caps for correct replacement and security after refuelling.
- m. Take all reasonable steps to ensure that the aircraft mass and balance is within the calculated limits for the operating conditions.
 - n. Confirm that the aircraft's performance will enable it to complete safely the proposed flight taking into account the aircraft configuration, environmental conditions and the operation of systems which may have an adverse effect on performance (including confirming that sufficient oxygen is carried on the flight).
 - o. Forbid any crew member or passenger from conducting any activity during take-off, initial climb, final approach and landing that are not required for the conduct of the safe and efficient operation of the aircraft.
 - p. Ensure as far as practical that all passengers remain properly secured in their seats whenever the aircraft is taxiing or flying and that any cargo is securely stowed in the approved stowages.
 - q. Ensure that the aircraft pre-flight inspection has been carried out.
 - r. Ensure that the documents and manuals required for flight are valid and carried.
 - s. In an emergency situation that requires immediate decision and action, take any action he considers necessary under the circumstances. In such cases he may deviate from rules, operational procedures, and methods in the interests of Safety. Whenever an aircraft in flight has manoeuvred in response to an airborne collision avoidance system (ACAS) resolution advisory (RA), the commander shall submit an ACAS report to the competent authority. Whenever a potential bird hazard is observed, the commander shall inform the air traffic service (ATS) unit as soon as flight crew workload allows. Whenever an aircraft for which the commander is responsible suffers a bird strike that results in significant damage to the aircraft or the loss or malfunction of any essential service, the commander shall submit a written bird strike report after landing to the competent authority.
 - t. Ensure that flight recorders are not disabled or switched off during flight, and that in the event of an occurrence other than an accident or a serious incident that shall be reported according to ORO.GEN.160(a), flight recorders' recordings are not intentionally erased and in the event of an accident or a serious incident, or if preservation of recordings of flight recorders is directed by the investigating authority that:
 - i. Flight recorders' recordings are not intentionally erased;
 - ii. Flight recorders are deactivated immediately after the flight is completed; and
 - iii. Precautionary measures to preserve the recordings of flight recorders are taken before leaving the flight crew compartment;
 - u. Ensure that a continuous listening watch is maintained on the appropriate radio communication frequencies at all times whenever the flight crew is manning the aircraft for the purpose of commencing and/or conducting a flight and when taxiing. The commander shall, as soon as possible, report to the

appropriate air traffic services (ATS) unit any hazardous weather or flight conditions encountered that are likely to affect the safety of other aircraft.

- v. Prohibit smoking in the aircraft at all times.
- w. Ensure that aircraft emergencies, IMC conditions and aircraft malfunctions are not simulated for any purpose on CAT flights.
- x. EFBs - The Aircraft Commander is responsible for ensuring:
 - Three (Four on the B727) serviceable iPads are carried with at least 70% charge at the start of the FDP (this may be reduced to two iPads for Single Pilot operations)
 - That there is sufficient charge for the duration of each subsequent individual flight
 - A fully charged battery pack and charging cable is carried (Battery not applicable for the B727)
 - The installed applications are up to date
 - IOS on EFB iPad is NOT updated unless instructed by the EFB Administrator and that any unserviceability's are reported immediately to Operations.

1.5 Duties and Responsibilities of Crew Members Other Than the Aircraft Captain

1.5.1 General. All crew members shall be responsible for the proper execution of their duties that are related to the safety of the aeroplane and its occupants or are specified in the Company Operations Manual. No person shall recklessly or negligently act in a manner to endanger an aircraft or any person therein nor to cause or permit an aircraft to endanger any person or property. Any crew member must report any incident that has, or may have, endangered safety and use the Company's incident reporting scheme as detailed at Section 11 of this Part of the Manual.

1.5.2 The First Officer. The First Officer (or Co-pilot) is responsible to the Aircraft Captain for assisting in the safe and efficient conduct of the flight and for deputising for him in the event of his high work-load or incapacitation. First Officers shall be responsible to the Aircraft Captain for the safe and efficient operation of the aircraft when it is under their control and for the safety of the aircraft occupants during its flight. First Officers:

- a. Shall assist the Aircraft Captain as delegated, allocated or requested;
- b. May operate the aircraft during any stage of flight in accordance with Company Standard Operating Procedures;
- c. Shall give absolute precedence to safety in setting priorities and making decisions, but do so with regard for economy, passenger comfort and the flight schedule;
- d. Shall volunteer advice information and assistance to the Aircraft Captain that may favourably contribute to the safe and efficient conduct of the flight;
- e. Shall seek and receive any information or explanation from the Aircraft Captain required to fulfil his function;
- f. Shall be familiar with relevant national and international air legislation and agreed aviation practices and procedures as well as the contents of this Manual.

- g. Shall support the Aircraft Captain in maintaining discipline and Company standards of professionalism and safety;
- h. Shall brief passengers on relevant safety procedures, methods of escape and the safety equipment carried on board the aircraft. On B727 aircraft this duty is more usually completed by the Flight Engineer. On B737 aircraft this duty is completed by the Cabin Crew.

1.5.3 Flight Engineers. The flight engineer is responsible to the Aircraft Captain (or First Officer in the event of Captain incapacitation) for assisting in the safe and efficient conduct of the flight. Flight engineers shall be responsible to the Aircraft Captain for the safe and efficient operation of the aircraft when it is under their control and for the safety of the aircraft occupants during its flight. Flight engineers:

- a. Shall assist the Aircraft Captain as delegated, allocated or requested.
- b. Shall operate the aircraft during any stage of flight in accordance with Company standard operating procedures.
- c. Shall give absolute precedence to safety in setting priorities and making decisions, but do so with regard for economy, passenger comfort and the flight schedule.
- d. Shall volunteer advice information and assistance to the Aircraft Captain that may favourably contribute to the safe and efficient conduct of the flight.
- e. Shall seek and receive any information or explanation from the Aircraft Captain required to fulfil his function.
- f. Shall be familiar with relevant national and international air legislation and agreed aviation practices and procedures as well as the contents of this Manual.
- g. Shall support the Aircraft Captain in maintaining discipline and company standards of professionalism and safety.
- h. Shall carry out the duties contained within OM Part B, assigned to him.
- i. Shall (in the absence of qualified Cabin Crew) brief passengers on relevant safety procedures, methods of escape and the safety equipment carried on board the aircraft.

1.5.4 Mission Crew / Mission System Operators. Mission crew, which may include CAA-agreed passengers, are passengers carried for the specific purpose of operating mission equipment installed or carried in the aircraft which is being used on special operations tasking. Where such passengers have direct impact on the operation of the aircraft as a system, for instance but not limited to, engineers operating test equipment or operators steering cameras carried for the purpose of the mission, they may require particular experience levels, qualifications, specialist training and even testing, in accordance with Parts D and S of this Operations Manual. Mission crews may be called upon to check the serviceability of mission equipment and as such they may have a direct bearing on the success of the mission. Specific examples are described at Part S.

1.5.4.1 Task Specialists. For Part-SPO flights Task Specialists may be carried on board the aircraft. In these circumstances and where the Task Specialist is not commuting as a passenger they shall:

Operate only the equipment installed on the aircraft for the purpose of completing their tasks.

- a. Obey all orders given by a crew member.
- b. Where necessary carry out any duties they might be reasonably expected to complete to promote safe, efficient flight.
- c. Familiarise themselves with the relevant safety aspects of the aircraft.
- d. Assist the Flight Engineer in any reasonable request to promote efficiency of the operation.
- e. Where necessary offer technical support to enhance the efficiency of flight.

1.5.5 Cabin Crew. Cabin Crew will carry out their duties in accordance with the guidance laid down in Part E of this Operations Manual. In addition, they shall:

- a. Assist the Aircraft Captain as delegated, allocated or requested.
- b. Operate the on-board equipment in their charge during any stage of flight in accordance with Company standard operating procedures.
- c. Give absolute precedence to safety in setting priorities and making decisions, but do so with regard for economy, passenger comfort and the flight schedule.
- d. Volunteer advice information and assistance to the Aircraft Captain that may favourably contribute to the safe and efficient conduct of the flight.
- e. Seek and receive any information or explanation from the Aircraft Captain required to fulfil their function.
- f. Perform their duties to best engage with their passengers; meet their reasonable needs and promote the VIP Charter product to the best of their ability.
- g. Support the Aircraft Captain in maintaining discipline and Company standards of professionalism and safety.
- h. Carry out the duties contained within OM Part B, assigned to them.
- i. Brief passengers on relevant safety procedures, methods of escape and the safety equipment carried on board the aircraft.

1.5.6 The Blades Ground Staff. The Blades ground staff shall be responsible to The Blades Team Leader for the safety of all Blades passengers prior to aircraft embarkation and after disembarkation and, specifically, they shall:

- a. Ensure passenger pre-flight, equipment familiarisation and safety briefings are carried out in accordance with the Operations Manual;
- b. Ensure all passengers fall within the weight and size limitations laid down for Company operations;
- c. Ensure the safe transfer of the passengers to and from the aircraft. (Note. the maximum number of passengers to each escorting member of qualified Company staff shall be 9);
- d. Assist the Aircraft Captains with marshalling and strapping in procedures;

Section 2

Operational Control and Supervision

2.1 Company Supervision of the Operation

2.1.1 In compliance with ORO.GEN.110, the duties and responsibilities of the Company's operational management system are described at Section 1 of Part A to this Manual.

2.1.2 The Accountable Manager is responsible for reviewing the Manual at appropriate intervals, particularly in connection with changes in regulations, technology, the number and types of aircraft and the flying programme, and for making recommendations as to the numbers, qualifications and training of management, technical and ground personnel required for the safe and efficient operation of the Company's aircraft. In particular he will ensure that:

- a. Crew licences and qualifications are valid for the periods throughout which aircrew are scheduled to fly (although day-to-day management of this process is delegated to the Chief Pilot);
- b. Crew members' proficiency has been checked and found satisfactory at the specified intervals (although day-to-day management of this process is delegated to the Chief Pilot);
- c. The requisite flight, personnel and maintenance records are being retained, analysed and stored for the statutory periods in order that the Company's established quality control procedures may be effectively implemented (although day-to-day management of this process is delegated to the Chief Pilot);
- d. Operations personnel are competent to perform their duties and that levels of competence are monitored (although day-to-day management of this process is delegated to the Operations Director);
- e. Sub-contractors are monitored by departmental heads and that their performance is discussed at regular intervals;
- f. The procedures enshrined herein are followed (although day-to-day assessment is delegated to the Compliance Monitoring Manager);
- g. The operations are as safe as reasonably practical (although day-to-day monitoring of risk is delegated to the Safety Manager and his departmental Safety Representatives).

2.1.3 Preservation of Company Documents. The Company will ensure adequate storage and reliable traceability of all activities developed in accordance with ORO.GEN.200 requirements for the documentation of all management system key processes. In addition the Company will retain original documentation, or copies thereof, in a form acceptable to the Authority for the periods stated below, even if the Company ceases to be the Operator of the aircraft and will store such records in a manner that ensures protection from damage, alteration or theft.

Page	Time	Kept By
Flight Planning Logs (where used)	3 months	Ops Dctr
Weight and Balance Sheets	3 months	Ops Dctr
Air Safety Reports and Mandatory Occurrence Forms	3 months	SMS Mgr
Flight Test Cards	3 months*	Chief TP
Flight Time Limitation Scheme Logs	12 months	Ops Dctr
Discretion Reports	6 months	Chief Pilot
Technical Log Sortie Record Pages	36 months	CAM
Technical Deferred Defects Page	24 months	CAM
Training Reports	36 months	Chief Pilot
Compliance System Records	60 months	CMM

* Or completion of the Test/Trial Report (Whichever is longer)

2.2 System of Promulgation of Additional Operational Instructions and Information

2.2.1 Flight Crew Notices, Cabin Crew Notices, Training Notices and Staff Instructions. Additional operational instructions and information will be made the subject of Flight Crew Notices (FCNs), Cabin Crew Notices (CCNs), Training Notices (TNs) and Staff Instructions (SIs). These will be promulgated by use of the Notices section within the Documents module of Centrik. Flight Crew and Cabin Crew are required to acknowledge via Centrik that they have read and understood these instructions prior to flying. Best practices which are not mandatory procedures or compliance items will be promulgated through Operational Advice Notes.

2.2.1.1 Publications. The following publications shall be accessible to Company Operations.

- EASA IRs – (maintained electronically via EASA website)
- CAP 393 – Air Navigation Order and the Regulations (maintained electronically via CAA Website)
- Aeronautical Information Circulars (maintained electronically via NATS website)
- The UK AIP (maintained electronically via NATS website)
- Class 1 and Class II NOTAMs (maintained electronically)

2.2.1.2 Aircraft Documentation. For each Company aircraft, a folder will be maintained containing the following documents:

- Original Certificate of Registration;
- Original Certificate of Airworthiness;

- c. Original aircraft Radio Licence;
- d. Hull and Third Party Liability Insurance Certificate(s) (copy);
- e. Certificate of Release to Service (copy);
- f. Certified true copy of the Air Operator's Certificate;
- g. MoD Airfield Waiver (copy);
- h. Aircraft Noise Certificate (copy, where applicable);
- i. The operations specifications relevant to type issued with the AOC (copy).

This folder is to be carried on each flight, within a fire proof holder. In case of loss or theft of the above documents, the operation is allowed to continue until the flight reaches the base or place where a replacement document can be provided.

2.2.1.2.1 The following manuals are to be available to the flight crew on every flight by each B727 or B737 aeroplane operated by the Company:

- a. Aeroplane Flight Manual (AFM)
- b. Airplane Operations Manual (AOM) Volume 1
- c. Company Operations Manual A, B, and C (via EFB)
- d. 3 x QRH (Quick Reference Handbook) (1 x QRH in case of B737)
- e. Flight engineer data book (B727 only)
- f. Minimum Equipment List (MEL)
- g. Boeing Weight and Balance Control and Loading Manual (basic); and Valsan and Ancra Supplement
- h. IATA Dangerous Goods ERG
- i. Navigational equipment user's manual
- j. Latest copy of the NAT Doc 007 - Guidance Concerning Air Navigation in and above the North Atlantic MNPS Airspace (via EFB)
- k. Passenger **Safety** Briefing cards (3 x Passenger **Safety** Briefing cards in case of B727)
- l. Cabin Crew Safety and Emergency Procedures Manual (B737 only)

2.2.1.3 Crew Documentation. Each Crew Member's Licence should be readily available. Crew Members are to bring their Licences to work when they are on, or might be on, flying duties and are to carry their licence with them when deploying from base. The Company will keep a copy of the licence of each Company Crew Member on file.

2.2.2 Daily Pre-Flight Brief. Owing to the nature of the Company's operations, separate lines of business may not start work at the same time. Therefore, the daily Pre-Flight Brief will be prepared by the Aircraft Captain. It should include:

- a. Weather briefing for local area, destination and diversion airfields;
- b. ATC serviceability states;
- c. Operating area restrictions and information;
- d. Flight Safety and FCN updates;
- e. Passenger numbers and special requirements;
- f. Aircraft serviceability states;
- g. NOTAMs affecting planned sorties.

2.3 Accident Prevention and Flight Safety Programme

2.3.1 The Safety Management Officer will control the Company's Flight Safety processes. In conjunction with the Chief Pilot, he is to ensure that all relevant MORs, SNs and SIBs, Flight Safety magazines, incidents and accident reports involving aircraft operated by the Company are brought to the attention of Company flightcrew, cabin crew and staff. He is also to encourage awareness of flight hazards particular to the Company aircraft, to monitor the CAA's Safety Critical Information (Safety Directives), Safety Notices and Information Notices process for any operational Airworthiness Directives, and to promote discussion amongst the pilots and ground staff with regard to any matter regarding safety of the Company aircraft or operation. The Company's Flight Safety Process and pertinent lessons learned by other operators are to be subsumed into the Company's Safety Management System. Notwithstanding this overarching responsibility, all operational Company personnel are to be assiduous in keeping themselves up to date with the latest relevant information.

2.4 Operational Control

2.4.1 The system for exercising operational control is approved through the issuance of the AOC and as such Company aircraft will be operated within the schemes laid out in this Manual. No changes may take place without the prior permission of the Accountable Manager, Operations Director, DFO, Chief Pilot or Chief Test Pilot. All Aircraft Captains must ensure that they operate within the law and rules of the air; this Operations Manual does not authorise breaking of the normal rules. However, where the missions require it, Aircraft Captains may use the alleviations detailed in, and operate in accordance with, Part S to this Manual for Special Flight Operations, and/or the procedures enshrined in the LE FTOM for Flight Test.

2.4.2 The Operations Director is responsible for arranging that Company resources are available for scheduled events.

2.4.3 For Company EA300 and PA31 aircraft whenever possible, individual passenger masses shall be obtained in advance in order to permit advanced programming to be conducted. More accurate specific calculations will be made by the Aircraft Captain prior to flight.

2.4.4 The DFO is responsible for the control and categorisation of airfields in accordance with the definition at Section 8, Para 8.1.3.2.1 and for the pertinent procedures and for maintaining Part C.

2.5 Powers of The Authority

2.5.1 Access to Company Flying. Save for the occasions detailed below, any person authorised by the Authority is permitted at any time to board and fly in any aeroplane operated in accordance with the Company's AOC. The CAA FOI is to be treated as a CAA-agreed passenger and may be flown whenever he requests it unless otherwise decided by the Commander for the flight crew compartment in accordance with CAT.GEN.MPA.135 and Section 8 Para 8.3.11.2 of this manual, in the interests of safety.

2.5.2 Access to Documents and Records. The Company will give any person authorised by the Authority access to any documents, and records which are related to flight operations and aircraft maintenance. The Company will produce these within a reasonable period of time when requested.

2.6 Flight Hours Reporting. In accordance with EASA CAT.OP.MPA.315, 2Excel shall make available to the Competent Authority the hours flown for each aircraft operated during the previous calendar year.

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Section 3

Management System

3.0 Introduction

3.0.1 This section of the Operations Manual sets out an overview of the policies and procedures of the 2Excel Aviation Ltd Management Systems which have been established in order to achieve and maintain continued compliance with EASA-IR. The Management Systems apply to the activities of all Company employees and sub-contractors whose duties and responsibilities affect the safe operation of Company aircraft. The Authority continues to be responsible for the drawing up of, and the overall surveillance of, the rules; the Operator is responsible for the safety of the operation under the Safety Management System and the compliance monitoring of those rules under a Compliance Monitoring System. The 2 systems are inextricably linked; their integration is shown at [Figure 1](#) on [Page 8](#) of this Section.

3.1 Safety Management System

3.1.1 Policy. Within 2Excel, safety is a prime consideration at all times. We must all be alive to all manner of risks in all our operations and, at all levels, we must all deal with them.

As the Accountable Manager it is my responsibility to maximize the level of safety in all our operations and I will ensure that adequate resources are provided to promote safe and effective operations. However, I cannot make things safe on my own and, applying resource is not enough. Every single person in the Company has a duty to play their part in ensuring that we don't take, or carry, unnecessary risk; in that, our safety culture is key.

While we want to minimize risk, that doesn't mean we won't take risk or we wouldn't do anything at all. As a Group and as responsible individuals within the Group, we will 'proactively manage risk' where we deem taking it to be necessary. If we identify a risk and we assess it to be too high, we will mitigate it until it is acceptable or we will change what we are doing.

Identifying risk is *the* most difficult fundamental to achieve. Our SMS gives us a process that helps us to quantify and manage risk. However, in a Company like ours, which is diverse, rapidly changing and relies on the skills and quality of its people to do difficult things safely and well, it is culture that really matters. An underlying culture of safety is the single most important facet of our SMS. While this Manual provides us with helpful, useful processes and methods to help formalise and record our risk management, first and foremost, it is our safety culture that allows us to proactively manage the risks that *will* occur with new and old activities, with change and from the external effects on our operations at every level.

Therefore, I exhort all staff and stakeholders to report openly and honestly potential hazards, threats and safety-related events. To that end, we have an open reporting culture that encourages open, free and frank reporting within our ‘just culture.’ That culture will not accept wilful misconduct, negligence or illegal activity but, recognizes that, in trying new things and continuously improving how we act, mistakes will be made. Each of us must ‘own our own mistakes’ because doing something about them will make us safer. The SMS helps us to do that.

Our SMS is a process, a process that should not become a burdensome, compliance-based, box-ticking exercise that just documents risk. If it does, we will have failed. Following that path, we not only risk failing to capitalize on our safety culture but we also risk stifling the very thing that makes us safe. We must preserve and develop our safety culture. Therefore, our SMS has been designed to help us and to give us the tools to reduce risk. It is bespoke to us and we should be proud of it. It is also a requirement! It has been assessed and it has been approved. It is the product of extraordinary efforts by the Safety Management Team and it is helpful, useful and practical. It is there for you.

Through our SMS we strive to achieve the following objectives:

- To reduce risks to as low as reasonably practical (ALARP);
- To have an accident and major incident free environment;
- To cement our safety culture;
- To achieve continuous safety improvement;
- To operate an effective SMS;
- To achieve and maintain full compliance with the statutory national and international regulations that are applicable to our operations.

These objectives are for the benefit of the Company, its employees and its customers. We have a shared responsibility to achieve these objectives because safety is everyone’s responsibility. Without safety, 2Excel is finished.

Personal Data
Name
Accountable Manager

3.1.2 Risk Management. The process for identifying safety hazards and for evaluating and managing the associated risks has been fully documented within the Company Safety Management System Manual (SMS Manual).

3.1.3 Hazard Reporting. The SMS cannot function if hazards and potential hazards are not identified. A crucial part of hazard identification is hazard reporting. The Company operates a confidential occurrence system; its aim is to enhance safety and not to apportion blame. All employees are encouraged to use the system. It is important to remember that hazard reporting is not intended to replace our culture of open and honest debriefing. Hazard reporting and identification can be reactive (from an event that has happened), or proactive (from a potentially unsafe situation being identified), or predictive (trying to forecast what

might or could happen in the future). 2Excel Aviation are required by EU law to report occurrences that meet certain safety trigger points, the circumstances of which are detailed in EU Reg 376 and Commission IR 2015/1018. All reports should be submitted to the Safety Manager using the Centrik reporting tool, they are then classified and transmitted onwards should they meet the EU reporting regulation. Individuals can still report directly and confidentially through the CAA Website.

3.2 Compliance Monitoring

3.2.1 Policy

- a. As a requirement of British and European Community air navigation legislation, the Company's Compliance Monitoring system is designed to ensure safe and legally compliant operations and the continued airworthiness of the aircraft under its control. Notwithstanding legislative requirements for it, our Compliance Monitoring System is a process that supports the Company's operational principles.
- b. 2Excel thrives on its performance as a world-class aviation-based business, performance that is embodied in the Company name and the core values and standards that those words represent. To maintain excellent performance in the challenging world of aviation requires the utmost professionalism from everyone involved. The Compliance Monitoring System is part of the process through which the Company achieves and maintains excellent standards of delivery. In simple terms, it checks that we do what we say we do and it advises where we can improve what we do.
- c. In meeting these objectives we are all responsible for supporting our Compliance Monitoring System, including the reporting of errors or incidents during the operation and maintenance of aircraft and for co-operating with internal and external Compliance Monitoring personnel.

3.2.2 Compliance Monitoring System. 2Excel sets out the Compliance aspects of the Management Systems in the Company Compliance Monitoring Manual (CM) [with functionality contained within the Quality module of the Centrik Management System.](#)

3.2.3 Compliance Monitoring Schedule. Compliance Monitors will carry out internal Compliance Monitoring activities, in line with the Annual Compliance Assurance programme, and will use a checklist generated from hierarchical documentation. They will perform Compliance Monitoring activities over the entire spectrum of the Company's flight operations, airworthiness, aircraft maintenance and ground operation activities. This will include those companies sub- contracted or contracted to repair, overhaul and maintain the aircraft and their component parts and any suppliers of any service to 2Excel Aviation Ltd that could affect flight operations and/or airworthiness.

3.2.4 Findings. Findings resulting from Compliance Monitoring activities will be presented to the operators representative for investigation to identify [Root Cause Analysis, Immediate Corrective Actions and Root Cause Correction](#) all of which will be subject to review by the CMM before acceptance.

3.2.5 Audits by the Authority. While not a formal part of the Company's Compliance Assurance programme, in accordance with its oversight requirements, the Authority will from time-to-time conduct Compliance Monitoring of the Company. Any findings will be addressed in accordance with the directives laid down and notified to the Company by the Authority.

3.3 Duties and Responsibilities

3.3.1 Accountable Manager. The Accountable Manager holds overall responsibility and accountability for all Company Management Systems including a direct accountability for Compliance and Safety.

3.3.2 Due to the size, nature and complexity of the Company activities (2Excel Aviation is classed as a Complex organisation) it employs a full time experienced Group Safety Manager and a full time trained, Form 4 certified and competent Compliance Monitoring Manager.

3.3.3 Group Safety Manager. The Safety Manager is the focal point for the development and improvement of the SMS, its administration and maintenance. The Safety Manager reports to and is answerable to, the Accountable Manager. The Safety Manager, through the 2Excel SMS, is to manage the SMS, drive his SMS Reps to maintain their registers, extract data and safety performance in order to identify trends to inform the Accountable Manager and the Safety Review Board.

3.3.3.1 Deputy Safety Manager. The Deputy Safety Manager assists the Safety Manager in the day-to-day running of the SMS and is the point of contact for safety matters at 2Excel Aviation while the Safety Manager is unavailable. The Deputy Safety Manager is responsible for ensuring that the correct level of training is given to all employees and for checking that mitigations are being implemented.

3.3.4 Safety Representatives. The Line of Business Safety Representatives are responsible for:

- a. Ensuring that SMS principles are used on a day-to-day basis within their respective Line of Business.
- b. Programming the Line of Business Safety Action Groups (SAGs).
- c. The completion of reports, investigations and risk assessments within Line of Business.
- d. Attending SMS Rep Meetings (chaired by the SM) to discuss:
 - On-going SMS activities within their Business Division.
 - Line of Business risk register.
 - Wider safety issues that may be applicable to other areas of the Company.
 - SMS culture, processes and standards.
 - Safety initiatives and strategies
 - Safety performance.
 - Feedback about the effectiveness of the SMS.

Note. If a Safety Representative is not available for a SAG, or the occurrence involves the Safety Representative, the respective Line Manager or, a suitably qualified person identified by the Line Manager, is to complete the process.

3.3.5 Safety Review Board (SRB). The SRB will meet at least semi-annually (nominally in January and July) to review safety performance and set Company strategic policy. The Safety Review Board will be chaired by the Accountable Manager and will be attended by the: Safety Manager, Deputy Safety Manager, Safety Representatives, Chief Pilot, Chief Test Pilot, Continuing Airworthiness Manager, Ops Director, Compliance Monitoring Manager, HR Manager, and, where applicable, relevant Third Party Contractors. The Competent Authority, the Director of Flight Operations (DFO) and the Fleet Captains will also be invited in order to conduct their Risk Based Oversight.

3.3.6 Safety Action Group (SAG). Each Line of Business will form a SAG which will meet when required to review safety within the Line of Business (LoB), complete occurrence reports, review its risk register and manage outstanding actions. It should comprise the HOD (Chair), SMS Rep, Fleet Captain, Fleet Manager and any other stakeholder or suitably qualified and experienced person (SQEP) deemed necessary. This meeting is to be minuted and a copy is to be provided to the Safety Department for monitoring and archiving. A Standing agenda is provided:

- Minutes of Previous Meeting
- Review of Occurrences
- Review of Risk Register
- Matters Arising
- AOB
- DoNM

3.3.7 Mini Safety Action Group (mSAG). An mSAG can be formed at any level at the discretion of the AM, SM or HOD. Its remit is to investigate and report on specific Occurrences, threats or hazards that may be too complex or time consuming or inappropriate for a formal SAG to consider. The Mini SAG may consist of SMEs from any stakeholder groups. These meetings must be minuted and a copy of those minutes must be provided to the safety department for archiving.

3.3.8 Compliance Monitoring Manager. The Compliance Monitoring Manager is responsible for implementing the Company's Compliance Monitoring System and achieving and maintaining regulatory compliance. In addition he has overall responsibility for Compliance Monitoring of the Management systems. He will report findings to the Accountable Manager not more than 3 working days after any audit has been performed.

3.3.9 Compliance Monitoring Assistants. Day-to-day Compliance Monitoring activities can be delegated to the nominated Compliance Monitoring Assistants. They are required to have access to all parts of the organization in order to carry out their duties and/or to verify the implementation of, and effectiveness of [immediate corrective action and root cause correction actions](#). The Compliance Monitoring Assistants remit includes, but is not limited to, assessing the Company's:

Actual flight operations
Ground de-icing-anti-icing
Flight support services
Load control
Technical standards
Operational procedures
Flight Safety procedures
Operational control and supervision
Aircraft performance
All weather operations
Communications and Navigation Equipment and Practices
Mass, Balance and Aircraft Loading
Instruments and Safety Equipment
Ground operations
Flight and Duty Time Limitations, rest requirements, and scheduling
Aircraft maintenance/operations interface
Use of the MEL
Flight crew
Cabin crew
Dangerous goods
Security

3.3.10 In order to assiduously check the Company's Compliance Monitoring control procedures, because (although he sits outside the direct systemic management team), the Compliance Monitoring Manager is a Company employee, who may, if required, arrange for a nominated [2Excel Group Compliance Monitoring member](#) to visit, in order to independently evaluate the Company's Compliance Management system.

3.4 Key Management System Processes

3.4.1 Key Management System processes [across the group](#) are further and fully documented in the following Company documentation:

- Safety Management System Manual
- Compliance Monitoring Manual
- Head of Departments (HoDs) Meeting
- [Company Integration Meeting](#)
- [Company Operations Meeting](#)
- [The JAM Meeting](#)
- [Individual Business Stream Meetings](#)
- Continuing Airworthiness Exposition
- Maintenance Organisation Exposition
- Scimitar Trials Handbook
- [Leading Edge](#) Flight Test Operating Manual

3.4.2 The process for amendment of Company manuals is documented within each individual manual; in the case of the OM it is detailed in Section 0.3.

- 3.4.3** The process for highlighting changes within Company manuals are summarised below;
- Key Company personnel have been issued with individual copies and this is controlled via the document distribution list contained within the document.
 - All other users are notified of the changes via the Flight Crew Notice (FCN) or Staff Instruction (SI) procedures managed by Operations.
 - Significant changes to the OM are additionally supported with a presentation for key users.
- 3.5** **Emergency Response Plan.** The 2Excel Emergency Response Plan (ERP) is a standalone document maintained by the Company Operations Director. It provides the actions to be taken by the Organisation and / or individuals in case of an emergency. The ERP ensures orderly and efficient transition from normal to emergency operations and the subsequent return to normal operations.
- 3.6** **Contacting SMS Personnel.** The key personnel within the SMS are not detailed in this manual, however, the roles and associated names are displayed in 2Excel Operations. Furthermore, the Safety Manager can be contacted at PD [@2excelaviation.com](mailto:PD@2excelaviation.com) for any safety related issue.

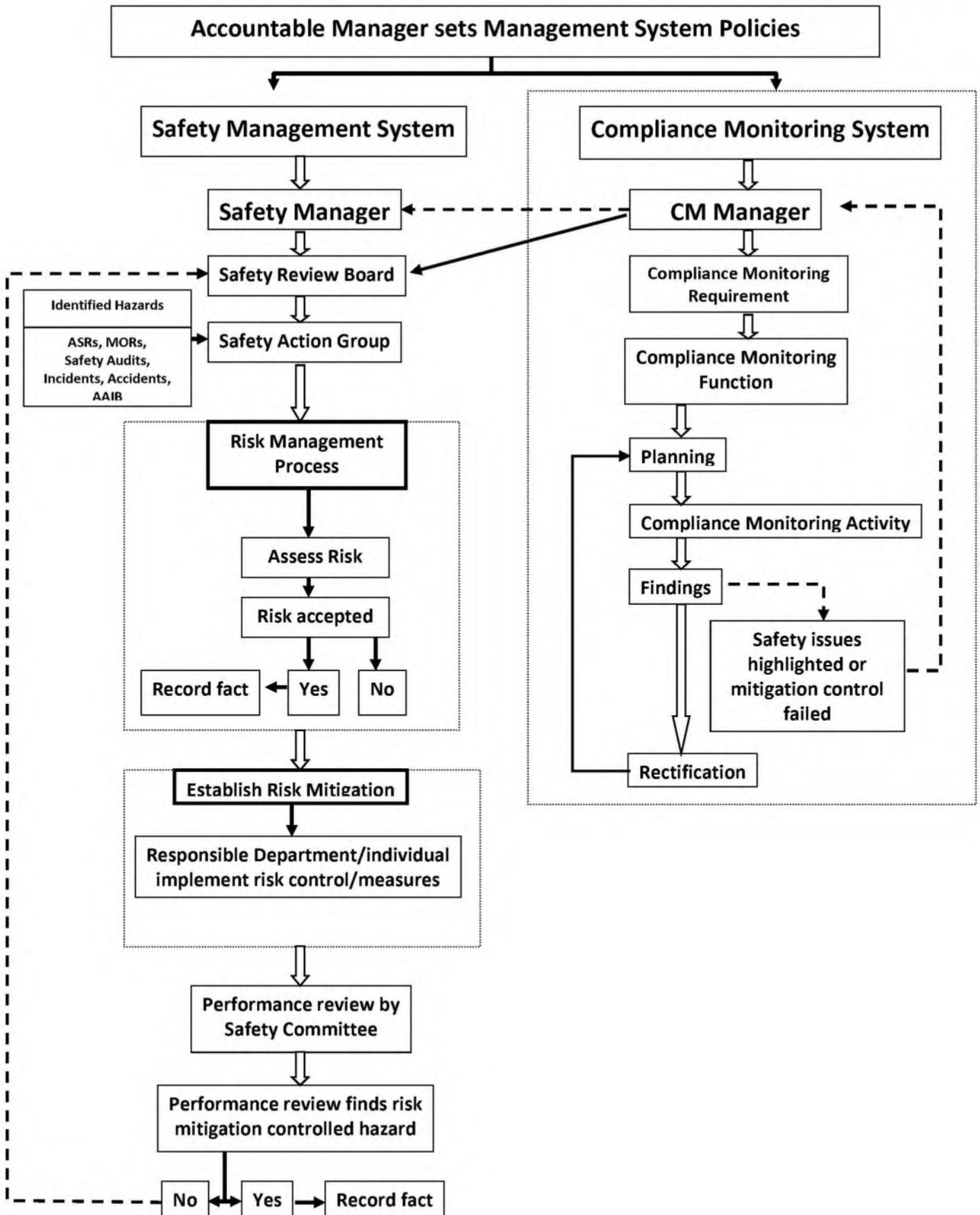


Figure 1. Safety Management and Compliance Monitoring System Interface

Section 4

Crew Composition

4.0 Introduction

4.0.1 The Company operates 4 classes and 5 types of aircraft: the 2-seat Extra 300L, the 6-seat PA-31 Navajo, the King Air BE200 in the 8 passenger seat configuration, the Boeing B727-2S2F aircraft in an Oil Spill Dispersant role and the Boeing 737-300 in 62 or 56 passenger seat VIP charter configuration.

4.0.2 Normal Company CAT and SPO flying covered by this Manual comprises:

- a. The Extra 300 aircraft being flown as a single-pilot operation with a single passenger;
- b. The PA-31 Navajo being flown with up to 6 passengers either as a single pilot operation or a multi-crew operation (one passenger may occupy the vacant right hand cockpit seat on Day VFR flights only).
- c. The King Air BE200 being flown either as a single pilot or a multi-crew operation with up to 8 passengers (an additional 9th passenger may occupy the vacant right hand cockpit seat on Single Pilot Day VFR flights only).
- d. The B727-2S2F being flown as a multi-crew operation.
- e. The B737-300 being flown as a multi-crew operation VIP Charter aircraft.

4.1 **Minimum Crew.** The minimum crew for 2Excel CAT and SPO flying will never be less than stated on the aeroplane Certificate of Airworthiness, the Aircraft Flight Manual or the Operations Manual. Qualification requirements are detailed at Section 5 to this Part of this Manual, but each crew member must hold a valid licence, be suitably trained, proficient, qualified and competent to carry out their assigned duties.

- a. All flying in the Extra 300 will be one pilot – the Aircraft Captain (unless dual under instruction).
- b. CAT and SPO flying in the King Air BE200 will be either single pilot or for multi-crew operations 2 pilots. One pilot will be nominated the Aircraft Captain for each flight. The nominated Aircraft Captain is the Aircraft Captain of the flight. To remove any ambiguity, it will be the Aircraft Captain that will sign the aircraft technical log and the load sheet as Captain of the aircraft. He will then remain in sole command of the

aircraft until he relinquishes command to another pilot or, the aircraft is handed over to an agent or officer of the Company on completion of the command period.

- c. CAT, SPO and PT flying in the PA-31 Navajo will be either one pilot or 2-pilot. Irrespective of the number of crew carried, one pilot will be nominated the Aircraft Captain for each flight. To remove any ambiguity, it will be the Aircraft Captain that will sign the aircraft technical log and the load sheet as Captain of the aircraft. He will then remain in sole command of the aircraft until he relinquishes command to another pilot or, the aircraft is handed over to an agent or officer of the Company on completion of the command period.
- d. CAT and SPO flying in the B727-2S2F will be multi-crew with 2 pilots and one flight engineer. One pilot will be nominated the Aircraft Captain for each flight. The nominated Aircraft Captain is the Aircraft Captain of the flight. To remove any ambiguity, it will be the Aircraft Captain that will sign the aircraft technical log and the load sheet as Captain of the aircraft. He will then remain in sole command of the aircraft until he relinquishes command to another pilot or, the aircraft is handed over to an agent or officer of the Company on completion of the command period.
- e. CAT flying in the B737-300 will be multi-crew with 2 pilots. One pilot will be nominated the Aircraft Captain for each flight. The nominated Aircraft Captain is the Aircraft Captain of the flight. To remove any ambiguity, it will be the Aircraft Captain that will sign the aircraft technical log and the load sheet as Captain of the aircraft. He will then remain in sole command of the aircraft until he relinquishes command to another pilot or, the aircraft is handed over to an agent or officer of the Company on completion of the command period. A minimum of 3 Cabin Crew must be onboard the aircraft before passengers can be boarded. Additional cabin crew members above the minimum crew complement may also be carried to provide a specific level of service, with duties in accordance with the OM E Section 5. Regardless of whether operating with minimum or normal crew complements, a Senior Cabin Crew Member (SCCM) must be part of the crew composition.

4.1.1 Single Pilot Crew. A single pilot crew may only be employed on IFR or night CAT operations in suitably certified aeroplanes if:

- a. The pilot has been trained in the single crew role (with particular reference to cockpit management);
- b. The pilot is suitably qualified;
- c. All his proficiency checks are valid;
- d. Aircraft equipment includes a serviceable, certificated autopilot with at least altitude and heading hold, a headset and boom microphone with a control column transmit button, and a conveniently placed illuminated chart holder.

- 4.1.2 VFR Operations.** A CPL holder may not operate as captain of an aeroplane outside a radius of 50nm from an aerodrome unless he has a minimum of 500hrs total flight time on aeroplanes or holds a valid Instrument Rating.
- 4.1.3 Extra 300 Seating.** Normally, the Aircraft Captain will occupy the rear seat of the Extra 300. However, during training and pilot testing, the Aircraft Captain may fly in the front seat. Single pilot operation must be from the rear seat.
- 4.1.4 PA-31 Seating.** For single pilot operations, the Aircraft Captain will occupy the left hand seat. For 2-pilot operations, check flights, or if RHS qualified, the Aircraft Captain may occupy either the left or the right hand seat according to the requirements of the sortie.
- 4.1.5 BE200 Seating.** The Aircraft Captain will occupy the left hand seat. However, during training and pilot testing, or if RHS qualified, the Aircraft Captain may occupy the right hand seat.
- 4.1.6 B727-2S2F Seating.** The pilot handling the aircraft is designated as the pilot flying (PF), the other pilot is known as the pilot monitoring (PM). The pilot occupying the left hand seat is the PF for all ground phases immediately prior to take-off and after landing. The pilot-in-command will be designated by the Company and is termed the Aircraft Captain. The Aircraft Captain must be a qualified Captain approved for the intended role of the mission. The Aircraft Captain may occupy either pilot seat if he is 'right seat' qualified. Only flight engineers may occupy the flight engineer's position. Flight engineers may not occupy any pilot seat except for pre- and post-flight procedures.
- 4.1.7 B737-300 Seating.** The pilot handling the aircraft is designated as the pilot flying (PF), the other pilot is known as the pilot monitoring (PM). The pilot occupying the left hand seat is the PF for all ground phases immediately prior to take-off and after landing. The pilot-in-command will be designated by the Company and is termed the Aircraft Captain. The Aircraft Captain must be a qualified Captain approved for the intended role of the mission. The Aircraft Captain may occupy either pilot seat if he is 'right seat' qualified.
- 4.2 Inexperienced Crew.** Inexperienced crew members will not be crewed together except, when agreed by the Authority, a new aeroplane is being introduced. Flight crew are defined as inexperienced [following completion of a type rating, and the associated line flying under supervision, until they have achieved on type either:](#)
- i. [100 flight hours and flown 10 sectors within a consolidation period of 120 consecutive days; or](#)
 - ii. [150 flight hours and flown 20 sectors \(no time limit\).](#)
- Inexperienced pilots will be so classed on their form D-1.
- 4.2.1 B727-2S2F Crew Experience.** As the only operator of B727 aircraft within Europe and given the nature of Part SPO aerial spraying operations, it is inevitable that the level of B727 specific experience on the flight deck of a B727 operated by the Company will be relatively low. This has been mitigated by appointing flight crew with other certain skill sets that contribute significantly to the safe and efficient operation of the aircraft. However, where possible, the Company should avoid pairing inexperienced crew members.

4.2.1.1 It is the responsibility of the B727 Fleet Captain, in consultation with the Chief Pilot and DFO to ensure that crew members are suitably paired or supervised on normal line operations. This could mean for example that an inexperienced but qualified flight engineer be supervised by another more experienced B727 flight engineer.

4.2.1.2 Notwithstanding the above, Captains shall comply with the following:

If the co-pilot has fewer than 100 hours of flight time in operations in the B727 aircraft, and the Captain is not an appropriately qualified TRI, the Captain must make all take-offs and landings at Category C airports designated by the Company and also in the following situations:

- a. The runway to be used has water, snow, slush or similar conditions that may adversely affect aircraft performance
- b. The braking action on the runway to be used is reported to be less than "good"
- c. The crosswind component for the runway to be used is in excess of 15 knots
- d. Wind shear is reported in the vicinity of the airport
- e. Any other condition in which the Captain determines it to be prudent to exercise his prerogative

4.2.1.3 Operations in Complex areas. Due to the varied nature of Company operations and the limitations imposed by the host computer databases of current B727 FSTD, it is not possible for crew members to be given an annual visit or simulator training to 'complex' areas. In lieu of this, *2Excel* requires a B727 TRI, or Company B727 Captain with at least 1000hrs of worldwide heavy jet / transcontinental business jet (>20 tonnes MTOW) experience to be on-board any flight operated in 'complex' areas where a crew member has not operated within the last twelve months.

4.3 Supernumerary Crew. Supernumerary crew are qualified or partially qualified crew that have a specific duty pursuant to the flight.

4.4 Pilot Incapacitation during Multi-Pilot Operations. In the event that one of the pilots becomes incapacitated during flight, the other pilot shall assume control of the aeroplane and return the aeroplane to a safe flight path; take whatever steps are necessary to ensure that the incapacitated pilot cannot interfere with the handling of the aeroplane; and land as soon as practical.

4.5 Operations on More Than One Type or Variant (ORO.FC.140 and ORO.FC.240).

Note: ORO.FC.240 (a) is not applicable if operations are limited to single pilot classes of piston aeroplanes under VFR by day and day VFR single pilot operations are therefore excluded from the 'count' of licence endorsements.

4.5.1 General

If a flight crew member operates more than one type or variant which are not within the same type or class rating, the following provisions shall be satisfied:

- a. Region and aerodrome competency qualification requirements must be satisfied and confirmed for the applicable type or class rating prior to commercial air transportation (CAT) operations
- b. The pilot shall not conduct single pilot operations under instrument flight rules (IFR) or at night unless he has carried out at least 3 take-offs and 3 landings at night in the single pilot role and 5 IFR flights, including 3 instrument approaches, during the preceding 90 days on the type or class of aeroplane in the single pilot role. This requirement may be replaced by an IFR instrument approach check and if required a night take-off and landing check on the type or class of aeroplane prior to CAT operations
- c. The minimum number of 3 flights on each type within a three-month period has been completed
- d. Recurrent checking requirements are maintained for each type (in accordance with ORO.FC.130 unless credits related to the training, checking and recent experience requirements are defined in the Operational Suitability Data for the relevant types or variants.)

4.5.2 Operation on More Than One Single-Pilot Aeroplane (SPA) Class or Type.

When a flight crew member operates more than one aeroplane class, type or variant for class-single pilot or type-single pilot, but not within a single licence endorsement, a flight crew member shall not operate more than:

- a. Three piston engine aeroplane types or variants; or
- b. Three turbo-prop aeroplane types or variants; or
- c. One turbo-prop aeroplane type or variant and one piston engine aeroplane type or variant; or
- d. One turbo-prop aeroplane type or variant and any aeroplane within a particular class.

When a flight crew member operates more than one aeroplane type or variant within one or more licence endorsement:

- a. The minimum flight crew complement specified in the operations manual is the same for each type or variant to be operated;
- b. The flight crew member shall not operate more than two aeroplane types or variants for which a separate licence endorsement is required;

- c. Only aeroplanes within one licence endorsement are flown in any one flight duty period. This does not apply to Company PA31 and King Air flights provided adequate flight preparation time is rostered between each flight.

4.5.3 Operation on More Than One Multi-Pilot Aeroplane (MPA) Type or MPA and SPA Type or Class.

When a flight crew member operates more than one aeroplane type or variant;

- For type-multi pilot, but not within a single licence endorsement; or
- For type-single pilot and type-multi pilot, but not within a single licence endorsement; or
- Combinations of aeroplane types or variants for class-single pilot and type-multi pilot; then:
 - a. The flight crew member shall not operate more than two aeroplane types or variants for which a separate licence endorsement is required;
 - b. Only aeroplanes within one licence endorsement are flown in any one flight duty period. This does not apply to Company PA31 and King Air flights provided adequate flight preparation time is rostered between each flight.

And, for CAT Operations:

- c. The minimum flight crew complement specified in the operations manual is the same for each type or variant to be operated;
- d. Before exercising the privileges of more than one licence endorsement;
 - i. Flight crew members must have completed two consecutive OPCs and must have 500 hours in the relevant crew position in CAT operations with the same operator; or for IFR and VFR night operations with performance class B aeroplanes, 100 hours or flight sectors in the relevant crew position in CAT operations with the same operator, if at least one licence endorsement is related to a class.
 - ii. In the case of a pilot having experience with an operator and exercising the privileges of more than one licence endorsement and then being promoted to command with the same operator on those types, the required minimum experience as commander is 6 months and 300 hours, and the pilot must have completed 2 OPCs before again being eligible to exercise the privileges of 2 licence endorsements.
- e. A minimum of three months and 150 hours experience within the first type rating shall be achieved before the flight crew member commences the conversion course for the second type rating;
- f. After completion of the initial line check on the new type, 20 sectors or 50 hours flying shall then be achieved exclusively on aeroplanes of the new type rating.

4.5.4 Cabin Crew.

A cabin crew member shall not be assigned to operate on more than 3 aircraft types except that with the approval of the Authority. The cabin crew member may be assigned to operate on 4 aircraft types if for at least two of the types:

- a. Safety and emergency equipment and type specific normal emergency procedures are similar, and;
- b. Non-type specific normal and emergency procedures are identical.

4.6 Operational Multi-Pilot Limitation (OML). Company pilots with an OML on their medical certificate shall only operate aircraft in **two-crew** / multi-pilot operations and when the other pilot is fully qualified on the relevant type, is not subject to an OML and has not attained the age of 60 years.

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Section 5

Qualification Requirements

5.0 Introduction. Personnel are to be qualified as detailed below in order to conduct Company flying.

5.1 Aircraft Captains' Qualification Requirements

5.1.1 Except where re-qualification flying or testing is being carried out, the minimum qualification requirements for pilots to act as Aircraft Captain of a Company aircraft for the purposes of CAT or SPO flying are:

- a. Successful completion of the Company's Conversion Course and;
- b. A valid Commercial Pilot's and for B727 or B737 (as required), Air Transport Pilot's Licence and;
- c. A valid Class or Type Rating and;
- d. A valid Class 1 Medical Certificate and;
- e. The Company's Aircraft Captain Approval and;
- f. Valid [recency](#) and;
- g. Valid recurrent checks (the Operator's Proficiency Check and the Line Check).

5.1.2 Formation Operations. If leading a formation of aeroplanes in Company CAT or SPO operations, the formation leader must also have passed his Formation Leading Check, or for non-aerobatic aircraft flying benign profiles, have been a previously qualified military fast jet pairs leader.

5.1.3 Single-Pilot CAT Operations. The holder of a CPL(A) (aeroplane) shall only act as commander in SP CAT on single-pilot aeroplanes if the following conditions are met:

(Note: Company Part-SPO crew do not have to meet these restrictions for Part-SPO operations only. Particular care must therefore be taken if crew switch between regulatory contexts in order to ensure required adherence to these CAT crewing restrictions.)

- a. When carrying passengers under VFR outside a radius of 50 NM (90 km) from an aerodrome of departure, he/she has a minimum of 500 hours of flight time on aeroplanes or holds a valid instrument rating. This does not apply for operations under VFR by day for Performance Class B aeroplanes;
- b. When operating under IFR, he/she has a minimum of 700 hours of flight time on aeroplanes, including 400 hours as pilot-in-command. These hours shall include 100

hours under IFR and, for multi-engine types only, 40 hours in multi-engine operations. The 400 hours as pilot-in-command may be substituted by hours operating as co-pilot within an established multi-pilot crew system prescribed in the operations manual, on the basis of two hours of flight time as co-pilot for one hour of flight time as pilot-in command;

- c. For aeroplane operations under IFR the pilot shall have:
 - i. A minimum of 50 hours flight time under IFR on the relevant type or class of aeroplane, of which 10 hours are as commander; and
 - ii. Completed during the preceding 90 days on the relevant type or class of aeroplane:
 - 1. Five IFR flights, including three instrument approaches, in a single-pilot role; or
 - 2. An IFR instrument approach check.
- d. For aeroplane operations at night the pilot shall have:
 - i. A minimum of 15 hours flight time at night which may be included in the 50 hours flight time under IFR in (c)(i); and
 - ii. Completed during the preceding 90 days on the relevant type or class of aeroplane:
 - 1. Three take-offs and landings at night in the single pilot role; or
 - 2. A night take-off and landing check.

Notes: The requirements at (c)(i) and (d)(i) may be extended up to a maximum of 120 days by flying under the supervision of a CRI/TRI or CRE/TRE.

For pilots qualified on more than one aeroplane, these requirements apply to each aircraft type separately.

- e. A pilot may operate as a pilot under supervision (co-pilot or Captain) when the supervisor is a CRE/CRI/TRE/TRI or Line Training Captain.

5.1.4 Multi-Pilot Operations.

- a. **General.** Pilots must have completed the relevant training in accordance with the relevant Part D to this Operations Manual (Part D, Para 3.6.4.1).
- b. **Aircraft Captains.** In order to fly Multi-Pilot CAT or SPO Operations as the Aircraft Captain, the pilot will have completed the Company's Command Course (which includes Crew Resource Management, aerodrome and route competence qualifications) and have flown 10 sectors as Aircraft Captain or Aircraft Captain under Supervision. Minimum qualifications in order to Captain Company B727 or Company B737 aircraft are:
 - i. EASA ATPL; or Third Country equivalent ICAO licence acceptable to the competent authority for validation

- ii. 3000 hours total time as pilot
- iii. 500 hours pilot-in-command on multi-engine jet aeroplanes with maximum take-off weight (MTOW) of at least 20 metric tonnes or;
- iv. 500 hours pilot-in-command on multi-engine turboprop aeroplanes with MTOW of at least 20 metric tonnes and 500 hours as co-pilot on jet aeroplanes with MTOW of at least 20 metric tonnes
- v. Type rated

c. First Officers. In order to fly Multi-Pilot CAT or SPO Operations as First Officer

- i. Save for sub-paras e and f, pilots shall fulfil at least all of the requirements at Para 5.1.1 above, and shall hold a valid instrument rating if operating IFR or more than 50nm from base under VFR.
- ii. Pilots shall have at least 250hrs;
- iii. Pilots may not carry out take-offs and landings unless they have operated as flying pilot during take-off and landing during the preceding 90 days.

Note. This period may be extended to 120 days when line-flying under the supervision of a CRI/TRI or CRE/TRE.

- iv. Minimum qualifications in order to act as First Officers on Company B727 or Company B737 aircraft are (these may be reduced or waived at the DFO's discretion):
 - 1. EASA commercial pilot licence (CPL); or Third Country equivalent ICAO licence acceptable to the competent authority for validation
 - 2. 1000 hours total time as pilot, and:
 - 3. 500 hours multi-engine, multi-crew turbine experience, multi-crew piston, or:
 - 4. 500 hours on jet aeroplanes as pilot (or military equivalent hours)
 - 5. Type rated

d. Flight Engineers. Minimum qualifications in order to act as Flight Engineer on Company B727 aircraft are:

- i. EASA member state National Authority Flight Engineer licence; or Third Country equivalent ICAO licence acceptable to the competent authority for validation
- ii. 4000 hours as flight engineer on multi-crew aeroplanes
- iii. Type rated

e. Cabin Crew. Cabin crew members shall only operate an aeroplane if qualified for duty in accordance with the following requirements:

- i. Cabin Crew Attestation issued in accordance with EASA Part-CC;
- ii. Recency experience is met;
- iii. Medical status, including medical certificate;
- iv. Initial training and checking / recurrent training and checking valid;
- v. Qualified on aircraft type;
- vi. CRM / Human factors training;
- vii. Dangerous Goods training;
- viii. Security Training;
- ix. Accumulated flight time, duty time, duty periods in compliance with FTL limitations.

5.1.5 Qualification for Pilots to Operate from Either Seat. Pilots may be assigned to either seat as long as they have completed the training and checking detailed in the relevant Part D, Section 3.6.5. Only Captains may occupy the left seat of a B727 or B737.

5.1.6 Operations on More Than One Type or Variant (ORO.FC.140 and ORO.FC.240) [Refer to OM A Section 4 Para 4.5](#)

5.1.7 Cabin Crew. Approval to provide cabin crew training and to issue cabin crew attestations require compliance with ORO.AOC.120. The cabin crew member shall hold a:

- i. Cabin Crew Attestation
- ii. Valid Medical Certificate

5.1.7.1 Validity of Attestations. The Cabin Crew Attestation does not have an expiry date. The attestation is valid if all training requirements listed in OM Part D are completed.

5.1.7.2 Recent Experience. A cabin crew member will not be assigned to undertake duties as a cabin crew member when the cabin crew member has been absent from flying duties during the preceding 6 months. The cabin crew member will undergo recurrent training before being assigned to cabin crew duties.

5.1.7.3 Renewal of Medical Certificate. Medical certificates shall be renewed according to Part-MED regulations. Each cabin crew member shall undergo an aero-medical assessment before being assigned to duties on an aircraft, and thereafter at intervals of a maximum 60 months. If a new medical certificate is denied or will be delayed, the Head of Cabin Services shall be informed without delay.

5.1.7.4 Operation of More than One Type or Variant. [Refer to OM A Section 4 Para 4.5](#)

5.2 Recency

5.2.1 In order to maintain [recency](#) for CAT and SPO operations, pilots assigned as part of the minimum certificated crew either as pilot flying or pilot monitoring must have completed a minimum of 3 take-offs and 3 landings in the preceding 90 days, as pilot flying in an aeroplane or in a flight simulator of the same type/class.

- 5.2.2** Where the 90 day **recency** has lapsed but the pilot has flown 3 take-offs and 3 landings in the preceding 120 days, line flying **recency** may be regained by flying a Training Flight (that shall include at least the requirements described in 5.2.1 above) under the supervision of a CRI / TRI.
- 5.2.3** In cases where the pilot's **recency** has lapsed beyond 120 days, the re-qualifying recency requirement shall be satisfied by the pilot conducting a Training Flight (that ensures that the pilot has flown 3 take-offs and 3 landings in the preceding 90 days and has demonstrated his competence to conduct the Company's standard procedures) to the satisfaction of a CRI / TRI.
- 5.2.4** Flight engineers shall not operate the aircraft as flight engineer unless they have carried out, in the preceding 90 days, at least 3 take-offs and landings in the aircraft or FSTD as flight engineer.
- 5.2.5** When the flight engineer does not comply with these requirements, he shall complete a training flight in the aircraft or FSTD under the supervision of a TRI, which shall include at least the requirements described above.
- 5.2.6** **Recency** records for each pilot will be held by the Company, via **LEON**.
- 5.2.7** **Aerial Dispersant Delivery.** No flight crew member shall form part of a crew conducting spraying operations unless they have received spray training in the FSTD in accordance with Part D and have practised spraying in the aircraft within the previous 200 days. Additionally, no crew member shall form part of a crew practising spraying unless they have received spray training in the FSTD. When a crew member does not comply with these requirements, he shall complete a training flight in the FSTD as applicable which shall include the requirements described in Part D before he can exercise his privileges.

5.3 Operator's Proficiency Check

- 5.3.1** Each flight crew member shall undergo six monthly Operator Proficiency Checks as part of a normal flight crew complement to demonstrate competence in carrying out normal, abnormal and emergency procedures. For all operations that require flight in accordance with IFR (all types other than the Extra 300), the check will be conducted without external visual reference (except that take-offs and landings should be conducted using the appropriate visual reference).
- 5.3.2** The period of validity of an OPC shall be 6 calendar months in addition to the remainder of the month of issue. If issued within the final 3 calendar months of validity of a previous OPC, the period of validity shall extend from the date of issue until 6 calendar months from the expiry date of that previous OPC.
- 5.3.3** The format of the OPC is detailed in Part D to this Manual. Operator proficiency checks must be conducted by a Class / Type rating examiner trained in CRM concepts and the assessment of CRM skills.

5.3.4 An OPC may be combined with a Line Check and a Formation Leading Check.

5.3.5 A record of every OPC will be kept by the Company.

5.4 Line Check

5.4.1 Each flight crew member shall undergo a yearly Line Check on the aircraft to demonstrate his competence in carrying out normal commercial line operations. Line checks must establish the ability to perform satisfactorily a complete line operation including pre-flight and post-flight procedures and use of the equipment provided.

5.4.2 **B727 and B737.** Where a pilot is required to operate as pilot flying and pilot monitoring, he will be checked on one sector as pilot flying and on another sector as pilot monitoring. Line checks must be completed in the aircraft and conducted by authorised captains nominated by the Company and acceptable to the Authority. On completion of the check the authorised captain should complete the [applicable forms](#) and return it to the Fleet Captain and annotate the journey log.

5.4.3 The period of validity of a Line Check shall be 12 calendar months, in addition to the remainder of the month of issue. If issued within the final 3 calendar months of validity of a previous Line Check, the period of validity shall extend from the date of issue until 12 calendar months from the expiry date of that previous Line Check.

5.4.4 The format of the Line Check is detailed in Part D to this Manual.

5.4.5 A Line Check may be combined with an OPC and a Formation Leading Check.

5.4.6 A record of every Line Check will be kept by the Company.

5.5 Formation Leader Check

5.5.1 Periodically, where required for Company [PT](#) or SPO operations, each pilot will undergo a Formation Leading Check on the aeroplane to demonstrate his competence to lead formations in Company operations.

5.5.2 The period of validity of a Formation Leading Check shall be 12 calendar months, in addition to the remainder of the month of issue. If issued within the final 3 calendar months of validity of a previous Formation Leading Check, the period of validity shall extend from the date of issue until 12 calendar months from the expiry date of that previous Formation Leading Check.

5.5.3 The format of the Formation Leading Check is detailed in Part D to this Manual.

5.5.4 A Formation Leading Check may be combined with an OPC and a Line Check.

- 5.5.5** A record of every Formation Leading Check will be kept by the Company.
- 5.5.6** This check requirement is waived for non-aerobatic aircraft flying benign profiles, provided the pilot is a previously qualified military fast jet pairs leader.
- 5.6 Licence Proficiency Check**
- 5.6.1** Each flight crew member shall undergo a Licence Proficiency Check each year. The check includes normal, abnormal and emergency procedures and incorporates the instrument rating renewal. It is Company policy to combine the LPC with the OPC.
- 5.6.2** The period of validity of an LPC shall be 12 calendar months in addition to the remainder of the month of issue. If conducted within the last 3 calendar months of validity of a previous licence proficiency check, the period of validity shall extend from the date of issue until 12 calendar months from the expiry date of that previous licence proficiency check. The period of validity of an SEP (Land) Class Rating shall be 24 calendar months in addition to the remainder of the month of issue.
- 5.6.3** LPCs must be conducted by a Company approved CRE / TRE. Where appropriate a language proficiency re-evaluation shall be conducted during the LPC.
- 5.6.4** The SEP Class Rating may be re-validated by flying experience by producing logbook evidence to an appropriately authorised FCL Examiner before the rating expiry date has passed. In the 12 months preceding the expiry date 12 hours of flight time must have been flown including:
- a. 6 hours as pilot-in-command
 - b. 12 take-offs and landings
 - c. A training flight of at least 1 hour's duration with an FI(A) or CRI(A) who must countersign the appropriate logbook entry
- 5.6.5** If re-validating by flying experience, and provided the examiner signs the Certificate of Revalidation page within the 3 months prior to the rating expiry, the validity of the rating will be calculated from the date of expiry of the preceding rating.
- 5.6.6** A record of every LPC will be kept by the Company.
- 5.7 Route and Aerodrome Competence Qualification**
- 5.7.1** The period of validity of the route and aerodrome competence qualification shall be 12 months in addition to the remainder of the month of qualification or from the latest operation on the route or to the aerodrome if that was more than 3 months prior to the end of the period of validity.
- 5.7.2** Validation, and re-validation, may be achieved on the annual Line Check.

5.7.3 For Performance Class B operations involving CAT under VFR by day route familiarisation training need not apply, however it is Company policy to ensure compliance with para 5.7.1 and 5.7.2 above.

5.8 Safety Equipment Procedures Check

5.8.1 All pilots will be trained and tested in Safety Equipment Procedures in accordance with Part D.

5.8.2 A Safety Equipment Procedures Check is valid for 12 calendar months in addition to the remainder of the month of issue. If issued within the final 3 calendar months of validity of a previous Safety Equipment Procedures Check, the period of validity shall extend from the date of issue until 12 calendar months from the expiry date of that previous Check.

5.8.3 Safety Equipment Procedures Checks may be combined with Formation Leading Checks, Line Checks and OPCs as detailed in Part D.

5.8.4 A record of every Safety Equipment Procedures Check will be kept by the Company.

5.9 Crew Resource Management (CRM)

5.9.1 Pilots must have completed either an initial CRM course or Operator Conversion CRM Training with a Company CRMT before being cleared to operate unsupervised as a line pilot with the Company. Where necessary for B737 crew, joint CRM training will be conducted with both Company B737 pilots and Cabin Crew.

5.9.2 All Company conversion and training courses are to include CRM training with particular focus where applicable on single pilot operations and formation flying. OPCs and Line Checks are to include assessments on CRM and team-working skills which will be tested by assessing passenger and mission briefings and captaincy in the air.

5.9.3 Records are to be maintained of pilots' initial and recurrent CRM assessments.

5.10 Training, Checking and Supervising Personnel

5.10.1 The DFO and Chief Pilot are responsible for appointing adequately trained and experienced staff to carry out conversion and operational training, for both ground and air related subjects.

5.10.2 The minimum qualifications and experience levels for Company Training Captains are either as follows, or as detailed in the relevant Part D (whichever are the more restrictive)(minimum qualifications and experience levels for Company B727, B737 or King Air TRI are detailed in Part D):

- a. A Commercial Pilot's Licence;
- b. 2000 hrs total flying on aeroplanes;
- c. Of which, 50 hrs shall be P1 on the aircraft type in question;

- d. CRE/CRI Certificates;
- e. Flying Instructor Certificate.

5.10.3 The DFO and Chief Pilot are responsible for appointing adequately trained and qualified staff to conduct the OPCs and Line Checks.

5.10.4 OPCs, LPCs and IR checks will be conducted by CREs or type qualified TREs as applicable. Examiners are to:

- a. Hold the endorsement “And OPC” on their Examiner Certificate; and
- b. Be sponsored or employed by 2Excel Aviation Ltd; or
- c. Be operating under Company auspices under an agreed contractual arrangement from another sponsor.

5.10.5 Line Checks and Formation Leading Checks will be conducted by suitably qualified and authorised Line Training Captains acceptable to the Company and the Authority.

5.11 Ground Staff

5.11.1 The Operations Director is responsible for ensuring that all ground staff are adequately trained to carry out their assigned duties.

5.11.2 Corporate Support Staff are to successfully complete the Company’s Corporate Support Staff Check.

5.11.3 The period of validity of a Corporate Support Staff Check shall be 12 calendar months, in addition to the remainder of the month of issue. If issued within the final 3 calendar months of validity of a previous Corporate Support Staff Check, the period of validity shall extend from the date of issue until 12 calendar months from the expiry date of that previous Corporate Support Staff Check.

5.11.4 Company Ramp Staff are to complete training as detailed in Company staff training guides.

5.11.5 Records of Corporate support staff and Ramp Staff training are to be maintained by the Company.

5.11.6 Operations Staff are to successfully complete the Company’s Operations Staff training programme.

5.11.7 Records of Operations Staff training are to be maintained by the Operations Manager.

5.12 Contract/Freelance and Part-time pilots. Where flight crew members work on a freelance or part-time basis the Company Chief Pilot shall verify that all applicable requirements of Part-ORO Subpart FC and the relevant elements of Part-FCL, including the

requirements on recent experience, are complied with, taking into account all services rendered by the flight crew to other operators to determine in particular:

- a. The total number of aircraft types or variants operated; and
- b. The applicable flight and duty time limitations and rest requirements.

Crews are responsible for maintaining their FTL records and providing each operator with the data needed to schedule activities in accordance with applicable FTL requirements.

Section 6

Crew Health Precautions

6.1 Alcohol

6.1.1 Although alcohol consumption may be socially acceptable, it has a detrimental effect on human skills and efficiency which is particularly noted in relation to flying duties. The effects of alcohol are primarily related to levels in the blood which vary individually according to the quantity and rate of consumption and may be significant long after the last alcoholic intake. A person commits an offence under Section 93 of the Railways and Transport Safety Act 2003 if they perform an aviation function at a time when the proportion of alcohol in their breath, blood or urine exceeds the prescribed limit, or they carry out an activity which is ancillary to an aviation function at a time when the proportion of alcohol in their breath, blood or urine exceeds the prescribed limit. Breaches of legislation will be investigated in line with Company Disciplinary Policy and may be just cause for dismissal due to Gross Misconduct.

6.1.2 Crew Members shall not consume alcohol while on standby or during the flight duty period. Crew Members shall not consume alcohol for a minimum period of at least 8 hours before standby or reporting for duty, and proportionally longer if more than small amounts are consumed.

6.1.4 Crew Members shall not commence a flight duty period with alcohol levels in excess of the following limits (by way of comparison these are approximately one quarter of the English driving limits)

- a. In the case of breath - 9 microgrammes of alcohol in 100 millilitres
- b. In the case of blood - 20 milligrammes of alcohol in 100 millilitres
- c. In the case of urine - 27 milligrammes of alcohol in 100 millilitres

Crew Members are to be aware that individuals absorb and excrete alcohol at different rates and in some countries the acceptable blood alcohol levels can be extremely low, and as such are cautioned against any consumption of alcohol in the period prior to a duty.

6.2 Narcotics And/Or Drugs

6.2.1 The use of narcotics and/or drugs which have not been prescribed by a medical practitioner is expressly forbidden at any time. This guidance also applies to sleep inducing drugs.

6.3 Medication

6.3.1 Many medications may have adverse effects on the nervous system, which may be more marked in flight than on the ground. As a general rule, if a crew member finds it necessary to take, or has been prescribed some form of medication, his fitness to fly must be suspect, and he shall seek aero-medical advice before commencing or continuing with flying duties.

6.4 Immunisation

6.4.1 Medical advice is to be sought concerning the period to be observed before returning to flying duties following immunisation.

6.5 Blood Donation

6.5.1 Crew members should not normally act as blood donors. If, for any reason, they have done so, they are to advise the Company immediately following each donation, and shall not undertake flying duties for at least 24 hours after they have given blood.

6.6 Diving

6.6.1 Crew members whose sporting activities include recreational diving shall not fly within 24 hours of completing such activity. When deep sea diving to a depth exceeding 10 metres they shall not fly within 48 hours of completing such diving activity.

6.7 Sleep, Rest And Fitness

6.7.1 Although the controls on flight and duty periods are intended to ensure that adequate opportunities are provided for crew members to obtain rest and sleep, individuals are responsible for ensuring that proper advantage is taken of such opportunities. A crew member shall not perform duties on an aeroplane if he knows or suspects that he is suffering from fatigue, or he feels unfit to the extent that the flight may be endangered. No individual shall act as a member of the crew of a Company aeroplane if, for any reason, his physical or mental condition is such that it could endanger the safety of the aeroplane or its occupants.

6.8 Meal Precautions

6.8.1 **General.** Cases of acute food poisoning during flight do occur occasionally and can have a significant impact on flight safety. Severe food poisoning, almost uniquely, can affect a whole crew causing high levels of incapacitation. It is important therefore that all crew members take common sense precautions to protect themselves before and during flight. Further specific information may be found in Part E 2.17.2.

6.8.2 **Meals Taken Before Flight.** Since the effects of acute food poisoning usually occur between 1 and 6 hours after contaminated food has been consumed crews should avoid eating food that has an increased risk of being contaminated, e.g. shellfish of dubious freshness, within 6 hours of a flight. Flight crew members should avoid eating the same dishes as each other before flight.

6.8.3 **Meals Taken During Flight.** When the required crew consists of two pilots they should eat different meals to minimise the risk of both pilots becoming incapacitated due to food poisoning. When the crew consists of additional flight crew members, the additional pilots or flight engineers are not constrained by this requirement. To avoid dehydration flight crew and cabin crew should take a drink every 30 to 40 minutes or be provided with a bottle of water.

6.8.4 **Symptoms.** The symptoms of food poisoning include general feeling generally unwell, nausea, diarrhoea, vomiting, stomach cramps, a high temperature of 38°C or above. The character and severity of the symptoms of food poisoning vary and depend on the toxin and the resistance of the individual. Severe cases may require hospitalisation.

6.9 Surgical Procedures

6.9.1 Aero-medical advice should be sought prior to returning to flying duties following any surgical procedure.

6.10 Wellbeing. 2Excel has a robust, confidential, and easy to access Peer Support Programme named MAPS. MAPS is managed and maintained independently by Kura Human Factors Ltd (KHF) and is run as a co-operative across several organisations thereby guaranteeing anonymity for those seeking peer support. All pilots, SOs and Cabin Crew (including contractors) can access the system to discuss issues impacting their wellbeing. Areas an employee may wish to discuss with a qualified peer are varied but likely to include professional, organisational, health or domestic matters which have caused them to experience a wellbeing issue. The service is fully outsourced, confidential and GDPR compliant. Covered employees who are interested in accessing the system can do so by visiting <https://kurahumanfactors.com/about-maps/>.

KHF work with 2Excel to select suitable candidates to work as Peers. Upon selection, Peers shall receive an initial course of training to qualify, recurrent training twice a year, and continuous personal development as Peers. KHF will monitor the workloads of all Peers and offer one-to-one support should a peer not receive enough practice in their role. It is recognised that the role of a peer may be a challenging one. To avoid secondary trauma, they will be supported by MAPS Supervising Peers and the Mental Health Professional team comprised of Clinical Psychologists and AME consultants in an advisory role.

Mental Health and Wellbeing should be included in both the OCC and Recurrent CRM courses.

Data generated by MAPS will be scrubbed of any information that may identify a data subject. It will then be aggregated ensuring anonymity with only general trends tracked as per regulatory guidelines.

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Section 7a

EA300, PA31 & King Air Flight Time Limitations

- 7.1 Purpose.** The purpose of the Company's Flight Time and Duty Limitations Scheme is to interpret the requirements of the relevant articles of the Air Navigation Order and CAP 371, Fourth Edition, as they apply to the regulation of flight times and the avoidance of fatigue in crew members.
- 7.2 Aim.** The aim of this Section is to express the intent behind the published relevant documents, thereby taking all reasonable precautions to ensure that crew members are adequately rested at the beginning of each flying duty period (FDP). To meet this aim, due note will be taken of length of duty cycles, periods of time off and cumulative duty hours.
- 7.3 Applicability.** The Scheme shall apply in relation to any duty carried out at the behest of the Company by a crew member. The Scheme shall apply to all cabin crew carried as crew members. The Scheme does not apply to hospitality staff.
- 7.4 Responsibilities**
- 7.4.1 The Company.** The Company will publish rosters in advance so that operating crew can plan adequate pre-flight rest. Where crew members request specific days off, 7 days or more in advance, this will normally be granted. Should such allocated days off subsequently need to be worked, this will be entirely at the discretion of the crew member concerned. The Company's master Roster is the electronic diary held on the Company's website. At a glance, it provides details of tasking, events, duty periods, flying duty periods, standby duty where applicable, rest periods and leave. Through the Chief Pilot, the Company will be satisfied that crew members employed on an irregular basis are not in breach of this FTL scheme before offering a flying duty.
- 7.4.2 Crew Members** Responsibility for the proper control of flight and duty time cannot and does not rest wholly with the Company. Crew members have a responsibility to make optimum use of the opportunities and facilities for rest provided. They are also responsible for planning and using their own rest periods properly in order to minimise incurring fatigue. The ANO places a further responsibility on crew members. Simply put, crew members shall not act as operating crew if they know, or suspect, that their physical or mental condition renders them unfit to operate. Furthermore, they must not fly if they know that they are in breach of this FTL Scheme. A pilot shall inform the Company of all flight time and FDPs undertaken by him, whether professionally or privately, except flying undertaken in aircraft not exceeding 1600kg maximum weight and not flying for the purpose of CAT, public transport or aerial work

(including flying instruction for which the pilot is remunerated or given valuable consideration).

7.4.3 Flight Crews employed on a part time basis. Any crew member engaged on an irregular basis shall satisfy the provisions of the company FTL scheme. Crew members not in the regular employ of the Company are to:

- a. Provide details of their previous 12 months flying hours, 28 day totals of flying hours/duty periods, and days off in the last 84 day period by completing and submitting each month the Flying and Other Duty Record Form (at Annex D to this section) to the Chief Pilot (via Operations) before undertaking a flying duty and;
- b. Ensure that their flying duty records are up to date and;
- c. Ensure that they are legal to fly.
- d. Ensure that they inform any other company for which they fly of any flying done for 2Excel.

7.5 Definitions

7.5.1 'Acclimatised' When a crew member has spent 3 consecutive local nights on the ground within a time zone which is 2 hours wide, and is able to take uninterrupted night's sleep. The crew member will remain acclimatised thereafter until a duty period finishes at a place where local time differs by more than 2 hours from that at the point of departure.

7.5.2 'Cabin Crew' A person employed to facilitate the safety of passengers, whose duties are detailed by the Company or the Aircraft Captain. Such persons will not act as a member of the flight crew. Hospitality staffs are not deemed to be cabin crew. Cabin Crew FTLs are to be in accordance with Section 7b of this OM (EASA Multi-Crew Flight Time Limitations.)

7.5.3 'Contactable' A short period of time, other than on a day off, unless mutually agreed, during which the Company requires a crew member to be contactable for the purpose of giving notification of a duty period which will commence not less than ten hours ahead. The contactable period will be between 1830 and 2100 local time, or for those conducting special flight operations between 1600 and 1830 local time.

7.5.4 'Crewmember' A member of the flight crew or cabin crew.

7.5.5 'Days Off' Periods available for leisure and relaxation free from all duties. A single day off will include two local nights. Consecutive days off will include a further local night for each additional consecutive day off. A rest period may be included as part of a day off. The term "TOIL" may be used on FTL records for management purposes in place of "Day Off" to signify a "Day off" not taken from weekend leave or annual leave periods in lieu of a weekend/Bank Holiday worked.

7.5.6 'Duty' Any continuous period during which a crew member is required to carry out any task associated with the business of the Company. Any task periods not involving standby or flying/simulator duties should be entered under the "Admin" drop down selection on the FTL record sheet. Examples of such "Admin" duties include ground training courses

(CRM/Fire/First Aid/DG/Security/Recurrent), office work, sensor operation, and positioning travel.

- 7.5.7 'Early Start Duty'** A duty is deemed an Early Start Duty if it commences in the period 0500 to 0659 hours local time.
- 7.5.8 'Flight Crew'** Those members of the crew of an aircraft who act as a pilot, or Flight Engineer.
- 7.5.9 'Floater'** A pilot generally used for relief duties and named as such, who operates from one or a number of bases not nominated as their home base.
- 7.5.10 'Flying Duty Period (FDP)'** Any time during which a person operates in an aircraft as a member of its crew. It starts when the crew member is required to report for a flight, and finishes at on-chocks or engines off, at the end of the final sector.
- 7.5.11 'Home Base'** The single place nominated by the Company to the crew member from where the crew member normally starts and ends a duty period, or series of duty periods, and at which place under normal conditions, the Company is not responsible for the accommodation of the crew member.
- 7.5.12 'Late Finish Duty'** A duty is deemed a Late Finish when the duty finishes in the period 0100 to 0159 hours local time.
- 7.5.13 'Local Night'** A period of 8 hours falling between 2200 and 0800 hours local time.
- 7.5.14 'Night Duty'** A duty is deemed a Night Duty if any part of that duty falls within the period 0200 to 0459 hours local time.
- 7.5.15 'Positioning'** The practice of transferring crew from place to place as passengers in surface or air transport at the Company's behest.
- 7.5.16 'Regular'** Regular, when applied to duties that are Late Finishes, Night or Early Starts, means a run of 4 or 5 consecutive duties, not broken by a period of 34 hours free from such duties, contained in a single 7 consecutive day period.
- 7.5.17 'Reporting Time'** The time at which a crew member is required by the Company to report for any duty.
- 7.5.18 'Rest Period'** A period of time before starting a FDP which is designed to give crew members adequate opportunity to rest before a flight.
- 7.5.19 'Rostered/Planned Duty'** A duty period, or series of duty periods, with stipulated start and finish times, notified to crew in advance, by the Company.
- 7.5.20 'Rostering Period'** Four consecutive weeks.

- 7.5.21 'Scheduled Duty'** The allocation of a specific flight or flights or other duties to a crew member within the pre-notified rostered / planned series of duty periods.
- 7.5.22 'Sector'** The time between an aircraft first moving under its own power until it next comes to rest after landing, on the designated parking position.
- 7.5.23 'Split Duty'** A flying duty period which consists of two or more sectors, separated by less than a minimum rest period.
- 7.5.24 'Standby Duty'** A period during which the Company places restraints on a crew member who would otherwise be off duty. However, it shall not include any time during which a crew member is contactable for the purpose of giving notification of a duty which is due to start 10 hours or more ahead.
- 7.5.25 'Suitable Accommodation'** A well-furnished bedroom which is subject to minimum noise, is well ventilated, and has the facility to control the levels of light and temperature.
- 7.5.26 'Travelling'** All time spent by a crew member transiting between the place of rest, and the place of reporting for duty.
- 7.5.27 'Week'** A period of 7 consecutive days starting at 0700 local on a Monday.
- 7.5.28 'Commercial Pleasure Flying'** When an aircraft takes-off from and lands at the same aerodrome without making an intermediate landing, but does not account for any positioning flight to or from that aerodrome.
- 7.5.29 'Air Ambulance Flying'** When the sole reason for the flight is to carry an ill or injured person to a recognised medical facility, or the carriage of a human organ necessary for a transplant operation.

7.6 Calculation of a Flying Duty Period. The maximum rostered FDP, in hours and fractions of hours, shall be in accordance with paragraph 7.13. Rostering limits in the tables may be extended by split duty under the terms of paragraph 7.14. On the day, the Aircraft Captain may at his discretion, and after taking note of the circumstances of other members of the operating crew, if carried, about their fitness, further extend the FDP actually worked as outlined in paragraph 7.16.

7.7 Additional Limits on Flying

7.7.1 Late Finishes/Early Starts

7.7.1.1 Sleep deprivation, leading to the onset of fatigue, can arise if a crew member is required to report early for duty, or finishes a duty late on a number of consecutive days.

Therefore, not more than 3 consecutive duties that occur in any part of the period 0100 to 0659 hours local time can be undertaken, nor may there be more than 4 such duties in any 7 consecutive days.

Any run of consecutive duties (Late Finishes or Nights or Early Starts) can only be broken by a period of not less than 34 consecutive hours free from such duties.

This 34 consecutive hours may include a duty that is not an Early, Late or Night duty.

7.7.1.2 **Employed on Early Morning Duties**

However, crew members who are employed on a regular early morning duty for a maximum of 5 consecutive duties will work to the following:

- a. The minimum rest period before the start of such a series of duties will be 24 hours.
- b. The duty will not exceed 9 hours, irrespective of the sectors flown.
- c. At the finish of such a series of duties, crew members will have a minimum of 63 hours free of all duties.

7.7.2 **Night Operations.** Should any duties be scheduled to be carried out in any part of the period between 0200 and 0459 hours local time, for 2 consecutive nights, then crew members will finish the duty preceding this series of duties by 2359 hours local time before commencing the block of consecutive night duties, such that crew members can take a rest period during a local night.

Note: In the event of 2359 hours being exceeded, then only the first of the 2 planned consecutive night duties that impinge on any part of the period 0200 to 0459 hours local time may be undertaken.

Should any duties be scheduled to be carried out in any part of the period between 0200 and 0459 hours local time, for 3 consecutive nights, then crew members will finish the duty preceding this series of duties by 2100 hours local time before commencing the block of consecutive night duties, such that crew members can take a rest period during a local night.

Note: In the event of 2100 hours being exceeded, and the individual crew members are willing to continue with the planned roster (ie 3 consecutive night duties) then provided the duty preceding this series of duties finishes no later than 2359 hours local time, the schedule may continue.

Under the above option, if the crew members choose not to continue the planned roster (after finishing duty between 2100 and 2359 hours local time) then only the planned first and second night duties that impinge on any part of the period 0200 to 0459 hours local time may be undertaken.

If the duty finished after 2359 hours local time, then only the first of the 3 planned consecutive night duties that impinge on any part of the period 0200 to 0459 hours local time may be undertaken.

7.7.2.1 Regular Night Duties

However, crew members who are employed on a regular night duty for a maximum of 5 consecutive nights will work to the following:

- a. The minimum rest period before the start of such a series of duties will be 24 hours.
- b. The duty will not exceed 8 hours, irrespective of the sectors flown.
- c. At the finish of such a series of duties crew members will have a minimum of 54 hours free of all duties.

7.7.2.2 Note that these limitations do not supersede the normal days off requirements which must be met (i.e. the 54 hours off between two blocks of 5 nights is only 1 proper day off).

7.7.3 Interrupted Rest. If, prior to the start of an FDP, a crew member's rest period is interrupted for operational reasons between 2300 and 0700 hours local time, then;

if the disturbance happens earlier than 1 hour before the planned departure from the crew member's place of rest, the time elapsed between that disturbance and the departure time from the place of rest minus 1 hour, is to count as part of the subsequent FDP.

Note. The phrase 'operational reasons' applies to such actions as contacting the customer, checking weather, liaison with ATC or any action pertaining to the planned flight.

7.8 Mixed Duties

7.8.1 When a crew member is required to report for duty in advance of the stipulated report time for a scheduled flight, to carry out a task at the behest of the Company, then the time spent on that task shall be part of the subsequent FDP.

7.8.2 Fixed Wing and Rotary Wing Flying. When both fixed wing and rotary wing flying is carried out the more restrictive flight and duty time limitations apply.

7.8.3 Mixed Single Pilot/Two Pilot Operations. In one duty period a pilot may fly as single flight crew up to the point where the total duty hours reach the single flight crew FDP limit. During this time the pilot may fly either in command or as a co-pilot on a two pilot aircraft. The pilot may then continue beyond the single flight crew FDP limit in a two pilot operation up to the two flight crew FDP maxima, but may only fly as a co-pilot.

7.8.4 Mixed Simulator and Aircraft Flying. When a flight crew member flies in a simulator, either on a check or training flight, or as a Training Captain or Instructor, and then within the same duty period flies as a flight crew member on a commercial flight, all the time spent in the simulator or aircraft shall count in full towards the subsequent FDP and daily flying hour maxima. The FDP shall be calculated from the reporting time of the simulator detail.

7.9 Travelling Time

7.9.1 Travelling time, other than that spent on positioning, shall not be counted as duty.

7.9.2 Travelling time, from home to departure aerodrome, if long distances are involved, is a factor influencing any subsequent onset of fatigue. If the journey time from home to normal departure airfield is usually in excess of 1.5 hours, crew members should make arrangements for temporary accommodation nearer to base. However, owing to the nature of the Company's business and the flexibility conferred by the normal sector length, individuals usually travelling in excess of 1.5 hours to work, but only travelling occasionally, may negotiate with the Company to use up to one hour of their FDP as 'extra' travelling time.

7.9.3 When crew members are required to travel from their home to an aerodrome other than the one from which they normally operate, any travelling time over and above the time taken for the journey from home to the usual operating aerodrome shall be classed as positioning. Such additional travelling time will be agreed between the crew member and the Company.

7.10 Delayed Reporting Time in a Single FDP

7.10.1 When a crew member is informed of a delay to the reporting time before leaving the place of rest, the FDP shall be calculated as follows:

- a. When the delay is less than 4 hours the maximum FDP allowed will be based on the original report time and the FDP will start at the actual report time.
- b. When the delay is 4 hours or more then the more limiting time band associated with the planned and actual reporting time will be used and the FDP will start 4 hours after the original report time.

7.10.2 When the Company informs a crew member, before leaving the place of rest, of a delay in reporting time of 10 hours or more ahead and that crew member is not further disturbed by the Company until a mutually agreed time, then that period is classed as a rest. If, upon the resumption of duty, further delays occur then the appropriate criteria in this paragraph and paragraph 7.10.1 above will be applied to the re-arranged reporting time.

7.11 Positioning

7.11.1 All the time spent on positioning at the behest of the Company will count as duty, but positioning does not count as a sector when calculating the FDP. In these circumstances the FDP commences at the time the crew member reports for the positioning journey, or positions in accordance with sub-paragraph 7.9.3. The subsequent rest period must account for the FDP plus the positioning journey.

7.11.2 If, after a positioning journey, the crew member spends less than a minimum rest period at suitable accommodation provided by the Company and then carries out an FDP, the

positioning will be counted as a sector if a split duty is claimed when calculating the allowable FDP. If it is not, then a split duty FDP will not be used.

7.12 Standby Duty

7.12.1 The time of start, end and nature of the standby duty will be defined and notified to crew members. The time a standby duty starts determines the allowable FDP, except that when the actual FDP starts in a more limiting time band, then that FDP limit will apply. However, when standby is undertaken at home, or in suitable accommodation provided by the Company, during the period 2200 to 0800hrs local time and a crew member is given 2 hours or less notice of a report time, the allowable FDP starts at the report time for the designated reporting place.

7.12.2 When a crew member is on standby duty on immediate readiness at an airport, then the allowable FDP is calculated **from and starts at** the start time of the standby duty **period**.

7.12.3 If a crew member is called out from standby, the standby duty will cease when the crew member reports at the designated reporting point.

7.12.4 The following limits apply:

Duty	Maximum Duration
Standby Duty (all cases)	12 hours
Standby followed by an FDP	As in Case A and B below

Case A. If a crew member is called out from standby to conduct an FDP before completing 6 hours standby duty then the total duty period is the sum of the time spent on standby and the FDP allowable from paragraph 7.13.

Case B. If a crew member is called out from standby to conduct an FDP after completing 6 or more hours standby duty, then the total duty period is the sum of all the time spent on standby and the allowable FDP from paragraph 7.13, reduced by the amount of standby worked in excess of 6 hours.

Note. The reference to 'total duty period' applies only to the sum of the standby time achieved + the allowable FDP obtained from paragraph 7.13. On the day, for cumulative duty totals and for minimum rest purposes, the total duty achieved will be standby time achieved + FDP achieved + post flight duties + any positioning.

7.13 Maximum FDP

7.13.1 Standard reporting times prior to flight will be 60 minutes. Pre-flight duties are part of the FDP. A minimum of 30 minutes duty will be allowed for post-flight activities. The time spent between reporting for a flight and the completion of post-flight tasks determines the length of the subsequent rest period. If this "period" for post FDP duties is routinely exceeded then the post FDP duty period stated in the scheme must be revised to better represent the actual time taken.

7.13.2 A non-standard reporting time designed to take advantage of an increased FDP from a more favourable time band, will not be used.

7.13.3 When any period of standby finishes, during which a call-out has not occurred, at least 12 hours rest must follow prior to the next duty period. Similarly, following the end of a contactable period or periods, at least 10 hours must elapse prior to the next duty period.

Local time of start	Sectors							
	1	2	3	4	5	6	7	8 or more
0600-0659	13	12¼	11½	10¾	10	9½	9	9
0700-1259	14	13¼	12½	11¾	11	10½	10	9½
1300-1759	13	12¼	11½	10¾	10	9½	9	9
1800-2159	12	11¼	10½	9¾	9	9	9	9
2200-0559	11	10¼	9½	9	9	9	9	9

Table A. Two Flight Crew

Local time of start	Sectors				
	Up to 4	5	6	7	8 or more
0600-0659	10	9¼	8½	8	8
0700-1259	11	10¼	9½	8¾	8
1300-1759	10	9¼	8½	8	8
1800-2159	9	8¼	8	8	8
2200-0559	8	8	8	8	8

Table B. Single Flight Crew

7.14 Extension of Flying Duty Period by Split Duty

7.14.1 When an FDP consists of two or more sectors - one of which can be a positioning journey counted as a sector - but separated by less than a minimum rest period, then the FDP may be extended by the amounts indicated below.

Consecutive Hours Rest	Maximum Extension of the FDP
Less than 3	NIL
3 - 10	A period equal to half the consecutive hours rest taken

The rest period shall not include the time allowed for immediate post flight and pre-flight duties (a minimum total of 30 minutes). When the rest period is 6 hours or less it will suffice if a quiet and comfortable place, not open to the public, is available. If the rest period is more than 6 consecutive hours, then suitable accommodation will be provided.

7.15 Rest Periods

7.15.1 The Company will notify all crew members in good time of a flying duty period so that sufficient and uninterrupted pre-flight rest can be obtained. When away from base the

Company will provide the crew with the opportunity and the facilities for adequate pre-flight rest. The Company will provide for suitable accommodation. When flights are carried out at such short notice that it is impracticable for the Company to arrange suitable accommodation, then this responsibility devolves to the Aircraft Captain.

7.15.2.1 The minimum rest period which will be provided before undertaking a flying duty period shall be at least as long as the preceding duty period, or 12 hours whichever is the greater.

7.15.2.2 When away from base, in the case when the rest period earned by a crew member is 12 hours, and suitable accommodation is provided by the Company, then that rest period will be reduced by one hour. In such circumstances, if the travelling time between the aerodrome and the accommodation is more than 30 minutes each way then the rest period will be increased by the amount the total time spent travelling exceeds one hour. In both situations the accommodation allocated to the crew member must be available for occupation for a minimum of 10 hours. **This subparagraph does not apply to rest periods that exceed 12 hours.**

7.15.3 If a duty period, which includes any time spent on positioning, exceeds 18 hours, then the ensuing rest period will include a local night.

7.15.4 After being called out from a standby duty the length of the minimum rest period will be determined by the length of standby duty, plus any time spent on positioning, and any FDP completed.

7.15.5 Crew members who are having difficulty in achieving adequate pre-flight rest must inform the Company, who will arrange for the individual to be given the opportunity to consult an aviation medical specialist.

7.16 Aircraft Captain's Discretion to Extend a Flying Duty Period

7.16.1 During Normal CAT Operations

- a. An Aircraft Captain may, at his discretion, and after taking note of the circumstances of other members of the crew, if carried, extend an FDP beyond that permitted in paragraph 7.13, provided he is satisfied that the flight can be made safely. The extension shall be calculated according to what actually happens, not on what was planned to happen. An extension of 3 hours is the maximum permitted, except in cases of emergency (see Note).
- b. An Aircraft Captain may exercise his discretion to extend an FDP involving 2 or more sectors up to a maximum of 2 hours prior to the first and subsequent sectors, but this may be up to 3 hours prior to the start of a single sector flight, or immediately prior to the last sector on a multi-sector flight.

- c. An Aircraft Captain may exercise discretion to extend an FDP following a reduced rest period, only exceptionally, and then only to the extent necessary to allow for unforeseen circumstances that become apparent during the last sector.

Note. In respect of an extension of a flying duty period, an emergency is a situation which in the judgement of the Aircraft Captain presents a serious risk to the health or safety of crew and passengers, or endangers the lives of others.

7.16.2.1 During SFOs Involving Emergency Call-outs. A Captain conducting SFO may only exercise his discretion as follows:

- a. Up to 1 hour after the duty period was scheduled to finish (or allowable FDP has been reached) – after which it would constitute an emergency call-out.
- b. To a cumulative total of 2 hours in any 7 consecutive days – after which it would constitute an emergency call-out.

Note. If the 1 hour limit and the 2 hour limit are exceeded within a consecutive 7 day period it constitutes 2 emergency call-outs (except where a single call-out exceeded the 2 hour limit).

- c. Discretion that results in the 7 consecutive day duty limit being exceeded may be used but in no circumstances may the 28 day duty limit be exceeded by discretion except in the case of the emergency call out procedure contained in para 7.24.

7.17 Aircraft Captain's Discretion to Reduce a Rest Period

7.17.1 An Aircraft Captain may, at his discretion, and after taking note of the circumstances of other members of the crew, if carried, reduce a rest period, but only insofar as the accommodation allocated to the crew member must be available for occupation for a minimum of 10 hours. The exercise of such discretion must be considered exceptional and must not be used to reduce successive rest periods. If the preceding FDP was extended, the rest period may be reduced, provided that the subsequent allowable FDP is also reduced by the same amount. In no circumstances may an Aircraft Captain exercise discretion to reduce a rest period below 10 hours at accommodation.

7.17.2 When away from base and where an individual crew member separates from the crew, or the crew as a whole splits up, then any use of discretion to reduce rest becomes a decision for an individual crew member. The decision to continue with the next flight and the submission of an associated discretion report is the responsibility of the relevant Aircraft Captain after the crew member, and/or the Company if it is in a position to do so, has informed the Aircraft Captain that a reduced rest period has been taken.

7.18 Reporting Exercise of Discretion

7.18.1 Whenever an Aircraft Captain extends an FDP it shall be reported to the Company's Chief Pilot on a Discretion Report Form, using the relevant form in the Annexes to this Section.

If the extension is greater than 2 hours or discretion is exercised after any reduced rest period, or the extension exceeds the 7 consecutive day limits, then the Company will submit the Aircraft Captain's written report, together with the Company's comments, to the CAA, within 14 days of the aircraft's return to base.

7.18.2 Whenever an Aircraft Captain reduces a rest period, it shall be reported to the Company's Chief Pilot on a Discretion Report Form, using the relevant form in the Annexes to this Section. If the reduction is more than 1 hour, then the Company will submit the Aircraft Captain's written report together with the comments by the Company, to the CAA, within 14 days of the aircraft's return to base.

7.19 Days Off

7.19.1 Wherever possible, and if required by the crew member, days off will be taken in the home environment.

7.19.2 A single day off will include 2 local nights, and will last at least 34 hours.

7.19.3 A planned rest period may be included as part of a day off.

7.19.4 Crew members will:

- a. Not be on duty more than 7 consecutive days between days off, and
- b. Have 2 consecutive days off in any consecutive 14 days following the previous 2 consecutive days off, and
- c. Have a minimum of 7 days off in any consecutive 4 weeks or, 8 days off in any consecutive 4 weeks if designated as SFO flight crew, and
- d. Have an average of at least 8 days off in each consecutive 4 week period or, 9 days off in any consecutive 4 weeks if designated as SFO flight crew, averaged over 3 such periods.

Note. Floaters are not deemed to be SFO designated aircrew.

7.20 Absolute Limits on Flying Hours

7.20.1 A person shall not act as a member of the flight crew of an aircraft if at the beginning of the flight the aggregate of all previous flight times:

- a. During the period of 28 consecutive days expiring at the end of the day on which the flight begins exceeds 100 hours. (This means that on the 28th day a flight crew member may depart on a single sector flight, and may complete that sector, even though at the end of the flight the total flying hours completed in 28 days will exceed

100 hours. Consequently, the flight crew member cannot then continue to operate as a flight crew member on any subsequent sectors during that day),

or

- b. During a period of 12 months, expiring at the end of the previous month, exceeds 900 hours.

Save that, for SFO designated flight crew:

- c. The limit in Para 7.20.1.a is reduced to 75hrs;
- d. The limit in Para 7.20.1.b is reduced to 600hrs; and
- e. Over any 3 consecutive 28 day period total flight time (excepting non-counting hours as defined at Para 7.4.2) exceeds 180 hours.

Note. Floaters are not deemed to be SFO designated aircrew.

7.21 Cumulative Duty Hours

7.21.1 Maximum Duty Hours. The maximum duty hours for flight crew, shall not exceed:

- a. 55 hours in any 7 consecutive days;
- b. 95 hours in any 14 consecutive days; and
- c. 190 hours in any 28 consecutive days.

Notes:

1. The cumulative duty hour totals may be affected by the emergency call-out procedure but the 28 day limit cannot be exceeded even with the use of discretion.
2. When a crew member is not rostered for either standby or flying duties for 28 or more consecutive days then any duty hours worked are not added to cumulative totals. However, when a crew member is anticipated to return to either, standby or, flying duties, then the duty hours worked in the 28 days preceding that duty must be recorded. Those hours worked will be used to ensure that the crew member complies with the requirements of this Scheme.

7.21.2 Calculation of Cumulative Duty Hours

- a. To count in full:
 - i. Duty periods and flying duty periods, plus subsequent post-flight duties
 - ii. All standby duty, except that specified in b) i) and ii) below
 - iii. The time spent on positioning.
- b. To count as half the time on duty:

- i. The standby duty, when the period of notice given to the crew member before reporting for duty is 3 hours.
- ii. The standby duty when undertaken at home, or in suitable accommodation provided by the Company, takes place during the period 2200 to 0800 hours local time, and the crew member can take undisturbed rest and is not called out for duty.

7.22 Rules Relating To Cabin Crew – Not applicable, refer to OM A Section 7b.

7.23 Records to be Maintained

7.23.1 Records for the duty and rest periods of all flying staff are to be kept. Records shall be preserved for at least 15 calendar months from the date of the last relevant entry. These records include:

- a. For each crew member:
 - i. The beginning, end and duration of each duty or flying duty period, and function performed during that period.
 - ii. Duration of each rest period prior to a flying duty or standby duty period.
 - iii. Dates of days off.
 - iv. 7 consecutive day totals of duty.
- b. Additionally for each flight crew member: Daily and 7 consecutive-day flying hours.

7.23.2 Aircraft Captain's discretion reports of extended flying duty periods and reduced rest periods are to be retained for a period of at least 12 months after the event.

7.24 Emergency Call-out

7.24.1 The following conditions apply to crew members who are requested to respond to an emergency situation by remaining on duty beyond the allowable FDP (including discretion), or to operate during either a day off or a rest period. A pilot shall not be obliged either to make themselves available or to keep fit for such a duty. However, a crew member who accepts such an emergency call-out shall be responsible for ensuring his fitness for the duty to be undertaken.

7.24.2 The emergency call-out duty shall not exceed a total of 5 hours. Remaining on duty during that 5 hours shall be at the sole discretion of the pilot concerned.

Note. Except that if a crew member is called out having achieved the minimum rest, which had included a local night, a full DP may be worked.

7.24.3 Should an emergency call-out occur following completion of an FDP, but prior to a crew member achieving the minimum rest period, the subsequent minimum rest period on completion of the emergency call-out FDP shall be as follows:

Initial FDP + rest achieved + emergency call-out duty.

Neither the crew member nor the Company shall have the right to reduce this rest period.

The Chief Pilot shall forward a report to the Authority of all such emergency call-outs.

7.24.4 No pilot may undertake more than 3 emergency call-out duties in any period of 28 consecutive days, or more than 2 emergency call-out duties per 28-day period averaged over 3 such periods.

7.24.5 Taking emergency call-out duty time into account, maximum duty hours shall not exceed 210 hours in any 28 consecutive days, but no more than 200 hours per 28-day period averaged over 3 consecutive 28-day periods.

7.24.6 Maximum duty hours in any 7-day period shall not exceed 60 hours, which may be increased to 65 hours in the event of unforeseen circumstances, such as when an emergency situation develops near the end of the normal 7-day DP.

7.25 Floaters

7.25.1 All pilots are allocated to a single home base. Where a pilot is nominated as a floater, the home base may be either one of the Company's operating bases or the home address of the floater and this shall be recorded.

7.25.2 When a floater is positioned to an operating base for relief duties, any travelling time taken over and above the nominal time taken for the journey from home to the designated operating aerodrome shall be classed as positioning (in accordance with Para 7.9 above).

7.26 Pleasure Flying/Air Ambulance Work

7.26.1 General. As the Company's business includes pleasure flying and potentially air ambulance work in addition to air taxi/sole use charter work two supplements to the main body of the Scheme are contained in the pages following. The conditions applying to each additional role are stated and must be followed by crew in the employ of the Company.

7.26.2 Scheme Applicability. On those occasions when a crew member is employed in the same duty period on flights to which the limits in the main body of this Scheme and the pleasure flying additions apply, then the hours flown and the duty period worked will be the more restrictive of the two.

7.27 Pleasure Flying

7.27.1 The following will apply whenever the pilot is **solely** engaged in Commercial Pleasure flying duties in a single FDP.

7.27.2 Flying Duty Period. A single FDP will not exceed 10 hours, except that this may be extended to 12 hours for the **sole purpose** of positioning the aircraft from/to the operator's base.

7.27.3 Flying Hours. A pilot will not spend more than 7 hours at the controls in any one flying duty period. When positioning the pilot may spend an additional 2 hours at the controls for the **sole purpose** of positioning the aircraft. The maximum period which a pilot may spend continuously at the controls without a break is 3 hours. During the FDP the pilot shall have breaks of 30 minutes duration according to the following table:

FDP	Breaks
Up to 3 hours	Breaks totalling at least 30 minutes
Up to 6 hours	Breaks totalling at least 1 hour
Between 6 and 8 hours	Breaks totalling at least 1½ hours
Over 8 hours	Breaks totalling at least 2 hours

7.27.4 Rest Period. At the completion of an FDP solely concerned with commercial pleasure flying, and if applicable the return of the aircraft **to the operator's base**, the flight crew will have a rest period of at least 12 hours.

7.28 Air Ambulance Flying

7.28.1 Dedicated Air Ambulance When carrying out an Air Ambulance flight (**patient or organs**), the allowable FDP extracted from paragraph 7.13 in the Company's approved FTL Scheme may be increased by up to a maximum of 4 hours, subject to all the following conditions being met:

- a. Where an **ill or injured person (patient) is carried** under the terms of this provision, a qualified medical attendant must accompany the flight.
- b. The only passengers that may be carried in addition to the patient and medical attendants are the immediate family or next of kin. One close friend only may be carried in lieu of any immediate family or next of kin.
- c. The crew must have had the full entitlement of rest relating to the preceding duty prior to starting an air ambulance flying duty
- d. **Single Pilot Crew.** If, exceptionally, the FDP is scheduled to be extended beyond the maximum of the 4 hours permitted by this supplement then an additional qualified Aircraft Captain must be carried as a relief pilot at least until the aircraft reaches the site where the patient or organ is disembarked. Aircraft Captain's discretion cannot be used to extend the FDP after the patient or organ has been disembarked. A discretion report must be submitted to the CAA.
- e. **Two Pilot Crew.** The use of Aircraft Captain's discretion to further extend the FDP, beyond the extra 4 hours permitted, may be exercised only to offload/deliver the

patient or organ to the destination. Such discretion cannot be used after the patient or organ has been offloaded. A discretion report must be submitted to the CAA.

- f. Following an Air Ambulance FDP the appropriate full rest period must be taken.
- g. At least 48 hours must elapse between the end of one extended Air Ambulance FDP and the start of another Air Ambulance FDP. In one Air Ambulance operation involving two or more extended FDP duties (the first of which is positioning to uplift a patient or organ) the necessity for the 48 hours rest may be deferred until return to base. In this case the Aircraft Captain may reduce the rest following the first FDP by up to 3 hours or to 10 hours in suitable accommodation, whichever is the greater.
- h. A pilot can only fly 3 air ambulance extended FDPs in any 28 consecutive days. (This ruling shall only apply where extensions exceed 1½ hours).
 - i. The relevant duty records must show where an FDP was conducted in accordance with this supplement.
 - ii. The use of split duty to extend the FDP is not permitted.

7.28.2 Combined Commercial Air Transport/Air Ambulance. On the day, if the Company wishes to use an aircraft and crew for a combination of Commercial Air Transport and Air Ambulance work then the FDP specified must be that obtained from paragraph 7.13. Extension of the allowable FDP by the use of split duty and Aircraft Captain's discretion, as stated in paragraphs 7.14 and 7.16 of the main scheme, is allowed. The extension permitted for dedicated air ambulance (in paragraph 7.26.1 above), does not apply in this case.

7.28.3 Air Ambulance - Heavy Crew

7.28.3.1 Heavy Crew Additional Requirements. A further 2 hours may be added to the 4 already allowable subject to the following additional conditions being met:

- a. A third Captain qualified crew member must be on board.
- b. A stretcher or comfortable reclining seat must be available for the resting crew member.
- c. Maximum duty will be 18 hours or as per Table A plus 6 hours whichever is the lesser.
- d. The air ambulance operation will terminate when the patient or organ has been offloaded and full rest entitlement must be taken at that point.
- e. An additional 'day off' (minimum 34 hours which includes 2 local nights) must be taken on completion of the full rest entitlement.
- f. All 'heavy crew' duty days carried out must be notified to the CAA.

7.28.3.2 Revised Cumulative Duty Hours Limitations

- a. Only 2 'heavy crew' duty days will be permitted in any 28 consecutive days.
- b. In any 28 day period containing a 'heavy crew' duty day:
 - i. A minimum of 10 days off will be achieved.
 - ii. Maximum duty hours must not exceed 160 hours.
 - iii. Maximum flying hours shall be limited to 75 hours.
 - iv. A maximum of 60 hours flying averaged over 3 such 28 consecutive day periods.
 - v. If one or more such periods contain 'heavy crew' duty days then the allowable flying hours for the 12 month period must be reduced to 700 hours.

Section 7b

B727/B737 - EASA Multi-Crew Flight Time Limitations

7.1 General

7.1.1 Scope. This scheme establishes the requirements to be met by 2Excel Aviation (henceforth referred to as 'The Company') and its crew members with regard to flight and duty time limitations and rest requirements for crew members.

7.1.2 Aim. The aim of this chapter is to detail the regulations, methods and procedures which the Company will use to ensure that crews are compliant with ORO.FTL and the Civil Aviation (Working Time) Regulations.

7.1.3 Applicability. The regulations contained within this chapter are applicable to Commercial Air Transport by aeroplanes for scheduled and charter operations, excluding emergency medical service (EMS), air taxi and single pilot operations. This scheme shall apply to all cabin crew carried as crew members.

7.2 Definitions

For the purpose of this scheme, the following definitions shall apply:

7.2.1 'Acclimatised' means a state in which a crew member's circadian biological clock is synchronised to the time zone where the crew member is. A crew member is considered to be acclimatised to a 2-hour wide time zone surrounding the local time at the point of departure. When the local time at the place where a duty commences differs by more than 2 hours from the local time at the place where the next duty starts, the crew member, for the calculation of the maximum daily flight duty period, is considered to be acclimatised in accordance with the values in the Table 1 below.

7.2.1.1 A crew member remains acclimatised to the local time of his reference time during 47 hours 59 minutes after reporting no matter how many time zones he has crossed. The maximum daily FDP for acclimatised crew is determined by using Table 2 in paragraph 7.6 with the reference time of the point of departure. As soon as 48 hours have elapsed, the state of acclimatisation is derived from the time elapsed since reporting at reference time and the number of time zones crossed.

Table 1

Time difference (h) between reference time and local time where the crew member starts next duty	Time elapsed since reporting at reference time				
	<48	48 – 71:59	72 – 95:59	96 – 119:59	≥ 120
<4	B	D	D	D	D
≥ 4 and ≤ 6	B	X	D	D	D
> 6 and ≤ 9	B	X	X	D	D
> 9 and ≤ 12	B	X	X	X	D

“B” means acclimatised to the local time of the departure time zone;

“D” means acclimatised to the local time where the crew member starts his/her next duty;

“X” means that the crew member is in an unknown state of acclimatisation.

7.2.2 Acclimatised ‘Reference time’ means the local time at the reporting point situated in a 2-hour wide time zone band around the local time where a crew member is acclimatised. For example, a crew member is acclimatised to the local time in Helsinki and reports for duty in London. The reference time is local time in London.

7.2.3 Acclimatised ‘Point of Departure’ means the reporting point for a flight duty period or positioning duty after a rest period.

7.2.4 Acclimatised ‘Time Elapsed Since Reporting at Reference Time’ The time elapsed since reporting at reference time for operations applying Table 5 in subparagraph 7.10.7.1 at home base refers to the time elapsed since reporting for the first time at home base for a rotation.

7.2.5 ‘Accommodation’ means, for the purpose of standby and split duty, a quiet and comfortable place not open to the public with the ability to control light and temperature. It must be equipped with adequate furniture that provides a crew member with the possibility to sleep, with enough capacity to accommodate all crew members present at the same time and with access to food and drink.

7.2.6 ‘Adequate furniture for accommodation’ should include a seat that reclines at least 45° back angle to the vertical, has a seat width of at least 20 inches (50 cm) and provides leg and foot support.

7.2.7 ‘Suitable accommodation’ means, for the purpose of standby, split duty, and rest, a separate room for each crew member located in a quiet environment and equipped with a bed, which is sufficiently ventilated, has a device for regulating temperature and light intensity, and access to food and drink.

- 7.2.8** **‘Augmented flight crew’** means a flight crew which comprises more than the minimum number required to operate the aircraft, allowing each flight crew member to leave the assigned post, for the purpose of in-flight rest, and to be replaced by another appropriately qualified flight crew member.
- 7.2.9** **‘Break’** means a period of time within a flight duty period, shorter than a rest period, counting as duty and during which a crew member is free of all tasks.
- 7.2.10** **‘Delayed reporting’** means the postponement of a scheduled FDP by the operator before a crew member has left the place of rest.
- 7.2.11** **‘Disruptive schedule’** means a crew member’s roster which disrupts the sleep opportunity during the optimal sleep time window by comprising an FDP or a combination of FDPs which encroach, start or finish during any portion of the day or of the night where a crew member is acclimatised. A schedule may be disruptive due to early starts or late finishes.
- Late type of disruptive schedule means:
- i. For ‘early start’ a duty period starting in the period between 05:00 and 06:59 in the time zone to which a crew member is acclimatised; and
 - ii. For ‘late finish’ a duty period finishing in the period between 00:00 and 01:59 in the time zone to which a crew member is acclimatised.
- 7.2.12** **‘Determination of Disruptive Schedules’** means that if a crew member is acclimatised to the local time at his/her home base, the local time at the home base should be used to consider an FDP as ‘disruptive schedule.’ This applies to operations within the 2-hour wide time zone surrounding the local time at the home base, if a crew member is acclimatised to the local time at his/her home base.
- 7.2.13** **‘Night duty’** means a duty period encroaching any portion of the period between 02:00 and 04:59 in the time zone to which the crew is acclimatised.
- 7.2.14** **‘Duty’** means any task that a crew member performs for the operator, including flight duty, administrative work, giving or receiving training and checking, positioning, and some elements of standby.
- 7.2.15** **‘Duty period’** means a period which starts when a crew member is required by an operator to report for or to commence a duty and ends when that person is free of all duties, including post-flight duty.
- 7.2.16** **‘Fatigue’** means a physiological state of reduced mental or physical performance capability resulting from sleep loss or extended wakefulness, circadian phase, or workload (mental and/or physical activity) that can impair a crew member’s alertness and ability to safely operate an aircraft or perform safety related duties (as defined by ICAO in the FRMS Manual Document 9966).
- 7.2.17** **‘Flight duty period (FDP)’** means a period that commences when a crew member is required to report for duty, which includes a sector or a series of sectors, and finishes when the

aircraft finally comes to rest and the engines are shut down, at the end of the last sector on which the crew member acts as an operating crew member.

- 7.2.18** **‘Flight time’** means, for aeroplanes, the time between an aircraft first moving from its parking place for the purpose of taking off until it comes to rest on the designated parking position and all engines or propellers are shut down.
- 7.2.19** **‘Home base’** means the location, assigned by the operator to the crew member, from where the crew member normally starts and ends a duty period or a series of duty periods and where, under normal circumstances, the operator is not responsible for the accommodation of the crew member concerned.
- 7.2.20** **‘Local day’** means a 24-hour period commencing at 00:00 local time.
- 7.2.21** **‘Local night’** means a period of 8 hours falling between 22:00 and 08:00 local time.
- 7.2.22** **‘Operating crew member’** means a crew member carrying out duties in an aircraft during a sector. A person on board an aircraft is either a crew member or a passenger. If a crew member is not a passenger on board an aircraft he/she should be considered as ‘carrying out duties’. The crew member remains an operating crew member during in-flight rest. In-flight rest counts in full as FDP, and for the purpose of OMA-7.7.
- 7.2.23** **‘Positioning’** means the transferring of a non-operating crew member from one place to another, at the behest of the operator, excluding:
- i. The time of travel from a private place of rest to the designated reporting place at home base and vice versa; and
 - ii. The time for local transfer from a place of rest to the commencement of duty and vice versa.
- 7.2.24** **‘Rest facility’** means a bunk or seat with leg and foot support suitable for crew members’ sleeping on board an aircraft.
- 7.2.25** **‘Reserve’** means a period of time during which a crew member is required by the operator to be available to receive an assignment for an FDP, positioning or other duty notified at least 10 hours in advance.
- 7.2.26** **‘Rest period’** means a continuous, uninterrupted and defined period of time, following duty or prior to duty, during which a crew member is free of all duties, standby and reserve.
- 7.2.27** **‘Rotation’** is a duty or a series of duties, including at least one flight duty, and rest periods out of home base, starting at home base and ending when returning to home base for a rest period where the operator is no longer responsible for the accommodation of the crew member.
- 7.2.28** **‘Single day free of duty’** means, for the purpose of complying with the provisions of Council Directive 2000/79/EC, a time free of all duties and standby consisting of one day and

two local nights, which is notified in advance. A rest period may be included as part of the single day free of duty.

7.2.29 'Sector' means the segment of an FDP between an aircraft first moving for the purpose of taking off until it comes to rest after landing on the designated parking position.

7.2.30 'Standby' means a pre-notified and defined period of time during which a crew member is required by the operator to be available to receive an assignment for a flight, positioning or other duty without an intervening rest period.

7.2.31 'Airport standby' means a standby performed at the airport.

7.2.32 'Other standby' means a standby either at home or in a suitable accommodation.

7.2.33 'Window of circadian low (WOCL)' means the period between 02:00 and 05:59 hours in the time zone to which a crew member is acclimatised.

7.3 Responsibilities

7.3.1 Operator's Responsibilities. The Company shall:

- a. Publish duty rosters sufficiently in advance to provide the opportunity for crew members to plan adequate rest. Rosters will be published 3 weeks in advance but no less than 14 days in advance;
- b. Ensure that flight duty periods are planned in a way that enables crew members to remain sufficiently free from fatigue so that they can operate to a satisfactory level of safety under all circumstances;
- c. Specify reporting times that allow sufficient time for ground duties;
- d. Take into account the relationship between the frequency and pattern of flight duty periods and rest periods and give consideration to the cumulative effects of undertaking long duty hours combined with minimum rest periods;
- e. Allocate duty patterns which avoid practices that cause a serious disruption of an established sleep/work pattern, such as alternating day/night duties;
- f. Comply with the provisions concerning disruptive schedules in accordance with subparagraph 7.2.11;
- g. Provide rest periods of sufficient time to enable crew members to overcome the effects of the previous duties and to be rested by the start of the following flight duty period;
- h. Plan recurrent extended recovery rest periods and notify crew members sufficiently in advance;
- i. Plan flight duties in order to be completed within the allowable flight duty period taking into account the time necessary for pre-flight duties, the sector and turnaround times;
- j. Change a schedule and/or crew arrangements if the actual operation exceeds the maximum flight duty period on more than 33% of the flight duties in that schedule during a scheduled seasonal period.

7.3.2 Scheduling. Scheduling has an important impact on a crew member's ability to sleep and to maintain a proper level of alertness. When developing a workable roster, the Company shall strike a fair balance between the commercial needs and the capacity of individual crew members to work effectively. Rosters will be developed and verified in such a way that they distribute the amount of work evenly among those that are involved.

7.3.2.1 Schedules will allow for flights to be completed within the maximum permitted flight duty period and flight rosters will take into account the time needed for pre-flight duties, taxiing, the flight- and turnaround times. Other factors to be considered when planning duty periods include:

- a. The allocation of work patterns which avoid undesirable practices such as alternating day/night duties, alternating eastward-westward or westward-eastward time zone transitions, positioning of crew members so that a serious disruption of established sleep/work patterns occurs;
- b. Scheduling sufficient rest periods especially after long flights crossing many time zones; and
- c. Preparation of duty rosters sufficiently in advance with planning of recurrent extended recovery rest periods and notification of the crew members well in advance to plan adequate pre-duty rest period.

7.3.2.2 Operational Robustness of Rosters. As described in the 2Excel SMS Manual the Company will monitor performance indicators which will assess and determine the robustness of its rosters. It will be used to measure such indicators as how often a rostered crew is unable to complete a duty within the rostered duty period, how often a roster changes within the 14 days prescribed in subparagraph 7.3.1(a) prior to a duty and monitor if any rostered duties are identified as causing fatigue.

7.3.3 Crew Member Responsibilities. Crew members shall:

- a. Comply with point CAT.GEN.MPA.100(b) of ANNEX IV (PART-CAT) which states specifically as follows:
"The crew member shall:
 - i. Comply with all flight and duty time limitations (FTL) and rest requirements applicable to their activities.
 - ii. When undertaking duties for more than one operator:
 - Maintain his/her individual records regarding flight and duty times and rest periods as referred to in applicable FTL requirements, and
 - Provide each operator with the date needed to schedule activities in accordance with the applicable FTL requirements.
 - iii. The crew member shall not perform duties on an aircraft if he/she knows or suspects that he/she is suffering from fatigue as referred to in 7.f of Annex IV to Regulation (EC) No 216/2008 or feels otherwise unfit, to the extent that the flight may be endangered."

- b. Make optimum use of the opportunities and facilities for rest provided and plan and use their rest periods properly.

7.3.3.1 Contract and Freelance Staff – Reporting Requirements. The Company must ensure that crew members who are employed on an irregular basis are not in breach of this section before being offered a flying duty. A flight crew member is required to inform anyone who employs their services as a flight crew member of all flight times and duty periods undertaken. When undertaking duties for more than one company, he/she shall:

- a. maintain his/her individual records regarding flight and duty times and rest periods as referred to in applicable FTL requirements; and
- b. provide each company with the data needed to schedule activities in accordance with applicable FTL requirements.

Crew members not in the regular employ of the Company must provide details of all their flying and, at least their previous 28 day duty hours before undertaking a flying duty assignment in accordance with Paragraph 7.12.3.

7.4 Fatigue Risk Management System

The Company does not currently hold a Fatigue Risk Management Approval. Fatigue risk will be managed through the Company SMS.

7.5 Home Base

7.5.1 The Company shall assign a home base to each crew member which will be annotated on their 'Crew Details' page within the LEON Operations Management System (LEON). Home bases for the Company are:

- a. Sywell Aerodrome, Northampton;
- b. Robin Hood Sheffield Doncaster Airport;
- c. London Stansted Airport.

7.5.2 The home base is a single airport location assigned with a high degree of permanence. In the case of a change of home base, the first recurrent extended recovery rest period prior to starting duty at the new home base is increased to 72 hours, including 3 local nights. Travelling time between the former home base and the new home base is positioning.

7.5.3 Travelling Time. Crew members should consider making arrangements for temporary accommodation closer to their home base if the travelling time from their residence to their home base usually exceeds 90 minutes. The Company provides suitable accommodation in crew houses near both Doncaster Sheffield and Sywell airfields which crews are strongly encouraged to make use of to reduce the fatigue caused by commuting from long distance.

7.6 Flight Duty Periods

7.6.1 Report Times. Pre and post-flight duties shall count as duty period. The minimum report times for the different Company operations are detailed below and are based on the assessment of the appropriate Fleet Captain. Should a Commander feel that insufficient time is available with the report times detailed below then he/she should annotate it on the Voyage Report along with further details of the airport involved and reasons why so further analysis can be conducted.

7.6.1.1 Boeing 727 Cargo Operations. Report time will be a minimum time of 60 minutes prior to departure and the duty period will also include 30 minutes to cater for post-flight duties. Crews will be informed of the report time for any ad-hoc cargo flights when they are called out from standby / reserve but it will remain a minimum of 60 minutes prior to departure.

7.6.1.2 Boeing 727 Oil Spill Response (OSRL). Due to the nature of an OSRL call-out, crews will be informed of their report time when they are called to report from standby. Their report time will be a minimum of 60 minutes prior to departure and the duty period will also include 30 minutes to cater for post-flight duties. When conducting deployed spray operations the Commander may allocate an increased report time / post-flight duty period to cater for the local operating environment. Any increase in report time must be accommodated within the planned FDP and communicated to the crew prior to their rest period.

7.6.1.3 Boeing 727 Training. For any nominated training sectors / simulator training sessions the report time will be a minimum of 60 minutes prior to departure to allow time for adequate briefing, with a 60 minute period post-flight to cater for de-briefing and 30 minutes post-simulator. The Line Training Captain can increase the report time if it is assessed that extra time is required for training activities pre or post-flight. All members of the crew will be informed of the change in sufficient time so as not to impact on their planned rest.

7.6.1.4 Boeing 737. The standard reporting time for flight crews prior to flight is **120 minutes for all passenger flights and 60 minutes for positioning flights**. Post-flight duties will be **60 minutes to prepare the aircraft for the next flight**. Should any extra time be required for post-flight duties such as de-briefing a training sector, that extra time must be recorded on the Journey Log and taken into account for subsequent rest periods as required.

7.6.1.4.1 Cabin Crew. The standard reporting time prior to flight is 60 minutes for all flights, except for designated training flights when this will be increased to 90 minutes to allow adequate briefing time. Post-flight duties will be 30 minutes. Reporting time, in the event of special cabin preparations for specific flights, may be extended by the SCCM to 120 minutes maximum. In the event of the cabin crew being required to report more than 60 minutes before flight or spend more than 30 minutes post-flight, that extra time must be recorded on the Journey Log and taken into account for subsequent rest periods as required.

7.6.2 Basic Maximum Daily FDP. The maximum daily FDP without the use of extensions for acclimatised crew members shall be in accordance with Table 2 below. The start of the FDP in the table refers to the 'reference time.' That means, to the local time of the point of departure, if this point of departure is within a 2-hour wide time zone band around the local time where a crew member is acclimatised.

Table 2
Maximum Daily FDP – Acclimatised Crew Members

Start of FDP at reference time	1 – 2 Sectors	3 Sectors	4 Sectors	5 Sectors	6 Sectors	7 sectors	8 Sectors	9 Sectors	10 Sectors
06:00 – 13:29	13:00	12:30	12:00	11:30	11:00	10:30	10:00	09:30	09:00
13:30 – 13:59	12:45	12:15	11:45	11:15	10:45	10:15	09:45	09:15	09:00
14:00 – 14:29	12:30	12:00	11:30	11:00	10:30	10:00	09:30	09:00	09:00
14:30 – 14:59	12:15	11:45	11:15	10:45	10:15	09:45	09:15	09:00	09:00
15:00 – 15:29	12:00	11:30	11:00	10:30	10:00	09:30	09:00	09:00	09:00
15:30 – 15:59	11:45	11:15	10:45	10:15	09:45	09:15	09:00	09:00	09:00
16:00 – 16:29	11:30	11:00	10:30	10:00	09:30	09:00	09:00	09:00	09:00
16:30 – 16:59	11:15	10:45	10:15	09:45	09:15	09:00	09:00	09:00	09:00
17:00 – 04:59	11:00	10:30	10:00	09:30	09:00	09:00	09:00	09:00	09:00
05:00 – 05:14	12:00	11:30	11:00	10:30	10:00	09:30	09:00	09:00	09:00
05:15 – 05:29	12:15	11:45	11:15	10:45	10:15	09:45	09:15	09:00	09:00
05:30 – 05:44	12:30	12:00	11:30	11:00	10:30	10:00	09:30	09:00	09:00
05:45 – 05:59	12:45	12:15	11:45	11:15	10:45	10:15	09:45	09:15	09:00

7.6.3 The maximum daily FDP when crew members are in an unknown state of acclimatisation shall be in accordance with the following table:

Table 3
Crew Members in an Unknown State of Acclimatisation

Maximum Daily FDP According to Sectors						
1 – 2	3	4	5	6	7	8
11:00	10:30	10:00	09:30	09:00	09:00	09:00

7.6.4 FDP with different reporting time for flight crew and cabin crew. Cabin crew, if carried, will report at the same time as flight crew. Whenever cabin crew requires more time than the flight crew for their pre-flight briefing for the same sector or series of sectors, the FDP of the cabin crew may be extended by the difference in reporting time between the cabin crew and the flight crew. The difference shall not exceed 1 hour. The maximum daily FDP for cabin crew shall be based on the time at which the flight crew report for their FDP, but the FDP shall start at the reporting time of the cabin crew.

7.6.5 Maximum daily FDP for acclimatised crew members with the use of extensions without in-flight rest.

- a. The maximum daily FDP may be extended in accordance with Table 4 in subparagraph 7.6.6 not more than twice in any 7 consecutive days. In that case:
 - i. The minimum pre-flight and post-flight rest periods shall be increased by 2 hours or
 - ii. The post-flight rest period shall be increased by 4 hours.
- b. When extensions are used for consecutive FDPs, the additional pre- and post-flight rest between the two extended FDPs required under subparagraph (a) shall be provided consecutively.
- c. The use of the extension shall be planned in advance.
- d. Extension of the maximum basic daily FDP without in-flight rest shall not be combined with extensions due to a split duty in the same duty period.

7.6.6 Extension of FDP without in-flight rest. The extension of FDP without in-flight rest is limited to the values specified in Table 4 below.

Table 4
Maximum Daily FDP with Extension

Starting Time of FDP	1-2 Sectors (in hours)	3 Sectors (in hours)	4 Sectors (in hours)	5 Sectors (in hours)
06:00 – 06:14	Not Allowed	Not Allowed	Not Allowed	Not Allowed
06:15 – 06:29	13:15	12:45	12:15	11:45
06:30 – 06:44	13:30	13:00	12:30	12:00
06:45 – 06:59	13:45	13:15	12:45	12:15
07:00 – 13:29	14:00	13:30	13:00	12:30
13:30 – 13:59	13:45	13:15	12:45	Not Allowed
14:00 – 14:29	13:30	13:00	12:30	Not Allowed
14:30 – 14:59	13:15	12:45	12:15	Not Allowed
15:00 - 15:29	13:00	12:30	12:00	Not Allowed
15:30 – 15:59	12:45	Not Allowed	Not Allowed	Not Allowed
16:00 – 16:29	12:30	Not Allowed	Not Allowed	Not Allowed
16:30 – 16:59	12:15	Not Allowed	Not Allowed	Not Allowed
17:00 – 17:29	12:00	Not Allowed	Not Allowed	Not Allowed
17:30 – 17:59	11:45	Not Allowed	Not Allowed	Not Allowed
18:00 – 18:29	11:30	Not Allowed	Not Allowed	Not Allowed
18:30 – 18:59	11:15	Not Allowed	Not Allowed	Not Allowed
19:00 – 03:59	Not Allowed	Not Allowed	Not Allowed	Not Allowed
04:00 – 04:14	Not Allowed	Not Allowed	Not Allowed	Not Allowed
04:15 – 04:29	Not Allowed	Not Allowed	Not Allowed	Not Allowed
04:30 – 04:44	Not Allowed	Not Allowed	Not Allowed	Not Allowed
04:45 – 04:59	Not Allowed	Not Allowed	Not Allowed	Not Allowed
05:00 – 05:14	Not Allowed	Not Allowed	Not Allowed	Not Allowed
05:15 – 05:29	Not Allowed	Not Allowed	Not Allowed	Not Allowed
05:30 – 05:44	Not Allowed	Not Allowed	Not Allowed	Not Allowed
05:45 – 05:59	Not Allowed	Not Allowed	Not Allowed	Not Allowed

7.6.7 Unforeseen Circumstances in Actual Flight Operations — Commander’s Discretion.

The Commander may use his/her discretion to increase an FDP to cater for unforeseen circumstances encountered during flight operations. The exercise of Commander’s discretion should be considered exceptional and only used after due consideration of the factors below. It should be avoided at home base and/or Company hubs where standby or reserve crew members should be available. All series of flights will be planned to be completed within an

allowable FDP with due regard for any likely turnaround times and any likely delays. Further details on FDP planning are contained in the 2Excel SMS Manual. The conditions to modify the limits on flight duty, duty and rest periods by the Commander in the case of unforeseen circumstances in flight operations, which start at or after the reporting time, shall comply with the following:

- a. The maximum daily FDP which results after applying Table 2 in subparagraph 7.6.2 and sub-paragraph 7.7.7 (Split Duty) may not be increased by more than 2 hours unless the flight crew has been augmented, in which case the maximum flight duty period may be increased by not more than 3 hours.
- b. If on the final sector within an FDP the allowed increase is exceeded because of unforeseen circumstances after take-off, the flight may continue to the planned destination or alternate aerodrome; and
- c. The rest period following the FDP may be reduced but can never be less than 10 hours.

7.6.7.1 In case of unforeseen circumstances which could lead to severe fatigue, and after consultation with the crew members concerned the Commander can reduce the actual flight duty period and/or increase the rest period in order to eliminate any detrimental effect on flight safety.

7.6.7.2 The Commander shall consult all crew members on their alertness levels before deciding the modifications under subparagraphs 7.6.7 and 7.6.7.1. The factors listed below which could have an adverse effect on a crew member's alertness levels should be taken into consideration by the Commander before discretion is exercised. If any crew member is likely to suffer degraded performance due to any of these factors, then extended FDPs or reduced rest under Commander's discretion should be avoided unless the increased risks identified can be mitigated by other means. The safety of crew members, passengers and aircraft should be the primary consideration with regards to any decisions made.

- a. WOCL encroachment;
- b. Weather conditions;
- c. Complexity of the operations and / or airport environment;
- d. Aircraft malfunctions or specifications;
- e. Flight with training or supervisory duties;
- f. Increased number of sectors;
- g. Circadian disruption; and
- h. Individual conditions of affected crew members (time since awake, sleep-related factor and workload etc).

7.6.7.3 The maximum daily FDP that results after applying Table 2 of subparagraph 7.6.2 should be used to calculate the limits of Commander's Discretion, if Commander's Discretion is applied to an FDP which has been extended under the provisions of subparagraph 7.6.5.

7.6.7.4 Whenever an Aircraft Captain reduces a rest period or increases an FDP, it shall be reported to the Company's Chief Pilot on a Discretion Report Form using the relevant form in Annex B to this Section. This process is entirely non-punitive and will be used to document any

use of Discretion. As the Company does not currently operate any seasonal or scheduled operations, it will not be possible to use Discretion Reports to identify any routes which regularly require the use of discretion. However Discretion Reports are useful for flight scheduling as certain factors may be identified which are causing crews to use Discretion (e.g. cargo loading is regularly taking longer than the allotted time) and can be incorporated into future FDP planning.

7.6.7.5 If the reduction of rest or increase in FDP exceeds 1 hour, then the Company will submit the Aircraft Captain's written report together with the comments by the Company, to the CAA, not later than 28 days after the event. The Chief Pilot shall review all Discretion Reports in order to identify any lessons that may be learned for future operations which will be disseminated to the appropriate personnel.

7.6.8 Unforeseen circumstances in flight operations – delayed reporting. The Company may delay the reporting time in the event of unforeseen circumstances. The purpose of the delayed reporting procedures is to allow a crew member to remain in his/her suitable accommodation when the delayed reporting procedure is activated. If the delayed reporting procedure is used it will be recorded as such within the 'trip supplementary information' for that particular flight on LEON along with the reason for the delayed report and the time that the crew were informed. The crew will also add the details of the delayed report to the Voyage Report which they complete post-flight. 2Excel Operations will maintain a spreadsheet listing any flights where a delayed report was used for future reference.

7.6.8.1 Crew members will be contacted by phone to notify them of a delayed report. They may not be notified between 12 and 2 hours prior to the original report time to avoid disturbing planned rest and the minimum notification period will be 1 hour prior to report.

7.6.8.2 In such a case, if the crew member is informed of the delayed reporting time, the FDP is calculated as follows:

- a. One notification of a delay leads to the calculation of the maximum FDP according to sub-paragraphs (c) or (d) below;
- b. If the reporting time is further amended, the FDP starts counting 1 hour after the second notification or at the original delayed reporting time if this is earlier;
- c. When the delay is less than 4 hours, the maximum FDP is calculated based on the original reporting time and the FDP starts counting at the delayed reporting time;
- d. When the delay is 4 hours or more, the maximum FDP is calculated based on the more limiting of the original or the delayed reporting time and the FDP starts counting at the delayed reporting time;
- e. As an exception to subparagraphs (a) and (b) above, when the Company informs the crew member of a delay of 10 hours or more in reporting time and the crew member is not further disturbed by the Company, such delay of 10 hours or more counts as a rest period.

7.6.9 Night Duties. When rostering night duties of more than 10 hours (referred to below as 'long night duties'), it is critical for the crew member to obtain sufficient sleep before such duties when he/she is adapted to being awake during day time hours at the local time where he/she is acclimatised. To optimise alertness on long night duties, the likelihood of obtaining sleep as close as possible to the start of the FDP will be considered when rostering rest periods

before long night duties, by providing sufficient time to the crew member to adapt to being awake during the night. Rostering practices leading to extended wakefulness before reporting for such duties will be avoided.

7.6.9.1 When establishing the maximum FDP for consecutive night duties, the number of sectors is limited to 4 sectors per duty. Careful attention will be paid to the rostering of long nights in relation to the surrounding duties and rest periods. Current Company flight operations do not require the rostering of regular long night duties and any future long night duties will be carefully considered in accordance with 2Excel SMS Manual. The fatiguing effects of the rostering of any long night duties will be monitored by the Company SMS through Hazard Logs and the Company Fatigue Management Procedure within the SMS Manual.

7.7 Flight Times and Duty Periods

7.7.1 The total duty periods to which a crew member may be assigned shall not exceed:

- a. 60 duty hours in any 7 consecutive days;
- b. 110 duty hours in any 14 consecutive days; and
- c. 190 duty hours in any 28 consecutive days, spread as evenly as practicable throughout that period.

7.7.2 The total flight time of the sectors on which an individual crew member is assigned as an operating crew member shall not exceed:

- a. 100 hours of flight time in any 28 consecutive days;
- b. 900 hours of flight time in any calendar year; and
- c. 900 hours of flight time in any 12 consecutive calendar months.

7.7.3 In addition to the limits laid out above, the following more restrictive limits from the CA(WT)R also apply:

- a. No person shall act as a crew member during the course of his working time, if during the period of 12 months expiring at the end of the month before the month in question the aggregate block flying time of that person exceeds 900 hours; and
- b. No crew member shall have a total annual working time of more than 2,000 hours during the period of 12 months expiring at the end of the month before the month in question.
- c. For the purpose of calculating the total annual working time under the regulation in (b), time spent by a crew member on standby is to count in full as working time except where (d) and (e) apply.
- d. If the period of notice given by the employer to the crew member before the crew member must report for duty is at least 2 hours 15 minutes then the time spent on standby is to count as half the time spent with regards to total annual working hours.
- e. The time spent by a crew member on standby will count as half the time spent on standby if the time spent by the crew member on standby is spent:
 - i. At home;

- ii. In accommodation provided by the employer away from the place where the crew member is next required to report for duty, or
- iii. In other accommodation arranged by the crew member to stay in while temporarily deployed away from home, and
- iv. Is between the hours of 2200 and 0800 local and during that time the crew member can take undisturbed rest and is not called upon to report for duty.

7.7.4 Post-flight duty shall count as duty period. The minimum time for post flight duties is 30 minutes.

7.7.5 The flight time and duty limits above will be tracked by a crew member's LEON FTL sheet to ensure they remain compliant.

7.7.6 **Positioning.** If the Company positions a crew member, the following shall apply:

- a. Positioning after reporting but prior to operating shall be counted as FDP but shall not count as a sector (even if positioning by air as a passenger);
- b. All time spent on positioning shall count as duty period.

7.7.7 **Split Duty.** When an FDP consists of two or more sectors, but separated by less than a minimum rest period, then the FDP may be extended by a Split Duty as long as the following criteria are met:

- a. The break on the ground within the FDP has a minimum duration of 3 consecutive hours.
- b. The break excludes the time allowed for post and pre-flight duties and travelling in accordance with sub-paragraph 7.6.1.
- c. The maximum FDP specified in Table 2 subparagraph 7.6.2 may be increased by up to 50% of the break.
- d. Suitable accommodation is provided either for a break of 6 hours or more or for a break that encroaches the window of circadian low (WOCL).
- e. A split duty shall not follow a reduced rest.
- f. The break on the ground shall count in full as FDP.
- g. In all other cases:
 - i. Accommodation is provided; and
 - ii. Any time of the actual break exceeding 6 hours or any time of the break that encroaches the WOCL does not count for the extension of the FDP.

7.8 Standby

7.8.1 **Standby and Duties at the Airport.** If the Company assigns crew members to standby or to any duty at the airport, the following shall apply:

- a. Standby and any duty at the airport shall be in the roster. The start and end time of standby shall be defined and notified in advance to the crew members concerned to provide them with the opportunity to plan adequate rest.
- b. A crew member is considered on airport standby from reporting at the reporting point until the end of the notified airport standby period.

- c. Airport standby shall count in full as duty period for the purpose of paragraphs 7.7 and 7.10.
- d. Any duty at the airport shall count in full as duty period and the FDP shall count in full from the airport duty reporting time.
- e. The Company shall provide accommodation to the crew member on airport standby.
- f. If not leading to the assignment of an FDP, airport standby will be followed by a rest period as specified in paragraph 7.10.
- g. If an assigned FDP starts during airport standby, the following applies:
 - i. The FDP counts from the start of the standby duty. The maximum FDP is reduced by any time spent on standby in excess of 4 hours;
 - ii. The maximum combined duration of airport standby and assigned FDP as specified in Table 2 of subparagraph 7.6.2 and subparagraph 7.6.6 is 12 hours.
- h. Sub-paragraph 7.7.3 also applies with regards to annual working time regulations and time spent on standby.

7.8.2 Standby Other Than Airport Standby (other standby). The procedures for notification of assigned duties during other standby for B727 crews during an OSRL call out are contained within 2Excel SMS Manual. For all other operations, the notification of assigned duties during other standby is in accordance with paragraph 7.8.3.1.

- a. The maximum duration of other standby is 12 hours;
- b. The Company's standby procedures are designed to ensure that the combination of standby and FDP do not lead to more than 18 hours awake time. Awake time is defined as the time from the start of standby time to the end of the FDP. Scientific research shows that continuous awake time in excess of 18 hours can reduce alertness and should be avoided;
- c. 25% of time spent on other standby counts as duty time for the purpose of paragraph 7.7;
- d. Standby will be followed by a rest period in accordance with paragraph 7.10;
- e. Standby ceases when the crew member reports at the designated reporting point;
- f. If standby ceases within the first 6 hours, the maximum FDP counts from reporting;
- g. If standby ceases after the first 6 hours, the maximum FDP is reduced by the amount of standby time exceeding 6 hours;
- h. If standby starts between 23:00 and 07:00, the time between 23:00 and 07:00 does not count towards the reduction of the FDP under (f) and (g) until the crew member is contacted by the Company; and
- i. The response time between call and reporting time established by the Company allows crew member to arrive from his/her place of rest to the designated reporting point within a reasonable time. Company response times for each operation are contained within 2Excel SMS Manual.

7.8.3 Minimum Rest and Standby.

- a. If airport or other standby initially assigned is reduced by the Company during standby that does not lead to an assignment to a flight duty period, the minimum rest requirements specified in paragraph 7.10 should apply;

- b. If a minimum rest period as specified in paragraph 7.10 is provided before reporting for the duty assigned during the standby, this time period should not count as standby duty;
- c. Standby other than airport standby counts (partly) as duty for the purpose of paragraph 7.7 only. If a crew member receives an assignment during standby other than airport standby, the actual reporting time at the designated reporting point should be used for the purpose of paragraph 7.10.

7.8.3.1 Standby Other Than Airport Standby Notification. Operations will give as much notice as possible of a reporting time for a duty from standby to allow crews time to prepare, except when crews are on standby between 2300 – 0700 when crews should be called a maximum of 3 hours before report time.

- a. If a crewmember is called out from standby, the standby duty will cease when the crewmember reports at the designated reporting point.
- b. If standby ceases within the first 6 hours, the maximum FDP counts from reporting;

Example:

If a crewmember is called out from standby to conduct an FDP before completing 6 hours standby duty then the total duty period allowed is the sum of the time spent on standby and the FDP obtained from Table 2 in 7.6.2.

- c. If standby ceases after the first 6 hours, the maximum FDP is reduced by the amount of standby time exceeding 6 hours;

7.9 Reserve

7.9.1 Reserve Policy. Further details of the Company's policy and procedures on the rostering of Reserve can be found in 2Excel SMS Manual.

7.9.2 The Company will roster a crew member on reserve under the provisions of this paragraph complying with the following:

- a. The crew member will be assigned to Reserve on the published roster;
- b. An assigned FDP counts from the reporting time;
- c. Reserve times do not count as duty period for the purpose of paragraph 7.7 and paragraph 7.10;
- d. The Company does not assign a crew member to Reserve for more than 5 consecutive days. This will ensure that the crew member on Reserve is afforded the requisite Recurrent Extended Recovery Rest period in accordance with paragraph 7.10.5.
- e. The rostered reserve will be for a maximum of 16 hours within a 24 hour period. To protect an 8-hour sleep opportunity, the Company will not contact crew members on Reserve during the period 23:00 to 07:00 on each reserve day.

7.9.3 Duty Notification During Reserve. The Company will aim to notify a crew member rostered on Reserve of any assigned duties no later than 24 hours before the start of the duty in order to avoid interference with sleep patterns. The minimum notification will be 10 hours

between the notification of an assignment for any duty and reporting for that duty during Reserve. This will include the period of 8 hours during which a crew member on Reserve is not contacted by the Company to allow for undisturbed rest.

7.9.4 Recurrent Extended Recovery Rest (RERR). Paragraph 7.10.5 (recurrent extended recovery rest periods) applies to crew members on Reserve.

7.9.5 Rostering of Reserve. A rostered Reserve period that does not result in a duty period may not retrospectively be considered as part of a RERR period. Crew members will be notified of their RERR period prior to any rostered period of Reserve by means of the published roster. Further details with regards to the rostering of Reserve are in 2Excel SMS Manual Chapter 9.

7.10 Rest Periods

7.10.1 Minimum Rest at Home Base.

- a. The minimum rest period provided before undertaking an FDP starting at home base shall be at least as long as the preceding duty period, or 12 hours, whichever is greater;
- b. By way of derogation from point (a), the minimum rest provided under para 7.10.2 applies if the Company provides suitable accommodation to the crew member at home base.

7.10.2 Minimum Rest at Home Base if Suitable Accommodation is Provided. The Company may apply the minimum rest period away from home base during a rotation which includes a rest period at a crew member's home base. This applies only if the crew member does not rest as his/her residence or temporary accommodation because the Company provides suitable accommodation. This type of roster is known as 'back to back' operation.

7.10.3 Minimum Rest Period Away from Home Base. The minimum rest period provided before undertaking an FDP starting away from home base shall be at least as long as the preceding duty period, or 10 hours, whichever is greater. This period shall include an 8-hour sleep opportunity in addition to the time for travelling and physiological needs. The time allowed for physiological needs should be 1 hour and 1 hour travel time to and from the hotel (30 minutes in each direction). Consequently, if the travelling time to and from the suitable accommodation is more than the combined 1 hour then the rest period will be increased in correlation to the extra travelling time.

7.10.4 Working on Rostered Days off or Overtime. The Company may ask a crewmember to work on a rostered day off due to unforeseen circumstances. If that crewmember still meets all of the requisite FTL requirements to work on that day then they may choose to forego their rostered day off to meet the requirement. The crewmember must be given at least 12 hours notice of the requirement prior to the intended report time and the roster consequences of them replacing a day off must be fully considered.

7.10.5 Recurrent Extended Recovery Rest Periods. The Company shall ensure that all crew members are rostered for regular Recurrent Extended Recovery Rest Periods to compensate for cumulative fatigue. The minimum RERR period shall be 36 hours, including 2 local nights, and in any case the time between the end of one RERR period and the start of the next shall not be more than 168 hours. The RERR period shall be increased to 2 local days twice every month.

7.10.6 Disruptive Schedules. If a crew member performs 4 or more night duties, early starts or late finishes between 2 extended recovery rest periods as defined in paragraph 7.10.5, the second RERR period is extended to 60 hours. If a transition from a late finish / night duty to an early start is planned at home base, the rest period between the 2 FDPs will include 1 local night.

7.10.7 Time Zone Differences. For the purpose this subparagraph, a ‘rotation’ is a series of duties, including at least one flight duty and rest period out of home base, starting at home base and ending when returning to home base for a rest period where the Company is no longer responsible for the accommodation of the crew member.

7.10.7.1 Time zone differences are compensated for by additional rest as follows:

- a. At home base, if a rotation involves a 4 hour difference or more, the minimum rest is as specified in the following table.

Table 5
Minimum local nights of rest at home base to compensate for time zone differences

Maximum time difference (h) between reference time and local time where a crew member rests during a rotation	Time elapsed (h) since reporting for the first FDP in a rotation involving at least 4-hour time difference to the reference time			
	<48	48 – 71:59	72 – 95:59	≥ 96
≤ 6	2	2	3	3
> 6 and ≤ 9	2	3	3	4
> 9 and ≤ 12	2	3	4	5

- a. The time elapsed since reporting for a rotation involving at least a 4 hour time difference to the reference time stops counting when the crew member returns to their home base for a rest period during which the Company is no longer responsible for the accommodation of the crew member.

- b. Away from home base, if an FDP involves a 4 hour time difference or more, the minimum rest following that FDP is at least as long as the preceding duty or 14 hours, whichever is greater. By way of derogation from sub-paragraph 7.10.7.1(a) above, and only once as specified in paragraph 7.10.5, the minimum rest provided under this paragraph may also apply to home base if the Company provides suitable accommodation to the crew member.
- c. In case of an eastward-westward or westward – eastward transition, at least 3 local nights of rest at home base are provided between alternating rotations. ‘eastward-westward and westward-eastward transition’ means the transition at home base between a rotation crossing 6 or more time zones in one direction and a rotation crossing 4 or more time zones in the opposite direction.
- d. The monitoring of combinations of rotations is conducted under the provisions of the Company’s Safety Management System Chapter 9 to ensure that there is no adverse effect on crew member fatigue.

7.11 Nutrition

7.11.1 During the FDP there shall be opportunity for a meal and a drink to avoid any detriment to a crew member’s performance, especially when the FDP exceeds 6 hours.

7.11.2 Every opportunity should be taken to allow crew members to have a minimum of 30 minutes for a meal opportunity during the FDP. This opportunity should be within 1 hour of the ‘regular meal window’ to avoid altering the crew member’s body rhythms. If the FDP encompasses 2 regular meal windows (e.g. if the FDP starts at 11:00 hours and ends at 22:00 hrs then meal opportunities for two meals should be given).

7.11.3 On any flight or series of flights with a sector time of more than 1 hour, crews will be able to have a food and drink opportunity in flight. Where the series of flights have sector times less than 1 hour, a nutrition break(s) will be rostered to provide adequate time for the crew to take a meal and drink opportunity. The length of break will vary depending on the length of duty, location of the break and the time of day but should not be less than 30 minutes. For night operations exceeding 6 hours, there should be a nutrition break which will occur around halfway through the scheduled operation.

7.11.4 The Commander will record on the Journey Log the meals that were taken by the crew during each sector. If the crew were unable to take their meal in accordance with paragraph 7.11.2 then the Commander is to record on the Voyage Report the reasons why the meal could not be taken within the prescribed time window. Any time a crew is not able to take the prescribed meals, Operations will record the circumstances for audit purposes.

7.11.5 B727 Spray Operations. If an aircraft is engaged in specialised spray operations then the workload will be too high to allow crew members an adequate nutrition break in-flight. Therefore, when engaged in such operations, the Commander should arrange with the deployed Company Operations personnel to provide adequate meals to be taken in between spray sorties, whilst the dispersant is being replenished and the aircraft refuelled. If the crew

are unable to take their nutrition breaks within the prescribed timescales above, then the Commander is to report that fact in the Voyage Report.

7.12 Records

7.12.1 LEON will record all the required details for each crew member which can be exported to a spreadsheet as required. An example of a typical FTL sheet which will be produced by LEON is at Annex A. The Company shall maintain through LEON the following details for a minimum period of 24 months:

- a. Individual records for each crew member including:
 - i. Flight times;
 - ii. Start, duration and end of each duty period and FDP;
 - iii. Rest periods and days free from all duties; and
 - iv. Assigned home base.
- b. Reports on extended flight duty periods and reduced rest periods.
- c. In addition to the above details, LEON will also track all the requirements of CA(WT)R.

7.12.2 Upon request the Company shall provide copies of individual records of flight times, duty periods and rest periods to:

- a. The crew member concerned; and
- b. To another operator, in relation to a crew member who is or becomes a crew member of the operator concerned.

7.12.3 Records referred to in point CAT.GEN.MPA.100(b)(5) in relation to crew members who undertake duties for more than one operator shall be kept for a period of 24 months. Crewmembers who undertake flying duties for other operators (contractors) shall notify such duties to Operations (FTL@2excelaviation.com) using the Flying and Other Duty Record Form (Annex D to this Section).

7.13 Fatigue Management Training

7.13.1 The Company will provide initial and recurrent fatigue management training to crew members, personnel responsible for preparation and maintenance of crew rosters and management personnel concerned.

7.13.2 This training will be delivered in accordance with the Company Fatigue Management Policy contained within the 2Excel SMS Manual and follows a programme that covers the following:

- a. Applicable regulatory requirements for flight, duty and rest.
- b. The basics of fatigue including sleep fundamentals and the effects of disturbing the circadian rhythms.
- c. The causes of fatigue, including medical conditions that may lead to fatigue.
- d. The effect of fatigue on performance.
- e. Fatigue countermeasures.
- f. The influence of lifestyle, including nutrition, exercise, and family life, on fatigue.
- g. Familiarity with sleep disorders and their possible treatments.
- h. Where applicable, the effects of long range operations and heavy short-range schedules on individuals.
- i. The effect of operating through and within multiple time zones; and
- j. The crew member responsibility for ensuring adequate rest and fitness for flight duty.



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Discretion Report

Aircraft Captain's Discretion Report						
Operator	 2Excel Aviation Ltd		Aircraft Type			
Flight Number			Aircraft Captain			
Date						
If discretion exercised for part crew ort individuals state name and operating capacity below:						
Captain / Co-pilot / Cabin Attendant(s)					Delete as applicable	
Part A	Extension of Flying Duty Period / Flying Hours					
Voyage Details						
Planned Schedule				Actual Schedule		
	Place	UTC	Local		UTC	Local
Duty to Start				Duty Started		
Depart				Departed		
Arrive				Arrived		
Depart				Departed		
Arrive				Arrived		
Depart				Departed		
Arrive				Arrived		
Depart				Departed		
Arrive				Arrived		
Depart				Departed		
Arrive				Arrived		
Depart				Departed		
Arrive				Arrived		
FDP to end				FDP ended		
Scheduled FDP		Hrs		Actual FDP:	Hrs	Mins
Split Duty	Actual Time Off..... On.....		Credit FDP:		Hrs	Mins
Maximum Allowable FDP					Hrs	Mins
Amount of Aircraft Captain's Discretion Exercised					Hrs	Mins
Maximum Flying Hours Permitted			In 28 days		Hours Flown:	
			In 1 yr			
Form continued overleaf						



Aircraft Captain’s Discretion Report (cont)		
Part B	Reduction of Rest	
Note. All times are to be recorded as date/time 6-figure groups, expressed in both UTC and local time		
Last duty started	UTC	Local
Last duty ended	UTC	Local
Rest earned	(Hours)	
Calculated earliest next available	UTC	Local
Actual start of next FDP	UTC	Local
Rest period reduced by:	(Hours)	
<p>Crew affected:</p> <p style="text-align: center;">Name(s) and Operating capacity(ies):</p>		
Part C	Discussion, Analysis, Remarks and Actions Taken	
(to be completed in all cases whichever Part above is completed)		
Aircraft Captain’s Report:		
Note. Electronic signature permitted	Signed:	
	Date:	
Company Remarks / Action Taken:		
Note. Electronic signatures permitted	Signed:	
	Date:	
Forwarded to CAA	Signature:	
Filed	Signature:	



Fatigue Observation Form

		Fatigue Observation Form			2XLFOF																						
<i>This form should be used to report openly or confidentially any fatigue related observation for risk management purposes</i>																											
Name:		Age:		Base: Choose an item.		Confidential? Choose an item.																					
This form is being completed in relation to: Choose an item.				Type of Duty: Choose an item.																							
When did it Happen?																											
Inflight: <input type="checkbox"/>		Driving to work: <input type="checkbox"/>		Driving home: <input type="checkbox"/>		Positioning: <input type="checkbox"/> Other: <input type="checkbox"/>																					
Local report date: <small>Click or tap to enter a date.</small>		Local report time:		Flight No:		From/To: Aircraft type: Choose an item.																					
Single Pilot? Choose an item.				Role: Choose an item.																							
What Happened?																											
Describe the symptoms of fatigue that you encountered:																											
How alert did you feel immediately prior to the event?																											
1	2	3	4	5	6	7	8	9																			
Extremely alert	Very alert	Alert	Rather alert	Neither alert nor sleepy	Some signs of sleepiness	Sleepy, but no difficulty remaining awake	Sleepy, some effort to keep awake	Extremely sleepy, fighting sleep																			
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																			
Physical Signs:				Cognitive Signs:																							
None <input type="checkbox"/>				Impaired attention <input type="checkbox"/>																							
Fidgeting <input type="checkbox"/>				Impaired memory <input type="checkbox"/>																							
Rubbing eyes <input type="checkbox"/>				Negative mood <input type="checkbox"/>																							
Yawning <input type="checkbox"/>				Reduced communication <input type="checkbox"/>																							
Frequent blinking <input type="checkbox"/>				Impaired problem solving <input type="checkbox"/>																							
Staring blankly <input type="checkbox"/>				Impaired situational awareness <input type="checkbox"/>																							
Long blinks <input type="checkbox"/>				Increased risk taking <input type="checkbox"/>																							
Difficulty keeping eyes open <input type="checkbox"/>				Other: <input type="checkbox"/>																							
Head nodding <input type="checkbox"/>																											
Other: <input type="checkbox"/>																											
What Fatigue Countermeasures were used?																											
Advised colleague of fatigue risk <input type="checkbox"/>				Food and drink <input type="checkbox"/>																							
Coordinated workload <input type="checkbox"/>				In-flight rest <input type="checkbox"/>																							
Increased communication <input type="checkbox"/>				Other: <input type="checkbox"/>																							
Caffeine <input type="checkbox"/>																											
Why do you think it happened?																											
Commute <input type="checkbox"/>		Early start time <input type="checkbox"/>		For the 48 hrs prior to the reported event, record the start and finish times for all sleep periods:																							
Delay <input type="checkbox"/>		Late finish time <input type="checkbox"/>																									
Health <input type="checkbox"/>		Long duty day <input type="checkbox"/>																									
Home issues <input type="checkbox"/>		Long term fatigue <input type="checkbox"/>																									
Home rest <input type="checkbox"/>		Positioning <input type="checkbox"/>																									
Hotel res <input type="checkbox"/>		Roster disruption <input type="checkbox"/>																									
Insufficient rest <input type="checkbox"/>		Don't know <input type="checkbox"/>																									
		Other <input type="checkbox"/>																									
				<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th></th> <th style="text-align: center;">Date</th> <th style="text-align: center;">Time: Choose an item.</th> </tr> </thead> <tbody> <tr> <td>Start</td> <td><small>Click or tap to enter a date.</small></td> <td style="text-align: center;">:</td> </tr> <tr> <td>Finish</td> <td><small>Click or tap to enter a date.</small></td> <td style="text-align: center;">:</td> </tr> <tr> <td>Start</td> <td><small>Click or tap to enter a date.</small></td> <td style="text-align: center;">:</td> </tr> <tr> <td>Finish</td> <td><small>Click or tap to enter a date.</small></td> <td style="text-align: center;">:</td> </tr> <tr> <td>Start</td> <td><small>Click or tap to enter a date.</small></td> <td style="text-align: center;">:</td> </tr> <tr> <td>Finish</td> <td><small>Click or tap to enter a date.</small></td> <td style="text-align: center;">:</td> </tr> </tbody> </table>				Date	Time: Choose an item.	Start	<small>Click or tap to enter a date.</small>	:	Finish	<small>Click or tap to enter a date.</small>	:	Start	<small>Click or tap to enter a date.</small>	:	Finish	<small>Click or tap to enter a date.</small>	:	Start	<small>Click or tap to enter a date.</small>	:	Finish	<small>Click or tap to enter a date.</small>	:
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Finish	<small>Click or tap to enter a date.</small>	:																									
Suggestions/Any additional information?																											
Completed forms should be returned to the Safety Manager or emailed to: PD @2excel.uk																											



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Section 8

Operating Procedures

8.0 Introduction. 2Excel Aviation Ltd operates aircraft classified as Performance Class A and B. Class A aircraft are defined as multi-engine aircraft powered by turbo-propeller engines with a maximum approved passenger seating configuration of more than 9 or a maximum take-off mass exceeding 5700kg, and all multi engine turbojet powered aircraft. Class B aircraft are defined as propeller-driven aircraft with a maximum approved seating configuration of 9 or less and a maximum take-off mass of 5700kg or less. Under the terms of this AOC and Company SPO declarations they must be operated in accordance with:

- a. Annex IV Part-CAT (Commercial Air Transport), Annex V Part-SPA (Specific Approvals), Annex VIII Part-SPO (Specialised Operations) and for non-commercial activity Annex VI Part NCC (Non-Commercial Complex Aircraft) and Annex VII Part-NCO (Non-Commercial other than Complex Aircraft);
- b. For State and Public Transport Activity under the National AOC, the Air Navigation Order.
- c. Their Certificates of Airworthiness;
- d. The approved limitations within their Aircraft Flight Manual;
- e. This Operations Manual.

8.1 Flight Preparation Instructions

8.1.0 General

8.1.0.1 Preparation for Flight. An Aircraft Captain shall not commence a Company flight unless he is satisfied that:

- a. That the flight can be safely made;
- b. The weather is within limits for sortie profile;
- c. The airfield is suitably licensed (including the availability of fire and crash cover), or for Part-SPO operations deemed adequate;
- d. The aircrew are appropriately licensed, qualified and current
- e. The aircraft is airworthy;
- f. The aircraft's Certificate of Maintenance is in, and will remain in, force for the duration of the flight;
- g. The aircraft configuration is in accordance with the provisions of the configuration deviation list (CDL) if applicable;
- h. The aircraft equipment and instruments conforms to the MEL appropriate to the planned flight;

- i. Adequate ground facilities, services and support required for the flight are available;
- j. Current and appropriate maps, charts and associated documentation or equivalent data are available to cover the intended operation of the aircraft including any diversion which may reasonably be expected. This shall include any conversion tables necessary to support operations where metric heights, altitudes and flight levels must be used.
- k. Those parts of the Operations Manual which are required for the conduct of the flight are available; the Operations Manual and the documents required at Section 2 of Part A of this Manual are available on the ground at the airfield used for Extra 300 operations.
- l. The provisions specified in this Operations Manual in respect of fuel, oil and oxygen requirements, minimum safe altitudes, aerodrome operating minima and availability of alternate aerodromes, where required, can be complied with for the planned flight;
- m. That the mass of the aircraft, at the commencement of take-off roll, will be such that the flight can be conducted wholly within the authorised performance flight envelope;
- n. Any additional and specific operational limitation in addition to sub-para l and m above can be complied with;
- o. Passenger and cargo weights have been checked, the aircraft's mass and balance are within limits and the load is properly distributed and secured;
- p. The passenger has been briefed on safety procedures and the sortie profile;
- q. The aircraft pre-flight check has been carried out (Note. The aircraft covers, blanks and, where applicable, chocks, are to be removed before the pre-flight check);
- r. Aircraft fuel and oil states are sufficient for the flight;
- s. The passenger's parachute harness (where applicable) has been checked and locked;
- t. The passengers are properly secured in the aircraft, either prior to taxi or before pushback commences;
- u. The Aircraft Captain must acknowledge that he has checked the above items by signing the Technical Log acceptance and, where applicable, the weight and balance sheet and the operational flight plan (OFP – commonly known as the PLOG) before commencing the flight.
- v. Required information relevant to the flight is preserved on the ground. This includes a copy of the operational flight plan (PLOG), signed by the Captain where appropriate, a copy of the relevant sector record page from the aircraft technical log, route specific NOTAM documentation, mass and balance documentation if required and any special loads notification.
- w. Required documentation specified in Para 8.1.12 "Documents, Forms and Additional Information to be Carried" is on board, and a Captain's flight brief if relevant has been prepared and passed in good time to the Aircraft Captain prior to the flight.

8.1.1 Minimum Flight Altitudes

8.1.1.1 General. When an aircraft is operated for the purposes of CAT or SPO, the minimum altitude / flight level at which it is permitted to fly may be governed by national regulations, this Manual, air traffic control requirements or by the need to maintain a safe height above terrain or obstacles en-route. Subject to any exemptions given, the highest of these heights shall be the lowest height that the Aircraft Captain may fly during each segment of his flight except when necessary for take-off or landing, or when descending in accordance with procedures approved by the competent authority.

8.1.1.2 Procedures for Calculating the Minimum Height for the Safe Avoidance of Terrain and Obstacles.

8.1.1.2.1 IFR. When operating IFR Aircraft Captains are to ensure that continuous awareness of the aircraft's position is maintained in order to ensure continued safe separation from terrain. All available information should be used to ascertain the pertinent minimum safe altitude for operations, including Grid MORA, Route MORA, Minimum En-Route Altitude (MEA) and Minimum Sector Altitude (MSA), appropriately corrected for wind speed and temperature, above which altitude pilots are to fly. The Jeppesen Airway Manual displays minimum altitudes as MEA, MOCA or MORA. For an explanation of the symbols associated with these values users should refer to the Jeppesen Airway Manual. Paras a-d below describe MEA, MORA, MOCA, and MSA.

- a. **Minimum En-route Altitudes (MEA).** MEAs are the lowest published altitude (or Flight Level) between radio fixes that meet obstacle clearance requirements between those fixes, and in many countries assures acceptable navigational and radio signal coverage. MEAs represent the lowest level or altitude that may be assigned on a section of an airway. These are shown on the Jeppesen charts. They must clear all obstacles within 5nm of the route centreline by 1000ft if reference point is less than 5000ft or by 2000ft if reference point is more than 5000ft.
- b. **Minimum Off-Route Altitude (MORA).** When flying off a published route and unless they are flying VFR pilots are to fly at or above MORA appropriately corrected for wind speed and temperature. Grid MORA is calculated for an area bounded every grid square on the pertinent aeronautical chart, omitting the last 2 digits; Route MORA provides reference point clearance within 10nm of track. MORA is calculated as the maximum terrain or obstacle elevation, plus 1000ft if that elevation is less than 5000ft or, plus 2000ft if it is more than 5000ft. If value is followed by a + or - sign the accuracy is not guaranteed. When a MORA is shown along a route as "unknown" or within a grid as "un-surveyed" the MORA is not shown due to incomplete or insufficient information.
- c. **Minimum Obstacle Clearance Altitude (MOCA).** MOCA is the lowest published altitude in effect between radio fixes on VOR airways, off airways routes, or route segments, which meets obstacle clearance requirements for the entire route segment. When flying on a published route, pilots are to fly above MOCA appropriately corrected for wind speed and temperature. MOCA will be the higher of the maximum

terrain or obstacle elevation plus 1000ft for elevations of 5000ft and below, or plus 2000ft for elevations exceeding 5000ft, rounded up to the next 100ft. On Jeppesen charts this elevation is referred to by a 'T' following the altitude (e.g. 4000T).

- d. **Minimum Safe/Sector Altitude (MSA).** The MSA is the altitude depicted on instrument approach, SID or STAR charts and identified as the minimum safe altitude which provides a 1000 ft (300 m) obstacle clearance within a 25 NM (46 km) (or other value as stated) radius from the navigational facility upon which the MSA is predicated. Except during positive radar control (radar vectors), or an IFR approach or departure (when on track with a published minimum altitude on airport charts) the minimum altitude must not be lower than the Minimum Sector Altitude (MSA) unless the aircraft is being flown VFR. This MSA does not guarantee navigational aid reception. The MSA is shown in a circle. Where the circle is divided into sectors, the dividing lines are clearly shown as magnetic bearings toward the Navigation facility, with MSA figures in each sector. The facility will always be shown outside and to the right of the circle. When the MSA Circle is divided into sectors, with a different MSA in each sector, these are referred to as Minimum Sector Altitudes.

8.1.1.2.2 Minimum Flight Altitude Corrections. The criteria listed above are to be considered the minimum acceptable. In all cases the altitude obtained is to rounded UP to the next 100ft. In order to determine the geometric altitude of the aircraft and thus ensure adequate obstacle clearance, corrections have to be applied when OAT and/or pressure differ from the standard atmosphere. The possibility of turbulence associated with strong winds over mountainous regions will also require a greater margin of safety.

- a. **Allowance for Wind Speed.** When operating within 20nm of terrain whose maximum elevation is greater than 2000ft AMSL, the MOCA and MORA are to be increased according to Table 1 below:

Terrain Elevation	Wind Speed in Kts			
	0-30 kts	30-51 kts	51-70 kts	> 70 Kts
2000-8000 ft	+500 ft	+1000 ft	+1500 ft	+2000 ft
>8000 ft	+1000 ft	+1500 ft	+2000 ft	+2500 ft

Table 1. Wind Speed Corrections.

- b. **Allowances for Temperature.** Pressure altimeters are calibrated to indicate true altitude under International Standard Atmosphere (ISA) conditions. Any deviation from ISA will therefore result in an erroneous reading on the altimeter. In cold conditions the altimeter will over-read even when the correct barometric pressure has been set. This altimeter error may be significant under very cold conditions.
 - i. **En Route.** When the surface air temperature en-route is well below the ISA value, MSAs must be corrected in accordance with Table 2 below.

Surface Temperature	Altitude Correction
ISA-16°C to ISA-30°C	MOCA/MORA Plus 10%
ISA-31°C to ISA-50°C	MOCA/MORA Plus 20%
ISA-51°C or below	MOCA/MORA Plus 25%

Table 2. Temperature Correction Rule of Thumb.

- ii. **During Procedures.** Where procedures detail heights above specific elevations, the Table 31 at Para 8.3.3.8.1 should be used and then applied by adding the value in the table to the published altitudes on the chart or plate.
- c. **Allowance for QNH.** When flying at levels with the altimeter set to 1013hPa, the minimum safe altitude must be corrected for deviations in pressure when the pressure is lower than the standard atmosphere. The correction is 28ft per hPa below 1013hPa. Table 3 gives some guide corrections indicating the size of the error. When using QNH altimeter settings a pressure correction is not required.

QNH of nearest station	Altitude Correction
1013	0ft
1010	-80ft
1005	-220ft
1000	-380ft
995	-510ft
990	-630ft
985	-780ft
980	-920ft
975	-1080ft

Table 3. QNH Pressure Correction.

Example:

Indicated altitude = 5000ft ISA, local QNH = 980hPa

True geometric altitude = 5000-920 = 4080ft

8.1.1.3 Minimum En Route Operating Heights

8.1.1.3.1 VFR in Sight of the Ground. Cognisant of Para 8.1.1.3.2 below, when pilots are operating under VFR rules in sight of the ground, Minimum Obstacle Clearance Altitude (MOCA), Minimum Off-Route Altitude (MORA), and the wind speed and temperature allowances shall not apply.

Single pilot VFR operation at night without an altitude hold or heading hold autopilot is prohibited for aircraft engaged in CAT or SPO. Additionally, at night, aircraft must not be flown at a height of less than 1000ft above the highest obstacle within a distance of 5nm unless it is necessary to do so in order to take off or land, or the aircraft has been otherwise authorised by the competent authority in relation to the area over which the aircraft is flying or the aircraft flies at an altitude not exceeding 3000ft AMSL and remains clear of cloud with the surface in sight.

8.1.1.3.2 Single-Engine Minimum Operating Heights. Except during take-offs and landings, single engine aircraft must be flown at such an altitude and speed that in the event of an engine failure, or other major in-flight emergency that requires a forced landing, the aircraft is

capable of reaching a place at which a safe forced landing could be made, which is defined as a point 1000ft above the intended forced landing area as follows:

- a. When operating above cloud, the minimum base height for manoeuvres will be 1000ft above the cloud tops or higher if required to meet CAT.POL.A.320.
- b. If operating within 2nm of a suitable airfield, the base height shall be 1000ft agl; or
- c. If operating in sight of a suitable landing area away from an airfield the minimum height is 1500ft agl; unless
- d. For missions that require en-route flight below 1500ft agl (e.g. military training sorties), where zoom-climb performance would enable the pilot to climb the aircraft to achieve a point 1000ft above the intended forced landing area.

8.1.1.3.3 Multi-Engine Minimum Operating Heights.

8.1.1.3.3.1 Normal Operation. En-route IFR flight levels or altitudes should be higher than the published MEA indicated on en-route charts. The minimum safe en-route altitude should be the higher of the MORA and MOCA. Both minimum altitudes are indicated on en-route charts where they exist. In case of incomplete or lack of safety altitude information, obstacles and reference points have to be located on ONC or topographic maps. These minimum altitudes must be respected along the track with all engines operative unless a procedure has been approved to cope with depressurisation. During flight preparation the minimum altitudes must be established in the OFP/PLOG for all route segments.

8.1.1.3.3.2 Abnormal Operation

8.1.1.3.3.2.1 Twin-engined aircraft. In the event of an engine failure en-route, in the meteorological conditions expected for the flight and with the remaining engines operating within the specified maximum continuous power conditions, the aircraft must be capable of flying at or above the minimum altitude for safe flight (as detailed in Para 8.1.1.2 above) to a point 1000ft above an aerodrome at which the performance requirements can be met. In the event that the aircraft could not hold its altitude, the aircraft must not assumed to be flying, with all engines operating at maximum continuous power, above the altitude at which the rate of climb equals 300ft/minute, and the assumed en-route gradient with one engine inoperative shall be the gross gradient with one engine inoperative minus a gradient of 0.5%.

- a. **PA-31.** See also OM B Section 4 para 4.6.
- b. **King Air BE200.** See also relevant OM B Section 4, para 4.5.
- c. **Boeing B737.** See also relevant OM B Section 4, para 5.1.4

8.1.1.3.3.2.2 B727 Aircraft operating with two engines inoperative. At no point along the intended track will Company B727 aircraft be more than 90 minutes, at the all-engines long range cruising speed at standard temperature in still air, away from an aerodrome at which the performance requirements applicable at the expected landing mass are met unless it complies with a-d below.

- a. **En-Route Net Flight Path.** The two engines inoperative en-route net flight path data must permit the aircraft to continue the flight, in the expected meteorological conditions, from the point where two engines are assumed to fail simultaneously, to an aerodrome at which it is possible to land and come to a complete stop when using the prescribed procedure for a landing with two engines inoperative. The net flight path must clear vertically, by at least 2000ft all terrain and obstructions along the route within 5nm on either side of the intended track. At altitudes and in meteorological conditions requiring ice protection systems to be operable, the effect of their use on the net flight path data must be taken into account. If the navigational accuracy does not meet the 95% containment level, an operator must increase the width margin given above to 10nm. The net flight path must have a positive gradient at 1500ft above the aerodrome where the landing is assumed to be made after the failure of two engines.
- b. **Critical Point.** The two engines are assumed to fail at the most critical point of that portion of the route where the aircraft is more than 90 minutes, at the all engines long range cruising speed at standard temperature in still air, away from an aerodrome at which the performance requirements applicable at the expected landing mass are met.
- c. **Fuel Jettisoning.** Fuel jettisoning is permitted to an extent consistent with reaching the aerodrome with the required fuel reserves, if a safe procedure is used.
- d. **Aircraft Mass.** The expected mass of the aircraft at the point where the two engines are assumed to fail must not be less than that which would include sufficient fuel to proceed to an aerodrome where the landing is assumed to be made, and to arrive there at least 1500 ft directly over the landing area and thereafter to fly level for 15 minutes.

8.1.2 Aerodrome Suitability Criteria.

8.1.2.1 General. Aircraft Captains are to ensure that all aerodromes selected for use (either as destinations or alternates) are adequate and suitable in all respects. In particular, airfield licensing, runway dimensions and surfaces, load classifications, local obstacles, airfield states, lighting, communications, navigation aids, weather reporting and ancillary services are to be of an appropriate standard and serviceability for the Company's intended operations and that aircraft performance requirements will be met at the weights at which the aircraft is planned to land and take-off, and in the conditions (including contaminated runways) which may be expected to exist at the time of the operation.

8.1.2.2 Fire Fighting and Rescue Services. ICAO Annex 14 specifies the aerodrome requirements for rescue and fire fighting, based upon the aircraft's length, fuselage width and the number of movements of individual types. For reference the minimum acceptable Fire Fighting and Rescue Service (RFFS) category for Company operations are:

- | | | |
|----|--------------|---------------------|
| a. | Extra 300 | Category Special |
| b. | PA-31 | Category 2 |
| c. | King Air 200 | Category 3 |
| d. | B727-2S2F | Category 7/ FAA 'C' |
| e. | B737-300 | Category 6/ FAA 'B' |

For aerial dispersant delivery operations, the B727 may be operated out of normal hours at Doncaster Airport with a minimum of RFFS Category 3.

At all other locations and in exceptional circumstances where no reasonable alternative is available, the DFO may authorise operations from aerodromes that do not meet these requirements.

ICAO Annex 14 states that the RFFS level of protection provided at an aerodrome should be equal to the RFFS category for the largest aircraft normally using the aerodrome. Where movements in the highest category are less than 700 in the busiest consecutive three months, the level of protection shall be not less than one category below the published category. This concession to use an aerodrome one category below the required category is known as remission. This remission is allowed subject to an agreement between the aerodrome licence holder and the operator.

8.1.2.3 Aerodrome Classification. The Company has 3 classifications of aerodromes and Aircraft Captains will be qualified to operate from each category specifically. Parts C Section 11 details the airfields themselves and Part D details how these competencies will be obtained and checked. Aerodromes will be categorised in ascending order of 'difficulty to operate to/from' from Category A to Category C.

8.1.2.3.1 Category 'A' Aerodromes. An aerodrome that satisfies all the following requirements:

- a. A day and night operations capability;

- b. At least one runway with no performance limited procedure of take-off and / or landing;
- c. An approved instrument approach procedure;
- d. Published circling minima of no higher than 1000ft above airfield level.

Pilots are authorised to operate into Category A aerodromes on the basis of the annual line check and should self-brief for these aerodromes using the flight documentation provided in the Jeppesen Airway Manual and if applicable the aerodrome performance data pages.

8.1.2.3.2 Category 'B' Aerodromes. An aerodrome that does not satisfy all the Category A requirements or which requires extra considerations such as:

- a. Non-standard approach aids or approach patterns;
- b. Unusual local weather conditions;
- c. Unusual characteristics;
- d. Unusual performance limitations;
- e. Significant terrain, obstacles or airspace constraints that may affect approach and / or departure patterns.

Prior to operating to a Category B aerodrome the pilot in command is to be briefed or should self-brief if so authorised on the aerodrome concerned.

8.1.2.3.3 Category 'C' Aerodromes. An aerodrome that does not satisfy all the Category A requirements and which requires extra considerations, which may be limited to those detailed in Para 8.1.2.3.2 above but, that are so significant that they require a physical visit to the aerodrome and a specific briefing package before Company operations may be carried out. The Chief Pilot is responsible for preparing operating instructions for each Category C aerodrome that the Company requires to operate into. These briefs will be held in the Documents module within Centrik. The Chief Pilot is responsible for maintaining the list of aerodrome competencies for each pilot in accordance with the relevant Part D Form D20.

Due to the limitations imposed by the host computer databases of current B727 FSTDs, it is not possible for B727 flight crew members to practise operations at specific Category 'C' airports. Where possible B737 flight crew members will qualify to operate to specific Category 'C' airports using appropriately approved FSTDs. Where use of an FSTD is not possible and prior to operating to a Category C airport, the Captain and B727 or B737 Fleet Captain shall ensure that at the very least the Captain has obtained adequate knowledge of the airport by the following means:

- a. Briefing or self-brief utilising the resources of Part OMC supplement B727/B737 aerodrome and en-route procedures;
- b. Have sight of a risk assessment carried out by a suitably qualified person appointed by the B727 or B737 Fleet Captain;
- c. Within reason visit the airfield as an observer with another operator that has experience of the particular airport or;
- d. Within reason visit the airport as a flight crew member or observer in a smaller or lower performance aircraft operated by 2Excel or a third party;

- e. Within reason fly the route on another aircraft type FSTD that has the particular airport contained within its host computer database.

The Captain is to certify that he has adequate knowledge of the Category C airport by signing the journey log.

8.1.2.4 Planning Minima Requirements. In order to carry out a planned approach and landing at an aerodrome the ground equipment and the aircraft equipment for the intended procedure must be operative, the required aircraft performance criteria must be met and the Aircraft Captain must be appropriately qualified.

8.1.2.4.1 Destination Aerodrome. For selection as a destination meteorological reports and/or forecasts should indicate that the weather at the aerodrome will be at or above the applicable planning minima for the type of approach to be flown, as specified below for ± 1 hour of the aircraft's ETA:

- a. For a precision approach RVR/Visibility in accordance with 8.1.3.4.4; and in addition
- b. For a non-precision or circling approach the ceiling must be at or above MDA;

If the destination forecast is at or above the expected operating minima for ETA ± 1 hour then only 1 alternate is required.

If the destination forecast is below the expected operating minima for ETA ± 1 hour (or no met is available) then 2 alternates are required.

8.1.2.4.2 Alternate Aerodromes and Runways. It is Company policy to identify and book alternate aerodromes. All required alternate aerodromes must be specified in the operational flight plan. For selection as a destination alternate or en-route alternate, an airport must satisfy the performance requirements for the aircraft as specified in the Operations Manual Part B (type specific AFM) for runway surface, length, slope and state. (It is assumed that the aircraft will land on the most favourable runway in still air and the runway most likely to be in use commensurate with the forecast wind and approach facilities). Where appropriate, one-engine inoperative limitations (such as loss of Cat II or III capability) must be taken into account when choosing the alternate aerodrome. En-route alternates may be selected for fuel planning purposes but must meet the planning minima specified below.

8.1.2.4.2.1 Take-Off Alternates. A take-off alternate aerodrome is required if the meteorological and/or performance considerations preclude return to the departure aerodrome. This take-off alternate shall be located within:

- a. For two engine aircraft:

One hour's still air flight time at the AFM one-engine operative cruising speed in ISA (or where this is not detailed in the AFM the one-engine maximum continuous power speed in ISA) calculated for the actual take-off mass.

- b. For three or four engine aircraft:

Two hours still air flight time at the AFM one engine inoperative cruising speed in ISA for the actual take-off mass.

For selection as a take-off alternate an aerodrome must satisfy the following conditions:

- a. Meteorological reports and/or forecasts must indicate that the weather at the aerodrome will be at or above the applicable landing minima for ± 1 hour of the aircraft's estimated time of arrival (ETA); and
- b. If only non-precision and/or circling approaches are available ceiling must be taken into account; and
- c. Any one-engine inoperative limitations must be taken into account. e.g. Loss of Cat II or III capability

8.1.2.4.2.2 Destination Alternates. At least one destination alternate must be selected unless:

- a. The whole flight will be conducted within 50nm of the departure aerodrome and under VFR conditions; or
- b. The planned flight duration (from take-off to landing) will be less than 6 hours; and
- c. Two separate runways are available and usable at the destination; and
- d. The weather reports and forecasts for the destination indicate that for one hour before and after the ETA at the destination aerodrome:
 - i. The ceiling will be at least 2000ft or circling height plus 500ft whichever is greater; and
 - ii. The visibility will be greater than 5km; or
- e. The destination aerodrome is isolated and no adequate destination alternate exists;

Note: Runways on the same aerodrome are considered to be separate when they are separate landing surfaces which may intersect such that if one runway is blocked a landing may still be made on the other and each of the landing surfaces has a separate approach procedure based on a separate aid.

Two destination alternates must be selected either when the appropriate weather reports or forecasts for the destination indicate that for one hour before and after ETA the weather conditions will be below the applicable planning minima, or when no meteorological information is available.

8.1.2.4.2.3 Destination Alternate and En-Route Alternate Aerodromes. Meteorological reports and/or forecasts must indicate that the weather at the aerodrome will be at or above the planning minima specified in Table 4 below for ± 1 hour of the aircraft's expected time of arrival.

Type of Approach	Planning Minima
Cat I	Non-precision (Notes 1 and 2)
Non Precision	Non precision (Notes 1 and 2) +200ft / 1000m
Circling	Circling (Note 3)

Table 4. Approach Planning Minima

Notes:

1. Applicable RVR minima for the aircraft.
2. The ceiling must be at or above the MDH.
3. The visibility must be above 1500m for Cat A aircraft, 1600m for Cat B aircraft, 2400m for Cat C aircraft and 3600m for Cat D aircraft (see Table 13).

8.1.2.5 Briefing. Aircraft Captains are to brief the airfield’s minimum weather limits and any local hazards, sensitive areas and local operating procedures prior to flight.

8.1.2.6 Aircraft Performance Classes. Company aircraft shall be operated with the applicable performance class requirements, where aircraft are grouped into the following classes:

8.1.2.6.1 Class A. Includes all multi-engine turbojet powered aircraft, and multi-engine turbo propeller powered aircraft with a maximum approved passenger seating configuration, of more than nine, or a maximum take-off mass exceeding 5700 kg. B727 and B737 aircraft are class A.

Aircraft operated to performance class A standards must be capable of meeting the following performance requirements for one engine inoperative en-route net flight path, in the event of loss of one engine at the most critical point along the route, and in the meteorological conditions expected for the flight:

- a. The gradient of the net flight path must be positive at least 1000 ft above all terrain and obstructions along the route within 5 nm (9.3 km) on either side of the intended track, or
- b. The net flight path must permit the aircraft to continue flight from the cruising altitude, clearing vertically by at least 2000 ft all terrain and obstacles along the route within 5 nm (9.3 km) on either side of the intended track, to an aerodrome where a landing can be made. The effect of the operation of ice protection systems on the net flight path must be taken into account if and when relevant.

8.1.2.6.2 Class B. Covers propeller-driven aircraft with a maximum approved passenger seating configuration of nine or less, and a maximum take-off mass of 5700 kg or less.

8.1.2.6.3 Class C. Comprises aircraft powered by reciprocating engines with a maximum approved Passenger seating configuration of more than nine, or a maximum take-off mass exceeding 5700 kg.

8.1.2.6.4 Obstacle Clearance during Take-off. The take-off flight path shall clear all obstacles by:

- a. A vertical distance of at least 50ft or;
- b. By a horizontal distance of at least half the aircraft wingspan plus 60m plus $0.125xD$, where D is the horizontal distance the aircraft has travelled from the end of the take-off distance available or the end of the take-off distance if a turn is scheduled before the end of the take-off distance available except as provided for below.
- c. When showing compliance with this requirement it must be assumed that:
 1. The take-off flight path begins at a height of 50ft above the surface at the end of the take-off distance required and ends at a height of 1500ft above the surface;
 2. The aircraft is not banked before the aircraft has reached a height of 50ft above the surface, and thereafter the angle of bank does not exceed 15° ;
 3. Failure of the critical engine occurs at the point on the all engine take off flight path where visual reference for the purpose of avoiding obstacles is expected to be lost;
 4. The gradient of the take-off flight path from 50ft to the assumed engine failure height is equal to the average all engine gradient during climb and transition to the en route configuration, multiplied by a factor of 0.77; and
 5. The gradient of the take-off flight path from the height reached in accordance with sub-para 4 above, to the end of the take-off flight path is equal to the one engine inoperative en route climb gradient shown in the AFM.
- d. When showing compliance with 8.1.2.6.4.a above for those cases where the intended flight path does not require track changes of more than 15 degrees obstacles need not be considered which have a lateral distance greater than:
 1. 300m if the flight is conducted under conditions allowing visual course guidance navigation, or if navigational aids are available enabling the pilot to maintain the intended flight path with the same accuracy; or
 2. 600m for flights under all other conditions.
- e. When showing compliance with 8.1.2.6.4.a above for those cases where the intended flight path requires track changes of more than 15° obstacles need not be considered which have a lateral distance greater than:
 1. 600m for flights under conditions allowing visual course guidance navigation;
 2. 900m for flight under all other conditions.

- f. When showing compliance with all of the above account must be taken of the following:
1. The mass of the aircraft at the commencement of the take-off run;
 2. The pressure altitude at the aerodrome.
 3. The ambient pressure at the aerodrome;
 4. Not more than 50% of the reported headwind component and not less than 150% of the reported tail wind component.

8.1.2.6.5 Class B Take-Off and Climb Performance. (For Perf Class A requirements see relevant Part B Section 4).

- a. **Take-off Mass.** The take-off mass shall not be allowed to exceed the maximum take-off mass specified in the AFM for the pressure altitude and the ambient temperature at the aerodrome at which the take-off is to be made.
- b. **Take-off Distance.** The un-factored take off distance, as specified in the AFM shall not exceed:
1. When multiplied by a factor of 1.25 the TORA; or
 2. When a stopway and / or clearway is available, the following:
 - (a) the TORA;
 - (b) when multiplied by a factor of 1.15, the TODA; and
 - (c) when multiplied by a factor of 1.3 the ASDA.
 3. The Aircraft Captain shall take account of the following:
 - (a) The mass of the aircraft at the commencement of the take-off run;
 - (b) The pressure altitude at the aerodrome;
 - (c) The ambient temperature at the aerodrome;
 - (d) The runway surface condition and the type of runway surface;
 - (e) The runway slope in the direction of take-off; and
 - (f) Not more than 50% of the reported headwind component or not less than 150% of the reported tailwind.
- c. **Take-off Climb - All Engines Operating.** The steady gradient of climb after take-off must be at least 4% with:
1. Take-off power on each engine;
 2. The landing gear extended except that if the landing gear can be retracted in not more than 7 seconds, it may be assumed to be retracted;
 3. The wing flaps in the take-off position;
 4. A climb speed not less than the greater of 1.1 V_{MC} and 1.2 V_{S1} .

d. Take-off Climb – One Engine Inoperative

1. The steady gradient of climb at an altitude of 400ft above the take-off surface must be measurably positive with:
 - (a) The critical engine inoperative and its propeller in the minimum drag position;
 - (b) The remaining engine at take-off power;
 - (c) The landing gear retracted;
 - (d) The wing flaps in the take-off position; and
 - (e) A climb speed equal to that achieved at 50ft.

2. The steady gradient of climb must not be less than 0.75% at an altitude of 1500ft above the take-off surface with:
 - (a) The critical engine inoperative and its propeller in the minimum drag position;
 - (b) The remaining engine at not more than maximum continuous power;
 - (c) The landing gear retracted;
 - (d) The wing flaps retracted; and
 - (e) A climb speed not less than $1.2 V_{S1}$.

e. Landing Climb – All Engines Operating. The steady gradient of climb must be at least 2.5% with:

1. Not more than the power or thrust that is available 8secs after initiation of movement of the power controls from the flight idle position.
2. The landing gear extended;
3. The wing flaps in the landing position; and
4. A climb speed equal to V_{REF} .

f. Landing Climb – One Engine Inoperative. The steady gradient of climb must be not less than 0.75% at an altitude of 1500ft above the landing surface with:

1. The critical engine inoperative and its propeller in the minimum drag position.
2. The remaining engine on not more than maximum continuous power;
3. The landing gear retracted;
4. The wing flaps retracted; and
5. A climb speed not less than $1.2 V_{S1}$.

8.1.2.6.6 Required RVR/Visibility For Departure. For multi-engine aircraft whose performance is such that in the event of a critical power unit failure at any point during the take-off the aircraft can stop or continue to a height of 1500ft above the aerodrome while clearing all obstacles by required margins, the take-off RVR / visibility minima may not be less than those given in Table 5.

Facilities	RVR/Vis (m)
Nil (Day Only)	500
Runway Edge Lighting and/or Centreline Marking	250 / 300 (Notes 1 & 2)
Runway Edge and Centreline Lighting	200 / 250 (Note 1)
Runway Edge, Centreline Lighting and Multiple RVR Info	150 / 200 (Note 1 & 4)

Table 5. RVR / Visibility Required for Departure.

Notes:

1. The higher values apply to Category D aircraft.
2. For night operations, at least runway edge and runway end lights are required.
3. The reported RVR/Visibility representative of the initial part of the take-off run may be replaced by pilot assessment.
4. The required RVR value must be achieved for all of the relevant RVR reporting points except as stated in Note 3 above.
5. For take-off, the relevant RVR reflects that portion of the runway required for the whole of the ground manoeuvre, including rejected take-off'.
6. For landing, the relevant RVR reflects the landing distance required down to a speed of 60kts.
7. ***Operations in RVRs/Visibilities less than 400m are NOT permitted without an LVTO operational approval and then only by Aircraft Captains who are current in Low Visibility Operations.***

8.1.2.6.6.1 King Airs and Boeing B727/B737. Company King Airs can comply with Para 8.1.2.6.5, and Company B727/B737 aircraft operate to Perf Class A performance requirements and as such both types are therefore limited only by runway facilities as per Table 5 and pilots' currency in Low Visibility Operations. Other than the B737 the Company operates to CAT 1 limits not 'lower than standard CAT 1' limits.

8.1.2.6.7 Multi-Engine Assumed Engine Failure Heights and Take-off Weather Limits.

- a. **Multi-Engine Aircraft That May Need To Re-Land.** Pilots of multi-engine aircraft which cannot comply with the performance conditions noted at para 8.1.2.6.5 above, may need to re-land immediately and to see and avoid obstacles in the take-off area. Such aircraft may be operated to the minima contained in Table 6 below, provided they are able to comply with the applicable obstacle clearance criteria assuming engine failure at the height specified. This height may not be lower than that from which the one-engine-inoperative net take-off flight path can be constructed. The RVR/Visibility limits applicable to a particular take-off shall be the higher of those contained in Table 5 or 6 for the circumstances.

Assumed Engine Failure Height above the Runway versus RVR/Visibility						
Assumed Engine Failure Height Above the Take-off Runway (ft)	<50	51-100	101-150	151-200	201-300	>300
RVR / Visibility (Note 2)	400 ¹	400 ²	400	500	1000	1500 ³

Table 6. Assumed Engine Failure Height Impact on Permitted Departure RVR / Visibilities

Notes:

1. 150 metres with LVTO approval
 2. 300 metres with LVTO approval
 3. 1500 metres is also applicable if no positive take-off flight path can be constructed.
 2. The RVR/Visibility value representative of the initial part of the take-off run may be replaced by pilot assessment.
- b. **PA-31 Minima.** The Company's PA-31 Navajo aircraft has an assumed engine failure height of 200ft which would give an absolute minimum RVR for departure of 500m (See Table 6 above). However, because the PA-31 cannot comply with Para 8.1.2.6.5 and the data does not exist to construct a net take-off flight path from below 200ft, the Company limits for PA-31 CAT take-offs are a cloud base of 300ft and 1500m visibility.

8.1.3 Aerodrome Operating Minima

8.1.3.1 Operating To and From Aerodromes under IFR. Where departure and arrival procedures exist they are to be followed unless deviation is specifically authorised by Air Traffic Control. For IFR operations, an approved approach procedure must be available and up to date copies of that procedure must be available for each operating pilot (either in the Company's En-Route Guide or as a specific subject of the Aircraft Captain's flight brief).

Company capability other than B737 aircraft will be restricted to CAT 1 operations and specific minima for particular combinations of approach aid, runway and lighting will normally be as contained in the approach plate for the aerodrome concerned or, if required stated in the Aircraft Captain's sortie brief. Company B737 aircraft, subject to the constraints of OMB B737 Section 2.4, will be limited to specific minima as contained in the approach plate for the aerodrome or the system or AOM whichever is higher.

8.1.3.2 Concept of Minima

8.1.3.2.1 Definitions

- a. **2D Non-precision Approach and Landing Operation.** An instrument approach and landing which does not utilise electronic glidepath guidance.
- b. **3D Precision Approach and Landing Operation.** An instrument approach and landing using precision azimuth and glidepath guidance.
- c. **3D Category 1 (CAT 1) Operation.** A precision instrument approach and landing using ILS, MLS or PAR with a DH not lower than 200ft and with an RVR not less than 550m.
- d. **3D Category 2 (CAT 2) Operation.** A precision instrument approach and landing using ILS or MLS with a DH below 200ft but not lower than 100ft and an RVR of not less than 300m.
- e. **3D Category 3 (CAT 3) Operation.** A precision instrument approach and landing using ILS or MLS with, for CAT 3A a DH below 100ft and an RVR not less than 200m, and for CAT 3B a DH below 50ft, or no DH and an RVR lower than 200m but not less than 75m.
- f. **Alert Height.** Alert height is a height defined at aircraft certification for a Fail-Operational flight control system.
- g. **APV Operation.** An Approach Procedure with Vertical Guidance is an approach which utilizes lateral and vertical guidance, but does not meet the requirements established for precision approach and landing operations, with a DH not lower than 250ft and an RVR not less than 600m.
- h. **Categories of Aircraft.** Aircraft are categorised for applicable weather minima according to the threshold speed at maximum landing weight. See 8.1.3.2.2.

- i. **Circling.** The visual phase of an instrument approach to bring an aircraft into position for landing on a runway which is not suitably located for a straight in approach.
- j. **Continuous Descent Final Approach (CDFA) or CDA.** A specific technique for flying the final approach segment of a non-precision instrument approach procedure as a continuous descent, without level-off, from an altitude/height at or above the Final Approach Fix altitude / height to a point approximately 50ft above the landing runway threshold or the point where the flare manoeuvre should be for the type of aircraft flown.
- k. **Converted Meteorological Visibility (CMV).** A value (equivalent to an RVR) which is derived from the reported meteorological visibility by using particular conversion factors. (Jeppesen publish all RVR values above 2000m as CMV).
- l. **Enhanced Vision System (EVS).** An electronic means of displaying a real-time image of the external scene through the use of imaging sensors.
- m. **Fail-Operational Flight Control System.** A flight control system is fail-operational if, in the event of a failure below Alert Height, the approach, flare and landing can be completed automatically. In the event of a failure the automatic landing system will operate as a fail-passive system.
- n. **Fail-Passive Flight Control System.** A flight control system is fail-passive if, in the event of a failure, there is no significant out-of-trim conditions or deviation of flight path or altitude, but the landing is not completed automatically. For a fail-passive automatic flight control system the pilot assumes control of the aircraft after a failure.
- o. **Final Approach Fix.** That part of an instrument approach procedure which commences at the specified final approach fix or point, or where such a fix is not specified:
 - i. At the end of the last procedure turn, base turn or inbound turn of a racetrack procedure, if specified; or
 - ii. At the point of interception of the last track specified in the approach procedure and ends at a point in the vicinity of an aerodrome from which:
 - 1. A landing can be made; or
 - 2. A missed approach procedure is initiated.
- p. **GBAS Landing System (GLS).** An approach operation using ground based augmented GNSS/GBAS information to provide guidance to the aircraft based on its lateral and vertical GNSS position. It uses geometric altitude reference for its final approach slope.
- q. **Head-up Display (HUD).** A display system, which presents flight information into the pilots forward external field of view and which does not significantly restrict the external view.
- r. **Head-up Guidance Landing System (HUDLS).** The total airborne system which provides head-up guidance to the pilot during the approach and landing and/or go-

around. It includes all sensors, computers, power supplies, indications and controls. A HUDLS is typically used for primary approach guidance to decision heights of 50ft.

- s. **Hybrid Head-up Display Landing System (Hybrid HUDLS).** A system which consists of a primary fail-passive automatic landing system and a second independent HUD/HUDLS enabling the pilot to complete a landing manually after failure of the primary system. Typically, the secondary independent HUD/HUDLS provides guidance which normally takes the form of command information, but may alternatively be situational (or deviation) information.
- t. **Low Visibility Procedures (LVP).** Procedures applied at an aerodrome for the purpose of ensuring safe operations during CAT 3, CAT 2. Other Than Standard CAT 2 and Lower Than Standard CAT 1 approaches and Low Visibility Take-offs.
- u. **Low Visibility Take-off (LVTO).** A take-off on a runway where the RVR is lower than 400m but not less than 75m.
- v. **Lower Than Standard CAT 1 Operation.** A CAT 1 instrument approach and landing operation using CAT 1 DH, but with an RVR lower than would normally be associated with the applicable DH, but not lower than 400m.
- w. **Minimum Descent Altitude (MDA).** The specified altitude in a 2D, NPA or circling approach below which descent to land may not be made without visual reference.
- x. **Missed Approach Point (MAPt).** That point in an instrument approach procedure at or before which the prescribed missed approach procedure must be initiated in order to ensure that the minimum obstacle clearance is not infringed.
- y. **Other Than Standard CAT 2 Operation.** A CAT 2 instrument approach and landing operation to a runway where some or all of the elements of the ICAO Annex 14 CAT 2 lighting system are not available, with a DH below 200ft but not lower than 100ft and an RVR of not less than 350m.
- z. **PBN.** Performance Based Navigation defines a navigation performance capability based on WGS 84 coordinates through application of Area Navigation (RNAV) and Required Navigation Performance (RNP).
- aa. **RNP APCH.** The PBN navigation specification dealing with approach procedures using GNSS. These approaches are generally charted under the name RNAV/(GNSS) or RNAV(GPS). RNP APCH covers three possible types of approach:

Non-Precision	LNAV	MDA/MDH
APV Baro VNAV	LNAV/VNAV	DA/DH
APV SBAS	LPV	DA/DH

Note: APV stands for Approach with Vertical Guidance

- ab. **RNP AR APCH.** RNP approach procedure with lower than standard lateral TSE on any segment of an approach procedure. Special aircraft and aircrew authorisation required.
- ac. **Stabilised Approach (SAp).** An approach which is flown in a controlled and appropriate manner in terms of configuration, energy and control of the flight path from a pre-determined point or altitude/height down to a point 50ft above the landing threshold or the point where the flare manoeuvre is initiated if higher.
- ad. **Visual Approach.** An approach when either part or all of an instrument approach procedure is not completed and the approach is executed with visual reference to the terrain.

8.1.3.2.2 Aircraft Approach Categories. For minima purposes, aircraft are divided into five speed categories based on their nominal threshold speeds. These are defined as 1.3 times the stalling speed in the landing configuration or 1.23 times V_S 1g for CS25 certificated aircraft, at maximum certificated landing mass. The five categories are as follows (B727-2S2F and B737 aircraft are Category C, except for circling – Category D):

Category	Threshold Speed (Kts)
A	Less than 91
B	91 to 120
C	121 to 140
D	141 to 165
E	166 to 210

Table 7 – Aircraft Categories

8.1.3.2.3 General. The term minima refers to the aerodrome weather conditions and defines the minimum (horizontal and vertical) visibility prescribed for taking off from, or landing an aircraft to the particular aerodrome under EASA regulations. The most restrictive minima is to be used to define the minima used for Company operations:

- a. Aircraft Capability. The lowest minima for which the aircraft has been certified.
- b. Aerodrome Operating Minima. Aerodrome operating minima noted on the aerodrome chart, established in accordance with the national authorities of the aerodrome. However, at the Aircraft Captain’s discretion, if other factors indicate that the operation cannot be conducted with the required standard of safety the selected minima can be higher than the allowed operating minima. NOTAM may affect these minima.
- c. Operator’s Minima. The operator’s minima approved by the National Authority of the operator. These are the lowest minima that the operator is allowed to use on a specified aerodrome. They cannot be lower than the aircraft capability and the minima published on the aerodrome chart except when specifically approved by the National Authority of the aerodrome.

- d. Crew Minima. Crew minima are the minima to which the crew is authorised to operate based upon the qualifications of the flight crewmembers.
- e. Take-Off Minima. Before commencing a take-off, the Captain must satisfy himself that:
 - i. The visibility or RVR is equal or better than the take-off visibility or RVR limits.
 - ii. The weather conditions at the departure airport are equal to or better than the applicable minima for approach and landing at that airport or at a usable takeoff alternate as defined in planning minima.
 - iii. When the reported meteorological visibility is below that required for take-off and RVR is not reported, a take-off may only be commenced if the Aircraft Captain can determine that the actual visibility along the take off runway is equal or better than the required minimum.
 - iv. When no reported meteorological visibility or RVR is available, a take-off may only be commenced if the Aircraft Captain can determine that the actual visibility along the take-off runway is equal or better than the required minimum.
 - v. **Visual Reference.** The take-off minima must be selected to ensure sufficient guidance to control the aircraft in the event of both a discontinued take-off in adverse circumstances and a continued take-off with failure of the critical power unit.

8.1.3.3 Obstacle Clearance after Take-off and Missed Approach

8.1.3.3.1 Airfield Standard Departure Procedures. Many airfields that the Company uses have standard departure procedures which have been designed to accommodate the rules (and which are explained more fully in CAP 168), with respect to obstacle clearance during the take-off segments. However, many airfields that the Company operates from do not have such procedures in place, even though they can be constructed.

8.1.3.3.2 Aircraft Captains' Responsibilities for Obstacle Clearance.

- a. Whether a procedure is published or not, during take-offs and missed approaches it is the Aircraft Captain's responsibility to ensure that obstacles are cleared by the required margins, even when those obstacles cannot be seen visually. These margins are fixed numbers (varying only a little across the Company's fleet according to aircraft wingspan).
- b. Moreover, for multi-engine aircraft the Aircraft Captain needs to know, and have briefed, the procedure he must fly in order to cater for the case of failure of the critical engine at the critical point. In the case of flying into cloud or during low visibility take-offs the 'critical point' is a variable height that is determined according to the weather.

- c. If the weather is better than the circling minima, then circling procedures may be used to cater for the one engine inoperative case.
- d. If the weather is worse than circling minima but would allow visual flight below cloud down an 'escape route,' the Aircraft Captain may be able to satisfy the obstacle clearance requirements by using visual course guidance navigation (VCGN). In such instances, a visual take-off route must be determined, plotted and followed up until the point that the aircraft can be landed or safely climbed at one engine inoperative rate of climb. In the event that a landing cannot be carried out at the take-off aerodrome, this escape route may be straight (which is defined as less than 15° from departure track); it may be curved or dog-legged; or, it may involve an 'Emergency Turn.'
- e. **Emergency Turns.** An Emergency Turn is controlled turn away from an obstacle or high ground to an egress direction that permits a one engine inoperative climb that complies with obstacle clearance minima. It is assumed that the Emergency Turn will be flown IMC, having been forced by the failure of the critical engine at or after the critical point. Therefore, the Emergency Turn is normally a pre-briefed procedural manoeuvre or one flown with reference to radio navigation aids. Captains must note the requirement to inform ATC when executing an Emergency Turn, and pre-brief ATC if a non-standard Go-Around track (including Emergency Turn) may be required.

8.1.3.3.3 Visual Course Guidance Navigation (VCGN). In order to allow visual course guidance navigation the pilot must ensure the weather conditions prevailing at the time of operation including ceiling and visibility, are such that the obstacles and / or relevant ground reference points can be identified and avoided.

8.1.3.3.3.1 Weather Limits for VCGN. Where no limiting ambient environmental condition or weather limits are specified by any published VCGN procedure, the Company defines the minimum weather limits for VCGN as:

- a. 1500m visibility and 300ft ceiling

Additionally, for night-time cases, either: ambient lighting and/or pilot visual aids; and/or guidance; and/or obstruction lighting; must also be sufficient to fly the required track.

8.1.3.3.3.2 Procedural Requirements for VCGN. The VCGN procedure must be either:

- a. Published; and
- b. Within the performance capabilities of the aircraft in the prevailing environmental conditions (taking into account aircraft and wind speeds; cloud and visibility; bank angle; and single engine performance).
Or
- c. Devised by the Aircraft Captain to conform to the rules above; and
- d. Within the performance capabilities of the aircraft in the prevailing environmental conditions (taking into account aircraft and wind speeds; cloud and visibility; bank angle; and single engine performance); and

- e. Written down and/or described pictorially;
- f. Briefed.

8.1.3.3.3 Planning Guidance for VCGN Escape Routes. If navigation aids are not readily available for Escape Route navigation, including any Emergency Turns, the following procedure may be used to derive a VCGN Escape Route:

- a. Obtain a topographical map that shows obstacles in the vicinity of the airfield;
- b. Draw route track lines over the most suitable terrain with radii (in nm) no less than the figure derived by dividing the one-engine inoperative climb speed in knots by 90; (e.g. 121kts divided by 90 = 1.34nm radius)
- c. Commence the first turn no earlier than one nm after the commencement of the take-off run;
- d. Calculate the ground speed along the track(s) at the one engine inoperative climb speed using the forecast wind and mark off 30sec intervals;
- e. Assess the one engine inoperative rate of climb that should be attained at each 30sec interval and enter the height / altitude attained at each point;
- f. Draw a safe clearance area boundary either side of the tracks in accordance with Para 8.1.2.6.4 above to identify relevant obstacles.
- g. Compare the height / altitude of the obstacle within the safe clearance area boundary with the height / altitude achieved at that point (interpolating between 30 sec intervals as required).
- h. Confirm that at least 50ft vertical clearance will be achieved over any obstacles within the safe clearance area.
- i. Iterate the process if the minima are not achieved at any point along the route.

8.1.3.3.4 Calculating the Minimum Obstacle Clearance Climb Performance Requirement. In some cases, it may not be possible to devise a route. Alternatively, the weight of the aircraft may have to be reduced to obtain the gradient of climb required to meet the minima. In such cases:

- a. Find the obstacle distance from the start of the emergency distance available in feet (where 1nm = 6080ft) and divide this number by the difference between the obstacle altitude and the threshold altitude +50ft.
- b. Then load the aircraft in such a way that the aircraft can achieve this gradient of climb with the one engine inoperative in accordance with the performance graph depicted in the AFM/POH.

8.1.3.4 Approach Operating Minima (Other than LVOs)

8.1.3.4.0 CAT 1, APV and Non-Precision Approach Operations. Approaches are defined according to the aids used for the approach as follows:

- a. **CAT 1 Precision Approaches** are precision instrument approaches using ILS, MLS, GLS (GNSS/GBAS) or PAR with a decision height of not lower than 200ft and a runway RVR of not less than 550m.
- b. **APV Approaches** are instrument approaches which use lateral and vertical guidance but that do not meet the requirements established for precision approach and landing operations with a DH not lower than 250ft and an RVR of not less than 600m.
- c. **Non-Precision Approaches** are instrument approach procedures with a MDH or DH of not lower than 250ft and an RVR / CMV of not less than 750m. Non-precision approaches are based on the use of non-precision aids or the partial use of precision aids such as:

Localizer with or without DME	NDB or NDB/DME
VOR or VOR/DME	SRA
VDF	RNAV/LNAV

8.1.3.4.1 Precision Approaches – Decision Height (DH). The DH to be used for an approach shall not be lower than the highest of:

- a. The minimum height to which the approach aid can be used without the required visual reference;
- b. The OCH for the Category of the aircraft;
- c. The published approach procedure DH where applicable;
- d. The system minima in Table 8 below;
- e. The minimum DH stated in the AFM or equivalent document;

8.1.3.4.2 Non-Precision Approaches – Minimum Descent Height (MDH). The MDH for a non-precision approach shall not be lower than the highest of:

- a. The OCH for the category of aircraft; or
- b. The system minima given in Table 8 below.
- c. The MDH specified in the AFM if stated.

Facility (approach aid)	Lowest DH/MDH (ft)
ILS/MLS/GLS	200
GNSS/SBAS (LPV)	200
GNSS (LNAV)	250
GNSS/Baro-VNAV (LNAV/VNAV)	250
Localiser with/without DME	250
SRA (terminating at 1/2 NM.)	250
SRA (terminating at 1 NM.)	300
SRA (terminating at 2 NM or more)	350
VOR	300
VOR/DME	250
NDB	350
NDB / DME	300
VDF (QDM and QGH)	350

Table 8. System Minima.

8.1.3.4.3 Visual Reference. A pilot may not continue an approach below MDA/MDH unless at least one of the following visual references for the intended runway is distinctly visible and identifiable to the pilot:

- a. Elements of the approach lighting system;
- b. The threshold, or its markings, or its lights or identification lights
- c. The visual glide-slope indicator
- d. The touchdown zone, zone markings or zone lights; or
- e. The runway edge lights;
- f. Other visual references accepted by the Authority.

8.1.3.4.4 RVR/Converted Met Visibility (CMV) Criteria

8.1.3.4.4.1 Minima. The minimum RVR / CMV is governed by DH and the approach lighting and runway lighting/marking available as shown in Tables 9 and 10 below. The minimum RVR / CMV / Visibility for an approach shall be the highest of the values derived from Tables 9 and 10 below (but not higher than the maximum value shown at Table 9 where applicable). An RVR of less than 750m as indicated in Table 9 may be used:

- a. For CAT 1 approaches to runways with FALS, runway touch down zone lights (RTZL) and runway centreline lights (RCLL) provided that the DH is not more than 200ft; or
- b. For CAT 1 approaches to runways without RTZL and RCLL when using approved HUDLS or equivalent systems, or when conducting a coupled approach or flight director flown approach equal to or greater than 200ft (as long as the ILS is not promulgated as restricted); or
- c. For APV approaches with FALS, RTZL and RCLL when using an approved HUD.

However, for single pilot operations, the minimum RVR must not be less than 800m unless a suitable autopilot coupled to an ILS or MLS is in use, in which case the RVR in Table 9 may be used as long as the DH is not less than 1.25x the minimum use height for the autopilot. For night operations, at least runway edge, threshold and end lights must be on.

Facilities / Conditions	RVR/CMV (m)	Category A and Category B Aircraft	Category C and Category D Aircraft
ILS, MLS, GLS, PAR, GNSS/SBAS, GNSS/VNAV	Min	According to Table 10	
	Max	1500	2400
NDB, NDB/DME, VOR, VOR/DME, LOC, LOC/DME, VDF, SRA, GNSS/LNAV with a procedure that fulfils Note 7.c	Min	750	750
	Max	1500	2400
NDB, NDB/DME, VOR, VOR/DME, LOC, LOC/DME, VDF, SRA, GNSS/LNAV with a procedure not fulfilling Note 7.c; or With a DH/MDH \geq 1200ft	Min	1000	1200
	Max	According to Table 10 if flown using CDFA Otherwise add on 200 (A&B)/400 (C&D) m to the values in Table 10 up to a maximum of 5000m	

Table 9. Minimum and Maximum Applicable RVR/CMV for all Instrument Approaches Down to CAT 1 Minima

Notes:

- Full facilities (FALS)** comprise runway markings; >720 m of HI/MI approach lights; runway edge lights, threshold and end lights. Lights must be on.
- Intermediate facilities (IALS)** comprise runway markings; 420-719m of HI/MI approach lights; runway edge, threshold and end lights. Lights must be on.
- Basic facilities (BALS)** comprise runway markings; <210 -419m of HI/MI approach lights; runway edge, threshold and end lights. Lights must be on.
- Nil approach light facilities (NALS)** comprise runway markings; runway edge, threshold and end lights less than 210m or no lights at all.
- The RVR values are either as reported or Converted Met Visibilities (CMV) converted as follows:

Lighting Elements in Operation	RVR/CMV = Met Vis x	
	Day	Night
HI Approach and Runway Lighting	1.5	2.0
Any Type of Lighting other than above	1	1.5
No Lights	1	N/A

Note that this conversion must not be used for take-off, for calculating any other RVR min less than 800m or when reported RVR is available.

6. The DH mentioned in Tables 9 and 10 refer to the initial calculation of DH. When selecting the associated RVR it is not necessary to take account of rounding up to the nearest 10ft which may be done for operational purposes.

DH/MDH (Note 6 above)	Facilities / RVR (Note 5 above)			
	Full (Note 1)	Intermediate (Note 2)	Basic (Note 4)	Nil (Note 4)
200	550	750	1000	1200
201-240	550	800	1000	1200
241-250	550	800	1000	1300
251-300	650	900	1200	1400
301-320	700	1000	1200	1400
321-340	800	1100	1300	1500
341-360	900	1200	1400	1600
361-380	1000	1300	1500	1700
381-400	1100	1400	1600	1800
401-420	1200	1500	1700	1900
421-440	1300	1600	1800	2000
441-460	1400	1700	1900	2100
461-480	1500	1800	2000	2200
481-500	1500	1800	2100	2300
501-520	1600	1900	2100	2400
521-540	1700	2000	2200	2400
541-560	1800	2100	2300	2500
561-580	1900	2200	2400	2600
581-600	2000	2300	2500	2700
601-620	2100	2400	2600	2800
621-640	2200	2500	2700	2900
641-660	2300	2600	2800	3000
661-680	2400	2700	2900	3100
681-700	2500	2800	3000	3200
701-720	2600	2900	3100	3300
721-740	2700	3000	3200	3400
741-760	2700	3000	3300	3500
761-800	2900	3200	3400	3600
801-850	3100	3400	3600	3800
851-900	3300	3600	3800	4000
901-950	3600	3900	4100	4300
951-1000	3800	4100	4300	4500
1001-1100	4100	4400	4600	4900
1101-1200	4600	4900	5000	5000
>1201	5000	5000	5000	5000

Table 10. RVR versus Facilities and MDH / DH

7. The figures at Table 9 are only applicable to conventional approaches with glide slopes not exceeding 4.5° (for the Company's Cat A and B aircraft), or 3.77° (for the Company's Cat C and D aircraft) where the facilities are:
- a. ILS, MLS, GLS or PAR; or
 - b. APV; and

where the final approach track is offset by not more than 15° for Cat A and B aircraft or 5° for Cat C and D aircraft.

- c. CDFA approaches using NDB, NDB/DME, VOR, VOR/DME, LLZ, LLZ/DME, VDF, SRA or RNAV/LNAV with a final approach segment of at least 3nm and:
 - i. The final approach track is offset by not more than 15° for Cat A and B aircraft, or by not more than 5° for Cat C and D aircraft;
 - ii. The FAF or another fix where descent is initiated is available, or distance to the threshold is available by FMS/RNAV or DME; and
 - iii. If the MAPt is determined by timing, the distance from the FAF to the Threshold is ≤ 8 nm.
8. For instrument approaches where the facilities are NDB, NDB/DME, VOR/DME, VOR, LLZ, LLZ/DME, VDF, SRA or RNAV/LNAV that do not fulfil Note 7.c above, Table 9 must be used.

8.1.3.4.5 Effect of Failed or Downgraded Ground Equipment. These instructions are intended for dispatch as well as an in-flight situation. It is not expected however that Aircraft Captains consult these instructions after passing the outer marker or equivalent position. If ground aids failure is announced on final approach, the approach could be continued at the Captain’s discretion. If however, failures are announced before “final” their effect on the approach should be considered as described in Table 11. For night operations or, for any operation where credit for runway and approach lights is required, the lights must be on and serviceable except as provided for in Table 11.

Failed or Downgraded Equipment ¹	Effect on Landing Minima	
	Cat 1	Non Precision
ILS Standby Transmitter	No effect	No effect
Outer Marker	No effect if replaced by height check at 1000ft	N/A
Middle Marker	No effect	No effect unless used as MAPt
Touchdown Zone RVR Assessment System	No effect	No effect
Midpoint or Stop End RVR	No effect	No effect
Anemometer for Runway in Use	No effect if other ground source available	
Ceilometer	No effect	No effect
Approach Lights	Minima as for nil facilities	
Approach Lights Except the Last 210m	Minima as for nil facilities	
Approach Lights Except the Last 420m	Minima as for intermediate facilities	
Standby Power for Approach Lights	No effect	No effect
Whole Runway Light System	Day – Minima as for nil facilities Night - Not allowed	
Edge Lights	Day Only, Night – Not allowed	

Centreline Lights	No effect	No effect
Centreline Lights Spacing Increased to 30m	No effect	No effect
Touchdown Zone Lights	No effect	No effect
Standby Power for Runway Lights	No effect	No effect
Taxiway Light System	No effect except delays due to reduced movement rate	

Notes

1. Conditions applicable to use of table
 - a. Multiple failures of runway lights other than indicated in the table are not acceptable.
 - b. Deficiencies of approach and runway lights are treated separately.
 - c. Failures other than ILS affect RVR only and not DH.
2. The effect on Landing Minima for failed or downgraded equipment during a Cat II/III approach can be found in OMB B737 Section 2.4

Table 11 Effect on Landing minima of failed or downgraded equipment.

8.1.3.5 Approach Technique. The Company uses the CDFA technique for its instrument approaches in order to benefit from the RVR reductions at Table 9.

- a. In non-precision approaches, published (Jeppesen or other) Aerodrome Operating Minima should be increased by adding an allowance to published DA(H) to establish an advisory DA(H) when carrying out such a CDFA non-precision approach.

For Company Perf A aircraft this CDFA allowance is 50ft; for Company Perf B aircraft this CDFA allowance is 30ft.

There is no requirement to apply this allowance to published DA when carrying out a circling approach. This Company requirement is designed to ensure that in the event of a go-around, descent below DA(H) does not occur. On a non-precision approach the aircraft must not descend below MDA unless appropriate visual reference has been established. If the required visual references to land do not exist at MDH plus 50ft, the go around must be initiated at that point. This increment applies to all non-precision approaches as defined by the let-down aids (at Table 8 above) and not by the term used on the approach plate (which, sometimes, by using the terms DA/DH to describe what are actually MDA/MDH, have been found to incorrectly imply a procedure is a precision approach when it is not).

- b. The missed approach shall be executed when reaching the DA/DH or the MAPt whichever occurs first. The lateral part of the missed approach procedure must be flown via the MAPt unless otherwise stated on the approach chart.

8.1.3.6 Instrument Approach Procedures Designed to PANS OPS and TERPS Criteria. Most of the approaches within 2Excel’s routine area of operations are designed in accordance with

PANS-OPS, a standard which has been extensively adopted worldwide. However, the United States produces their own set of standards, TERPS, which are adopted at certain destinations outside the USA, including Canada, Korea, Saudi Arabia and Taiwan, and some military ones. There are significant differences in obstacle clearance criteria between the two systems. Because the IAS used for TAS calculation is greater and the assumed bank angle is lower, the radius of the circling area used in PANS-OPS is larger than that used in US TERPS. This means that an obstacle within the assumed circling area calculated using PANS-OPS criteria might fall outside the obstacle area calculated using US TERPS. Circling procedures based on US TERPS calculations afford considerably lower safety margins than those based on PANS-OPS. It is therefore essential that pilots understand these differences and are aware of the basis of calculations for all airfields at which they intend to operate, including alternates. The basis for calculation of minima is usually printed on the bottom left of the approach plate. Table 12 below highlights the differences used by Pans-Ops and TERPS to construct the circling obstacle clearance area.

Aircraft Approach Category	PANS-OPS radii from threshold	TERPS Radii from threshold (Old)	TERPS Radii from threshold (New) 				
			Circling MDA in feet MSL				
			< = 1000	1001-3000	3001-5000	5001-7000	7001-9000
Cat A	1.68nm	1.3nm	1.3nm	1.3nm	1.3nm	1.3nm	1.4nm
Cat B	2.66nm	1.5nm	1.7nm	1.8nm	1.8nm	1.9nm	2.0nm
Cat C	4.20nm	1.7nm	2.7nm	2.8nm	2.9nm	3.0nm	3.2nm
Cat D	5.28nm	2.3nm	3.6nm	3.7nm	3.8nm	4.0nm	4.2nm

Table 12. Radius of the Obstacle Clearance Area

Aircraft Captains are responsible for confirming the terminal approach construction in use.

8.1.3.7 Commencement and Continuation of an Instrument Approach. An approach may be commenced regardless of the reported RVR/VIS. If the reported RVR/VIS is less than the applicable minimum the approach shall not be continued:

- a. below 1000ft above the aerodrome; or
- b. into the final approach segment in the case where the DA/H or MDA/H is more than 1000ft above the aerodrome.

The touchdown zone RVR shall always be controlling, unless midpoint and stopend RVR are reported and relevant (^{ie} speed expected to still be above 60kts). Where the RVR is not available, RVR values should be derived by converting the reported visibility.

If after passing 1000ft above the aerodrome the reported RVR/VIS falls below the applicable minimum the approach may be continued to DA/H or MDA/H. The approach may be continued below DA/H or MDA/H and the landing may be completed provided that the required visual reference for the type of approach and the intended runway has been established and is maintained.

All instrument approaches should be stabilised by 1000ft above airfield level (aal) in IMC and 300ft in VMC (500ft VMC in a Company Perf A Aircraft). If a stabilised approach cannot be achieved or maintained a 'Go-Around' must be carried out.

8.1.3.8 Visual Manoeuvring (Circling) Approaches. Visual manoeuvring (circling) is the term used to describe the visual phase of an instrument approach required to position an aircraft for landing on a runway which is not suitably located for a straight-in approach. Visual manoeuvring with prescribed tracks is an accepted procedure. Descent and level flight to the missed approach point (MAP) is restricted to the circling minima when the approach track being flown is not within 30° of the runway heading.

The minimum MDH and visibility which are required for visual manoeuvring shall be the higher of:

- a. The circling OCH and visibility for the aircraft category (if published);
- b. The DH/MDH of the preceding instrument approach procedure and RVR/CMV derived from Tables 9 and 10 above for the preceding instrument approach procedure; or
- c. The minimum circling height and visibility derived from Table 13 below.

Aircraft Category	MDH (ft) (AAL)	Minimum Meteorological Visibility (m)
A	400	1500
B	500	1600
C	600	2400
D	700	3600

Table 13. Visibility and MDH Minima for Visual Manoeuvring

The MDA for circling shall be calculated by adding the published aerodrome elevation to the MDH, as determined by the above.

8.1.3.8.1 Missed Approaches from Circling Approaches. In the event of a missed approach, the procedure to be carried out is the one applicable to the instrument approach runway unless another procedure is prescribed. Once the aircraft has left the instrument procedure and commenced circling, an initial climbing turn towards the runway and overhead the aerodrome will be made, where the aircraft will then establish in a climb on the missed approach track of the instrument approach runway. Because of the variability of circling procedures other patterns may be needed at different stages in order to keep the aircraft in a safe area and to establish the missed approach track. If the instrument approach procedure is carried out with the aid of an ILS, the Missed Approach Point (MAP) associated with an ILS procedure without glide path (Localiser only MAP) should be considered.

8.1.3.8.2 Instrument Approach Followed by Circling Without Prescribed Tracks.

- a. Before visual references are established, but not below MDA, the pilot should follow the corresponding instrument approach procedure.

- b. From commencement of the level flight phase at or above MDA, the instrument approach track determined by radio navigation aids should be maintained until the Aircraft Captain:
 - i. Estimates that, in all probability, visual contact with the runway or runway environment will be maintained during the entire procedure; and
 - ii. Estimates that the aircraft is within the circling area before commencement and will remain within the circling area during final approach; and
 - iii. Is able to determine his aircraft's position in relation to the runway using external references.
- c. If the conditions in sub-para b above are not met before the MAP, a missed approach must be carried out in accordance with the instrument approach procedure.
- d. After the aircraft has left the track of the corresponding instrument approach procedure, the flight phase outbound from the runway should be limited to the distance which is required to align the aircraft for the final approach. Flight manoeuvres should be conducted within the circling area and in such a way that visual contact with the runway or runway environment is maintained at all times.
- e. Flight manoeuvres must be carried out at an altitude which is not less than the circling minimum descent altitude (MDA).
- f. Descent below MDA must not be initiated until the threshold of the runway has been identified, can be used as the reference for the final approach and the aircraft is in a position to continue with a normal rate of descent to land within the touchdown zone.

8.1.3.8.3 Instrument Approach Followed by Circling with Prescribed Track.

- a. Before visual reference is established, but not below MDA the pilot must follow the corresponding instrument approach procedure.
- b. The aircraft must be established in level flight at or above the MDA and the instrument approach track determined by the radio navigation aids must be maintained until visual references can be achieved and maintained.
- c. At the divergence point, the aircraft should leave the instrument approach track and must follow the published routeing and heights.
- d. If the divergence point is reached before the necessary visual references are acquired, a missed approach procedure should be initiated not later than the MAPt, and carried out in accordance with the instrument approach procedure.
- e. Unless otherwise specified in the procedure, final descent must not be initiated until the threshold of the runway to be used has been identified and the aircraft is in a

position to continue with a normal rate of descent and land within the touchdown area.

8.1.3.9 Lower than the standard Category I Operations. Only used for B737 Operations. See OMB B737 Section 2.4

8.1.3.10 Precision Approach – Category II and other than Standard Category II Operations. Only used for B737 Operations. See OMB B737 Section 2.4

8.1.3.11 Precision Approach – Category III Operations. Only used for B737 Operations. See OMB B737 Section 2.4

8.1.3.12 Enhanced Vision Systems. Not used

8.1.3.13 Visual Approaches.

- a. The minimum RVR for a visual approach shall be 800 metres.
- b. **Extra 300.** For Extra 300 aircraft, accepting that the aircraft may still be in the finals turn, the final approach is to be stabilised at 90kts +/-10kts by 300ft aal.
- c. **Multi-Engine Aircraft.** In the Company's multi-engine aircraft, the wings should be level on finals by 300ft aal, or 500ft aal for Boeing aircraft, which is the committal point, with the aircraft stabilised and configured for landing.

8.1.3.14 Flights to Airfields without Let-down Aids. In order to operate to aerodromes without approach aids (either because of their absence or their unserviceability), where the aircraft is not VFR in sight of the ground en route, and no radar service exists, and it is not possible to use radio aid to descend to VMC, pilots are to use the following let-down procedure:

- a. The approach and landing at destination will take place entirely in VMC and in accordance with the following requirements.
- b. The weather forecast for the destination aerodrome must give reliable assurance that the minimum weather conditions prescribed in sub-para d below will exist at ETA; and
- c. On arrival over the destination aerodrome, descent below en-route safety altitude may not be commenced until the aircraft's position has been positively identified by visual reference; and
- d. The descent below safety altitude must be made clear of all cloud, in sight of the surface and with a flight visibility of at least 5kms (8kms above 3000 ft amsl);
- e. An alternative aerodrome must be nominated for the flight which the aircraft is capable of using that does have a serviceable let-down aid and for which there is an authorised procedure.

8.1.3.15 Maximum Number of Approaches. Except in an emergency, or when there has been a significant change in reported weather conditions, no more than two successive approaches to an airport may be carried out where both approaches have resulted in a go-around, before a diversion to an alternate must be made.

8.1.3.16 Determination of Minima at British Military Aerodromes. Military aerodromes in the UK are in the process of changing the design criteria for their approach charts from APATC-1 to PANS-OPS. For those aerodromes that have already changed to PANS-OPS the method of determining AOM will be as outlined above. For charts designed using APATC-1 the method for determining AOM is as outlined below. For those approach charts using APATC-1 the Procedure Minimum for each IAP is shown on the Royal Air Force Approach Chart in a Table of Aircraft Categories; however, the words 'Procedure Minimum' are not shown. The Procedure Minimum shown in bold print is a minimum height (minimum with QFE set on the altimeter) with the minimum altitude shown in light print beside to the left. The Procedure Minimum (minimum height) will also be passed by ATC who will request the pilot's DH/MDH and intentions. The Procedure Minimum can be converted to an equivalent to OCH by following the procedures in the following paragraphs. This equivalent OCH can then be used to calculate the DH/MDH and RVR in the normal way in accordance with the procedures above.

Precision Approaches, ILS and PAR, for which the absolute minimum is 200ft above touchdown elevation, are normally based on a 3° glidepath. The glidepath angle, also shown on the chart, may be as low as 2.5°. The following increments should be made to the given Procedure Minimum to obtain the equivalent of OCH. There is no provision for the use of radio altimeters.

Nominal Glide Path Angle	Aircraft Categories			
	A	B	C	D
2.5	Nil	10ft	20ft	30ft
2.6	10ft	20ft	30ft	40ft
2.7	10ft	20ft	30ft	40ft
2.8	20ft	30ft	40ft	50ft
2.9	20ft	30ft	40ft	50ft
3.0	30ft	40ft	50ft	60ft

Table 14 - Increments to be added when operating at British Military Aerodromes

For non-precision approaches the Procedure Minimum may be taken to be the OCH. DH/MDH should then be determined as previously described and the related RVR obtained from Table 10.

For Circling, the OCH should be determined by adjusting the published Royal Air Force values, shown on the Approach Charts, as follows:

Aircraft Categories	Increment (ft)
A and B	Zero
C and D	+100

The minimum visibility should be determined as previously described. OCH information will not be used at British Military Aerodromes. Instrument Approaches and landings at UK Military Aerodromes are usually flown on QFE, as is flying in the visual circuit. Aircraft that are unable to comply with the above procedure should inform ATC and will be accommodated wherever possible.

8.1.3.17 Landing

8.1.3.17.1 Landing on Dry Runways

- a. The determined landing mass of the aircraft for the estimated time of landing shall allow a full stop landing from 50ft above the threshold within 70% of the landing distance available (LDA) for turbo-prop aircraft, or within 60% of the LDA for turbo-jet aircraft at the destination aerodrome and at any alternate aerodrome.
- b. When showing compliance, account shall be made of the following:
 1. The altitude at the aerodrome;
 2. Not more than 50% of the headwind component or not less than 150% of the tail wind component.
 3. The runway surface condition and type of runway surface; and
 4. The runway slope in the direction of landing if greater than +/- 2%
- c. When despatching an aircraft in accordance with para a above, it must be assumed that:
 1. The aircraft will land on the most favourable runway in still air; and
 2. The aircraft will land on the runway most likely to be assigned considering the probable wind speed and direction and the ground handling characteristics of the aircraft and considering other conditions such as landing aids and terrain.
- d. If unable to comply with para c above for the destination aerodrome, the aircraft may be dispatched if an alternate aerodrome is designated which permits full compliance with sub-paras a, b and c.

8.1.3.17.2 Landing on Wet Runways

- a. Should appropriate weather reports or forecasts, or a combination thereof, indicate that a runway at the estimated time of arrival may be wet LDA must be equal to or exceed the LDR determined in accordance with para 8.1.3.17.1.a multiplied by a factor of 1.15.
- b. A landing distance on a wet runway shorter than that required by para a above, but not less than that required by 8.1.3.17.1.a may be used if the AFM includes specific additional information about landing distances on wet runways.

- 8.1.3.17.3 Landing on Contaminated Runways.** For contaminated runway operations see the relevant Part B Aircraft Supplement, and Para 8.3.8.7 to this Section.
- 8.1.3.17.4 Steep Approach Operations.** CAT Steep approach operations using glideslope angles of 4.5° or more and with screen heights of less than 60ft but not less than 35ft require the prior approval of the Authority.
- 8.1.3.17.5 Short Field Landings.** Only the Extra 300 is cleared for short field operations under the terms of the Company Approvals. The normal landing procedure requires the aircraft to be landed from 50ft above the runway threshold at a normal gradient of descent. Short field landings include those where the aircraft is landed from short field landing technique, and may be flown from a height of lower than 50ft over the threshold. In order to carry out the latter safely, there must be a Declared Safe Area short of the runway that allows the aircraft to be descended below 50ft before the threshold. The declared safe area must be clear of obstructions or depressions that would endanger an aircraft undershooting the runway, and its slope must not exceed 5% upward or 2% downward slope in the direction of landing. The usable length of the declared safe area shall not exceed 90 metres and its width shall not be less than twice the runway width, centred on the extended runway centreline. It is assumed that the crossing height over the beginning of the declared safe area shall not be less than 50ft.
- 8.1.3.17.6 Standard Safe Areas.** The Declared Safe Area that accords with CAT.POL.A.250 (b), pilots may subtract 90metres from the actual landing distance calculation made using the AFM before multiplying the result by 1.43 to obtain the minimum runway length necessary.
- 8.1.3.17.7 Non Standard Safe Areas.** If the Declared Safe Area does not comply fully with CAT.POL.A.250 (b) pilots may subtract the declared safe length as defined by the aerodrome manual from the actual landing distance calculation made using the AFM (before multiplying the result by 1.43 where applicable) to obtain the minimum runway length necessary.
- 8.1.3.17.8 Undeclared Safe Areas.** There are some airfields where the Airfield Operator has not declared a safe area, but there is an area that can be declared safe for the period of Company operations by agreement between the Airfield Operator and the Company. In such cases, subject to the area being effectively sterilized for the period of Company operations and subject to the area's compliance with CAT.POL.A.250 (b) pilots may subtract the declared safe length as defined by the agreement between the Company and the Aerodrome Operator from the actual landing distance calculation made using the AFM before factoring for CAT ops.
- 8.1.3.18 Weather Decisions.** Met briefing will take place at the start of daily operations. Operating pilots are to be fully aware of the forecast meteorological conditions. If at any time the operating pilots assess the actual weather condition as unsuitable, they are to divert, return to base or cancel the sortie. For IFR operations:
- a. In the event of in-flight re-planning the Captain of an IFR flight shall not continue beyond the point from which a revised flight plan applies unless the expected weather

conditions at the destination and/or the alternate aerodromes are at or above the planning minima detailed above.

- b. A Captain of an IFR flight shall not continue beyond the diversion decision point or the point of no return unless the expected weather conditions at the destination and/or the alternate aerodromes are at or above the operating minima.
- c. The Captain of an IFR flight shall not continue towards the planned destination aerodrome unless the latest information available indicates that at the ETA, the weather conditions at the destination, or at least one destination alternate aerodrome, are at or above the required aerodrome operating minima.

8.1.4 En-route VFR Weather Minima

8.1.4.1 General. The weather minima for Company day and night VFR operations are detailed at Table 15 below. Company aircraft may also be operated under Special VFR in the UK. SVFR is an authorization by ATC for a pilot to fly within a Control Zone although he is unable to comply with IFR. ATC will not issue a Special VFR clearance to any fixed-wing aircraft intending to depart from an aerodrome within a Control Zone, when the official meteorological report indicates that the visibility is 1800 m or less and/or the cloud ceiling is less than 600 ft. More restrictive limits may be imposed at specific aerodromes.

Airspace Class	B (None in UK)		C, D or E		F or G	
	FL100 or Above	Below FL100	FL100 or Above	Below FL100	FL100 or Above	Below FL100
Distance from Cloud	Clear of Cloud	Clear of Cloud	1500m Horizontally 1000ft Vertically	1500m Horizontally 1000ft Vertically (1)	1500m Horizontally 1000ft Vertically	1500m Horizontally 1000ft Vertically (2)
Flight Visibility	8 km	5 km	8 km	5 km	8 km	5 km (2)

Table 15. Weather Limits for VFR Operations.

Notes. 1. Or **BY DAY ONLY** if at 3000 ft amsl or below and flying at 140 KIAS or less:
Clear of Cloud and with the surface in sight in a Flight Visibility of at least 5 km.

2. Or if at 3000 ft amsl or below: either: any aircraft:
Clear of Cloud and with the surface in sight in a Flight Visibility of 5 km.

or: **BY DAY ONLY** any aircraft which is not a helicopter flying at 140 KIAS or less:
Clear of Cloud and with the surface in sight in a Flight Visibility of 3000 m.

8.1.4.2 In the course of delivering its services, The Company conducts a variety of singleton and formation flight profiles (including aerobatics and formation aerobatics) in VFR conditions. For aircraft so cleared in their AFMs, for conducting these manoeuvres with passengers, the minimum weather conditions are detailed at Table 16 below.

Sortie Profile	Cloud Base	Visibility
Singleton Flying	1100ft	3Km
Formation Flying	1100ft	3Km
'Flat' Formation Aerobatics	1300ft	5Km
'Full' Formation Aerobatics	2000ft	5Km
Opposition Passes	1500ft	5Km
Interception	600ft	3Km

Table 16. Weather Limits for Single-Engined Formation and Aerobatic Flying

8.1.5 Presentation and Application of Aerodrome and En-route Operating Minima

8.1.5.1 Presentation. Specific Category I and non-precision approach minima for all aerodromes likely to be used by company aircraft is contained within the Jeppesen Airway Manual. If the manual does not contain such information for a particular aerodrome, the details will be included in the Aircraft Captain's flight brief. Minima for precision, APV and non-precision approaches are listed in terms of decision altitude / height and RVR. For circling approaches, the minimum descent altitude / height will be shown together with a minimum in-flight visibility (IFV) and if applicable, minimum cloud ceiling requirements. Minima are listed in four rows applicable to category of aircraft type.

As a result of changes brought about by the implementation of EASA rules on all-weather operations, all non-precision approaches will be reviewed by Jeppesen to show CDFA profile and minimums. In case of CDFA only, a DA(H) is shown instead of the previously published MDA(H). The missed approach point is still shown according to state source but the missed approach initiation arrow is moved to the point where the DA(H) is reached. For CDFA profiles Jeppesen will show DME vs altitude bands, distance vs altitude bands or timing vs altitude tables. Non CDFA profiles and minimums will be shown in exceptional cases only and may be combined with CDFA profiles and minimums. In addition, the acronym CMV (converted meteorological visibility) will replace RVR when the required RVR exceeds the technical capabilities of the aerodrome transmissometer. The introduction of DA(H) for non-precision approaches employing the CDFA technique and the addition of CMV does not in any way alter the approach minima or the Company's non-precision approach SOPs.

Published Jeppesen Aerodrome Operating Minima should be increased by adding an allowance to published DA(H) to establish an advisory DA(H) when carrying out a CDFA non-precision approach. See OM A Section 8, Para 8.1.3.5 for values.

There is no requirement to apply this allowance to published DA when carrying out a circling approach. The company requirement for an additional allowance is designed to ensure that in the event of a go-around, descent below DA(H) does not occur. On a non-precision approach the aircraft must not descend below MDA unless appropriate visual reference has been established.

8.1.5.2 Application. An Aircraft Captain is not permitted to operate to minima which are lower than those published in the Jeppesen Airway Manual, calculated in accordance with para 8.1.3.4 above, or notified by the State which controls the aerodrome in question. Before commencing take-off, an Aircraft Captain must satisfy himself that the RVR or visibility required for take-off is equal to or exceeds the applicable minima. Once the flight has started, the Aircraft Captain must be prepared to amend the intended minima for any aerodrome he is scheduled to use, in order to take account of any change in status of the relevant approach aids which occurs during the flight.

Additional increments may be added to published minima such as:

- a. Any increment imposed by the Authority. (consult NOTAMS for short term increments).
- b. Those added by an Aircraft Captain who elects to operate to higher minima than those established by any of these means if he considers that under the circumstances of the flight to do otherwise might compromise the safety of his aircraft or its passengers.
- c. Increments to minima in accordance with aircraft performance criteria and crew qualification.
- d. Altimeter temperature corrections.

8.1.5.3 System Failures. There are no increments to be added to Company specified operating minima for precision approaches (category I, ILS or PAR) following the loss of auto-pilot, flight director or engine failure.

8.1.6 Interpretation of Meteorological Information

8.1.6.1 General. All flight crew members are required to develop and maintain a sound working knowledge of the system used for reporting aerodrome actual and forecast weather conditions and codes associated with it. Some of the codes (e.g. for wind velocity) use the same figures as the values being reported; thus, a wind blowing from 280° at 15 knots is reported as '28015KT'. Some of the more important codes, however, use lettered abbreviations which can become particularly significant when flight crews are attempting to assess whether conditions at a particular destination or alternate will be above Company minima at the planned time of arrival. Further environmental data, including ambient light levels and associated weather modifiers, is available through the specialised Electro-Optic prediction programmes, such as WINANVIS and MODTRAN, for captains operating with NVG/EVS. The basic codes are discussed briefly in the following paragraphs, the codes and notes on their use are in the METEOROLOGY section of the Jeppesen Airway Manual.

8.1.6.2 Actual Weather Reports (METARs). Routine actual weather reports (METARs) are compiled half-hourly or hourly at fixed times while the aeronautical meteorological station is open. They include the following terms to clarify the codes used in reporting the various elements:

- a. **Prevailing Visibility.** This is the visibility that is reached or exceeded within at least half the horizon circle or the surface of the aerodrome. Prevailing visibility alone will be forecast or reported unless the minimum visibility (in any sector of the aerodrome) is less than 50% of that prevailing or below 1500 metres (whichever is the worse). In those circumstances a minimum visibility value and direction, e.g. '4000NE' will be given in addition to the prevailing visibility. When two visibilities are given, the lower figure should be used for operational decisions if it could affect the aircraft's approach to land. When a decision to carry out a non-precision or circling approach is based on prevailing visibility, crew should bear in mind that the visibility in certain sectors could be up to 50% less than that forecast or reported. A code figure of '9999' indicates a visibility of 10 km or more, while '0000' indicates that the visibility is less than 50 metres.
- b. **Runway Visual Range (RVR).** RVR is included in the METAR whenever the lowest visibility is less than 1500m. An RVR group has the prefix R followed by the runway designator, then an oblique stroke followed by the touch-down zone RVR in metres. If the RVR is assessed simultaneously on two or more runways, the RVR group will be repeated; parallel runways will be distinguished by the addition of L, C or R after the runway designator to indicate the left, central or right parallel runway respectively, e.g. 'R24L/1100 R24R/1150'. When the RVR is greater than the maximum value which can be assessed, or more than 1500 metres, the group will be preceded by the letter P, followed by the lesser of these two values, e.g. 'R24/P1500'. When the RVR is less than the minimum value which can be assessed, the RVR will be reported as 'M' followed by the minimum value that can be assessed, e.g. 'R24/M0050'.
- c. **Cloud.** Up to four cloud groups may be included, in ascending order of their bases. Each group consists of three letters to indicate the amount (FEW = 1 to 2 oktas, SCT, or

scattered = 3 to 4 oktas; BKN, or broken, = 5 to 7 oktas, and OVC, or overcast = 8 oktas) and three figures indicating the height of the base of the cloud layer in hundreds of feet above aerodrome level. Apart from significant convective clouds (CB = cumulo-nimbus; TCU = towering cumulus) cloud types are not indicated. Cloud layers or masses are reported such that the first group represents the lowest individual layer of any amount; the second group is the next individual layer of more than 2 oktas, the third group is the next higher layer of more than 4 oktas, and the additional group, if any, represents significant convective cloud, if not already reported, e.g. 'SCT010 SCT015 SCT18CB BKN025'.

- d. **CAVOK and SKC.** 'CAVOK' will replace the visibility, RVR, weather and cloud groups when the visibility is 10 km or more; there is no cloud below 5000 feet or below the highest MSA, whichever is the greater, and no cumulo-nimbus; and there is no precipitation, thunderstorm, shallow fog or low, drifting snow. If any of these conditions are not met, but there is no cloud to report, then the cloud group is replaced by 'SKC' (sky clear).
- e. **Air Temperature and Dewpoint.** The air temperature and dewpoint are shown in degrees Celsius, separated by an oblique stroke. A negative value is indicated by an 'M' in front of the appropriate digits, e.g. 10/03 or '01/M01'.
- f. **Pressure Setting.** The QNH is rounded down to the next whole millibar and reported as a four-figure group preceded by the letter 'Q'. If the QNH value is less than 1000 Mbs, the first digit will be '0' e.g. 'Q0993'.
- g. **Recent Weather.** Operationally significant weather which has been observed since the previous observation, but which was not current at the time of the present observation, will be reported using the standard present weather code preceded by the indicator 'RE', e.g. 'RETS'.
- h. **Wind Shear.** A wind shear group may be included if wind shear is reported along the take-off or approach paths in the lowest 1600 feet with reference to the runway in use. 'WS' is used to begin the group as in the examples: 'WS TKOF RWY20', 'WS LDG RWY20'.
- i. **Runway State.** When snow or other runway contamination is present, an eight-figure group may be added at the end of the METAR to indicate the contaminant state.
- j. **Trend.** A trend group is added when significant changes in conditions are forecast to occur during the two hours following the time of observation. The codes 'BECMG' (becoming) or 'TEMPO' (temporarily) are used, and may be followed by a time group (in hours and minutes UTC) preceded by one of the indicators 'FM' (from), 'TL' (until) or 'AT' (at). These are followed by the expected change using the standard codes e.g. 'BECMG FM 1100 250/35G50KT' or 'TEMPO FM 0630 TL0830 3000 SHRA'. Where no such significant changes are expected, the trend group will be replaced by the word 'NOSIG'.

- k. **DENEB.** The code word 'DENEB' may be added to a METAR to indicate that fog dispersal operations are in progress.
- l. **Missing Information.** Information which is missing from the METAR may be indicated by the use of oblique strokes to replace the missing code figure/letters.

8.1.6.3 Aerodrome Weather Forecasts (TAFs). Aerodrome weather forecasts (TAFs) are usually issued to describe the forecast conditions at an aerodrome covering a period of 9 to 24 hours. The validity periods of many of the longer forecasts may not start for up to 8 hours after the time of origin and the forecast details over the last 18 hours. The 9-hour TAFs are updated and re-issued every 3 hours, and those valid for 12 and 24 hours, every 6 hours. Amendments are issued as and when necessary. A TAF may be sub-divided into two or more self-contained parts by the use of the abbreviation 'FM' (from) followed by the time UTC to the nearest hour, expressed as two figures. Many of the groups used for METARs are also used in the TAFs, but differences are noted below. The TAF codes and notes on their use are contained in the METEOROLOGY section of the Jeppesen Airway Manual.

- a. **Validity Period.** Whereas a METAR is a report of conditions at a specific time, the TAF contains the date and time of origin, followed by the start and finish times of the validity period in whole hours UTC, e.g. 'TAF EGLL 130600Z (date and time of issue) 0716 (period of validity 0700 to 1600 hours UTC).
- b. **Horizontal Visibility.** The minimum visibility only is forecast; RVR is not included.
- c. **Weather.** If no significant weather is expected, the group is omitted. After a change group however, if the weather ceases to be significant, the abbreviation 'NSW' (no significant weather) will be inserted.
- d. **Cloud.** When clear sky is forecast, the cloud will be replaced by 'SKC' (sky clear). When no cumulo-nimbus, or clouds below 5000 feet or below the highest minimum sector altitude, whichever is the greater, are forecast, but 'CAVOK' or 'SKC' are not appropriate, the abbreviation 'NSC' (no significant cloud) will be used.
- e. **Significant Changes.** In addition to 'FM' and the time (see para 8.1.6.3, above) significant changes may be indicated by the abbreviation 'BECMG' (becoming) or 'TEMPO' (temporarily). 'BECMG' is followed by a four-figure group indicating the beginning and ending of the period in which the change is expected to occur. The change in the forecast conditions is expected to be permanent, and to occur at an unspecified time within this period. 'TEMPO' will similarly be followed by a four-figure time group; it indicates a period of temporary fluctuations in the forecast conditions which may occur at any time during the stated period. The 'TEMPO' conditions are expected to last less than one hour in each instance, and in aggregate, less than half the period indicated.
- f. **Probability.** The probability of a significant change occurring will be given as a percentage, but only 30% and 40% will be used. The abbreviation 'PROB' will precede

the percentage, which will be followed by a time group, or a change and time group, e.g. 'PROB 30 0507 0800FG BKN004', or 'PROB40 TEMPO 1416 TSRA BKN010CB'.

- g. **Amendments.** When a TAF requires amendment, the amended forecast will have 'AMD' inserted between 'TAF' and the aerodrome identifier, and will cover the remainder of the validity period of the original forecast.

8.1.7 Fuel and Oil

8.1.7.0 Policy. Any changes to the fuel policy detailed below require prior approval by the Authority.

8.1.7.1 Records. Aircraft fuel and oil states will be recorded in the technical log Sortie Record Pages. For all A-to-A operations, all documentation shall be held at the operating airfield prior to and during flying operations. For A-to-B operations the fuel and oil records shall be held on the aircraft until the aircraft's next return to base or, when appropriate, its deployed operating base.

8.1.7.2 Fuel Reserves. The aircraft fuel state is to be checked (visually if possible) prior to each flight. Based on the appropriate consumption figures for the stage of flight as contained in Part B of the manual for the specific aircraft type, the fuel on board at the start of each flight must be sufficient to cover the following:

- a. **Taxi Fuel**, the total amount of fuel expected to be used prior to take-off including allowances for the operation of ice protection systems and APU.
- b. **Trip Fuel**, to include:
 - i. Take-off and climb to initial cruising level/altitude, taking into account the expected departure routeing;
 - ii. Cruise from top of climb (TOC) to top of descent (TOD), including any step climb/descent;
 - iii. TOD to initial approach point, taking into account the expected arrival routeing and procedure; and
 - iv. Approach and landing at destination.
- c. **Contingency Fuel** which should be the higher of:
 - i. Either:
 - a. 5% of the planned trip fuel or, if in-flight re-planning, 5% of the trip fuel for the remainder of the flight, or
 - b. Not Less than 3% of the planned trip fuel or in the event of in-flight re-planning, 3% of the trip fuel for the remainder of the flight, provided that an en-route alternate (Fuel ERA) is available.
 - ii. or fuel for a 5-minute hold at 1500 ft above the destination aerodrome in ISA.

Note 1: At the planning stage not all factors which could have an influence on the fuel used to the destination aerodrome can be foreseen. Consequently, contingency fuel is carried to compensate for eventualities such as:

Deviations of an individual aircraft from the baseline fuel consumption data;
Deviations from forecast meteorological conditions; and
Deviations from planned routings and/or cruising levels/altitudes.

d. Alternate Fuel, to include:

- i. A go-around from the applicable MDA/DH at the destination aerodrome to missed approach altitude, taking into account the complete missed approach procedure;
- ii. Climb from missed approach altitude to cruising level / altitude;
- iii. Cruise from TOC to TOD;
- iv. TOD to initial approach point taking into account the expected arrival routing and procedure; and
- v. Approach and landing at the destination alternate aerodrome selected;

Note 2: If, in accordance with the above, two destination alternates are required then alternate fuel must be sufficient to cover the case of the alternate requiring the greater amount of fuel.

Note 3: The departure aerodrome may be selected as a destination alternate.

e. Final Reserve Fuel which is the fuel required to be on board at landing (and is detailed at Part C Section 2 Para 2.1.8 for each aircraft and operation) and is to be sufficient to hold at 1500 ft above aerodrome elevation for an additional period of 45 minutes for reciprocating engines or 30 minutes for turbine engines as required by CAT.OP.MPA.151 (iii) (B) in ISA calculated with the estimated landing weight on arrival at the alternate or the destination, when no alternate is required.

f. Additional Fuel to be carried if so dictated by the mission. This is only required to be carried if the fuel calculated in accordance with i-v above does not provide sufficient for the circumstances listed below:

- i. Holding for 15 minutes at 1500 ft above aerodrome elevation in ISA when a flight is being operated without a destination alternate;
- ii. Following an engine or pressurisation failure at the most critical point en-route, descend as necessary and proceed to an adequate aerodrome; and 15 minutes hold at 1500ft in ISA above the adequate aerodrome; plus approach and landing;

g. Extra Fuel, at the discretion of the Captain.

8.1.7.3 Reduced Contingency Fuel Procedure. When planning to a destination aerodrome via an en-route decision point the fuel required is the greater of a or b below:

- a. The sum of:
 - i. Taxi fuel;
 - ii. Trip fuel to the destination aerodrome, via the decision point;
 - iii. Contingency fuel of not less than 5% of the estimated fuel used from the decision point to the destination aerodrome;
 - iv. Alternate fuel, if a destination alternate is required;
 - v. Final reserve fuel;
 - vi. Additional fuel, if required; and
 - vii. Extra fuel, at the discretion of the Aircraft Captain;

- b. The sum of:
 - i. Taxi fuel;
 - ii. Trip fuel to a suitable en-route alternate via the decision point;
 - iii. Contingency fuel of not less than 3% of the estimated trip fuel;
 - iv. Final reserve fuel;
 - v. Additional fuel, if required; and
 - vi. Extra fuel, at the discretion of the Aircraft Captain;

8.1.7.4 Isolated Aerodrome Procedure. Using an Isolated aerodrome as destination aerodrome with aircraft requires the prior approval of the Authority. When planning to an isolated aerodrome for which an alternate does not exist the fuel required is the sum of:

- a. Taxi fuel;
- b. Trip fuel;
- c. Contingency fuel in accordance with para 8.1.7.2.c;
- d. Additional fuel as required, but for turbine engine aircraft not less than sufficient fuel to fly for two hours, calculated with the normal cruise consumption, after arriving overhead the destination aerodrome, including final reserve fuel, and for reciprocating engine aircraft fuel to fly for 45 minutes plus 15% of the flying time planned to be spent at cruising level or 2 hours, whichever is less; and extra fuel, at the discretion of the Aircraft Captain.

8.1.7.5 Predetermined Point Procedure. When planning to a destination alternate where the distance between the destination aerodrome and the destination alternate is such that a flight can only be routed via a predetermined point to one of these aerodromes the fuel required is the greater of (a) or (b) below:

- a. The sum of:
 - i. Taxi fuel;
 - ii. Trip fuel to the destination aerodrome via the predetermined point;
 - iii. Contingency fuel in accordance with para 8.1.7.2.c;

- iv. Additional fuel if required, but not less than that in para 8.1.7.4d;
 - v. Extra fuel, at the discretion of the Aircraft Captain;
- b. The sum of:
- i. Taxi fuel;
 - ii. Trip fuel from the departure aerodrome to the alternate aerodrome, via the predetermined point;
 - iii. Contingency fuel in accordance with para 8.1.7.2.c;
 - iv. Additional fuel if required, but not less than sufficient fuel for 30 mins (45 mins for piston engines) hold at 1500 feet in ISA including Final Reserve fuel; and
 - v. Extra fuel, at the discretion of the Aircraft Captain.

8.1.7.6 Oil Reserves. The aircraft oil level must be checked before flight to ensure that there is enough oil to conduct the flight in accordance with the manufacturer's recommendations, and between flights to determine if any excess oil consumption has taken place. Minimum oil reserves required to commence a sortie are detailed at Part C to this Operations Manual, Section 2 Para 2.1.9 (and in the Part B for the relevant aircraft).

8.1.8 Aircraft Mass and Centre of Gravity

8.1.8.1 Definitions

- a. **Dry Operating Weight (DOW).** The total weight of the aircraft ready for a specific type of operation excluding all usable fuel and traffic load. This weight includes items such as:
 - i. Crew and crew baggage;
 - ii. Catering and removable passenger service equipment; and
 - iii. Potable water and lavatory chemicals.
- b. **Maximum Zero Fuel Weight (MZFW).** The MZFW is the maximum permissible weight of an aircraft with no usable fuel. In some circumstances the AFM will require fuel in specified tanks to be included in the maximum zero fuel mass.
- c. **Maximum Structural Landing Weight (MLW).** The maximum permissible total aircraft weight upon landing under normal circumstances.
- d. **Maximum Structural Take-Off Weight (MTOW).** The maximum permissible total aircraft weight at the start of the take-off run.
- e. **Passenger Classification and Standard Mass Values:**
 - i. Adults, male and female – persons of an age of 12 years and above.
 - ii. Children – persons of 2 years and above but less than 12 years of age.
 - iii. Infants – persons who are less than 2 years of age.

Passenger(s)	Total No. of Passenger Seats				
	1-5	6-9	10-19	20 or More	30 or More (All Adult)
Male	104kg (229lbs)	96kg (211 lbs)	92kg (203lbs)	83kg (183lbs)	76kg (168lbs)
Female	86kg (189lbs)	78kg (172lbs)	74kg (163lbs)	69kg (153lbs)	76kg (168lbs)
Children	35kg (77lbs)	35kg (77lbs)	35kg (77lbs)	35kg (77lbs)	35kg (77lbs)

Table 17a. Standard Mass Values for Passengers in CAT/SPO operations

Notes.

1. The '20 or More' passenger weights above are for Charter flights.
2. On flights with 30 or more passengers the 'All Adult' weights may be substituted for the Charter weights.
2. When the number of passenger seats is less than 10, and when indicated in the Aircraft Captain's brief, passenger mass may be established by use of a verbal statement. Personnel responsible for boarding passengers must assess whether the stated mass is reasonable.
3. On flights with 19 passenger seats or less, where no hand baggage is carried in the cabin or where hand baggage is accounted for separately, 13lbs (6kg) may be deducted from the above male and female masses. Articles such as an

overcoat, umbrella, small handbag or purse, reading material or a small camera are not considered as hand baggage for the purpose of Table 17.

4. On flights with 19 passenger seats or less, where survival suits are worn or carried 7lbs (3kg) shall be added to the above masses.
5. Where helmets and NVGs are employed, 6lbs (3kg) shall be added to the above masses.

- f. **Mass values for Baggage:** For aircraft with 19 passenger seats or less, the actual mass of checked baggage should be determined. Where the total number of passenger seats available on the aircraft is 20 or more the standard mass values for checked baggage in the table below should be used (unless a significant deviation is expected):

Type of Flight	Baggage Standard Mass
Domestic	11kg (24lbs)
Within the European Region	13kg (29lbs)
Intercontinental	15kg (33lbs)
All other	13kg (29lbs)

Table 17b. Standard Masses for Baggage – aeroplanes with 20 or more passenger seats

Notes.

1. Domestic flight means a flight with origin and destination within the borders of one State.
2. Flights within the European region mean flights, other than domestic flights whose origin and destination are within the are depicted below:



3. Intercontinental flights means flights beyond the European region with origin and destination in different continents.

- f. **Traffic Load.** The total weight of passengers, baggage, cargo and carry-on specialist equipment, including any ballast.

8.1.8.2 Aircraft. The weight and centre of gravity (C of G) of each Company aircraft must be established by actual weighing before it is used for the purpose of CAT or SPO. All aircraft are to be reweighed thereafter at intervals of four years unless, with the agreement of the Competent Authority, fleet weights are used, in which case they are to be recalculated at 9 year intervals. A basic aircraft weight and CofG position will normally be noted on the weighing report, or weight and centre of gravity schedule, as produced by the manufacturer or approved maintenance organisation. These will be used by the Company to calculate an aircraft DOW and CofG for each aircraft, or for each fleet, as appropriate. The accumulated effects of modifications and repairs on weight and balance must be taken into account. Details are contained in the Tech Log for the particular aircraft. If the aircraft are to be operated in a variety of roles, e.g. CAT, test and evaluation, and / or freight, specific DOW values for each role will be provided, and are to be used as the basis for all loading calculations.

Actual mass must be used when taking freight or ballast into account.

If the weight of engine oil has not been included in the calculation of basic aircraft weight it must be included in the DOW. The mass of the fuel and / or oil load must be calculated using either actual density or standard density values of 0.695 for AVGAS, 0.79 for AVTUR and 0.88 for oil. While oil is normally counted in the DOW, fuel is not; the standard density value for AVGAS fuel is 1.53 lbs / litre, for AVTUR/Jet A-1 it is 1.76 lbs / litre. The effect of all the above items on the aircraft CofG must be determined and taken into account.

8.1.8.3 Company Pilots

- a. **Extra 300 Pilots.** Pilots will be weighed during every annual medical. Moreover, each pilot is to check his weight on the Company's scales in order to re-assess their accuracy. If he perceives that the scales are weighing more than 5Kg in error, the pilot is to notify the Ground Operations Coordinator who is to have them checked for accuracy. Pilots are responsible for reassessing their weight periodically throughout the year.
- b. **Multi-Engine Aircraft Pilots.** The weight of crew members and crew baggage to be included in the aircraft DOW may be achieved using either standard weights or actual weights.
- c. **Crew Standard Mass Value.** Where appropriate a standard mass value (including hand baggage) of 85Kg (187lbs) for flight crew members and 75kg (165lbs) for cabin crew members may be used. The B727 uses a standard mass of 96 Kg (210lbs) for flight crew members.

8.1.8.4 Passengers and Baggage

- a. **Extra 300.** Passengers will be weighed during the induction and briefing process. Actual passenger and pilot weights will be used in the weight and balance calculations using the Chart at Annex A to this Section which shows the permitted variation in passenger weights against a range of possible pilot weights; Pilots are to use their most

recent weight (or the next heavier weight) when using the chart. Determination of aircraft gross weight and centre of gravity will be carried out prior to each flight. Pilots are to be satisfied this procedure has been carried out and that weight and balance are within limits.

- b. **Multi-Engine Aircraft.** Actual or standard masses may be used for passengers and baggage when determining the aircraft traffic load. For multi-engine flying standard masses will normally be used except when:
 - i. There are instructions in the Aircraft Captain's brief to use actual masses;
 - ii. It is expected that the passenger and or baggage mass on the aircraft will be significantly less than standard;
 - iii. If a significant number of passengers on any flight and/or a significant amount of checked baggage is/are expected to exceed the standard mass, then actual mass must be used or an adequate increment to the standard mass must be added. Whenever the actual mass of passengers and or baggage is more than the standard mass then the actual masses must be used.

8.1.8.5 Loadsheet Documentation. Company mass and balance documentation is to be raised either through the PPS system or through the loadsheets shown at Annex A. The integrity of mass and balance data and documentation generated by computerised systems should be verified at a minimum of 6 monthly intervals. Amendments to input data (such as updated BEW) will be passed to Company operations by Fleet Managers for incorporation prior to use. The calculation is to be recorded and one copy is to be carried on the aircraft, whilst the other, as accepted by the Captain, must remain available on the ground until the aircraft has landed back at base. One copy must be kept with the flight documentation for a period of at least 3 months. Mass and balance documentation must be raised for all flights unless;

- a. The aircraft's Maximum Take-off Weight Authorised (MTWA) does not exceed 1150Kg, or
- b. The aircraft MTWA does not exceed 2730Kg and the flight is not intended to exceed 60 minutes in duration and is either;
 - i. a flight solely for training persons to perform duties in an aircraft; or
 - ii. an A-to-A flight.

8.1.8.6 Mass and Balance Calculations. Part B contains detailed loading instructions and a sample mass and balance document for each aircraft type. Irrespective of the method used in establishing the aircraft's mass and C of G position, the final mass and balance document must contain details of the disposition of all loaded items, including fuel, and must indicate whether standard or actual mass values have been used. Additionally:

- a. The name of the person preparing the loadsheet must be recorded on the loadsheet.

- b. The person supervising the loading must sign the loadsheet in confirmation that the load and its distribution is as indicated on the loadsheet.
- c. The loadsheet must be acceptable to the Aircraft Captain who should sign countersign the document when it is completed to his satisfaction.

Details of any late alterations in the load must be passed to the Aircraft Captain, and must be entered in the 'last minute changes' spaces on the mass and balance document. The limiting figure at which a new loadsheet must be prepared is published in the Operations Manual Part B (Mass and Balance / Loading)

8.1.8.7 Aircraft Captain's Responsibility. The Aircraft Captain is responsible for satisfying himself that the load is correctly and safely distributed and properly stowed and secured. He must check and sign the loadsheet before departure ensuring specifically that where applicable for his aircraft:

- a. The loadsheet is signed by the Captain
- b. Aircraft registration, basic weight and index correspond with that placarded, contained in the OM B or GOM (Mass and Balance / Loading) or the Tech Log
- c. Flight number and date are for the intended flight are correct
- d. Names of crew are correct
- e. The limiting weights are correct, especially if these are non-standard on the day due to performance, operational, or configuration reasons
- f. The take-off fuel agrees with the flight plan, including changes
- g. The actual take-off weight, including any last-minute changes, corresponds with that previously estimated for a gross error check
- h. The balance chart on a manually completed load sheet has been used correctly
- i. Cargo has been correctly weighed and that correct passenger weight allowance has been made
- j. The load has actually been loaded in accordance with the loadsheet and / or balance chart
- k. The trim of the aircraft, loaded in accordance with the combined loadsheet or balance chart, is within the indicated limits
- l. All goods carried are properly manifested
- m. The actual passenger number and names are coherent with the Passenger Manifest. Before departure, a copy of the checked passenger manifest must be left with a ground agent until after landing.

8.1.9 Air Traffic Service (ATS) Flight Plans

8.1.9.1 **General.** A flight plan *may* be filed for any flight, and *must* be filed in the circumstances given in Table 18 below.

Type of Airspace/Flight	Type of FPL
All flights within Class A Airspace.	Only IFR allowed
All flights within any Controlled Airspace (CAS) in IMC or at night (including those operating under Special VFR, although not required if operating under a Special VFR clearance).	IFR
All flights within any CAS, if the flight is to be conducted in accordance with IFR.	IFR
All flights within Class B, C and D CAS irrespective of weather conditions.	IFR or VFR
Any flight from an aerodrome in the United Kingdom, being a flight whose destination is more than 40 km from the aerodrome of departure and the aircraft Maximum Total Weight Authorised exceeds 5,700 kg.	IFR or VFR
All flights to or from the United Kingdom which will cross the United Kingdom FIR Boundary.	IFR or VFR
Any flight in Class F Airspace wishing to participate in the Air Traffic Advisory Service.	IFR or VFR

Table 18 Type of FPL required

- a. **A-A and VFR Flights.** Save for any requirements of the local Air Traffic Services or the host nation, flight plans are not required for the Company's A-to-A flights that will be conducted wholly under VFR. Details of such flights, and local area training flights or those involving air tests of aircraft or their systems, are to be passed to the ATS unit by booking out unless it is intended to fly IFR in Class G airspace.
- b. **Filing Procedure.** A-to-B flights are not to be commenced unless an ATS flight plan has been submitted, or if VFR only, adequate information has been deposited in order to permit alerting services to be activated if required. ATS flight plans are normally arranged by Company Operations. Captains should confirm that ATC have received the flight plan and check on ATC slot requirements. Should it be necessary to re-schedule, Operations will arrange for a new flight plan to be filed.
- c. **Aircraft Captain's Responsibility.** The Aircraft Captain is responsible for ensuring that a plan has been filed, and that he is fully aware of the details therein. If, exceptionally, it is not possible to submit a flight plan when one would normally be required (for instance in cases of a lack of ATS facilities or communications failure) the Aircraft Captain must ensure that a suitable person is made responsible for alerting search and rescue facilities and for holding the flight 'airborne' until it is confirmed as completed. It is advisable to file a VFR or IFR FPL if the flight involves flying; over the sea, more than 10 nm from the UK coastline; over sparsely populated areas where Search and Rescue operations would be difficult; into an area in which search and rescue operations are in progress. The flight plan should include the expected times of entering and leaving the area and the details must also be passed to the appropriate ACC. The ACC will notify Kinloss ARCC.

8.1.10 Operational Flight Plans

8.1.10.1 An Operational Flight Plan (or PLOG) is to be prepared and used for all CAT/SPO flights other than those intended to take-off and land at the same aerodrome under VFR, and for B727 flights; of less than 100nm, when on air test, or when transiting less than 200nm radius to spray areas. The flight crew will be required to produce PLOGs primarily using the PPS or [RocketRoute](#) computer based service or alternatively using one of the reversionary manually completed proforma, dependant on the number of crew, type of aircraft and purpose of the flight. [All entries on the operational flight plan should be made concurrently and be permanent in nature.](#) Company Operations staff will normally arrange for the prepared flight plan to be available to the crew at the departure airfield.

- a. The following information is to be recorded:
 - i. Aircraft registration;
 - ii. Aircraft type and variant;
 - iii. Date of flight;
 - iv. Flight identification;
 - v. Names of flight crew members;
 - vi. Duty assignment of flight crew members;
 - vii. Place of departure;
 - viii. Time of departure (actual off-block time, take-off time);
 - ix. Place of arrival (planned and actual);
 - x. Time of arrival (actual landing and on-block time);
 - xi. Type of operation (ETOPS, VFR, Ferry flight, etc.);
 - xii. Route and route segments with checkpoints; waypoints, distances, time and tracks;
 - xiii. Planned cruising speed and flying times between check-points/waypoints.
 - xiv. Estimated and actual times overhead;
 - xv. Safe altitudes and minimum levels;
 - xvi. Planned altitudes and flight levels;
 - xvii. Fuel calculations (records of in-flight fuel checks);
 - xviii. Fuel on board when starting engines;
 - xix. Alternate(s) for destination and, where applicable, take-off and en-route, including information required in sub-paragraphs (xii), (xiii), (xiv) and (xv);
 - xx. Initial ATS Flight Plan clearance and subsequent re-clearance;
 - xxi. In-flight re-planning calculations; and
 - xxii. Relevant meteorological information.

Items which are readily available in other documentation or from an acceptable source (for instance the pertinent Sortie Record Page of the Tech Log system), or that are irrelevant to the type of operation, may be omitted from the PLOG.



Log Nr.: 8575 Page 1

EGBJ-EGTK BRO

2EXCEL	A/C TYPE: Super King Air B200 : 21.08.2020		FROM: EGBJ	TO : EGTK	TYPE OF OPERATION Com / Pvt / Trg / Ferry Dispatcher :		
	REG : G-JASS	Leg No :	ETD : 14:00	ETA :14:09			
	Cruise : 1700 rpm	File No:	ALT1: EGTC	ALT2:			
FUEL CALCS FL 70		CORRECTIONS (MTOM)		MASS AND BALANCE			
FUEL TIME Lbs CHGS	FL WC TIME FUEL 10KT D/C	SEATS PAX Lbs	LUG Lbs	FUEL Lbs	BOM Lbs MAX		
Taxi 90	190 28 11.0 108 5 17	Seat 3 0 0	Aft 20	main 2586	ZFM 8717 11000		
Trip 0:09 128	170 29 10.7 107 5 10	Seat 4 0 0	Wing 0	aux 0	TOM 11213 12500		
Alt1 0:09 138	ACT 70 30 10.6 106 5 8	Seat 5 0 0			ELM 11085 12500		
Alt2 0:00 0	130 32 10.6 110 5 9	Seat 6&7 0 0			RAMP 11303 12590		
MCP 70	110 36 10.6 113 5 12	Seat 8&9 0 0					
FRES 0:30 300	90 36 10.2 121 5 10	Toilet10 0 0					
MReq 0:48 727	TRIP INFO		Seat 2 0 0		ARMS MIN ACT MAX		
Plan 3:54 2586	Time to Dest : 0:09		0 0		ZERO FUEL 181.0 183.2 196.4		
FAT 3:06 1859	Avg Wind Comp: 35 KTS TAIL		0 0		TAKE OFF 181.0 183.1 196.4		
	Total Dist : 42				LANDING 181.0 183.1 196.4		
DEPARTURE INFO Route: BUGUP DCT OX			Sywell Ops: 131.910 Doncaster Ops: 131.965				
ATIS:			TIMES				
Clearance:			Off Blk Airborne				
			On Blk Land				
			Total Total				
			CREW DUTY				
			LTC				
			Captain G HUDSON				
			Co Pilot S DAMOO				
			Signature				
DEPARTURE INFO		DESTINATION INFO		Alternate 1		Alternate 2	
Airport : GLOUCESTERSHIRE	TOP : 1406 Lbs	Airport : OXFORD	ICAO : EGTK	Airport : CRANFIELD	ICAO : EGTK	ICAO :	ICAO :
ICAO : EGBJ	FOB : 2496 Lbs	ICAO : EGTK	ELM : 11085 Lbs	ICAO : EGTK	ICAO : EGTK	IATA :	IATA :
IATA : GLO	ZFM : 8717 Lbs	ELM : 11085 Lbs	Elevation: 270	Elevation: 360	Elevation: 0	Elevation: 0	Elevation: 0
Elevation: 101	AUM : 11213 Lbs	Elevation: 270	R/W Lgth: 5000	R/W Lgth: 5900	R/W Lgth: 0	R/W Lgth: 0	R/W Lgth: 0
R/W Lgth : 4600	ELM : 11085 Lbs	R/W Lgth: 5000	LAT : N51:50.2	LAT : N52:04.3	LAT : N00:00.0	LAT : N00:00.0	LAT : N00:00.0
LAT : N51:53.6	POB : 2	LAT : N51:50.2	LONG : W001:19.2	LONG : W000:37.0	LONG : W000:00.0	LONG : W000:00.0	LONG : W000:00.0
LONG : W002:10.0	LOAD: 20 Lbs	LONG : W001:19.2					

Log Nr.: 8575 Page 2

EGBJ-EGTK BRO

DATE : 21.08.2020	REG:BRO	ETD:14:00	ATD:													
FROM : EGBJ	WIND 35 KTS TAIL	Based on forecast :08211400	OPR: 2Excel Aviation													
TO : EGTK			Tel: +44 (0)1604 790218													
IDENT	FREQ	AIRWAY	GRID	MT	TAS	WIND	DIST	TIME	ETO	ATO	FUEL MREQ	ACT	FAT	ALT	HDG	FREQ/CLEARANCE
EGBJ	101ft	ALT	MORA	MH	GS	OAT	LEG/REM	LEG/ACC			FUEL REMR	REM				
GLOUCESTERSHIRE							42				2496					
BUGUP		DCT		093	360	229/052	25	6			476					
BUGUP		DSC	30	101	411	VAR	17	0:06			2405					
OX	367.50	DCT		103	360	229/052	12	2			449					
OXFORD		DSC	23	110	411	VAR	5	0:08			2379					
EGTK	270ft			031	360	229/052	5	1			438					
			23	028	411	VAR	0	0:09			2368					
Alternate EGTK WCO DCT																
WCO	335.00	DCT		086	225	231/052	18	4			378					
WESTCOTT		DSC	30	23	266	14		0:13			2307					
EGTK		DCT		044	225	231/052	23	5			300					
CRANFIELD		DSC	25	277	14			0:18			2229					

Climb : 10 NM in 0:04 hrs 137 Lbs Descent: 23 NM in 0:04 hrs 51 Lbs

DATE : 21.08.2020	REG:BRO	ETA:14:09
FROM : EGBJ	WIND 35 KTS TAIL	
TO : EGTK	Based on forecast :08211400	OPR: 2Excel Aviation Ops: +44 (0)1604 790218
ARRIVAL ATIS	ALTERNATE ATIS	HANDLING AGENT
		FREQ

8.1.11 Technical Log System

8.1.11.1 General. The Company's Technical Log is designed to allow recording of aircraft operating data, defects, malfunctions, and maintenance performed on the aircraft to which it applies whilst the aircraft is operating between, and during, scheduled maintenance inspections. In addition, it includes maintenance information required by the operating crew and is used for recording operating information and data relevant to Flight Safety, and Continuing Airworthiness. The Technical Log also contains the Role Fit Record, to log the installation and removal of certain optional design changes.

The Technical Log is made up of six sections, following a preface:

Preface This section contains instructions to technical log users, and useful operational matter such as keys, out-brief and fuel cards where necessary.

Section 1 Operator and Aircraft Information. General information about the Operator and complete international registration details for the aircraft.

Section 2 Certificate of Release to Service and Maintenance Statement. The Certificate of Release to Service (CRS), normally for the last scheduled maintenance check. The Company's Maintenance Statement identifying the next scheduled and out of phase maintenance requirements, including Navigation Database Record.

Section 3 Sector Record Pages. The Sector flight data and maintenance activity log.

Section 4 Acceptable Deferred Defects Log and Dent & Buckle Chart. A record of Acceptable Deferred Defects (iaw the MEL) and the aircraft dent and buckle chart.

Section 5 Maintenance Support Information. Maintenance support information and contacts and the aircraft MEL.

Section 6 Role Fit Record. A log of the approved installation and removal of optional 'role-fit' design changes. Any fit and removal requires a corresponding Reference in Section 3 "Defect details" to record the Role change and associated Pt145 CRS endorsement prior to Flight.

Additional material may be included in the Technical Log at the discretion of the CAM.

8.1.11.2 Technical Log Completion. Flight Crew will be trained on Sector Record Page (SRP) completion before using the Technical Log system, as part of the Company CAMO induction training. Entries in the technical log form a permanent part of the aircraft records and irregularities may invalidate the legality of such records. Only authorised personnel, therefore, may make entries in the technical log. Entries in the technical log shall be:

- a. In accordance with the Company procedures;
- b. Accurate, complete and as concise as possible;

- c. Printed clearly using a black ball point pen such that the information is transferred to the bottom copies;
- d. Ensure that the 'Barrier Card' is correctly inserted before writing on the Sector Record Page (SRP).
- e. In UTC time throughout.

8.1.11.2.1 Instructions for Use – Pilots. Aircraft Captains are to complete the relevant sections of the Technical Log for each aircraft before and after each flight. The Sector Record Page (SRP) is a log for the recording of aircraft activity, status and serviceability; one page per day up to 6 sectors. All SRPs are serially numbered and in quadruplicate, coloured White, Blue, Yellow and Pink:

- a. The White copy remains in the Technical Log until they are removed by the Pilot or Fleet Manager. White copy only to be removed once completed and placed in the relevant Base Ops/CAMO tray to be forwarded to Tech Records.
- b. The Blue copy held on ground at the departure station (destroyed after 48 hrs).
- c. The Yellow copy is to be given to the Fleet Manager for record purposes.
- d. The Pink sheets remain in the Technical Log until last SRP used for reference purposes.

Completion:

Before Flight:

Prior to doors closing for departure, the Captain shall:

- a. Ensure correct flight identification details are entered as follows:
 - Aircraft type, (pre-printed)
 - Full aircraft registration, (pre-printed)
 - Correctly sequenced SRP Serial # is used.
 - Date (UTC).
 - (and for B727/B737 print Crew names at CAPT/FO/FE (a/r) and insert Flight Number/Callsign.)
- b. Ensure all defects on previous SRP(s) have been cleared or deferred in the 'action taken' column. There should be no defect entries on the current SRP prior to flight.
- c. Ensure that the "Daily Inspection" section has been appropriately certified and that sufficient validity remains. The daily inspection must be carried out prior to the first flight of the day, with a validity of 24 hours. The daily inspection is to be carried out and certified by an appropriately Licensed Maintenance Engineer or Pilot/Flight Engineer under EASA Part-145, including inserting the Part 145 organisation approval number (which may be found on the maintenance information summary page in the Technical Log), onto the SRP in the relevant place under Daily Check. Check A

Schedules must be followed; a laminated copy from the AMP is included in the Technical Log.

- d. Ensure next inspection date and hours are completed correctly with cross-reference to the Maintenance Statement.
- e. Similarly, the Brought Forward Airframe Hours and Cycles are completed correctly to ensure sufficient allowance remains for the anticipated sequence of flights.
- f. Confirm any operational, maintenance or calendar limitations with SRP deferred defects table including cross-reference to the Acceptable Deferred Defects (ADD) Log for any deferred defects (Section 4), update SRP accordingly, the Maintenance Statement (Section) and the Role Fit Log (Section 6).
- g. For other than B727/B737 logs, complete the Before Flight section with the Captains name (in full not LEON codes), Passenger or crew, Duty Planned (using ICAO codes), Relevant Details (i.e. Trial Name/OPC, Crew Type (i.e. SP/MP and type of operation (i.e. CAT/SPO/PT/PRV/TRG).

EGBK	TRIAL BF3
EGXP	SP/SPO

- h. Complete the fuel uplift section as appropriate, ensuring sufficient fuel is loaded for the planned flight. If nil uplifted then enter NIL or strikethrough. 'Before' and 'After' refers to fuel quantity before fuel uplift and after fuel uplift respectively. Departure fuel is also to be completed.
- i. Complete the oil uplift section as appropriate. For B727/B737 ensure sufficient Hydraulic Oil is noted. Engine Oil uplift, if required, will be carried out and recorded on the SRP (post engine shutdown for B727/B737). If nil uplifted then enter NIL or strikethrough. For B727/B737 APU total hours can be recorded for maintenance purposes.
- j. Determine if ground de-icing is required. If required, complete the ground de-/anti-icing table, entering a start and finish time, type of fluid used together with the ratio of the mixture and the temperature of the fluid. If de-/anti-icing is not required enter 'NIL'. De-icing and anti-icing activities do not require EASA part-145.
- k. The aircraft captain is to sign confirming satisfactory completion of the before-flight inspection, including cover, lock and blank removal (see Paragraph 6).

Before departure, leave a Ground Record of SRP, Mass and Balance and Pax Manifest with responsible person (e.g. handling agent) with instructions to destroy in 48hrs if nothing heard. If on a multi-sector trip, you may have to leave photocopies. [It is acceptable to email copies \(photo or scan\) to Company operations if no onsite facility is available.](#)

Ensure that the Tech Log is carried in its fireproof bag.

Post Flight:

Post flight, the Captain shall ensure:

- a. In the “After Flight” section and enter actual landing and take-off times (HH:MM UTC).
- b. Accurate completion of Sector Flight Time (HH:MM) and Landings. For B737 ensure completion of Autoland block.
- c. At the completion of flying for the day, accurate completion of the Total Carried Forward and landings and correct transfer of data to the next SRP.
- d. Ensure landing fuel is entered and detailed on the SRP.
- e. The post-flight Instrument Flying and Defect are accurately recorded in the appropriate section.
- f. Record defects in defect details section (See Paragraph 5). For multiple defects, the next SRP(s) may be used, noting the continuation at the bottom-right corner of the SRP.
- g. Under the “Captain’s After Flight Signature” the captain must sign, confirming completion of sector details, any applicable defect reporting and to state, where applicable that locks, pins, covers and blanks are fitted. Whenever an aircraft is to be parked outside overnight, or is hangered on completion of flying, (or for B727/B737 purposes outside in ‘poor weather’ - considered to be snow, icing conditions, hail, heavy rain, gusting wind conditions and sandstorms). pitot covers, all provided blanks and the flying controls and prop locks and gear locks if applicable are to be fitted. (The Captain signing the Technical Log in the captain post-flight section and pre-flight inspection and acceptance section respectively records the fitting and removal of these items.)
- h. B727 and B737 Engine health monitoring - Completion of the Engine Health Monitoring section is to be carried out every flight for each Engine unless there are specific reasons why parameters could not be taken (annotate on EHM Grid) as follows:

During Engine start:

- maximum EGT

Once established in Cruise for at least 5 minutes:

- Flight Level
- Air Temp
- Airspeed
- Engine Pressure Ratio (EPR)
- Fan Speed (N1)
- Exhaust Gas Temperature (EGT)
- HP Compressor Speed (N2)

- Fuel Flow (F/F)
- Oil Pressure (OIL PX (psi))
- Oil Temperature (OIL TEMP (°c))

Defects:

- a. In the event that a defect arises on the aircraft, the defect must be entered in the “Defect details” space provided on the left side of the SRP detailing date and time, plus name and signature of who raised it. The white SRP sheet must be retained in the Technical Log until cleared.
- b. Ground defects are to be entered after the last crew entry, continuing the sequence of defect numbering. All defects must be cleared under the “Action taken” column.
- c. Scheduled Maintenance inspections may be signed only by an appropriately licensed Maintenance Engineer under EASA Part-145.
- d. When a defect is recorded, it must be rectified and cleared by EASA Part-145 Maintenance activity, or transferred to the ADD Log, if eligible, in accordance with the Minimum Equipment List (MEL) and/or Configuration Deviation List (CDL), prior to the next flight:
 - i. When a defect has been raised in the 'Defects' column of the Technical Log SRP and, is deemed to be within the allowance quoted in the MEL, then it may be subject to carry forward action. Consideration should also be given by the person carrying forward the defect to the possible effects that multiple and related defects may have, even where these are covered as individual items in the MEL
 - ii. The entry in the 'Action Taken' column of the SRP should be annotated 'Defect deferred in accordance with the MEL reference..... ADD No. raised.' This entry may be made by the operating crew or maintenance personnel.
 - iii. The ADD record pages (Section 4) must be suitably annotated with details of the defect and a time limit must be specified (date and time or remaining flight hours and/or cycles). No Certificate of Release to Service is to be issued for the carried forward item until the defect has been cleared on a subsequent SRP
 - iv. Defect clearance must be certified only by an appropriately licensed Maintenance engineer under EASA part-145, unless Nil or Nil Further.
 - v. Deferral of a defect i.a.w the MEL, must be certified by a specific EASA Part-145 entry or the Aircraft Captain on a Technical Log SRP and detailed in the ADD log at Section 4.
 - vi. If defect is not listed in MEL, it cannot be an ADD authorised by the Captain. It may however be deferred by the part 145 i.a.w 2Excel Aviation procedures.

- e. An aircraft Captain may only defer an acceptable defect in accordance with the MEL and/or CDL, provided no engineering actions are called for by the MEL/CDL or Dispatch Deviation Guide (DDG), however care must be taken to ensure that all (O) Operating procedures are adhered too. Instructions for the use of the MEL are contained in the MEL front matter. When so doing the aircraft Captain must enter the defect in the column 'DEFECT DETAILS', sign (including licence number) for his/her action and enter a reference to transferring of the defect to the Acceptable Deferred Defects page in accordance with the relevant MEL / CDL item number in the 'ACTION TAKEN' column. The "Part-145 Release to Service" is not to be completed by the aircraft Captain and must be left blank.

8.1.11.3 Daily Summaries. At the end of the day the cumulative totals are to be calculated, and the relevant boxes completed. Remove white and yellow SRP records:

White and yellow copies are to be sent to CAMO Tech Records to be archived.

Red copies are maintained in the Technical Log until the block is complete. When complete, the Red block is to be archived.

Note: For reasons to do with space saving, the SEP fleet do not have blocks of SRPs equipped with carbon copy. The Extra Fleet Manager is still to comply with the ground record and archiving requirements of these instructions where applicable.

8.1.11.4 Role Changes. Only authorised pilots (who have completed the relevant training and are within the currency stipulations laid down in the CAME) may carry out role changes on Company aircraft. In the Tech Log the required 'Role Change' is entered as a 'Defect' and then once the change has been effected it is signed off as 'Action Taken'. The Certificate of Release to Service (CRS) should then be signed by the Aircraft Captain.

8.1.11.5 Cabin Defects It is the Commander's responsibility to review all defects that have been entered in the Cabin Defects Log by the SCCM. The Commander shall, for each defect, determine whether it affects the airworthiness of the aircraft or not.

- a. If the defect is assessed as having an airworthiness affect the Commander shall transfer the defect to the Aircraft's Technical Log.
- b. If the defect is assessed as not affecting airworthiness the defect shall remain open in the Cabin Defects Log.
- c. Tick the Captain's Assessment box as appropriate, including recording the Aircraft's Technical Log where required, and sign with the date and time.
- d. Each individual defect needs to be assessed and signed for.

8.1.12 Documentation, Forms and Additional Information to be Carried On-board

8.1.12.1 Flight Crew are to ensure that their flying licences and ratings, medical certificates, engineering authorisations, passports, visas, and vaccination certificates if held are carried on-board.

8.1.12.2 **Multi-Engined Aircraft.** For multi-engined operations, the following documents (as appropriate to type) will be carried on the aircraft:

- a. The Aircraft Flight Manual (AFM) and/or POH or equivalent document
- b. The original Certificate of Registration
- c. The original Certificate of Airworthiness
- d. The Aircraft Noise Certificate, including an English translation where one has been provided
- e. A certified true copy of the Air Operator Certificate
- f. The Operations Specifications relevant to the aircraft type as issued with the AOC
- g. The original Aircraft Radio Licence
- h. The Aircraft Hull and Third Party Liability Insurance Certificate
- i. The journey log or equivalent (for Company aircraft this is the technical log and PLOG/OFPP)
- j. The Aircraft Technical Log
- k. The filed ATS flight plan (if applicable)
- l. Current and suitable aeronautical charts (inc maps and terminal charts) for the route of the proposed flight and all routes along which it is reasonable to expect that the flight may be diverted.
- m. Procedures and Visual signals information for use by intercepting and intercepted aircraft. (Jepp Manual / Pooleys Guide / Part S)
- n. Information concerning Search and Rescue services for the area of the intended flight which shall be easily accessible in the flight crew compartment. (Jepp Manual)
- o. The current parts of the 2Excel Operations Manual that are relevant to the duties of the crew members, which shall be easily accessible to the crew members
- p. The MEL
- q. Appropriate NOTAMs and AIS briefing documentation
- r. Appropriate meteorological information
- s. Cargo and/or Passenger Manifests as applicable
 - For Navajo flights where the TFO/SO is the only passenger insertion of the TFO/SOs identity on the Sector Record Page entry for that flight may be considered as fulfilling the requirement for the completion of a passenger manifest.
- t. The mass and balance documentation
- u. The Operational Flight Plan if applicable
- v. Notification of Special Categories of Passengers (SCPs) and special loads if applicable (including NOTOC for DG)
- w. Any other documentation that may be pertinent to the flight or is required by the States concerned with the flight (such as overflight clearances and customs declaration forms).
- x. Passenger safety briefing cards

- y. Dangerous goods documentation (when so authorised and in accordance in Section 9 to this Part) (including ERG)
- z. Forms to comply with any Company reporting requirements, and

In case of loss or theft of documents b-h, the operation is allowed to continue until the flight reaches the base or place where a replacement document can be provided.

And additionally, for B727 and B737 operations:

- a. The Aircraft Operations Manual (AOM) Volume 1
- b. 3 x QRH (Quick Reference Handbook) (1 x QRH for B737)
- c. Flight Engineer data book (not required on B737)
- d. The Boeing Weight and Balance Control and Loading Manual (basic); and Valsan and Ancra Supplements (not required on B737)
- e. The latest version of NAT Doc 007 [North Atlantic Operations and Airspace Manual \(via EFB\)](#)
- f. The 2Excel Ground Operations Manual (GOM) [\(via EFB\)](#)

8.1.12.3 Extra 300. For operations under VFR by day taking off and landing at the same aerodrome within 24 hours, or remaining within the local area (A to B operations under VFR by day with SEP are assumed to classify as local operations) the following documents may remain at the aircraft operating airfield:

- a. The aircraft noise certificate
- b. The aircraft radio licence
- c. Journey log or equivalent (for Company aircraft this is the technical log and PLOG/OFP)
- d. The Aircraft technical log
- e. Appropriate NOTAMS and AIS briefing documentation
- f. Appropriate meteorological information
- g. Notification of Special Categories of Passengers (SCPs) and special loads if applicable
- h. The mass and balance documentation

8.2 Ground Handling

8.2.0 For additional detailed ground handling related information refer also to the Company Ground Operations Manual (GOM).

8.2.1 Fuelling

8.2.1.1 **Passengers on Board.** Passengers must be accompanied at all times by a crew member. If appropriate to type then passenger stairs must be attached to the aircraft. In any aircraft using wide-cut or AVGAS fuel, fuelling is not to be undertaken with passengers on board, embarking or disembarking.

8.2.1.2 **At Base.** Fuelling is to be supervised by the operating pilots or qualified ground support staff. Captains are to confirm with Operations that the fuel quantity ordered is sufficient to meet the calculated requirements for the flight and they, or a nominated crew member are responsible for confirming that:

- a. Smoking is not being conducted within 15 metres of the aircraft;
- b. The bowser or other fuel installation is correctly earthed to the aircraft structure, before the hose is extended, and remains so until refuelling is complete;
- c. The correct type, grade and quantity of fuel have been loaded;
- d. The fuel drains are operated to check for water content and are left properly closed;
- e. A visual check (if possible) of the fuel level corroborates the amount of fuel loaded.
- f. The aircraft fuel gauges indicate that the tanks have been filled to the required levels;
- g. All fuel tank caps are properly secured;
- h. Details of the Fuel uplift have been correctly entered in the technical log and a gross error check is carried out.
- i. If an APU unit located within the fuelling zone or which has an exhaust efflux discharging in to the zone is stopped for any reason during a fuelling operation it should not be restarted until the flow of fuel has ceased and there is no risk of igniting fuel vapours.

8.2.1.3 **When Deployed.** In addition to the items detailed at Para 8.2.1.2 above, a Company flight crew member will be present during re-fuelling in order to ensure that:

- a. The re-fuelling agency is carefully briefed as to the type, grade, quantity (and in particular the 'units' of measurement of quantity) required and that the bowser markings correspond to the grade required;
- b. The quantity of any icing inhibitor or anti-freeze additive is dispensed into the fuel where specified in accordance with the Manufacturer's schedules.
- c. The fuel bowser/installation readings at the start and finish of refuelling reflect accurately the fuel uplift as indicated on the aircraft fuel quantity gauges, and a gross error check is carried out.

8.2.1.4 Wide Cut Fuels. Mixing of wide cut fuels with Jet A, or its equivalent must be accomplished in accordance with the instructions found in the aircraft AOM. When fuelling with turbine fuels not containing anti-static additive and where wide cut fuels, such as JP4, are involved, a substantial reduction in fuelling flow rate will be used.

Wide cut fuel is considered to be 'involved' when it is being supplied; when it is present in the aircraft tanks, or if the tanks before fuelling, contain a mixture of more than 5% wide cut fuel in kerosene.

The 5% wide cut level is considered to have been achieved after 20 flying hours have elapsed following the last uplift of wide cut fuel.

The amount of reduction in flow rate needed is dependent upon the fuelling equipment in use and the type of filtration employed on the aircraft fuelling distribution system and it is thus difficult to quote precise rates of flow. It is, however, recommended that the flow rate should be in accordance with the provisions of the Fuel Company's operating manual.

Whenever wide cut fuel is involved:

- a. The APU (if installed) may not be started while refuelling is taking place
- b. Strict adherence to the bonding and grounding precautions must be observed because of the lower flash point of the mixture. Therefore, aircraft and refuelling vehicles must be kept securely connected to adequate ground-earthing points and the refuelling vehicles must be bonded to the aircraft prior to connecting the nozzle to the aircraft fuelling adapter
- c. On completion of refuelling with a wide cut fuel, a placard should be placed on the flight deck instrument panel stating that this fuel has been uplifted and giving the date and time. An entry will also be made in the technical log.

8.2.1.5 Aircraft Maintenance Operations During Refuelling

- a. Electrical and radio equipment may be checked but maintenance must be limited to the exchange of complete units.
- b. Radar must not be operated during fuelling operations or when within 30 meters (100ft) of such operations, fuel tanks, fuel trucks or fuel storage areas.
- c. In certain emergency situations resulting from the failure of an APU and / or equivalent ground support equipment and where no alternative is available, fuelling with one engine running is permitted provided that there is strict adherence to the procedures contained in the aircraft manual. At some airports it is necessary for the fuel company to obtain approval from the Airport Authority immediately prior to the commencement of fuelling in such circumstances.

- d. When wide cut fuel is involved, radio equipment including radio paging devices, pocket calculators and similar electrical equipment, unless otherwise stated to be intrinsically safe, must not be taken into the fuelling zone or within 20ft of a fuel spillage.
- e. Strobe lights are not to be operated or tested during refuelling or de-fuelling.
- f. An APU may be started during fuelling operations. However, an APU must not be restarted following automatic shutdown or started following defect rectification until the fuelling operation has ceased.
- g. Refuelling with electrical storms within close proximity of the airfield will require co-ordination with the refuelling agency on when fuel delivery will be allowed.

8.2.2 Aircraft, Baggage and Passenger Handling

8.2.2.1 General Responsibilities. All personnel who are to be made responsible for the ground handling of the Company's aircraft, including the loading and offloading of both passengers and baggage or freight, are to be given detailed guidance in the completion of their duties in respect of each aircraft type for which they may be responsible. Such personnel include flight and cabin crews and the Company's own ground personnel. In the event of using non-company ground personnel it is the responsibility of the Captain to ensure that they are adequately briefed.

All ground staff are to be made aware of any pertinent aspects of ramp or manoeuvring area safety with particular reference to fire prevention, blast and suction areas, and the need to be constantly aware of (and remove where appropriate) loose objects and debris. The aircraft should be positioned using support of ground marshalls wherever possible and be parked away from transit routes such that, for example, brake failures of vehicles, ground support units, or the aircraft itself would not cause a collision.

8.2.2.2 Passenger Reception. Passengers will be met and fully briefed by suitably qualified, uniformed, ground staff on arrival. Passengers waiting will be able to relax and wait in the Company or deployed ground facilities. For charter operations this function may be carried out by nominated 3rd parties using airside facilities as necessary.

8.2.2.3 Passenger Briefing. Passengers will be fully briefed on the sortie profile, general safety procedures and aircraft emergency procedures using a mixture of electronic and/or paper presentations, verbal briefs and their physical introduction to the aircraft by trained and qualified Company staff. The briefing items are at Annex D to this Section.

8.2.2.4 Spectators. Spectators watching from Company premises will also be given a ground safety brief, specifically covering aircraft hazards, airfield hazards, and general safety. All spectators will be barred from the aircraft operating surfaces unless they are escorted by trained ground support staff marshals. On the airfield operating surfaces, the maximum ratio of passengers to trained Company staff will be 9:1; marshals should reduce this ratio for children under 12 unless the children are being properly controlled by a responsible adult. However, if the Company aircraft are on the airfield operating surface but are cordoned off and their keys are physically removed from the cockpit, up to 50 spectators may be allowed around the aircraft as long as they remain within the cordon. With the aircraft keys confirmed as removed spectators may be allowed in front of the aircraft wing lines. However, at no stage are the propellers to be touched. Unless there is direct access to a holding area off the operating surface the route between the aircraft and the holding area must be marked and controlled by ground support staff marshals.

8.2.2.5 Passenger Embarkation and Disembarkation. Having confirmed that local aerodrome procedures permit pedestrian passengers traversing the aircraft movement area, and having obtained the necessary permissions, qualified ground support or flight crew personnel are to escort passengers to and from the aircraft, using approved courtesy transport where applicable. The route between the holding area and the aircraft is to be constructed in such a way as to keep the passengers away from the front hemisphere of the aircraft whenever they

are within 15 metres of it. Except in cases where a twin's right engine is kept running for operational reasons, ground support staff are to wait for propellers to stop before approaching, embarking on, or disembarking from the aircraft. When disembarking, unless deplaning with the right engine running for operational reasons, passengers are to be advised to remain on the aircraft until the engines have been shut down, and arrangements have been made for them to proceed to the terminal with an escort. Every care is to be taken to ensure that they remain in a unified group, refrain from smoking, and are kept well clear of propeller or rotor wash, jet engine intake and exhaust danger areas while on the operating surfaces.

8.2.2.6 Multi-Engine Aircraft - Passenger Embarkation and Seating.

8.2.2.6.1 As far as is possible, subject to mass and balance requirements, passengers are to be allowed a free choice of seating from the space available on the aircraft when they arrive to check-in. Regard must be paid, however, to seat allocation affecting weight and balance and the emergency evacuation of the aircraft. To that end passengers are to be categorised into groups and seats allocated accordingly.

- a. **Passengers likely to assist evacuation.** Only those persons who appear reasonably fit and strong should be seated adjacent to the exits.
- b. **Passengers Who Are Unlikely To Affect Evacuation Performance.** Passengers with no seating restrictions.
- c. **Special Categories of Passengers (SCPs) likely to impede evacuation.** Passengers requiring special conditions, assistance and/or devices when carried on a flight shall be considered as SCPs. The Commander shall be notified when SCPs are to be carried on board. They shall be carried under conditions that ensure the safety of the aircraft and its occupants and as such should be seated where they will not have direct access to emergency exits or where their presence could obstruct emergency equipment or exits, or otherwise impede the crew in carrying out their duties. This group includes:
 - i. Persons with reduced mobility (PRMs) who without prejudice to their rights are understood to be any person whose mobility is reduced due to any physical disability, sensory or locomotory, permanent or temporary, intellectual disability or impairment, any other cause of disability, or age;
 - ii. Infants and unaccompanied children;
 - iii. Deportees, inadmissible passengers or prisoners in custody.

Note: When the number of PRMs forms a significant proportion of the total number of passengers carried they must not exceed the number of able bodied persons capable of assisting with an emergency evacuation.

8.2.2.6.2 Normally Inadmissible Passengers. If the Company is required to carry such normally inadmissible passengers as deportees or persons charged with criminal offences, the Captain is to be notified with full details of any special arrangements that have been made or may be

necessary (including the provision for the carriage of weapons in accordance with Section 9 to this Part and Part S) so that he can make any necessary arrangements.

8.2.2.6.3 Access to Emergency Exits. The following categories of passengers are among those who should not be allocated to or directed to seats that permit direct access (meaning proceeding directly to the exit without entering an aisle or passing around an obstruction) to emergency exits:

- a. Passengers suffering from obvious physical or mental disability to the extent that they would have difficulty in moving quickly if asked to do so;
- b. Passengers who are either substantially blind or substantially deaf to the extent that they might not readily assimilate printed or verbal instructions given;
- c. Passengers who because of age or sickness are so frail that they have difficulty in moving quickly or reaching and passing through the adjacent emergency exit;
- d. Children (whether accompanied or not) and infants;
- e. Deportees, inadmissible passengers or persons in custody; and
- f. Passengers with animals.

8.2.2.6.4 Multiple occupancy of seats. Multiple occupancy is only permitted when one occupant is an infant under 2 years old and the other is a responsible adult aged 16 years or more.

8.2.2.6.5 Passenger Embarkation Order. For Company Navajo aircraft passenger and baggage embarkation should be controlled, in order to maintain the aircraft within its 'standing balance.' Passengers should be shown to their allocated seats in an order which will ensure that weight is distributed such that the aircraft rests firmly on its 3 wheels and remains stable throughout the loading process.

8.2.2.6.6 Securing the Aircraft for Flight. Once the passengers are seated the cabin door is to be closed and locked and confirmed as so by inspection.

8.2.2.6.7 Pre-Flight Passenger Briefing. Once settled, the passengers are to be briefed on the emergency procedures, operation of the normal and emergency exits, the use of seat-belts, the no-smoking policy, and the general requirements for cabin comfort and security during flight.

8.2.2.7 Extra 300 Strapping In and Un-strapping. Because of the nature of the Extra 300 flying passengers will be strapped into Extra 300 aircraft by a qualified ground support staff or the operating pilot. The Extra 300 canopy is to remain closed whenever the engine is running. Passengers will be reminded not to un-strap until the propeller is stationary and either a ground support person or the aircraft captain is 'at their side'.

8.2.2.8 Refusal of Embarkation. The Aircraft Captain has the authority to refuse entry to his aircraft anyone whose presence in flight could represent a hazard to the safety of the flight. In order to assist him in properly exercising of this authority, all Company personnel engaged in passenger handling and loading, including other crew members, should alert him if at any time they consider the condition or temperament of a particular passenger could jeopardise

the safety of the flight. If difficulty is encountered in dealing with such passengers, particularly where physical restraint may be required, staff may need to resort to requesting the assistance of the aerodrome staff or the police. In addition, passengers may be refused embarkation for the following reasons:

- a. They do not have adequate identification;
- b. They do not have a passport or visa as applicable/required;
- c. They are considered to be under the influence of alcohol or drugs;

8.2.2.9 Missing Passengers. In case a passenger is missing, his baggage must be unloaded. If necessary all checked baggage should be unloaded and all passengers should be disembarked and required to identify their baggage. The Captain shall request airport security assistance should any unidentified baggage remain. At arrival copies of the checked passenger manifest must be available on board the aircraft to be given to the authorities (police, customs).

8.2.2.10 Cargo and Baggage

8.2.2.10.1 Extra 300 SPO Flying. Carriage of cargo is prohibited.

8.2.2.10.2 Multi-Engined Flying

- a. **Cabin Baggage.** Apart from crew member flight bags and operational cases, no other baggage is allowed in the cockpit. Cabin baggage will normally be restricted to handbags, briefcases, laptops, cameras, outdoor coats and other items that can be reasonably stowed in approved stowage positions. The mass of individual cabin baggage items should reflect that passenger's standard allowance, unless the pieces are weighed and accounted for. The size and number of items to be allowed per passenger is determined by the aircraft type, route and load factor and will be detailed in Part B or the Mass, Balance and Loading instructions at Annex A to this Part. Stowage of items of baggage is to be as shown below:
 - (i) Each item carried in a cabin must be stowed and restrained in an approved stowage position;
 - (ii) Mass limitations placarded on or adjacent to stowage positions must not be exceeded;
 - (iii) Baggage and cargo placed in lockers must not prevent latched doors from being closed securely;
 - (iv) Baggage and cargo must not be placed where it could impede access to emergency equipment; and
 - (v) Checks must be made before take-off, before landing, and whenever the fasten seat belts signs are illuminated, or it is otherwise so ordered, to ensure that baggage is stowed where it cannot impede evacuation from the aircraft or cause injury by any reactionary movement.
- b. **Hold Baggage.** Hold baggage is to be stowed and secured only in those areas and compartments designated for its carriage, and subject to the floor loading limitations of the particular area. It may be necessary to restrict the spread and types of luggage

carried in particular areas (e.g. to grips and holdalls in smaller aircraft wing lockers) or to restrict the weight carried for balance purposes rather than for structural considerations. The Aircraft Captain is to ensure that the personnel who may be responsible for loading the aircraft are made aware of any such restrictions. For B727 operations all crew member and passenger baggage must be secured in the forward hold. For B737 operations all crew member and passenger baggage must be loaded in accordance with standard load plan as highlighted in the relevant section of the Ground Operations Manual (GOM).

- c. **Mission Rack.** In Company trials aircraft a specially designed stowage may be embodied to carry items of test equipment and special loads; this is known as the mission rack. It is inside the aircraft cabin. The mission rack is a closed container designed to hold items of equipment and contain them in the event of a crash.
- d. **Freight.** Freight is not to be carried unless the particular aircraft has been cleared for operations in the freight role, and the appropriate spreader boards, freight lashings, nets and anchor points are available and approved. For such approved aircraft, details of the freight configuration(s) and loading restrictions will be found in the Operations Manual Part B for the aircraft type, and the Ground Operations Manual (GOM). Additional instructions are included for the carriage of Dangerous Goods.

8.2.2.11 Live Animals in the Cabin. The carriage of live animals in the cabin is permitted subject to certain conditions. Carriage of approved guide dogs and assistance dogs will normally be permitted, but the Aircraft Captain has the ultimate authority regarding carriage of any animals. See also Part S Section 3.

8.2.2.11.1 Guide Dogs. A guide dog is one that has been trained to provide mobility assistance to a blind or partially sighted person. A guide dog is trained, assessed and accredited by an individual or organization that is accepted by and affiliated to the International Guide Dog Federation.

8.2.2.11.2 Assistance Dogs. An assistance dog is one which has been specifically trained to assist a disabled person and which has been qualified by a person or organization or which meets the full membership criteria of the established international assistance dog organizations: Assistance Dogs International and Assistance Dogs Europe. It should be noted that assistance dogs could be of any breed and size from a large Labrador to a miniature Yorkshire Terrier.

8.2.2.11.3 Carriage of other Dogs or Animals. Any dog not meeting the above criteria, or any other animal, must be treated as a pet. These animals must be transported in conditions so as not to cause them injury or undue suffering. This may be via an appropriate travel container, of a suitable size for the animal. A small animal may be restrained from moving around the cabin by a lead. Pets may only be brought into the UK under the Pets Travel Scheme through an approved facility/FBO with which the Company holds a Service Level Agreement and DEFRA RMOP Pet Travel Scheme approval.

8.2.3 Ground Operations

- 8.2.3.1 Marshalling.** Whenever an aircraft is to be positioned on the ramp, whether under tow or under its own power, the assistance of marshallers or wingtip guides, as appropriate, should be obtained if there is any doubt about the clearances available for manoeuvring. Once on the hard standing, positioning of the aircraft should represent the best available compromise between the requirements of the aerodrome and/or air traffic control authorities, the prevailing wind direction, and the proximity to buildings and other aircraft. If the aircraft is to be parked for any significant period, the control locks and intake and exhaust blanks should be fitted.
- 8.2.3.2 Parking.** Aircraft must not be parked on soft or sloping ground. When parked, suitable chocks must be placed both fore and aft of the main undercarriage wheels or nosewheel. Under high or gusty cross wind conditions, consideration should be given to leaving the parking brake 'on'. Whenever possible, the aircraft should come to rest with the nose wheel in line with the fore and aft axis of the aircraft; this applies particularly during conditions of high wind. If this is not possible, it must be remembered that the tail of the aircraft will swing when the aircraft starts moving again and due allowance must be made when moving passenger and maintenance steps etc. from the vicinity. Personnel responsible for the parking of aircraft in the open should liaise with the local meteorological office in case of change in weather that might otherwise result in damage to the aircraft.
- 8.2.3.4 Ground Support Vehicles.** Once the aircraft has been parked, ground support vehicles should be stationed clear of its extremities and if possible parallel to the fuselage or main plane centreline so that in the event of brake failure they will not collide with the aircraft itself. Ground equipment should also be positioned so that inadvertent movement will not endanger the aircraft structure. In all cases, free access to the aircraft main exit must be preserved.
- 8.2.3.5 Departure and Arrival.** When departing from the ramp, local procedures for start-up and taxi clearance are to be followed. Engine start should not be initiated until all passengers or freight have been loaded, the aircraft doors and hatches have been closed, and all ground equipment, except for a ground power unit when used, has been removed from the vicinity of the aircraft. As for the arrival, the assistance of marshallers should be arranged when manoeuvring in relatively confined or crowded areas of the apron. Where provided for embarkation / disembarkation crew must ensure the continued provision of steps until such time that the doors are ready to be closed, should steps be removed prior to door closure then a crew member must be in attendance at the open door.
- 8.2.3.6 Ground Staff.** Ground staff must have been briefed on all aspects of ramp safety with particular reference to fire prevention, blast and suction areas, and the need to be constantly alert to remove loose objects and / or debris.
- 8.2.3.7 Procedures.** Procedures for push back, engine start during push back, and power back are, if relevant, detailed in the appropriate Operations Manual Part B. Towbarless towing shall not be undertaken unless:

- a. The aircraft is protected from damage to the nose wheel steering system due to towbarless towing operation, or
- b. Procedures are in place to ensure that the flight crew are alerted to the fact that such damage may have occurred, or
- c. The towbarless towing vehicle is designed to prevent damage to the aircraft type.

8.2.3.8 Aircraft in Hangars. An aircraft should not be moved into a hangar until relative dimensions have been checked to ensure relative clearance and it has also been ensured that all overhead tackle and other servicing equipment has been cleared. Taxiing in and out of hangars is prohibited.

8.2.4 Icing, Anti-Icing and De-Icing

8.2.4.1 General. Any deposit of ice, snow or frost on the external surfaces of an aircraft may drastically affect its flying qualities because of reduced aerodynamic lift, increased drag and modified stability and control characteristics. Icing affects the performance of an aircraft less through the added weight than through impairment of the wing's aerodynamic properties (i.e. the change in profile). Tests have shown that ice on the leading edge and upper surfaces of the wing, having a thickness and surface roughness similar to medium or coarse sandpaper, can reduce wing lift by as much as 30% and increase drag by 40%. Air tests have indicated that light ice can reduce the one engine inoperative climb capability by about 50%, while heavy contamination may prevent the aircraft maintaining altitude at V₂ with one engine inoperative. Additionally, freezing deposits may cause moving parts such as elevators, ailerons, flap actuating mechanism etc. to jam and create a potentially hazardous condition. Engine operation may be seriously affected by the ingestion of snow or ice into the engine, causing engine stall or compressor damage. The most critical ambient temperature range is between +3°C and -10°C. However, at much higher ambient temperatures ice may form on the top and underside of fuel tanks containing large quantities of cold fuel.

8.2.4.2 Ice Accretion on Aircraft on the Ground

- a. In fog or misty weather with temperature at or below freezing point, rime ice may form on any part of the aircraft. The ice layer may become very thick on the windward side.
- b. On nights with clear skies frost may form on surfaces which have a temperature lower than the surrounding air.
- c. After landing, if the skin temperature of the aircraft is below freezing and wet snow or rain is falling, or in falling snow, with temperatures at or below freezing point ice may form locally:
 - i Near warm cowlings, oil tanks etc;
 - ii On tanks filled with relatively warm fuel;
 - iii On the wing and fuselage, if snow on top of the fuselage is melting as a result of residual cabin heat;
 - iv On the engine air intakes.
- d. At en-route stops, where no fuel has been uplifted, the fuel remaining in the tanks is often below the freezing temperature of water. If it is raining, water can run down the underside of the wing and will freeze in the area of the fuel tanks. A considerable thickness of ice may form in this manner and may require removal before departure.

8.2.4.3 De-icing. De-icing is a procedure by which frost, ice, slush or snow, is removed from an aircraft in order to provide uncontaminated surfaces.

8.2.4.4 Anti-icing. Anti-icing is a precautionary procedure which provides protection against the formation of frost or ice and accumulation of snow on treated surfaces of the aircraft for

a limited period of time (the holdover time). Note that de/anti-icing fluids are only required until the aircraft becomes airborne, after which the on-board de/anti-icing systems then operate.

8.2.4.5 Rotation Speed. The rotation speed of an aircraft is important as it determines which de/anti-icing fluid is most appropriate for use. Serious aerodynamic consequences can result with incorrect fluid use. Consult the aircraft manufacturer's Pilot Operating Handbook, Aircraft Flight Manual, or maintenance manual for complete details.

8.2.4.6 Captain's Responsibility. Aircraft Captains are to ensure that anti-icing and de-icing operations appropriate to the conditions are carried out on the ground before departure, and that pre-flight inspection indicates that all deposits of hoar frost, ice and snow have been removed before any attempt is made to take-off. Aircraft are not certificated to take off when carrying ice deposits accumulated on the ground. In particular, take off is forbidden if there is any frozen deposit on any of the critical surfaces and, in the case of rear engine aircraft, on the fuselage. Any effect of ground de-icing on aircraft performance as described in the aircraft performance manual must also be taken into account. When the decision to de-ice the aircraft has been made, the Aircraft Captain will ensure that all crewmembers and passengers are informed.

Under circumstances where frost forms on the aircraft wing as a result of cold soaked fuel, take-off may be permitted with a limited accumulation depth on the underside of the wing surface in the area of the wing fuel tanks subject to the appropriate entry within the aircraft flight manual.

It should be taken into account that in many cases de-icing/anti-icing procedures may be ineffective in providing sufficient protection for continued operations. Examples of such weather conditions are freezing rain, ice pellets and hail, severe blizzard, heavy wet snow or at any time when freezing precipitation with high water content is present. In these cases take off may not be possible. All critical surfaces must be checked clear of all frozen deposits after de-icing/anti-icing procedures have been completed.

8.2.4.7 Clear Ice. Clear ice can form on aircraft surfaces underneath a layer of snow or slush. Significant amounts of clear ice can form in the vicinity of fuel tanks and on both upper and lower wing surfaces. This type of ice formation is very difficult to detect. This type of build-up normally occurs at low wing temperatures and when there is a quantity of cold fuel remaining in the wing. This does not rule out the formation of clear ice in other conditions. The best means of detection is a "tactile" check to ensure that all such deposits have been removed.

8.2.4.8 "Clean" Aircraft. The clean aircraft concept must be understood as an important part for the safety of the flight. A clean aircraft is considered to be either totally clean or cleaned and protected with de-icing/anti-icing fluids that still protect the surfaces and are able to perform aerodynamically correctly. Contaminated fluid on the surface must not be understood to constitute a clean aircraft.

8.2.4.9 Limits to Successive Applications. An aircraft which has been anti-iced should never receive a further coating of anti-icing fluid on top of the contaminated film. If additional

treatment is required before flight, a complete de-icing / anti-icing cycle shall be performed. Any residues remaining from previous treatment must be flushed off. Anti-icing alone is not permitted.

8.2.4.10 Ground De-icing. Depending on the facilities available at the aerodrome, and on the aircraft type, removal may be achieved by brushing, the application of fluids, or a combination of these methods. Flight crews should familiarise themselves with the methods locally available, and with those areas of their aircraft from which the removal of deposits is vital, or which may be adversely affected by the incomplete or careless removal of snow or slush (e.g. control surface hinges, engine intakes or static ports).

8.2.4.11 Taxiing Considerations. It is possible for tyres to retain enough heat to melt snow or ice on the ramp and for it to refreeze in a short period. When a tyre is frozen to the ramp, enough distortion can take place to break the seal at the rim and cause partial deflation of the tyre. Avoid taxiing close behind another aircraft, as this may cause adherence of ice to the wing leading edges and engines.

8.2.4.12 Certification for Use in Icing Conditions

8.2.4.12.1 Extra 300 Aircraft. The Extra 300 aircraft is not cleared for flight in icing conditions. Moreover, they are not to be operated if any frost, snow or ice is present on the airframe. Sywell Aerodrome prohibits the use of de-icing chemicals for environmental reasons, and the aircraft themselves would be damaged by the use of some de-icing chemicals. The Company's aircraft hangarage policy should preclude the need for any de-icing to be carried out. However, were a potential icing situation to occur (for instance blown snow to be lying on the aircraft), Aircraft Captains are to ensure that any and all deposits of hoar frost, ice or snow have been removed before any attempt is made to take-off. If specialist personnel carry out any de-icing, the Aircraft Captain is to supervise the activities and he is to record the action in the Sortie Record Page as a defect and to sign as having cleared it once complete.

8.2.4.12.2 Multi-Engine Aircraft. The fact that the aircraft is fitted with anti- or de-icing equipment does not mean that it has been certificated for flight in icing conditions. Particularly in the case of the smaller twin-engined aircraft it may mean simply that flight tests have shown that, when installed, the equipment has had no adverse effects on the aircraft's normal flight characteristics. Company pilots are to ensure that they are familiar with the details as contained in the Flight Manual and its supplements and that if icing exceeds the intensity of icing for which the aircraft is certified they shall exit the icing conditions without delay, by a change of level and/or route, if necessary by declaring an emergency to ATC.

8.2.4.12.2.1 Tail Plane Stall. As the rate at which ice accumulates on an aerofoil is related to the shape of the aerofoil, with thinner aerofoils having a higher collection efficiency than thicker ones, ice may accumulate on the horizontal stabilizer at a higher rate than on the wings. A tailplane stall occurs when its critical angle of attack is exceeded. Because the horizontal stabilizer produces a downward force to counter the nose-down tendency caused by the centre of lift on the wing, stall of the tail plane will lead to a rapid pitch down. Application of flaps, which may reduce or increase downwash on the tail plane depending on the

configuration of the empennage (i.e., low set horizontal stabilizer, mid-set, or T-tail), can aggravate or initiate the stall. Therefore, pilots should be very cautious in lowering flaps if tail plane icing is suspected. Abrupt nose-down pitching movements should also be avoided, since these increase the tail plane angle of attack and may cause a contaminated tail plane to stall. A tail plane stall can occur at relatively high speeds, well above the normal 1g stall speed. The pitch down may occur without warning and be uncontrollable. It is more likely to occur when the flaps are selected to the landing position, after a nose-down pitching manoeuvre, during airspeed changes following flap extension, or during flight through wind gusts. Symptoms of incipient tail plane stall may include:

- a. abnormal elevator control forces, pulsing, oscillation, or vibration;
- b. an abnormal nose-down trim change (may not be detected if autopilot engaged);
- c. any other abnormal or unusual pitch anomalies (possibly leading to pilot induced oscillations);
- d. reduction or loss of elevator effectiveness (may not be detected if the autopilot is engaged);
- e. sudden change in elevator force (control would move down if not restrained); and/or
- f. a sudden, uncommanded nose-down pitch.

Corrective Actions. If any of the above symptoms occur, the pilot should consider the following actions unless the AFM dictates otherwise:

- a. Plan approaches in icing conditions with minimum flap settings for the conditions. Fly the approach on speed for the configuration.
- b. If symptoms occur shortly after flap extension, immediately retract the flaps to the previous setting. Increase airspeed as appropriate to the reduced setting.
- c. Apply sufficient power for the configuration and conditions. Observe the manufacturer's recommendations concerning power settings. High power settings may aggravate tail plane stall in some designs.
- d. Make any nose-down pitch changes slowly, even in gusting conditions, if circumstance allow.
- e. If equipped with a pneumatic de-icing system, operate several times to attempt to clear ice from the tail plane.

8.2.4.13 Definitions

- a. **Active Frost:** A condition when frost is forming. Active frost occurs when aircraft surface temperature is at or below 0°C, and at or below dew point.
- b. **Anti-icing:** A precautionary procedure that provides protection against the formation of frost or ice and accumulation of snow on treated surfaces of the aircraft for a limited period of time (holdover time).
- c. **Anti-icing Fluid:** There are broadly four categories of fluid:
 - a. Mixture of water and Type I fluid;
 - b. Premix Type I fluid in accordance with SAE 1424 or ISO 11075;

- c. Type II fluid, Type III fluid or Type IV fluid in accordance with SAE 1428 or ISO 11078;
 - d. Mixture of water and Type II fluid, Type III fluid or Type IV fluid;
Fluids mentioned in a) and b) must be heated to ensure a temperature of 60°C minimum at the nozzle.
- d. **Check:** An examination of an aircraft against the relevant standard by a trained and qualified person.
 - e. **Cold soak effect:** The wings of an aircraft are said to be 'cold soaked' when they contain very cold fuel as a result of having just landed after a flight at high altitude or from having been refuelled with very cold fuel. Whenever precipitation falls on a cold-soaked aircraft on the ground clear ice may occur. Even in ambient temperatures between -2°C and +15°C, ice or frost can form in the presence of visible moisture or high humidity if the aircraft structure remains at 0°C or below. Clear ice is very difficult to be detected visually and may break loose during or after take-off. The following factors contribute to cold soaking: temperature and quantity of fuel in fuel cells, type and location of fuel cells, length of time at high altitude, temperature of refuelled fuel and time since refuelling.
 - f. **Contamination:** All forms of frozen or semi-frozen moisture such as frost, snow, ice or slush.
 - g. **Contamination check:** Check of aircraft surfaces for contamination to establish the need for de-icing.
 - h. **Critical surfaces:** The wings, control surfaces, propellers (if applicable), horizontal and vertical stabilisers, any other stabilizing surfaces on the aircraft and, in the case of an aircraft with rear mounted engines, the upper surface of the fuselage, and any other surfaces as determined by the aircraft manufacturer. Frozen deposits on these surfaces will adversely affect the safe operation of the aircraft.
 - i. **De-icing:** A procedure by which frost, ice, slush and snow is removed from an aircraft in order to provide uncontaminated surfaces.
 - j. **De-icing / Anti-icing:** A combination of the two procedures described above. It may be performed in either one or two steps.
 - k. **De-icing Fluid:** There are broadly five categories of de-icing fluid:
 - a. Heated water;
 - b. Mixture of Type I fluid and water;
 - c. Premix Type I fluid in accordance with SAE 1424 or ISO 11075
 - d. Type II fluid, Type III fluid or Type IV fluid in accordance with SAE 1428 or ISO 11078;
 - e. Mixture of water and Type II fluid, Type III fluid or Type IV fluid.De-icing fluid is normally applied heated in order to assure maximum efficiency.

- l. Freezing Conditions:** Conditions in which the outside air temperature is below +3°C and visible moisture in any form (such as fog with visibility below 1.5 km, rain, snow, sleet or ice crystals) or standing water, slush, ice or snow is present on the runway.
- m. Freezing Drizzle:** Fairly uniform precipitation composed exclusively of fine drops (diameter less than 0.5 mm) very close together which freezes upon impact with the ground or other exposed objects.
- n. Freezing Fog:** A suspension of numerous minute water droplets which freezes upon impact with ground or other exposed objects, generally reducing the horizontal visibility at the earth's surface to less than 1 km.
- o. Frost / Hoar Frost:** Ice crystals that form from ice saturated air temperatures below 0°C by direct sublimation on the ground or other exposed objects.
- p. Hail:** Precipitation of small balls or pieces of ice with a diameter ranging from 5 to > 50mm (0.2 to 2 ins) falling either separately or agglomerated.
- q. Holdover Time:** Estimated time for which an anti-icing fluid will prevent the formation of frost or ice and the accumulation of snow on the protected (treated) surfaces of an aircraft, under weather conditions as specified in paragraph 8.2.4.15.3.
- r. Ice Crystals / Diamond Dust:** A fall of unbranched ice crystals (snow crystals are branched) in the form of needles, columns or plates.
- s. Ice Pellets:** Precipitation of transparent (grains of ice), or translucent (small hail) pellets of ice, which are spherical or irregular, and which have a diameter of 5mm (0.2 ins) or less. The pellets of ice usually bounce when hitting hard ground.
- t. Light Freezing Rain:** Precipitation of liquid water particles which freeze upon impact with the ground or other exposed objects, either in the form of drops of more than 0.5mm (0.02 inches) or smaller drops which in contrast to drizzle, are widely separated. Measured intensity of liquid water particles is up to 2.5 mm per hour (0.10 inches per hr) or 25 gms/dm²/hour with a maximum of 0.25 mm (0.01 inches) in 6 minutes.
- u. Lowest Operational Use Temperature (LOUT):** The lowest operational use temperature (LOUT) is the higher (warmer) of:
 - a. The lowest temperature at which the fluid meets the aerodynamic acceptance test (according to AS5900) for a given type (high speed or low speed) of aircraft, or
 - b. The freezing point of the fluid plus the freezing point buffer of 10°C for Type I fluid and 7°C for Type II, III or IV fluids.

For applicable values refer to the fluid manufacturer's documentation.

- v. **Moderate and Heavy Freezing Rain:** Precipitation of liquid water particles which freezes upon impact with the ground or other exposed objects, either in the form of drops of more than 0.5mm or smaller drops which, in contrast to drizzle, are widely separated. Measured intensity of liquid water particles is up to 2.5 mm per hour or 25 gms/dm²/hour.
- w. **Negative Buffer:** A negative buffer exists when the freezing point of a de-icing fluid is above the OAT.
- x. **One-Step De-icing / Anti-icing:** De-icing and anti-icing are carried out at the same time using a de-icing/anti-icing fluid to both remove frozen deposits and to protect the de-iced area for a limited period of time.
- y. **Radiational Cooling:** A process by which temperature decreases, due to an excess of emitted radiation over absorbed radiation. On a typical calm clear night aircraft surfaces emit long wave radiation, however there is no solar radiation (short wave) coming in at night and this long wave emission will represent a constant net energy loss. Under these conditions the aircraft surface temperature may be up to 4°C or more below the surrounding air.
- z. **Rain or High Humidity (on cold soaked wing):** Water, visible moisture or humidity forming ice or frost on the wing surface, when the temperature of the aircraft wing surface is at or below 0°C.
- aa. **Rain and Snow (Sleet):** Precipitation in the form of a mixture of rain and snow. For operation in light rain and snow (sleet) treat as light freezing rain.
- ab. **Rime Ice:** Small frozen water droplets, spherical opaque/milky granular appearance looking similar to frost in a freezer. Typically rime ice has low adhesion to the surface and its surrounding rime ice particles.
- ac. **Slush:** Snow or ice that has been reduced to a soft watery mix by rain, warm temperatures and/or chemical treatment.
- ad. **Snow:** Precipitation of ice crystals, most of which are branched, star-shaped or mixed with un-branched crystals. At temperatures higher than -5°C, the crystals are generally agglomerated into snowflakes.
- ae. **Snow Grains:** Precipitation of very small white and opaque grains of ice. These grains are fairly flat or elongated; their diameter is less than 1mm. When the grains hit hard ground they do not bounce or shatter. Treat as snow for holdover time purposes.
- af. **Snow Pellets:** Precipitation of white and opaque grains of ice. The particles are round or sometimes conical; their diameter is about 2-5mm. Snow pellets are brittle, easily crushed; they bounce and may break on hard ground. For holdover time purposes treat snow pellets as snow.

- ag. **Two-Step De-icing/Anti-icing:** De-icing and anti-icing are carried out in two separate steps, the first step, de-icing, being immediately followed by the second step, anti-icing.

8.2.4.14 De-icing and Anti-icing Fluids. The basic function of these fluids is to lower the freezing point of freezing precipitation as it collects on the aircraft and thus delay the accumulation of ice, snow, slush or frost on the aircraft surfaces. The main types of de-icing / anti-icing fluids are:

a. **Type I Fluid (Un-thickened) (SAE AMS 1424A or ISO 11075)**

This fluid has a high glycol content and a low viscosity in its concentrated form. De-icing performance of the fluid is good. However, due to low viscosity, it provides only limited anti-icing protection during freezing precipitation. It is used predominantly for removing frozen deposits from aircraft surfaces, either as the first step in a two-step operation or where precipitation has stopped. With this type of fluid no additional protection is provided by increasing the concentration of the fluid/water mix. Type I fluids are coloured orange.

b. **Type II Fluid (Thickened) (SAE AMS 1428A or ISO 11078)**

This fluid generally has a lower glycol content (a minimum of around 50%) in its concentrate form than Type I fluid due to the inclusion of a pseudo plastic thickening agent. This effectively means that when applied to the surface of an aircraft the viscosity is high, thus allowing the fluid to remain on and protect against freezing precipitation for a period of time. However, the increasing effect of the airflow over the wing during the take-off roll will effectively shear the fluid, reducing its viscosity and allowing it to readily flow off the critical surfaces. With this type of fluid the holdover time can be extended by increasing the concentration of the fluid in the fluid/water mix. Type II fluids are usually straw coloured.

c. **Type III Fluid (Thickened) (SAE 1428A)**

Type III fluid is designed primarily for aircraft with low rotation/take-off speeds and their properties lie between those of Type I and Type II/IV; they also contain thickening agents, providing for longer holdover times than Type I fluids, but are designed to shear off at lower speeds than Type II/IV fluids, (rotation speeds typically less than 100 kts). Type III fluids are usually coloured yellow.

d. **Type IV Fluid (Thickened) (SAE AMS 1428A or ISO 1428A)**

This fluid is similar in both composition and operation to Type II fluids. However, through the use of advanced thickening systems it is able to provide more holdover time than Type II fluids, when used in concentrated form. As with Type II fluids the holdover time can be extended by increasing the concentration of fluid in the fluid/water mix. Type IV fluids are usually coloured green and **are unsuitable for use by propeller driven aircraft.**

Notes:

1. Wherever fluid Types I, II, III, or IV are indicated in this Manual, this always refers to the latest version of the applicable ISO and SAE fluid types. (For example: Type I fluid refers to ISO Type I per ISO 11075 as well as SAE Type I per AMS 1424. Type II fluid refers to ISO Type II per ISO 11078 as well as SAE Type II per AMS 1428. Type III and Type IV fluid only refers to SAE Type III and Type IV respectively per AMS 1428).

2. De-Icing Fluids

- a. Heated water;
- b. Type I fluid;
- c. Mixture of water and Type I fluid;
- d. Type II, III or IV fluid;
- e. Mixture of water and Type II, III or Type IV fluid.

Note: De-icing fluid is normally applied heated to ensure maximum efficiency.

3. Anti-Icing Fluids

- a. Type I fluid;
- b. Mixture of water and Type I fluid;
- c. Type II, III or IV fluid;
- d. Mixture of water and Type II, III or Type IV fluid.
- e. Anti-icing fluid is normally applied unheated on clean aircraft surfaces but may also be applied heated.

Note: Fluids at a) and b) must be heated to ensure a temperature of 60° C minimum at the nozzle.

8.2.4.15 Guidelines and Constraints for De-icing and Anti-icing Fluid Use and Application**8.2.4.15.1 Cautions**

- i. Under certain circumstances the upper wing skin temperatures may be lower than the OAT. When this is suspected, e.g. when large quantities of 'cold' fuel remain from the previous sector, consideration should be given to selecting a stronger mix than would be required by the existing OAT. This will ensure that an adequate buffer is maintained between the freezing point of the fluid used and the temperature of the upper wing surface.
- ii. The application of Type II, III, or IV fluid, especially when used in a one step process or in the first step of a two-step process, may cause residues to collect in aerodynamically 'quiet' areas, cavities and gaps. Dried residues may rehydrate and freeze following a period of high humidity and/or rain conditions. This may impede flight control systems. These residues may require removal. The use of hot water or heated mix of Type I fluid/water for the first step of a two-step de-icing/anti-icing process will minimise the formation of residues.

- iii. If a Type II, III or IV fluid is used in the first step of a two-step process, then an appropriate inspection and cleaning programme shall be established. Whenever suitable, de-ice and anti-ice with only Type I fluid.
- iv. Anti-icing of the lower side of the wings and/or horizontal stabiliser and elevator is not normally foreseen. However, if these surfaces must be de-iced, the freezing point of the de-icing fluid must be low enough to prevent refreezing.
- v. When checking for residues, their visibility may be facilitated by misting with water.

8.2.4.15.2 The following Tables provide guidelines for the application of Type I and Type II fluids, and on the likely period of protection that their use will subsequently provide. They contain a number of important notes and cautions.

8.2.4.15.2.1 Type I Fluids. The freezing point of the Type I fluid mixture used for either one-step de-icing/anti-icing or as a second step in the two-step operation shall be at least 10°C below the outside air temperature. The freezing point of the Type I fluid mixture used for the first step in a two-step operation must not be more than 3°C above the ambient temperature

OAT ¹	One Step Procedure	Two Step Procedure	
	De-icing / Anti-icing	First Step – De-icing	Second Step – Anti-icing ²
-3°C and above	Mix of heated fluid and water, with a freeze point of at least 10°C below actual OAT	Heated water or a heated mix of fluid and water.	Heated mix of fluid and water, with a freeze point of at least 10°C below actual OAT
Below -3°C down to LOU ^T		Freeze point of heated fluid mixture shall not be more than 3°C above actual OAT	

1. In no case shall this temperature be lower than the Lowest Operational Use Temperature (LOU^T).
2. To be applied before first step fluid freezes, typically within 3 minutes.

Table 19. Guidelines for the Application of Type I Fluid/Water Mixtures (Minimum Concentrations) as a Function of OAT.

Notes:

- a. Temperature of water or fluid/water mixtures shall be at least 60°C at the nozzle. The upper temperature limit shall not exceed the fluid and aircraft manufacturer’s recommendations.
- b. To use Type I Holdover Time Guidelines, at least 1 litre/m² must be applied to the de-iced surfaces.
- c. This table is applicable for the use of Type I Holdover Time Guidelines. If holdover times are not required, a temperature of 60°C at the nozzle is desirable.

Cautions:

- a. Wing skin temperature may be lower than OAT. A stronger mix (more glycol) may be needed under these conditions.
- b. Type I fluids supplied as concentrates for dilution with water prior to use shall not be used undiluted. For exceptions refer to fluid manufacturer’s documentation.

8.2.4.15.2.2 Type II, III and IV Fluids. Approved concentrations of Type II, III and IV fluids, used for one step de-icing/anti-icing or as the first or second step in a two-step operation are listed in below, together with details of the lowest temperatures at which the various concentrations may be applied to aircraft surfaces. Type II, III, and IV fluids used as de-icing/anti-icing agents may have a lower temperature application limit of -25°C. The application limit may be even lower than -25°C, provided a 7°C buffer is maintained between the freezing point of the neat fluid and outside air temperature.

OAT ¹	Concentration of neat fluid/water mixture in vol% / vol%		
	One-Step Procedure	Two-Step Procedure	
	De-icing/Anti-icing	First Step: De-icing	Second Step: Anti-icing ²
-3°C and above	50/50 heated ³ Type II, III or IV	Water heated ³ to 60°C minimum at the nozzle or a heated ³ mix of Type I, II, III or IV with water.	50/50 Type II, III or IV
-3°C to -14°C	75/25 heated ³ Type II, III ⁴ or IV	Heated ³ suitable mix of Type I, II, III or IV with freeze point not more than 3°C above actual OAT	75/25 Type II, III ⁴ or IV
-14°C to -25°C	100/0 heated ³ Type II, III ⁴ or IV	Heated ³ suitable mix of Type I, II, III or IV with freeze point not more than 3°C above actual OAT	100/0 Type II, III ⁴ or IV
Below -25°C	Type II/Type III/Type IV fluid may be used below 25°C provided that the freezing point of the fluid is at least 7°C below OAT and that the aerodynamic acceptance criteria are met (LOUT). Consider the use of Type I/water mix when Type II, III or IV fluid cannot be used (table 14).		

1. In no case shall this temperature be lower than the Lowest Operational Use Temperature (LOUT).
2. To be applied before first step fluid freezes, typically within 3 minutes.
3. Clean aircraft may be anti-iced with unheated fluid.
4. Type III fluid may be used below -10°C provided that the freezing point of the fluid is at least 7°C below OAT and that aerodynamic acceptance criteria are met (LOUT).

Table 20: Guidelines for the Application of Type II, III and IV Fluid/Water Mixtures (Minimum Concentrations) as a Function of OAT.

Notes:

- a. For heated fluids and fluid mixtures, a fluid temperature not less than 60°C at the nozzle is desirable. When the first step is performed using a fluid/water mix with a freezing point above OAT, the temperature at the nozzle shall be at least 60°C and at least 1 litre/m² must be applied to the surfaces to be de-iced. The upper temperature limit shall not exceed fluid and aircraft manufacturer's recommendations.

Cautions:

- a. Wing skin temperature may be lower than OAT; a stronger mix (more glycol) may be needed under these conditions.

- b. Whenever frost or ice occurs on the lower surface of the wing in the area of the fuel tank, indicating a cold soaked wing, 50/50% dilution Type II, III or IV fluid shall not be used because fluid freezing may occur.
- c. An insufficient amount of anti-icing fluid, especially in the second step of a two-step procedure, may cause a substantial loss of holdover time. This is particularly true when using a Type I fluid mixture for the first step (de-icing).
- d. Some fluids shall only be used undiluted. For some fluids the lowest operational use temperature may differ. For details refer to fluid manufacturer's documentation.

8.2.4.15.3 Holdover Times. A holdover time is the estimated time for which an anti-icing fluid will prevent the formation of frost or ice and the accumulation of snow on the protected surfaces of an aircraft, under specific weather conditions. Tables 21, 22, 23, 24 and 25 below show generic estimated holdover times that could reasonably be expected under the weather conditions annotated, including notes and cautions which must be read in conjunction with the tables. They are neither minima nor maxima; the actual time will be a function of the conditions existing at the time. Specific types of approved fluids may provide greater levels of protection; consult manufacturers' instructions/guidelines for holdover information in such cases.

The holdover time guidelines are derived from the Association of European Airlines (AEA) publication, 'Recommendations for De-Icing / Anti-icing of Aircraft on the Ground', which is reviewed annually for revisions which, where applicable, are incorporated into the Company Operations Manual.

Holdover times are only guidelines because ambient weather conditions and the aircraft skin temperature can reduce the effectiveness of the fluid. It should also be noted that continuing precipitation will dilute all types of fluid, eventually to the point where the coating freezes or deposits begin to accumulate.

Holdover time is obtained by anti-icing fluids remaining on the aircraft surfaces. With a one-step de-icing / anti-icing the holdover time begins at the start of the treatment and with a two-step de-icing / anti-icing at the start of the second step (anti-icing). Holdover time will have effectively run out when frozen deposits start to form/accumulate on treated aircraft surfaces.

Due to their properties, Type I fluids form a thin liquid wetting film, which provides limited holdover time, especially in conditions of freezing precipitation. With this type of fluid no additional holdover time would be provided by increasing the concentration of the fluid in the fluid / water mix.

Type II / III / IV fluids contain a pseudo plastic thickening agent which enable the liquid to form a thicker liquid wetting film on the external aircraft surfaces. This film provides a longer holdover time especially in conditions of freezing precipitation. Generally, with this type of fluid additional holdover time will be provided by increasing the concentration of the fluid in the fluid/water mix, with the maximum holdover time available from undiluted fluid.

The lower limit of the published time span is used to indicate the estimated time of protection during moderate precipitation and the upper limit indicates the estimated time of protection during light precipitation.

Recent developments in ground de-icing techniques include the need to evaluate the prevailing weather conditions closely and adjust holdover times accordingly. Holdover ceases if frozen deposits begin to form or accumulate on treated surfaces. Significant factors may be that:

- a. Protection against icing (holdover) time afforded by the application of de-icing fluid can be shortened by high winds or jet blasts causing damage to the de-icing fluid film which forms to protect the aircraft surface.
- b. Wing skin temperatures can be significantly lower than the OAT. It can therefore be a more representative guide to the de-icing requirements, de-icing fluid/water mixing ratio and subsequent holdover times.

OAT	Approximate Holdover Times Anticipated Under Various Weather Conditions and OAT (Hours : Minutes)						
	Active Frost	Freezing Fog	Snow / Snow Grains / Pellets ¹	Freezing Drizzle ²	Light Freezing Rain	Rain on cold-soaked Wing	Other ³
> -3°C	⁵	0:09-0:16	0:03-0:06	0:08-0:13	0:02-0:05	0:01-0:05 ⁴	Caution No holdover time guide exists
-3°C >x< -6°C	⁵	0:06-0:08	0:02-0:05	0:05-0:09	0:02-0:05		
-6°C >x< -10°C	⁵	0:04-0:08	0:02-0:05	0:04-0:07	0:02-0:05		
x< -10°C	⁵	0:04-0:07	0:02-0:04				

Table 21. Guidelines for Holdover Times Anticipated for Type 1 Fluid Concentrations as Function of Weather Conditions and OAT

Notes

1. In light 'Rain and Snow' conditions use 'Light Freezing Rain' holdover times.
2. Use light freezing rain holdover times if positive identification of freezing drizzle is not possible.
3. Other conditions are: heavy snow, ice pellets, hail, moderate freezing rain and heavy freezing rain.
4. No holdover time guidelines exist for this condition for 0°C and below.
5. See table 20 for conditions of active frost.
6. Type I fluid / water mixture is selected so that the freezing point of the mixture is at least 10 °C below actual OAT.

Cautions

1. The time of protection will be shortened in heavy weather conditions. Heavy precipitation rates or high moisture content, high wind velocity or jet blast may reduce holdover time below the lowest time stated in the range. Holdover time may also be reduced when the aircraft skin temperature is lower than the OAT. **Therefore, the indicated times should be used in conjunction with a pre-takeoff check.**
2. Fluids used during ground de-icing / anti-icing are not intended for and do not provide ice protection during flight.

OAT	Type II Fluid Concentration / Water (%vol/%vol)	Approximate Holdover Times Anticipated Under Various Weather Conditions and OAT (Hours : Minutes)						
		Active Frost	Freezing Fog	Snow / Snow Grains ¹	Freezing Drizzle ²	Light Freezing Rain	Rain on Cold-soaked Wing	Other ³
x ≥ -3°C	100/0	⁶	0:35 - 1:30	0:20 - 0:45	0:30 - 0:55	0:15 - 0:30	0:05 - 0:40 ⁴	Caution No holdover time guidelines exist
	75/25	⁶	0:25 - 1:00	0:15 - 0:30	0:20 - 0:45	0:10 - 0:25	0:05 - 0:25 ⁴	
	50/50	⁶	0:15 - 0:30	0:05 - 0:15	0:08 - 0:15	0:05 - 0:09		
-3°C >x> -14°C	100/0	⁶	0:20 - 1:05	0:15 - 0:30	0:20 - 0:45 ⁵	0:10 - 0:20 ⁵		
	75/25	⁶	0:20 - 0:50	0:10 - 0:20	0:15 - 0:30 ⁵	0:08 - 0:15 ⁵		
-14°C >x> -25°C	100/0	⁶	0:15 - 0:35	0:15 - 0:30				
x < -25°C	100/0	Type II fluid may be used below -25°C provided the freezing point of the fluid is at least 7°C below the OAT and the aerodynamic acceptance criteria are met. Consider the use of Type I fluids when Type II cannot be used (Table 17).						

Table 22. Guidelines for Holdover Times Anticipated for Type II Fluid Concentrations as Function of Weather Conditions and OAT

Notes:

1. In light 'Rain and Snow' conditions use 'Light Freezing Rain' holdover times.
2. See light freezing rain holdover times if positive identification of freezing drizzle is not possible.
3. Other conditions are: heavy snow, ice pellets, hail, moderate freezing rain and heavy freezing rain.
4. No holdover time guidelines exist for this condition for 0° C and below.
5. No holdover time guidelines exist for this condition below -10° C
6. See table 20 for conditions of active frost.

Cautions:

1. The time of protection will be shortened in heavy weather conditions. Heavy precipitation rates or high moisture content, high wind velocity or jet blast may reduce holdover time below the lowest time stated in the range. Holdover time may also be reduced when the skin temperature is lower than the OAT. **Therefore, the indicated times should be used only in conjunction with a pre-takeoff check.**
2. Fluids used during ground de-icing / anti-icing are not intended for and do not provide protection during flight.

OAT	Type III Fluid Concentration / Water (%vol/%vol)	Approximate Holdover Times Anticipated Under Various Weather Conditions and OAT (Hours : Minutes)						
		Active Frost	Freezing Fog	Snow / Snow Grains ¹	Freezing Drizzle ²	Light Freezing Rain	Rain on Cold-soaked Wing	Other ³
x ≥ -3°C	100/0	⁵	0:20 - 0:40	0:10 - 0:20	0:10 - 0:20	0:08 - 0:10	0:06 - 0:20 ⁴	Caution No holdover time guidelines exist
	75/25	⁵	0:15 - 0:30	0:08 - 0:15	0:08 - 0:15	0:06 - 0:10	0:02 - 0:10 ⁴	
	50/50	⁵	0:10 - 0:20	0:04 - 0:08	0:05 - 0:09	0:04 - 0:06		
-3°C >x> -10°C	100/0	⁵	0:20 - 0:40	0:09 - 0:15	0:10 - 0:20	0:08 - 0:10		
	75/25	⁵	0:15 - 0:30	0:07 - 0:10	0:09 - 0:12	0:06 - 0:09		
-10°C >x	100/0	⁵	0:20 - 0:40	0:08 - 0:15				

Type III fluid may be used below -10°C provided the freezing point of the fluid is at least 7°C below the OAT and the aerodynamic acceptance criteria are met. Consider the use of Type I fluids when Type III cannot be used (Table 17).

Table 23. Guidelines for Holdover Times Anticipated for Type III Fluid Concentrations as Function of Weather Conditions and OAT

Notes:

1. In light 'Rain and Snow' conditions use 'Light Freezing Rain' holdover times.
2. See light freezing rain holdover times if positive identification of freezing drizzle is not possible.
3. Other conditions are: heavy snow, ice pellets, hail, moderate freezing rain and heavy freezing rain.
4. No holdover time guidelines exist for this condition for 0° C and below.
5. See table 20 for conditions of active frost.

Cautions:

1. The time of protection will be shortened in heavy weather conditions. Heavy precipitation rates or high moisture content, high wind velocity or jet blast may reduce holdover time below the lowest time stated in the range. Holdover time may also be reduced when the skin temperature is lower than the OAT. **Therefore, the indicated times should be used only in conjunction with a pre-takeoff check.**
2. Fluids used during ground de-icing / anti-icing are not intended for and do not provide protection during flight

OAT	Type IV Fluid Concentration / Water (%vol/%vol)	Approximate Holdover Times Anticipated Under Various Weather Conditions and OAT (Hours : Minutes)							
		Active Frost	Freezing Fog	Snow / Snow Grains ¹	Freezing Drizzle ²	Light Freezing Rain	Rain on Cold-soaked Wing	Other ³	
x ≥ -3°C	100/0	⁶	1:55 - 3:10	0:40 - 1:20	0:50 - 1:30	0:35 - 0:55	0:10 - 1:15 ⁴	Caution No holdover time guidelines exist	
	75/25	⁶	1:05 - 1:45	0:30 - 0:55	0:45 - 1:10	0:30 - 0:45	0:09 - 0:50 ⁴		
	50/50	⁶	0:20 - 0:35	0:07 - 0:15	0:15 - 0:20	0:08 - 0:10			
-3°C >x> -14°C	100/0	⁶	0:20 - 1:20	0:30 - 0:55	0:20 - 1:00 ⁵	0:10 - 0:25 ⁵			
	75/25	⁶	0:25 - 0:50	0:20 - 0:40	0:15 - 1:05 ⁵	0:10 - 0:25 ⁵			
14°C >x> -25°C	100/0	⁶	0:15 - 0:40	0:15 - 0:30					
x < -25°C	100/0	Type IV fluid may be used below -25°C provided the freezing point of the fluid is at least 7°C below the OAT and the aerodynamic acceptance criteria are met. Consider the use of Type I fluids when Type IV cannot be used (Table 17).							

Table 24. Guidelines for Holdover Times Anticipated for Type IV Fluid Concentrations as Function of Weather Conditions and OAT (Valid for both Metallic and Composite Surfaces)

Notes:

1. In light 'Rain and Snow' conditions use 'Light Freezing Rain' holdover times.
2. Use light freezing rain times if positive identification of freezing drizzle is not possible.
3. Heavy snow, ice pellets, hail, moderate and heavy freezing rain.
4. No holdover time guidelines exist for this condition for 0° C and below.
5. No holdover time guidelines exist for this condition below -10° C
6. See table 20 for conditions of active frost.

Cautions:

1. The time of protection will be shortened in heavy weather conditions. Heavy precipitation rates or high moisture content, high wind velocity or jet blast may reduce holdover time below the lowest time stated in the range. Holdover time may also be reduced when the aircraft skin temperature is lower than the OAT. **Therefore, the indicated times should be used only with a pre-takeoff check.**
2. Fluids used during ground de-icing / anti-icing are not intended for and do not provide ice protection during flight.

OAT° C	Type II, III and IV Fluid Concentration Neat Fluid/Water vol % / vol %	Approximate Holdover Times Under Various Weather Conditions (hours:minutes)			
		Active Frost			
		Type I ^{1,2}	Type II	Type III	Type IV
Above -1	100/0	0:35	8:00	2:00	12:00
	75/25		5:00	1:00	5:00
	50/50		3:00	0:30	3:00
Below -1 to -3	100/0		8:00	2:00	12:00
	75/25		5:00	1:00	5:00
	50/50		1:30	0:30	3:00
Below -3 to -10	100/0		8:00	2:00	10:00
	75/25		5:00	1:00	5:00
Below -10 to -14	100/0		6:00	2:00	6:00
	75/25		1:00	1:00	1:00
Below -14 to -21	100/0		6:00	2:00	6:00
Below -21 to -25	100/0		2:00	2:00	4:00

Table 25. Guidelines for holdover times anticipated for Type I, II, III and IV fluid mixtures in active frost conditions as a function of OAT

Notes.

1. Type I fluid/water mixture is selected so that the freezing point of the mixture is at least 10° C below the outside air temperature.
2. May be used below -25°C provided the lowest operational use temperature (LOUT) of the fluid is respected.

Caution. De-icing/anti-icing fluids used during ground de-icing/anti-icing are not intended for, and do not provide, protection during flight.

8.2.4.15.4 Ice Pellet Allowance Times. Comprehensive ice pellet research was conducted jointly by the research teams of the FAA and Transport Canada. This research consisted of extensive climatic chamber, wind tunnel, and live aircraft testing with ice pellets (light or moderate) and light ice pellets mixed with other forms of precipitation. Results of this research provide the basis for allowance times for operations in ice pellets (light or moderate) and operations in light ice pellets mixed with other forms of precipitation. Additionally, Type IV anti-icing fluid with ice pellets embedded was evaluated for its ageing qualities over periods of time beyond the allowance times, when the active precipitation time was limited to the allowance times.

8.2.4.15.4.1 Operational Guidelines. Tests have shown that ice pellets generally remain in a frozen state embedded in Type IV anti-icing fluid, and are not dissolved by the fluid in the same manner as other forms of precipitation. Using current guidelines for determining anti-icing fluid failure, the presence of a contaminant not dissolved by the fluid (remaining embedded) is an indication that the fluid has failed. These embedded ice pellets are generally not readily

detectable by the human eye during pre-take-off contamination inspection procedures. The research data have also shown that after proper de-icing and anti-icing, the accumulation of light ice pellets, moderate ice pellets, and light ice pellets mixed with other forms of precipitation in Type IV fluid will not prevent the fluid from flowing off the aerodynamic surfaces during take-off. The allowance times were developed based on this aerodynamic testing and are contained in Table 26.

Research has also shown that propylene glycol (PG) and ethylene glycol (EG) fluids behave differently under certain temperature and ice precipitation conditions. Specifically, higher aircraft rotation speeds are required to effectively remove PG fluid contaminated with light or moderate ice pellets at a temperature less than -10°C . Therefore, there are no allowance times associated with the use of PG fluids on aircraft with rotation speeds less than 100 knots in conditions of light or moderate ice pellets at temperatures below -10°C .

Furthermore, recent research with newer generation type aerofoils has shown that the allowance times are shorter when using PG fluids under certain conditions. Since it is challenging to determine which aircraft may be affected, the allowance time when using PG fluids at temperatures of -5°C and above is limited to 15 minutes in moderate ice pellets.

The ice pellet allowances are contingent on the following conditions and restrictions that must be satisfied:

- a. The aircraft critical surfaces must be properly de-iced before the application of Type IV anti-icing fluid
- b. The allowance time is valid only if the aircraft is anti-iced with undiluted Type IV fluid
- c. These allowance times are from the start of the Type IV anti-icing fluid application
- d. The allowance time is limited to aircraft with a rotation speed of 100 knots or greater
- e. If the take-off is not accomplished within the applicable allowance time in Table 8.17, the aircraft must be completely de-iced, and if precipitation is still present, anti-iced again prior to a subsequent take-off
- f. The allowance time cannot be extended by an inspection of the aircraft critical surfaces from either inside or outside the aircraft
- g. If the temperature decreases below the temperature on which the allowance time was based, where the new lower temperature has an associated allowance time for the precipitation condition and the present time is within the new allowance time, then that new time must be used as the allowance time limit
- h. If ice pellet precipitation becomes heavier than moderate or if the light ice pellets mixed with other forms of allowable precipitation exceeds the listed intensities or temperature range, the allowance time cannot be used

- i. If the precipitation condition stops at or before the time limits of the applicable allowance time in Table 26 and does not restart, the aircraft may take-off up to 90 minutes after the start of the application of the Type IV anti-icing fluid. However, under conditions of light ice pellets mixed with light freezing rain, the OAT must not decrease during the 90-minute period.

8.2.4.15.4.2 Ice Pellet Examples

- a. Type IV anti-icing fluid is applied with a start of application time of 10:00, OAT is 0°C, light ice pellets fall until 10:20 and stop and do not restart. The allowance time stops at 10:50; however, provided that no precipitation restarts after the allowance time of 10:50; the aircraft may take off without any further action up to 11:30.
- b. Type IV anti-icing fluid is applied with a start of application time of 10:00, OAT is 0°C, light ice pellets mixed with freezing drizzle falls until 10:10, stops and restarts at 10:15, and stops at 10:20. The allowance time stops at 10:25; however, provided no precipitation restarts after the end of the allowance time at 10:25, the aircraft may take off without any further action up to 11:30.
- c. Type IV anti-icing fluid is applied with a start of application time of 10:00, OAT is 0°C, light ice pellets mixed with light freezing rain falls until 10:10, stops and restarts at 10:15, and stops at 10:20. The allowance time stops at 10:25; however, provided that the OAT remains constant or increases and that no precipitation restarts after the end of the allowance time at 10:25, the aircraft may take off without any further action up to 11:30.
- d. On the other hand, if Type IV anti-icing fluid is applied with a start of application time of 10:00, OAT is 0°C, light ice pellets mixed with freezing drizzle falls until 10:10, stops and restarts at 10:30, with the allowance time stopping at 10:25, the aircraft may not take off, no matter how short the time or type of precipitation after 10:25, without being de-iced and anti-iced if precipitation is present.

	OAT -5°C and above	OAT less than -5°C to -10°C	OAT less than -10°C
Light Ice Pellets	50 minutes	30 minutes	30 minutes ¹
Moderate Ice Pellets	25 minutes ²	10 minutes	10 minutes ¹
Light Ice Pellets Mixed with Light or Moderate Freezing Drizzle	25 minutes	10 minutes	Caution No allowance times currently exist
Light Ice Pellets Mixed with Light Freezing Rain	25 minutes	10 minutes	
Light Ice Pellets Mixed with Light Rain	25 minutes ³		
Light Ice Pellets Mixed with Moderate Rain	25 minutes ⁴		
Light Ice Pellets Mixed with Light Snow	25 minutes	15 minutes	
Light Ice Pellets Mixed with Moderate Snow	10 minutes		

Notes:

1. No allowance time exists for propylene glycol (PG) fluids, when used on aircraft with rotation speeds less than 115kts, (for these aircraft, if fluid type is not known assume zero allowance time).
2. Allowance time is 15 minutes for propylene glycol (PG) fluids or when fluid type is unknown.
3. No allowance times exist in this condition for temperatures below 0°C; consider use of light pellets mixed with light freezing rain.
4. No allowance times exist in this condition for temperatures below 0°C.

Table 26 - Ice Pellet Allowance Times

8.2.4.16 General Precautions When De-icing. Normally, unless the aircraft is being de-iced by the approved contractor at its main base, the flight crew will be required either to undertake de-icing operations themselves, or to supervise those carried out by, or on behalf of, a handling agency. Personnel carrying out the de-icing/anti-icing operation are responsible for ensuring that the task is performed in accordance with the requirements detailed in the latest edition of the Aircraft Maintenance Manual and ISO 11076 or SAE ARP 4737 or AEA recommendations on de-icing. When de-icing / anti-icing are carried out, particular consideration should be given to the following:

- a. Care must be taken to clear any snow or slush from control surfaces, engine inlets, wheel wells and static ports. If snow in these areas melts subsequent freezing can interfere with their functions, particularly control surface movements. If there is any doubt, a close inspection should be made, using a ladder if necessary, followed by a full control check. Frost, ice and snow must be removed from the upper surfaces of the wings, stabilizer and associated panels, by sweeping in a direction away from control surface hinges and system intakes;

- b. Control locks (if fitted) must remain engaged until all loose snow and ice has been removed;
- c. All doors, hatches and windows must remain closed prior to spraying with de-icing fluid, fluids should not be directed onto windows as some formulations can cause crazing of acrylics or penetrate the window sealing;
- d. The de-icing team should be requested to use only the minimum fluid required and their attention directed to any particular areas needing special attention. In general, de-icing fluid is not good for the aircraft paintwork and some alcohol-based fluids will dilute or wash out the oils and greases from hinges etc;
- e. Hinges and flap runs should only be sprayed directly if required.
- f. De-icing fluid must not be directed into the orifices of pitot heads, static vents or directly onto airstream direction detector probes/AOA sensors;
- g. De-icing fluids should not be sprayed directly onto hot brakes, wheels, exhaust stacks or thrust reversers;
- h. Spraying should where possible take place from the front of the aircraft. This allows the fluid to follow the aerodynamic lines of the airframe and helps to prevent fluid collection in unwanted areas. This tends to leak out over the airframe over long periods and plays havoc with the long-term cleanliness of the aircraft;
- i. Any treatment or application of fluids should be done symmetrically (i.e. the same process should be applied to both sides of the airframe), a wide angle spray should be used to reduce splash off and to cover a large area with each sweep;
- j. On vertical surfaces spraying should start at the top to allow fluid to run down the surface.
- k. Since the de-icing fluid may be further diluted by the melting deposits which it is designed to remove, refreezing may occur if the solution runs onto other parts of the aircraft, and close attention should be paid to this possibility;
- l. Care should be taken to prevent de-icing fluid from accumulating around cockpit transparencies or areas forward of same, on which it may cause smearing and loss of vision as speed is increase during a subsequent take-off, deposits should be removed prior to departure, but do not use windscreen wipers for this purpose;
- m. Attention should be made to the engine intake area and any loose ice or snow on the ground moved away from the engine / propeller area, however all reasonable precautions must be taken to minimise fluid entry into engines and other intakes;
- n. Undercarriage and wheelbays must be kept free from build-up of slush or ice;

- o. When de-icing operations have been completed, ideally as close to the scheduled departure time as possible, a post-process inspection of the aircraft is to be completed in order to confirm satisfactory de-icing/anti-icing and that flying and control surfaces have been cleared of deposits, and that intake and drain holes are free of any obstruction. If possible control surfaces should be moved over their full range and engine compressors rotated by hand to ensure that they are not frozen in position;
- p. Propeller spinners should be checked for trapped snow or moisture, which could subsequently refreeze and cause propeller imbalance or malfunction. Undercarriage components should be checked for cleanliness, and micro-switches and uplocks for normal functioning;
- q. Under freezing fog conditions, it is necessary for the rear side of the fan blades to be checked for ice build-up prior to start up. Any deposits discovered are to be removed by directing air from a low flow hot air source such as a cabin heating unit onto the affected area.
- r. Engines may be running during de-icing operations but must be slow running;
- s. If possible, post application, the aircraft should be moved away from the de-icing area before boarding passengers, so that fluid is not carried inside on their feet.
- t. Care should be taken during push back and start up procedures, that engines are not started in such a position that snow can be blown onto adjacent aircraft or can be blown onto the aircraft by other aircraft manoeuvring in the vicinity
- u. With the APU operating, ingestion of de-icing fluid will contaminate the air conditioning system and cause objectionable fumes and odours to enter the aircraft. This may also cause erratic operation and damage to the APU. APU and Engine Bleed air should be selected off. Aircraft should be configured as per relevant Cold Weather Operations checklists
- v. After de-icing / anti-icing and prior to departure the flight crew must receive an “all clear” signal from the ground crew that it is safe to taxi.
- w. After de-icing, the Aircraft Captains are to consider the severity of the weather conditions with respect to further build-up of contaminants and modification of holdover times if necessary. If weather conditions are severe, consideration should be given to performing de-icing/anti-icing operations after passengers have boarded, so that holdover time is maximised. If possible, a visual inspection of the aircraft wings, particularly the leading edges, should be performed just prior to take-off to confirm free of contamination.
- x. After de-icing/anti-icing, should weather conditions deteriorate further or extended taxi times encountered, Aircraft Captains must review holdover times; if any doubt exists regarding the status of the aircraft, a further inspection must be carried out, including a return to the ramp area if necessary.

- y. Under extreme conditions, departure should be delayed.

8.2.4.17 Hot Water De-Icing. Hot water de-icing (HWD) is available for use at some airports. Using this process, deposits of snow and ice on aircraft are removed by the use of hot water only, i.e. the water is not mixed with the freezing point depressant. When all ice is removed the aircraft is then given an overspray of 50 / 50 water glycol as an anti-ice precaution. The advantages of HWD over the traditional use of water / glycol mixtures are:

- Decreased wash-out of aircraft lubricants and therefore less corrosion;
- Improved working conditions for ground staff; and
- Reduced adverse impact on the environment.

Furthermore, water has the advantage of slightly higher specific heat. That is, pure water will contain and deliver per unit of weight more heat than would a water/glycol mixture of the same temperature.

8.2.4.18 Centralised De-Icing. Centralised de-icing facilities exist at a number of airports. They are approved for use on company aircraft. When using centralised de-icing facilities, the following steps apply:

- a. Pre-departure checks to be completed except for de-icing
- b. Aircraft will proceed to the de-icing area. Main engines will be kept at idle throughout the de-icing operation
- c. During de-icing all reasonable precautions will be taken to prevent de-icing fluid entering the engines
- d. The de-icing personnel in charge will ensure de-icing is completed

The Aircraft Captain is to follow the published procedures for the facility in use in order to ensure that the aircraft is fully de-iced and serviceable for take-off. After de-icing and prior to departure the flight crew must receive an 'all clear' signal from the ground crew that it is safe to taxi.

For a centralised de-icing facility the following points should also be noted:

- a. Windows need not be cleaned after de-icing
- b. Aircraft nose need not be cleaned after de-icing
- c. Covers and blanks must not be fitted
- d. Engine bleeds should be switched off
- e. Flaps should not be operated
- f. All windows and doors must be closed
- g. Engines should be set and held at ground idle

8.2.4.19 Subcontracting. As the majority of the Company's operations are ad-hoc it is not possible to carry out a formal audit of all de-icing facilities that could be used, or for the company to establish a formal contract with all de-icing suppliers that could be used. Therefore, the following guidelines shall be used to ensure the quality of de-icing, these

should be used to supplement the relevant AFM at Part B for the aircraft type (which are to be used as the authority on de/anti-icing procedures).

- a. **Supervision.** As no formal contract is likely to exist which would detail responsibilities of all personnel with regard to the de/anti-icing operation to be carried out, flight crew must supervise the de/anti-icing operation whilst it is being carried out and once the operation has been concluded the crew must conduct an inspection of all aircraft surfaces to ensure that they are free from contaminants.
- b. **De-contaminants.** The brand name (e.g. Kilfrost), the type (e.g. Type I, Type II etc.) and the mix ratio of the de/anti-icing fluid to be used should be established prior to its application and checked against the relevant tables for the correct application. Only those fluids that are approved for use on aircraft shall be used.
- c. **Rigs.** The de/anti-icing rig to be used should be assessed for its suitability for the aircraft type that is to be de/anti-iced and, if considered necessary, specific instruction with regard to the use of the rig on the aircraft should be given by the flight crew to the de/anti-icing personnel. (e.g. caution should be used if it is necessary to use a rig designed for de/anti-icing a Boeing 747 on a Piper Navajo). Flight crew should assess the state of the de/anti-icing rig, if it is in a poor state of repair then further investigations should be made into its quality prior to de/anti-icing.
- e. **Subcontracting.** Where possible if an airfield becomes a very regular destination, a formal contract will be put in place, this contract will address the following:
 - i. Provision of the fluid to be used (it must include the proprietary or brand name which must be one specified by the aircraft manufacturer);
 - ii. Specific aircraft type requirements which will include the application of fluids to an aircraft, details of no-spray areas, techniques, aircraft configuration, inspections etc;
 - iii. The concentration, viscosity and degradation checks of fluids prior to use;
 - iv. Supervision of the completion, and performance, of the de/anti-icing operation;
 - v. The performance of a final inspection of the aircraft after the de-ice/anti-ice operation and procedures to inform the flight crew of the results.

8.2.4.20 Communications to Ground Support Personnel. Before the aircraft is to be treated with the flight crew on board, the ground crew will confirm with the former, the type of fluid to be used, the extent of the treatment and any aircraft type-specific procedures to be used.

8.2.4.21. Technical Log Procedures. An entry must be made in the aircraft technical log to record the process, even in the case of an interrupted or failed application. The time the de-icing and / or anti-icing processes started, the fluid type used, fluid temperature and the mixture ratio (fluid / water) are to be recorded in the aircraft technical log. The Aircraft Captain is to ensure that an appropriate entry has been made and signed for. This entry should also show the OAT, and the expiry of the holdover time (in the FINISH box). This holdover expiry time is the holdover time (derived from the tables) added to the start time of

the de-icing / anti-icing process. If there is subsequent departure delay, or further deterioration in the weather conditions, the pilot should use this information, to decide whether further de-icing/anti-icing is required.

8.2.4.22 Pre Take-off Checks. The Captain must continually monitor the environmental situation after any de-icing/anti-icing treatment is performed and assess whether the applied holdover time is still appropriate. Within five minutes of take-off a check must be made to ensure that the critical surfaces, particularly the wing leading and trailing edges, are free from frozen contamination. This check will where possible be a visual one from the aircraft cabin, carried out by the Aircraft Captain or other flight crew member, so that the wings may be inspected. If the visual check is not able to confirm the absence of contamination or effectively assess the condition of the critical surfaces, or when the applied holdover time has been exceeded then a pre take off contamination check is required and shall include a visual and tactile check. If these checks are not satisfactory then a complete de-icing / anti-icing re-treatment of the aircraft is required. In addition, if before take-off any member of the aircraft crew observes that there is frost, ice or snow adhering to the wings of the aircraft, that crew member shall immediately report that fact to the Aircraft Captain and a member of the flight crew shall inspect the wings before the aircraft is permitted to take off.

8.2.4.23 Departure During Snowfall. If during taxiing it can be determined that the snow falling onto the wings does not stick to any part of the wings surfaces, take-off is permitted. This will usually occur in temperatures well below zero. If conditions are encountered whereby cold dry snow is falling onto the cold wing of an aircraft, the wind often causes the snow to swirl and move across the surface of the wing and it is evident that the snow is not adhering to the wing surface. Under these circumstances the application of de-icing/anti-icing fluid to the wing of the aircraft would result in the snow sticking to the fluid. Under such operational conditions it may not be prudent to apply fluids to the wing.

However, if snow has accumulated at any location on the wing surface it must be removed prior to take-off. It cannot be assumed that an accumulation of snow on a wing will 'blow off' during the take-off. Wet snow will tend to stick to the aircraft's surfaces and the Aircraft Captain shall ensure that the aircraft surfaces are clear of all contamination before take-off.

Within five minutes of take-off a careful inspection of the wing surfaces is required as described above (para. 8.2.4.22). Sufficient clearance should be kept from other aircraft with running engines to avoid snow from being blown into the air intakes. Normally, 150ft runway width should be cleared from snow and slush, and the edges clearly marked at night by lights. Snow banks along the edges of runways, taxiways and aprons have to be avoided as damage may be caused to turbine engines by ingestion or to propellers (which may bend when hitting heaps of snow, even at taxi RPM). Therefore, when sufficient clearance is not ensured the relevant engines may have to be stopped.

Take-off will not be made if the condition of the wings cannot be properly inspected from inside the aircraft. In temperatures around freezing snow may be in its most dangerous form since a frozen mass may build up very rapidly.

De-icing compounds should not be used for anti-icing purposes when it is snowing at temperatures below freezing. This is because the snow will melt and may then freeze to the surfaces when the compound becomes less effective after some time.

Wing and tail heaters should not be used on the ground while taxiing or during the take-off ground run in temperatures below or near freezing as ridges of ice or snow may form at the intersection of heated and unheated surfaces. Even in slightly below zero conditions water running back from the heated portion may form an ice ridge on the upper and lower side of the surfaces or ice particles on the lower side thus spoiling the aerofoil and the aircraft's performance.

WARNING: The ridges or icicles on the lower side cannot be seen from the cockpit. It may help to complete loading in an unheated hangar to minimize exposure time on the ground.

8.2.4.24 Departure During Freezing Rain Or Drizzle. Take-off in freezing rain or drizzle is prohibited. Even with negligible accretion during taxiing, ice build-up may increase rapidly with gathering speed on take-off accumulating to excessive amounts before becoming airborne.

8.2.4.25 Final Dispatch Procedure. On completion of the de-icing/anti-icing procedure and before the aircraft is permitted to taxi the de-icing/anti-icing codes shall be provided to the Aircraft Captain. The method of providing this information will vary with local arrangements but should consist of:

- a. The fluid type (i.e. Type I, II, or IV.) and application temperature.
- b. The concentration of fluid within the fluid/water mix, expressed as a percentage by volume. (Not required for Type I fluid.)
- c. The local time (hours/minutes) at the beginning of the final de-icing/anti-icing step.
- d. The date.

The person releasing the aircraft after the completion of the de-icing / anti-icing procedures shall make a final walk round of the aircraft and inform the Aircraft Captain that the critical surfaces are clear in accordance with the clean aircraft concept. A check will also be made at this point that all ground equipment is clear of the aircraft and a sign given to the Aircraft Captain that it is safe to taxi.

8.2.4.26 Visibility In Snow vs Snowfall Intensity. To use the table: Assume that the daytime visibility in snowfall is 1 statute mile and the temperature is -7°C. Based on these conditions, the snowfall intensity is light. This snowfall intensity is used to determine which holdover time guideline value is appropriate for the fluid in use. Table 27 is applicable to all fluid Types I, II, III, and IV.

Lighting	Temperature Range	Visibility in Snow (Metres)			
		Heavy	Moderate	Light	Very Light
Darkness	-1°C and above	<=1600	<=1600 to 4000	<=4000 to 6400	<=6400
	Below -1°C	<=1200	<=1200 to 2400	<=2400 to 4800	<-4800
Daylight	-1°C and above	<=800	<=800 to 2400	<=2400 to 4800	<=4800
	Below -1°C	<=600	<=600 to 1400	<=1400 to 3200	<=3200

Table 27 - Visibility in Snow vs. Snowfall Intensity

8.2.4.27 Operational Considerations. The application of de-icing/anti-icing fluids must be in accordance with the aircraft manufacturer’s practices and procedures. Aircraft Captains must comply with any operational requirements such as an aircraft mass decrease and/or an increased takeoff speed when operating with a particular fluid applied to the aircraft. Non-metallic surfaces (e.g. composite) have a lower heat transfer than metallic surfaces. De-icing may take longer and more de-icing fluid may be used. Thickened fluids are particularly known to have caused loss of aerodynamic lift on turboprop aircraft with rotation speeds of less than 100kts, and turbo-jet aircraft have been similarly affected. Aircraft Captains must also take into account any changes to flight handling procedures, stick force, rotation speed and rate, takeoff speed, aircraft attitude etc., stipulated by the aircraft manufacturers associated with a particular fluid applied to the aircraft. In particular, where runway length or other performance factors are not limiting, pilots are strongly urged to consider increasing the rotate speed Vr by 5 to 10 kts. The limitations or handling procedures resulting from the preceding paragraphs must be included in the flight crew pre-takeoff briefing.

8.2.4.28 Maintenance Inspections. Repetitive anti-icing applications may lead a residue of degraded anti-ice fluids to build up and collect in aerodynamically ‘quiet’ areas such as balance bays, and on wing and stabiliser rear spars, which may cause moving parts such as elevators, ailerons, and flap actuating mechanisms to stiffen or jam in flight. This residue may re-hydrate, and increase to many times its original size during flight and freeze under certain temperatures, high humidity and / or rain conditions. It may also block or impede critical flight control systems, and cause aeriels to malfunction. The Part 145 Maintenance organisation is contracted to inspect such areas during routine servicing when De/Anti-icing has been used.

8.2.4.29 Training. The Company will establish and provide appropriate initial and recurrent de-icing / anti-icing training for both flight and ground crew personnel. The syllabus for this training can be found in Part D of this Operations Manual. When de-icing/anti-icing is contracted out to ground handling agencies, the Ground Operations Controller is to ensure that such agency’s training and procedures are IAW this Manual.

8.2.4.30 Compliance Monitoring. Aircraft Captains are responsible to the Compliance Monitoring Manager for ensuring that de-icing / anti-icing activities are carried out in accordance with the operator’s procedures at all stations where de-icing / anti-icing is carried out.

8.2.5 Taxiing of Company Aircraft

8.2.5.1 General. A Company aircraft shall not be taxied unless the person at the controls is:

- a. A Company pilot qualified to taxi the aircraft (Captains in the case of the B727 and B737);
- b. An engineer/mechanic who has received instruction in controlling the aircraft on the ground and in respect of aerodrome layout, routes, signs, markings, lights, ATC signals, procedures and phraseology and who is qualified to use the R/T; or
- c. A person trained and qualified in the manner outlined in b. above and who has been authorised by a designated agent of the company.

Persons being trained in accordance with 8.2.5.1 b or c above should have their skills and knowledge assessed in accordance with GM1 CAT.GEN.MPA.125 prior to being authorised to taxi an aircraft. When an aircraft is being towed or pushed by tractor, the responsibility of the Aircraft Captain is limited to ensuring that the procedures for operating crew are correctly carried out. Avoidance of collision during these manoeuvres is the responsibility of the mechanic in charge of the ground crew.

However, operating crew should of course warn the mechanic if they become aware of a potential hazard or if they receive instructions from ATC to halt the operation, but they should not take any other action unless requested to do so by the mechanic.

8.2.6 Ground Running of Engines

8.2.6.1 Ground running of aircraft engines shall only take place in accordance with airport local regulations and with the permission of the ATC unit if applicable.

Engines should only be started and run by aircrew or ground staff duly authorised to do so. Engines should not be ground-run or checked for power where loose ice, stones or sand might be picked up by the propellers or ingested into the engines, or where any obstruction is in front of the aircraft that may be impacted if the aircraft brakes fail.

During power runs the aircraft brakes must be closely guarded by the person responsible for the control of the power levers.

8.2.7 Operation of Aircraft Doors

8.2.7.1 Passenger and service doors may only be opened and closed by trained Company or technical staff or crew members (including SOs). Towing of the aircraft with doors/compartments doors open is not approved, (Excepting Navajo upper door portion).

8.3 Flight Procedures

8.3.1 IFR/VFR Policy

8.3.1.1 General. Company commercial flights fall into 3 categories: A-to-A, A-to-B and Specialised Operations. The former are generally short pleasure or experience flights or longer trials flights that will generally be conducted in daylight VFR. Company Extra 300 flights will only be carried out during daylight hours and will be conducted in accordance with visual flight rules subject to the constraints of Paras 8.1.2 and 8.1.3.18 above. Subject to the driving exigencies of the purpose of the flight, (for example a pleasure flight or experience flight that may land at a different airfield to that of departure), A-to-B flights should normally be routed via the most convenient, available airway network and in accordance with the IFR, irrespective of the forecast and actual weather conditions for the route. When the departure or destination aerodrome is clear of controlled airspace, or there is no appropriate interconnecting airway structure, more direct flights may be planned. Under such circumstances, flights in accordance with the visual flight rules may be undertaken provided that the forecast and latest actual weather conditions indicate that at the proposed cruising altitudes, the requisite visibilities and clearances from cloud can be maintained. For all flights, air traffic services must be used whenever available. Specialised Operations may be conducted in VFR or IFR according to the requirements of the mission.

8.3.1.2 ATC Flight Plan. The ATC flight plan is to indicate clearly whether the flight is to be conducted under IFR or VFR. In cases where the rules governing the flight are expected to be changed en route, the change from IFR to VFR, or vice versa, is to be annotated on the flight plan, as is the position at which the change is planned to take place. If circumstances such as an un-forecast deterioration in weather conditions indicate the need for a revised clearance, this is to be requested immediately from the appropriate ATC unit. Flight in visual meteorological conditions is to be maintained until the IFR clearance is received.

8.3.1.3 Continuing on an IFR Flight Plan. On an IFR flight plan, an Aircraft Captain shall not continue towards the planned destination aerodrome unless the latest information available indicates that, at the expected time of arrival, the weather conditions at the destination, or at least one destination alternate aerodrome, are at least at or above the applicable aerodrome minima.

8.3.1.4 Cancellation of IFR. IFR flight plans may be cancelled:

- a. If the Aircraft Captain is able to fly uninterrupted visual meteorological conditions (VMC) for so long as he remains in controlled airspace, and
- b. He has informed the appropriate ATC unit of his intention to continue the flight in compliance with Visual Flight Rules and has requested that unit to cancel his flight plan.
- c. If the Aircraft Captain has not requested the ATC unit to cancel his flight plan he must do so when he lands within, or leaves controlled airspace.

8.3.2 Navigation Procedures

8.3.2.1 General. Company aircraft may be fitted with a variety of navigation equipment. Navigation will be conducted by visual and electronic means. Aircraft Captains are responsible for carrying appropriate maps. Irrespective of the particular equipment fit, however, the general principle for all operations is that all such equipment be checked for serviceable and normal operations before each flight. Once in flight, those equipments which are not directly required for navigation along the selected route should be tuned to ground stations within range whose indications will enable the accuracy of the primary aids to be verified, or from which the bearing and distance indications will enable ground-speed checks or ETA adjustments to be made. The routine use of all fitted equipment will ensure that errors in performance or faulty operation may be detected, and rectification arranged at an early stage.

8.3.2.2 Selection, Identification & Programming of Navigation Equipment. Reliance should not be placed on information derived from ground beacons until the appropriate coded signal has been identified and, in the case of two-pilot crews, confirmed by both pilots. When equipments other than VOR, ADF and DME, with cockpit computer and keyboard installations are in use, particular care is to be taken in ensuring that the correct sequences are programmed when entering data from the navigation plan into the installation. In two-pilot crews, one pilot should read aloud the co-ordinates, tracks or distances while the other pilot operates the keyboard and reads back the figures he has programmed as a cross-check of their accuracy. For single-pilot operations, a conscientious system of self-monitoring is to be adopted to minimise the risk of errors. In flight, other available navigation equipment should be selected and used to confirm the accuracy of the primary aid, and to be readily available for use if the primary equipment gives indications of inaccuracy or malfunction. Above all, flight crew members must remain alert to the possibility of errors in programming or performance, and be prepared to revert to the use of raw data provided by such standard VOR, ADF and DME equipment as are available or, indeed, visual navigation.

8.3.2.3 Completion of Navigation Logs. Navigation logs (PLOGs) should be comprehensively completed en route, except when operating in busy terminal areas at lower altitudes, and ETAs should be kept amended to take account of significant changes. Note should be made of any diversion from the planned route, whether initiated by the pilot or requested by air traffic control, with a brief description of the circumstances, the time the alteration was made, and any fuel re-planning calculations which were necessary. If difficulties are encountered in following a particular route, the more information that is recorded to assist a post-flight investigation, the greater will be the chances of overcoming the problems on future flights over the same route. It must be noted that when operating off the route indicated on the navigation log the listed safety altitudes may not be valid and caution must be exercised especially during climb out and at top of descent to ensure that minimum safe altitudes are adhered to.

8.3.2.4 In Flight Re-planning. In flight re-planning is to be carried out using demonstrated performance figures (fuel flows, ground speeds etc) and up to date weathers and airfield states to ensure that the aircraft does not land at less than the minimum fuel and outside the pilots' qualifications.

8.3.2.5 Jeppesen Manual. The ATC and emergency sections of the Jeppesen Manual are designed to provide pilots with ICAO Standards and Recommended Practices and Procedures for international operations. In addition, on a state-by-state basis, flight procedures, unique to a state or different from the published ICAO rules and procedures, are included. Flight crew are required, in particular, to familiarise themselves with the following:

- a. Visual and Instrument Flight Rules
- b. Communication procedures including COMM failure procedures
- c. Information and instructions relating to the interception of civil aircraft
- d. Signals
- e. ATC clearances, adherence to flight plan and position reports
- f. Visual signals used to warn an unauthorized aircraft flying in or about to enter a prohibited, restricted or danger area
- g. Procedures for pilots observing an accident or receiving a distress call
- h. The ground/air visual signals for use by survivors of an accident; and
- i. Distress and urgency calls

8.3.2.6 Operation in Oceanic Control Areas. A large portion of the airspace of the North Atlantic Region, between FL285 and FL420, is designated as the NAT High Level Airspace (NAT HLA). Until February 2016, most of this airspace was designated Minimum Navigation Performance Standards (MNPS) airspace. The re-designation from MNPS to HLA is in keeping with the transition from capability based (MNPS) to Performance Based Navigation (PBN) in this segment of the NAT airspace.

8.3.2.6.1 NAT HLA Airspace. The lateral dimensions of the HLA include Gander, Reykjavik, Bodø Oceanic, Shanwick (except the Shannon Oceanic Transition Area (SOTA) and Brest Oceanic Transition Area (BOTA)), Santa Maria Oceanic and that portion of New York Oceanic East that is north of 27° N. Within this airspace a formal Approval Process by the State of Registry of the aircraft or the State of the Operator ensures that aircraft meet defined NAT HLA Standards and that appropriate crew procedures and training have been adopted. HLA Standards include the requirement for two approved independent Long Range Navigation Systems (LRNS).

The unidirectional, flexible track structure of the North Atlantic Organised Track System (NAT OTS) is located within HLA, predominantly in the Gander and Shanwick Oceanic CTAs.

Aircraft not meeting the navigation requirements for HLA airspace can choose to fly above FL420 or below FL285. Additionally, within the HLA, special routes, referred to as "Blue Spruce Routes", have been designated for aircraft equipped with only one LRNS plus normal short-range navigation equipment (VOR, DME, ADF), which require to cross the North Atlantic between Europe and North America (or vice versa). As these routes are within NAT HLA Airspace, State approval must be obtained prior to flying along them. These routes are also available for interim use by aircraft normally approved for unrestricted NAT HLA operations that have suffered a partial loss of navigation capability and have only a single remaining functional LRNS.

8.3.2.6.2 NAT HLA Flight Operation and Navigation Procedures. Suitable Company aircraft may operate up to two hours from an adequate aerodrome (not applicable to B727 aircraft). Information on operations in the North Atlantic OCA and NAT HLA area is given in Operations Manual Part Bs and in the Jeppesen Airway Manual. Comprehensive procedures regarding operation within NAT HLA airspace are provided in the NAT Doc 007 – North Atlantic Operations and Airspace Manual, which may be accessed on Company EFBs via the Centrik Documents module.

8.3.2.6.3 Special Procedures for In-Flight Contingencies. Although all possible contingencies cannot be covered, the procedures below cater for the more frequent cases such as:

- a. Inability to comply with assigned clearance due to meteorological conditions, (paragraph 5.1.1.4.10 refers);
- b. En-route diversion across the prevailing traffic flow (for example, due to medical emergencies; and
- c. Loss of, or significant reduction in, the required navigation capability when operating in an airspace where the navigation performance accuracy is a prerequisite to the safe conduct of flight operations, or pressurization failure.

In all cases, the pilot shall take action as necessary to ensure the safety of the aircraft, and the pilot's judgement shall determine the sequence of actions to be taken, having regard to the prevailing circumstances. Air traffic control shall render all possible assistance.

If an aircraft is unable to continue the flight in accordance with its ATC clearance, a revised clearance shall be obtained, whenever possible, prior to initiating any action.

If prior clearance cannot be obtained, the following contingency procedures should be employed until a revised clearance is received:

- a. Leave the cleared route or track by initially turning at least 30 degrees to the right or to the left, in order to intercept and maintain a parallel, direction track or route offset 9.3 km (5.0 NM). The direction of the turn should be based on one or more of the following:
 - i. Aircraft position relative to any organized track or route system,
 - ii. The direction of flights and flight levels allocated on adjacent tracks,
 - iii. The direction to an alternate airport;
 - iv. Any strategic lateral offset being flown, and
 - v. Terrain clearance;
- b. The aircraft should be flown at a flight level and an offset track where other aircraft are less likely to be encountered.
- c. Maintain a watch for conflicting traffic both visually and by reference to ACAS (if equipped) leaving ACAS in RA mode at all times, unless aircraft operating limitations dictate otherwise;
- d. Turn on all aircraft exterior lights (commensurate with appropriate operating limitations);
- e. Keep the SSR transponder on at all times and, when able, squawk 7700, as appropriate;

- f. As soon as practicable, the pilot shall advise air traffic control of any deviation from assigned clearance;
- g. Use whatever means is appropriate (i.e. voice and/or CPDLC) to communicate during a contingency or emergency;
- h. If voice communication is used, the radiotelephony distress signal (MAYDAY) or urgency signal (PAN PAN) preferably spoken three times, shall be used, as appropriate;
- i. When emergency situations are communicated via CPDLC, the controller may respond via CPDLC. However, the controller may also attempt to make voice communication contact with the aircraft;
- j. Establish communications with and alert nearby aircraft by broadcasting, at suitable intervals on 121.5 MHz (or, as a backup, on the inter-pilot air-to-air frequency 123.450 MHz) and where appropriate on the frequency in use: aircraft identification, the nature of the distress condition, intention of the person in command, position (including the ATS route designator or the track code, as appropriate) and flight level; and
- k. The controller should attempt to determine the nature of the emergency and ascertain any assistance that may be required. Subsequent ATC action with respect to that aircraft shall be based on the intentions of the pilot and overall traffic situation.

Once established on a parallel, same direction track or route offset by 9.3 km (5.0 NM), either:

- a. Descend below FL 290, and establish a 150 m (500 ft) vertical offset from those flight levels normally used, and proceed as required by the operational situation or if an ATC clearance has been obtained, proceed in accordance with the clearance; or

Note. — Descent below FL 290 is considered particularly applicable to operations where there is a predominant traffic flow (e.g. east-west) or parallel track system where the aircraft's diversion path will likely cross adjacent tracks or routes. A descent below FL 290 can decrease the likelihood of: conflict with other aircraft, ACAS RA events and delays in obtaining a revised ATC clearance.

- b. Establish a 150 m (500 ft) vertical offset (or 300 m (1000 ft) vertical offset if above FL 410) from those flight levels normally used, and proceed as required by the operational situation, or if an ATC clearance has been obtained, proceed in accordance with the clearance.

Note. — Altimetry System Error may lead to less than actual 500 ft vertical separation when the above procedure is applied. In addition, with the 500 ft vertical offset applied, ACAS RAs may occur.

8.3.2.6.4 Strategic Lateral Offset Procedure. The Strategic Lateral Offset Procedure has been implemented within North Atlantic Region Airspace including the New York Oceanic FIR (WATRS area) west of 60W and south of 3830N. The procedure provides for the application of lateral offsets within the following guidelines:

- a. Strategic lateral offsets and those excluded to avoid wake turbulence are to be made to the right of route or track

- b. In relation to a route track, there are three positions that an aircraft may fly: centreline, 1 or 2NM right
- c. Offsets are not to exceed 2NM right of centreline

The procedure is intended to reduce risk (i.e. increase the safety margin) by distributing aircraft laterally and equally across the three available positions. In this connection, pilots must take account of the following:

1. Aircraft without automatic offset programming capability must fly the centreline
2. It is recommended that pilots of aircraft capable of programming automatic offsets elect to fly an offset one or two nautical miles to the right of the centre line in order to obtain lateral spacing from nearby aircraft (i.e. those immediately above and / or below). Pilots should use whatever means are available (e.g. TCAS, communications, visual acquisition, GPWS) to determine the best flight path to fly
3. Any aircraft overtaking another aircraft is to offset within the confines of this procedure, if capable, so as to create the least amount of wake turbulence for the aircraft being overtaken
4. For wake turbulence purposes, pilots should fly one of the three positions above and never offset to the left of centreline nor offset more than 2NM right of centreline. Pilots may contact other aircraft on the air-to-air channel, 123.45 MHz, as necessary, to co-ordinate the best wake turbulence mutual offset option. It is recognised that the pilot will use their judgment to determine the action most appropriate to any given situation and has the final authority and responsibility for the safe operation of the aircraft
5. Pilots may apply an offset outbound at the oceanic entry point but must return to centreline at oceanic exit point
6. Aircraft transiting radar controlled airspace e.g. Bermuda, are to remain on their established offset positions
7. There is no ATC clearance required for this procedure and it is not necessary that ATC be advised; and
8. Voice position reports are to be based on the current ATC clearance and not the exact co-ordinates of the offset position.

8.3.2.6.5 Weather Deviation Procedures. The following procedures are intended to provide guidance for deviations around thunderstorms. All possible circumstances cannot be covered and therefore the pilot's judgment shall ultimately determine the sequence of actions taken.

If the aircraft is required to deviate from track to avoid weather and prior clearance cannot be obtained, an air traffic control clearance shall be obtained at the earliest possible time.

When the pilot initiates communications with ATC, rapid response may be obtained by stating “weather deviation required” to indicate that priority is desired on the frequency and for ATC response.

If a revised air traffic control clearance cannot be obtained and deviation from track is required to avoid weather, the pilot should take the following actions:

- a. If possible, deviate away from an organized track or route system.
- b. Establish communication with and alert nearby aircraft by broadcasting, at suitable intervals: flight identification, flight level, aircraft position (including the ATS route designator or the track code) and intentions (including the magnitude of the deviation expected) on the frequency in use, as well as on frequency 121.5 MHz (or, as a back-up, the VHF inter-pilot air-to-air frequency 123.45).
- c. Watch for conflicting traffic both visually and by reference to TCAS.
- d. Turn on all aircraft exterior lights (commensurate with appropriate operating limitations).
- e. For deviations of less than 5nm, aircraft should remain at the level assigned by ATC.
- f. For deviations of greater than 5nm, when the aircraft is approximately 5nm from track, initiate a level change based on the following criteria:-

Route Centre Line Track	Deviations >5nm	Level Change
EAST (000-179 magnetic)	LEFT RIGHT	Descend 300ft Climb 300ft
WEST (180-359 magnetic)	LEFT RIGHT	Climb 300ft Descend 300ft

(Simple rule of thumb: if deviating north of track descend 300ft, south of track climb 300ft)

- g. If contact was not established prior to deviating, continue to attempt to contact ATC to obtain a clearance. If contact was established, continue to keep ATC advised of intentions and obtain essential traffic information.
- h. When returning to track, be at its assigned flight level, when the aircraft is within approximately 5nm of centre line.

Note: b and c above call for the pilot to: broadcast aircraft position and pilot’s intentions, identify conflicting traffic and communicate air-to-air with near-by aircraft. If the pilot determines that there is another aircraft at or near the same FL with which his aircraft might conflict, then the pilot is expected to adjust the path of the aircraft, as necessary, to avoid conflict.

8.3.2.7 RNAV / RNP Area Navigation

8.3.2.7.1 General. The performance-based navigation (PBN) concept specifies that aircraft RNAV system performance requirements be defined in terms of accuracy, integrity, availability, continuity and functionality required for the proposed operations in the context of a particular airspace concept, when supported by the appropriate navigation infrastructure.

In that context, the PBN concept represents a shift from sensor-based to performance based navigation. Performance requirements are identified in navigation specifications, which also identify the choice of navigation sensors and equipment that may be used to meet the performance requirements.

The performance-based navigation (PBN) concept is made up of three interrelated elements: the navigation specification, the navaid infrastructure, and the navigation application. Navigation specifications are used by States as a basis for certification and operational approval. Navigation specifications describe, in detail, the requirements placed on the area navigation system for operation along a particular route, procedure or within an airspace where approval against the navigation specification is prescribed. These requirements include:

- a. The performance required of the area navigation system in terms of accuracy, integrity, continuity and availability
- b. The functions available in the area navigation system so as to achieve the required performance
- c. The navigation sensors, integrated into the area navigation system, that may be used to achieve the required performance; and
- d. Flight crew and other procedures needed to achieve the performance mentioned of the area navigation system.

The navigation aid infrastructure relates to space or ground-based navaids that are mentioned in each navigation specification.

Navigation specifications which require on-board performance monitoring and alerting are termed RNP specifications. Those that do not require on-board performance monitoring and alerting are known as RNAV specifications. The use of on-board performance monitoring and alerting to distinguish between RNP and RNAV is a convenience. This simplifies the fact that there are a few differences and many common functional aspects to aircraft systems that must perform the desired flight operations.

A 'navigation application' is when a navigation specification and associated navigation aid infrastructure are applied to ATS routes, instrument approach procedures and/or defined airspace volume, in accordance with the airspace concept. Examples of how the navigation specification and navaid infrastructure may be used together in a navigation application

include RNAV or RNP SIDs and STARs, RNAV or RNP ATS routes, and RNP approach procedures.

Table 28 below shows the navigation specifications and their associated navigation accuracies and demonstrates, for example, that the designation of an oceanic / remote, en-route or terminal navigation specification includes an indication of the required navigation accuracy, and that the designation of navigation specifications used on final approach is different:

- The numbers given in the table refer to the 95 per cent accuracy requirements (NM).
- RNAV 5 is an en-route navigation specification which may be used for the initial part of the STAR outside 30 NM and above MSA.
- RNP 2 and Advanced-RNP 1 are expected to be included in a future revision of the PBN manual.

The table shows that for any particular PBN operation, it is possible that a sequence of RNAV and RNP applications is used. A flight may commence in an airspace using a Basic-RNP 1 SID, transit through en-route then oceanic airspace requiring RNAV 2 and RNP 4, respectively, and culminate with terminal and approach operations requiring RNAV 1 and RNP APCH.

Navigation Specification	Flight Phase							Departure
	En-route oceanic/remote	En-route continental	Arrival	Approach				
				Initial	Intermediate	Final	Missed	
RNAV 10	10							
RNAV 5		5	5					
RNAV 2		2	2					2
RNAV 1		1	1	1	1		1 ^b	1
RNP 4	4							
Basic RNP1			1 ^{a,c}	1 ^a	1 ^a		1 ^{a,b}	1 ^{a,c}
RNP APCH				1	1	0.3	1	

- Note:
- a. The navigation application is limited to use on STARs and SIDs only.
 - b. The area of application can only be used after the initial climb of a missed approach phase.
 - c. Beyond 30nm from the airport reference point (ARP), the accuracy value for alerting becomes 2nm.

Table 28 – RNP by flight phase

8.3.2.7.2 RNAV10 (RNP10). RNAV10 (RNP10) was developed for operation in oceanic and remote areas to support reduced lateral and longitudinal separation minima where the availability of navigation aids, communications and surveillance is limited. The minimum route spacing where RNAV10 (RNP10) is utilized is 50 NM. RNAV10 (RNP10) requires that aircraft operating in oceanic and remote areas be equipped with at least two independent and serviceable LRNSs comprising an INS, an IRS FMS or a GNSS, with an integrity such that the navigation system does not provide an unacceptable probability of misleading information.

Operations in airspace or on routes designated as RNAV10 (RNP10) require a lateral total system error to be within ± 10 NM for at least 95 per cent of the total flight time. The along-track error must also be within ± 10 NM for at least 95 per cent of the total flight time.

When operating within RNP airspace the letter 'R' should be entered in field 10 of the flight plan and in field 18 remarks, to indicate the accuracy capability RNAV10 or better as appropriate.

At least two LRNSs capable of satisfying RNAV10 (RNP10) navigation specification must be operational at the oceanic entry point. If this is not the case, then the crew should consider an alternate route which does not require that particular equipment or having to make a diversion for repairs. Prior to entering oceanic airspace, the position of the aircraft must be checked as accurately as possible by using external navigation aids. This may require DME / DME and/or VOR checks to determine navigation system errors through displayed and actual positions. Regular cross-checking must be carried out in order to identify navigation errors in sufficient time to prevent aircraft from inadvertent deviation from ATC cleared routes. ATC must be advised of any deterioration or failure of the navigation equipment below the navigation performance requirements or of any deviations required for a contingency procedure.

Flight director or autopilot in LNAV mode should be used to monitor for lateral deviations during RNAV10 (RNP10) operations. Maintain route centrelines during all RNP operations unless authorized to deviate by ATC or under emergency conditions. For normal Operations, cross-track error/deviation (the difference between the RNAV system computed path and the aircraft position relative to the path) should be limited to $\pm \frac{1}{2}$ the navigation accuracy associated with the route (i.e. 5 NM). Brief deviations from this standard (e.g. overshoots or undershoots) during and immediately after route turns, up to a maximum of one-times the navigation accuracy (i.e. 10 NM), are allowable.

8.3.2.7.3 RNAV 5. RNAV 5 operations are based on the use of RNAV equipment which automatically determines the aircraft position using input from one or a combination of the following types of position sensors, together with the means to establish and follow a desired path:

- VOR/DME
- DME/DME
- INS or IRS; and
- GNSS.

During operations in airspace or on routes designated as RNAV 5 (which includes most of the European route structure), the lateral total system error must be within 5 NM for at least 95 per cent of the total flight time. The along-track error must also be within ± 5 NM for at least 95 per cent of the total flight time. All Company aircraft are fitted with equipment that complies with this basic requirement. Flight Plans must also accurately reflect the equipment and associated accuracy capability in both field 10 and field 18 remarks.

Where a navigation database is used, it should be current and appropriate for the region of intended operation and must include the navigation aids and waypoints required for the route.

The availability of the navaid infrastructure, required for the intended routes, including any non-RNAV contingencies, must be confirmed for the period of intended operations using all available information. Since GNSS integrity (RAIM or SBAS signal) is required, the availability of these should also be determined as appropriate. For aircraft navigating with SBAS receivers, check appropriate GPS RAIM availability in areas where SBAS signal is unavailable.

Flight crews should cross-check the cleared flight plan by comparing charts or other applicable resources with the navigation system textual display and the aircraft map display, if applicable. If required, the exclusion of specific navigation aids should be confirmed. During the flight, where feasible, the flight progress should be monitored for navigational reasonableness, by cross-checks with conventional navigation aids using the primary displays in conjunction with the RNAV control and display unit (CDU). Flight director or autopilot in LNAV mode should be used to monitor for lateral deviations during RNAV 5. Pilots may use a navigation map display without a flight director or autopilot. Any lateral deviation display must ensure that lateral deviation scaling is suitable for the navigation accuracy associated with the route/procedure (e.g. full-scale deflection: ± 5 NM).

Maintain route centrelines, as depicted by on-board lateral deviation indicators and/or flight guidance, during all RNAV operations, unless authorized to deviate by ATC or under emergency conditions. For normal operations, cross-track error/deviation (the difference between the RNAV system-computed path and the aircraft position relative to the path) should be limited to $\pm \frac{1}{2}$ the navigation accuracy associated with the procedure or route (i.e. 2.5 NM). Brief deviations from this standard (e.g. overshoots or undershoots) during and immediately after procedure/route turns, up to a maximum of one-times the navigation accuracy (i.e. 5 NM), are allowable.

If ATS issues a heading assignment taking the aircraft off a route, the pilot should not modify the flight plan in the RNAV system until a clearance is received to re-join the route or the controller confirms a new clearance. When the aircraft is not on the published route, the specified accuracy requirement does not apply.

ATC must be notified if RNAV performance ceases to meet the requirements for RNAV 5. In the event of communications failure, the flight crew should continue with the flight plan in accordance with the published "lost communication" procedure.

Where stand-alone GNSS equipment is used:

- a. In the event of that there is a loss of the RAIM detection function, the GNSS position may continue to be used for navigation. Flight crew should attempt to cross-check the aircraft position, with other sources of position information, (e.g. VOR, DME and/or NDB information) to confirm an acceptable level of navigation performance. In the event that the navigation display is flagged invalid due to a RAIM alert, or the GPS itself fail the flight crew should revert to an alternative means of navigation and advise

ATC. Any decision to continue along the route planned should be based on the response from the ATSU and the availability of traditional nav aids along the route.

- b. See aircraft specific Operations Manual Part B Checklist, Section 2 for details of required equipment, contingency procedures and operating procedures.

8.3.2.7.3.1 Reporting the loss of RNAV5/BRNAV. If RAIM/GPS failures have occurred during flight in BRNAV airspace the Aircraft Captain shall complete a company incident report, complete the tech log defect box and inform engineering so that rectification work, where necessary can be carried out.

8.3.2.7.4 RNP AREAS. The following is a guide only to RNP Navigational Areas, reference should be made to the Jeppesen Airway Manual to ascertain the latest applicable requirements.

a. **RNP-4**

- Canadian RNP Airspace
- Tokyo Domestic Airspace
- Atlantic High Airspace

b. **RNAV-5**

- ECAC Airspace
- MID / ASIA REGION (Amman, Baghdad, Bahrain, Beirut; Cairo, Damascus, Jeddah, Kabul, Kuwait, Muscat, Sana'a; Saudi Arabia, Tehran, Tel Aviv, United Arab Emirates).

c. **RNAV-10 (RNP10)**

- Asia to Middle East / Europe
- South-of-the-Himalayas (EMARSSH)
- Australian RNAV Network
- EUR / SAM Corridor
- Indian Ocean Random RNAV Area (IORRA)
- Pacific Organised Track System (PACOTS)
- South China Sea RNAV Route Structure
- West Atlantic Route System (WATRS)
- Tasman Sea / New Zealand

RNAV-10 (RNP-10) is intended for oceanic and remote areas where an aircraft separation minimum, in the order of 50 nm, is applied.

The North Atlantic [HLA](#) / RVSM area is not an RNP area.

8.3.2.7.5 RNAV1 (PRNAV) and RNAV 2

8.3.2.7.5.1 General. RNAV 1 & 2 airspace includes ECAC P-RNAV and US RNAV airspace. RNAV 1 airspace can be applicable to all ATS routes, including en-route, Standard Instrument

Departures (SIDs), and Standard Arrival Routes (STARs). It may also apply to instrument approach procedures up to the Final Approach Fix and holding patterns.

RNAV 1 will normally have direct controller pilot communications and be in a radar environment.

During operations in airspace or on routes designated as RNAV 1(P-RNAV), the required navigational accuracy is +/- 1 NM for at least 95% of the total flight time.

Prior to dispatch, a crew must check they are qualified and current and that the aircraft is fit for RNAV 1 (P-RNAV) operations IAW with the MEL and OMB. They must also consult Flight Planning data for satellite coverage during the anticipated period of RNAV operation.

For existing systems, compliance with both P-RNAV (TGL-10) and U.S. RNAV (FAA AC 90-100) assures automatic compliance with this ICAO specification and aircraft approved for RNAV 1 operations are automatically approved to operate within the United States or airspace of the Member States of the European Civil Aviation Conference (ECAC).

In addition, an operational approval to this specification allows the conduct of RNAV 1 operations globally.

The RNAV 1 navigation specification is primarily developed for RNAV operations in a radar environment (for SIDs, radar coverage is expected prior to the first RNAV course change). However, RNAV 1 may be used in a non-radar environment or below minimum radar vectoring altitude (MRVA) if the implementing State ensures appropriate system safety and accounts for lack of performance monitoring and alerting.

Any database or chart anomaly identified during RNAV operations must be reported via an ASR.

8.3.2.7.5.2 General Operating Procedures. An RNAV 1 SID or STAR must not be flown unless it is retrievable by route name from the on-board navigation database and conforms to the charted route.

The manual entry or creation of new waypoints by latitude and longitude is not permitted.

Additionally, pilots must not change any RNAV SID or STAR database waypoint type from a fly-by to a fly-over or vice versa.

For RNAV 1 routes, pilots must use a lateral deviation indicator, flight director, or autopilot in lateral navigation mode, and maintain route centrelines, unless authorised to deviate by ATC or under emergency conditions.

For normal operations, cross-track error / deviation (the difference between the RNAV system computed path and the aircraft position relative to the path, i.e. FTE) should be limited to $\pm\frac{1}{2}$ the navigation accuracy associated with the procedure or route (i.e. 0.5 nm for RNAV 1).

Brief deviations from this standard (e.g. overshoots or undershoots) during and immediately after procedure / route turns, up to a maximum of 100% of the navigation accuracy (i.e. 1.0 nm for RNAV 1), are allowable.

Caution: Manually selecting aircraft bank limiting functions may reduce the aircraft's ability to maintain its desired track and is not recommended.

If ATC issues a heading assignment taking the aircraft off a route, the pilot should not modify the flight plan in the FMS until a clearance is received to re-join the route or the controller confirms a new route clearance.

Note: When the aircraft is not on the published route in these circumstances, the specified accuracy requirement does not apply.

8.3.2.7.5.3 Flight Planning. In the flight planning phase, Flight Crew should:

- a. Identify which portions of the flight are to be conducted in RNAV 1 airspace and verify the entry and exit points.
- b. Ensure that the letter R is annotated in item 10 of the ATC Flight Plan. Additional information should be displayed in the Remarks section indicating the accuracy capability.
- c. Ensure that adequate navigation capability is available en-route to enable the aircraft to navigate to RNAV 1 requirements.

Note: RAIM levels required for RNAV 1 can be verified either through NOTAMs, or use of prediction software.

In the event of a predicted, continuous loss of appropriate level of fault detection of more than five minutes for any part of the RNAV 1 operation, the flight plan should be revised (e.g. delaying the departure or planning a different departure procedure).

8.3.2.7.5.4 Pre-Flight at the Aircraft. At the aircraft, Flight Crew should:

- a. Check the Technical Log to ensure that there is no defect in navigational equipment that would preclude RNAV 1 operations.

Note: The MEL identifies those alleviations that are not suitable for RNAV 1 operations.

- b. Confirm that the navigation database is current.

Caution: Navigation databases must be current for the duration of the flight.

- c. Crosscheck the flight plan with the aircraft navigation unit and map display. If required, the exclusion of specific navigation aids should be confirmed.

Note: Pilots may notice a slight difference between the navigation information portrayed on the OFP and their primary navigation display. Differences of 3° or less may result from the equipment manufacturer's application of magnetic variation and are operationally acceptable.

- d. Check and brief the contingency procedures for the area in which RNAV 1 operations are to be conducted.

Note: This may be deferred to any time before entering RNAV 1 airspace if there is a lengthy non- RNAV 1 sector before entering RNAV 1 airspace.

8.2.2.7.5.5 RNAV SID Specific Requirements. During the pre-flight, the aircraft navigation unit tracks and distances must be checked against the Jeppesen Chart **by both pilots**. This includes confirmation of the waypoint sequence, reasonableness of track angles and distances, any altitude or speed constraints, and, where possible, which waypoints are fly-by and which are fly-over.

Before commencing the take-off, the Flight Crew should verify that the aircraft's RNAV system is available, operating correctly, and that the correct aerodrome, runway and RNAV procedure data are loaded. This is particularly important where a change of runway or procedure occurs and Flight Crew must verify that the appropriate changes are entered and available for navigation prior to take-off.

A final check of proper runway entry and correct route depiction, shortly before take-off, is recommended.

Caution: The creation of new waypoints by manual entry into the RNAV system by the Flight Crew would invalidate the route and is not permitted. All published altitude and speed constraints must be observed.

Route modifications in the terminal area may take the form of radar headings or Direct To clearances and the Flight Crew must be capable of reacting in a timely fashion. This may include the insertion of tactical waypoints loaded from the database.

Caution: Manual entry or modification by the Flight Crew of the loaded route, using temporary waypoints or fixes not provided in the database, is not permitted.

8.3.2.7.5.6 RNAV STAR Specific Requirements. Before descent, the aircraft navigation unit tracks and distances must be checked against the Jeppesen Chart **by both pilots**. This includes confirmation of the waypoint sequence, reasonableness of track angles and distances, any altitude or speed constraints, and, where possible, which waypoints are fly-by and which are fly-over.

Caution: The creation of new waypoints by manual entry into the RNAV system by the Flight Crew would invalidate the route and is not permitted. All published altitude and speed constraints must be observed.

Route modifications in the terminal area may take the form of radar headings or Direct To clearances and the Flight Crew must be capable of reacting in a timely fashion. This may include the insertion of tactical waypoints loaded from the database.

Caution: Manual entry or modification by the Flight Crew of the loaded route, using temporary waypoints or fixes not provided in the database, is not permitted.

8.3.2.7.5.7 Contingency Procedures. Where the contingency procedure requires reversion to a conventional arrival route, necessary preparations must be completed before commencing the RNAV route including the pre-tuning of Nav Aids.

The Flight Crew must notify ATC of any loss of the RNAV capability, together with the proposed course of action.

If unable to comply with the requirements of an RNAV route, the Flight Crew must advise ATS as soon as possible. If radar control is not available the crew must immediately climb to MSA. The loss of RNAV capability includes any failure or event causing the aircraft to no longer satisfy the RNAV requirements of the route.

8.3.2.7.5.8 Communications. In the event of communications failure, continue with the RNAV route in accordance with established lost communications procedures.

Condition	Phraseology
When checking if an aircraft is able to accept a SID / STAR, ATC will use	ADVISE IF ABLE (designator) DEPARTURE [or ARRIVAL]
If the aircraft is unable to accept an ATC issued clearance for a RNAV SID / STAR, the Flight Crew will use	UNABLE (designator) DEPARTURE [or ARRIVAL] DUE RNAV TYPE Note: In this case, ATC will normally seek to provide an alternative routing
If the aircraft is unable to continue with RNAV operations due to some failure or degradation of the RNAV system, the Flight Crew will use	UNABLE RNAV DUE EQUIPMENT Note: Aircraft in flight which announce to ATC the loss of RNAV capability should normally expect to be provided with radar vectors, routed via conventional routes or routed direct to conventional NAVAIDs.
If ATC is unable to assign a RNAV SID / STAR requested by the Flight Crew for reasons associated with the type of on-board RNAV equipment indicated on the ATC flight plan, ATC will inform the pilot using	UNABLE TO ISSUE (designator) DEPARTURE [or ARRIVAL] DUE RNAV TYPE

8.3.2.8 Reduced Vertical Separation Minimum (RVSM)

8.3.2.8.1 General. RVSM is the generic term for the reduction in vertical separation from 2000 ft to 1000 ft that can be applied to approved operators of approved aircraft operating at between FL290 and FL410 inclusive within RVSM Airspace. The purpose of RVSM is to increase airspace capacity and provide airspace users with more flight levels and thus optimised flight profiles.

8.3.2.8.2 Approval for RVSM Operations. Operation within RVSM Airspace is permitted only by RVSM approved aircraft. Operational approval is granted by the Civil Aviation Authority to an operator when:

- a. Each aircraft type has been given airworthiness approval demonstrating compliance with RVSM minimum aircraft system performance specification (MASPS).
- b. Operations manual and maintenance procedures specific to RVSM operations have been approved.

8.3.2.8.3 Height Monitoring. The continued confirmation of aircraft height-keeping performance enables initial and continued validation of safety requirements. This confirmation is achieved by measuring the precise heights at which approved aircraft are flying, either by their passage over dedicated Height Monitoring Units (HMUs) or the carriage of GPS Monitoring Units (GMUs). RVSM compliant aircraft are required to participate in the RVSM height monitoring programme which commences prior to the implementation date. Ground based HMUs are located at Strumble (UK) and Linz (Austria) with additional units available at Nattenheim (Germany) and Geneva (Switzerland). For a successful measurement by an HMU the aircraft is required to remain in level flight for approximately five minutes, between FL290 and FL410 (inclusive) within the coverage (45NM radius) of the HMU.

8.3.2.8.4 RVSM Procedures in Transition Areas. A number of FIR / UIRs in RVSM Airspace have been designated to handle the transition of aircraft from an RVSM to non-RVSM environment and vice-versa. Within this 'RVSM Transition Airspace', special procedures will allow ATC to transition both RVSM and non-RVSM civil and State aircraft. Flight crews can expect to change from conventional flight levels to RVSM flight levels and vice-versa. ATC will continue to provide a 2,000ft VSM between a non-RVSM approved aircraft and any other aircraft. See Jeppesen Airway Manual for details of FIRs and UIRs where RVSM Airspace and RVSM Transition Airspace applies.

8.3.2.8.5 Aircraft Equipment. In general terms the following equipment is required to comply with RVSM MASPS:

- a. Two independent altitude measurement systems each equipped with:
 - i. Cross-coupled static/source system with ice protection, if located in areas subject to ice accretion,
 - ii. Display of the computed pressure altitude to the flight crew,
 - iii. Digital encoding of the displayed altitude,

- iv. Signals referenced to a pilot selected altitude for automatic altitude control and alerting,
 - v. Static source error correction.
- b. One SSR transponder with an altitude reporting system in use for altitude keeping.
 - c. An altitude alerting system.
 - d. An automatic altitude control system.

Specific aircraft type equipment required to comply with RVSM MASPS is published in the relevant Operations Manual Part B, Minimum Equipment List.

8.3.2.8.6 Flight Plans. RVSM Approved operators should enter a letter 'W' in field 10 of the ICAO standard flight plan or in item Q of a repetitive flight plan whenever the aircraft to which the approval relates are to be operated at any level in RVSM Airspace.

8.3.2.8.7 Flight Crew Procedures

8.3.2.8.7.1 Pre-Flight. Flight crew shall check:

- a. The aircraft is certified for RVSM operations.
- b. Reported and forecast en-route weather.
- c. The Minimum Equipment List with reference to height keeping and altitude alerting systems.
- d. Any airframe or operating restriction for the specific aircraft type related to RVSM approval.

8.3.2.8.7.2 Pre-flight Procedures at the Aircraft for Each Flight. The following actions should be accomplished during the pre-flight procedure:

- a. Review technical logs and forms to determine the condition of equipment required for flight in the RVSM airspace. Ensure that maintenance action has been taken to correct any defects to required equipment;
- b. During the external check of aircraft, particular attention should be paid to the condition of static sources and the condition of the fuselage skin near each static source and any other component that affects altimetry system accuracy. This check may be accomplished by a qualified and authorised person other than the pilot (e.g. a flight engineer or ground engineer);
- c. Before take-off all altimeters should be set to latest airfield QNH and checked against a known airfield reference datum. The maximum difference should not exceed 75ft, additionally the two primary altimeters should also agree within limits specified by the aircraft type operating manual. Checks of altitude indicating systems should be performed before take-off, equipment required for flight in RVSM airspace should be operative, and any indications of malfunction should be resolved.

8.3.2.8.7.3 Procedures Prior to RVSM Airspace Entry. The following equipment should be operating normally at entry into RVSM airspace:

- a. Two primary altitude measurement systems.
- b. One automatic altitude-control system.
- c. One altitude-alerting device.
- d. Operating Transponder.

Should any of the required equipment fail prior to the aircraft entering RVSM airspace a new clearance should be requested to avoid entering this airspace.

8.3.2.8.7.4 In-flight Procedures. Flight crews shall:

- a. Comply with operating restrictions, e.g. limits on indicated Mach number. (See aircraft type specific operations manual part B).
- b. Promptly set standard setting on all altimeters to 1013.2 (hPa) /29.92 (in.Hg) on passing transition altitude and re-check for proper altimeter setting and tolerances when reaching the initial cleared flight level.
- c. Ensure that the cleared flight level is carefully maintained taking particular care to read back and cross check clearances. Do not intentionally depart from the cleared flight level without a positive clearance from ATC unless the crew is conducting contingency or emergency procedures.
- d. When approaching the first cleared flight level, and/or when changing flight level in RVSM airspace, aim to keep vertical speed within 500 to 1,000 feet per minute do not exceed 1,500 feet per minute, and ensure that the aircraft neither undershoots nor overshoots the cleared flight level by more than 150ft, manually overriding if necessary. Level off should be accomplished using the altitude capture feature of the automatic altitude-control system.
- e. Ensure that the automatic altitude-control system remains operative and engaged during level cruise, except when circumstances such as the need to re-trim the aircraft or turbulence require disengagement. In any event, adherence to cruise altitude should be done by reference to one of the two primary altimeters. Following loss of the automatic height keeping function, any consequential restrictions will need to be observed.
- f. Ensure that the altitude-alerting system is operative.
- g. When crossing a waypoint or at intervals of approximately one hour a cross-check of the primary altimeters should be made. Altimeters must agree within ± 200 feet. Failure to meet this condition will require that the altimetry system be reported as defective and notified to ATC.

- h. The ADC source coupled to the active autopilot must be the same as that coupled to the ATC transponder during flight in RVSM airspace.
- i. Before entering RVSM airspace, record the initial altimeter cross check of primary and standby altimeters.
- j. If notified by ATC of an assigned altitude deviation which exceeds ± 300 feet, shall take action to return to cleared flight level as quickly as possible.

8.3.2.8.7.5 Contingency Procedures after Entering RVSM Airspace. Flight crew shall notify ATC of any contingency (equipment failure, weather such as severe turbulence etc.) which affect the ability to maintain the cleared flight level or the RVSM requirements (e.g. Minimum Equipment List).

The following equipment failures must be reported to air traffic control:

- a. Loss of thrust on one or more engines necessitating descent;
- b. Loss of one or more altimetry systems;
- c. Failure of all automatic altitude control systems.

When notified by ATC of an assigned altitude deviation of more than 300 feet, the flight crew shall take action to return to the cleared level as soon as possible. If unable to notify ATC and obtain an ATC clearance prior to deviating from the cleared flight level, the pilot should follow any established contingency procedures and obtain ATC clearance as soon as possible. RVSM contingency checklists are carried onboard Company aircraft

8.3.2.8.7.6 EUR RVSM Airspace. Within European RVSM airspace, it is expected that all aircraft will be in continuous radio contact with ATC either on the assigned frequency or on the distress and emergency frequency (121.5MHz). Flight crew will therefore be able to advise ATC of any abnormal circumstances where RVSM performance requirements cannot be met. ATC will then respond and issue an appropriate revised clearance before the pilot initiates a deviation from the original clearance. It is recognised, however, that there may be some circumstances (such as an emergency descent following the loss of cabin pressurisation) where deviations may have to occur with little or no prior notice to ATC. In such cases the pilot will need to obtain a revised clearance as soon as possible after the deviation.

8.3.2.8.7.7 NAT RVSM Airspace. Within NAT RVSM airspace direct controller-pilot communication may not always be possible. If the pilot is unsure of the vertical or lateral position of the aircraft or if the aircraft deviates intentionally from its assigned altitude (or route) without prior ATC clearance, the pilot must take action to mitigate the potential for collision with aircraft on adjacent routes or flight levels. The following procedures are intended for aircraft unable to maintain assigned level due to:

- a. Weather (e.g. severe turbulence),
- b. Aircraft performance problems,
- c. or pressurisation failure.

These procedures are applicable primarily when rapid descent, turn back, or diversion to an alternate aerodrome is required. The pilot's judgement will determine the specific sequence of actions taken, having regard to the prevailing circumstances. An aircraft unable to continue flight in accordance with ATC clearance should obtain a revised clearance prior to initiating any action using the distress ('mayday') or urgency ('pan') prefix as appropriate.

If unable to comply with the above, leave assigned track by turning 45° right or left. Direction of turn to be determined by the position of aircraft relative to any organised tracks, any lateral offset being flown, levels allocated, direction to alternate and terrain. Following the turn the pilot should, if unable to maintain assigned FL, minimise descent while turning to acquire a 15nm offset, taking account of other aircraft being laterally offset, and, once established on the offset track, climb or descend to select a FL which, differs by 500 ft from those normally used.

When turning to acquire the offset track crews should, where practicable, avoid overshooting the track to be acquired. However excessive bank angle should be avoided and if the turn cannot be contained within 15 nm continue the turn to regain the required offset track.

Obtain ATC clearance soonest using the distress ('mayday') or urgency ('pan') prefix as appropriate and broadcast position (including Track code, if appropriate) and intentions on 121.5 (with 123.45 as back up) until ATC clearance received. Put all aircraft lights on, maintain the look-out assisted by TCAS. RTF phraseology is shown in Table 29 below

CIRCUMSTANCE	PHRASEOLOGY
ATC ascertain the RVSM approval status of a flight:	“(Callsign) CONFIRM RVSM APPROVED”
Pilot indication of non-RVSM approval status: To be stated: i. in the initial call on any frequency within the RVSM airspace <i>(ATC shall provide a readback with the same phrase)</i> ii. in all requests for flight level changes pertaining to flight levels within the RVSM airspace, and iii. in all readbacks to flight level clearances pertaining to flight levels within RVSM airspace. In addition, pilots of aircraft, other than State aircraft, shall respond to level clearance involving the vertical transit through either FL290 or FL410 with this phrase.	“NEGATIVE RVSM”
Pilot indication of RVSM approval status:	“AFFIRM RVSM”
Pilot of State aircraft indicating that flight is non-RVSM approved:	“NEGATIVE RVSM STATE AIRCRAFT”
ATC denial of clearance into the RVSM Airspace	“(Callsign) UNABLE CLEARANCE INTO RVSM AIRSPACE, MAINTAIN <i>(or</i> DESCEND TO, <i>or</i> CLIMB TO) FLIGHT LEVEL (number)”
For the case of an individual aircraft reporting severe turbulence or other severe weather related phenomenon, the pilot phraseology shall be:	“UNABLE RVSM DUE TURBULENCE”
The phraseology required of a pilot to communicate those circumstances which would cause an aircrafts equipment to degrade below altimetry MASPS compliance levels shall be: The phrase is to be used to convey both the initial indication of the non-altimetry MASPS compliance and, henceforth, on initial contact on all frequencies within the lateral limits of the RVSM airspace until such time as the problem ceases to exist.	“UNABLE RVSM DUE EQUIPMENT”
The pilot shall communicate his ability to resume operation within the RVSM airspace after an equipment related contingency, or his ability to resume RVSM operations after a weather related contingency with the phrase:	“READY TO RESUME RVSM”
To solicit this information ATC shall use the phrase:	“(Callsign) REPORT ABLE TO RESUME RVSM”

Table 29 - RTF phraseology

8.3.2.8.7.8 Post Flight. Care should be taken to provide sufficient detail in the Tech Log to enable engineering to identify and rectify any fault affecting the ability of the aircraft to conform to RVSM requirements. The following information should be recorded as appropriate:

- a. Primary and standby altimeter readings.
- b. Altitude selector setting.
- c. Subscale setting on altimeter.
- d. Autopilot used to control the aircraft and any differences when an alternative autopilot system was selected.
- e. Differences in altimeter readings, if alternate static ports selected.
- f. The transponder selected to provide altitude information to ATC and any difference noted when an alternative transponder was selected.

8.3.2.8.7.9 Wake Turbulence. When operating within RVSM airspace and the aircraft encounters severe turbulence due to weather or wake vortex and the Aircraft Captain believes the vertical navigation performance requirements for RVSM airspace cannot be maintained, the Aircraft Captain shall:

- a. Inform ATC as soon as possible (“unable RVSM due turbulence”)
- b. Obtain a revised ATC clearance prior to initiating any deviation from cleared route or flight level.
- c. Where such revised ATC clearance could not be obtained prior to such deviation, obtain a revised clearance as soon as possible thereafter.
- d. Complete a wake turbulence report form.

8.3.2.9 Instrument Departure and Approach Procedures.

- a. The Aircraft Captain shall ensure that instrument departure and approach procedures established by the State in which the aerodrome is located are used.
- b. Notwithstanding subparagraph a above, an Aircraft Captain may accept an ATC clearance to deviate from a published departure or arrival route, provided obstacle clearance criteria are observed and full account is taken of the operating conditions. The final approach must be flown visually or in accordance with the established instrument approach procedure.
- c. Different procedures to those required to be used in accordance with subparagraph a above may only be implemented provided they have been approved by the State in which the aerodrome is located, if required, and accepted by the Authority.

8.3.3 Altimeter Procedures

8.3.3.1 Checks. During the pre-flight check, with aerodrome QFE set, the altimeter must read zero +/- 75ft, with aerodrome QNH set altimeters should read within 75ft of aerodrome elevation. For aircraft with 2 altimeters or more the altimeters must agree within the limits specified in the AFM/AOM. The millibar setting knobs should be rotated through 10millibars and the altimeter needle must move through 300 +/- 90ft.

8.3.3.2 Company Altimeter Setting Procedures. For aircraft with 2 altimeters, the #1 altimeter is the handling pilot's primary instrument and the #2 is the secondary. The altimeters should be set according to Table 30. Whenever altimeter subscale settings are changed the altitude readings must be cross checked (for multi crew operations this means both pilots compare altimeters).

Phase Of Flight	Altimeter #1 Setting	Altimeter #2 Setting	Remarks
Start up and Taxi	QNH	QNH	Aerodrome Setting
Take Off to Depart	QNH	QNH	Aerodrome Setting ¹
Climb to above Transition Level	1013.2	1013.2	At Flight Levels ³
En Route below Transition Altitude	QNH	QNH	Regional Setting ²
En Route above Transition Altitude	1013.2	1013.2	At Flight Levels ³
Initial Descent	QNH	QNH	Aerodrome Setting ⁴
Terminal Descent, Final Approach and Landing	QNH	QNH	Aerodrome Setting ⁵
Missed Approach	QNH	QNH	Aerodrome Setting ⁵
Take Off to Remain in Airfield Circuit	QFE	QFE	Aerodrome Setting
Visual Recoveries, Circuits and Landing or where local procedures so dictate	QFE	QFE	Aerodrome Setting

Table 30. Altimeter Setting Procedures

Notes.

1. If appropriate the acceleration altitude (1000ft AGL or greater if applicable) should be bugged on both main altimeters. After take-off, if any altimeters have to be changed from QFE to QNH, the PF should command the change saying "Set QNH", prompting a reply from the PM e.g. "one zero two four set passing altitude four hundred".
2. When en route, the QNH used should be the appropriate Regional value, unless operating below a Terminal Area (TMA) when the Zone QNH or Aerodrome QNH of the associated aerodrome should be set.
3. For single crew operations the #2 altimeter may remain on the relevant QNH. For multi-crew aircraft with primary altimeters for both crew, and a standby altimeter the QNH may remain set on the standby to allow reference if required after a climb to a flight level has commenced.
4. All altimeters are to be set to and cross checked, when cleared to an altitude/height below transition level in the descent and when no further flight level reports are required by ATC

5. When appropriate, the aerodrome QFE may be used as an alternative, in which case it should be set on the #1 altimeter for single-pilot operations, and on both altimeters in the two-crew case. When required to set QFE, the PF should command the change saying “set QFE”. The PM then changes his altimeter subscale setting to QFE and checks the difference indicated between the altitude his instrument now displays and the SBY altimeter still set on QNH, is close to the to the elevation published for the airfield to which the approach is being made. He should then announce, e.g. “one zero one eight set, difference minus sixty”. PF, who will have specified in his pre-descent briefing what the airfield elevation is, would reply “sixty is correct, setting one zero one eight, passing five hundred”. PM confirms that his altimeter also reads five hundred at that point.

8.3.3.3 Periodic cross checks. When crossing a waypoint or at intervals of approximately one hour a cross-check of the primary altimeters should be made. Altimeters must agree within ± 200 feet. Failure to meet this condition will require that the altimetry system be reported as defective and notified to ATC. Encoded altitude on transponders should also be checked and reported after flight if noted to be in error.

8.3.3.4 Decision/Minimum Descent Altitude. For Category I approaches DA or MDA must be determined by reference to the servo (main) altimeters. Radio altimeter based DH's or MDH's are not approved for category I approaches.

8.3.3.5 Standard Altimeter Calls

- a. Standard altimeter calls are given in the Operations Manual Part B. By making the check calls as given as a routine drill the possibility of altitude busts and, more importantly, descent below minimum safe altitude, should be much reduced.
- b. If the pilot responsible for initiating a call misses a call, the other pilot will make the call and expect the appropriate response.
- c. If the responding pilot does not respond to a standard call, the call should be repeated, louder and clearer. If there is still no response, pilot incapacitation should be assumed until the pilot initiating the call is satisfied that this is not the case.
- d. Altimeter drills should take priority over routine calls.

8.3.3.6 Altitude and Level Changes. Altitude and Level changes must not be reported to ATC until the aircraft has actually left the previously cleared, or arrived at the cleared, altitude or flight level.

8.3.3.7 Air Traffic Control – Altimeter Settings. Before entering a country's airspace, the Aircraft Captain will check the altimeter setting procedure laid down by the state concerned, as detailed in the flight guide. At some airfields the aircraft apron or parking area may differ in height to the runway threshold. Where this occurs, this must be taken in to account when carrying out pre-flight altimeter checks, and also the height reading of both altimeters must be cross-checked at the runway threshold, prior to take-off.

8.3.3.8. Altimeter Temperature Error Corrections. Pressure altimeters are calibrated to indicate true altitude under International Standard Atmosphere (ISA) conditions. Any deviation from ISA will therefore result in an erroneous reading on the altimeter, proportional to ISA deviation and the height above the aerodrome pressure datum. The error is approximately 4ft/1000ft per °C of difference. When temperature is LESS than ISA an aircraft will be LOWER than the altimeter reading. The altimeter error may be significant under very cold conditions and to ensure adequate obstacle clearance a correction value should be ADDED to published/calculated altitudes or heights.

8.3.3.8.1 ICAO standard procedures state that when necessary, the relevant minimum vectoring altitude shall include a correction for low temperature effect and it is the responsibility of the ATS authority to provide the controller with minimum altitudes corrected for temperature effect, however this is not universally embodied. Additionally, and notwithstanding the more general Rule of Thumb for MSAs at Pt A Section 8 Table 2, the temperature error corrections detailed at Table 31 should be applied under the following circumstances:

When the aerodrome temperature is 0°C or colder, correction must be added to:

- a. DH / DA or MDH / MDA and step down fixes inside the FAF.
- b. All low altitude approach procedure altitudes in mountainous regions (where terrain is 3,000 ft amsl or higher).

When intending to apply corrections to the FAF crossing altitude, procedure turn or missed approach altitude ATC must be advised of the intention and the correction to be applied.

IFR assigned altitudes may be refused if altimeter temperature error will reduce obstacle clearance below acceptable minima. However, once an assigned altitude has been accepted, it must not subsequently be adjusted to compensate for temperature error.

Aero-drome	Altitude Above Altimeter Source Elevation (ft) (normally destination elevation)													
	200	300	400	500	600	700	800	900	1000	1500	2000	3000	4000	5000
Temp °C														
0	20	20	30	30	40	40	50	50	60	90	120	170	230	280
-10°C	20	30	40	50	60	70	80	90	100	150	200	290	390	490
-20°C	30	50	60	70	90	100	120	130	140	210	240	420	570	710
-30°C	40	60	80	100	120	140	150	170	190	280	380	570	760	950
-40°C	50	80	100	120	150	170	190	220	240	360	480	720	970	1210
-50°C	60	90	120	150	180	210	240	270	300	450	590	890	1190	1500

Table 31. Temperature Error Corrections

Notes: Use the next colder temperature to actual aerodrome temperature and the next higher height above the aerodrome.

8.3.3.8.2 UK Flight Information Regions (FIRs). ATC presently do not apply a temperature correction when allocating altitudes. Pilots are reminded that they should NOT adjust altitudes issued by ATC during either surveillance or procedural approaches. However, if a pilot considers that the altitude given in any way causes concern, or might endanger the aircraft, then a higher vectoring altitude should be requested from ATC.

8.3.3.9 Altimeter Static Position Error Corrections. Company policy is to fly the cleared flight level without correction for position error. I.e FL240 fly 24000ft on the servo altimeter.

8.3.3.10 Altimetry Operations within Airspace referenced to the Metric System and/or QFE.

8.3.3.10.1 General. Company aircraft are equipped with non-metric altimeters. Clearances that are referenced to the metric system must be converted to the equivalent non-metric value by reference to data contained within:

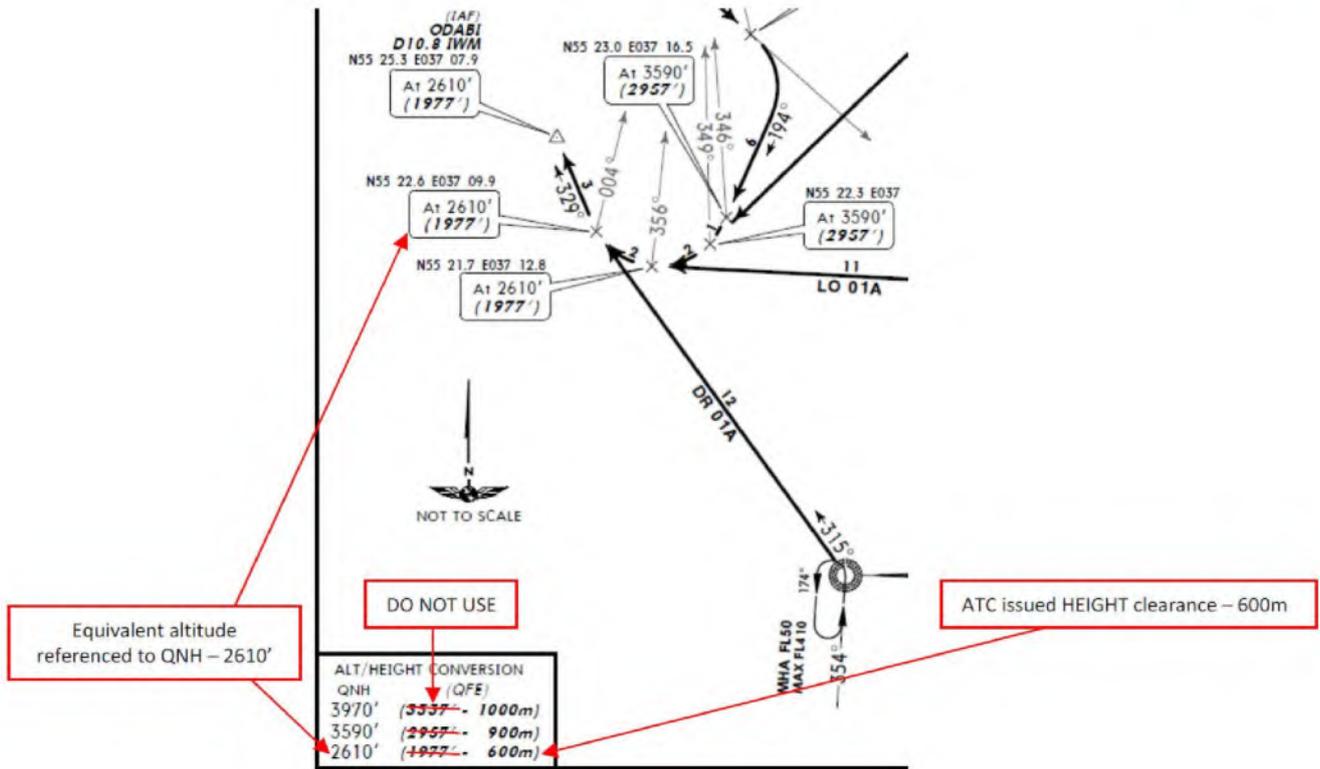
- Jeppesen en-route charts for cruise flight levels, as applicable, and
- Jeppesen terminal charts (STAR, SID and approach charts) for flight within terminal areas.

8.3.3.10.2 Transition between Non-Metric and Metric airspace (cruise flight levels). When transiting from non-metric to metric airspace and vice versa, crew members will obtain the equivalent present or intended flight level from the table shown on the Jeppesen en-route chart for the applicable region. All crew members must be vigilant that the correct non-metric equivalent value is extracted.

8.3.3.10.3 Operating within Terminal Areas where altimetry is referenced to QFE, and the metric system (as applicable). It is Company policy that all flights below transition altitude or flight level are operated on QNH. Each flight deck crew member must have a set of terminal charts for the applicable airport in order to independently obtain the equivalent non-metric QNH referenced value. In terminal areas below transition altitude / level, where ATC issues clearances (heights) referenced to QFE, the equivalent value referenced to sea level (altitude) must be extracted from the applicable terminal chart and the aircraft flown at that equivalent altitude. See Jeppesen chart example figure below. Any discrepancies must be investigated immediately, by questioning each independently extracted equivalent value. If climb or descent cannot be initiated or continued, ATC must be informed immediately.

All crew members must be especially vigilant that QNH is correctly set. The equivalent QNH value is obtained from ATC and cross-checked by applying a factor of 30ft per hPa referenced to the APR elevation.

8.3.3.10.4 Aircraft Equipped with Automatic Altitude Capture Capability. The closest rounded value must be preset on the altitude alerter. When climbing, this value would be the closest below the intended flight level or altitude, when descending, this value would be the closest above the intended flight level or altitude. Immediately after the preset altitude has been acquired, the aircraft will be flown to the exact altitude by means of the autopilot pitch function (preferably vertical speed mode) and the altitude hold function verified engaged.



8.3.4 Altitude Alerting System Procedures

8.3.4.1 For the purpose of this paragraph, 'altitude alerting systems' include both those devices which, when set, give aural/visual warning of the approach to, or deviation from the selected altitude/flight level, and the simpler device which merely acts as a reminder, via a digital indicator, of the required altitude/flight level. Whenever an altitude or flight level change is notified by the appropriate ATS unit, or the Captain elects to vary his cruising altitude/flight level and advises the ATS unit accordingly, the altitude alerting system is to be reset to the new altitude/level. In two-pilot crews, the new setting is to be cross-checked by the pilot who has not been responsible for resetting the system itself. Care must be exercised when re-setting altitude alerting devices that form part of the aircraft's auto pilot in order to prevent any unplanned excursion from the desired flightpath. More detailed procedures are supplied in the relevant aircraft's Part B. See also Para 8.3.3.10.4 for use in metric airspace.

8.3.5 Ground Proximity Warning System (GPWS) Procedures

8.3.5.1. General. GPWS if fitted is to be energised and used throughout the flight, unless it has become unserviceable and the MEL for the particular aircraft type permits it to remain so for a specified period. The following paragraphs are intended as a guide to the purposes and use of GPWS generally; specific technical details of particular equipment are referred to in the relevant Operations Manual Part B.

GPWS is intended to provide warning of potential CFIT as a result of which remedial action can be taken by the flight crew. It is not infallible, but an immediate and positive response must be made to all its alerts and warnings. During GPWS response action, high pitch angles may result. Investigation of the reason for the alert/warning must take second place. Alerts and warnings are defined as follows:

- a. Alert - a caution generated by the GPWS equipment.
- b. Warning - a command generated by the GPWS equipment which may be:
 - i. Genuine, i.e. in accordance with its technical specification;
 - ii. Nuisance, i.e. although the equipment is operating as intended, the pilot is following an authorised, safe procedure;
 - iii. False, i.e. the equipment is not operating as designed and the warning is spurious.

Irrespective of their nature, except when flying VFR at low level, all warnings are to be reported to the Company, in accordance with the occurrence reporting scheme, so that the circumstances may be investigated and the reliability of the equipment established. Flight crews must beware of becoming slow to react to GPWS alert/warnings purely on the basis of previous suspect performance.

8.3.5.2 Alerts, Warnings and Modes. Table 32 illustrates the relationship between alerts, warnings and modes.

GPWS Mode		BASIC EQUIPMENT		ADVANCED EQUIPMENT	
		Alert	Warning	Alert	Warning
1.Excessive descent rate		-	Whoop Whoop "Pull-Up"	"Sink Rate"	Whoop Whoop "Pull-Up"
2.Excessive terrain closure rate		-	Whoop Whoop "Pull-Up"	"Terrain, Terrain"	Whoop Whoop "Pull-Up"
3. Altitude loss after take-off or go-around		-	Whoop Whoop "Pull-Up"	"Don't Sink"	Whoop Whoop "Pull-Up"
4. Unsafe terrain clearance while not in the landing configuration	4a. Proximity to terrain Gear not locked down	-	Whoop Whoop "Pull-Up"	"Too Low Gear"	Whoop Whoop "Pull-Up"
	4b. Proximity to terrain Flaps not in a landing position	-	Whoop Whoop "Pull-Up"	"Too Low Flaps"	"Too Low Terrain"
5. Descent below glideslope		"Glideslope"	-	"Glideslope"	
6. Descent below "minimums"		-	-	"Minimums"	

Table 32 - Relationship between Alerts, Warnings and Modes.

8.3.5.3 Basic GPWS. As indicated in Table 31 above, basic GPWS equipment gives warnings, rather than alerts, in all modes except Mode 5, Descent Below Glideslope. In this mode, activation will cause the aural warning “Glideslope” to be repeated, and the flight crew must take immediate action to regain the glideslope as quickly as possible, until the alert ceases. Whenever a warning is received, the immediate response must normally be to level the wings and initiate a maximum gradient climb to the minimum safe altitude (MSA) for the sector being flown, (but see 8.3.5.7, below).

8.3.5.4 Advanced GPWS. The more advanced GPWS equipment indicates the mode of operation and provides alerts as well as warnings (see 8.3.5.2, above). The immediate action on receiving an alert will vary according to the stage of flight and aircraft configuration, but should involve correcting the condition for which the alert was valid. No attempt should be made to recover the original flight path until the cause of the alert has been positively established and eliminated. Whenever a warning is received, however, the immediate response must be to level the wings and initiate a maximum gradient climb to the (MSA) for the sector being flown, except as in 8.3.5.7, below.

8.3.5.5 Limitations – Basic and Advanced GPWS. Un-enhanced GPWS equipment does not have a forward-looking facility so that little or no warning may be given if the aircraft is approaching sharply rising terrain. Alerts and warnings in Modes 1 and 2 are only given when the aircraft is less than 2500 ft above the local terrain. If no corrective action is taken, a maximum of some 20 seconds will elapse between initial receipt of the alert/warning and contact with the ground, and this will be lessened if the rate of descent is excessive, or there is rising ground beneath the aircraft.

8.3.5.6 Terrain Awareness and Warning System (TAWS). TAWS is a development of GPWS that includes a predictive terrain hazard warning function. The predictive function is achieved by feeding the aircraft’s known position (as determined by a Flight Management System, FMS, or by a Global Positioning System, GPS) to a terrain data base, enabling the computer to predict terrain ahead and to the side of the aircraft’s flight path. Terrain features can then be displayed to the flight crew. TAWS therefore overcomes shortcomings associated with GPWS in that it produces earlier alerts and warnings of significant terrain that lie ahead at all stages of flight. Furthermore, with reference to terrain around airfields, it can warn of descent below safe vertical profiles when the aircraft is in a landing configuration and there is no ILS glideslope signal present.

It must be remembered that with TAWS fitted the terrain display is intended to serve as a situational awareness tool only as it may not provide the level of accuracy needed for terrain avoidance manoeuvring.

8.3.5.7 Warnings – Discretionary Action by Captain. The response to a warning, as outlined in 8.3.5.3 and 8.3.5.4, above, may be limited to that appropriate to an alert only if:

- a. The aircraft is being operated by day in conditions which enable it to remain 1nm horizontally and 1000 ft vertically from cloud, and in a flight visibility of at least 5nm and

- b. it is immediately obvious to the Aircraft Captain that the aircraft is in no danger in respect of its configuration, proximity to terrain or current flight manoeuvre.

8.3.5.8 Unwanted Warnings. Unwanted (i.e. false or nuisance) warnings may be received during normal, safe operations when, for example, the aircraft is being vectored by ATC and is descending in an area of hilly terrain. The activation envelope for the Mode 2A alert is such that it is possible to receive a warning at relatively low rates of descent (vertical speed) if the terrain closure rate is high, due to rising ground and/or high forward speed. In airspace where speed restrictions apply, the likelihood of a nuisance warning is remote, but where no restrictions apply, nuisance warnings can occur if high speed is maintained in descent over rising terrain. A Mode 5 (glideslope) alert may be triggered when the aircraft is being flown outside the validity area of the glideslope signal, such as when manoeuvring visually to land on a non-instrument runway following an approach to the ILS runway. An alert/warning will also be triggered if the approach is flown with the flaps set to a different position from that normally used for landing. Provided that flight crews remain fully aware of these limitations of the equipment, however, and follow the recommended procedures immediately on receipt of GPWS/TAWS alerts and warnings, its use may well avoid an otherwise inadvertent closure, or contact, with the ground. It is emphasised that even if a warning is anticipated or suspected to be false or nuisance, immediate and aggressive action is required by the crew unless it is beyond doubt that 8.3.5.7 can be complied with.

8.3.6 Policy for the Use of TCAS/ACAS

8.3.6.0 General. Airborne collision and avoidance systems (ACAS) provide flight crew with an independent back up to visual search and the ATC system by alerting the crew to collision hazards, independent of any ground-based aids which may be used by air traffic control for such purposes.

When ACAS is installed and serviceable, it shall be used in flight in a mode that enables Resolution Advisories (RA) to be produced unless to do so would not be appropriate for conditions existing at the time.

When undue proximity to another aircraft (RA) is detected by ACAS, the Aircraft Captain or the pilot to whom conduct of the flight has been delegated must ensure that any corrective action indicated by the RA is initiated immediately, unless doing so would jeopardize the safety of the aircraft.

Where fitted, Company aircraft are equipped with TCAS II (Traffic Alert and Collision Avoidance System Type II) at Version 7.1 as detailed in the following paragraphs.

The Altitude Tag should always be set to RELATIVE ALTITUDE MODE in order to provide a direct reading of nearby traffic.

8.3.6.1 TCAS II. TCAS II provides collision avoidance manoeuvre advice in the vertical plane, in one of two forms:

- Traffic Advisories (TAs), which indicate the approximate position relative to the subject aircraft, either in azimuth only, or azimuth and altitude, of nearby transponder equipped aircraft which may become a threat;
- Resolution Advisories (RAs), which recommend manoeuvres or manoeuvre restrictions in the vertical plane to resolve conflicts with transponder equipped aircraft emitting SSR Mode C altitude.

8.3.6.2 Actions in the Event of TA. TAs are intended to alert the crew that an RA, requiring a change in flight path, may follow. A visual search should immediately be concentrated on that part of the sky where the TA indicates the conflicting traffic to be. If the potential threat cannot be seen and gives cause for concern, air traffic control assistance should be requested, however TAs are not required to be reported to ATC. No manoeuvres shall be made in response to a TA.

8.3.6.3 Resolution Advisory. Stall warning, windshear and Ground Proximity Warning System alerts have precedence over ACAS. Visually acquired traffic may not be the same traffic causing an RA. Visual perception of an encounter may be misleading, particularly, at night.

- a. Ensure that any corrective action indicated by the RA is initiated immediately, unless doing so would jeopardize the safety of the aircraft. The corrective action must:

- i. Never be in a sense opposite that indicated by the RA
- ii. Be in the correct sense indicated by the RA even if this is in conflict with the vertical element of an ATC instruction
- iii. Be the minimum possible to comply with the RA indication

In the case of an ACAS–ACAS co-ordinated encounter, the RAs complement each other in order to reduce the potential for collision. Manoeuvres or lack of manoeuvres that result in vertical rates opposite to the sense of an RA could result in a collision with the threat aircraft.

- b. As soon as possible, as permitted by flight crew workload, notify the appropriate ATC unit of the RA, including the direction of any deviation from the current air traffic control instruction or clearance.

Unless informed by the pilot, ATC does not know when ACAS issues RAs. It is possible for ATC to issue instructions that are unknowingly contrary to ACAS RA indications. Therefore, it is important that ATC be notified when ATC instruction is not being followed because it conflicts with an RA.

- c. Promptly comply with any modified RAs;
- d. Promptly return to the terms of the ATC instruction or clearance when the conflict is resolved; and
- e. Notify ATC when returning to the current clearance.

8.3.6.4 UK Registered Aircraft. All aircraft registered in the United Kingdom, wherever they may be, and all aircraft wherever registered when flying in the United Kingdom, powered by one or more turbine jets or turbine propeller engines having a maximum take-off weight exceeding 5700 kg or which in accordance with the certificate of airworthiness in force in respect thereof may carry more than 19 passengers shall be equipped with, and operate, TCAS II.

8.3.6.5 Limitations. It is emphasised that TCAS II relies upon information received from transponder equipped aircraft, by aircraft which are similarly fitted. RAs will only be generated if both the receiving aircraft and the potential intruder are transponder equipped with altitude Mode 'C'. The equipment is not capable of resolving with complete accuracy the bearing, heading or vertical rates of intruding aircraft; pilots should not therefore attempt to manoeuvre solely on the basis of TA information. Pilots must be aware of the limitations of the particular equipment, as the full range of TAs and RAs may not be produced beyond the minimum and maximum altitudes specified for its operation.

8.3.6.6 Nuisance Advisories. Even if TAs and RAs are suspected of being nuisance or false advisories, they should be treated as genuine unless the intruder has been positively identified and shown visually to be no longer a threat.

8.3.6.7 Departure from ATC Clearance. Whenever, as a result of a TCAS II warning, an aircraft has been manoeuvred such that it has departed from its air traffic control clearance, the

appropriate ATC unit is to be informed as soon as possible of the departure, and of the return to the previous or newly assigned clearance.

8.3.6.8 Reporting of TCAS Events. Whenever an aircraft has departed from an ATC clearance in compliance with an RA, the Aircraft Captain is to report the circumstances to the Company and / or Authority as follows:

- a. On an AIRPROX Report form in compliance with Section 11 of this Manual when the Aircraft Captain considers that his aircraft may have been endangered to the extent that a definite risk of collision existed
- b. On an MOR form in compliance with Section 11 of this Manual for all other cases where an aircraft or its occupants or any other person are considered to have been endangered; this includes such occurrences as result from defects or malfunctions of TCAS II equipment
- c. Notwithstanding a and b above, on a TCAS II Event - Pilot Report form. A supply of these forms is carried in the aircraft documents and forms wallet. Completed forms should be submitted, within 72 hours, to the Director of Flight Operations who will forward them to the appropriate address.

8.3.6.9 Policy and Procedures for the Use of TAS. Several Company aircraft are fitted with TAS. These Traffic Systems actively interrogate the transponders of other nearby aircraft to determine their bearing, distance, altitude and vertical trend relative to your aircraft. Aircraft with operating transponders are detected, and aircraft with altitude reporting transponders will also include altitude and vertical trend information (level, climbing, or descending). This information is then shown on a compatible traffic display.

TAS Systems also provide visual and aural alerts to assist in visually acquiring traffic. Aural and visual alerts are given as a Traffic Advisory (TA) for conflicting traffic, however note that no Resolution Advisories (RAs) are provided.

See the relevant Part B supplement for the operating procedures.

8.3.7 In-flight Fuel Management

8.3.7.1 Checks. In flight fuel checks are to be made on all flights of more than 1 hour duration. The checks are to be entered on the OFP for retention post flight. Computer generated OFPs show the minimum fuel quantity required by each leg. Checks should be made at top of climb and then at least once per hour in MEJ aircraft and every half an hour in turbo-prop and piston aircraft. On flights of less than one hour, an intermediate check is to be made at a convenient time when the cockpit workload is low. Pilots are carry out regular fuel checks while airborne in order to recover to land with the requisite fuel minima. At each check actual consumption is to be compared to planned consumption; the fuel expected to remain at the destination is to be calculated; and that the fuel remaining is to be confirmed as sufficient to complete the flight.

8.3.7.2 Actions on There Being Inadequate Fuel Remaining to Complete the Route. In the event that a check reveals that there is insufficient fuel to complete the planned route (with the required alternate fuel plus final reserve fuel, remaining at the Missed approach point), the Aircraft Captain is to seek information from ATC concerning any expected delays, assess traffic, operational and meteorological conditions at the destination and the alternate (and along the routes to each) when deciding whether to proceed or divert so as to land with not less than final reserve fuel. In particular, where an aerodrome has fewer than two separate and suitable runways available, a decision to continue to it must be very carefully considered. Otherwise the Aircraft Captain should divert to refuel unless he considers that in his reasonable opinion, it is safer in the circumstances to continue to the destination. The minimum fuel upon landing on board should be at least the Company minimum reserve fuel.

8.3.7.2.1 In-Flight Options. If it becomes apparent that the fuel remaining is becoming close to the minimum amounts specified, the Aircraft Captain should first consider the following options while en-route:

- Adjusting aircraft speed;
- Obtaining a more direct routeing;
- Flying at a different flight level;
- Landing and refuelling; and
- Selecting an alternate aerodrome which is closer to the destination airfield than that specified in the ATC flight plan so reducing the alternate fuel requirement.

8.3.7.3 Isolated Aerodromes. The use of an isolated aerodrome requires the prior approval of the Authority. On a flight to an isolated aerodrome the last possible point of diversion to any available en-route alternate aerodrome shall be determined. Before reaching this point, the Aircraft Captain shall assess the fuel expected to remain overhead the isolated aerodrome, the weather conditions, and the traffic and operational conditions prevailing at the isolated aerodrome and any en-route aerodromes before deciding whether to proceed to the isolated aerodrome or to divert to an alternate aerodrome. When approaching the last possible point of diversion to an available en-route aerodrome, unless the fuel expected to remain overhead the isolated aerodrome is at least equal to the additional fuel calculated as being required for the flight, or unless two separate runways are available at the isolated aerodrome and the expected weather conditions at the aerodrome comply with those

specified for planning in 8.1.2.4, the Aircraft Captain should not proceed to the isolated aerodrome. In such circumstances, the he should instead proceed to the en-route alternate unless according to the information he has at that time, such a diversion appears inadvisable.

8.3.7.4 Re-clearance in Flight. For flights that use the re-clearance in flight procedure, when passing the re-clearance point the fuel expected to remain at the MAP of the "new" (originally desired) destination should not be less than the sum of alternate and reserve fuel. Fuel actually on board at the time a re-clearance is requested, must satisfy the requirements established under the Company's fuel policy. In the final resort, the objective must be to land with not less than final reserve fuel remaining on board.

8.3.7.5 Company Minimum Reserve Fuel. Company minimum reserve fuel is at least the sum of the *alternate fuel* required and the *final reserve fuel*.

8.3.7.6 Low Fuel State. If at any time it becomes apparent that the aircraft **may** land with less than final reserve fuel, a "**Minimum Fuel**" call to ATC is to be made. ATC must then be kept fully aware of the situation, and will inform the pilot of either the estimated delay if en-route or holding, or the estimated track mileage if being vectored to an instrument approach. "Minimum Fuel" does not imply that an aircraft is in emergency, and ATC are not required to give priority; If at any time it is evident that the aircraft **will** land with less than the final reserve fuel, an emergency **MAYDAY, Fuel** call is to be made.

8.3.7.7 Pre and Post Flight Fuel Considerations. Prior to re-fuelling, the required uplift must be calculated and recorded in the technical log sector pages. After re-fuelling the actual (delivered) and required uplift must be compared and any discrepancy of more than 5% (or 20litres for piston engine aircraft) must be investigated.

The technical log makes provision for recording fuel gauge readings prior to and after re-fuelling, uplift and take-off and landing fuel load.

If the aircraft has landed with less than final reserve (holding) fuel remaining, a Company Occurrence Report / MOR must be submitted.

8.3.7.8 Fuel Conservation in Flight

8.3.7.8.1 General. The care with which crewmembers carry out their flight management duties can significantly affect fuel consumption. In Company piston engine aircraft correct leaning of the mixture throughout the flight has a large impact on overall fuel consumption. In turbine engine aircraft the proper choice of cruise altitude and speed together with good cruise control techniques will improve fuel economy considerably. Full use should be made FMS, air data computer or any other aids available.

For turbine engine aircraft the fuel economy procedures outlined in the following paragraphs provide guidance and aircraft manuals should be consulted for information appropriate to type.

8.3.7.8.2 Take Off. Reduced thrust take-off may not significantly affect the fuel burned. However, the resulting reduced engine deterioration will improve consumption. The aircraft

should be turned on course, cleaned up and established in the climb phase as soon as practical.

8.3.7.8.3 Climb. The most economical method of operating is to climb to the optimum altitude as soon as possible even if this means a relatively short time at cruise altitude. With the present ATC system, it is often not possible to attain higher altitudes on relatively short sectors, but the highest altitude within reason should be requested, even though any stored flight plan may be for a lower altitude. A stored plan level does not take into account aircraft weight, temperature and wind effects.

8.3.7.8.4 Cruise. The technique for setting up cruise should be, when within 1,000 feet of cruise altitude, to climb at the cruise airspeed. The airspeed indicator is more accurate than the Mach indicator. When levelling at cruise altitude, set up thrust from the tables provided. Allow the aircraft to settle down in cruise and adjust thrust to maintain the cruise airspeed. If the airspeed is too high when setting cruise thrust, it will probably remain high and result in increased fuel flow. Unlike operations at a fixed Mach number, when using LRC an increase in cruise altitude will give an increased true airspeed. This can be up to 40kts. Consequently, by selecting the highest practical cruising altitude, flight time will be considerably reduced in addition to the fuel saving achieved by using LRC speed schedules.

8.3.7.8.5 Descent. Descent should be carried out at the recommended speeds. It should be noted that when cruising at LRC, the initial descent rate is very high until normal descent speed has been attained. Descent should be delayed to take account of the reduced descent time. Early descents should be avoided because of the high fuel consumption at low altitude. It may be necessary to descend a few thousand feet and cruise at this level for a few minutes to allow the cabin to descend.

8.3.7.8.6 Approach. While intermediate approach may require more careful handling techniques, if the aircraft is clean a considerable fuel saving can be achieved. Furthermore, the aircraft is structurally safer in turbulence when flaps are retracted. A stabilised final approach must be established as detailed below.

8.3.7.8.7 Landing. The aircraft should be kept as clean as possible on the approach provided the approach is stabilised at the prescribed point. Regardless of the technique used, all approaches must be stabilised in the landing configuration by 500ft in VMC, (300ft for Company Perf B aircraft), or the outer marker / 1000ft (whichever is later) in IMC. Minimum reverse and braking consistent with safety and the full available runway length should be used. Attempting to turn off the runway at intermediate intersections by use of high reverse thrust and severe braking results in unnecessary fuel consumption and damage to tyres and brakes. Minimum thrust should be used to get the aircraft moving and once the aircraft is moving reduce thrust to IDLE.

8.3.7.8.8 Alternates. Distinction should be made between those cases where fuel to alternate is carried to comply with the legal requirements and where operational needs exist due to marginal weather conditions. Where no operational need exists, any suitable airfield can be used, however close, and the reserve fuel requirements should not cause any greater fuel uplift at outstations than absolutely necessary. When marginal weather conditions are

forecast or exist, the alternate chosen should be the closest of those listed where forecast weather is suitable and which is not under the same local influence.

8.3.7.8.9 Route Mileage (Navigation by Ground Based Radio Aids). Turning points should not be overshoot. DME can eliminate overshooting the VOR station and the new track by allowing proper anticipation of a turn. It should be noted that the altitude of the aircraft must be accounted for in computing distances near the DME stations allowing 1nm for every 6,000 ft as an approximation.

8.3.8. Flight in Adverse and Potentially Hazardous Atmospheric Conditions

8.3.8.1 Thunderstorms. Notwithstanding the advice that follows the most basic advice is that thunderstorms should be avoided, either visually, by the use of radar or by other methods. Irrespective of the equipment fitted, the latest meteorological forecasts and actual weather reports should be used to plan routes along which the risk of a thunderstorm encounter is low. If, despite these precautions, the Aircraft Captain finds himself committed to flying through an area of thunderstorm activity, the following procedures are recommended.

8.3.8.1.1 Recommended Techniques for Flying Through Areas of Thunderstorm Activity

a. Approaching the Thunderstorm Area:

- i. Ensure that crew members' and passengers' safety belts or harnesses are firmly fastened and any loose articles or equipment are secured. Switch on seatbelt signs.
- ii. One pilot should control the aircraft and the other (if flying 2 pilot operations) should monitor the flight instruments and electrical supplies continuously.
- iii. Select an altitude for penetration, bearing in mind the importance of ensuring adequate terrain clearance in likely downdraughts. (Investigations have shown that although in some thunderstorms there is very little turbulence at the lower levels, in others there is a great deal; altitude is not necessarily a guide to the degree of turbulence. Increasing height will decrease the buffet margin and up currents may force the aircraft into buffet owing to an increased angle of attack).
- iv. Set the power to give the recommended speed for flight in turbulence, adjust the trim and note its position so that any excessive changes due to autopilot or mach trim can be quickly assessed.
- v. Ensure that the pitot heaters are switched on.
- vi. Check the operation of all anti-icing and de-icing equipment and operate all these systems in accordance with manufacturer's instructions and Company SOPs.
- vii. Disregard any radio navigation indications subject to interference from static, e.g. ADF.
- viii. Turn the cockpit lighting fully on and lower the crew seats and sun visors to minimise the blinding effect of lightning flashes.
- ix. Follow the AFM's recommendations on the use of the autopilot (where fitted) in thunderstorms. Where there are none stated, height, mach, rate of climb or descent and airspeed locks should be disengaged but the yaw damper(s), if fitted, should be operative. (On many aircraft the autopilot, when engaged in a suitable mode - turbulence or basic altitude mode - is likely to produce lower structural loads than would result from manual flight. However, if major trim movements occur due to the autopilot's automatic trim the autopilot should be disengaged. Mach trim operation may occur on some aircraft but the mach trim should remain engaged).

- x. Continue operating, not just monitoring any weather radar in order to select the safest track for penetration, and to minimise the time of exposure whilst avoiding areas of intense activity.
- xi. Be prepared to encounter turbulence, rain, hail, snow, icing, lightning, static discharge and windshear. If fitted switch on the continuous ignition system (considering any system limitations that may exist).
- xii. Avoid flying in close proximity to (including over the top of) a thunderstorm whenever possible. Overflying small convective cells close to large storms should also be avoided, particularly if they are on the upwind side of a large storm, because they may grow very quickly. Similarly, do not contemplate flying beneath the cumulonimbus cloud. In addition to the dangers associated with turbulence, rain, hail, snow or lightning, there may well be a low cloud base, poor visibility and possibly low level windshear.
- xiii. An encounter with severe weather should be the subject of an Air Safety Report (ASR).

b. Within the Storm Area

- i. Maintain positive control of the aircraft whilst concentrating on maintaining a constant pitch attitude appropriate to climb, cruise or descent, by reference to the attitude indicators, avoid harsh or excessive control movements. Do not be misled by conflicting indications on other instruments. Do not allow large attitude excursions in the rolling plane to persist, because these may result in nose down pitch changes.
- ii. Attempt to maintain the original heading – it is usually the quickest way out, turning should not be attempted.
- iii. Do not correct for altitude gained or lost through up and down draughts unless absolutely necessary.
- iv. Maintain the trim settings and avoid changing the power setting except when necessary to restore margins from stall warning or high-speed buffet. The target pitch attitude should not be changed unless the mean IAS differs significantly from the recommended penetration speed.
- v. If trim variations due to the autopilot (auto-trim) are large the autopilot should be disengaged. Movement of the mach trim, where it occurs, is however necessary and desirable. Monitor that the yaw-damper remains engaged.
- vi. If negative 'G' is experienced, temporary warnings (e.g. low oil pressure) may occur. These should be ignored.
- vii. On no account climb in an attempt to get over the top of the storm.

c. After a Thunderstorm Encounter – In Flight

- i. If hail has been encountered, considerable damage to the airframe, not visible from the cockpit or cabin, may have occurred. Consideration should therefore be given to diverting to a suitable nearby aerodrome where the aircraft can be inspected for damage. If this damage has occurred to aerodynamically significant areas, e.g. nose radome, the increased drag will affect fuel burn. Thus the aircraft, if continuing to its destination, may burn considerably more

fuel than expected or planned. Actual fuel usage should now be monitored very closely bearing in mind that some FMS calculate 'expected overhead destination' fuel, based on data that assumes normal (planned) conditions and normal (i.e. full clean) aircraft aerodynamic states.

- ii. If the aircraft has been struck by lightning, treat all magnetic information (e.g. from direct or remote compasses) with extreme caution. The large electric currents associated with a lightning strike can severely and permanently distort the magnetic field of an aircraft rendering all such information highly inaccurate.

d. **Air Traffic Control Considerations**

- i. Modern ATC radars in general do not display the build-up of weather that may constitute a hazard to aircraft and ATC advice on weather avoidance may, therefore, be limited.
- ii. A pilot intending to detour round observed weather when in receipt of an Air Traffic Service which involved ATC responsibility for separation, should obtain clearance from or notify ATC so that separation from other aircraft can be maintained.
- iii. If for any reason the pilot is unable to contact ATC to inform the controller of his intended action, any manoeuvre should be limited to the extent necessary to avoid immediate danger and ATC must be informed as soon as possible.
- iv. Because of the constraints on airspeed and flight path and the increased workload on the crew when flying in a TMA, pilots should consider making a diversion from, or delaying entry to a TMA if a storm encounter seems probable.

e. **Take-off and Landing**

- i. The take-off, initial climb, final approach and landing phases of flight in the vicinity of thunderstorms may present the pilot with additional problems because of the aircraft's proximity to the ground and the maintenance of a safe flight plan in these phases can be very difficult.
- ii. Do not take off if a thunderstorm is overhead or approaching
- iii. At destination hold clear if a thunderstorm is overhead or approaching. Divert if necessary.
- iv. Avoid severe thunderstorms even at the cost of diversion or an intermediate landing.

- f. **On the Ground.** Light aircraft should be adequately secured on the ground when severe thunderstorm activity is forecast or present.

g. **Airworthiness and Maintenance Considerations**

- i. Severe weather conditions may cause damage to the aircraft and power plant installations, some of which may be invisible to the naked eye. Flight manuals and maintenance documents may quantify levels of turbulence which would

trigger a maintenance inspection, similar to those that may be applicable to 'heavy landings'. Hail and lightning damage may often be obvious to crews; however, there will be occasions where damage may be restricted to parts of the airframe not normally visible from the ground, or from the cockpit, immediately following a thunderstorm encounter.

- ii. In the event that crews believe that an aircraft has been exposed to hail, lightning, turbulence greater than moderate, or a heavy landing, they should record the fact(s) in the technical log on arrival to ensure that an appropriate inspection is completed prior to a subsequent release to service.

8.3.8.1.2 Use of Weather Radar - Guidance to Pilots

8.3.8.1.2.1 Echo Avoidance. The table below shows the minimum distance by which echoes should be avoided.

Flight Altitude (ft)	Echo Characteristics			
	Shape	Intensity	Gradient of Intensity	Rate of Change
0-20000	Avoid by 10 miles echoes with hooks, fingers, scalloped edges or other protrusions from the main storm return	Avoid by 10 miles echoes with sharp edges or strong intensities	Avoid by 10 miles echoes with strong gradients of intensity	Avoid by 10 miles echoes showing rapid changes of shape, height or intensity
Above 20000	Avoid all echoes by 20 miles			

Table 33 – Echo avoidance

8.3.8.1.2.2 Summary

- a. Gradient of intensity is applicable to sets with either iso-echo or a colour display. Iso-echo produces a hole in a strong echo when the returned signal is above a pre-set value. Where the return around a hole is narrow, there is a strong gradient of intensity.
- b. If above 20,000ft echoes must be avoided by a minimum of 20nm; if below avoided by a minimum of 10nm.
- c. If storm clouds have to be over-flown, at least 5,000 ft vertical separation must be maintained from cloud tops. It is difficult to estimate this separation but ATC or Met information on the altitude of the tops may be available for guidance.
- d. If the radar is inoperative, any storm that by visual inspection is tall, growing rapidly or has an anvil top must be avoided by 10 nm.
- e. Long ranges on radar must be intermittently monitored to avoid getting into situations where no alternative remains but to penetrate possibly hazardous areas. It is usually

necessary to adjust both 'gain' and 'tilt' during this monitoring process to ensure that new weather 'targets' are not missed and that active clouds are continually tracked.

- f. Avoid flying under a cumulonimbus overhang. If such flight cannot be avoided, the antenna must be tilted full up occasionally to determine, if possible, whether precipitation (which may be hail) exists in or is falling from the overhang.

8.3.8.2 Icing. While the multi-engined aircraft that the Company operates are cleared for flight in icing conditions, the Extra 300 is not. Where possible, flight in icing conditions should be avoided. If icing is encountered, and exceeds the intensity of icing for which the aircraft is certified they shall exit the icing conditions without delay, by a change of level and/or route, if necessary by declaring an emergency to ATC. Pitot head, static vent and fuel vent heaters should be selected 'ON' for all flights through icing conditions, and any equipment fitted should be used for anti-icing or de-icing according to the prevailing conditions and as recommended in the AFM. Company procedures and aircraft limitations in respect of flight in icing conditions are published in the OM Part B for the respective type.

8.3.8.3 Turbulence. If the weather conditions, cloud structure and route forecast indicate that turbulence is likely to be encountered passengers should be pre-warned to expect a 'bumpy ride' and (in the Extra 300) that the pilot might use harsh movements of the control column in order to offset its effects. In the Company's multi-engine aircraft cabin crew, if carried, should be pre-warned, and the passengers advised to return to, and/or remain in their seats, and to ensure that their seat belts/harnesses are securely fastened. Catering and other loose equipment should be stowed and secured until it is evident that the risk of further turbulence has passed. Where possible, holding speed should be increased to allow a greater operating margin but respecting any aircraft or airspace limitations. En-route, the airspeed should be set to that recommended in the flight manual. It is recommended that the autopilot remains engaged unless there is an unintentional disconnection. It is also recommended that the auto-thrust (if fitted) remains engaged initially and the speed is monitored. If there is a large decrease in airspeed the recommended action is to select climb power by deselecting auto-thrust using the throttle push button and set climb power manually. When the speed has increased to a satisfactory level, re-engage the auto-thrust.

8.3.8.4 Wind Shear. Pilots must remain alert to the possibility of wind shear, and be prepared to make relatively harsh control movements and power changes to offset its effects. Immediately after take-off, the pilot's choices of action will be limited, since he will normally have full power applied, and be at the recommended climb speed for the configuration. If the presence of shear is indicated by rapidly fluctuating airspeed and/or rate of climb/descent, ensure that full power is applied and aim to achieve maximum lift and maximum distance from the ground. Similarly, if the shear is encountered during the approach, positive application of the power and flying controls should be used to keep the speed and rate of descent within the normal limits; if there is any doubt, the approach should be abandoned. If a pilot considers there to be a likelihood of wind shear, and the runway permits it, approach speeds should be increased by half the gust factor to cater for any sudden loss of lift. Whenever wind shear is encountered, its existence should be reported to air traffic control (and, where appropriate, following pilots) as soon as possible.

8.3.8.5 Jetstreams. Pilots should avoid flying along the edge of jetstreams due to the possibility of associated turbulence. Pilots should be aware of the effect of increased fuel consumption due to unexpected significant head wind components that can be experienced. It may be possible to avoid jetstreams by changing route and/or altitude.

8.3.8.6 Clear Air Turbulence. Clear air turbulence may sometimes be avoided by increasing/decreasing the cruising level if operational considerations so permit. Monitoring of other aircraft reports also assists in avoidance.

8.3.8.7 Contaminants. A runway is considered to be contaminated when a significant portion of the runway surface area (whether in isolated areas or not) within the length and width being used is covered by one or more of the substances listed under the runway surface condition descriptors listed below:

- a. 'Compacted snow': snow that has been compacted into a solid mass such that aeroplane tyres, at operating pressures and loadings, will run on the surface without significant further compaction or rutting of the surface.
- b. 'Dry snow': snow from which a snowball cannot readily be made.
- c. 'Frost': ice crystals formed from airborne moisture on a surface whose temperature is below freezing; frost differs from ice in that the frost crystals grow independently and, therefore, have a more granular texture.

Note 1: below freezing refers to air temperature equal to or lower than the freezing point of water (0 °C).

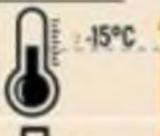
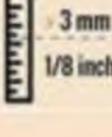
Note 2: under certain conditions, frost can cause the surface to become very slippery, and it is then reported appropriately as 'reduced braking action'.

- d. 'Ice': water that has frozen or compacted snow that has transitioned into ice, in cold and dry conditions.
- e. 'Slush': snow that is so water-saturated that water will drain from it when a handful is picked up or will splatter if stepped on forcefully.
- f. 'Standing water': water of depth greater than 3 mm.
Note: running water of depth greater than 3 mm is reported as 'standing water' by convention.
- g. 'Wet ice': ice with water on top of it or ice that is melting.
Note: freezing precipitation can lead to runway conditions associated with wet ice from an aeroplane performance point of view. Wet ice can cause the surface to become very slippery. It is then reported appropriately as 'reduced braking action'.
- h. 'Wet snow': snow that contains enough water to be able to make a well-compacted, solid snowball, but water will not squeeze out.

8.3.8.7.1 Global Reporting Format. The Global Reporting Format introduces a common language between airport operator, ATC and pilots and enables the harmonized assessment and reporting of runway surface conditions and a correspondingly improved flight crew assessment of take-off and landing performance based on the following criteria:

- a. The Runway Condition Assessment Matrix (RCAM)
 - Matrix allowing the assessment of the runway condition.
- b. The Runway Condition Code (RWYCC)

- A score from 0 (wet ice) to 6 (dry) describing the runway surface condition.
- c. The Runway Contaminants and descriptors
 - Type of contaminants (standing water, compacted snow, dry snow, wet snow, slush, frost, ice) with criteria of depth or temperature.
- d. The Pilot's Report on Braking Action.
 - Whenever the runway braking action encountered during the landing roll is not as good as that reported by the aerodrome operator in the runway condition report (RCR), the commander shall notify the air traffic services (ATS) by means of a special air-report (AIREP) as soon as practicable.

Assessment Criteria from aerodrom operator		Downgrade Assessment Criteria from PILOT	
RWY Cond* Code	RWY-CONDITION-DESCRIPTION	OBSERVATION	AIREP Braking Action
6	DRY		
5	FROST WET SLUSH DRY SNOW WET SNOW 	Braking deceleration is normal for the wheel braking effort AND directional control is normal	GOOD
4	COMPACTED SNOW 	Braking deceleration OR directional control is between Good and Medium	GOOD TO MEDIUM
3	SLIPPERY WET (wet runway) DRY SNOW or WET SNOW (any depth) ON TOP OF COMPACTED SNOW DRY SNOW WET SNOW  COMPACTED SNOW 	Braking deceleration is noticeably reduced for the wheel braking effort applied OR directional control is noticeably reduced	MEDIUM
2	STANDING WATER SLUSH 	Braking deceleration OR directional control is between Medium and Poor	MEDIUM TO POOR
1	ICE	Braking deceleration is significantly reduced for the wheel braking effort applied OR directional control is significantly reduced	POOR
0	WET ICE WATER ON TOP OF COMPACTED SNOW DRY SNOW or WET SNOW ON TOP OF ICE	Braking deceleration is minimal to nonexistent for the wheel braking effort applied OR directional control is uncertain	LESS THAN POOR

Note. At Government aerodromes, runway surface conditions may be described in plain language, and where a braking action measuring device has been used, braking action will be described as GOOD, MEDIUM or POOR.

8.3.8.7.1.1 Runway Condition Report. The outcome of the runway condition assessment matrix and consequent assignment of a runway condition code are transmitted to pilots using a Runway Condition Report, enabling use of the condition code to correctly carry out landing and take-off performance calculations for wet or contaminated runways:

- Aircraft Performance Section (mandatory)
 - Airport Designator
 - Assessment Date and Time
 - Lower Runway Designator
 - RWYCC per third
 - Coverage per third
 - Depth of contamination per third
 - Contaminant type per third
 - Width for which assessment of RWYCC applies
- Situational Awareness Section (optional)
 - Reduced Runway length
 - Drifting Snow
 - Loose Sand
 - Chemical Treatment
 - Snowbanks on Runway
 - Snowbanks on Taxiway
 - Snowbanks adjacent to Runway
 - Taxiway Conditions
 - Apron Conditions
 - Measured Friction
 - Free-text Remarks

GG EADBZQZX EADNZQZX EADSQZX
070645 EADDYNYX
SWEA0151 EADD 02170055
SNOWTAM 0151

EADD 02170055 09L 5/5/5 100/100/100 NR/NR/NR WET/WET/WET
EADD 02170135 09R 5/2/2 100/50/75 NR/06/06 WET/SLUSH/SLUSH
EADD 02170225 09C 2/3/1 75/100/100 06/12/12 SLUSH/WET SNOW/WET SNOW 30
RWY 09L SNOWBANK R20 FM CL. RWY 09C ADJ SNOWBANKS. TWY B POOR. APRON NORTH POOR.

8.3.8.7.2 Basic Effects of Contaminants. A water depth of less than 3mm is normal during and after heavy rain and in such conditions, no corrections to takeoff performance are necessary other than the allowance, where applicable, for the effect of a wet or slippery surface. However, on such a runway where the water depth is less than 3mm and where the additional drag is insignificant, isolated patches of standing water or slush of depth in excess of 15mm located in the latter part of the takeoff run may still lead to ingestion and temporary power fluctuations which could impair safety. Depths greater than 3mm of water, slush or wet snow, or 10mm of dry snow, are likely to have a significant effect on the performance of aircraft. The main effects are:

- a. Additional drag - retardation effects on the wheels and spray impingement drag;
- b. Possibility of power loss or system malfunction due to spray ingestion or impingement;
- c. Reduced wheel braking performance - the problems of aquaplaning;
- d. Directional control problems;
- e. Possibility of structural damage.

8.3.8.7.3 Runways Designated Slippery When Wet. Additionally, a number of runways are designated "Slippery When Wet". When this designation is used the runway should have a braking action that requires the application of a lower crosswind limit and an adjustment to the take off and landing deceleration performance calculations. Knowing the decrement to apply depends on the amount of information that is available about the runway that has been notified as "slippery when wet". Information on runways designated as "Slippery When Wet"

can be obtained from the special briefings referred to in Part C to the Manual which are held in the Aerodrome Briefing File in Operations, from NOTAMS, the flight brief and other means such as ATC. When a runway is notified as “may be slippery when wet” with no other substantive information, take offs or landings in wet conditions should only be considered when the distances available equal or exceed those required for a slippery or icy runway, as determined from the approved information in the AFM. When a specified portion of the runway is notified as “slippery when wet” and the location, length and breadth of that portion are specified along with its braking action and or friction characteristics, the restrictions on take-off and landing performance can be further refined. Take offs and landings in wet conditions should only be considered after taking account of this information in accordance with the manufacturers’ recommendation with respect to performance calculations and maximum applicable crosswind limit. A mean braking action that is an average of the whole runway must not be used in the foregoing considerations because it can mask the slippery portion of the runway and be misleading. It is only the braking or friction information for the “slippery when wet” portion which can be used as above. In these cases, the surface of the rest of the runway can be assumed to provide normal braking action. A continuous depth of water of greater than 3mm is unlikely as a result of rain alone, but can occur if torrential rain combines with a lack of runway camber/crossfall or a crosswind to reduce the rate of water drainage from the runway. In such conditions the water depth is unlikely to persist for more than about 15 minutes after the rain has ceased and takeoff should be delayed accordingly.

8.3.8.7.4 Ground Operations. On the ground, manoeuvring may require the use of slower taxiing speeds to allow for the reduction in braking performance in snow, slush or standing water. At the same time, higher power settings may be required to overcome the drag caused by such contaminants, and great care should be taken to avoid jet blast from blowing unsecured ground equipment or contaminants into nearby aircraft. When taxiing, account may need to be taken of banks of cleared snow and their proximity to wings, propeller tips and engine pods. It may be advisable to delay the completion of such vital actions as flap selection to minimise the danger of damage to such surfaces, or the accumulation of slush on their retraction mechanisms. Greater distances should be observed between successive aircraft to avoid damage from jet blast or propeller wash.

8.3.8.7.5 Take-offs

- a. **Minimizing Risks.** For unavoidable operations from contaminated runways the following procedures may assist:
- i. Takeoffs should not be attempted in depths of dry snow greater than 60mm or depths of water, slush or wet snow greater than 15mm. If the snow is very dry, the depth limit may be increased to 80mm;
 - ii. Ensure that all retardation and anti-skid devices are fully serviceable and check that tyres are in good condition;
 - iii. Consider all aspects when selecting the flap/slat configuration from the range permitted in the AFM;
 - iv. Do not carry unnecessary fuel;
 - v. Ensure that de-icing of engine intakes, if appropriate, has been properly carried out and that the aircraft is aerodynamically clean at the time of takeoff;

- vi. Pay meticulous attention to engine and airframe anti-ice drills;
 - vii. Do not attempt a takeoff with a tailwind or, if there is any doubt about runway conditions, with a crosswind in excess of the slippery runway crosswind limit. In the absence of a specified limit takeoff should not be attempted in crosswinds exceeding 10kt;
 - viii. Adopt taxiing techniques which will avoid snow/slush adherence to the airframe or accumulation around the flap/slat or landing gear areas;
 - ix. Use the maximum runway distance available and keep to a minimum the amount of runway used to line up. Any significant loss should be deducted from the declared distances for the purpose of calculating the RTOW;
 - x. Normal rotation and takeoff safety speeds should be used, (e.g. where the AFM includes data for the use of overspeed procedures to give improved climb performance, these procedures should not be used). Rotation should be made at the correct speed using normal rate to the normal attitude;
 - xi. Maximum takeoff thrust should be used.
- b. **Decision Making Considerations.** Aircraft Captains should also take the following factors into account when deciding whether to attempt a takeoff:
- i. The nature of the overrun area and the consequences of an overrun off that particular runway;
 - ii. Degradation of visual acuity of NVIS or other EVS due to the environmental conditions;
 - iii. Weather changes since the last braking and contaminant report, particularly precipitation and temperature, the possible effect on acceleration and stopping performance and whether subsequent contaminant depths exceed AFM limits.
- c. **TOD and ASD.** On the runway, directional control may be adversely affected by surface contamination; take-off distance may be increased due to slower acceleration and because of poor braking action and/or aquaplaning, accelerate-stop distance may be further increased. In assessing the performance effect of increased drag the condition of the upwind half of the takeoff runway is most important, i.e. the area where the aircraft is travelling at high speed. Small isolated patches of standing water will have a negligible effect on performance, but if extensive areas of standing water, slush or wet snow are present and there is doubt about the depth, takeoff should not be attempted.
- d. **Techniques.** Undercarriage and flap retraction should be delayed to blow contaminants off the services and to minimize the risk of incorrect service position indications (micro-switch fouling) and contaminants freezing on surfaces or services during flight.

8.3.8.7.6 Cruise

- a. When encountered whilst in flight, heavy precipitation can be associated with significant downdrafts and wind shear.
- b. Any specific considerations in the AFM for engine and electrical generation handling must be observed.

8.3.8.7.7 Landing

- a. **Aquaplaning.** Depths of water or slush exceeding approximately 3mm over a considerable portion of the runway length can have an adverse effect on landing performance. Under such conditions aquaplaning is likely to occur with its attendant problems of negligible wheel braking and loss of directional control. Moreover, once aquaplaning is established it may, in certain circumstances, be maintained in much lower depths of water or slush. A landing should only be attempted in these conditions if there is an adequate distance margin over and above the normal Landing Distance Required and when the crosswind component is small.
- b. **Crosswinds.** If landing on a contaminated runway is unavoidable, any crosswind component should be well below the normal dry runway figure.
- c. **Techniques.** Touchdown should be made firmly and at the beginning of the touchdown zone, the nose wheel lowered as early as possible, and any retarding devices such as spoilers, lift dump or reverse thrust/pitch, being used before beginning to apply wheel brakes, in order to give the wheels time to spin up. If anti-skid braking systems are fitted and serviceable, they should be used immediately and to the maximum degree.
- d. **Diversion Decisions.** Heavy precipitation can quickly lead to high levels of runway contamination so runway clearance/drainage rate must be closely monitored in order to assess if a diversion might be necessary.

8.3.8.8 Sandstorms

- a. Sandstorms are limited in nature due to the relatively "heavy" nature of the material. Sandstorms tend to be no higher than several thousand feet, with most of the material fairly low. They are dependent on the strong winds to keep the sand aloft and when the wind dies, the particles drop. Many sandstorms tend to settle around sunset.
- b. Dust storms, however, are similar though comprise of finer material though there are some important differences that need to planning for. The stronger winds create a greater hazard. Dust storms tend to average heights of about 3000 to 6000 feet. When a large storm system moves through, the heights almost double to about 10,000 feet. There are reported extremes of haze and dust at elevations from 35,000 to 40,000 feet. Low visibility associated with dust storms can be severe; this is the greatest hazard to aviation. With strong storm systems, the wind may be so strong and the amount of material aloft so great that visibility is near zero. Most dust storms produce visibilities from one-half to three miles near the strongest winds at the edge of the storm. The visibility picks up within about 150 nm to almost two to five nm. Unfortunately, once the finer particles are aloft, the wind speeds can decrease and the dust remains in the atmosphere. Reduced visibilities can last for several days, with slant range visibility being worse than the horizontal visibility. Like ice crystals at

higher altitudes, the dust can create some interesting light shows using reflected and refracted sunlight to create halos and coronas.

- c. Besides visibility restrictions, the next biggest hazard to aviation is the 'wear and tear' from slow abrasion of dust and sand. Equipment will need to be checked more often and cleaned continuously to permit sustained operations in these environments.
- d. Avoid flying in sandstorms whenever possible. When on the ground, aircraft should ideally be kept under cover if dust storms are forecast or in progress. Alternatively, all engine blanks and cockpit covers should be fitted, as well as the blanks and 'gloves' for the various system and instrument intakes and probes. These should be carefully removed before flight to ensure that accumulations of dust are not deposited in the orifices which the covers are designed to protect.

8.3.8.9 Mountain Waves

- a. Air flowing over any high ground is likely to be more disturbed and turbulent than over level country, and the forced ascent of air over high ground often leads to cloud formation, which may extend to a substantial height if the relative humidity is high. The forced ascent of air will also increase any instability present and thunderstorms are more likely, even where there is no convective cloud formation over the lower ground. The prevalence and severity of icing is also likely to be greater. Even where the air is dry there will be turbulence, which may not be indicated by associated cloud formation.
- b. The severity of the turbulence will be in direct proportion to the speed of the airflow. Strong down currents will be formed by the air descending on the downwind slopes of high ground, which can give rise to hazardous situations for aircraft flying in the lower levels in the vicinity of high ground. Pilots should also be alert to the dangers and severity of turbulence in the lee of high ground. Severe turbulence and windshear may be encountered within a lee-wave rotor caused by flow separation behind the mountain range. Take-off and landing is not advisable in such conditions. If severe turbulence is encountered at low level in the lee of a mountain range, the quickest way out is up. If unable to climb, the next best course of action is to fly directly away from the range.
- c. On some occasions the disturbance of air flowing across a ridge or range of hills or mountains will cause an organised system of large downdraughts and updraughts known as standing waves (or lee waves or mountain waves). Standing wave effect is most pronounced where the air is flowing across the high ground at right angles (within about 30°) to a substantial ridge, but can be associated with a relatively low range of hills. Wind speed will increase with altitude and direction will normally be fairly constant. The strongest waves are often associated with jetstreams at altitude.
- d. Mountain waves may extend for many miles down-wind of the initiating high ground, between 50 and 100 nm is quite usual, and the effect has been detected up to 250 nm from the Pennines. Wave systems may extend into the stratosphere.

- e. Lenticular clouds provide the most unmistakable evidence of standing wave effect. They have a smooth lens shaped outlines and may appear at several levels, looking something like a stack of inverted saucers in the sky. Lenticular clouds form in the crests of the waves and remain more or less stationary. The air in the region of the lenticular cloud is usually smooth, but a ragged edge to the 'lens' can be an indication of turbulence. Rotor clouds are another characteristic of mountain waves. These clouds form beneath the wave crests parallel to and downwind of the line of the high ground. Airflow within the region of these clouds is rotating about a horizontal axis usually having the same height as the high ground. The air in the vicinity of rotor clouds is extremely turbulent with vertical accelerations of 2g - 4g being common.
- f. Although cloud can provide the visual indication of wave effect, the characteristic cloud types may be obscured by other cloud systems, particularly frontal cloud, or the air may be too dry to form any clouds at all.
- g. When flying through standing waves, strong fluctuations of wind velocity and associated turbulence can be expected. The transition from smooth to turbulent air may be very abrupt, and this can be a primary danger at the higher cruising levels where the margin between the Mach number for 1g buffet and the stall is restricted. Turbulence in jetstreams will often be greatly increased over high ground both in extent and intensity. Turbulent air is most usual on the cold side of the jetstream, but in standing wave turbulence may be most severe on the warm side.
- h. An aircraft entering a wave system with the auto-pilot (including height and airspeed locks) fully engaged may begin to oscillate in the pitching plane as the auto-pilot attempts to maintain the selected height and airspeed. This oscillation can become unstable and if not checked may put the aircraft in a dangerous flight condition as a result of excessive tailplane deflection. If the aircraft is being flown manually and the pilot attempts to maintain height or airspeed, a similar result may occur. In either case it is important to follow the well-established technique of flying attitude in these conditions.
- i. When planning flights in the vicinity of high ground Aircraft Captains should be aware of the possibility of standing wave effect, particularly if frontal conditions are present in the area and a jetstream is expected at altitude. Although areas of turbulence associated with standing waves cannot be forecast with accuracy, known areas and heights of turbulent layers are included in SIGMET warnings in briefing folders and broadcast on Volmet. MSA should be increased as indicated in 8.1.1 of this Operations Manual for flights in the region of known or suspected standing wave effect.

8.3.8.10 Volcanic Ash

8.3.8.10.1 General. Volcanic dust may remain in the atmosphere over an area of hundreds of miles for some considerable period of time after a volcanic eruption. The atmospheric repercussions of volcanic activity can be particularly hazardous to aircraft. Flight through dense volcanic ash clouds can cause extreme abrasion to all forward facing parts of the aircraft, to the extent that visibility through the windshields may be impaired, aerofoil and

control surface leading edges may be damaged, airspeed indications may be unreliable through blocking of the pitot heads and engines may become so choked as to cause power interruptions or even shut-downs. The NOTAM system details known areas where ash may be present in the atmosphere. Flight into such areas should be avoided, particularly at night or in daytime forecast IMC conditions when ash clouds may not be seen. Airborne weather radar is not designed to detect volcanic dust and cannot be relied upon to do so. Reported instances of flight into such activity indicate that the weather radar will not pick up any returns so the only avoidance methods are by ASHTAM, SIGMET, ATC reports or visual contact. In the UK, areas of ash contamination will be displayed on the Volcanic Ash Concentration Chart available from the UK Met Office. The CAA will issue NOTAMS specifying UK airspace predicted to contain medium and high concentrations of ash; these may be different to the Met Office data due to procedures such as smoothing and buffering.

8.3.8.10.2 Ash Concentration Definitions. In the event that there is volcanic ash present in the air, ICAO has defined three levels according to the concentration of ash contamination in an area of defined dimensions. “Defined dimensions” refer to horizontal and vertical limits:

- a. **Low.** An airspace of defined dimensions where volcanic ash may be encountered at concentrations equal to or less than 2×10^{-3} g/m³ but greater than 2×10^{-4} g/m³.
- b. **Medium.** An airspace of defined dimensions where volcanic ash may be encountered at concentrations greater than 2×10^{-3} g/m³ but less than 4×10^{-3} g/m³.
- c. **High.** An airspace of defined dimensions where volcanic ash may be encountered at concentrations greater than 4×10^{-3} g/m³ or areas where there is no guidance available.
- d. **Temporary Danger Area (TDA).** Volcanic ash TDAs will be established around areas of high concentration of volcanic ash and will be promulgated by NOTAM. They may be layered but letterboxes would be inappropriate. There will be a 1000ft buffer below a TDA. Should an aircraft operating at the maximum useable level beneath the TDA receives a TCAS RA “Climb”, this can be complied with as per normal procedures. A TDA does not imply the airspace is closed.

8.3.8.10.3 Effects of Volcanic Ash on Company Aircraft

- a. **Warnings.** The Company flies its piston engine aircraft predominantly in VFR conditions by day. It is unlikely that there will be a need for Company aircraft to fly through high concentrations of ash, or that they would fly through volcanic ash without warning. ASHTAM forecasting in the European Region means it is extremely improbable that a Company pilot would penetrate an ash cloud inadvertently. Company jet and turbo-prop aircraft are more at risk of inadvertent volcanic ash encounters than it’s piston engine fleets.

- b. **Risk Assessment.** The aircraft themselves are affected to different degrees by volcanic ash. The engine and airframe manufacturers have been consulted and a risk assessment has been submitted to and approved by the Authority.
- c. **Engine Failure Threat.** The major volcanic ash threat is ash causing an engine to stop. But, for the Company's piston engine aircraft, this threat is remote because volcanic ash melts at a temperature above the running temperature of the engines. In general, the higher the engine running temperature, the greater the risk. Therefore, the jet turbine powered aircraft carry the greater risk. However, while, large quantities or long exposure to ash could damage the engines internally by abrasion, the ash is unlikely to melt and, therefore, it will not markedly change the friction or flow characteristics of the various engine chambers. It may however block fuel burner nozzles or starve the engine of oxygen.
- d. **Extra 300.** The Company's Extra 300 operations are invariably flown in day VFR. Therefore, any dense ash clouds would be likely to be seen. The Extra 300 is powered by an unfiltered piston engine and, while it does not run at a temperature that could melt ash, it could ingest ash which could damage the insides of the engine. In extremis, which is extremely improbable, large quantities of ash might block the engine intake causing the engine to fail. However, because such dense ash clouds would be seen and smelled and avoided, it is almost inconceivable that this would occur.
- e. **PA-31 Navajo.** Navajo operations are conducted predominantly under VFR conditions but occasionally under IFR and/or at night when ash clouds would not be seen with the naked eye. PA-31 operations with the aid of EVS may facilitate early detection of ash clouds, depending on composition/concentration. Operator experience suggests that dense clouds would be smelled (the sulphur dioxide 'rotten eggs' smell would swiftly and easily penetrate the unpressurized cabin of the Company's PA-31 aircraft). The Navajo's engines are fitted with filters and, therefore, it is improbable that the engines would become blocked sufficiently to stop. In the event that they were starved of the primary source of air, and were they to rough run, the alternate air source would be used to circumvent the blockage.
- f. **King Air.** King Air operations are conducted both VFR and IFR by day and night but owing to European weather forecasting inadvertent flight into an unseen cloud is extremely improbable. The King Air engines are turbines; they run hotter than piston engines. The maximum inter-turbine temperature is 1000°C (during start) and the engines' maximum normal operating temperature is 700°C. Ash melts at 1100°C, so it is improbable that ash will melt in the engine and affect the flow of air or change the effective size of any of the chambers (thereby reducing the tolerances of moving parts which might cause engine failure). Even though the King Air cabins are pressurized, fed by bleed air from the engine, recent experience gleaned from other operators suggests that ash clouds would be smelled (the sulphur dioxide 'rotten eggs' smell). Were this to happen the aircraft should be flown out of the ash cloud (by reverse routing and / or by changing height).

- g. **Boeing 727 / 737.** If volcanic dust is encountered, all thrust levers must be retarded and continuous ignition selected ON until clear of the area. If EGT continues to rise at idle power, indicating a stalled condition, such that the EGT limit is likely to be exceeded, the engine should be shut down and a relight initiated immediately. When clear of volcanic dust each engine should be SLOWLY accelerated to the required power and monitored to confirm satisfactory operation. (see manufacturer's supplementary procedures – operation in volcanic ash / dust – corrective actions).

8.3.8.10.4 Flight in Areas Affected By Volcanic Ash. For Company CAT operations:

- a. All flights in Class A and C areas must comply with published TDA procedures. Company flight is permitted subject to extant safety risk assessments acceptable to the Authority.
- b. Turbine engine flight in Class D and G airspace must comply with published TDA procedures. Company flight is permitted subject to extant safety risk assessments acceptable to the Authority.
- c. Piston engine flight in the HIGH, MEDIUM or LOW concentration areas in Class D and G airspace is permitted subject to extant safety risk assessments acceptable to the Authority.
- d. Operations at aerodromes contaminated by volcanic ash is permitted subject to extant safety risk assessments acceptable to the Authority.

8.3.8.10.5 Pre-Flight Procedures

- a. Before all flights, aircrew are to check both the NOTAMs (AHSTAMS) and met office web site to confirm the position of any volcanic ash.
- b. If CAT operations have been planned to be within the areas of volcanic ash they should be re-routed if possible. Captains are not to plan to fly over ash clouds unless they can avoid descending into it in the event of an emergency. The buffer should be 2000ft.
- c. If a flight is permitted and flown from an area contaminated by ash the Operator is to inspect for erosion, damage and/or system degradation daily. In particular, check: wing leading edges; navigation lights and radomes; landing gear; horizontal stabilizer; all extruding structures; pitot tubes and static ports; windows and windshields; engine inlets and nacelles; engine compressors and turbines; engine oil systems; blades.
- d. If a permitted flight is planned through an area contaminated by ash pilots are to:
 - i. Avoid it if possible (preferably upwind);
 - ii. Carry extra fuel in order to route round it if possible;
 - iii. Minimize the time spent within it if flying through it;
 - iv. Avoid IMC wherever possible (as droplets provide nuclei for ash to cling to);
 - v. Record the time actually spent within each zone on the aircraft Tech Log;

- vi. Notify the CAM (who will ensure that engine and airframe manufacturers' requirements are complied with post flight);

8.3.8.10.6 In-Flight Procedures. If the pilot suspects he has flown into an ash cloud that might constitute an area of HIGH concentration. He is to:

- a. Select minimum power and disconnect the auto throttle if appropriate;
- b. Initiate a descending 180° turn out of the zone;
- c. Declare a PAN/MAYDAY as appropriate
- d. Tell ATC that you have had a volcanic ash encounter;
- e. Brief the passengers (who may well be able to smell it);
- f. Use 100% oxygen as required (in accordance with the relevant smoke and fumes drills)
 - i. Procedurally for flight crew as a precaution;
 - ii. As required for passengers if appropriate;
- g. Re-start any failed engines (using 'starter assist' procedures);
- h. Use alternate air as appropriate;
- i. Consider that speed indications may be unreliable (in extremis use GPS speed adjusted for wind);
- j. Land as soon as practical.

8.3.8.10.7 Post Flight Actions. Following unpredicted flight into an area of ash:

- a. The Captain should submit a Special Air Report to the UK Met Office on PD 918.
- b. The Aircraft Captain is to complete an MOR through the SMS.
- c. Before a further CAT/PT flight, the aircraft is to be inspected by appropriately qualified engineers and subsequently cleared to fly by the CAM.
- d. Tech logs are to be completed showing the length of time flown in each area.
- e. Aircraft engines are to be sampled and inspected in accordance with the manufacturers' requirements.

8.3.8.11 Temperature Inversions. All ambient temperature variations have an effect on aircraft performance. Inversions will usually affect performance adversely, pertinent if being flown at performance limits. The significance of this will vary according to aircraft type and operating mass. Examples of inversion effects include those shown below.

- a. **Climb Performance.** Large temperature inversions encountered shortly after take-off can seriously degrade an aircraft's climb performance, particularly at high operating mass. Similarly, if the aircraft is operating to a maximum landing mass limited by go-around climb performance considerations, the required gradient may not be achieved.
- b. **Cruise Capability.** The maximum cruising altitude capability of the aircraft can be significantly reduced if a temperature inversion of even small magnitude exists in the upper levels. This may prevent an aircraft reaching its preferred cruising altitude. Should an aircraft encounter an area of inversion once in the cruise at limiting altitude its buffet margins may be so eroded that a descent is necessary.

- c. **Low Level Temperature Inversions.** Temperature inversions at lower levels in the atmosphere are frequently associated with deteriorating visibility and can prevent the clearance of fog for prolonged periods.

- b. **Landing in Shallow Fog.** In shallow fog conditions, especially at night, the whole of the approach and/ or runway lighting may be visible from a considerable distance on the approach even though runway visual range or meteorological reports indicate the presence of fog. On descent into such fog layer, the visual reference is likely to diminish rapidly, in extreme cases reducing from the full length of the approach lights to a small segment. The employment of NVG may exacerbate these effects under conditions of mist/thin fog. A rapid fall-off of visibility in the final stages of the approach may cause an illusion that the aircraft has pitched nose up, inducing a “corrective” movement in the opposite direction. The risk of striking the ground with a high rate of descent of this erroneous correction is very real.

8.3.9 Wake Turbulence

8.3.9.1 Spacing Requirements for Normal Use. The physical characteristics of aircraft are such that their passage leaves an area of disturbed air in their wake. This wake turbulence tends to increase with the size of the aircraft and can be dangerous to following aircraft. The dangers are greatest during the critical stages of flight on take-off or landing and pilots are to be aware of and avoid the hazards of wake turbulence by allowing an adequate interval or spacing between their own and preceding aircraft for any such turbulence to dissipate.

Although air traffic controllers will normally warn departing or arriving aircraft of the need to observe particular intervals when following aircraft of a higher wake turbulence category Aircraft Captains must also be aware and apply separation.

For en-route flight no special longitudinal wake turbulence separations based on time are required. The following surveillance-based wake turbulence separation minima are applied in en route flight: minimum of 5 NM between a Heavy (including a Super) and a Medium (Upper and Lower), Small or Light aircraft following or crossing behind at the same level or less than 1,000 ft below.

8.3.9.2 Weight Categories (maximum take-off mass in kg). The UK wake turbulence categories differ from those of ICAO, with aircraft divided into **six** categories for approach and **five** categories for departure. These UK/ICAO criteria differences do not affect the composition of Flight Plans which should be completed iaw ICAO PANS-ATM, indicated in item 9 as J, H, M or L.

Category	ICAO and Flight Plan	UK Departures	UK Arrivals
Super (J)	136 000 or greater	136 000 or greater	136 000 or greater
Heavy (H)	136 000 or greater	136 000 or greater	136 000 or greater
Medium(M)	7000 – 136 000	40 000 - 136 000	N/A
Upper Medium(UM)	N/A	N/A	104 000 – 136 000
Lower Medium(LM)	N/A	N/A	40 000 – 104 000
Small(S)	N/A	17 000 - 40 000	17 000 - 40 000
Light(L)	7000 or less	17 000 or less	17 000 or less

Table 35. Weight Categories for Wake Vortex Separations

Note: Within the UK, the B707, B757, DC8, and IL62 are classified as Upper Medium.

Note: The SUPER category is only assigned to specific aircraft types by the competent authority. Types assigned to the SUPER category by the CAA are the Airbus A380-800, Antonov AN-124 Ruslan and Antonov AN-225 Mriya.

8.3.9.3 Wake Turbulence Separation Minima - Final Approach. The minimum spacing specified in Table 36 below is to be applied between successive aircraft when an aircraft is operating directly behind or crossing behind another aircraft at the same altitude or less than 1000ft below, or both aircraft are using the same runway or parallel runways separated by less than 760m.

Leading Aircraft	Following Aircraft	Wake Turbulence Separation Minima Distance (NM)
<u>SUPER</u>	<u>SUPER</u>	#
<u>SUPER</u>	HEAVY	<u>5</u>
<u>SUPER</u>	UPPER & LOWER MEDIUM	7
<u>SUPER</u>	SMALL	7
<u>SUPER</u>	LIGHT	8
HEAVY	SUPER	#
HEAVY	HEAVY	4
HEAVY	UPPER & LOWER MEDIUM	5
HEAVY	SMALL	6
HEAVY	LIGHT	7
UPPER MEDIUM	SUPER	#
UPPER MEDIUM	HEAVY	#
UPPER MEDIUM	UPPER MEDIUM	3
UPPER MEDIUM	LOWER MEDIUM	4
UPPER MEDIUM	SMALL	4
UPPER MEDIUM	LIGHT	6
LOWER MEDIUM	SUPER	#
LOWER MEDIUM	HEAVY	#
LOWER MEDIUM	UPPER MEDIUM	#
LOWER MEDIUM	LOWER MEDIUM	#
LOWER MEDIUM	SMALL	3
LOWER MEDIUM	LIGHT	5
SMALL	SUPER	#
SMALL	HEAVY	#
SMALL	UPPER MEDIUM	#
SMALL	LOWER MEDIUM	#
SMALL	SMALL	3
SMALL	LIGHT	4
LIGHT	SUPER	#
LIGHT	HEAVY	#
LIGHT	UPPER MEDIUM	#
LIGHT	LOWER MEDIUM	#
LIGHT	SMALL	#
LIGHT	LIGHT	#

Signifies that separation for wake turbulence reasons alone is not necessary.

Table 36. Wake Turbulence Spacing on Final Approach (Including Whenever Flight Paths will Cross)

8.3.9.4 Wake Turbulence Separation Minima – Departures. The minimum spacing specified in Table 37 below is to be applied when aircraft are using the same runway, or parallel runways separated by less than 760m, or crossing runways if the projected flight path of the second aircraft will cross the projected flightpath of the first aircraft at the same altitude or less than 1000ft below. (If parallel runways are separated by 760m or more the spacing need only be applied if the projected flight path of the second aircraft will cross the projected flight path of the first aircraft at the same altitude or less than 1000ft below.)

Leading Aircraft	Following Aircraft		Minimum Spacing (from time aircraft are airborne)
Super	Super	Departing from the same position or from a parallel runway <760m separation	No wake turbulence separation minima required
	Heavy		2 minutes
	Medium (UM/LM) Small or Light		3 minutes
Heavy	Heavy		4nm or time equivalent
	Medium (UM/LM) Small or Light		2 minutes
Medium or Small	Light		
Super	Super	Departing from an intermediate point on the same or a parallel runway <760m separation	No wake turbulence separation minima required
	Heavy		3 minutes
	Medium (UM/LM) Small or Light		4 minutes
Heavy (Full length Take off)	Heavy		4 NM or time equivalent
	Medium (UM/LM) Small or Light		3 minutes
Medium or Small (Full length Take-off)	Light		3 minutes

Table 37. Take-off Wake Turbulence Spacing from a Runway or Parallel Runways Under 760m Apart (Including Grass Strips)

8.3.9.5 Wake Turbulence Separation Minima – Displaced Landing Threshold. Minima in accordance with Table 38 below are applied between departing aircraft following a heavier category arrival, and between arriving aircraft following a heavier category departure if the projected flight paths are expected to cross.

Leading Aircraft		Following Aircraft		Minimum Spacing at time aircraft are airborne or have touched down
Super	Arr/Dep	Heavy	Arr/Dep	2 minutes
	Arr/Dep	Medium Small or light	Arr/Dep	3 minutes
Heavy	Arr/Dep	Medium Small or light	Arr/Dep	2 minutes
Medium or Small	Arr/Dep	Light	Arr/Dep	

Table 38. Operations from a Runway with a Displaced Landing Threshold if the Projected Flight Paths are Expected to Cross

8.3.9.6 Opposite Direction Runways Operations. A minimum of 3 minutes (4 minutes if Medium, Small or Light following Super) shall be applied between a light, small or medium aircraft and a heavy aircraft and between a light aircraft and a small or medium aircraft when the heavier aircraft is making a low or missed approach and the lighter aircraft is:

- a. Using an opposite direction runway for take-off.
- b. Landing on the same runway in the opposite direction.
- c. Landing on a parallel opposite direction runway separated by less than 760 metres

8.3.9.7 Wake Turbulence Separation Minima – Crossing and Parallel Runways. When parallel runways separated by less than 760 metres are in use, such runways are considered to be a single runway, for wake turbulence reasons, and the wake turbulence minima listed apply to landing and departing aircraft respectively. At aerodromes where a grass strip is in use in addition to the runway(s), the strip will be counted as a runway for the application of wake turbulence separation minima. The final approach minima listed in 8.3.9.3 will apply to:

- a. Departures from crossing and/or diverging runways if the projected flight paths will cross; or,
- b. Departures from parallel runways more than 760 m (2500 ft) apart if the projected flight paths will cross.

8.3.9.8 Wake Turbulence Separation Minima – Intermediate Approach. The following wake turbulence separation minima shall be applied in the intermediate approach segment:

- a. 5 NM between a Heavy (excluding Super) and a Medium (Upper and lower) or small aircraft following or crossing behind at the same level or less than 1000 ft below;
- b. 6 NM between a Heavy (excluding Super) and light aircraft following or crossing behind at the same level or less than 1000 ft below;
- c. As per Final Approach minima for aircraft following a Super at the same level or less than 1000 ft below.

The intermediate approach phase is specific to each individual instrument approach procedure. Therefore, ATC units should define and specify the area or portion of a procedure where the intermediate approach wake turbulence separation minima apply.

8.3.10 Crew Composition *(See also Section 4 to this Part)*

8.3.10.1 Single Pilot Operations. Company piston and turbo-prop aircraft may be operated on CAT/SPO flights single pilot subject to the MEL and the Captain being so qualified and having enough hours and valid single pilot recurrent checks. The pilot will occupy the left hand or rear seat as applicable. For a single-pilot IFR or night flights in aircraft so certified, the auto-pilot must be serviceable.

8.3.10.2 Two Pilot Operations. The Company's multi-engine piston and King Air aircraft are cleared for 2-pilot operations subject to the crew-members' qualifications and the validity of their respective recurrent checks.

8.3.10.3 Multi-Crew Operations. The Company's MEJ aircraft are only to be operated with a full crew complement of Captain, First Officer and for B727 only, a Flight Engineer.

8.3.10.4 Crew Members at Their Stations

8.3.10.4.1 Extra 300. In the Extra 300, the aircraft captain will occupy the rear seat; the passenger will occupy the front seat. When the aircraft is being flown by a pilot under instruction or test, the Captain may fly in the front seat.

8.3.10.4.2 Twin Engine Aircraft. In the Company's twin-engine aircraft, the Captain may occupy either the right or the left seat if there are 2 pilots; however, if the aircraft is being flown by a single crew member, they are to occupy the left-hand seat.

8.3.10.4.3 Multi-Crew Aircraft. During take-off and landing each flight crew member required to be on flight deck duty shall be at his station. Operating flight crew should not leave the flight deck, after the commencement of flight and before the termination of flight, other than for reasons of health (including physiological needs), safety or security. Should a member of operating flight crew leave the flight deck for physiological, health, safety or security reasons, a cabin crew member (if carried) should be in attendance on the flight deck until that flight deck member returns. The guiding principle is that unless safety of the aircraft or its crew or passengers takes precedence, at no time should a single flight crew member be left in the cockpit alone.

During all phases of flight each flight crew member required to be on flight deck duty shall remain alert. If a lack of alertness is encountered, appropriate counter measures shall be used. If unexpected fatigue is experienced a controlled rest procedure, organised by the Aircraft Captain, is an effective mitigation and can be used if workload permits. Controlled rest taken in this way can never be considered to be part of a rest period for the purpose of calculating flight time limitations nor used to justify any duty period. It is not a substitute for proper preflight sleep, but intended as a response to unexpected fatigue experienced during operations. Use of a Fatigue Observation Form should be considered where controlled rest has been taken to alleviate unexpected periods of fatigue and is actively encouraged to identify potentially fatiguing flight duty periods.

8.3.10.4.3.1 Flight Crew Controlled Rest Procedures. Basic principles:

- It should be considered a safety net.
- It should only be used on flights of sufficient length that it does not interfere with required operational duties.
- It should only be used during low workload phases of flight.
- Controlled rest on the flight deck may be used at the discretion of the Captain to manage both unexpected fatigue and to reduce the risk of fatigue during higher workload periods later in the flight.

Recommended Procedures

- a. Only one pilot may take controlled rest at a time in his/her seat. The harness should be used and the seat positioned to minimize unintentional interference with the controls.
- b. The autopilot and auto-thrust systems (if available) should be operational.
- c. Any routine system or operational intervention which would normally require a cross check, should be planned to occur outside controlled rest periods.
- d. The Captain should define criteria for when rest should be interrupted.
- e. Hand-over of duties and wake-up arrangements (to allow for 15 mins of sleep inertia) should be reviewed.
- f. If the aircraft has a third crewmember (not necessarily a pilot), they should be used to monitor controlled flight deck rest.
- g. The controlled rest period should be no longer than 40-45 minutes, to minimize the risk of pronounced sleep inertia on awakening.
- h. Controlled rest should only be utilized during the cruise period from the top of climb to 30 minutes before the planned top of descent. The nap recovery, that includes the allowance for sleep inertia, should be planned to be completed in time for a full descent briefing prior to both top of descent and/or an anticipated increase in workload.
- i. A short period of time should be allowed for rest preparation. This should include an
 - i. operational briefing;
 - ii. completion of tasks in progress, and
 - iii. attention to any physiological needs of either crew member.
- j. During controlled rest, the non-resting pilot cannot leave his/her seat for any reason, including physiological breaks, and shall perform:
 - i. the duties of both the pilot flying and the pilot monitoring;
 - ii. be able to exercise control of the aircraft at all times, and
 - iii. maintain situational awareness.
- k. Personal equipment (such as eye shades, neck supports, ear plugs, etc) should be permitted for the resting pilot.

8.3.10.4.4 Cabin Crew. During critical phases of flight, each cabin crew member shall be seated at the assigned station and shall not perform any activities other than those required for the safe operation of the aircraft. During taxiing, the cabin crew members are allowed to perform safety briefings and demonstrations until the announcement from the flight deck requiring cabin crew to be seated for take-off.



Cabin crew may only take controlled rest if the remaining number of cabin crew exceeds the legal minimum. Cabin Crew controlled rest can only be taken in an area secluded from the passengers and as with Flight Crew controlled rest taken in this way can never be considered to be part of a rest period for the purpose of calculating flight time limitations nor used to justify any duty period.

8.3.11 Admission to the Flight Deck

8.3.11.1 The Captain shall ensure that all persons carried on the flight deck are made familiar with the relevant safety and operational procedures and that admission to, and carriage on, the flight deck does not compromise safety. The Aircraft Captain has the absolute authority to refuse admission to and/or carriage on the flight deck for whatever reason.

8.3.11.2 Authorised Inspectors. Provided only that the safety of the aircraft will not be compromised, authorised inspectors from the Competent Authority are permitted to enter and remain on the flight deck in flight when suitable facilities exist (e.g. unoccupied second pilot's seat), for the performance of his official duties.

8.3.11.3 Staff. Staff may be carried on the flight deck at the discretion of the Aircraft Captain.

8.3.11.4 Passengers. During 2-pilot operations, passengers may not occupy flight deck seating positions. During single pilot operations, passengers are permitted to occupy the vacant crew seats provided that:

- a. The aircraft is not being flown at night or under IFR;
- b. The person's stature is such that he remains clear of the flying controls while seated normally; and
- c. The person is briefed by the Aircraft Captain on the use of the full harness and the times when the full harness and just the lap strap may be worn; and
- d. In accordance with the conditions specified at Para 8.3.11.5 below:

8.3.11.5 Vacant Crew Seats. The occupancy of a vacant flight crew seat on the flight deck or crew seat in the cabin by a person who is not a member of the operating flight or cabin crew is permitted providing the following conditions detailed below are complied with:

- a. Any applicable AFM limitation is observed;
- b. The person is assessed as able to operate self-help exits;
- c. The person has the permission of the Operations Manager and/or the Aircraft Captain;
- d. The Aircraft Captain ensures that the person is properly briefed on safety procedures and equipment, and relevant operating procedures;
- e. The Aircraft Captain emphasises the importance of avoiding contact with, or operation of, any control or switch;
- f. Multiple seat occupancy is not permitted.

Carriage of passengers in cabin crew seats is permitted providing the Aircraft Captain has granted permission, the passenger is over 12 years of age and has been briefed by cabin crew in the use of all safety items applicable to the seat position.

8.3.11.6 B737 Normal Flight Deck Access Procedure. The flight deck door shall be closed and locked from the time all external doors are closed following embarkation until any such door is opened for disembarkation, except when necessary to permit access and egress by authorized persons. For the purposes of this paragraph authorised persons are defined as:

- a. Crewmembers assigned to that flight
- b. Company personnel travelling in an operational capacity associated with the successful completion of that flight
- c. Personnel acting on behalf of the Civil Aviation Authority as part of an agreed duty

The following may, with the permission of the Captain and only in exceptional circumstances be deemed authorized persons

- d. Qualified medical personnel assisting the crew during on-board medical emergency or medical repatriation
- e. Officers of the Law, Military personnel or government employees whose role on the flight has a direct influence on flight safety

The flight deck door shall only be opened after ensuring the curtain or the door is closed to the cabin and ensuring that there is no interference from passengers. The MAXIMUM time limit is 7 seconds.

From off-block to on-block, active crewmembers shall always call flight deck via intercom before allowed admission to flight deck, and they must ensure that there is no possibility of unauthorized persons entering without permission.

A normal access request is initiated from the cabin using the service interphone system. To ensure that operations are normal, all communication between the cabin and cockpit shall be in plain native language. If in doubt of the crew member's identity, the flight crew may ask for the cabin crew member's personal 3-letter code.

The Service Interphone shall only be used by the active crewmembers.

The cockpit door shall not be left open or unlocked at any time unless the Captain deems it necessary for flight safety purposes. Such situations will be reported using a Company ASR.

8.3.11.7 Procedures with an Operative Video Surveillance System. If installed with an operative cockpit door surveillance system, the flight crew must visually monitor that the entrance area is clear, before opening the cockpit door.

8.3.11.8 Procedure without an Operative Video Surveillance System. If there is no operative video surveillance system and in order to monitor the entrance area, a two-way communication must be established between the cabin and cockpit using the interphone system.

In order to ensure that operations are normal and the entrance area is clear, all communication shall be in plain native language. If in doubt of the crew member's identity, the flight crew may ask for the cabin crew member's personal 3-letter code.

8.3.11.9 Normal Egress Procedure. Whenever the flight deck door is closed and locked and a flight crew member should find it necessary to leave the flight deck, flight crew shall as far as other safety related tasks permit:

- a. Establish communication with the cabin crew to ensure a cabin crew member is in the forward area when the flight deck door is unlocked;
- b. Ensure the area is secure before opening the door by looking out the viewing lens;
- c. The door shall only be opened from the inside by means of the door handle;
- d. A crew member shall lock the door, remain on the flight deck and verify that the immediate area is clear, as stated in b. above, before allowing access to the returning flight crew member.

The door shall never be opened unless it can be ensured that there is no risk of any unauthorized persons entering the flight deck.

8.3.12 Use of Safety Harnesses for Crew and Passengers

8.3.12.1 Extra 300 Aircraft. The Aircraft Captain is to ensure the passenger has been briefed to remain strapped in (unless ordered to bail out) for the duration of the flight and is to confirm that the passenger is securely strapped in prior to closing the canopy. Pilots are to fully strap in and be secure for the duration of the flight.

8.3.12.2 Use of Parachutes. Parachutes are normally to be worn for aerobatics. However, if the passenger is too large to wear one comfortably, or where to do so might potentially stressing the canopy, Aircraft Captains may fly aerobatic sorties where the passenger does not wear a parachute.

8.3.12.3 Use of Crew/Passenger Safety Belts/Harnesses in Aircraft with Cabins

8.3.12.3.1 Flight Crew. During take-off and landing, and whenever the Aircraft Captain considers it necessary in the interests of safety, each flight crew member shall be at their station properly secured by the safety belts and harnesses provided. During other phases of flight, any one flight crew member may, with the permission of the Captain, leave their assigned station for an agreed purpose and period. Those flight crew members on the flight deck shall keep their safety belts and harnesses fastened while at their station.

8.3.12.3.2 Cabin Crew. During take-off, final approach and landing and whenever deemed necessary by the Captain, each cabin crew member shall be properly secured by all safety belts and harnesses provided.

8.3.12.3.3 Passengers

- a. The Aircraft Captain shall ensure that each person on board is briefed before take-off on how to fasten and unfasten his safety belt/harness.
- b. Before take-off and landing, and whenever he considers it necessary in the interests of safety, the Aircraft Captain shall ensure that each passenger on board occupies a seat with his safety belt/harness properly secured. On B727 aircraft passengers shall keep their seat belts fastened at all times while seated.

8.3.12.3.4 Infants. Infants may be carried on board Company aircraft with cabin seating using infant lap belt extensions, or secured child car-type safety seats.

Multiple occupancy of aircraft seats is only allowed by one adult and one infant under 2 years who must be properly secured by means of a supplementary loop belt provided by the Company on board the aircraft.

Alternatively, children between the ages of 6 months and 2 years may be secured in an approved car-type child seat, provided by the person responsible for the infant, which is itself secured to the aircraft seat by the lap strap. It must not be located in a seat adjacent to an emergency exit. The child seat must be forward facing and must remain in position for the duration of the flight.

8.3.13 Incapacitation of Flight Crew Members

8.3.13.0 General. Incapacitation is defined as any condition which affects the health of any member of the aircraft crew to the extent that the crew member is unable to continue to carry out their duties. Incapacitation can be gradual or sudden, subtle or overt, partial or complete and may not be preceded by any warning.

8.3.13.1 Partial or Gradual Incapacitation. The following procedures are to be used if a pilot suffers any medical symptoms in flight which might impair his ability to handle the aircraft such that, if he were in a two pilot crew, he would hand over control. These symptoms include severe pain (especially sudden severe headache or chest pain), dizziness, blurring or partial loss of vision, disorientation, vomiting or diarrhoea. The procedures must be followed even if the pilot has apparently recovered, as temporary symptoms are often a warning of more severe illness to follow, and self diagnosis is notoriously unreliable.

- a. **Two pilot crew.** If the affected pilot is handling the aircraft, he is immediately to inform the other pilot and hand over control to him. The destination, base or appropriate agency, is to be informed of the problem and a diversion made to the nearest suitable landing place, bearing in mind the nature and severity of the symptoms and the availability of medical facilities. The affected pilot is not to take control again for the remainder of the flight and is to lock his shoulder harness to prevent him falling on to the controls if the illness becomes more severe. The affected pilot is not to fly again as a crew member until he has been medically examined or, in the case of diarrhoea or vomiting, has had no symptoms for 24 hours.
- b. **Single pilot crew.** It is very important that a single pilot should react early to any illness in flight before it becomes severe enough to affect his handling of the aircraft and an immediate radio call is essential. The first consideration must be for the safety of the aircraft and passengers, therefore, the availability of medical assistance must carry less weight when choosing the nearest suitable diversion.

8.3.13.2 Sudden or Complete Incapacitation. Complete incapacitation may be subtle or overt, and may not be preceded by any warning at any stage of flight, where the pilot handling the aircraft is incapacitated, an accident is inevitable unless the other pilot detects the collapse and is able to assume control in sufficient time. Detection of the incapacitation in the subtle case may be indirect, i.e. only as a result of the pilot not taking some expected action. If, for example, the pilot conducting the approach to land collapses without any overt sign and the body position is maintained, the other pilot may not be aware of his colleague's collapse until the expected order of events becomes interrupted. For 2 pilot crews:

- a. In the context of pilot incapacitation it is essential that crew members closely monitor the aircraft's flight path in the critical stages of take-off, initial climb, final approach and landing, or missed approach and immediately question any deviation from the norm.
- b. Normal crew duties require that during all stages of the flight, pilots and other crew members call the handling pilot's attention to any deviation from the normal flight

path or ATC clearance. Adherence to this procedure should assist early detection of the incapacitation of the handling pilot.

- c. Where the pilot handling the aircraft has collapsed, the other pilot will assume control. Taking control presupposes that the collapsed pilot's body does not interfere with the essential primary flying controls and for this reason the requirement to wear full harness whilst occupying a pilot seat is a safeguard.
- d. Once incapacitation has been detected, the first requirement is to ensure that the affected pilot does not interfere with any controls. It is therefore essential that his harness should be locked and, if possible, the seat slid back. Consideration should be given, if practical, to the briefing and use of cabin crew or passengers for this task, but caution must be observed due to the risk of the seat moving forward when it becomes unlocked. The next priority is to re-plan the flight, including consideration of diverting to the nearest suitable destination.
- e. Medical advice indicates that immediate first aid is not essential or necessary in cases of sudden incapacitation. Therefore, any attempts at first aid should be delayed until after the immediate operational problems have been dealt with.

8.3.13.3 Single Pilot Incapacitation Actions. The Company carries out extensive single pilot operations. This drives more frequent medical assessments than for 2-crew operations and makes Section 6 to this Part all the more important. In single pilot operations, pilot incapacitation could prove catastrophic. Therefore, pilots are only to go flying if they feel fit to do so. If, once airborne, a pilot feels unwell and suspects that he will become incapacitated, he must land the aircraft as soon as possible while he is still fit to do so.

8.3.13.4 Two-Crew 'Incapacitation' Actions. When operating with two pilots, the recovery from a detected incapacitation of the handling pilot shall follow the sequence below:

- a. The fit pilot must assume control and return the aircraft to a safe flight path;
- b. The fit pilot must take whatever steps are possible to ensure that the incapacitated pilot cannot interfere with the handling of the aircraft. These steps may include involving cabin crew and passengers to restrain the incapacitated pilot.
- c. The fit pilot must land the aircraft as soon as practicable to ensure safety of the occupants.

8.3.13.5. The Two Communication Rule. The 'Two communication' rule of thumb should be invoked to assist in detecting incapacitation. This states that a flight crew member should suspect the onset of incapacitation any time when a pilot does not respond appropriately to a second verbal communication associated with a significant deviation from a standard operating procedure or designated flight profile.

8.3.13.6 Incapacitation of the Senior Cabin Crew Member (SCCM). In case of incapacitation of the SCCM, any other active SCCM on the flight will take over the duties. In case no other active SCCM is present, CCM 2 will take over the duties.

In case of incapacitation of the SCCM or CCM and they are not able to guard or even block the designated emergency station, an able-bodied passenger should sit in the crew seat and the incapacitated SCCM or CCM will sit in a passenger seat.

8.3.14 Cabin Safety

8.3.14.1 Smoking. Smoking, including use of electronic smoking devices is not permitted on board Company aircraft.

8.3.14.2 General. For ground support procedures and passenger handling procedures see Para 8.2.2 above. The Aircraft Captain will be responsible for cabin safety from the point at which the ground support staff hand over control of the passenger to him until the passenger has been disembarked and handed over to the ground support staff.

For B737 flights the SCCM assigned to the flight is responsible to the Captain for the cabin safety from the time the first passenger enters the aeroplane until all passengers have been offloaded at the end of the flight. The SCCM shall ensure that all requisite emergency equipment is on board the aeroplane in appropriate stowage(s) according to the Emergency Equipment Checklist. B737 Cabin safety procedures are detailed further in the Cabin Crew SEP Manual.

8.3.14.3 Pre-Flight Briefings. The passenger is to be briefed on likely in flight situations prior to flight in accordance with Annex D to this Section. For sorties in aircraft with cabins, a reminder is to be given on aircraft entry regarding the location and use of emergency equipment and exits; the stowage of tables; the stowage of carry-on baggage; the restrictions on the use of portable electronic devices including flashlights, laptops and mobile telephones; and the prohibition of smoking. The use, fastening and unfastening of seat belts and harnesses are to be demonstrated. If the flight will take-off or land over water, or will be over 50nm from shore, then the use of the lifejacket is to be demonstrated. Any additional in-flight briefings will be given verbally through the aircraft intercom. If an emergency occurs the passengers are to be briefed at the time on such emergency action as may be appropriate to the circumstances by the Aircraft Captain.

8.3.14.4 During Extra 300 Flying. It is understood that the Captain will be unable to physically control the passenger during the flight. Therefore, particular cognisance should be taken as to the attitude and mental state of the passenger: by both the escorting ground support staff and the Captain up until hand over of control of the passenger to the Captain; and by the Captain throughout the flight. If at any time the Aircraft Captain becomes concerned about the passenger he should land immediately in a manner that does not exacerbate the situation. If a passenger becomes incapacitated during a sortie, the Aircraft Captain is to terminate the sortie and land as soon as possible at the nearest suitable airfield. However, if the passenger is merely air-sick, the Aircraft Captain is to land as soon as practical i.e. he may choose to return to base even if that is not the closest airfield.

8.3.14.5 After Extra 300 Flying. The passenger should be reminded to remain strapped in until the aircraft and engine have stopped and either, ground support staff is present at the canopy, or the Aircraft Captain has un-strapped, opened the canopy and is alongside the passenger exit himself.

8.3.14.6 Carriage of Baggage During Extra 300 Flying. The Company operates a 'clean pocket' policy.

- 8.3.14.7 During Twin-Engine Flying.** No person should be in any part of the aircraft that is not designed for their accommodation unless the Captain has granted temporary access for safety reasons, or to examine cargo/stores, or to use a vacant crew seat. In the single pilot case, the use of any available cabin warning signs should be supplemented by drawing the nearest passenger's attention to any requirement to tighten lap straps and secure any catering in case of turbulence, or prepare seats, fold away tables, stow baggage and secure straps for landing. Provided that he can be spared from the flight deck, a second pilot, when carried, may visit the cabin at appropriate times to check such details or when so ordered by the Aircraft Captain.
- 8.3.14.8 After Twin-Engine Flying.** Passengers must be instructed to remain seated with their seat belts fastened until the aircraft has come to rest and the engines have been stopped. Normally a crew member is to open the aircraft door and to remain in attendance with the passengers until an approved escort is available. The Captain is to ensure that local aerodrome procedures do not prohibit pedestrian passengers from traversing the movement area.
- 8.3.14.9 Carriage of Baggage in Twin-Engine Aircraft.** The crew member responsible for cabin safety is to ensure that before taxiing, take-off and landing all exits and escape paths are unobstructed.
- 8.3.14.10 Accessibility of Emergency Equipment.** The Captain is to ensure that relevant emergency equipment remains easily accessible for immediate use.
- 8.3.14.11 Life Rafts and ELTs for Extended Flights over Water.** On overwater flights, an aircraft shall not be operated at a distance away from land, which is suitable for making an emergency landing, greater than that corresponding to:
- a. 120 minutes at cruising speed or 400 nautical miles, whichever is the lesser, for aircraft capable of continuing the flight to an aerodrome with the critical power unit(s) becoming inoperative at any point along the route or planned diversions; or
 - b. 30 minutes at cruising speed or 100 nautical miles, whichever is the lesser, for all other aircraft;

Unless the equipment specified below is carried;

The aircraft has sufficient life-rafts to carry all persons on board and at least two survival emergency locator transmitters (ELT (S)) capable of transmitting on the distress frequencies prescribed in ICAO Annex 10, Volume V, Chapter 2 (406 MHz). Unless excess rafts of enough capacity are provided, the buoyancy and seating capacity beyond the rated capacity of the rafts must accommodate all occupants of the aircraft in the event of a loss of one raft of the largest rated capacity. The life-rafts shall be equipped with:

- a. A survivor locator light; and
- b. Life saving equipment including means of sustaining life as appropriate to the flight to be undertaken.

8.3.14.12 Portable Electronic Devices. (PEDs)

8.3.14.12.1 Definitions and Categories. PEDs are any kind of electronic device, typically but not limited to consumer electronics, brought on-board the aircraft by crew members, passengers or as part of the cargo and that are not included in the approved aircraft configuration. All equipment that is able to consume electrical energy falls under this definition. They can be powered from internal sources such as batteries or the devices may also be connected to specific aircraft power sources.

PEDs fall into 3 categories:

1. Non-intentional transmitters can non-intentionally radiate RF transmissions. This category includes, but is not limited to, computing equipment, cameras, radio receivers, audio and video reproducers, electronic games and toys. In addition, portable, non-transmitting devices provided to assist crew members in their duties are included in this category. The category is identified as PED.
2. Intentional transmitters can radiate RF transmissions on specific frequencies as part of their intended function. In addition, they may radiate non-intentional transmissions like any PED. The term 'transmitting PED' (T-PED) is used to identify the transmitting capability of the PED. Intentional transmitters are transmitting devices such as RF based remote control equipment, which may include some toys, two-way radios (sometimes referred to as private mobile radio), mobile phones of any type, satellite phones, computer with mobile phone data connection, WiFi or Bluetooth capability. After deactivation of the transmitting capability, e.g. by activating the so-called 'flight mode' or 'flight safety mode', the T-PED remains a PED having non-intentional emissions.
3. A controlled PED (C-PED) is subject to administrative control by the operator. This will include, inter alia, tracking the location of the devices to specific aircraft or persons and ensuring that no unauthorised changes are made to the hardware, software or databases. A controlled PED will also be subject to procedures to ensure that it is maintained to the latest amendment state. C- PEDs can be assigned to the category of non-intentional transmitters (PEDs) or intentional transmitters (T-PEDs).

8.3.14.12.2 Definition of the switched-off status. Many PEDs are not completely disconnected from the internal power source when switched off. The switching function may leave some remaining functionality e.g. data storage, timer, clock, etc. These devices can be considered switched off when in the deactivated status. The same applies for devices having no transmit capability and operated by coin cells without further deactivation capability, e.g. wrist watches.

8.3.14.12.3 Use of PEDs on-board. It is important to prevent the use of portable electronic devices (PEDs) on board Company aircraft that may adversely affect the performance of the aircraft's systems and equipment. PEDs may be found in the different aircraft zones – passenger compartment, flight compartment, and cargo compartments. Furthermore, some PEDs may as a specific case be qualified and under configuration control by the Company as controlled PEDs (C-PEDs).

8.3.14.12.3.1 Restrictions on the use of PEDs in the passenger compartment. Passengers may use PEDs on board Company aircraft, subject to the following procedures to control their use. Crew members and ground personnel are trained to enforce the restrictions on this equipment in line with these procedures.

- a. As the general principle all PEDs (including transmitting PEDs (T-PEDs)) are switched-off at the start of the flight when the passengers have boarded and doors have been closed, until a passenger door has been opened at the end of the flight.
- b. The following exceptions from the general principle may be granted at the discretion of the Aircraft Captain:
 - i. Medical equipment necessary to support physiological functions does not need to be switched-off.
 - ii. The use of PEDs, excluding T-PEDs, may be permitted during non-critical phases of flight, such as the cruise, but excluding taxiing.
 - iii. T-PEDs such as Company Satellite phones, may be used during non-critical phases of flight, excluding taxiing, on aircraft equipped with a system or otherwise certified allowing the operation of such technology during flight. The restrictions coming from the corresponding aircraft certification as documented in the aircraft flight manual (AFM), or equivalent document(s), stay in force.
 - iv. The use of C-PEDs during critical phases of flight, however, may only be permitted if the operator has accounted for this situation in its assessment.
 - v. The Aircraft Captain may permit the use of any kind of PED when the aircraft is stationary during prolonged departure delays, provided that sufficient time is available to check the passenger compartment before the flight proceeds. Similarly, after landing, the commander may authorise the use of any kind of PED in the event of a prolonged delay for a parking/gate position (even though doors are closed and the engines are running).
 - vi. The use of PEDs as part of a research, development, test and evaluation capability is detailed in the [CapDev Trial Process Manual](#).
- c. Attention should be paid during the cabin safety brief to inform passengers of the restrictions applicable to PEDs (in particular to T-PEDs).
- d. Where in-cabin electrical power supplies are available for passenger use the following should apply:
 - i. Information cards giving safety instructions are provided to the passengers;
 - ii. PEDs should be disconnected from any in-seat electrical power supply, switched-off and stowed during taxiing, take-off, approach, landing, and during abnormal or emergency conditions; and
 - iii. Flight crew and cabin crew should be aware of the proper means to switch-off in-cabin mission power supplies used for PEDs.
- e. During boarding and any phase of flight:

- i. Flight crew should monitor and be prepared to deal with interference or other safety problems associated with PEDs;
 - ii. Passenger use of equipment during the flight is monitored;
 - iii. Suspect equipment is switched off; and
 - iv. Particular attention is given to passenger misuse of equipment that could include a built-in transmitting function.
- f. The Aircraft Captain may for any reason and during any phase of flight require deactivation and stowage of PEDs.
- g. Occurrences of suspected or confirmed interference that have potential safety implications should be reported to the Authority. Where possible, to assist follow-up and technical investigation, reports should describe the offending device, identify the brand name and model number, its location in the aircraft at the time of the occurrence, interference symptoms and the results of actions taken by the crew. The cooperation of the device owner should be sought by obtaining contact details.
- h. Special requests to operate a PED or T-PED during any phase of the flight for specific reasons (e.g. for security measures) should be handled properly.
- i. Specifically during LVO Approaches the Aircraft Captain will ensure the Senior Cabin Crew Member informs the passengers of the need to switch off all PEDs for the duration of the approach. PEDs may be switched on after landing when the aircraft has taxied clear of the runway.

8.3.14.12.3.2 Restrictions on the use of PEDs in the flight compartment. Due to the higher risk of interference and potential for distracting crew from their duties, PEDs should not be used in the flight compartment during CAT and PT flights. However, the Company allows the use of PEDs to assist the flight crew in their duties during SPO and private flights only, ensuring the following:

- a. The use of PEDs in-flight is limited to the use of iPad devices running Sky Demon VFR and Jeppesen Mobile FlightDeck applications. If not used for these purposes they should be switched off and stowed during all phases of flight. Additionally, a Spidertracker device may be connected.
- b. The PEDs do not pose a loose-item risk or other hazard.
- c. During critical phases of flight only those C-PEDs are operated, for which the operator has demonstrated that the radio frequency (RF) interference levels are below those considered acceptable for the specific aircraft environment. Guidance for such test is provided 8.3.14.12.3.4 below.
- d. During pre-flight procedures, e.g. when loading route information into navigation systems or when monitoring fuel loading, no T-PED should be operated. In all other cases, flight crew and other persons on board the aircraft involved in dispatching the aircraft should observe the same restrictions as applicable to passengers.

- e. These restrictions should not preclude use of a T-PED (specifically a mobile phone) by the flight crew to deal with an emergency. However, reliance should not be predicated on a T-PED for this purpose.

8.3.14.12.3.3 PEDs not accessible during the flight. PEDs not accessible during the flight should be switched off. This should apply especially to PEDs contained in baggage or transported as part of the cargo. The operator may allow deviation for PEDs for which tests have demonstrated their safe operation. Other precautions, such as transporting in shielded, metal boxes, may also be used to mitigate associated risks. In case an automated function is used to deactivate a T-PED, the unit should be qualified for safe operation on board the aircraft.

8.3.14.12.3.4 Test methods. The means to demonstrate that the RF radiations (intentional or non-intentional) are tolerated by aircraft systems should be as follows:

- a. The radio frequency (RF) emissions of PEDs should meet the levels as defined by EUROCAE ED-14E/RTCA DO 160E Section 21 Category M for operation in the passenger compartment and EUROCAE ED-14E/RTCA DO 160E Section 21 Category H for operation in the cargo bay. Later revisions of those documents may be used for testing. The assessment of intentional transmissions of T-PEDs is excluded from those test standards and needs to be addressed separately.
- b. When the operator intends to allow the operation of T-PEDs, its assessment should follow the principles set out in EUROCAE ED-130.

8.3.14.12.4 Fire caused by PEDs. In-flight lithium battery fires caused by electronic devices pose a risk to aircraft safety. AvSax Fire Containment bags are carried onboard all Company multi-engined aircraft and additional Lithium battery fire kits may be carried when appropriate to help mitigate the threat iaw Company SMS risk assessment.

8.3.15 Landing Spacing

8.3.15.1 Responsibility. For Company operations, notwithstanding any Air Traffic clearances, the final responsibility for ensuring the landing can be safely made rests with the Aircraft Captain.

8.3.15.2 Landing Clearance. Paraphrasing Rule of the Air 17(7) (b): ‘at aerodromes without Air Traffic Control, aircraft shall not land at a runway if the runway is not clear.’ However, due to the nature of the Company’s business, the Authority has issued an exemption to this rule for Company aircraft such that, even operating from an aerodrome without Air Traffic Control, when conducting ‘stream’ or ‘formation’ landings, Company aircraft may:

- a. Land in stream with 500m between aircraft (to ensure that the landing run for the ‘following aircraft’ is clear).
- b. In an emergency (for example ASI Failure), land together (with nose tail and lateral separation).

8.3.16 Use of Auto-Pilots

8.3.16.1 Only the Company’s multi- engine aircraft have auto pilots. The Company’s pilots are to maintain their hand flying skills. It is quite possible for pilots to be able to fly all the aircraft in the Company’s fleet to BRNAV accuracy (RNP5) by hand. However, correctly set and properly monitored, the auto-pilot provides a robust facility for accurate automatic flying. Pilots are expected to use the auto-pilot throughout the cruise and it may be used for climbs and descents as required. In particular, in poor weather, the autopilots’ glide path and localiser following capabilities are likely to produce highly accurate IFR approaches leaving the pilots’ capacity free for systems and approach monitoring and decision making.

8.3.17 Cosmic and Solar Radiation

8.3.17.1 Detection Equipment Requirements. Aircraft will not be operated above 49,000ft unless they are fitted with an instrument to measure and indicate continuously the dose rate of total cosmic radiation being received. The instrument fitted must also be capable of indicating the cumulative dose on each flight and be serviceable. Procedures for the use of this equipment if fitted are to be found in the relevant aircraft Part B.

8.3.17.2 Assessment of Aircrew Exposure. If applicable the Company will conduct a periodic assessment of cumulative annual exposure rate of aircrew to cosmic radiation. These assessments are carried out to ensure that operating crew remain within prescribed exposure levels, as defined in Article 42 of the Council Directive 96/29/Euratom, where no further action is required. Assessment is achieved by means of a validated computer programme, provided by the US Civil Aeromedical Institute, which determines an estimated exposure to cosmic radiation for a given route when flight is conducted above 26,000ft.

8.3.18 Engine Failure in Flight

8.3.18.1 Whenever the Aircraft Captain exercises his discretion and does not land at the earliest safe opportunity, the reason for the decision must be recorded in his subsequent Occurrence Report. In the event of an engine failure on any aircraft on take-off, the flight should not continue and the aircraft should land at the airfield of departure or the return alternate if applicable.

8.3.19 Operation of Controls

8.3.19.1 In Company Multi-engined aircraft no person other than a pilot employed by the Company may be permitted to operate the controls while the aircraft is in flight.

8.3.20 Practice of Emergencies in Flight

8.3.20.1 Practising abnormal procedures or manoeuvres during Commercial operation is prohibited. On B727 or B737 aircraft engines must not be shut down or engine failure simulated or any system or equipment rendered inoperative even when freight or passengers are not being carried. The practice of emergency procedures is restricted to the B727/B737 simulator and to authorised training flights.

8.3.21 Flight Data Recorder / Cockpit Voice Recorder

8.3.21.1 General. The Aircraft Captain must ensure that if fitted the flight data recorders are not disabled or switched off during flight and that, in the event of an accident or incident that is subject to mandatory recording are not intentionally erased and are de-activated immediately after the flight is completed. Recorders must only be re-activated with the agreement of the investigating authority. The cockpit voice recorder must not be disabled or switched off during flight unless the Aircraft Captain believes that the recorded data, which would otherwise be erased automatically, should be preserved for incident or accident investigation. Recorded data must not be manually erased during or after a flight in which an accident or a reportable incident occurs.

8.3.21.2 Preservation, Production and Use of Flight Data Recordings. When a flight data recorder is required to be carried aboard an aircraft, the Company shall:

- a. Save the recordings for the period of operating time as required by CAT.GEN.MPA.195, CAT.IDE.A.185 and CAT.IDE.A.190 except that, for the purpose of testing and maintaining flight data recorders, up to one hour of the oldest recorded material at the time of testing may be erased; and
- b. Keep a document which presents the information necessary to retrieve and convert the stored data into engineering units.

8.3.21.2.1 The Company will to the extent possible, preserve the original recorded data as retained by the recorder for a period of 60 days unless otherwise directed by the investigating authority, in the following circumstances:

- a. Following an accident;
- b. Following an incident that is subject to mandatory reporting, unless prior permission has been granted by the Authority,
- c. Additionally, when the Authority so directs,

8.3.21.2.2 Production of Recordings. The Company shall, within a reasonable time after being requested to do so by the Authority, produce any recording made by a flight recorder which is available or has been preserved.

8.3.21.2.3 Use of Recordings

- a. The cockpit voice recorder recordings may not be used for purposes other than for the investigation of an accident or incident subject to mandatory reporting except with the consent of all crew members concerned.
- b. The flight data recorder recordings may not be used for purposes other than for the investigation of an accident or incident subject to mandatory reporting except when such records are:
 - i. Used by the operator for airworthiness or maintenance purposes only; or
 - ii. De-identified; or
 - iii. Disclosed under secure procedures.

8.3.22 Excessive Bank after Take-Off

8.3.22.1 Company Multi-engine pilots must use the following maximum bank angle after take-off versus height above ground:

Max Bank	Height Above Ground
5°	Below 50ft
15°	50-100ft
25°	Above 500ft

8.3.23 Change of Take-Off Distance

8.3.23.1 Whenever there is a change to the take-off distance available caused by a reduction to the runway surface available or change of runway, the Aircraft Captain must re-calculate the take-off performance to ensure all take-off criteria are met.

8.3.24 Use of Headset

8.3.24.1 Each flight crew member required to be on the flight deck shall wear a headset with a boom microphone or equivalent whenever the aircraft is in motion and for both IFR and VFR operations and use it as the primary device to listen to voice communications with Air Traffic Services when:

- a. On the ground:
 - i. When receiving the ATC departure clearance via voice communication,
 - ii. When engines are running,
- b. In flight below transition altitude or 10,000 feet, whichever is higher, and
- c. Whenever deemed necessary by the Aircraft Captain.

The boom microphone or equivalent shall be in position which permits its use for two way communications. During simulator training, crew members and the instructor / examiner will use headsets at all times.

8.3.25 Sterile Cockpit

8.3.25.1 Below FL100, the crew shall not engage in conversation, which is not relevant to the flight or phase of flight (sterile cockpit concept). In unpressurised aircraft with cruise levels below FL100 this sterile cockpit procedure must be adopted during the departure and recovery phases of flight.

8.3.26 Stabilised Approach

8.3.26.1 All approaches in IMC are to be stabilised from 1000ft AGL to touchdown. The aircraft will be in landing configuration, on profile (glideslope, or published rate of descent to MDA, or visually established glide angle), speed within a maximum of + 10kt of 'target speed', normal rate of descent, engines 'spooled up', bank angle less than 30 degrees and Before Landing Checklist complete. If the approach is not stabilised at 1000 feet or becomes unstable below 1000ft, a go-around shall be executed. The glideslope and localiser deviation shall not exceed one dot when below 1000 ft.

8.3.26.2 Approaches in VMC must be stabilised by 500ft AGL in Company Perf A aircraft and 300ft AGL in Company Perf B aircraft.

8.3.27 Administration Duties on Short Flights

8.3.27.1 For short flight legs (i.e. < 30 minutes), the crew shall refrain from administration duties, such as expense sheet and tech log, and work on the OFP shall be kept to a minimum.

8.3.28 Airspace Classification and Separation Services Provided

8.3.28.1 Table 39 states the UK ATS Airspace Classifications, and the separation and services provided for each by a relevant ATS Unit.

UK AIRSPACE CLASSIFICATION						
A	B	C	D	E	F	G
MOST AIRWAYS AND CERTAIN TERMINAL CONTROL ZONES AND AREAS	ABOVE FL 250 UP TO FL 660	NOT PRESENTLY USED IN UK	MANY CONTROL ZONES AND AREAS	PARTS OF THE SCOTTISH TCA BELOW 6000'	ALL ADVISORY ROUTES	OPEN FIR
SEPARATION: ALL AIRCRAFT.	SEPARATION: ALL AIRCRAFT.	SEPARATION: IFR from IFR. IFR from VFR.	SEPARATION: IFR from IFR ONLY.	SEPARATION: IFR from IFR ONLY.	SEPARATION: IFR from IFR ONLY. PARTICIPATING TRAFFIC ONLY.	SEPARATION: NIL.
AIR TRAFFIC CONTROL SERVICE	AIR TRAFFIC CONTROL SERVICE	AIR TRAFFIC CONTROL SERVICE	AIR TRAFFIC CONTROL SERVICE, including info about VFR flights (& traffic avoidance advice on request)	AIR TRAFFIC CONTROL SERVICE, including info about VFR flights as far as practicable	AIR TRAFFIC ADVISORY SERVICE, & FLIGHT INFORMATION SERVICE	FLIGHT INFORMATION SERVICE
ATC CLEARANCE: REQUIRED	ATC CLEARANCE: REQUIRED	ATC CLEARANCE: REQUIRED	ATC CLEARANCE: REQUIRED	ATC CLEARANCE: REQUIRED	ATC CLEARANCE: NOT REQUIRED	ATC CLEARANCE: NOT REQUIRED

Table 39 – UK airspace classification

Note that within airspace classifications D - G no separation from VFR traffic is provided by ATC to an aircraft operating IFR. In fact, other aircraft are not required to inform airport ATC of their adjacent presence, even if IMC, unless actually entering an ATZ (though they are recommended to do so if within 15 miles, or 5 minutes flying time, from it). ATC cannot offer any more than advisory information in this situation.

8.3.28.2 Pilots must be aware that the when operating within such airspace classifications (i.e. D - G), that even when operating IFR, no separation will be provided from VFR traffic by ATC. If VFR traffic is operating only 1500 metres from cloud (or simply “clear of cloud and in sight of the surface” if below 3000ft amsl), but at the same level as a Company aircraft which exits cloud, the time for visual acquisition is MINIMAL to NIL. Good look out, even when IFR, as well as “listen out” at all times, is vital.

8.3.29 Noise Abatement and Standard Take-Off Profiles

8.3.29.1 General. Company policy concerning noise abatement techniques is contained within this section. Amplification of aircraft specific handling techniques is contained within the relevant Part B. Aerodrome specific noise abatement information can be found in Part C to this Manual. The following general exclusions and assumptions apply:

- a. The pilot-in-command has the authority to decide not to execute a noise abatement procedure if conditions preclude the safe execution of the procedure, and can refuse a runway offered for noise preferential reasons if prompted by safety concerns.
- b. Conduct of noise abatement climb procedures is secondary to meeting obstacle clearance requirements.
- c. The power or thrust settings to be used subsequent to the failure or shutdown of an engine or any other apparent loss of performance, at any stage in the take-off or noise abatement climb, are at the discretion of the pilot-in-command, and noise abatement considerations no longer apply.
- d. The power or thrust settings specified in the aircraft operating manual are to take account of the need for engine anti-icing when applicable.
- e. Noise abatement climb procedures are not required in conditions where wind shear warnings exist, or the presence of wind shear or downburst activity is suspected or when thunderstorms are expected to affect the approach or departure.
- f. The maximum acceptable body angle specified for an aircraft type shall not be exceeded.
- g. An aircraft should not be diverted from its assigned route unless it has attained the altitude or height which represents the upper limit for the noise abatement procedures; or it is necessary for the safety of the aircraft (e.g. for avoidance of severe weather or to resolve a traffic conflict).

8.3.29.2 Noise Abatement Techniques - Propeller Aircraft

- a. **Extra 300.** Once the aircraft is airborne and climbing away, at both 'full' or 'formation climb' power settings, the RPM is to be wound back to 2500rpm and the climb continued at 100kts or the briefed climb speed.
- b. **Navajo.** Owing to the poor single engine climb performance of the PA-31, pilots are to climb at full power in accordance with the AFM procedures to achieve blue line speed as soon as possible and the desired climb speed as soon as possible thereafter. Only then should the engine power be reduced (to 36inches MAP) and the RPM wound back to 2400rpm. This power setting should be maintained until the aircraft is at least 1000ft agl.
- c. **King Air.** Maximum torque and RPM (subject to ITT limitations) are to be used for take-offs. Following completion of the take-off segment, ending at gear retraction and once the aircraft is deemed at a safe height away from the ground by the Captain, in the absence of any emergency, as soon as practical and safe, the Captain should reduce to not more than 1900RPM and reset maximum torque in compliance with the noise certification of the aircraft.

8.3.29.3 Noise Abatement Techniques - Multi-engine Jet aircraft. Company standard operating procedures incorporate the ICAO recommended NADP 1 or 2 (noise abatement departure procedures) take-off climb profile as appropriate. If no NADP is required or specified, the Aircraft Captain should default to NADP 1. Company standard acceleration height / minimum flap retraction height for one engine inoperative is 1,000 feet AGL, unless this is increased by a second segment climb requirement. Any increased flap retraction height will be specified on the runway take-off analysis sheet and must be complied with.

Certain noise sensitive airports including, Zurich, Geneva, Basle, Paris (Le Bourget) and Orly mandate the requirement to follow the ICAO NADP 1 profile. This profile mitigates the noise footprint close to the airport and requires an extended second segment climb to 3,000 feet AGL. The IAS speed tolerance is based on V2 for the take-off flap setting, acceleration and flap retraction must be commenced above 3,000 feet AGL.

The ICAO requirement for V2 +10 to 20 KIAS is sometimes impractical for the Company's B727 fleet due to body angle, however the procedure specified in part B complies with the vertical and lateral noise tracking requirements at airports employing NADP 1 noise abatement procedures.

NADP requirements are specified in either the Jeppesen 10-4 noise abatement pages or 10-1 airport briefing (departure) pages.

Active noise tracking is enforced at these noise sensitive airports mentioned above, SID radar track accuracy, altitude and ground speed is assessed for each departure to ensure compliance. The penalty for non-compliance can be a substantial environmental fine. It is important to remember that the speed / altitude profile from the vertical profile monitoring, acceleration below the minimum flap retraction height/altitude will be detected as non-compliance with the noise abatement procedure.

8.3.29.4 Aircraft Operating Procedures (Take-Off)

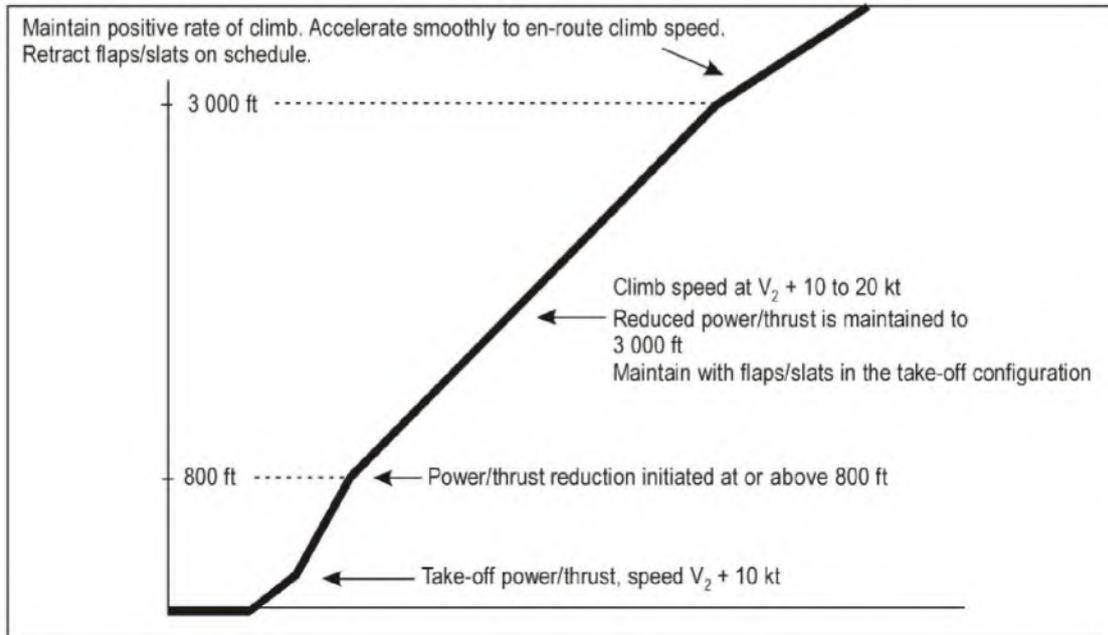
- a. Noise abatement shall not be a determining factor in runway nomination (however noise abatement departure procedures do apply), under the following circumstances:
 - If the runway surface conditions are adversely affected (e.g. by snow, slush, ice, water, mud, rubber, oil or other substances)
 - For take-off when the visibility is less than 1900m.
 - When the crosswind component, including gusts, exceeds 15kt, or the tailwind component, including gusts, exceeds 5kt.

- b. The level of thrust for flap / slat configuration, after thrust reduction, shall not be less than:
 - Computed climb power / thrust for aircraft in which de-rated take-off thrust and climb thrust are computed by the flight management system
 - Normal climb power / thrust for other aircraft

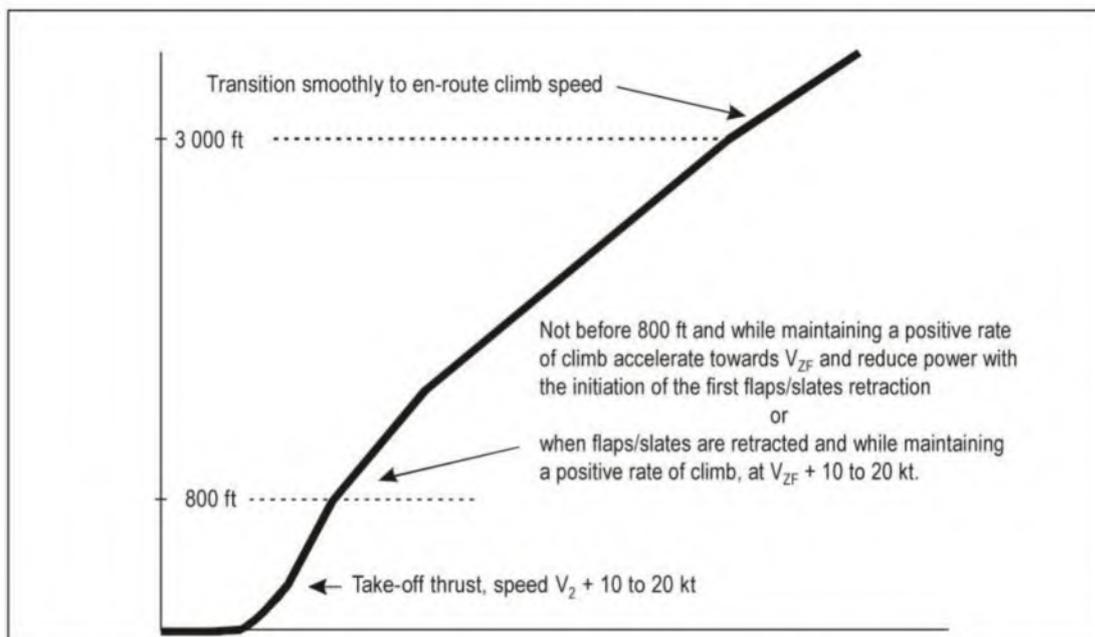
- c. Turns during take-off and climb should not be required unless:

- The aircraft has reached (and can maintain throughout the turn) a height of not less than 500ft above terrain and the highest obstacles under the flight path
- The bank angle for turns after take-off is limited to 15° except where adequate provision is made for an acceleration phase permitting attainment of safe speeds for bank angles greater than 15°

The diagrams below depict NADP 1 and 2:



Noise abatement take-off climb — Example of a procedure alleviating noise close to the aerodrome (NADP 1)



Noise abatement take-off climb — Example of a procedure alleviating noise distant from the aerodrome (NADP 2)

8.3.29.5 Aircraft Operating Procedures (Landing)

- a. Noise abatement shall not be a determining factor in runway nomination, and noise abatement procedures are not required under the following circumstances:
 - If the runway surface conditions are adversely affected (e.g. by snow, slush, ice, water, mud, rubber, oil or other substances).
 - When the ceiling is lower than 500ft above aerodrome elevation or the visibility is less than 1900m.
 - When the approach requires vertical minima greater than 300ft above aerodrome elevation and the ceiling is lower than 800ft above aerodrome elevation, or the visibility is less than 3000m.
 - When the crosswind component, including gusts, exceeds 15kt, or the tailwind component, including gusts, exceeds 5kt.
- b. Noise abatement procedures do not prohibit the use of reverse thrust during landing, however pilots are expected to limit reverse thrust commensurate with safety.
- c. The aircraft shall not be required to be in any configuration other than the final landing configuration at any point after passing the outer marker or 5nm from the threshold of the runway of intended landing, whichever is earlier.

8.3.30 Flight Deck Loose Articles

8.3.30.1 General. Crews must be cognisant of the risk posed by loose or misplaced items on the flight deck of Company aircraft. Pens, water bottles and other such items should be correctly stowed when not in use, and care taken to retrieve any articles that have been dropped or fallen, either onto the cockpit flooring or in and around consoles. If turbulence is expected or encountered, then any unnecessary items should be secured. A pen may be stowed loose on the centre console if applicable, but such items must not be placed anywhere where they may migrate into operating controls (such as above the engine control levers on PA31 aircraft).

8.3.30.2 Lost Items. Crews to seek engineering support in the event that a lost item on the flight deck cannot be recovered as it may pose a risk of jamming control cables or other equipment which may have an effect on flight safety.

8.4 All Weather Operations

8.4.1 Non-precision and Category I Operations

8.4.1.0 Operating Minima shall be as determined in Para 8.1.3 and 8.1.4 above.

8.4.2 Operating Minima Definitions. (Sourced from ICAO Doc 9365)

- a. **Approach Ban.** Applicable to the commencement and continuation of approach:
- i. A pilot-in-command may commence an instrument approach regardless of the reported RVR/Visibility but the approach shall not be continued beyond the outer marker, or equivalent position (see Note below), if the reported RVR/Visibility is less than the applicable minima.
 - ii. Where RVR is not available, for non-precision and Category I approaches only, the pilot-in-command may derive an RVR value by converting the reported visibility in accordance with Para 8.1.3.4.4.
 - iii. If, after passing the outer marker or equivalent position in accordance with (i) above, the reported RVR/Visibility falls below the applicable minimum, the pilot-in-command may continue the approach to DA/H or MDA/H.
 - iv. Where no outer marker or equivalent position exists, the pilot-in-command shall make the decision to continue or abandon the approach before descending below 1000 ft above the aerodrome on the final approach segment.
 - v. A pilot may continue the approach below DA/H or MDA/H and the landing may be completed provided that the required visual reference is established at the DA/H or MDA/H and is maintained.

Note. The equivalent position referred to in i. above can be established by means of a DME distance, a suitably located NDB or VOR, SRE or PAR fix or any other suitable fix that independently establishes the position of the aircraft.

- b. **Category I (Cat I) Operation.** A precision instrument approach and landing using ILS, MLS or PAR with a decision height of not lower than 200ft and an RVR not less than 550m.
- c. **Categories of Aircraft.** All Company aircraft are Performance Class A or B.

For All Weather Operations the PA-31 is classified as Aircraft Approach Category A ($V_{AT} < 91kt$), the King Air B200 is Aircraft Category B ($V_{AT} 91-120kt$). The Boeing B727 2S2F and Boeing B737-300 are classified as Aircraft Category C ($V_{AT} 121-140kt$) and Category D for circling.

- d. **Circling Approach.** Circling is the term used to describe the visual phase of an instrument approach to bring an aircraft into position for landing on a runway which is not suitably located for a straight in approach.
- e. **Cloud Base.** The lowest reported cloud level (reported as FEW).
- f. **Cloud Ceiling.** The vertical distance from the elevation of the aerodrome to the lowest part of any cloud visible from the aerodrome which is sufficient to obscure more than one half of the sky above the elevation of the aerodrome (reported as BKN).
- g. **Decision Altitude/Height (DA/H).** A specified altitude/height in the precision approach at which a missed approach must be initiated if the required visual reference to continue the approach has not been established.

Notes:

- 1. Decision Altitude (DA) is referenced to mean sea level (MSL) and decision height (DH) is referenced to the threshold elevation
 - 2. The Required Visual Reference means that section of the visual aids or of the approach area which should have been in view for sufficient time for the pilot to have made an assessment of the aircraft position and rate of change of position, in relation to the desired flight path.
- h. **Final Approach.** That part of an instrument approach procedure which commences at the specified final approach fix or point, or where such a fix or point is not specified,
 - i. at the end of the last procedure turn, base turn or inbound turn of a racetrack procedure, if specified; or
 - ii. at the point of interception of the last track specified in the approach procedure; and ends at a point in the vicinity of an aerodrome from which:
 - (a) a landing can be made; or
 - (b) a missed approach procedure is initiated.
 - i. **Minimum Descent Altitude/Height (MDA/H).** A specified altitude/height in a non precision approach or circling approach below which descent may not be made without visual reference.
 - j. **Missed Approach Point (MAPt).** That point in an instrument approach procedure at or before which the prescribed missed approach procedure must be initiated in order to ensure that the minimum obstacle clearance is not infringed.
 - k. **Non-precision Approach and Landing Operations.** An instrument approach and landing which does not utilise electronic glide path guidance.

- l. **Obstacle Clearance Altitude/Height (OCA/H).** The lowest altitude (OCA), or alternatively the lowest height above the elevation of the relevant runway threshold or above the aerodrome elevation as applicable (OCH), used in establishing compliance with appropriate obstacle clearance criteria.
- m. **Obstacle Clearance Limit (OCL).** The height above aerodrome elevation below which the minimum prescribed vertical clearance cannot be maintained either on approach or in the event of a missed approach.
- n. **Precision Approach and Landing Operations.** An instrument approach and landing using precision azimuth and glide path guidance with minima as determined by the category of operation.
- o. **Reported RVR.** The RVR communicated to the captain of an aircraft, by or on behalf of the person in charge of the aerodrome.
- p. **Runway Visual Range (RVR).** The range over which the pilot of an aircraft on the centreline of a runway can see the runway surface markings or the lights delineating the runway for identifying its centreline.
- q. **Visual Approach.** An approach by an IFR flight when either part or all of an instrument approach procedure is not completed and the approach is executed in visual reference to terrain. A visual approach may not be conducted when the RVR, or factored equivalent, is less than 800 metres.
- r. **Visual Reference, Category I Approach.** A pilot may not continue an approach below the Category I DA/H unless at least one of the visual references described in para 8.1.3.3 for the intended runway is distinctly visible and identifiable to the pilot.
- s. **Visual Reference, Non-precision Approach.** A pilot may not continue an approach below MDA/H unless at least one of the following visual references for the intended runway is distinctly visible and identifiable to the pilot:
 - i. Elements of the approach light system;
 - ii. The threshold;
 - iii. The threshold markings;
 - iv. The threshold lights;
 - v. The threshold identification lights;
 - vi. The visual glide slope indicator;
 - vii. The touchdown zone or touchdown zone markings;
 - viii. The touchdown zone lights;
 - ix. Runway edge lights; or
 - x. Other visual references accepted by the Authority.

8.4.3 Operating Procedures

8.4.3.1 Take-off Briefing. Before every take-off the Aircraft Captain shall ensure that he has covered all the relevant aspects of that take-off and subsequent departure in his preparation. Full details of this briefing are contained in the relevant Part B.

8.4.3.2 Monitoring of Radio Aids

- a. **Cross monitor possible.** i.e. the ability to use one radio aid to cross check the information from another when multiple aids are available such as ILS with NDB/VOR etc. All radio aids are to be identified by at least one pilot and the primary aid is to be identified by all operating flight deck crew members.
- b. **No cross monitor possible.** When one radio aid alone is used then it must be identified by the Aircraft Captain and the call sign must be monitored or re-identified as follows (on EFIS or Garmin 530 equipped aircraft it is not necessary to identify navigation aids aurally provided the appropriate identification code is displayed):

- i. **ILS.** The call sign must be re-identified:

- (a) When the aircraft is established on the localiser;
 - (b) Whenever warning flags have appeared and cleared;
 - (c) Whenever indications are in doubt.

Note. Presence of an ILS call sign does not confirm the integrity of the glide slope signal.

- ii **VOR.** The call sign must be re-identified:

- (a) When established on the inbound radial or when on final approach;
 - (b) Whenever warning flags have appeared and cleared including passing an indicated overhead;
 - (c) Whenever indications are in doubt.

- iii **NDB.** The call sign is to be monitored throughout the approach, and missed approach when relevant.

8.4.3.3 Stopwatch Timing. Even if a stopwatch timing facility is not obligatory for the type of approach being conducted it must be remembered that timing provides useful navigational information and can be used as a gross error check.

8.4.3.4 Missed Approach. An instrument approach must be discontinued if visual reference has not been attained or **cannot be maintained** and:

- a. Warning flags indicate a failure;
- b. The call sign of the primary aid ceases;
- c. Indications are in doubt;
- d. The aircraft is displaced vertically and/or laterally beyond pre-determined limits;
- e. On an SRA or PAR approach if communications cease.

8.4.3.5 Warning Flags. It is possible during certain ground station malfunctions for warning flags not to appear when the main signal is invalid. This emphasises the need for cross-monitoring when possible and being alert at all times to aircraft anomalous behaviour, e.g. abnormal headings and rates of descent for the type of approach flown and current wind velocities.

8.4.3.6 Descent for Approach. An aircraft must not descend below the appropriate safety altitude except:

- a. By using an approved Instrument Approach procedure; or
- b. When under positive radar control and the Aircraft Captain is satisfied with the flight profile; or
- c. When in continuing visual contact with the ground and able to ensure adequate clearance from all obstacles affecting the intended flight path.

Note: Descent when using ILS glide slope information as the sole means of vertical guidance must not be made below the relevant safety altitude until the aircraft is established on the ILS localiser and is within 10 nm of touchdown.

8.4.3.7 Position Fixes Prior to Descent. The position of the aircraft must be positively established prior to commencing descent and re-confirmed prior to descending below the relevant safety altitude.

8.4.3.8 Limit to Successive Approaches. Except in an emergency, or when there has been a significant change in reported weather conditions, no more than two successive approaches to an aerodrome may be carried out where both approaches have resulted in go-around.

8.4.3.9 Approach and Landing Briefing. The approach and landing briefing must be given by the handling pilot or Aircraft Captain before the aircraft commences its initial descent for approach and should cover at least the following:

- a. Initial descent point navigational fix;
- b. Any aerodrome special briefing including determination of landing distance;
- c. Safety altitudes, MOCA, MORA and Sector Safety Altitude (SSA) and Minimum Safe Altitude (MSA) from approach plate;
- d. The STAR or arrival route including transition level, holding facility, minimum holding altitude and speed restrictions;
- e. The Instrument Approach Plate (Chart) covering procedures, radio aids, and approach minima;

- f. The aerodrome chart covering touchdown elevation, QNH/QFE millibar/hectopascal difference if relevant, expected visual cues on contact, runway conditions and expected runway exit;
- g. Aircraft operation and configuration covering flap setting, anti-icing, approach speed and wind additives, continuous ignition, wipers, landing lights, reverse thrust/pitch and wheel brake settings;
- h. Planned alternate aerodrome and fuel requirement;
- i. Any additional items; and
- j. Questions

8.4.3.10 Landing Checklist. All pre-landing checks should be completed before the aircraft descends below 1000 ft above the runway threshold excepting only type specific and/or late phase items such as landing lights, windscreen wipers etc. This is in order that the final stages of the approach can be adequately monitored.

8.4.3.11 Descent Path Monitoring. During all descents and approaches the aircraft's descent path must be carefully monitored. The Flight Crew should note when the aircraft descends below the minimum safety altitude and also when indications first appear on the radio altimeter, if fitted. This is of particular relevance when conducting non-precision approaches where altitude/height versus range/fix checks are to be strictly observed.

8.4.3.12 Aerodromes Without Published Instrument Approach Procedures and/or NavAids. For operations to aerodromes where there are either no navigational aids or published procedures, specific instructions are detailed in Part C Section 11.

8.4.4 Low Visibility Procedures (LVPs)

8.4.4.0 COMPANY B737 AIRCRAFT ARE NOT CURRENTLY CLEARED FOR CAT II/III APPROACHES.

8.4.4.1 Low Visibility Take-off (LVTO). All take-offs with an RVR less than 400 metres are considered to LVTO.

For an LVTO with an RVR below 400 metres the required RVRs are:

Facilities	RVR (m)*,**
Day: Runway edge lights and runway centre-line markings Night: Runway edge lights and runway end lights or runway centre-line lights and runway end lights	300
Runway edge lights and runway centre-line lights	200
Runway edge lights and runway centre-line lights	TDZ, MID and rollout 150***
High intensity runway centre line lights spaced at 15 metres or less and high intensity edge lights spaced 60 metres or less are in operation	TDZ, MID and rollout 125***

* The reported TDZ RVR value can be replaced by pilot assessment

** Performance A aeroplanes

*** The required RVR value to be achieved for all relevant RVRs

For an LVTO with an RVR less than 150 metres but not less than 125 metres a 90 metre visual segment shall be available from the flight crew compartment at the start of the take-off run and the required RVR value is achieved for all the relevant reported RVR reporting points.

8.4.4.1.1 Operating Minima. Operating minima for LVTO shall be obtained from the Jeppesen aerodrome chart for any aerodrome where such take-offs are available. [The pre-flight planning process should include the determination and selection of a departure alternate in the event of an incident that requires an immediate diversion and landing, as per Section 8.1.2.4.2.1.](#)

8.4.4.2 Precision Approach Category II

8.4.4.2.1 General. A Category II procedure is a precision instrument approach and landing using ILS or MLS with:

- a. A DH below 200 feet but not lower than 100 feet: and
- b. An RVR of not less than 300 metres.

8.4.4.2.2 Decision Height. The DH for standard CAT II operations shall not be lower than:

- a. The minimum DH specified in the AFM, if stated; or
- b. The minimum height to which the precision approach aid can be used without the required references; or
- c. The DH to which the flight crew is authorised to operate; or
- d. 100 feet

Whichever is the highest.

8.4.4.2.3 Visual References for CAT II Operations. The following visual aids should be available:

- a. Standard runway day markings and approach and the following runway lights: runway edge lights, threshold lights and runway end lights;
- b. For operations in RVR below 450 m, additionally touch-down zone and/or runway centre line lights;
- c. For operations with an RVR of 400 m or less, additionally centre line lights.

A pilot may not continue an approach below Category II DH unless visual reference containing a segment of at least three consecutive lights, being:

- a. Centre line lights of the approach lights; or
- b. Touchdown zone lights; or
- c. Runway centre line lights; or
- d. Runway edge lights; or
- e. A combination of these is attained and can be maintained

This visual reference must include a lateral element of the ground pattern, i.e. an approach lighting crossbar or the landing threshold; or a barette of the touchdown zone lighting.

8.4.4.2.4 Required RVR for CAT II Approach. The lowest minima to be used for Category II operations are:

DH (FT)	AIRCRAFT CATEGORY	
	A, B, C	D
	RVR (m)	RVR (m)
100 – 120	300	300 / 350*
121 – 140	400	400
141 & above	450	450

*300 metres may be used for a category D aircraft conducting an autoland.

8.4.4.3 Precision Approach Category III

8.4.4.3.1 General. The following provisions should apply to CAT III operations:

- a. Where the DH and RVR do not fall within the same category, the RVR should determine in which category the operation is to be considered.
- b. For operations in which a DH is used, the DH should not be lower than:
 - i. The minimum DH specified in the AFM, if stated; or
 - ii. The minimum height to which the precision approach aid can be used without the specified visual reference; or
 - iii. The DH to which the flight crew is qualified to operate.
- c. Operation with no DH should only be conducted if:
 - i. The operation with no DH is specified in the AFM;
 - ii. The approach aid and the aerodrome facilities can support operations with no DH; and
 - iii. The flight crew is qualified to operate with no DH.
- d. The lowest RVR minima to be used are specified below:

CAT	DH (ft)	Rollout Control	RVR (m)
IIIA	Less than 100 feet	Not required	200
IIIB	Less than 100 feet	Fail-passive	150*
IIIB	Less than 50 feet	Fail-passive	125
IIIB	Less than 50 feet or no DH	Fail-operational	75

*For aeroplanes certified in accordance with CS-AWO 321(b)(3) or equivalent

8.4.4.3.2 Visual References for CAT III Operations. CAT III operating minima do not provide sufficient visual references to allow a manual landing to be performed. The minima only permit the pilot to decide if the aircraft will land in the touchdown zone and to ensure safety during rollout.

For both CAT IIIA and CAT IIIB operations conducted with a fail-passive flight control system, a pilot may not continue an approach below the DH unless a visual reference containing a segment of at least three consecutive lights, being:

- a. Centre line lights of the approach lights; or
- b. Touchdown zone lights; or
- c. Runway centre line lights; or
- d. Runway edge lights; or
- e. A combination of the three is attained and can be maintained.

For CAT IIIB operations conducted with a fail-operational flight control system, a pilot may not continue an approach below the DH unless a visual reference containing at least one centre line light is attained and can be maintained.

8.4.4.4 Effect on Landing Minima of Temporarily Failed or Downgraded Equipment

8.4.4.4.1 General

- a. These instructions are intended for the use of both pre-flight and in-flight. It is however not expected that the commander would consult such instructions after passing 1,000 feet above the aerodrome. If failures of ground aids are announced at such a late stage, the approach could be continued at the commander's discretion. If the failures are announced before such a late stage in the approach, their effect on the approach should be considered as described in the table below and the approach may have to be abandoned.
- b. The following conditions should be applicable to the tables below:
 - i. Multiple failures of runway/FATO lights other than indicated in the table are
 - ii. Deficiencies of approach and runway/FATO lights are treated separately
 - iii. For CAT II and CAT III operations, a combination of deficiencies in runway/FATO lights and RVR assessment equipment are not permitted; and
 - iv. Failures other than ILS and MLS affect RVR only and not DH.

8.4.4.4.2 Table

Failed or downgraded equipment	Effect on landing minima			
	CAT IIIB (no DH)	CAT IIIB	CAT IIIA	CAT II
ILS/MLS standby transmitter	Not allowed	RVR 200 m	No effect	
Outer Marker	No effect if replaced by height check at 1,000 ft			
Middle Marker	No effect			
RVR assessment systems	At least one RVR value to be available on the aerodrome	On runways equipped with two or more RVR assessment units, one may be inoperative.		
Approach lights	No effect	Not allowed for operations with DH > 50 ft	Not allowed	
Approach lights except the last 210 metres	No effect		Not allowed	
Approach lights except the last 420 metres	No effect			
Standby power for approach lights	No effect			
Edge lights, threshold lights and runway end lights	No effect		Day: No effect	Day: No effect
			Night: RVR 550 m	Night: not allowed
Centre line lights	Day: RVR 200 m	Not allowed	Day: RVR 300 m	Day: RVR 350
	Night: not allowed		Night: RVR 400 m	Night: RVR 550 m
Centre line light spacing increased to 30 m	RVR 150 m		No effect	
Touchdown zone lights	No effect	Day: RVR 200 m	Day: RVR 300 m	

		Night: RVR 300 m	Night: RVR 550 m. with autoland 350 m
Taxiway light system	No effect		

8.4.4.5 Runway Visual Range (RVR) Requirements

8.4.4.5.1 General. RVR measurements are provided by a system of calibrated transmissometers and account for the effects of ambient background light and the intensity of runway lights.

Transmissometer systems are located to provide RVR measurement associated with three portions of a runway:

- a. The touchdown zone TDZ
- b. The mid-point portion MID
- c. The roll-out portion or stopend RO

The touchdown zone RVR shall always be controlling. If reported and relevant, the midpoint and stopend RVR shall also be controlling. The minimum RVR value for the midpoint RVR shall be 125 metres, or the required RVR for the touchdown zone if less, and the stopend RVR shall be 75 metres.

Note: Relevant, in this context, means that part of the runway used during the high speed phase of a landing or rejected take-off down to a speed of approximately 60 kts.

8.4.4.6 Low Visibility Taxiing

8.4.4.6.1 General. Prior to leaving the parking position and when preparing for a landing, the commander shall brief the likely taxi routing paying special attention to any Hot Spots identified on the taxi chart.

In low visibility conditions careful accurate navigation of the aircraft is always vital. Ground speed and distance can easily be misjudged by visual cues alone. The crew should use all aids available to assist in the navigation of the aircraft on the ground. If there is any doubt about the aircraft's position, the aircraft should be stopped immediately, and ATC advised. If necessary, a 'Follow Me' van may be requested.

Taxiing in these conditions is a crew coordinated procedure and it is strongly advised that checks are not completed until the aircraft is stationary.

8.4.4.6.2 Holding Points. The crew shall ensure that they identify the relevant holding points so that they do not infringe the sensitive area when LVPs are in force. Illuminated Stop Bars must not be crossed.

8.4.4.7 LVO Approach Procedures

8.4.4.7.1 Pre-Flight Planning. In addition to normal flight preparation, the following shall be performed whenever ILS CAT II or ILS CAT III approach conditions are likely to be encountered at the destination aerodrome:

- Review NOTAMS to make sure that the destination airport meets ILS CAT II/III requirements. This includes areas such as:
 - o Runway and approach lighting;
 - o Navigation aid availability;
 - o RVR equipment availability, etc.
- Review the aircraft's technical log for defects that may affect the ILS CAT II/III status;
- Review the qualifications of the flight crew
- Check that the weather forecast at destination and alternate are suitable for the flight. If the weather forecast at destination is below ILS CAT I minima, the forecast for the alternate must be at CAT I minima or better.
- Review extra fuel requirements. Extra fuel should be considered for possible approach delays.

8.4.4.7.2 Approach Preparation. The commander is responsible for verifying that the minimum equipment requirements (SPA.LVO.130) as specified in the OM Part B are satisfied for the type of approach expected.

8.4.4.7.3 Aerodrome Requirements. Unless the aerodrome is reporting that 'Low Visibility Procedures are in Force', ATC shall be advised that a CAT II or CAT III approach is required. ATC will then check and confirm the status of the ILS and lighting, confirm that the sensitive area is protected from incursion by aircraft or vehicles and advise accordingly. A CAT II or CAT III approach may not be undertaken without ATC clearance.

8.4.4.7.4 Weather. Prior to commencing an approach, the reported RVR should be equal to or greater than the required RVR, or there is clear favourable trend in the RVR values.

8.4.4.7.5 Failed or Downgraded Equipment. In the event of failed or downgraded equipment the flight shall review the table in 8.4.4.4.2 and determine whether the CAT II or CAT III approach can be continued.

8.4.4.7.6 LVO Approach Briefing. The LVO approach briefing should include the normal as for any IFR arrival and, in addition, the following areas should be emphasised:

- a. Destination and alternate weather
- b. Aerodrome and runway operational status
- c. Aircraft systems status and capability
- d. Review of task sharing
- e. Review options to downgrade
- f. Confirm seat position is optimal and flight deck lighting is appropriate
- g. Confirm use of APU and autobrakes as required
- h. Identify likely taxi route, with special emphasis on airfield Hot Spots.
- i. Diversion options

8.4.4.7.7 Use of Aircraft Lights. At night in low visibility conditions, landing lights can be detrimental to the acquisition of visual references. Reflected light from water droplets or snow may reduce visibility. Therefore, the use of landing lights during CAT II and CAT III approaches should be reviewed.

8.4.4.7.8 Acquisition of Visual References. During approaches with a DH it is important that the PF includes the outside environment in his scan prior to reaching DH. The PF needs to gain the required visual reference prior to reaching DH so that he can announce his decision to continue the approach at DH. If the PF has not gained the required visual references on reaching DH, or loses them below DH, he must immediately initiate a missed approach. If the visual references are lost after touchdown a go-around should not be attempted. The rollout should be continued using either the autopilot ROLLOUT mode, or the PF maintaining the centreline by use of the localiser.

8.4.4.7.9 For all autolands, the pilot in the left-hand seat shall be PF.

Irrespective of the actual weather conditions, all approaches preceding an autoland shall be performed in accordance with LVO procedures.

8.5 ETOPS Procedures

8.5.1 The Company does not hold an ETOPS approval. Therefore, 2Excel shall not operate a two-engined aircraft under CAT operations over a route that contains a point further from an adequate aerodrome, under standard conditions in still air, than the appropriate distance for the given type of aircraft among the following:

- a. For performance class A aircraft with a maximum operational passenger seating configuration (MOPSC) of 20 or more, the distance flown in 60 minutes at the one-engine-inoperative (OEI) cruising speed;
- b. For performance class A aircraft with an MOPSC of 19 or less, the distance flown in 120 minutes or, subject to approval by the competent authority, up to 180 minutes for turbojet aircraft, at the OEI cruising speed;
- c. For performance class B or C aircraft, whichever is less:
 - i. The distance flown in 120 minutes at the OEI cruising speed;
 - ii. 300 NM.

8.5.2 The following limits therefore apply to Company aircraft:

Type	OEI Cruise Speed	Distance Flown at OEI Cruise	Max Distance Allowed from Adequate Aerodrome
PA31	120 kts TAS	240 nm	240 nm
King Air	165 kts TAS	330 nm	300 nm
B737	380 kts TAS	380 nm	380 nm

8.6 Use of Minimum Equipment Lists (MEL) and Configuration Deviation Lists (CDL)

8.6.1 CDL. The CDL lists the aircraft panels and doors that may be missing for a particular operation and pictorially indicates areas of damage to the aircraft skin/structure that is considered acceptable for flight. The B727 and the B737 are the only Company aircraft with a CDL manual.

8.6.2 Unserviceabilities. Occasions arise when certain items of installed aircraft equipment may be unserviceable without adversely affecting the aircraft's fitness for a particular flight, or the required level of safety. The Company holds a permission from the Competent Authority which allows its aircraft to operate with such items unserviceable, subject to the requirements of its MEL. The MEL is based on, but may not be less restrictive than the Master MEL which has been produced for the type by the aircraft manufacturer, and approved by the Authority.

8.6.2.1 Company Policy. Company aircraft may be operated with the items of equipment listed in the relevant MEL at Part B to this Manual not installed / inoperative / unserviceable. For the purposes of this Section, the word 'unserviceable' is used; where appropriate the words 'inoperative' or 'uninstalled' should be inferred or assumed.

8.6.3 MEL. The Company's MELs are shown at the relevant tables in Section 9 to the Type specific Part B of this Manual, (Section 2 for Extra 300). For Company CAT/SPO operations, pilots may only accept aircraft equipment unserviceabilities that are identified on the Company MEL. The MEL is a 'go' document not a 'stop' document and provides the Aircraft Captain with the authority to operate the aircraft with specified items of equipment unserviceable, but it must be emphasised that, irrespective of the provisions of the MEL, he is not obliged to operate with a particular defect or defects if in his opinion these unserviceabilities could adversely affect the safety of a proposed flight. Further, the MEL must take into account the area of operation including whether the aircraft is being despatched from base or an outstation.

8.6.4 Circuit Breakers. Flight crews are advised not to reset circuit breakers which have tripped in flight for other than essential services and even then only when there is no clearly associated condition of smoke or fumes. A second reset should not be attempted. Essential services should be services essential for the safety of flight and does not include circuit breakers for cabin service equipment such as ovens, water boilers etc. Such circuit breakers are not essential for safe flight and are not to be reset in flight.

8.7 Flights Other Than Commercial Air Transport under the Terms of The AOC (See also Part A, Section 0, Para 0.1.2 - 0.1.7 and Table 0.1)

8.7.1 Passenger Flights. Passengers are defined as anyone carried by the 2Excel Aviation Ltd excluding crew, employees and directors of the Company. All Company flights on which passengers are carried are classed as commercial air transport (CAT), Public Transport (PT) or SPO flights and should be conducted as in accordance Company's Operations Manual. Special or State activities carrying CAA-agreed passengers will also be conducted in accordance with this Manual making use of the alleviations of Part S where necessary. Within the 2Excel Group a separate company (2Excel Corporate Ltd) has been established to allow the carriage of passengers on flights operated as private flying. Normally, all operations should be conducted in accordance with this Manual including adherence to CAT FTLs, however for private flights by Company Performance Class B aircraft (not meeting Part NCC criteria), the aircraft (instead of CAT factored) performance and airfield licensing limits may be used.

8.7.2 Cargo Flights. Cargo Flights carrying freight from A-to-B for financial reward are classed as CAT flights and are to be conducted in accordance with this Operations Manual.

8.7.3 Non-Passenger Carrying Flights and Training Flights. When no passenger or cargo is carried, while Aircraft Captains should use the procedures outlined in this Manual as a guide, the operations envelope permitted is expanded. In particular, aircraft may be operated to its full performance envelope; and to/from unlicensed airfields (provided that the specific performance requirements and aerodrome operating minima continue to be met). Nevertheless, Aircraft Captains are to:

- a. Remain within the limitations laid down by the aircraft Certificate of Airworthiness;
- b. Obey the Rules of the Air and the Air Navigation Order;
- c. Obey the laws of the host Nation State.
- d. Remain within the requirements and limitations Pilots' Operating Handbook pertinent to the aircraft configuration;
- e. Obey the policies and limitations laid out in the pertinent Company own policies and documents.
- f. Obey the limitations laid down by the Company's insurers.

8.7.4 Ferry Flights. A ferry flight is a flight that involves positioning an aircraft, without revenue payload, to the nearest suitable maintenance base for rectification of a technical defect.

8.7.4.1 Ferry Flight Considerations

- a. Where the aircraft cannot be flown in accordance with its Certificate of Airworthiness or with its MEL a ferry flight may be conducted in accordance with the relevant permissions (which would usually be a Permit to Fly, issued by the Competent Authority and arranged by the CAMO).
- b. Where a ferry flight would involve over-flight of other countries the Operations Department will need obtain the required over-flight clearances.

- c. Carriage of passengers, other crew members or cargo is prohibited on ferry flights.
- d. The Aircraft Captain shall carry the written Company authorisation, the flight permit and copies of all over-flight clearances as required.

8.7.4.2 B727 Two-engine Ferry Flights. In the case of a two-engine ferry on a B727 aircraft, they may be carried out only by crew who are qualified through training in the particular procedure.

8.7.5 Air Displays

- a. Air displays shall be carried out under the stipulations of the ANO or its equivalent legislation in the relevant Nation State noting that an exemption to the ANO issued by the Competent Authority may be issued against certain limitations (using the guidance and procedures defined in CAP 403 or its equivalents).
- b. Only the minimum aircraft crew may fly in air displays; passengers may not be carried.
- c. Aircrew may only conduct the manoeuvres permitted by their Display Authority and the limitations of the AFM.

8.7.6 Flypasts. Flypasts are not classed as air displays and they may be conducted under the rules of the ANO or its equivalent legislation in the relevant Nation State.

8.7.7 Test Flights. The rules governing Test Flying are described in detail in the Leading Edge Flight Test Operations Manual (LE FTOM).

8.7.8 Functional Check Flights. Functional Check Flights (FCFs) are flights conducted to confirm aircraft (and its sub-system) performance for a wide range of purposes. Depending on the nature of the FCF, and the risks therein, specific Aircraft Captain (and crew) qualifications may be required by the Permit to Fly or the Flight Test Cards; for example, where performance or handling qualities are in doubt (ACF 8.7.7.b.iii below), a Cat 1 TP may be required. The CAME define this. FCFs include:

- a. **Operational Check Flights.** Operational Check Flights (OCFs) are where an aircraft is checked for proper operational function (such as following a period of inactivity). OCFs are usually conducted by line pilots / crews.
- b. **Airworthiness Check Flights.** Airworthiness Check Flights (ACFs) usually called for by CAM (see the Company CAME Para 1.13), are conducted to confirm Continuing Airworthiness (CAW):
 - i. Where the CAW may have been compromised or;
 - ii. Where flight characteristics could have been affected or;
 - iii. Where there is evidence of abuse or neglect or;
 - iv. Where power or performance or handling qualities are in doubt or;
 - v. Has not been affected by the introduction of a combination of design changes and their interactions.

Specific Test Flying qualifications may be required in the crew conducting an ACF.

- c. **Maintenance Check Flights.** Maintenance Check Flights (MCFs) are usually called up to check sub-systems function correctly after a period of maintenance.
- d. **Acceptance Check Flights.** Acceptance Flights (AFs) are defined in Acceptance Flight Test Schedules in order to perform a general functional check of the aircraft and its sub-systems when leaving a Part 145 MRO after maintenance or modification (usually for contractual purposes). Any appropriately briefed Aircraft Captain (or crew) may perform an AF.

8.8 Oxygen Requirements

8.8.1 Extra 300. There is no oxygen system on the aircraft so all flights will be conducted below FL 100 (or, if appropriate 10 000 ft).

8.8.2 Non Pressurized Aircraft. Non-pressurised aircraft shall not be operated at altitudes exceeding 10,000 ft unless supplemental oxygen is provided to meet the following requirements:

- a. Supply for all members of the flight crew for the entire flight time above a pressure altitude of 10,000 ft;
- b. Supply for all required cabin crew members for the entire flight time at pressure altitudes above 13,000 ft and for any period exceeding 30 minutes at pressure altitudes above 10, 000 ft but not exceeding 13,000 ft;
- c. Supply for all passengers for the entire flight time above a pressure altitude of 13,000 ft;
- d. Supply for 10% of the passengers for the entire flight time after 30 minutes above a pressure altitude of 10,000 ft but not exceeding 13,000 ft;
- e. When a cabin crew member is required to be carried, a dedicated supply of therapeutic oxygen for one person.

8.8.3 Pressurised Aircraft. Oxygen requirements for aircraft which are intended to operate at altitudes above 10,000 ft, and which are designed to maintain cabin pressure altitudes below 10,000 ft are as follows:

8.8.3.1 Flight Crew. Company aircraft are equipped with a high pressure gaseous oxygen storage system and quick donning masks located within immediate reach of each pilot member of the flight crew. Where a full face mask is not provided, goggles are available at each flight crew station for use when eye protection is necessary. Consult the Minimum Equipment List concerning flight without all oxygen sets available. Each member of the flight crew on flight deck duty shall have:

- a. An oxygen mask located within his immediate reach while at his duty station, if the aircraft is operating above 25,000 ft, the mask shall be of the quick donning type;
- b. In the event of cabin pressure failure, sufficient oxygen for the entire flight time when the cabin pressure altitude exceeds 13,000 ft and the entire flight time when the cabin pressure altitude exceeds 10,000 ft but does not exceed 13,000 ft after the first 30 minutes at those altitudes. This is subject to a minimum supply of oxygen of 30 minutes for aircraft certificated to fly at altitudes not exceeding 25,000 ft, and 2 hours for aircraft certificated to fly at altitudes greater than 25,000 ft;
- c. The Captain shall ensure that flight crew members engaged in performing duties essential to the safe operation of an aircraft in flight use supplemental oxygen continuously after 30 minutes when cabin pressure altitude exceeds 10,000 ft and at all times when the cabin pressure altitude exceeds 13,000 ft;

- d. Should a flight be conducted above FL 410, at least one pilot at the pilot station must wear an oxygen mask at all times.

8.8.3.2 Cabin Crew. When cabin crew members are carried, the following supplies need to be available:

- a. When operating above 25,000 ft, sufficient spare outlets and masks, and/or portable oxygen units with masks for use by all required cabin members, so distributed through the cabin as to ensure immediate availability of oxygen to each one irrespective of his/her location at the time of failure;
- b. Sufficient oxygen for the entire flight time when the cabin altitude exceeds 13000 ft, but not less than 3mins, and the entire flight time when the cabin pressure altitude is greater than 10,000ft but does not exceed 13000ft after the first 30mins between these altitudes.

8.8.3.3 Passengers. The following supplies are to be available to all passengers:

- a. When operating above 25,000 ft, a dispensing unit attached to an oxygen supply for each passenger, wherever seated, with 10% more dispensing units and outlets than the number of seats, distributed evenly through the cabin;
- b. Supply for all passengers carried for the entire flight time when the cabin pressure altitude exceeds 15,000 ft, or for 10 minutes, whichever is the greater;
- c. Supply for 30% of the passengers for the entire flight time when the cabin pressure altitude exceeds 14,000 ft but does not exceed 15,000 ft;
- d. Supply for 10% of the passengers for the entire flight time when the cabin pressure altitude exceeds 10,000 ft, but does not exceed 14,000 ft after the first 30 minutes at these altitudes;
- e. For aircraft not certified to fly above 25,000 ft the oxygen supply requirements in b, c, and d above apply and may be reduced to the entire flight time between 10,000 and 13,000 ft cabin pressure altitudes for all required cabin crew members and for at least 10% of the passengers if, at all points along the route to be flown, the aircraft is able to descend safely within 4 minutes to a cabin pressure altitude of 13,000 ft;
- f. If the aircraft is certified to fly at altitudes exceeding 25,000 ft, and a cabin crew member is required to be carried, a supply of undiluted first aid oxygen for passengers who, for physiological reasons, might require oxygen following a cabin depressurisation, the supply should be sufficient for one person, for the entire flight time at cabin pressure altitudes exceeding 8,000 ft after depressurisation.

8.8.3.4 Escape Routes for Flight Over High Terrain. Prior to flight over areas of high terrain the Aircraft Captain is to ensure that in the event of a rapid decompression or en-route engine failure an escape route from the high terrain to a suitable diversion airport has been planned and plotted using the Jeppesen charts provided.

Oxygen duration and single engine drift down calculations must be determined during the pre-flight planning stage with charts used for plotting being retained with post flight paperwork.

- a. VFR terrain overlays, high altitude airway and low altitude airway charts depicting MSA areas will be supplied by operations for any flight where it is considered MSA critical.
- b. The Aircraft Captain is to identify all areas of high terrain on the flight planned route using the charts provided and confirmed by MSA data from the OFP
- c. Critical MSA areas are to be highlighted on charts and transcribed to operational flight plan by circling appropriate way points.
- d. Diversion notes should be made at those waypoints on the operational flight plan. This will indicate routeing and intentions in the event of a decompression or single engine failure.

8.8.3.5 Crew Protective Breathing Equipment

8.8.3.5.1 General. Portable protective breathing equipment (PPBE) is provided on Company B727, B737 and BE200 aircraft for use in investigating and fighting fire. The equipment provides oxygen for not less than 15 minutes and gives full protection to the eyes, nose and mouth.

8.8.3.5.2 Flight Crew. Each member of flight crew on flight deck duty shall have equipment to protect his eyes, nose and mouth and to provide oxygen for a period of not less than 15 minutes; if the flight crew is more than one and a cabin crew member is not carried, a portable protective breathing apparatus to protect the eyes, nose and mouth of one member of the flight crew, and to provide breathing gas for not less than 15 minutes must also be available on the flight deck and be easily accessible for immediate use by each member of the flight crew in his duty station.

8.8.3.5.3 Cabin Crew. Cabin crew are provided with PPBE as detailed in the Cabin Crew SEP Manual.

2Excel Aviation Limited

Extra 300L Mass and Balance Chart

Pilot Weight (Kgs)	Passenger Weight (Kgs)	Aircraft Fuel Weight (Kgs)	Aircraft Fuel State (Litres)
75	< 150	37	51 L
	< 136	52	71 L
	< 100	87	120 L
80	< 145	37	51 L
	< 131	52	71 L
	< 95	87	120 L
85	< 140	37	51 L
	< 126	52	71 L
	< 90	87	120 L
90	< 135	37	51 L
	<121	52	71 L
	<85	87	120 L
95	< 130	37	51 L
	< 116	52	71 L
	< 80	87	120 L
100	< 125	37	51 L
	<111	52	71 L
	<75	87	120 L
105	< 120	32	45 L
	<106	47	65 L
	<70	82	115 L
110	< 115	32	45 L
	<101	47	65 L
	<65	82	115 L

Instructions for Use

1. Aircraft mass is assumed to be the heaviest of the Company's aircraft.
2. Smoke system is assumed to be inoperative.
3. Max take-off weight is 950 Kg.
4. Pilot weights are to be measured clothed.
5. Pilots are to review their own weight at every medical.
6. Pilots are to use their most recent weight (or the next heavier weight) when using the chart above.
7. For moment calculations, pilot weight is applied to the rear seating position.
8. Passenger weight is to be assessed and if necessary measured clothed.
9. From the table, permitted fuel states for the sortie and configuration are gleaned.
10. If the passenger cannot fly the planned sortie due to mass balance limitations:
 - a. In the first instance he is to be allocated to a different pilot or flying wave;
 - b. If still outside limits accurate mass and balance calculations are to be made;
 - c. If still outside limits the captain's sortie profile may need to be amended.



2Excel Aviation Limited PA-31 Mass and Balance Chart



AIRCRAFT REG & TYPE	FLT #	DATE	PREPARED BY	CAPTAIN	I/CONFIRM AIRCRAFT LOAD AND DISTRIBUTION IS AS SHOWN:
G-RHYM PA31					SIGNED LOADER SIGNED CAPTAIN

Part A Basic Weight	W (lbs)	Arm (in.)	M (lb in.)
BEW	4945	131.0	647987
Basic Weight Changes Present			
Seat 8 (optional)	No	0	242
Spare			
Nighthawk Turret (S21.53-90-1025)	16	32	512.0
Spare			
Nighthawk Controls (S21.25-90-1513)	33.3	60.39	2011.0
Changed Weight	49.3	51.2	2523.0
Actual Basic Weight	4994	130.3	650510

Part B Variable Weight	W (lbs)	Arm (in.)	M (lb in.)
Seat 1	209	119	23800
Seat 2	165	119	19635
TOTAL VARIABLE LOAD	365	119.0	43435
DRY OPERATING MASS	5359	129.5	693945

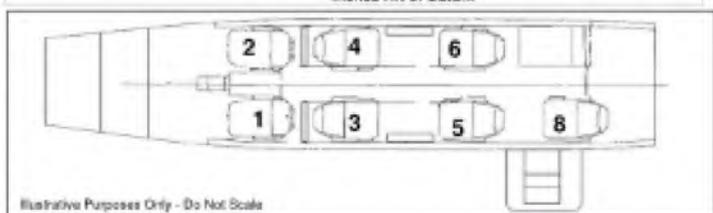
Part C Useful Load	max.	W (lbs)	Arm (in.)	M (lb in.)
Fuel (main/inbd) (112USG, 420L) (lbs)	667	381	126.8	48305
Fuel (Aux/outbd) (80USG, 300L) (lbs)	476	159	148	23492
Less Unusable Fuel inc. in BW (10L)	-16	-16	135.5	-2168
Baggage Nose (20kg = 44lbs)	120	0	43	0
Baggage Aft Cabin	200	0	255	0
Baggage Nacelle	150	0	168	0
Seat 3 Pax	n/a	0	159	0
Seat 4 Pax	n/a	0	159	0
Seat 5 Pax	n/a	0	198	0
Seat 6 Pax	n/a	0	198	0
Not Used	n/a	-	-	-
Seat 8 Pax	n/a	0	242	0
Mission Rack Equipment	175	0	228	0
TOTAL USEFUL LOAD	n/a	523.7	133.0	69629

Remaining Load Capacity	533	lbs	
TOTAL RAMP WEIGHT	6536	5883	129.8
ZERO FUEL WEIGHT	6200	5343	129.5

Taxi Fuel (10L) (Max 12L/36lbs)	36	16	148	2349
TOTAL T/O WEIGHT	6500	5867	129.8	761225

TRIP TIME (hrs)	1.3
Assumes Fuel Flow 140L/Hr. Oil consumption negligible	
TRIP FUEL (lbs)	n/a 222.2
TOTAL LANDING WEIGHT	6500

FUEL PLANNING	
Remaining Fuel Capacity	390 Litres
Ramp Fuel Inboard (main tanks)	240 Litres
Ramp Fuel Outboard (Aux tanks)	100 Litres
TOTAL Ramp Fuel	340 Litres
Unusable Fuel	10 Litres
USABLE Ramp Fuel	330 Litres



Status:
Within MTOW, Confirm balance within limits

Fuel Converter & Notes:			
Litres	390	Pounds	10
Pounds	142.5	Litres	6.3

Last minute changes: Calculate new TOW, ZFW (inc. arm) and LW, mark and initial graph above.



2Excel Aviation Limited King Air 200 Mass and Balance Chart

AIRCRAFT REGISTRATION G-XXXX	PILOT	DATE	TO	FROM	SIGNATURE

MRW **12590** MTOW **12500** MLW **12500** MZFW **11000**

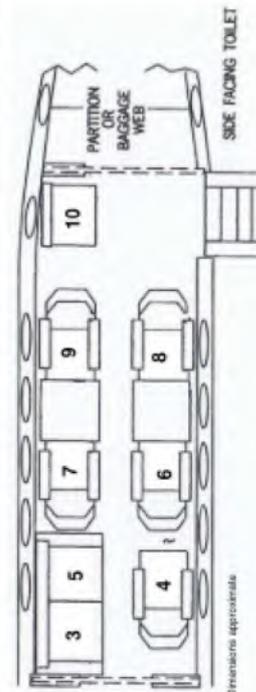
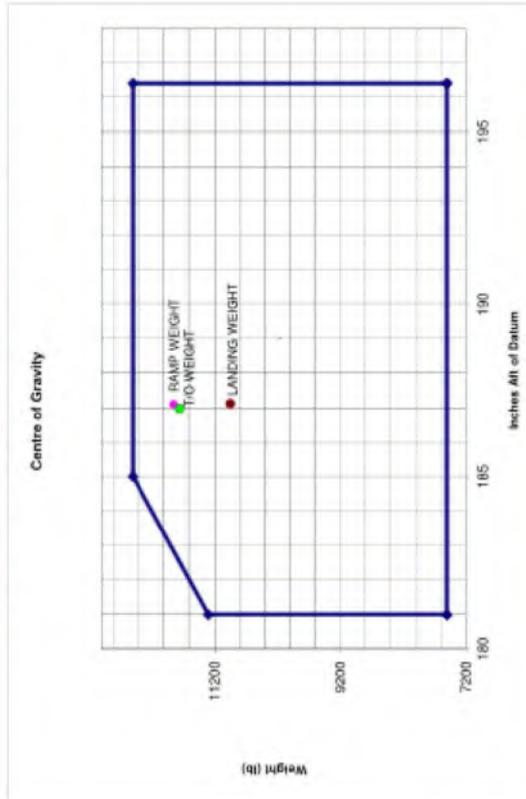
	W	Arm	M
Part A Basic Weight	8296	185.73	1540697
Basic Weight Changes			
Present	No	0.0	0.0
	No	0.0	0.0
Removed Weight	No	0.0	0.0
Actual Basic Weight	8296	185.72	1540697.0

	W	Arm	M
Part B Variable Weight	0	129	0
Seat 1 (Row 1)	0	129	0
Seat 2 (Row 1)	0	129	0
TOTAL VARIABLE LOAD	0	0	0

	W	Arm	M
Part C Useful Load			
Fuel (main)	2550	185	471750
Fuel (Aux)	1059	204	204000
Baggage All Cabin	410	325	0
Std side facing fwd (Seat 3)	0	163	0
Port Fwd Facing (Rear) (Seat 4)	0	176	0
Std side facing fwd (Seat 5)	0	183	0
Port side facing aft (Seat 6)	0	215	0
Std Aft Facing (Mid) (Seat 7)	0	215	0
Port Aft Facing (Mid) (Seat 8)	0	259	0
Std Fwd Facing (Rear) (Seat 9)	0	259	0
Toilet Seat (Seat 10)	0	293	0
TOTAL USEFUL LOAD	3550	190.35211	675750
TOTAL USEFUL LOAD	3550	190.35211	675750
TOTAL VARIABLE LOAD	0	0	0
BASIC WEIGHT	8296	185.71565	1540697.0
TOTAL RAMP WEIGHT	11846	187.11	2216447
ZERO FUEL WEIGHT	11000	185.71565	1540697
Fwd Fuel (52L/90lbs)	90	80.00	204
TOTAL TOW WEIGHT	12500	186.97576	2198087
Trip Time (hrs)	1.0		

TRIP FUEL lbs	0	800.0	185.0	148000.0
TOTAL LANDING WEIGHT	12500	10955.0	187.1	2050087.0
FUEL PLANNING				
TOTAL Ramp Fuel		3550	Lbs	
		2029	Lbs	
Fuel Flow	600	lbs/hour		
Total Endurance	5.9	HRS		
Legal Endurance (ex. 45min Res.)	5.2	HRS		
Trip Fuel (ex. 90lbs Taxi)	890.0	Lbs	509	Litres
Remaining Load Capacity	744	Lbs	425	Litres
Landing Fuel	2660.0	Lbs	1520	Litres

Note: To be archived with the PLOG
Issue: 4



Status: **Fuel OK & within MTOW. Confirm balance within limits**

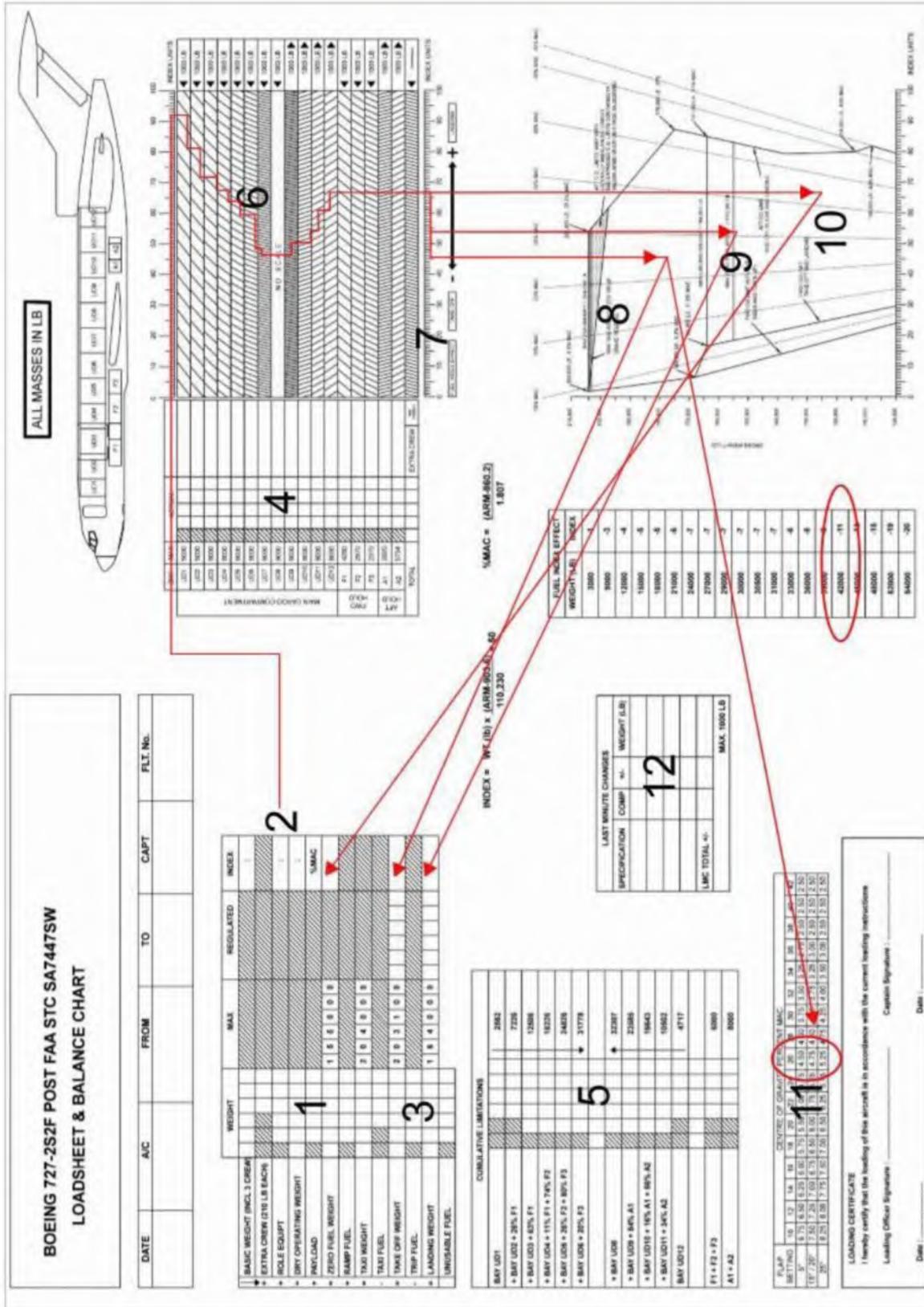
Fuel Calc Scratchpad
 Fuel: 400
 Litres: 230

T/O CoG: 186.9758 (LIMIT 181/185 to 196.4)

Notes:
 Standard Masses:
 Male = 190
 Female = 159
 Child (2-12yrs) = 77



2Excel Aviation Limited B727 Mass and Balance Chart





**BOEING 727-2S2F POST FAA STC SA7447SW
LOADSHEET & BALANCE CHART
TERSUS ROLE FIT**

DATE	A/C	FROM	TO	CAPT	FLT. No.
CONFIG					

	WEIGHT	MAX	REGULATED	INDEX
DRY OPERATING WEIGHT				1
FRIGHT				
DRY ZERO FUEL WEIGHT				1
+ FLUID (S.G. ...)				%MAC
= WET ZERO FUEL WEIGHT	1 5 5 0 0 0			
+ RAMP FUEL				
= TAXI WEIGHT	2 0 4 0 0 0			
- TAXI FUEL				
= TAKE OFF WEIGHT	2 0 3 1 0 0			
- TRIP FUEL				
= LANDING WEIGHT	1 6 4 0 0 0			
UNUSABLE FUEL				

INDEX = WT (lb) x (ARM-903.6) + 50
110,230

%MAC = (ARM-860.2)
1.807

CUMULATIVE LIMITATIONS (weight of Tersus deducted)				
TANK 1 CONTENTS + F1				6185
TANK 2 CONTENTS + F2				10742
TANK 3 CONTENTS + F3				16165
TANK 4 CONTENTS				22542
TANK 5 CONTENTS				23820
TANK 6 CONTENTS				14874
TANK 7 CONTENTS + A1 + A2				9925
F1 + F2 + F3				6060
A1 + A2				8000

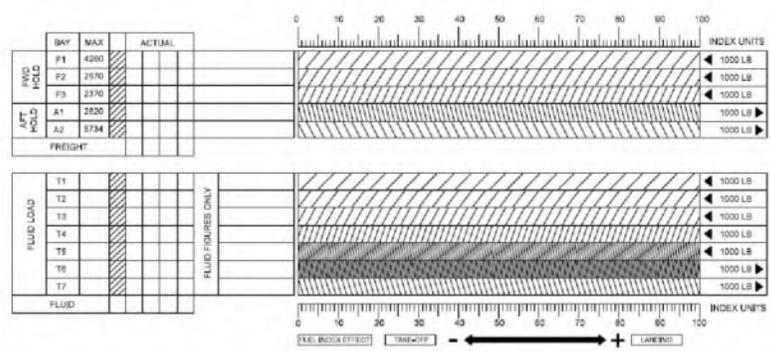
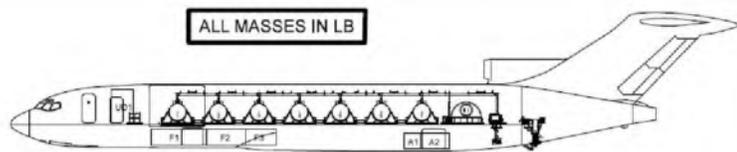
LAST MINUTE CHANGES			
SPECIFICATION	COMP	±	WEIGHT (LB)
LMC TOTAL ±			
MAX. 1000 LB			

FLAP SETTING	CENTRE OF GRAVITY PERCENT MAC																
	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40	42
5°	6.75	6.50	6.25	6.00	5.75	5.50	5.00	4.75	4.50	4.00	3.75	3.50	3.25	2.75	2.50	2.50	2.50
15° / 20°	7.50	7.25	7.00	6.75	6.50	6.00	5.75	5.25	4.75	4.50	4.00	3.75	3.25	3.00	2.50	2.50	2.50
25°	8.25	8.00	7.75	7.50	7.00	6.50	6.25	5.75	5.25	4.75	4.25	4.00	3.50	3.00	2.50	2.50	2.50

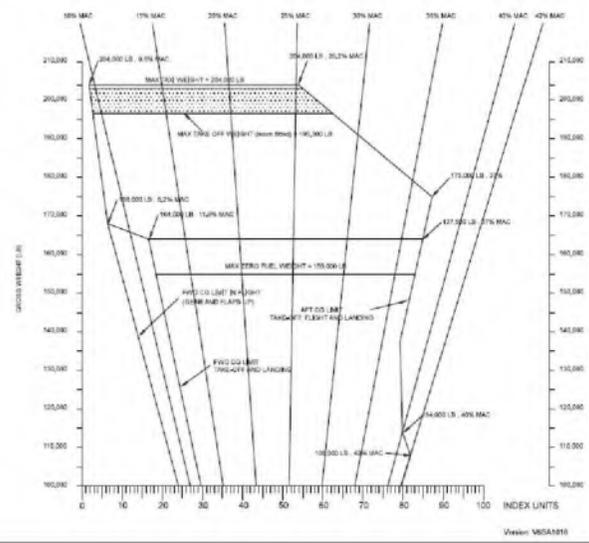
LOADING CERTIFICATE
I hereby certify that the loading of this aircraft is in accordance with the current loading instructions

Loading Officer Signature : _____ Captain Signature : _____
 Loading Officer Name : _____ Captain Name : _____
 Date : _____ Date : _____

POB



FUEL INDEX EFFECT	
WEIGHT (LB)	INDEX
3000	-1
9000	-3
12000	-4
15000	-5
18000	-6
21000	-6
24000	-7
27000	-7
29000	-7
30000	-7
30800	-7
31000	-7
33000	-6
36000	-6
39000	-6
42000	-11
45000	-13
48000	-15
62000	-19
54000	-20





Aircraft:	Date:	From:	To:	Fit No:	Captain:	FO:	FE:	Loadmaster:



BOEING 727 2S2F LOAD & TRIM CALCULATION (Tersus Role)

	Mass	Index	%MAC
BASIC (inc 3 crew)		50.00	47.87
Extra Crew Row 2			
Extra Crew Row 3			
Tersus Role Fit	17,490		
DRY	17,490	870.36	2885.24
Freight			
Dispersant SG 1			
ZFM	17,490	870.36	2885.24
Fuel		#N/A	
Taxi	17,490	#N/A	#N/A
TAKE OFF	17,490	#N/A	#N/A
Fuel to start spray	N/A		
AUM at Start Spray	N/A		
Trip Fuel		#N/A	
LANDING	17,490		-150.37

I certify that any spray fluid has been loaded IAW ICA IN491-005-12-10-00-610-803 and any freight has been loaded IAW current instructions, the freight is trim neutral and the cumulative loads are within limits.

Signatures:

Loading Officer: _____

Captain: _____

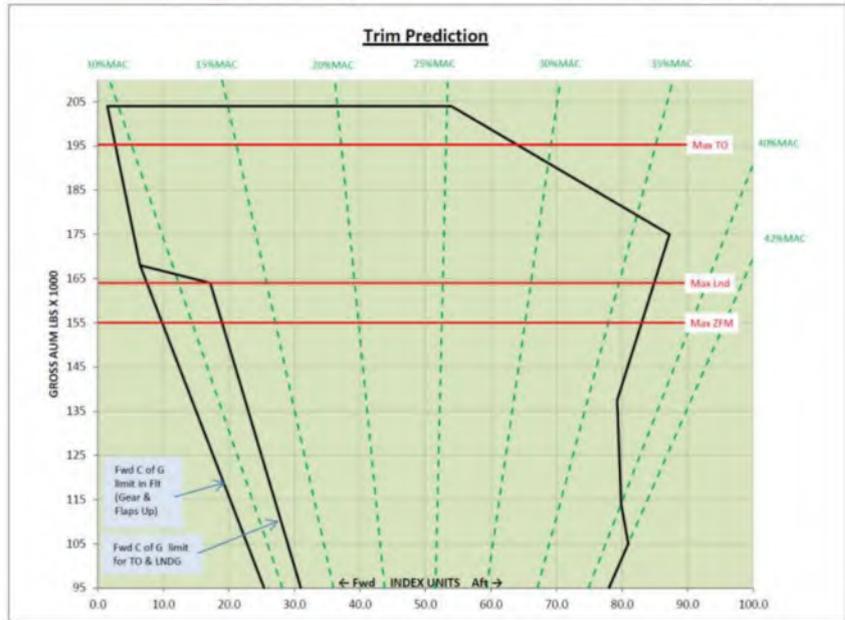
Date: _____

Compiled By: _____

Published: _____

Version: 2.6 Weighed N/A

Cumulative Load	Lower Fwd Limit	BOOM REMOVED	Take Off Flap
	Lower Aft Limit		Stab Trim
			#N/A



Date	Flight No	ETD

Input and planning

Compiled by

From	To	Aircraft	Captain	FO	FE	Load Master	Extra Crew Row 2	Extra Crew Row 3

Dispersant Distribution

SG	Tank 1	Tank 2	Tank 3	Tank 4	Tank 5	Tank 6	Tank 7
Volume - Lts							
Mass - lbs	0	0	0	0	0	0	0

	F1	F2	F3	Freight Attributes	A1	A2	Total Fwd	Total Aft
Max	4260	2970	2370		2820	5734	6000	8000
Freight lbs				Cumulative			0	0
Correction	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A		

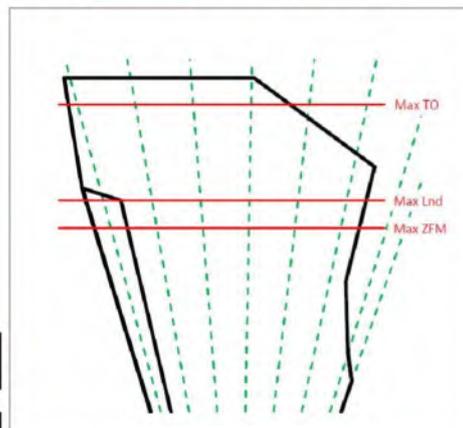
Freight & Dispersant Mass	
Total UD (dispersant)	0
Total LD (Freight)	0
Total Payload	0

Fuel	
Tank 1	
Tank 2	
Tank 3	
Total	0
Trip	

Take Off Flap	
Stab Trim	#N/A

Flight Profile	
----------------	--

Version 2.6 Weighed N/A



Aircraft Totals	Max Structural	Max Regulated	Max Boom Fitted
RAMP	0	204000	
TAKE OFF	0	203100	195300
LANDING	0	164000	164000
ZFM	0	155000	

In-Flight Landing Mass Update	
Flowmeter reading (litres)	
Fuel at Landing (lbs)	0
Landing AUM (lbs)	18,526



Intentionally Blank

Blades Passenger Flying Formation SOPs

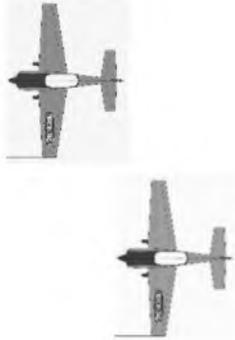
1. INTRODUCTION

1.1 CONTEXT

This annex expands on the Domestic briefing Guide at Annex C to this section and details the Blades Formation Standard Operating Procedures (iaw ORO.GEN.110) with specific reference to the risk mitigations for passenger flying in formation. The initial flight for any passenger follows a set profile, although how much of the profile is flown is dependent on each passenger. This 'qualifying' flight gives an indication of their suitability for a more advanced sortie profile as part of 'Flight Club' where they can experience a wider range of flying elements, such as advanced formation aerobatics, advanced singleton aerobatics, basic air combat techniques, and a chance to actually fly the aircraft.

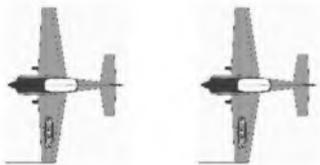
1.2 FORMATION POSITIONS

Formation positions will be flown by use of visual references detailed in the Table below.

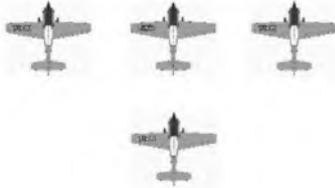
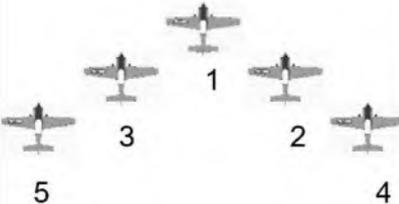
Position	Plan View	References	Separation	Remarks (Including Escapes)
ECHELON		Reference: 1. The base of the wing spade directly below the spinner. 2. The tailplane tip between the 3 rd and 4 th rivet of the fuselage.	Minima: 1. 12 feet wing tip to wing tip 2. Always separated by height	Escape: Always flown away from the leader by increasing the G and banking away from leader. ¹ Can be flown as a pair, a VIC or a BOX formation
LINE ABREAST		Reference: 1. Back of wingsight on leader's head. 2. 1 wings width between wingtips visually judged using own wing as an aid.	Minima: 1. 12 feet wing tip to wing tip	Escape: The escape is to pull and increase the G until positive separation is achieved. Can be flown with up to 5 aircraft.

¹ Escapes are always accompanied by a RT call; however if time is critical the escape manoeuvre is flown first and then followed by the RT call. If it is possible to remain in position (for instance during a minor emergency) an escape is requested to the leader, who will then complete any manoeuvre and clear the wing man to leave the formation.

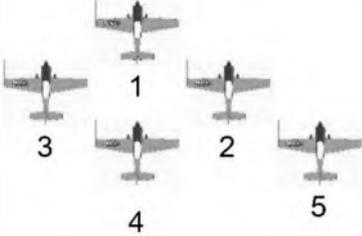


Position	Plan View	References	Separation	Remarks (Including Escapes)
<p>LINE ASTERN</p>		<p>Reference:</p> <ol style="list-style-type: none"> 1. Tailplane tips in line with wing spades. 2. Outside edges of wheel spats, 1 spats width inside aileron edges. 3. Front edge of wing spades on leading edge of wing. 	<p>Minima</p> <ol style="list-style-type: none"> 1. 12 feet nose to tail 2. Always separated by height 	<p>Escapes:</p> <p>If more than 2 aircraft, the escape is to pull with nose tail separation. The last man in line astern can also reduce power to fall off the back</p>
<p>SWAN</p>		<p>Reference:</p> <ol style="list-style-type: none"> 1. Tailwheel 1 foot above the wing spade on the lead aircraft. 2. The base of the wing spade on front edge of swoosh on number 4 aircraft 	<p>Minima:</p> <ol style="list-style-type: none"> 1. 12 feet wing tip to wing tip 2. Always separated by height 	<p>Escapes:</p> <ol style="list-style-type: none"> 1. Blades 1 & 4 to maintain depth or pull out of formation with nose tail separation. 2. Blades 2 & 3, always flown away from Blade 4 by increasing the G and banking away from him. <p>Can be flown as a 5-ship, with the 5th aircraft positioned outside 2 or 3.</p>



<p>TANGO</p>		<p>Reference:</p> <ol style="list-style-type: none"> Blades 2 & 3 fly line abreast on the leader. Blades 4 to fly line astern with the lead. 	<p>Minima:</p> <ol style="list-style-type: none"> 12 feet wing tip to wing tip Always separated by height 	<p>Escapes:</p> <ol style="list-style-type: none"> Blades 1, 2 & 3 to maintain depth or pull out of formation. Blades 4 can reduce power and drop off the back. <p>Can be flown as a 5-ship, with the 5th aircraft positioned outside 2 or 3.</p>
<p>BIG 5</p>		<p>Reference:</p> <ol style="list-style-type: none"> Blades 2 & 3 fly echelon on the leader. Blades 4 & 5 fly heads in line with the lead. Blades 4 & 5, the base of the wing spade directly below the spinner on Blades 2 & 3. 	<p>Minima:</p> <ol style="list-style-type: none"> 12 feet wing tip to wing tip Always separated by height 	<p>Escapes:</p> <ol style="list-style-type: none"> Blades 1, 2 & 3 to maintain depth or pull out of formation. Blades 4 & 5, always flown away from the inside wingman by increasing the G and banking away from him.



5 ARROW		Reference:	Minima:	Escapes:
		<p>1. Blade 2, 3 & 4 fly same reference as Box.</p> <p>2. Blade 5 flies either outside 2 or 3 using same technique as 'Big 5' above</p> <p>The actual formation positions for 4 & 5 can be swapped in line with experience, but will be pre-briefed carefully.</p>	<p>1. 12 feet wing tip to wing tip</p> <p>2. Always separated by height</p>	<p>1. Blades 1, 2, 3 & 5 to maintain depth or pull out of formation with nose tail separation.</p> <p>2. Blades 4, always flown away from the inside wingman by increasing the G and banking away from him.</p>

1.3 FORMATION SHAPE CHANGES

Formation changes may be made under a condition of steady G and with constant bank angle. All changes are initiated by the leader over the radio using the call '(new position), Go'. This order is to be acknowledged by all aircraft that are required to move, and in the order that the movement will take place. If an aircraft is required to vacate a space for another aircraft to use, the call 'callsign, clear' is made by the rearmost aircraft to ensure separation. Specific moves have specific calls and calls for any unusual moves will be covered in the brief.

To ensure safety throughout a move, the R/T order and subsequent responses must be correct before anyone moves. If there is a missed or incorrect call, or there is any doubt, then nobody should move and the leader will resolve the problem over the radio. For example, in a move from Box to Line Astern, the acknowledgement calls would be '4 clear', '2', '3'. 4 would lengthen before calling 'clear' but no other aircraft would move until completion of the full acknowledgements from #2, #3 and #4.

If an aircraft loses R/T communications he is to maintain station if possible. During a subsequent formation change, the lack of response from that aircraft will alert other formation members to the problem. The leader will then widen the formation and continue in accordance with the lost comms procedure.



1.4 GENERAL FORMATION DECONFLICTION THEORY

Generally, when in loose formation, each aircraft has collision avoidance on all other aircraft of a lower number than himself, ie #3 holds collision avoidance on #2 and #1 but not #4. To ensure collision avoidance, pilots should position their aircraft, not only to be **always** visual with those other aircraft, but also to be able to react to any unexpected manoeuvre they may perform. That said, all pilots should endeavour to remain predictable.

Notwithstanding the general principle of collision avoidance above, once in close formation, each aircraft is responsible for remaining within their own 'box'. Any unintended movement towards the edge of this 'box' (ie any error in position) should, in the first instance, be halted. Once the aircraft is positionally stable again, small corrections can be made to regain the ideal position.

However, if a pilot loses sight of the aircraft they are forming on, or if they become a safety factor to another aircraft in the formation, they should break out of formation. This is known as an 'escape'. The escape manoeuvre is specific to the formation shape and/or formation manoeuvre to ensure separation between all aircraft (and the ground) through-out the break-out.

2.0 FLIGHT PROCEDURES

2.1 BRIEFING

A mission brief will take place prior to all formation sorties and all aircraft captains are to be present. The briefing will comprise the Domestic Brief (Annex C), the sortie aims, objectives and flow, contingencies and emergencies.

All passengers will receive a passenger specific safety briefing, either from the video or from a suitably qualified Blades member of staff. The briefing will comprise the Passenger Brief (Annex D).

2.2 PRE-FLIGHT

All passengers and guests will be escorted by Blades staff whenever they are airside. Once the passenger is strapped in, they should be reminded of the salient points of the safety briefing (as detailed at Annex D).

2.3 TAXYING

Pilots automatically taxi in single file, weaving in sequence to ensure at least 10m nose-tail separation from the aircraft in front and to ensure the path ahead is clear of obstacles. The weave should manifest itself with even numbers paralleling fuselages and odd numbers doing the same. Once moving, if the leader needs to come to a stop, he will warn the formation by double clicking on the radio or calling a stop. A sudden, unexpected stop by any member of the formation will be called on the radio '*callsign, stopping*'.

If taxiing up a >20m wide runway, the leader will taxi up one side of the runway, weaving as necessary and following aircraft taxi in a straight line whilst maintaining their respective alternate sides of the runway. All aircraft should maintain nose-tail separation with the aircraft ahead on the other side of the runway and this will then guarantee nose-tail separation with the aircraft ahead on the same side of the runway. The leader will double click on the R/T when he wishes the formation to regain normal single file taxiing.

Note: at Sywell, when entering at hold B1 to line up on Runway 21R, the formation should remain in single file, since it is only a short taxi.



2.4 ENGINE CHECKS

Engine checks are usually completed prior to entering the runway, and all aircraft cock off the taxiway centre line with parallel fuselages so as not to blow other aircraft with prop-wash (ideally with heads in line if possible). Once individual checks are complete, a thumbs up should be passed up the line towards the leader. If the checks are completed on the runway, once complete, a thumbs up should be passed to the leader of the section.

2.5 RUNWAY LINE-UP FOR TAKE-OFF

Once cleared to enter the runway, the leader will call the type of line-up before entering the runway. This call will be acknowledged by #2 and is a 'check' of clearance to enter the runway. If the formation have not been cleared onto the runway, #2 should call 'stop' and query the clearance. The aircraft should line up as instructed by the leader.

The aircraft will line up on the runway as a pair with each aircraft either side of the centreline, or as a VIC with the leader on the centreline, with no wing overlap, replicating the standard echelon references. Note the references are tilted due to the attitude of the aircraft on the ground. If there are multiple sections, the pairs should be separated by a minimum of 50m (so that the leader can just see the section ahead). Aircraft within a section normally line up so that they are on their 'usual' side. The leader of the rear element or rear singleton can 'cock off' if required to keep the element ahead in sight and to ensure the runway is clear for their take-off roll.

Once lined up for take-off, the leader or leader of the rear section will call '*X ready, check fuel and canopy*'. All formation members should physically check the fuel tank selector and that the canopy is down and locked (tell-tale not visible). If the rear aircraft is a singleton, that aircraft will line up on the upwind side and the call will be '*callsign, ready on the left/right, check fuel and canopy*'. The leader will make this call prior to entering the runway for a 'rolling stream take-off'.

Once cleared for take-off, and the leader of the rear section has called ready, the leader will call the type of take-off (stream, pairs or VIC). A close formation take-off call should be acknowledged by the leader of the rear section, or #2 if only a 1 section take-off. A stream take-off call should be acknowledged by all formation members.

2.6 TAKE-OFF PROCEDURES

The leader will indicate with a wind-up signal to set 1800RPM – he will also make the call '*Blades set power*' if there are multiple sections. He will continue to signal until he sees a repeated signal in confirmation from his wingmen. He will then set 1800RPM. When the wingmen are ready to take-off, they will give a thumbs-up to the leader, which he will acknowledge with a thumbs up.

To initiate the **close formation take-off** roll, the leader will tap his head 3 times and then, on his head nod, release the brakes and smoothly apply 25" of power (27" can be set if G-ZXLL is the only aircraft on the wing). If there are multiple sections, he will also make the call '*Blades rolling now*' and will release his brakes on the 'n' of 'now'.

The minimum separation between the sections rolling will be 10 seconds to ensure that the section ahead will be airborne or, if the section ahead has encountered a problem, there has been time to pass the abort over the radio.

To initiate the **stream take-off** roll, the leader will make the call '*1 rolling*' and release his brakes. Subsequent aircraft should wait until the previous aircraft is just lifting off (approx. 10 secs) before



starting their take-off roll and calling '*callsign, rolling*'. On a shorter runway, a '**rolling stream take-off**' may be initiated from the hold point, with subsequent aircraft judging the timing of their taxi onto the runway to coincide with when the previous aircraft getting airborne. The minimum separation between singleton aircraft taking-off will be 5 seconds.

Any pilot experiencing a problem before rolling calls '*Delay the roll, callsign, nature of problem*'. If the problem is remedied, an R/T call of '*continue*' is made by the affected pilot.

The maximum pairs take-off cross wind limit is 15kts.

The minimum runway width for a pairs take-off is 20m and for a VIC take-off is 30m. Finger 4 take-offs may be flown on runways of 45m width or more.

2.7 ABORTING TAKE-OFF

Aborting a close formation take-off. In the event the leader requires the whole formation to abort, they will call '*Abort, Abort, Blades Abort*'. All aircraft abort their take-off roll. The front section will need to leave sufficient runway clear for the following section. In the event of an individual abort, the call '*Callsign, Aborting*' should be made and the aircraft should maintain its side of the runway. The rest of that section continues with the take-off – if it is the lead of a section who has aborted, the lowest number aircraft takes the lead of that section. The following section stays together, and the section lead will decide whether their section will abort or continue to take-off. Once the tailwheels of the following section has been lifted, it is likely that the best option is to continue the take-off; prior to tailwheel lift the following section should be able to abort without conflict with the aborting aircraft in front.

Aborting from a stream take-off. Any pilot having to abort when taking off in stream is to call "*Callsign, aborting*". Subsequent aircraft should not begin their take-off roll.

2.8 POST TAKE-OFF / JOIN UP

Climb and cruise checks (Part B Extra Section 5 Annex A) should be completed individually when able. Only the leader should squawk at this stage.

The join up is described in the brief by the leader and will routinely be into box or vic formation. Aircraft should join in numerical order and cut the corner to expedite the join. If #4 is in G-ZXLL, the rear element lead will set 27"/full power to expedite the join and will wave off #4 once established on a clear flightpath - however #4 holds collision avoidance for all other aircraft through-out the join.

Immediately after the first check-in on Stud 1, the leader will call '*check fuel*'. This is acknowledged by #2 but the fuel selector switch should be checked by all pilots.

2.9 SORTIE PROFILE

The sortie profile will be progressive. Gentle manoeuvring and formation shape changes are used to transit out to the operating area. If the overhead is used for operations, there will be a period of straight and level and gentle manoeuvring to acclimatise the passengers to the situation.

Subsequent close formation manoeuvring, and subsequent singleton manoeuvring will be flown in a progressive manner with breaks in between each evolution to establish the comfort level of the passengers and retain the confidence, comfort and enjoyment.

A typical initial passenger sortie will comprise (some) of the following:



- 1 - gentle manoeuvring and formation shape changes whilst transiting to the operating area
- 2 - progression to wing-overs and formation aerobatics (loops and occasionally $\frac{1}{4}$ clover)
- 3 - progression to singleton aerobatics (barrel roll, aileron roll, inverted flight, stall turn, zero 'g' flight from vertical roll, torque roll, lomcovak) as appropriate for the passenger. See detail below.
- 4 – corkscrew (1 aircraft barrel rolling around up to 3 aircraft in close formation whilst maintain nose tail separation)

Returning customer sorties may also comprise the following:

- opposition crosses (subject to the comfort and desire of the passenger). See detail below.
- tailchase (subject to the comfort and desire of the passenger). See detail below.

Prior to the first formation loop, the leader will confirm that all aircraft captains are happy to proceed with the manoeuvre. Subsequently an aircraft can 'sit-out' a manoeuvre for the comfort of the passenger or simply return back to the airfield, if it is felt that the passenger will not enjoy any further aerobatics.

Singleton Aerobatics. Individual aircraft may separate completely from the formation, or the whole formation or elements of it may 'widen' into 'Wall' formation so that singleton aerobatics may be flown. When not in close formation, all aircraft should squawk 7004. At the split or widen to wall, the leader will call 'Squawk' as a reminder.

With 2 or more aircraft within the 'Wall' formation, manoeuvres are flown in the direction of travel, and vertical manoeuvres will be preceded by a radio call from the element leader, which will include the direction of travel on recovery from the manoeuvre to maintain formation integrity. With only 2 aircraft, vertical manoeuvres may be flown one aircraft at a time, with the subordinate element (who is responsible for safe separation of at least 200ft), positioning so that his passenger can observe the other aircraft's manoeuvre before the roles are reversed. This changeover of lead can be verbal, or visual using the smoke system. If verbal, once visual with subordinate aircraft, the lead element calls 'X visual, Y you have the lead', acknowledge by 'Y has the lead'.

The smoke method, which cuts down on potential confusion between two pairs of aircraft, is to be used as follows: once the lead aircraft has completed his manoeuvre, the subordinate aircraft is to manoeuvre so that he can be seen and then emit smoke. When the lead aircraft sees the aircraft, he emits smoke himself, which signals the change of lead. In both methods, if the lead aircraft is not visual after completing the manoeuvre he is to call 'X blind' and the subordinate element is to continue to maintain separation whilst describing his position until the leader calls 'X visual, Y you have the lead'.

Opposition Cross. When the sortie is to contain a 180 By 100 (opposition) cross, this is to be specifically briefed prior to take-off. If 4 aircraft are flying, the cross will normally be flown as a pair opposing a pair with the lead aircraft of each element specifically nominated. This may be broken down further to a 2v1 cross or a 1v1 cross as required by removing the element wing-men's responsibilities.

The set-up for the pairs 180 by 100 cross shall be from an arrow or finger 4 formation, by performing a flat split with 2 aircraft turning left and 2 aircraft turning right through 45 degrees. The height and altimeter setting for the cross shall be specifically briefed and the escape path to be flown by all aircraft if affected by an aircraft emergency or if the opposing aircraft are not visual shall be pre-briefed with elements each turning right and taking up their datum heights. The subordinate aircraft



of each element shall remain in formation with the lead aircraft of that element in fighting wing, arrow formation. The manoeuvre is to be called on the RT with a confirmation of pressure setting and datum heights for each element to cater for the case of 'lost visual'.

The formation leader shall call the inwards turn ('*Turn In*') at the appropriate point and all aircraft will commence an inwards turn to position for the cross. A suitable line-feature on the ground may be briefed to aid the line-up but due to the relative angles (100ft lateral split at no lower than 1000ft msd) the visual references remain the master references. The subordinate element lead is responsible for establishing and maintaining collision avoidance, and specifically for setting up the required lateral pass distance and for ensuring that element flight paths do not cross. In the event that visual is lost, smoke may be used to aid early re-acquisition. Moreover, in such cases, the element that sees the other is to take over the responsibility for collision avoidance. Once turned in, rolled out and still visual with the opposing element, each element lead shall call '*Callsign Visual*' over the RT. Element lead aircraft shall pass left wing to left wing during opposition crosses with the subordinate aircraft to the right of their element leaders.

The aircraft shall pass no closer than 100 feet (4 wing spans) during the 180 by 100 cross and shall not point towards, or cross flight paths until the rear aircraft have passed each others 3-9 line. Once the cross has occurred, the aircraft shall turn as required to set up for the next manoeuvre.

Tail chase. A tail-chase will be flown in accordance with CAP 403. Therefore, tail-chasing is defined as being when the aircraft are flown between 50-200m nose-tail separation. The optimum separation is 100m. The leader will position the subordinate aircraft in echelon and break away from the formation smoothly setting 24''. Subordinate aircraft will follow at 3 second spacing. The leader will fly predictable turn at 2G through 180 degrees until the last member in the tail-chase calls 'Aboard'.

The maximum number of aircraft for a tail chase is 4. The leader's minimum speed will be 60 kts and he will always remain under positive G. If the leader flies through the sun his flight path is to remain predictable and he will continue on his current track or arc. These restrictions will limit the manoeuvres to wingovers, loops and barrel rolls under positive G. It should be noted that the Extra 300 radius of turn is such that with 4 aircraft in the tail-chase and all aircraft at maximum extension for completed perfect looping manoeuvres the trailing aircraft may become an issue for the leader. Therefore, consideration should be given to flying offset, twisted loops in order not to fly back through your own flightpath during tail-chasing. No intentional departures are to be flown; however, if an aircraft departs inadvertently an immediate and executive '*Breakaway*' RT call must be made, following which the following aircraft are to avoid the departed aircraft preferably by lag in order to keep sight. If at any point any aircraft loses sight of the aircraft ahead, he is immediately to call '*Blade # Blind*' and fly into clear airspace. The tail-chase will be terminated, the aircraft will be rolled out on the same heading and a rejoin will be initiated.

Change of Formation Lead

Formations must be led by formation leaders. Where there is more than one formation leader in the formation, formation lead may be handed over during the sortie. Formation lead changes will be pre-briefed, and the change is can be initiated by either hand signals or an RT call as follows:

Leader: '*3 - You have the lead*'; #3: '*1 have the lead*'

If there are more than 2 aircraft in the formation, the leader must put the formation into a suitable shape to perform the change of lead.



2.10 LIMITATIONS

'G' Limits. Normal sortie G forces will be between +4G and -1G in order to conduct the manoeuvres; however, to cater for some singleton manoeuvres the limits are +6G and -2G. These are the maximum values and the intention will always be to limit the G to ensure that the passengers enjoy the experience and determine their own personal limits.

Weather Limits. Weather limits are described at Para 8.1.4 of Section 8 to this Part.

Wind Limits. For Part-SPO operations, the crosswind limit for take-off and landing is 15Kts. The limit for passenger operations is steady 35Kts or gusting to 40Kts.

2.11 CAT OR PART-SPO DISSIMILAR AIRCRAFT (MIXED) FORMATION FLYING

Dissimilar aircraft CAT or Part SPO flying flown in Company aircraft will be flown in accordance with these SOPs as applicable save that it is approved for Company pilots to carry out mixed formation with Navajo, King Air, B727 and Extra 300 aircraft flown by Company pilots.

Any CAT or Part-SPO formation flying with aircraft flown by non-Company aircraft / pilots (save for emergency formation flying) will only be carried out after due consideration to the operational requirements, the commercial benefits, the pilots involved (and particularly their formation experience levels), the aircraft involved (and particularly the operational compromises inherent therein) and any situational and programming pressures. Having satisfied himself that a CAT or Part SPO dissimilar aircraft formation mission is appropriate, the Operations Director, the DFO, the Chief Pilot, [Head of the Blades](#) or Blade 1 may sanction detailed procedural investigations by the Company aircrew involved with a view to carrying out the mission.

Subject to:

- Those investigations identifying procedures that mitigate the risks involved, and;
- The investigating aircrew recommending that the mission be flown; and
- The approval of the Operations Director, the DFO, the Chief Pilot, [Head of the Blades](#) or Blade 1 and;
- The approval of the assigned FOI being given (noting that in exceptional circumstances where the FOI is unavailable, a Company Director may sanction the flight).

The mission may be approved for any formation-flying qualified Company pilot to carry out. For dissimilar aircraft formation flying the aircraft captains must brief together prior to the first formation mission. Formation positions, speed envelopes, collision avoidance responsibilities, join procedures, escapes, hazards, limitations and emergencies are to be agreed and briefed. Between captains these line items may then become SOP. However, rendezvous plans and positions, join axes, heights sanctuaries and frequencies, mission profiles, contingencies emergencies and other mission objectives (that are separate to the formation portion of the mission but may have an impact on it) must be briefed before each mixed formation mission.

2.12 LOSS OF R/T COMMUNICATIONS

If an aircraft loses R/T communications he is to maintain station if possible. During a subsequent formation change, the lack of a response from that aircraft will alert other formation members to the problem. The leader will then widen the formation and continue in accordance with the lost comms procedure. Following a total communications failure, the pilot shall indicate by tapping his microphone and his headset and giving the thumbs down signal. The element lead shall then bring the emergency aircraft back to base, making his calls for him and dropping him off at short finals.



Should a pilot suffer only a microphone or headset failure this should be indicated in the following manner:

- (a) Microphone only failure - signalled to the leader by pointing to his microphone followed by thumbs down signal.
- (b) Headset failure – signalled to the leader by pointing to his earpiece followed by a thumbs down signal.
- (c) Either of these failures will result in the sortie being curtailed.

If intercom is lost the passenger can indicate at any time by a 'thumbs down' that he/she would like to terminate the flight.

2.13 RECOVERIES

Recovery to the airfield shall be in accordance with approved local procedures; the formation may recover for:

- a formation break into the circuit with a numerical formation break to achieve the required separation downwind to turn finals and land with at least 500m between aircraft
- an overhead join or straight-in stream landing via any point in the circuit.

On recovery, individual recovery checks should be completed, and particular attention should be given to the position of the fuel tank selector. The leader will state the type of recovery, either on the discrete frequency or on the approach / tower frequency. The standard recovery is to stream (uncalled) on approach to base leg or straight in.

2.14 STREAM APPROACHES

Once all other traffic has been identified, and it is safe to do so, the formation will start to stream, with #4 lengthening sufficiently for #3 to cross sides and position between #2 and #4. #1 will keep his speed up to assist the stream. If approaching via base, it is generally better to generate spacing by fanning out, rather than reducing speed. Weaving to generate space should be avoided since it compounds issues further back in the formation.

2.15 FORMATION BREAKS

There are 3 types of breaks that can be flown with passengers;

- Flat break
- Looping break
- Echelon break

The flat and looping break are essentially the same break; but the latter is preceded by a loop in box and therefore the term 'flat', in this case, indicates 'not looping'.

Flat break. This break is generally performed from box or vic formation and the leader will make the call '*this is for a flat left/right hand break*'. As the formation approaches the runway from initials, the leader calls a reminder '*flat left/right hand break*' which #2 acknowledges. The leader will then initiate the break by calling '*1 breaking now*'. The break manoeuvre is a sharp 45 degree pitch up, derry roll under, followed by a break in the pre-briefed direction. The smoke is turned off and the call '*callsign*' is made at the pull after the derry roll. Each aircraft then subsequently breaks in numerical order, each



aircraft initiating their break on the previous aircraft's *'callsign'* call. This call ensures that the airspace above the formation is clear to pull into for each breaking aircraft.

Looping break. This break is generally performed from box or vic formation and the leader will make the call *'this is for a looping left/right hand break'* which #2 acknowledges. The leader flies an SOP loop. During the loop he then reminds the team with the call *'left/right hand break'* which is acknowledged by #2. Once level, the leader initiates the break by calling *'1 breaking now'* and the rest of the manoeuvre is flown as per the flat break above.

Echelon break. This break is flown from echelon (ie echelon left for a right-hand break and echelon right for a left-hand break) and is used for smart arrivals at airfields when an aerobatic manoeuvre is not appropriate.

The leader will call *'Echelon left/right, Go'*. For echelon left – the response is *'4 clear', '3 clear', '2'*. For echelon right – the response is *'4 clear', '3'*. This ensures collision avoidance is maintained throughout the move. As a reminder the leader will then repeat his call of *'left/right hand echelon break'*, which is acknowledged by #2 before the leader breaks (silently) in the pre-briefed direction. This break can be flown level or climbing depending on the situation / location. Smoke is turned off at 90 degrees. The break is flown at 3G until the 90 and then the aircraft are rolled out and the downwind leg intercepted a/r.

Errors in the break. If a pilot breaks in the wrong direction he is to make a call to that effect, continue downwind and land last.

2.16 LANDING

The finals turn is flown with reference to the slipstream of the aircraft ahead, although awareness of the proximity of the ground and the airfield is important.

Each aircraft will get individual landing clearance. Occasionally ATC may clear the whole formation to land in response to the leader's *'final'* call. In this case, individual final calls are not required. The Blades have a CAA exemption from the ANO to land with other Blades aircraft on the runway as long as the visibility is $\geq 3000\text{m}$, the minimum separation distance between aircraft is $\geq 200\text{m}$ and the airfield has given permission².

If landing on a runway whose width is less than 20m, the minimum separation distance on touchdown is 500m. On short finals, pilots should remain clear of the preceding aircraft's slipstream by adjusting their flightpath on the final approach when necessary; the first aircraft should land from a slightly shallow approach, and following aircraft should fly progressively (slightly) steeper approaches, touching down beyond the touchdown point of the aircraft ahead. All aircraft are to land on the centreline and move to the pre-briefed slow lane once under control before clearing the runway (normally the slow lane is the side of the runway the aircraft will exit for parking). Pilots should avoid harsh braking on the roll-out unless dictated by runway length, to prevent the need for harsh braking by following aircraft. On shorter runways, where there is no slow lane, the leader may pre-brief additional spacing on finals (ie double or triple spacing) so that the runway is clear by the time each aircraft lands.

When landing on a runway whose width is at least 20m, the minimum separation distance on landing is 250m and aircraft will land in the centre of their half of the runway, alternating either side of the

² See Exemptions documents on Teams



runway centre-line maintaining their side of the runway until the runway end. The first aircraft will land on the half closest to the expected turn off the runway. Once again, when required pilots should remain clear of the preceding aircraft's slipstream by adjusting their flightpath on the final approach as above when there is no discernible crosswind. With a crosswind, those aircraft on the upwind side on the approach are to fly a slightly shallow approach and those on the downwind side are to fly a slightly steeper approach, touching down slightly beyond the touchdown of the aircraft ahead. This is known as 'the stack'.

The first aircraft to land should emit a short burst of smoke on short finals to provide an indication of the drift. Other aircraft can do the same thing if appropriate. Once landed aircraft are permitted to close up towards the aircraft ahead, however they must maintain nose tail separation. When the runway is vacated, each aircraft calls '*callsign, clear*'. If landing on alternate sides of the runway centreline, then those on the opposite side of the runway to the final turn off the runway should maintain their side until opposite the turning, and ensure they are clear to vacate ahead of the following aircraft before doing so.

2.17 LANDING EMERGENCIES.

In the event of an aircraft going around, the following aircraft will still land on the same side as planned, however the following aircraft is to be aware that the aircraft ahead is now on the same side of the runway, and the minimum separation distance is now 500m between those 2 aircraft.

If an aircraft needs to 'go around', select full power, wings level and climb immediately. An R/T call of '*callsign going around*' should then be made and the subsequent circuit flown in the original direction and the pilot should land last. If required, the last aircraft on finals may smoke to assist the overshooting aircraft to acquire him.

If an aircraft needs to roll after touchdown (eg brake failure or loss of directional control) the pilot should move to the centre of the runway if possible and initiate a 'go around'. The radio call of '*callsign coming through*' can be made to alert the aircraft ahead.

2.18 REVERSE

The object of a reverse is to turn the whole formation around on the runway after landing in a safe, tidy and expeditious manner. All aircraft turn inwards simultaneously through 180° to remain on their side of the runway, pointing in the opposite direction. The procedure for a Reverse is as follows:

- a. The leader initiates a Reverse by calling '*this is for a reverse*' once on the runway. It is acknowledged by #2. It is likely that the formation will already be expecting a Reverse if ATC have requested the formation to backtrack to clear the runway.
- b. Once under control and ready to turn, the last aircraft to land calls '*Ready reverse*'.
- c. The leader calls '*Blades, Reverse*'
- d. All aircraft carry out the Reverse as described above.
- e. The aircraft taxi back down the runway in reverse order, unless briefed otherwise by the leader. Once clear of the runway, it may be possible to re-order if there is space to do so.



2.19 PARKING

Wherever possible, the aircraft are parked in one line in numerical sequence. Parallel fuselages / the red wing sight / other pilots' heads can be used to ensure that the aircraft are in-line. Where possible the leader will use a line feature. If an aircraft makes a late assessment that he is too close to the previous aircraft, he can call '*callsign, coming out*' to warn following aircraft that their lateral separation is about to be eroded in turn. Ultimately, any aircraft can call '*callsign, stopping*'.

2.20 SHUTDOWN

Pre-shut down checks should be done individually (including lights off). Final shut-down (ie mixture cut-off) is initiated by the leader with a shut-down hand signal, which should be repeated by all pilots to ensure that every pilot can see it. Assuming 1000RPM was set pre-shut down, all the propellers should stop in the same place. The remaining post shut-down checks should then be completed individually. Once the aircraft has been vacated (and the key confirmed as being safe), the propeller should be moved so that a blade is vertical.



3. FLIGHT CLUB

3.1 INTRODUCTION

'Flight Club' is a series of advanced flights that a passenger can progress onto, having flown the basic passenger flight profile as described in the previous section. It is designed to encourage repeat business. None of the limitations (ie wind, 'g') or procedures described in the previous section are altered; Flight Club flights simply expose the passenger to a wider range of flight profiles.

3.2 PRE-FLIGHT

All passengers will receive a passenger specific safety briefing, either from the video or from a suitably qualified Blades member of staff. The briefing will comprise the Passenger Brief (Annex D). They will also participate in the mission brief, at which all relevant aircraft Captains are to be present. The briefing will comprise the Domestic Brief (Annex C), the sortie aims, objectives and flow, contingencies and emergencies. All other pre-flight procedures are as described previously.

3.3 FLIGHT PROFILES

Each flight will begin with some benign 'warm-up' manoeuvres to consolidate the passenger's previous Blades flight and to ensure that they are comfortable and happy to progress. As with the traditional passenger flight, the profile flown is subject to passenger comfort and enjoyment.

'Advanced Aerobatics'. The aim is to expose the passenger to some additional singleton aerobatic manoeuvres to the ones they have seen in the basic profile. The flight is flown as a singleton. The following additional manoeuvres are typically flown:

- Tumble, Centrifuge

'Take Control'. The aim is to allow the passenger to experience flying the Extra 300L themselves and to get an appreciation for flying some basic aerobatic manoeuvres. The flight is flown as a singleton and with an FI as Captain. The following manoeuvres are typically taught:

- Loop, aileron roll, stall turn. Further manoeuvres may be taught subject to the passenger's ability and experience.

'Advanced formation'. The aim is to expose the passenger to some additional formation manoeuvres to the loop that they have seen in the basic profile. The sortie is flown as a pair. The following additional manoeuvres may be flown:

- ¼ clover, crazy (with inverted leader), hammerhead into snake, pairs break (flown at height)

'Air Combat'. The aim is to allow the passenger to understand some basic air combat principles and to experience them in flight. This is achieved by demonstrating lead and lag and culminating in a tailchase. It is flown as a pair.



3.4 ADVANCED FORMATION SORTIE GUIDE

BRIEF

Strapped in tight – explain that going to be inverted for at least 30 secs which can feel different!

PRE-FLIGHT

**Very important to strap pax in properly and secure loose shoulder straps and any cables near camera to avoid them getting in camera shot.*

Control column – really stress the need to keep hands free – thighs or handles best place.

SORTIE

REFRESH BASIC FORMATION:

START	Echelon L/R – 130-150 kts
FLOW	STANDARD COMM THROUGHOUT <i>Start with level turn towards wingman – reverse turn away from wingman to put wingman on outside of turn – put wingman into line-abreast.</i> <i>Maintain for approx 360 degrees then reverse turn again – put wingman into line astern. Put wingman back into ech L/R (on side they normally fly) – fly a loop.</i> <i>Swap lead and repeat.</i>
NOTES	Normal pax references flown throughout.

INVERTED – CRAZY - HAMMERHEAD:

START	Ech on the right – 150 kts 25"
FLOW	Lead: "INVERTED NEXT, 2 WIDEN" Wingman: "2...CLEAR" <i>Wingman widens. Once lead sees 2 is clear:</i> Lead: "1, ROLLING IN" – "CLOSE, GO" Wingman: "2" <i>Lead aircraft maintains inverted whilst 2 closes back to a closer position (closer to line-abreast length and deep enough so you can see wingtip camera on lead ac far wing) – when ready:</i> Lead: "2, YOU'RE CLEARED CRAZY IN YOUR OWN TIME" Wingman: "2" <i>Wingman widens slightly and then flies crazy for approx. 20-30 secs – when lead complete:</i> Lead: "2, WIDEN" <i>Wingman rolls out and maintains wide line-abreast position ready for Hammerhead.</i>



	<p>Wingman: "2...CLEAR" Lead: "1, ROLLING OUT"</p> <p><i>Wingman maintains wider position.</i></p> <p>Leader: "HAMMERHEAD NEXT, 2 CALL READY" Wingman: "2" – "2, READY" Leader: "SMOKE ON, GO...AND PULLING UP...HOLDING...RUDDER, GO (minimum 50kts and always flown to the left)...LINE ASTERN, GO" (auto collapse into line-astern)</p> <p><i>Both aircraft ease out of the dive back to level flight in line-astern.</i></p> <p>Leader: "2, ECHELEON LEFT, GO" Wingman: "2" Leader: "2, YOU HAVE THE LEAD ON THE LEFT" Wingman: "2"</p> <p><i>Repeat exercise from start. Remain in line-astern after Hammerhead.</i></p>
NOTES	

SNAKE – GATLING – FORMATION BREAK:

START	Remain in line-astern from Hammerhead, #2 leading the first one. 150-160 kts 25''
FLOW	<p>Lead: "SNAKE NEXT, 1 CALL READY" Wingman: "1" – "1, READY" Lead: "LEADER PULLING UP...NOW" (3-4 G pull) Wingman: "AND...GO" Lead: "SMOKE ON, GO" (20'') – "COMING RIGHT NOW" – "HOLDING THE BANK, NOW" – "LETTING IT OUT...ROLLING OUT" – "SMOKE OFF, GO" (25'')</p> <p><i>Wingman maintains swept echelon left position.</i></p> <p>Lead: "GATLING NEXT, 1 CALL READY" Wingman: "1" – "1, READY" Lead: "SMOKE ON, GO" – "1, ROLL, GO" – "COMING, LEFT, NOW"</p> <p><i>Wingman flies 3 – 4 rolls before recovering to a swept echelon left position ready for the formation break.</i></p> <p>Lead: "LEADER ROLLING OUT" Wingman: "SMOKE OFF, GO"</p> <p>Lead: "FORMATION BREAK NEXT, 1 CALL READY" Wingman: "1" – "1, READY" Lead: "THIS IS FOR [LEAD] TO BREAK LEFT, [WINGMAN] TO BREAK RIGHT, ACKNOWLEDGE" Wingman: "1" Lead: "SMOKE ON, GO" – "FORMATION...BREAK, BREAK, GO"</p>



	<p><i>Use a roll-pause-pull cadence so pax get exposure to pre-break positioning - lead always breaks up and left, wingman always up and right. Pull through to complete 180 turn.</i></p> <p>Lead: "SMOKE OFF, GO" – "1, YOU HAVE THE LEAD ON THE LEFT" Wingman: "1" Now Lead: "2, LINE ASTERN GO" Wingman: "2"</p> <p>Wingman joins into line astern ready to repeat exercise.</p>
NOTES	

Pitch map holder guide

PAIRS T/O - Checks

BASIC FORMATION (1 leads initially)

- Ech L/R, LAbreast, LAstern, Ech L/R, Loop
- Swap lead - repeat

INVERTED – CRAZY – HAMMERHEAD (1 leads initially)

- Ech R, Inv Ech, Roll out, Crazy, H'head > LAstern
- Call to Ech, swap lead, repeat

SNAKE – GATLING – FORMATION BREAK (2 leads initially)

- 2 Leads, Snake, Gatling,
- Break (Leader up & L, wingman up & R)
- 180 turn – swap lead, LAstern for set up

FLAT/LOOPING BREAK

3.5 AIR COMBAT SORTIE GUIDE

BRIEF

Bubble – Talk about 'sphere' around the aircraft. Explain only applicable once doing air combat.

Slipstream – Mention there could be a bump if you fly through the slipstream.

G awareness – Explain it could be up to 3-4 G but that the pax should let you know if they are struggling. Sortie can still be completed but with less G.

Head position – Talk about how you will ask them to check-6 at some stage but they should not strain to do so as could result in a stiff neck later – point made through difficulty of doing so!

Principle slide – Explain why you want to get behind someone:

- Fixed forward-firing guns.
- Less crossing angle.
- More stable tracking solution and time for aiming – use analogy of cars passing on the road or following each other.
- Control Zone – Talk through why it is shaped like it is, particularly the min and max ranges.



Lead/Lag slide – Use analogy of 2 model trains placed on opposite sides of the circle to explain a neutral fight.

SORTIE

G-warm – 2 x 180 turns, first 2G, second 3G – “FOR G-WARM, TURNABOUT L/R”

Lead/lag and yo-yo demo:

START	Battle (spacing approx. 1200') – 130kts – 2000'
FLOW	<p>Lead: “SETTING UP FOR LEAD AND LAG DEMO, 2 CALL READY” Wingman: “2 READY” Lead: “BLADES, KICK 60 L/R”</p> <p><i>Leader turns away from wingman - both aircraft turn and roll out on new heading.</i></p> <p>Wingman: “2’s VISUAL, FIGHTS ON”</p> <p><i>Lead aircraft turns towards wingman and enters a 45 deg aob turn. Wingman delays turn and then stabilizes on same circle initially to show nothing is changing – then pulls a tighter turn to reduce range and close towards the CZ – once approaching min range, wingman demos lag to reposition back into initial stable position.</i></p> <p>Wingman: “TIGHTEN”</p> <p><i>Lead tightens to a 60 deg aob turn and turns smoke on for reference. Wingman tightens as well and simulates reaching max performance – then demos a low yo-yo to close – once closing, wingman generates an overshoot and uses a high yo-yo to stabilize.</i></p> <p>Wingman: “2 COMPLETE – 1 REVERSE – ROLL OUT THERE”</p> <p><i>Aircraft roll out in battle ready for next exercise.</i></p> <p>Lead: “2, YOU HAVE THE LEAD” Wingman: “2 HAS THE LEAD, REPEAT OF LEAD/LAG DEMO NEXT, 1 CALL READY”</p>
NOTES	Defensive element to talk pax through how hard it is to see someone behind – encourage a brief look but don’t prolong.

Simulated dogfight:

START	Battle – 130kts – 2500'
FLOW	<p>Lead: “SETTING UP FOR SIMULATED DOGFIGHT, 2 CALL READY” Wingman: “2 READY” Lead: “BLADES, CHECK AWAY”</p> <p><i>Both aircraft turn outwards through 45 deg and select 25” power.</i></p> <p>Lead: “TURN IN”.</p> <p><i>Both aircraft turn towards each other but the lead element always floats to the outside of the turn.</i></p>



NOTES	<p>Lead: "1's VISUAL" Wingman: "2's VISUAL" Lead: "FIGHTS ON"</p> <p><i>Pass made as tight as comfortable and holding knife-edge, canopy-to-canopy for a few seconds prior - aircraft enter a level, rate fight once passing the 3-9 line – lead aircraft to purposefully only start at 2 G – wingman will gradually become offensive - start working into wingovers.</i></p> <p><i>Lead aircraft to make it obvious they are committing nose low into a barrel roll – wingman to simulate a quick snapshot at end of barrel roll.</i></p> <p>Wingman: "SNAPSHOT"</p> <p><i>Lead aircraft to turn on smoke to simulate a hit – then starts to ramp up manoeuvring to include loops, barrel rolls and reversals – wingman can demo a lag roll during a reversal – after appropriate amount of time wingman to position for a shot and call it.</i></p> <p>Wingman: "GUNS KILL!" Lead: "1, ACKNOWLEDGED"</p> <p><i>Lead aircraft conducts 2 aileron rolls in acknowledgement.</i></p> <p>Wingman: "1, COME L/R" – "ROLL OUT THERE, 2's BATTLE LEFT/RIGHT" Lead: "2, YOU HAVE THE LEAD" Wingman: "2 HAS THE LEAD, SIMULATED DOGFIGHT NEXT, 1 CALL READY"</p>
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2Excel Aviation Limited Domestics Brief

- Check List:** Maps/Charts/Flight Plan/PLOG/Load Sheet/Customs Declarations (if applicable)
- Sortie Aim:** Aim/Alternative Exercise/Poor Weather Plan/Loser Plan
- Timings:** Check in/Taxy/Take-off
- Composition:** Pilots/Passenger(s)/Aircraft
- Weather:**
- Fuel:** Start Fuel/Bingo/Landing Fuel
- Comms:** Check-in/Frequencies Required/ATC
- SUTTO:** Taxi Order/Take-off/RV
- Recovery:** Formation/Slow Lane/Wake Turbulence
- Emergencies:** Take-off/Airborne/Recovery/Landing
- Route:** Navigation/NOTAMs/Avoids/Temp Airspace Upgrades/Local Procedures
- Air Ex:** Route / Formation / Shapes / Changes / Comms / Collision Avoidance / Emergencies / Escapes / Sortie Flow

C/S	Date	A/C	Times
Aim:		1	Brf
R/W:		2	Walk
WIND: Surface	2000ft 5000ft 10kft	3	Start
WX:		4	Cx-in
VIS:		5	T/O
Cloud:			
QFE:			
QNH:			
DIVS:			
R/W -			
Wind -			
Cloud -			
QFE -			
Fuel -			



Intentionally Blank

2Excel Aviation Limited Passenger Brief

Domestics

- Manifest details – name, address, Company contact; telephone numbers, next of kin, next of kin contact details;
- Medical questions:
 - Cardio-vascular problems (angina, heart attacks)?
 - Respiratory problems (asthma, emphysema)?
 - Deep vein thrombosis?
 - Recent diving?
 - Epilepsy (how well controlled? when? where is medication?)
 - Diabetes (how well controlled?)
 - Recent operations? (Implications of gas and or straining)
 - Discomfort:
 - Common cold; sinus; valsalva
 - Glasses / contact lenses (both are acceptable)
 - Have you any other medical conditions you think you should disclose?
- Implications of flying on personal insurance; and Company insurance;
- Passenger weight established;
- Clean pocket policy;
- Flying clothing.

Parachute Use and Abandoning Procedures for the Extra 300 (where applicable)

- Describe the parachute and assist with fitting
- Describe parachute roll.
- Familiarize with D-Ring
- Describe bail-out procedure.
- Following Captain's instructions at all times.

Transit To and From the Aircraft

- Hazards on the Aircraft Operating Area – especially other users
 - Escorts and marshals; cordon, boundary and limit markings
 - Noise (and earplugs);
 - Hazards around the aircraft:
 - Route to the aircraft (not in front of wing line within 15m)
 - Propellers;
 - Manoeuvring area;
 - Control surfaces;
 - Pitot probes and wing sights;
 - Embarkation hazards (especially weight at the rear of the PA 31; the foot-step and slippery surfaces);
 - Hazards of un-strapping and how to place straps in the Extra 300;
- Normal Egress – not before help is along-side;
Importance of following Ground Support Staff instructions at all times.

Extra 300 Cockpit Familiarization

- Canopy
 - Fragility of the canopy;
 - Opening and Closing;
 - Where to (and not to) place straps.
- Point out cockpit details.
 - Intercom jack plugs, volume, altimeter, ASI and G meter.
 - Demonstrate movement of the stick and throttle (ensure hands clear of surfaces during demonstration)
 - What not to touch (fuel selector); where not to step (brake lines)
 - Importance of keeping hands clear of stick and throttle during flight.
 - Describe rudder/toe brake combination and importance of keeping toes clear.
- Demonstrate hand-hold positions
- Ensure passenger's questions are answered and he is at ease.

Extra 300 Strapping-in Procedure

- Ground Support Staff will assist and guide the strap-in.
 - Parachute Donning ([where worn](#))
 - Helmet Donning and microphone positioning
- Operation of the buckles, tensioning and releasing straps.
- Where to find the D-Ring ([where applicable](#))
- Emergency ground egress actions
-

Sortie Content

- Start up, taxi and take-off. What to look for and what to expect.
- Airborne manoeuvring; close formation positions; heights to be flown.
- Landing – including need to keep toes clear.

Sensations to Expect

- Describe the sensation of increased G-forces;
- Describe the noise of engine/airflow at high power settings/speeds;
- Demonstrate how to access the sick bag;
- Describe expected intercom and radio volumes;
- Describe radio traffic and when it is OK to speak to the captain;
- Describe lack of forward visibility;
- Describe the take-off and landing rolls and the rough ride over grass runways;
- Describe where to look to see out and to see the other aircraft.

Emergency Procedures

- Loss of intercom (hand signals);
- Forced landing / ditching (if applicable) technique and what to expect;
- Emergency egress procedure;
- Actions in the event of air-sickness;
- Actions in the event of illness or incapacitation.

Re-cap

- Refresh the passenger on the sortie content;
- Ensure passenger at ease and encourage questions.



Extra 300 Passenger - Pre-flight Questionnaire and Medical Declaration

First Name:	Surname:	Date of Birth*:	Company:
Work Phone:	Mobile Phone:	Email Address:	
Emergency Contact:			
First Name:	Surname:	Work Phone:	Mobile Phone:
Relationship:			

Condition	NO	YES	Comments if YES
Cardio-vascular problems (angina, heart attacks)?			
Respiratory problems (asthma, emphysema)?			
Deep vein thrombosis?			
Recent diving?			
Pregnant?			
Epilepsy (how well controlled, when, medication)			
Diabetes (how well controlled, doctor's advice)			
Recent operations (Implications of gas and/or straining)			
Discomfort: (common cold, sinus, valsalva, glasses, contact lenses)			
Any other medical condition you think you should disclose?			

We endeavour to produce a short video of your flight with The Blades, which we will share with you by emailing a video link. Is this ok? Yes No

Can we contact you about future events and marketing initiatives by email, SMS, phone or other electronic means? Yes No

We may take photographs and video footage of you today that may be used in marketing material both electronic and printed. Is this ok? Yes No

We will always treat your personal details with care and never sell them to other companies for marketing purposes. Our Privacy Policy is available on our website www.theblades.com.

*Signed: Name: Date:

*Where the Passenger is under 18 years of age, this form must be signed by a parent or guardian.



Frequent Passenger Multi-Engined Aircraft Cabin Safety Training Record

First Name:	Surname:	Date of Birth:	Company:
Business Address:		Home Phone:	
		Work Phone:	
		Mobile Phone:	
		e-mail Address:	
Next of Kin Details:			
First Name:	Surname:	Relationship:	
Address:		Home Phone:	
		Work Phone:	
		Mobile Phone:	

Frequent Passenger Briefing Declaration valid for: King Air 200 / Boeing B727/B737 / PA31 Navajo (delete as applicable)	Date	Signature
I certify that I have received instruction on the topics listed below, including the location and use of all emergency and safety equipment carried on the aeroplane, and the location and use of all types of exits.		

- Smoking prohibition.
- Seating positions.
- Specific brief on the use of vacant flight crew seating (when applicable)
- Operation of safety belts (fastening and unfastening demonstration).
- Carry-on baggage stowage.
- Restrictions on the use of portable devices.
- Table stowage.
- Normal and emergency exits; egress routes, procedures and responsibilities.
- Location of emergency equipment.
- Communications with the cockpit (sterile flight deck).
- Instructions, including emergency commands ('signal to brace').
- Brace positions.
- Donning and operation of life jackets (demonstration when applicable)
- Life raft stowage.
- Emergency oxygen masks (demonstration when applicable).
- Instruction to read the Safety Card (detailed at Annex D to OMA Section 8).

This Certificate is valid for six months from the end of the calendar month of completion but a briefing/demonstration must be given if passenger has not flown on aircraft type within last 90 days

Previous Expiry Date:		New Expiry Date:	
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NAVAJO / KING AIR AIRCRAFT CABIN SAFETY BRIEFING – Crew Reminder

Note. Seats should have Safety Cards placed on them and already be in the upright position with armrests lowered. Cabin baggage should be stowed before embarkation.

BEFORE START	
Safety Card and Location	Excuse me....I wonder if I might have your attention for a short safety brief... Safety instructions for this aircraft are shown on the Safety Card (<i>point to card</i>) along with other useful information – a copy was placed on your seat, and for your safety, and that of the other passengers please take a moment to study the card before we depart. When you have finished, please place the cards in the seat back pockets.
Seat Belt Demo	Your seat belt must be securely fastened for take-off, landing, and at any time when the FASTEN SEAT BELT light is on. They fasten like this...(demo, including adjustment) (and please note that the seats have an additional shoulder belt). I suggest that you leave at least the lap strap loosely fastened throughout the flight, unless you are actually moving around the cabin. The brace position is different for each seat – please study the safety card carefully.
Exit Locations	There are two emergency exits on this aircraft. The first was the door you used to enter the aircraft and the second is this window exit (<i>point to window</i>). Crew should briefly describe operation of the exits to those seated adjacent. Children/the old and infirm should not be seated adjacent to an emergency exit.
Oxygen Mask Demo	Drop Down Masks: At any time if the oxygen masks drop from the ceiling, first pull the lanyard to release the oxygen flow ... (<i>demo following with mask</i>)... then pull the mask towards you and place it over your nose and mouth. Pull the elastic strap over your head; tighten if necessary; and breathe normally. Plug In Masks: If I announce via the aircraft PA that oxygen masks are required, locate your oxygen mask in the seat back pocket, plug the connector into one of the receptacles above and place the mask over your nose and mouth. Pull the elastic strap over your head; tighten if necessary; and breathe normally. (Do optional brief for children/infants – i.e. do your own first)
Life Jacket Demo*	Mk20 Jackets: Individual life jackets are under each seat (<i>point out where those are for toilet seat if occupied</i>). If necessary, remove the jacket from its case, (<i>demo following</i>) place over your head, pass the straps around your waist and fasten in a bow at the front. To inflate, pull on the toggles. There are tubes for topping up the air and a light and whistle for attracting attention. Do not inflate the jacket until you are outside the aircraft.
Seats, Armrests, Tables, Loose Items	For take-off and landing your seats must be in the upright position, with the armrests down and tables stowed away. Any loose items should be stowed, and items such as cups or glasses placed in this drawer please (<i>point to drawer</i>)
Phones, PEDs	Mobile phones or any other transmitting portable electronic device should be switched off, and must remain off, or in 'flight safe mode,' until you have exited the aircraft at our destination. Portable electronic equipment may be used once the aircraft is in the cruise but only in a flight safe mode.
No Smoking	Finally I would like to remind you that this is a no smoking flight. Does anybody have any questions? In which case, have a pleasant flight.

* Life Jacket briefing can be omitted if not flying more than 50 miles from the coast, and ditching following a take-off or landing incident is unlikely.



NAVAJO / KING AIR AIRCRAFT PA Announcements – Crew Reminder

BEFORE TAKE-OFF – PA Announcement

We are about to take-off; please ensure that your seats are in the upright position with armrests lowered and seat belts fastened. Tables and loose items should be stowed and electrical devices switched off.

CRUISE – PA Announcement

I have now switched off the FASTEN SEAT BELTS light. I suggest that you leave at least the lap strap loosely fastened throughout the flight, unless you are actually moving around the cabin. Passengers are also reminded that this is a no smoking flight.

BEFORE LANDING – PA Announcement

We are about to begin our descent for landing; please return your seats to the upright position with armrests lowered and fasten your seat belts. Tables and loose items should be stowed and electrical devices switched off.

POST LANDING – PA Announcement

Welcome to Please remain seated with seatbelts fastened until the aircraft has come to a complete stop and the engines have been switched off. I will pass through the cabin to open the door and call you forward when ready for you to exit the aircraft. Smoking is not permitted until you are inside the terminal building within a designated smoking area.

PASSENGER SAFETY CARD

THIS INFORMATION CARD CONTAINS IMPORTANT INFORMATION PLEASE READ BEFORE TAKE OFF



SYMBOL KEY



TAKE-OFF & LANDING



EMERGENCY LANDING



LANDING ON WATER



TURBULENCE



AT ANY TIME



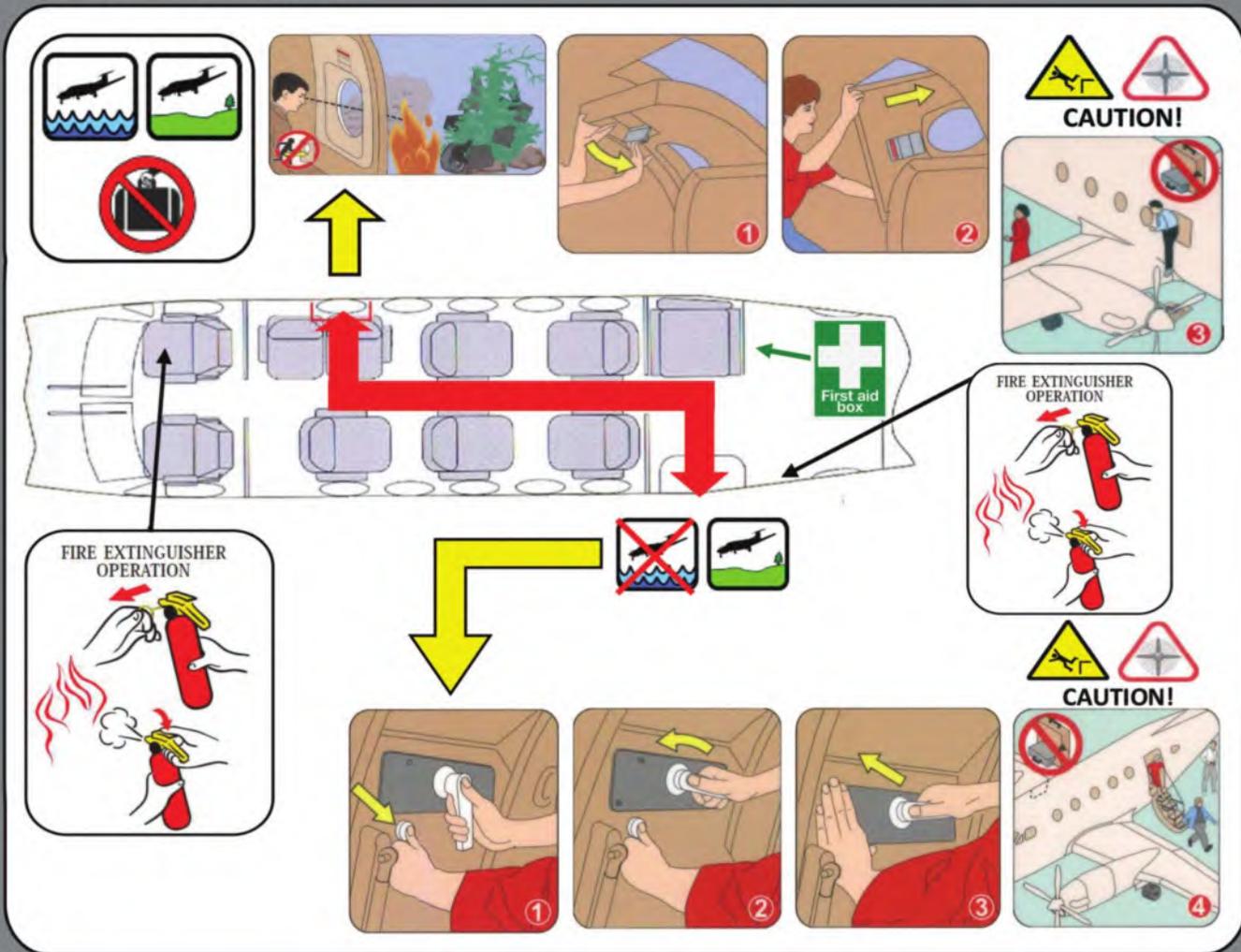
AT ANY TIME

USE OF SEAT BELTS



Illustration showing the correct use of seat belts in three steps: 1. Buckle up, 2. Buckle across chest, 3. Buckle under feet. Includes symbols for take-off/landing, emergency landing, and turbulence, and 'no smoking' and 'no mobile phone' signs.

EMERGENCY EXITS



Emergency exit procedure diagram. Cabin layout shows exit paths (red arrows) to the front and rear exits. Includes 'First aid box' location. Fire extinguisher operation instructions are provided for both front and rear exits. Exit steps are numbered 1-4. Includes 'CAUTION!' signs and 'no smoking'/'no mobile phone' signs.

KING AIR 200

* PLEASE READ OTHER SIDE *
DO NOT REMOVE FROM AIRCRAFT

OXYGEN

PULL LANYARD TO RELEASE OXYGEN FLOW

- 1
- 2
- 3
- 4
- 5

LIFE JACKETS

Life jacket location

Wrap straps around waist

DO NOT inflate inside

Inflate outside ✓

WHISTLE FOR ATTRACTING ATTENTION

LIGHT WILL ILLUMINATE ON CONTACT WITH WATER

TOP UP AIR USING MOUTH PIECE

BRACE POSITION

DIRECTION OF FLIGHT ←

BRACE

LEG POSITION

- 1
- 2
- 3

KING AIR 200

* PLEASE READ OTHER SIDE *
DO NOT REMOVE FROM AIRCRAFT

PASSENGER SAFETY CARD

THIS INFORMATION CARD CONTAINS IMPORTANT INFORMATION PLEASE READ BEFORE TAKE OFF



SYMBOL KEY



TAKE-OFF & LANDING



EMERGENCY LANDING



LANDING ON WATER



TURBULENCE



AT ANY TIME



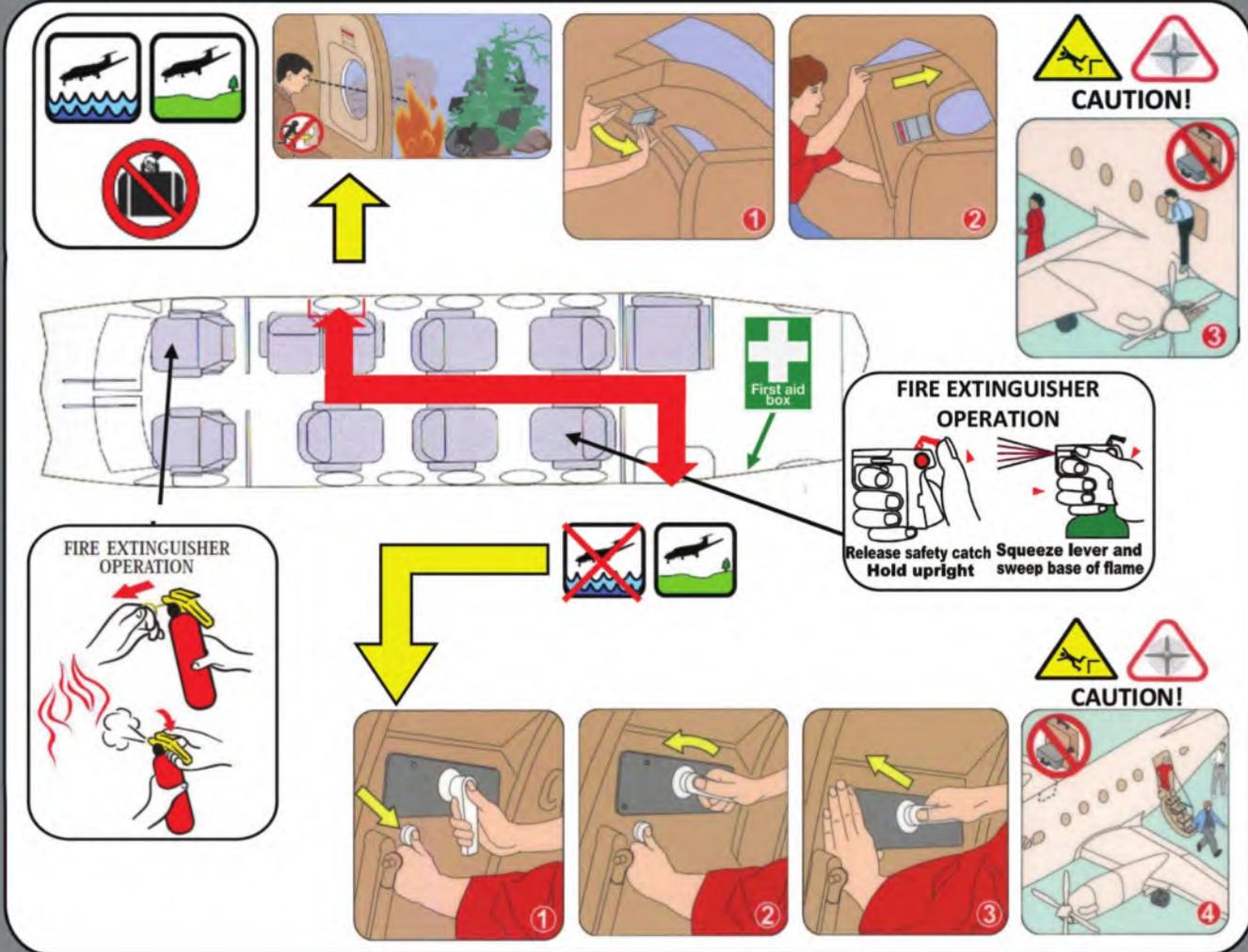
AT ANY TIME

USE OF SEAT BELTS



1 2 3

EMERGENCY EXITS



CAUTION!

FIRE EXTINGUISHER OPERATION

Release safety catch Hold upright

Squeeze lever and sweep base of flame

1 2 3 4

KING AIR 200

* PLEASE READ OTHER SIDE *
DO NOT REMOVE FROM AIRCRAFT

OXYGEN

PULL LANYARD TO RELEASE OXYGEN FLOW

- 1
- 2
- 3
- 4
- 5

LIFE JACKETS

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WHISTLE FOR ATTRACTING ATTENTION

LIGHT WILL ILLUMINATE ON CONTACT WITH WATER

TOP UP AIR USING MOUTH PIECE

BRACE POSITION

DIRECTION OF FLIGHT ←

BRACE

LEG POSITION

- 1
- 2
- 3

KING AIR 200

* PLEASE READ OTHER SIDE *
DO NOT REMOVE FROM AIRCRAFT

PASSENGER SAFETY CARD

THIS INFORMATION CARD CONTAINS IMPORTANT INFORMATION PLEASE READ BEFORE TAKE OFF

EXCEL AVIATION PARTNERS
BROADSWORD

SYMBOL KEY



TAKE-OFF & LANDING



EMERGENCY LANDING



LANDING ON WATER



TURBULENCE



AT ANY TIME

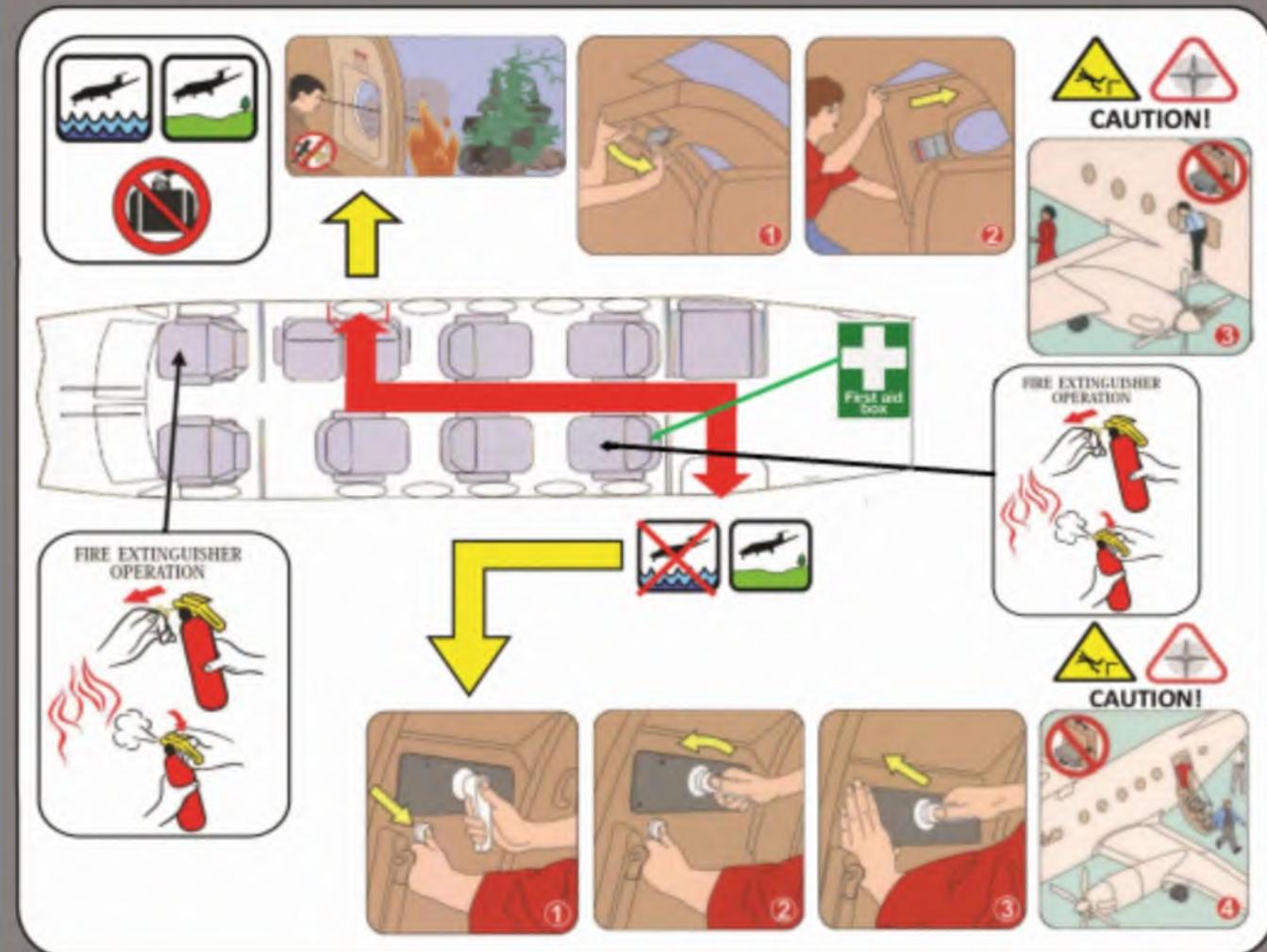


AT ANY TIME

USE OF SEAT BELTS



EMERGENCY EXITS



KING AIR 200

* PLEASE READ OTHER SIDE *
DO NOT REMOVE FROM AIRCRAFT

OXYGEN

PULL LANYARD TO RELEASE OXYGEN FLOW

1. Pull the oxygen mask down from the overhead storage bin.
2. Pull the lanyard to release the oxygen flow.
3. Place the mask over your nose and mouth.
4. Breathe normally through the mask.
5. If assisting another passenger, place the mask over their nose and mouth.

LIFE JACKETS

Life jacket location

Wrap straps around waist

DO NOT inflate inside

Inflate outside ✓

LIGHT WILL ILLUMINATE ON CONTACT WITH WATER

TOP UP AIR USING MOUTH PIECE

WHISTLE FOR ATTRACTING ATTENTION

BRACE POSITION

DIRECTION OF FLIGHT

BRACE

LEG POSITION

1. Passenger in yellow suit sitting upright with hands on lap.
2. Passenger in red suit sitting upright with head and neck braced.
3. Passenger in blue suit sitting upright with arms crossed.

KING AIR 200

* PLEASE READ OTHER SIDE *
DO NOT REMOVE FROM AIRCRAFT

PASSENGER SAFETY CARD

THIS INFORMATION CARD CONTAINS IMPORTANT INFORMATION PLEASE READ BEFORE TAKE OFF

SYMBOL KEY



TAKE-OFF & LANDING



EMERGENCY LANDING



LANDING ON WATER



TURBULENCE



AT ANY TIME

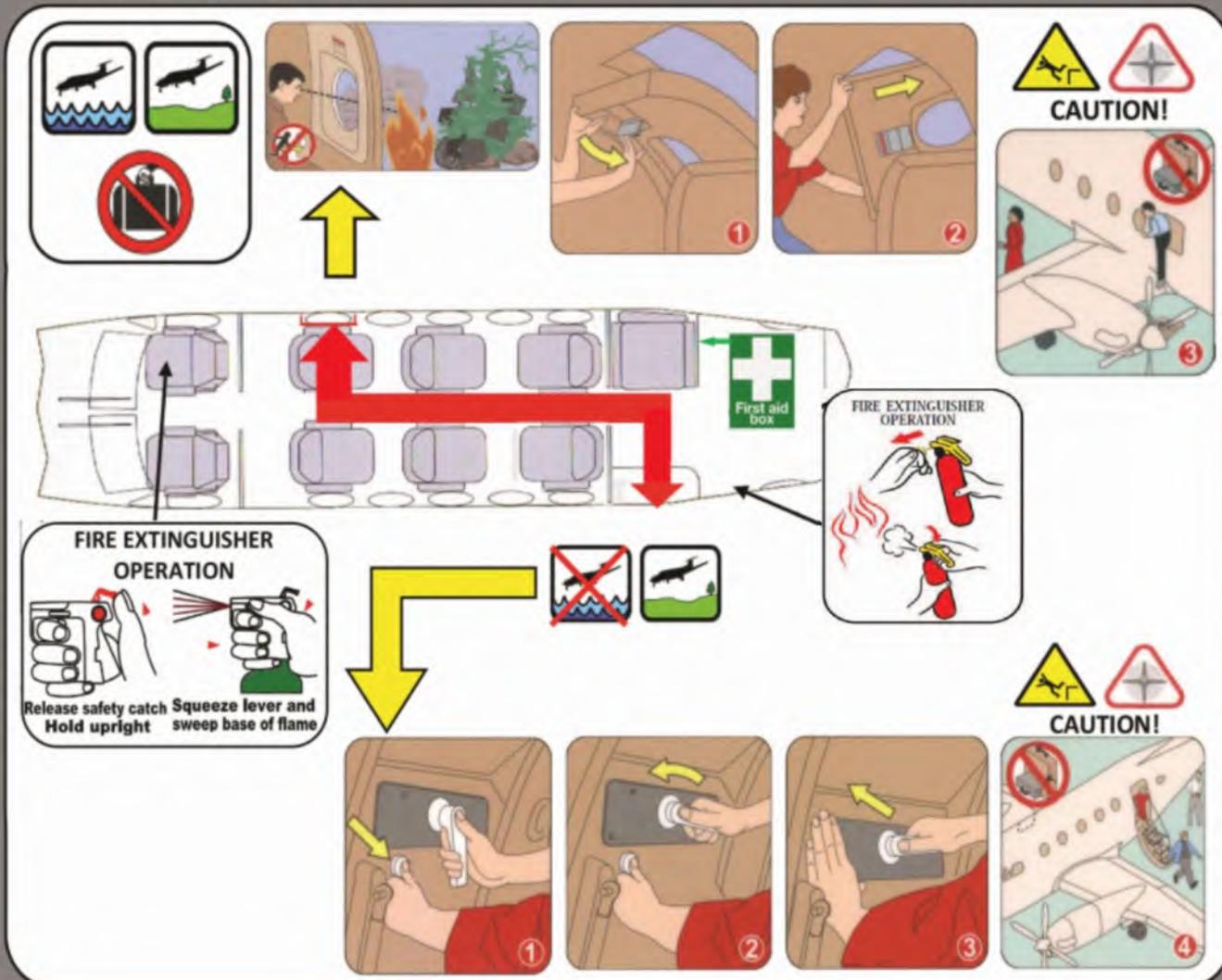


AT ANY TIME

USE OF SEAT BELTS



EMERGENCY EXITS



KING AIR 200

DO NOT REMOVE FROM AIRCRAFT

OXYGEN

PULL LANYARD TO RELEASE OXYGEN FLOW

1. Pull the oxygen mask down from the overhead storage bin.

2. Pull the lanyard to release the oxygen flow.

3. Place the mask over your mouth and nose.

4. Breathe normally into the mask.

5. Assist another passenger if needed.

LIFE JACKETS

Life jacket location

Wrap straps around waist

DO NOT inflate inside

Inflate outside ✓

LIGHT WILL ILLUMINATE ON CONTACT WITH WATER

TOP UP AIR USING MOUTH PIECE

WHISTLE FOR ATTRACTING ATTENTION

BRACE POSITION

DIRECTION OF FLIGHT ←

BRACE

LEG POSITION

1. Sit upright with feet flat on the floor.

2. Lean forward with your back to the seat backrest.

3. Hold your feet against your thighs and your hands against your knees.

KING AIR 200

* PLEASE READ OTHER SIDE *
DO NOT REMOVE FROM AIRCRAFT

PASSENGER SAFETY CARD

THIS INFORMATION CARD CONTAINS IMPORTANT INFORMATION PLEASE READ BEFORE TAKE OFF



SYMBOL KEY



TAKE-OFF & LANDING



EMERGENCY LANDING



LANDING ON WATER



TURBULENCE



AT ANY TIME



AT ANY TIME

USE OF SEAT BELTS

EMERGENCY EXITS

KING AIR 200

* PLEASE READ OTHER SIDE *
DO NOT REMOVE FROM AIRCRAFT

OXYGEN

PULL LANYARD TO RELEASE OXYGEN FLOW

1. Pull the oxygen mask down from the overhead storage bin.

2. Pull the lanyard to release the oxygen flow.

3. Place the mask over your mouth and nose.

4. Breathe normally through the mask.

5. Assist a passenger in putting on their oxygen mask.

LIFE JACKETS

Life jacket location

Wrap straps around waist

DO NOT inflate inside

Inflate outside ✓

LIGHT WILL ILLUMINATE ON CONTACT WITH WATER

TOP UP AIR USING MOUTH PIECE

WHISTLE FOR ATTRACTING ATTENTION

BRACE POSITION

BRACE

DIRECTION OF FLIGHT

LEG POSITION

1. Sit upright with feet flat on the floor.

2. Bend forward at the hips, resting your head on your knees.

3. Sit upright with arms crossed over your chest.

KING AIR 200

* PLEASE READ OTHER SIDE *
DO NOT REMOVE FROM AIRCRAFT

SAFETY BRIEFING CARD



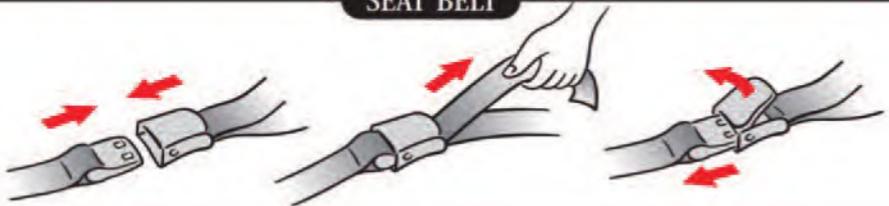
IN THE UNLIKELY EVENT OF AN EMERGENCY FOLLOW THE DIRECTIONS OF YOUR FLIGHT CREW AND THE PROCEDURES ON THIS CARD

PROHIBITED

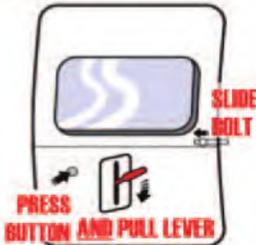
AT ANY TIME



SEAT BELT



OPENING EXITS



BRACE POSITION

FORWARD



LIFE JACKET



* PLEASE READ OTHER SIDE *

DO NOT REMOVE FROM AIRCRAFT

EXITS AND EMERGENCY EQUIPMENT

FIRE EXTINGUISHER OPERATION



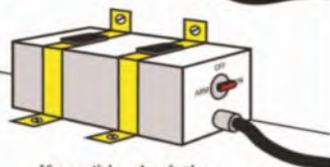
Release safety catch
Hold upright

Squeeze lever and
sweep base of flame

EMERGENCY LOCATOR TRANSMITTER OPERATION

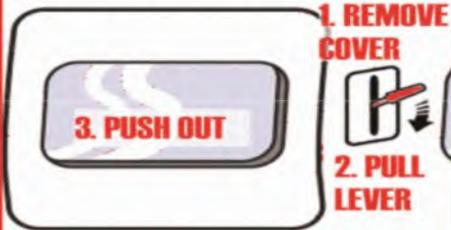


Ensure the ELT
is switched to
the ON position



If possible, check the
switch on the ELT unit
is in the ON position

WINDOW EXIT OPERATION



1. REMOVE
COVER

2. PULL
LEVER

3. PUSH OUT

PLEASE READ OTHER SIDE
DO NOT REMOVE FROM AIRCRAFT

SAFETY BRIEFING CARD



IN THE UNLIKELY EVENT OF AN EMERGENCY FOLLOW THE DIRECTIONS OF YOUR FLIGHT CREW AND THE PROCEDURES ON THIS CARD

PROHIBITED

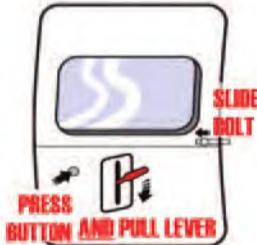
AT ANY TIME



SEAT BELT



OPENING EXITS



BRACE POSITION

FORWARD



LIFE JACKET



* PLEASE READ OTHER SIDE *

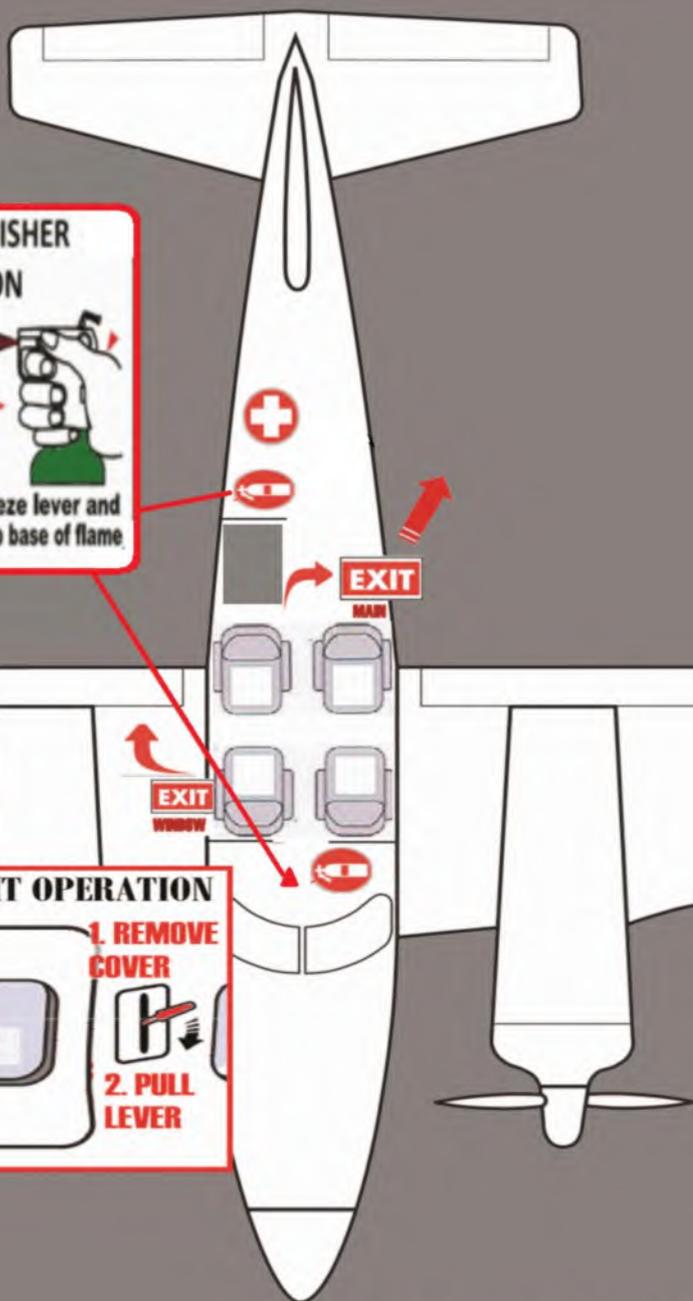
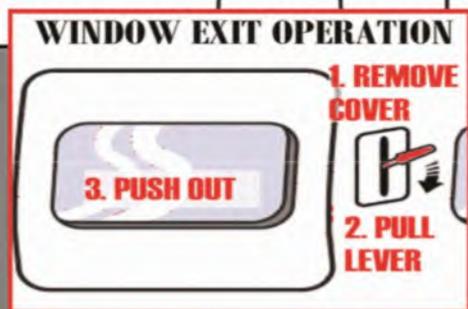
DO NOT REMOVE FROM AIRCRAFT

AL20 (G-UKCS)

PIPER PA31 NAVAJO

INQ000646_0389

EXITS AND EMERGENCY EQUIPMENT



* PLEASE READ OTHER SIDE *
DO NOT REMOVE FROM AIRCRAFT

SAFETY BRIEFING CARD



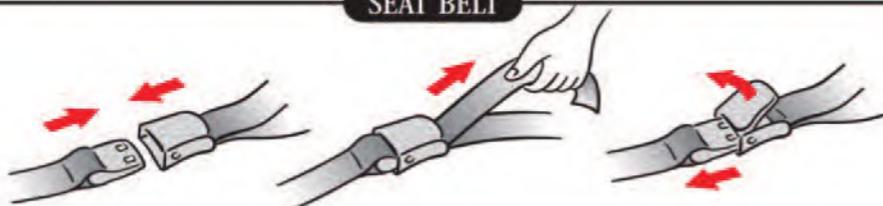
IN THE UNLIKELY EVENT OF AN EMERGENCY FOLLOW THE DIRECTIONS OF YOUR FLIGHT CREW AND THE PROCEDURES ON THIS CARD

PROHIBITED

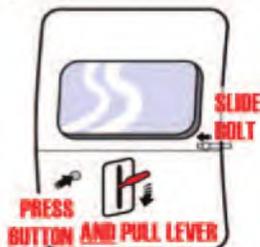
AT ANY TIME



SEAT BELT



OPENING EXITS



BRACE POSITION

FORWARD



LIFE JACKET



* PLEASE READ OTHER SIDE *

DO NOT REMOVE FROM AIRCRAFT

AL20 (G-OUCP)

PIPER PA31 NAVAJO

INQ000646_0391

EXITS AND EMERGENCY EQUIPMENT

FIRE EXTINGUISHER OPERATION

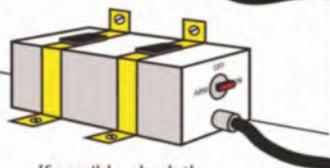


Release safety catch
Hold upright

Squeeze lever and
sweep base of flame.

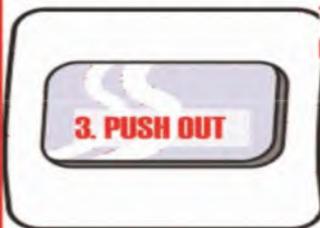
EMERGENCY LOCATOR TRANSMITTER OPERATION

Ensure the ELT is switched to the ON position



If possible, check the switch on the ELT unit is in the ON position

WINDOW EXIT OPERATION



1. REMOVE COVER



2. PULL LEVER

SAFETY BRIEFING CARD



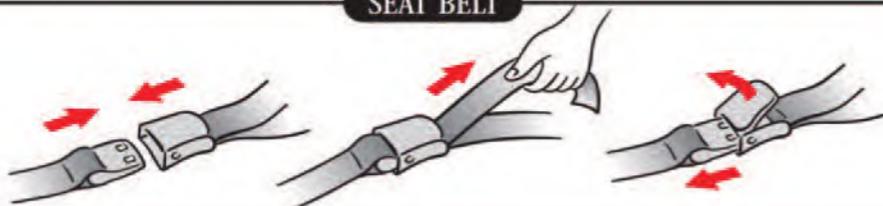
IN THE UNLIKELY EVENT OF AN EMERGENCY FOLLOW THE DIRECTIONS OF YOUR FLIGHT CREW AND THE PROCEDURES ON THIS CARD

PROHIBITED

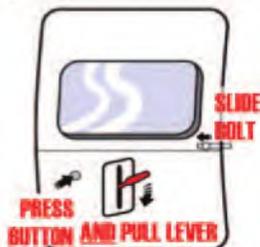
AT ANY TIME



SEAT BELT



OPENING EXITS



BRACE POSITION

FORWARD



LIFE JACKET



* PLEASE READ OTHER SIDE *

DO NOT REMOVE FROM AIRCRAFT

EXITS AND EMERGENCY EQUIPMENT

FIRE EXTINGUISHER OPERATION



Release safety catch
Hold upright

Squeeze lever and
sweep base of flame

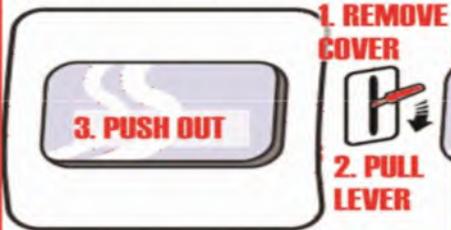
EMERGENCY LOCATOR TRANSMITTER OPERATION

Ensure the ELT is switched to the ON position



If possible, check the switch on the ELT unit is in the ON position

WINDOW EXIT OPERATION



1. REMOVE COVER

2. PULL LEVER

3. PUSH OUT

SAFETY BRIEFING CARD



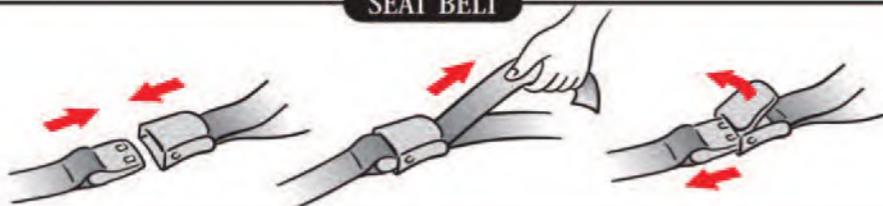
IN THE UNLIKELY EVENT OF AN EMERGENCY FOLLOW THE DIRECTIONS OF YOUR FLIGHT CREW AND THE PROCEDURES ON THIS CARD

PROHIBITED

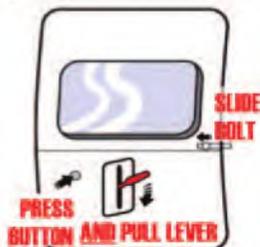
AT ANY TIME



SEAT BELT



OPENING EXITS



BRACE POSITION

FORWARD



LIFE JACKET



* PLEASE READ OTHER SIDE *

DO NOT REMOVE FROM AIRCRAFT

AL26 (G-SCMR, G-SCIR)

PIPER PA31 NAVAJO

INQ000646_0395

EXITS AND EMERGENCY EQUIPMENT

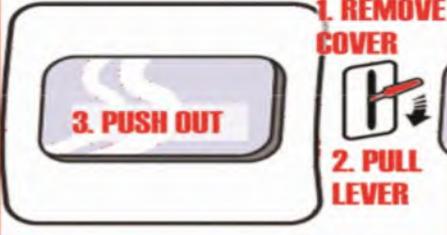
FIRE EXTINGUISHER OPERATION



Release safety catch
Hold upright

Squeeze lever and
sweep base of flame

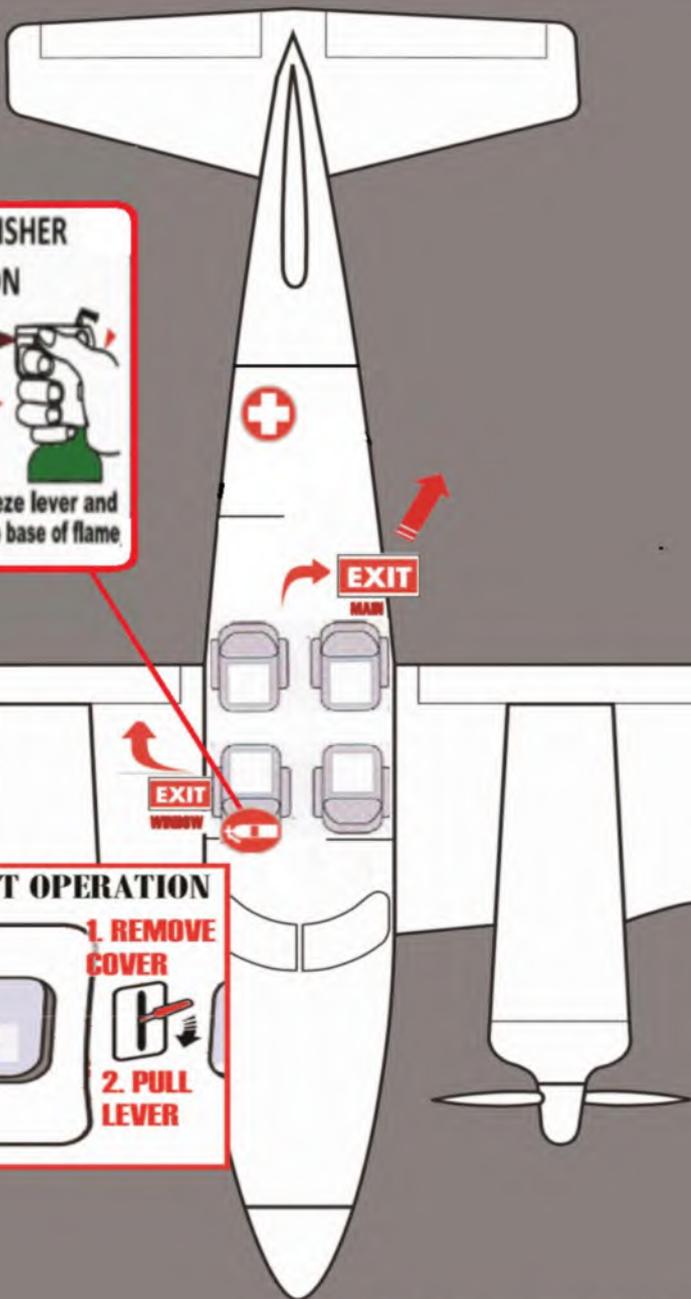
WINDOW EXIT OPERATION



1. REMOVE COVER

2. PULL LEVER

3. PUSH OUT



PASSENGER SAFETY CARD



THIS INFORMATION CARD CONTAINS IMPORTANT INFORMATION PLEASE READ BEFORE TAKE OFF

SYMBOL KEY



TAKE-OFF & LANDING



EMERGENCY LANDING



LANDING ON WATER



TURBULENCE

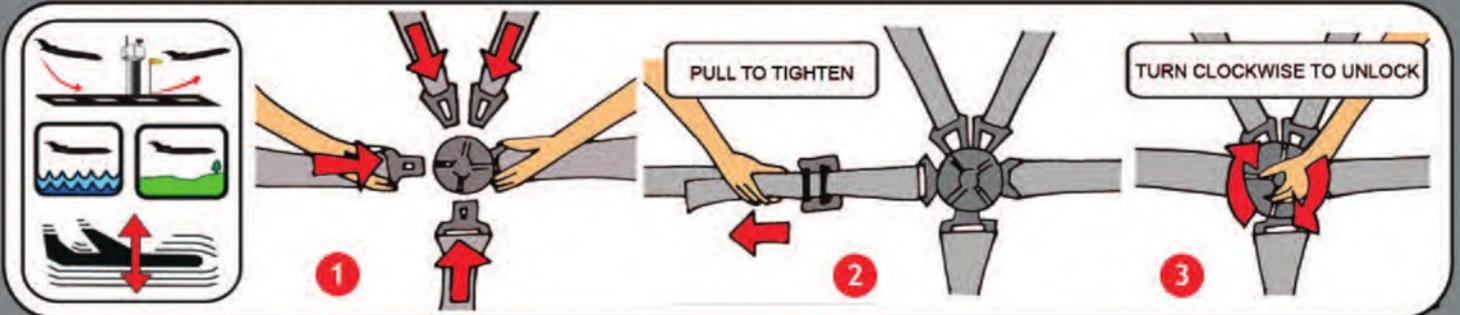


AT ANY TIME

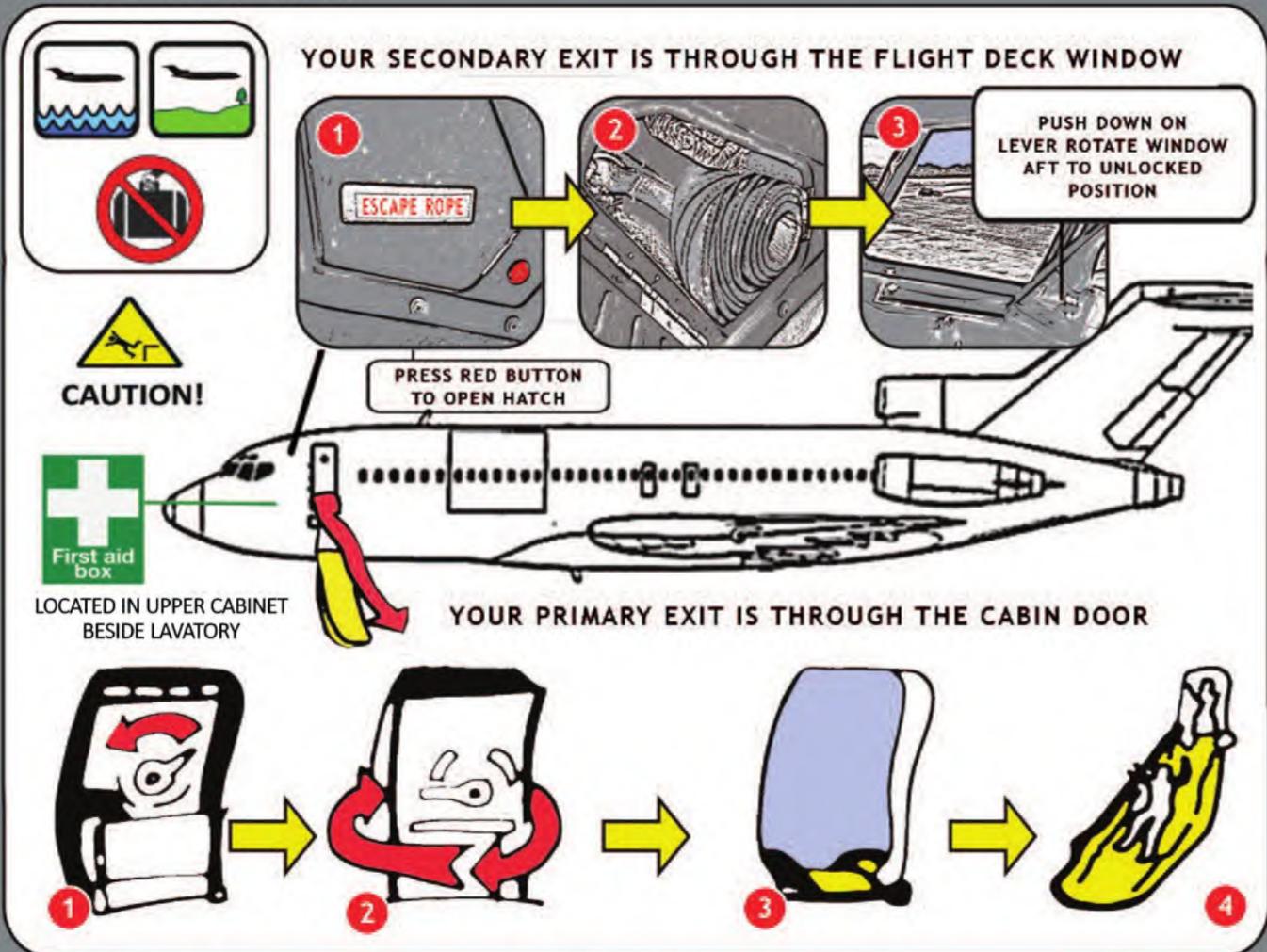


AT ANY TIME

USE OF SEAT BELTS



EMERGENCY EXITS

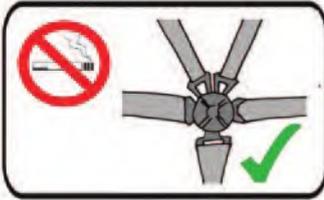


BOEING 727 -200

* PLEASE READ OTHER SIDE *
DO NOT REMOVE FROM AIRCRAFT



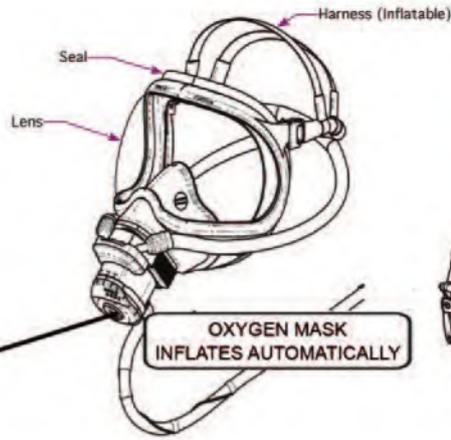
OXYGEN



LOCATED LEFT HAND SIDE OF FLIGHT DECK

Control Knob

- 100% Oxygen (at all altitudes)
- Normal or Diluter Demand (oxygen flow varies with altitude)
- Emergency (100% oxygen while maintaining a positive pressure in mask)



LIFE JACKETS



Place over your head, pass straps around waist



Fasten clips at the front



Pull down tabs to inflate

LIGHT WILL ILLUMINATE ON CONTACT WITH WATER

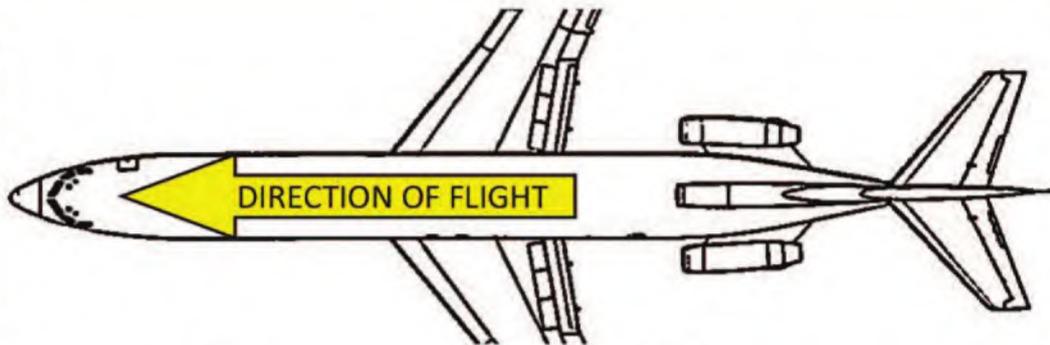
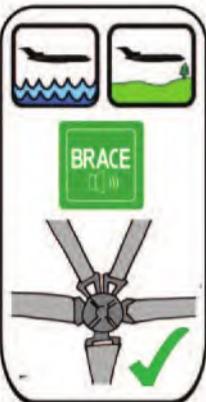


TOP UP AIR USING MOUTH PIECE



Do not inflate inside aircraft

BRACE POSITION



LEG POSITION



2



BOEING 727 -200

* PLEASE READ OTHER SIDE *
DO NOT REMOVE FROM AIRCRAFT



SAFETY BRIEFING CARD

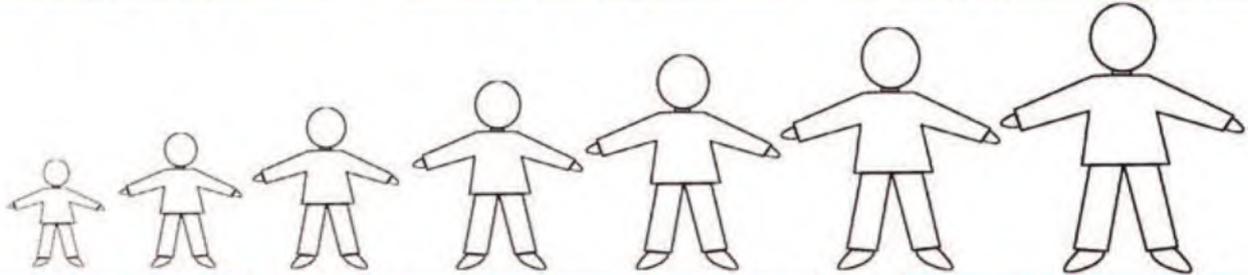
FLOTATION AIDS FOR CHILDREN AND INFANTS



BABY SURVIVAL COT
0-16kg/35 lbs

INFANT LIFEJACKET
9-16kg/20-35 lbs

CONVERTED ADULT LIFEJACKET
16kg/35lbs +



0 > 18 months

Approx 12 > 36 months

Approx 24 months +

BABY SURVIVAL COT

* THE CREW WILL ADVISE OF THE LOCATION **BEFORE** TAKEOFF

BABY SURVIVAL COT
0-16kg/35 lbs



BABY SURVIVAL COT
MAX 84cm/33ins in length

To inflate the cot

1. Pull the tear strip and remove the cot from its cover
2. Inflate the cot by pulling sharply on the red toggle inside the cot. If it fails to inflate blow into the mouthpiece on the opposite side.
3. Inflate the bottom by blowing into the mouthpiece near the cylinder.



0 > 18 months

After impact and after the command to evacuate has been given

1. Place the baby inside the cot and fit the thermal waistcoat.
2. Fasten the clip at the end of the tape to the buckle on the opposite side.
3. Zip the hood closed and interlock the covers to make it waterproof.

Once outside the aircraft the cot should be tied to the guardians life jacket using the lanyard.



* PLEASE READ OTHER SIDE *

DO NOT REMOVE FROM AIRCRAFT

INFANT LIFEJACKET

* THE CREW WILL ADVISE OF THE LOCATION BEFORE TAKEOFF

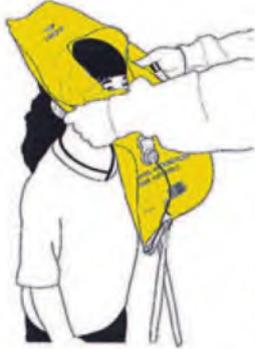


INFANT LIFEJACKET 9-16kg/20-35 lbs



DO NOT INFLATE INSIDE AIRCRAFT

Additional carrying strap



1. Place lifejacket over the child's head



2. Pass the tapes around the back



3. Tie in a double bow UNDER the lifejacket



Approx 12 > 36 months

CONVERTED ADULT LIFEJACKET

* THE CREW WILL ADVISE OF THE LOCATION BEFORE TAKEOFF

CONVERTED ADULT LIFEJACKET 16kg/35lbs +



Tie securely OVER the lifejacket

Inflation tube and deflation key



To fit the lifejacket

1. Remove the lifejacket and **inflate** by pulling down on the red toggle
2. Insert the deflation key into the inflation tube and **deflate by one third.**
3. Place the lifejacket over the child's head and pass the tapes around the waist and tie securely in a double bow **OVER** the lifejacket.
4. Return the child to their seat and deflate sufficiently for the child to brace.
5. **Once outside the aircraft** re-inflate the lifejacket by blowing into the inflation tube.

Approx 24 months +

* PLEASE READ OTHER SIDE *

DO NOT REMOVE FROM AIRCRAFT

SAFETY INFORMATION CARD

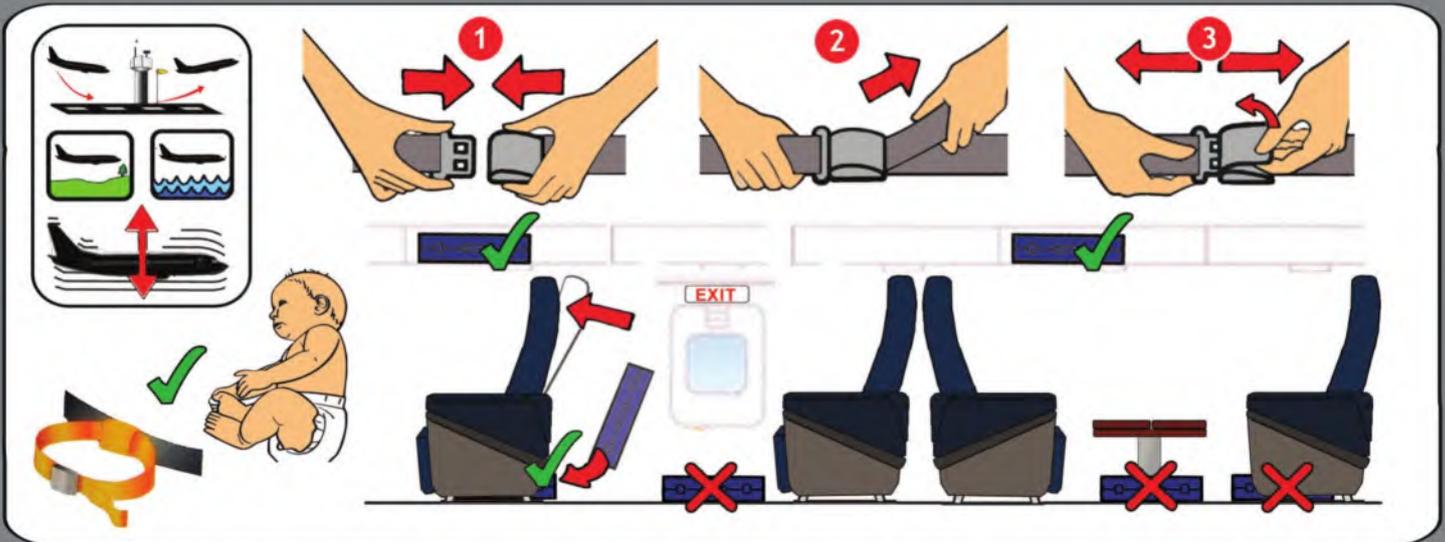
CONTAINS IMPORTANT INFORMATION PLEASE READ BEFORE TAKE OFF

EXCEL AVIATION PARTNERS
BROADSWORD

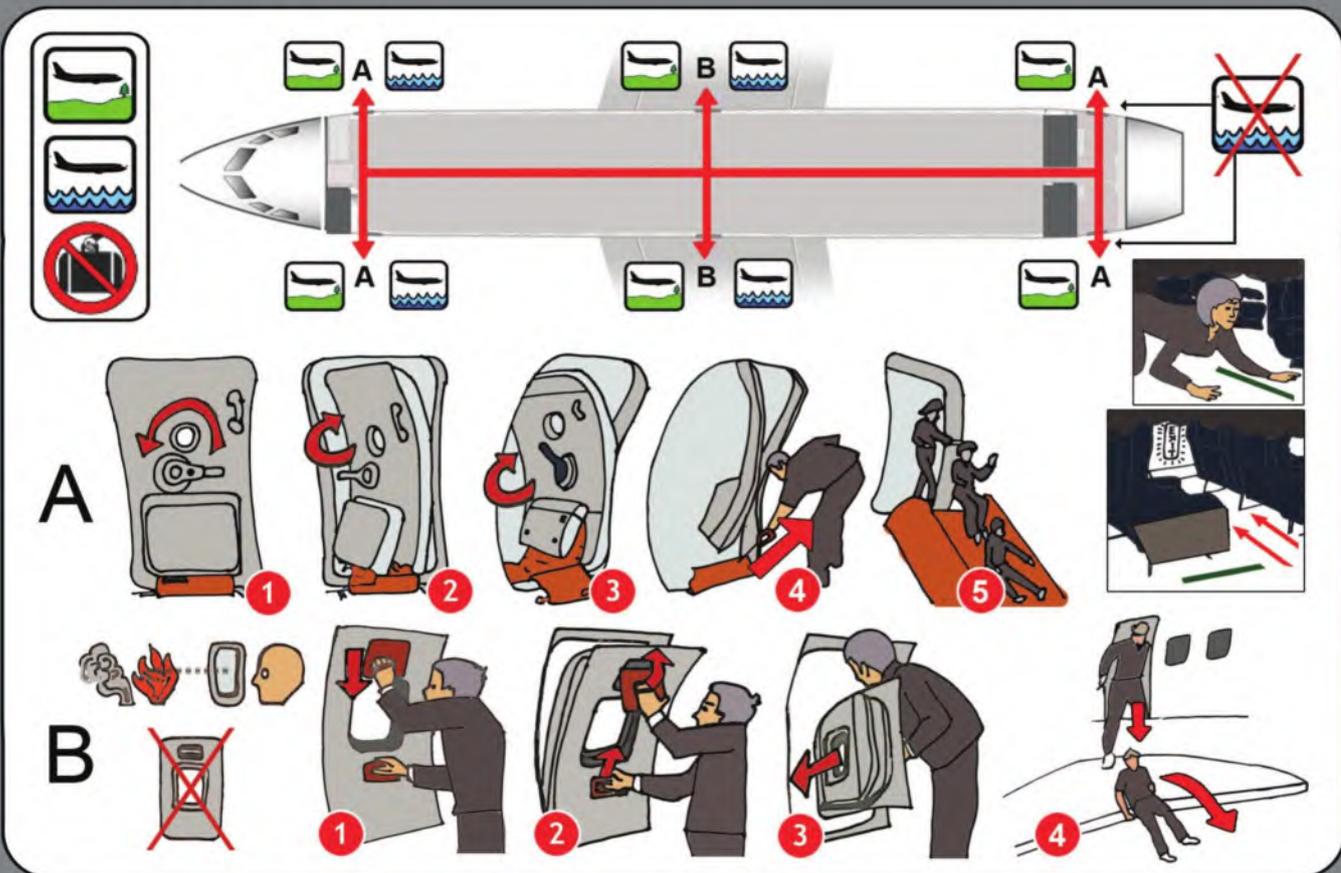
SYMBOL KEY



SEAT BELTS



EMERGENCY EXITS



BOEING 737 -300

* PLEASE READ OTHER SIDE *
DO NOT REMOVE FROM AIRCRAFT

CONTAINS IMPORTANT INFORMATION PLEASE READ BEFORE TAKE OFF

SYMBOL KEY



TAKE-OFF & LANDING



EMERGENCY LANDING



LANDING ON WATER



TURBULENCE



AT ANY TIME



FLIGHT SAFE ONLY

OXYGEN

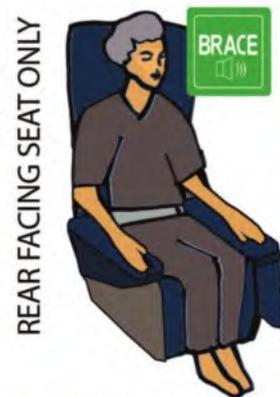
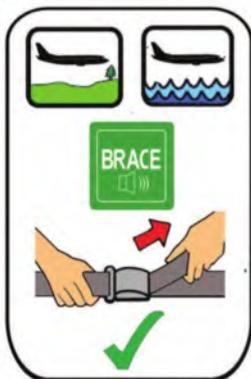


LIFE JACKETS



Do not inflate inside aircraft

BRACE POSITION



* PLEASE READ OTHER SIDE *

DO NOT REMOVE FROM AIRCRAFT

2Excel Aviation Limited Out Brief

General

- Type of flight – [SP/MP?](#) CAT, SPO, STATE, PT, or Non-Commercial (private) flight.
- On time and Fit to Fly?
- Callsign
- Recency / Currency and Orders signed
- [EFB Updated](#) / Maps / PLOG / Load Sheet / Manifest / Flight Plan /GAR
- FDP & DP end, [hours available for future tasking?](#)

Weather

- Departure Minima: [\(PA31: 300' 1500m unless restricted location. B200: 400m, B727/737 125m\)](#)
- Destination & Alternate. [Take-Off alternate, if required](#)
- Operating area weather
- Hazards (Icing / CBs / Cross Wind / [Sea State](#))

Restrictions

- NOTAMs
- Airfield Operating hours / [Fuel](#) / [Handling](#) / Restrictions / Blades Slots
- Hot Poop

Sortie Plan

- Departure – [Taxi Plan, VFR/IFR SID, SFN / ACN](#)
- [Task Area – Relief in Place Co-ordinated, Search Pattern, Sensor Plan](#)
- Booked out: 2Excel Ops Doncaster/ Airfield / Flight Plan filed / [ARCC](#) / [NATS](#)
- Recovery – Refuel Plan, ([Next Sortie: Op? / Pax / Perf](#))

Aircraft

- Ready & Check A complete. [Pre-Flight & Before Start Cx completed if SpM](#)
- [Ballast Requirement calculated / loaded](#)
- Next due maintenance items, Snags and ADD expiry limits clear for planned flights
- Fuel State and Fuel Plan ([EDM 960, Gauges and tanks checked against tech log](#))
- Performance Calculations [including Endurance & Max permissible landing fuel if SpM](#)
- Tech Log completed and Sortie Record Page (blue copy) left/[emailed](#) to Ops

SO/Passengers

- Safety Brief complete / Frequent flyer sheet current

Threat and Error Management

- [Emergencies, CRM considerations](#)

Last Chance

- | | |
|---|--|
| <ul style="list-style-type: none"> • Keys/Tech Log/EFBs & Battery & Cable • Headset, Batteries & Spare • Phone/Passport/Licence/ID • Mission Equipment (if required) – Laptop | <ul style="list-style-type: none"> • Survival Equipment (if required) • Spare SRPs, CAT Envelopes • Ground Transport / HOTAC • Food / Drink / Relief Bag |
|---|--|



2Excel Aviation Limited In Brief

Airworthiness

- Tech Log Complete & Returned with fireproof cover
- Update Fleet Manager of tech issues
- Remove Sector Record Page if last flight of day and no defects raised
- Carry SRP pages over
- Fuel Discrepancy?
- Send photo / scan of SRP to Ops / Airworthiness
- Restock Aircraft Consumables – Oil/blue roll etc
- Aircraft refuelled/Shadin Updated?
- Cleaning required?

Operations

- Envelope complete if CAT, SPO, or PT flight (and owner King Air Flights)
- FTL record complete - LEON updated with photo of envelope attached.
- EFB, Battery and Cable Returned
- Voyage Report complete
- Inform Operations of any issues / de-brief points

Mission Specific Items (if applicable)

- Update “Hours Remaining” on whiteboard
- Freshwater wash required? (Maritime Ops)
- Complete mission outputs and distribute
- Mission Data uploaded to ACRONIS
- Complete Task Tracking Spreadsheet
- Next Event / Points for oncoming crew?
- Debrief – Safety (OR?), Aim, Plan, Execution, Lessons Identified



Sector Record Page - Issue 2

2Excel Aviation Ltd / 2Excel Corporate / The Tiger House, Sywell Aerodrome, Sywell, Northants NN6 0BN				PA-31 (Navajo)		G - RHYM		Date:		Serial 01490																						
Pre-Flight Release																																
Daily Check <small>CRS. Certifies that the work specified below except as otherwise specified was carried out in accordance with Part 145 Approval Reference UK145.....* and in respect to that work the aircraft / aircraft component is considered ready for release to service. *Insert Part 145 number</small>				Acceptable Deferred Defects/Limitations Nil/Start Finish Fluid Mix				Next Scheduled Maintenance Hrs Date																								
												Nature		Limitation																		
Date/Time Group:																																
Signature:																																
Authorisation No:																																
Before Flight:						Totals Brought Forward from Previous Sector Record Page:																										
Serial	Captain	Passenger (s) or Crew	Duty Planned (From; To; Nature of Flight)	Oil Uplifted (Qts)		Departure Oil (Qts)		Fuel Uplifted (L)		Departure Fuel (L)		Captain's Pre-Flight Signature	Off-Chocks Time	Take-off Time	Landing Time	On-Chocks Time	Flight Time			Total Time	Landing Fuel (L)		IFR Sector (Y/N)	Instr Appr (No. of)	Defect (No. or Nil)	Landings (Capt / Co)		Captain's After Flight Signature				
				Left	Right	Left	Right	Inner	Outer	Inner	Outer						Day	Night	Total		Inner	Outer				Capt.	Co-Pilot					
1																																
2																																
3																																
4																																
5																																
6																																
Totals Carried Forward to Next Sector Record Page:																																
Defect No.		Defect Report Details				Date		Signature		Action Taken				Signature		Authority		Date														

CRS. Certifies that the work specified above except as otherwise specified was carried out in accordance with Part-145 and in respect to that work that aircraft / aircraft component is considered ready for release to service



2Excel Aviation Ltd / 2Excel The Tiger House, Sywell Aerodrome, Sywell, Northants NN6 0BN	Extra EA 300L	Date	Serial
---	----------------------	-------------	---------------------

Pre-Flight Release			
Daily Check (Check 'A') <small>CRS. Certifies that the work specified below except as otherwise specified was carried out in accordance with Part 145 Approval Reference UK.145.01075 and in respect to that work the aircraft / aircraft component is considered ready for release to service.</small>	Acceptable Deferred Defects		Next Scheduled Maintenance Type:
	Nature	Limitations	Due at Hours:
Date/Time Group:			Due on Date:
Signature:			
Authorisation No:			

Totals Brought Forward from Previous Sortie Record Page			G –
--	--	--	------------------

Before Flight										After Flight											
Serial	Captain	Passenger or Crew	Duty Planned (From; To; Nature of Flight)	Oil Uplifted (Qts)	Departure Oil (Qts)	Fuel Uplifted (L)	Departure Fuel (L)	Captain's Pre-Flight Signature	Off-Chocks Time	Take-off Time	Landing Time	On-Chocks Time	Flight Time	Total Tachometer Time (Decimal Hrs)	Landing Fuel	Duty Carried Out	Defect (No. or Nil)	Landings		Captain's After Flight Signature	
																		Paved	Grass		
1																					
2																					
3																					
4																					
5																					
6																					
7																					
8																					
9																					
10																					

Totals Taken Forward to Next Sortie Record Page			
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Defect No.	Defect Report Details	Date	Signature	Action Taken	Signature	Authority	Date

CRS. Certifies that the work specified above except as otherwise specified was carried out in accordance with Part 145 and in respect to that work the aircraft / aircraft component is considered ready for release to service.



		2Excel Aviation Ltd, The Tiger House, Sywell Aerodrome, Sywell, Northampton. NN6 0BN. UK. Tel: PD 309		G-OSRA		727-2S2F		CAPT:	FO:	FE:	Callsign:	Sector Record Page No.					
											SRP ISSUE 3			Date:			
DAILY INSPECTION i.a.w. ISSUE # Part-145 Release to Service**				Dep airfield	Take-off time	Arrival airfield	Landing time	Captain's Pre-Flight Acceptance			Flight Hours		Min	Cycles			
Sign:		Name:		Next Insp Due (Date)							From:	To:	Duty:	B/Fwd			
Date/time:		Auth:		Next Insp Due (Hrs / Mins)							Sign:*			Sector Flown			
		Pt145 Approval:		Next Insp Due (Cycles)							* I hereby certify that the quantities and distribution of fuel and oil shown are acceptable for the intended flight; a pre-flight inspection has been carried out and any defects rectified or deferred i.g.y, the MEL. The aircraft has been de- / anti iced if necessary and security checks have been completed.			Total C/Fwd			
Acceptable Deferred Defects								1	2	3	Total (lbs)		Ground De-ice or Anti Ice: Y / N Fluid Temp:				
Serial No	Defect	Limitation		FUEL		B/F Total							Start Time : Finish Time :				
						Uplift							Fluid/Water mix ratio: / Fluid Type:				
						Total							Engine / Hydraulic Oil Record				
						Landing								E1	E2	E3	APU
				Fuel SG / Metered Total				lbs		APU Hrs:		Post Flight (US Gal)		Uplift (gts)			
DESCRIPTION OF DEFECT				DEFECT RECTIFICATION						Replacement Components							
ITEM 1	ATA Ref:	Date & Time / / :		ADD No Raised			ADD No Cleared			Signature		P/N Off					
										Auth		S/N Off					
Name:										Date		P/N On					
										Date		S/N On					
										Date		Batch					
ITEM 2	ATA Ref:	Date & Time / / :		ADD No Raised			ADD No Cleared			Signature		P/N Off					
										Auth		S/N Off					
Name:										Date		P/N On					
										Date		S/N On					
										Date		Batch					
ITEM 3	ATA Ref:	Date & Time / / :		ADD No Raised			ADD No Cleared			Signature		P/N Off					
										Auth		S/N Off					
Name:										Date		P/N On					
										Date		S/N On					
										Date		Batch					
Pt145 Approval No.....													**Signatories certify that the work specified except as otherwise specified was carried out in accordance with Part 145 and in respect to that work the aircraft is considered ready for release to service.				
EHM		Max Start EGT	Flight Level	Air Temp	Airspeed	EPR	N1 %	EGT	N2 %	Fuel Flow	Oil PX	Oil Temp	Captain's Post-Flight Declaration				
ENG	1												Sign:				
	2																
	3																



		2Excel Aviation Ltd, The Tiger House, Sywell Aerodrome, Sywell, Northampton. NN6 0BN. UK. Tel: PD 309		G-	737-300	Capt:	FO:	Callsign:	Date: / /	Sector Record Page No. 000001	SRP ISSUE 1						
DAILY INSPECTION: Part-145 Release to Service**				Dep airfield	Take-off time	Arrival airfield	Landing time	Captain's Pre-Flight Acceptance			Flight Hours	Min	Cycles				
				From:		To:		Planned Duty:			B/Fwd						
Sign:		Name		Next Insp Due (Date)				Sign:*			Sector Flown						
Date/time		Auth:		Next Insp Due (Hrs)				* I hereby certify that the quantities and distribution of fuel and oil shown are acceptable for the intended flight; a pre-flight inspection has been carried out and any defects rectified or deferred in accordance with the MEL. The aircraft has been de- / anti iced if necessary and security checks have been completed.			Total C/Fwd						
Pt145 Approval:		Next Insp Due (Cycles)									Ground De-ice or Anti ice: Y / N. Fluid Temp:						
Acceptable Deferred Defects				Fuel	L	C	R	Total (KGs)		Start Time : Finish Time :		Fluid/Water mix ratio: / Fluid Type:					
Serial No	Defect	Limitation			B/F Total					Engine / Hydraulic Oil Record (US quarts)							
					Uplift 1					Eng 1	Eng 2	APU	Hyd 1	Hyd 2	STBY Hyd		
					Uplift 2					Post Flight							
					Total					Uplift							
Auto Land: SATIS / UNSATIS / NCO		A/C APP Capability: CAT I / CAT II / CAT IIIA		Uplift Fuel SG / Metered Total		Kgs	APU Hrs										
DESCRIPTION OF DEFECT				DEFECT RECTIFICATION				Replacement Components									
ITEM 1	ATA Ref:	Date & Time / / :		ADD No Raised		ADD No Cleared		Signature		P/N Off							
Name:								Auth		P/N On							
								Date		Batch		S/N Off					
								S/N On									
ITEM 2	ATA Ref:	Date & Time / / :		ADD No Raised		ADD No Cleared		Signature		P/N Off							
Name:								Auth		P/N On							
								Date		Batch		S/N Off					
								S/N On									
ITEM 3	ATA Ref:	Date & Time / / :		ADD No Raised		ADD No Cleared		Signature		P/N Off							
Name:								Auth		P/N On							
								Date		Batch		S/N Off					
								S/N On									
Pt145 Approval No.													**Signatories certify that the work specified except as otherwise specified was carried out in accordance with Part 145 and in respect to that work the aircraft is considered ready for release to service.				
EHM		Max Start EGT	Flight Level	Air Temp	Airspeed	N1 %	EGT	N2 %	Fuel Flow	Oil PX	Oil Temp	Captain's Post-Flight Declaration Sign:					
ENG	1																
	2																



Intentionally Blank

2Excel Aviation Limited

Electronic Flight Bags – Policy and Procedures

G.0 Definitions

Electronic Flight Bag (EFB) means an electronic information system, comprised of equipment and applications for flight crew, which allows for the storing, updating, displaying and processing of EFB functions to support flight operations or duties;

EFB application means a software application installed on an EFB host platform that provides one or more specific operational functions which support flight operations;

EFB host platform means the hardware equipment in which the computing capabilities and basic software reside, including the operating system and the input/output software;

EFB system means the hardware equipment (including any battery, connectivity provisions, input/output components) and software (including databases and the operating system) needed to support the intended EFB application(s);

Human-machine interface (HMI) means a component of certain devices that is capable of handling human-machine interactions. The interface consists of hardware and software that allow user inputs to be interpreted and processed by machines or systems that, in turn, provide the required results to the user;

Minor failure condition means a failure condition that would not significantly reduce aircraft safety, and which involves flight crew actions that are well within their capabilities;'

Portable electronic device (PED) means any kind of electronic device, typically but not limited to consumer electronics, brought on board the aircraft by crew members, passengers, or as part of the cargo, that is not included in the configuration of the certified aircraft. It includes all equipment that is able to consume electrical energy. The electrical energy can be provided from internal sources such as batteries (chargeable or non-rechargeable) or the devices may also be connected to specific aircraft power sources.

Type A EFB application means an EFB application whose malfunction or misuse has no safety effect;

Type B EFB application means an EFB application:

- (1) whose malfunction or misuse is limited to a minor failure condition; and
- (2) which neither replaces nor duplicates any system or functionality required by airworthiness regulations, airspace requirements, or operational rules;

Type B EFB applications may replace paper copies of information required to be carried in the aircraft by operational rules.'

G.1 Introduction - Use of iPad as Aircraft EFB

Information and data for flight crews to use on the flight deck has traditionally been in paper format but now much, if not all, of this information is available electronically. The purpose of this Annex is to provide guidance to Flight Crew in the use of electronically stored and processed information when in the form of an Electronic Flight Bag (EFB). The EFB has many benefits to both the Company and the flight crew.

Ultimately the aim is to have a near paperless flight deck, eliminating the need to carry Jeppesen Charts, Technical Manuals, and Company Operations Manuals and decreasing the flight crew workload by providing a configuration controlled single source of reference with quick search functionality.

G.2 System Architecture Overview

EFB systems are divided into 2 classes, Portable and Installed, as well as different software types. 2Excel operate the Apple iPad that falls into the Portable hardware category and type B software. Company iPads are controlled. Prior to flight, the Commander must ensure that the minimum number of serviceable iPads, as specified in OM A Section 1, Para 1.4 are carried.

The Apple iPad is an off the shelf system that is fully portable and that does not rely / use aircraft power during normal line operations. It is considered as a controlled PED and is used under normal circumstances with data connectivity disabled.

The device does not use or form part of the aircraft system and does not require manufacturer approval. The Apple iPad is designed with simplicity in mind allowing the user to instinctively scroll and zoom using finger strokes and pinches, allowing the user to easily navigate the displayed data and applications.

The iPads are tracked and allocated to specific aircraft and issued to crews at despatch, but within each fleet are fully interchangeable should this be required. Separate fleets may use different sized or configured devices.

The EASA EFB Software evaluation report 2012 has been referenced to demonstrate the functionality of the IOS software and Jeppesen FD software during EFB use.

The EFB utilises the Jeppesen Mobile FD application for Airport and Airways navigational charts, including Airport Moving Map Display (AMMD) and in flight own-ship position display.

All EFBs are centrally controlled by the System Administrator via the installed Mobile Device Management (MDM) software. This allows complete oversight on usage, location and installed software on all devices.

Multi engine aircraft EFBs are secured using a Window Mount.

When not in use the devices are securely stored in lockable charging cupboards, within Company operations in order to protect against malicious intervention.

G.3 Human Machine Interface & Human Factors

The EFB and mounting device have been designed so that they should not interfere with the pilot and aircraft systems. The procedures and EFB use have been carefully considered so as not to result in an unacceptable flight crew workload during critical phases of flight.

The EFB should be secured in such a way that it can be referenced without impeding any of the aircraft systems and controls. This includes positioning the EFB so that there is no significant light reflection. Crews are not to vary the position of the EFB mount from the approved standard location for their fleet.

The approach and navigation charts depicted are the same size as the paper charts previously carried. This can also be zoomed in on using an intuitive pinching motion on the screen.

A brightness control and night mode is available.

Flight crew should consider good CRM methodology whilst conducting their briefings using EFB. These should be interactive, and possibly the use of one device during briefing to ensure engagement and participation.

Pre-selection of the expected charts is recommended for fast access when changing charts.

G.4 Hardware and Operating System Control and Configuration

G.4.1 iPad

The iPad is a commercially available Portable Electronic Device, with many advanced features. They have become ubiquitous in 21st Century life.

G.4.2 Batteries

iPads feature an advanced lithium polymer battery that provides up to ten hours of use. In addition to providing hours of use, the iPad battery has been designed to meet international safety certification standards. All iPad batteries are tested, certified, and in compliance with the standards which meet the safety and testing criteria set forth in the FAA Advisory Circular AC 120-76B regarding the airworthiness and use of portable electronic flight bags. Only OEM replacement parts are to be used.

G.4.3 Chargers

Depending on the model, iPad comes with a 5W, 10W, or 12W power adapter. All three Apple USB power adapters are designed for use with power sources rated to provide 100V AC to 240V AC at 50Hz to 60Hz.

The Type A (flat parallel-blade design) Apple 5W as well as the 10W and 12W USB power adapters (with Type A AC plug attached) also comply with the IEC/UL 60950-1 standard for use with power sources rated to provide 115V AC at 400Hz.

G.4.4 External Power

Several of 2Excel Aircraft are fitted with USB power supplies, it is permitted to use these as EFB power supplies to recharge the EFB during all phases of flight (using OEM charging cables). For those aircraft not fitted with USB ports an external battery pack is provided. In all cases cables, shall be routed so as not to cause a snag or egress hazard and checked for any fraying or defects prior to use.

The external battery pack is the RAV Power 1600mAh External Battery Pack.



Specifications:

Model	RP-PB19
Input	DC 5V/2A
iSmart Output1	USB 5V/1A-2.1A
iSmart Output2	USB 5V/1A-2.4A
Dimensions	127 x 81 x 22 mm
Net Weight	320 g / 11.3 oz
Capacity	16000mAh/59.2Wh
Working Temperature	0°C ~45°C
Storage Temperature	-10°C ~45°C

G.5 Software Application Control and Configuration

G.5.1 EFB System Maintenance & Software updates

EFB software must only be installed by the EFB System Administrator [via the MDM software](#). This ensures a standard layout and only 2EA approved software on every device. New or replacement devices should be thoroughly tested for serviceability and accuracy before the device is placed on board the aircraft.

The EFB devices are aircraft type specific and are not interchangeable between fleets.

Flight crew and operations should click the update buttons on the EFBs before using applications to ensure that the latest information is installed. This does not require administrator privileges.

The EFBs, components and installed software shall be tested, updated and checked regularly by the EFB System Administrator as part of the IOS update program, to ensure functionality and serviceability.

The monthly check will be recorded and retained.

G.5.2 Procedures to Avoid Corruption / Errors

Updating the iPad operating system software (IOS) shall only be conducted by the EFB System Administrator. This ensures that the essential software applications are not corrupted.

Any new iOS major version should imply an evaluation by the EFB System Administrator to verify it has no adverse effect on the Application, using a trial (not for flight) device.

The EFB shall be thoroughly tested for serviceability and accuracy before the device is placed on board the aircraft.

G.5.3 EFB Unserviceability and Maintenance

For Single Pilot Operations 2 operating EFBs at despatch are required for normal operations, for Multi pilot operations 3 operating EFBs (4 for the B727) are required.

Any unserviceability of iPad device, portable power connections, fixed EFB power outlets or mounting devices are to be handled and recorded in accordance with the aircraft MEL.

All EFB items (including mounts) are carry on equipment/PED, all defects and deficiencies are to be recorded in the Aircraft Tech Log and Acceptable Deferred Defect Log for tracking. Once defective items are replaced, the ADD log entry is cleared with the pilot's signature and licence number. However fixed equipment defects (power outlets) may only be rectified and certified in accordance with EASA Pt145.

Company Operations hold spare EFBs and mounting equipment.

Any reduction in operating battery life is to be notified to Operations for a check of installed battery performance or replacement.

Any erroneous or corrupted data within software will be communicated via Operational Notice. If a crew have already dispatched when an issue is identified they will be notified by Operations.

G.5.4 iPad Reboot



G.5.5 Installed Software

List of Type A applications installed:

- Calculator
- Adobe Acrobat Reader

List of Type B applications installed (dependant on Fleet):

- | | |
|--------------|-------------------------------|
| JeppFD | Rocket Route |
| Centrik | SkyDemon |
| CrewBriefing | AeroWeather Pro |
| Runway HD | Performance GURU2 (B737 only) |
| SpiderTracks | HaiVision Play |
| Leon | |

Applications used in flight are located in the quick access bar at the base of the home screen. **Only the applications required by each fleet/department will be shown on the quick access bar. The order of display will be standard and controlled.**

Example of screen layout:



G.6 EFB Mounting

G.6.1 Multi Engined Fixed Wing Aircraft

G.6.1.1 Introduction

The iPad is mounted to the window and can be rotated between portrait and landscape.

The RAM twist lock suction cup mount consists of double suction cup locking base with a ball attached via a diamond plate, a double socket arm and a round plate with drilled holes including the universal AMPS hole pattern.

The PIVOT iPad mini mount is an integral mount and hard case that attaches to a window mounted PanaVise suction cup.

G.6.1.2 iPad Mount



RAM Mount



PIVOT Mount

G.6.1.3 Limitations

If a case is fitted then the iPad may remain in the case prior to using the mount.

The mounting must be removed from the window and checked for any defects at the end of the Flight Duty Period.

At the start of the FDP the next crew must wipe the window and re-apply the mount. Crew taking over an aircraft MUST NOT use the mount without first following these procedures.

G.7.1 Procedures

The following procedures apply if the iPad is used on board:

- a. Prior to arrival at the aircraft pilots are to check that the latest Mobile FD / Sky Demon updates are installed on the iPad, and no red indicators on Centrik App home page.
- b. Prior to engine start the full range of iPad wireless, Bluetooth and 3G functionality may be used on the Flight Deck and the mount position must be checked to ensure in standard position and does not interfere with the controls.
- c. From before engine start to after engine shut down iPad 'Airplane Mode' must be enabled and verified by the pilot/s.
- d. If removed from mounts for briefing purposes then the iPad tablets must be securely stowed in the mount from before entering the departure runway until 2000 feet AAL and on arrival from 2000 feet AAL until after vacating the landing runway.
- e. Prior to taxi or TOD, the PF may brief / self-brief the departure or approach using the iPad.
- f. Use of own-ship position on Jepp taxi charts as an Airport Moving Map Display is only designed to assist flight crew members in orientating themselves on the airport surfaces so as to improve positional awareness during taxiing and is not to be used as the basis for ground maneuvering.
- g. All departures and arrivals are to be flown by PF with iPad reference as the primary chart reference.
- h. Use of own-ship position in flight should not be used as a primary source of information to fly or navigate the aircraft. The display of own-ship position is only to be enabled in aircraft that also have a certified navigation display (moving map), except for VFR flights over routes navigated by reference to visual landmarks. Systematic cross checks with avionics-based navigation information should be made to confirm validity, in addition to monitoring the Jepp GPS status warning within the app. If EFB displayed location appears in error it should be disabled via the Jepp menu options to avoid distraction or confusion.
- i. Prior to departure and descent, the iPad mounting must be checked to ensure security and that it does not interfere with the controls

G.7.2 EFB Issue Reporting

A Company ASR must be filed at the first opportunity in the event of any incident, or hazard identified relating to the use of EFB.

G.7.3 Jeppesen Charts, EFB and Chart Briefings

The EFB is to be used as the primary source for crew briefing. Crews are to ensure that after the route and aerodromes have been entered into the software and prior to despatch, that charts are available in the database. If not, or if for any other reason a paper 'Trip Kit' is required the following applies:

The 'Trip Kit' must comprise of a minimum of:

- ❖ Departure
- ❖ Take-off Alternate (If required)
- ❖ En-Route Alternate (If Required)
- ❖ Destination
- ❖ Destination Alternate
- ❖ 2nd Destination Alternate (If Required)



Crews must cross check the validity of the electronic and paper charts to be used

In the event of a validity confliction only the most up to date chart source should be used for the briefing and procedures and a Company ASR filed at the first opportunity

G.7.4 Faults / Repairs or Replacements (see also G5.3)

The following procedure should be implemented for reporting EFB failures to equipment or software:

On returning to Operations, complete the sign in sheet recording defaults in the comments section

Verbally report the fault with the EFB to the local EFB administrator

EFB Administrator should try to replicate the fault for confirmation purposes

EFB should be removed from use until reboot of software with no fault found or replacement device has been sourced

If crews notice that iPad battery strength appears to be declining they should note this in the comments section to allow monitoring and replacement

G.7.5 Use of Jeppesen Mobile FliteDeck

The Jeppesen Mobile FliteDeck app can be used to view En-route Charts, Terminal Charts and Airway Manuals. A full description of its features, and use is contained in the Company EFB Training guide.

G.7.6 Centrik Document Management

The Centrik App holds all Ops Manuals, Airfield Briefings and Notices to Crews as well as hosting the Safety Management System. All crew members must ensure that the EFB Centrik App is up to date at the start of the FDP. Any red modules must be updated by clicking on the relevant line or on the update all. A full description of its features and use is contained in the Company EFB Training guide.

G.7.7 EFB Overheating, Smoke or Fire

G.7.7.1 Introduction

Following several fires in the cabin caused by lithium battery powered portable electronic devices, the International Civil Aviation Organization (ICAO) has amended its “Emergency Response Guidance for Aircraft Incidents Involving Dangerous Goods” (ICAO Doc 9481 AN/928) to include guidance to crew to assist in dealing with such incidents.

G.7.7.2 Device Overheating

Apple lists the normal temperature operating range for the iPad as 0°C – 35° C. While using the device below the freezing point may cause the screen to lag a bit, it will still function. However, use of the iPad at the other temperature extreme, may lead to a thermal protection mode and become completely unusable until the internal temperature of the device is reduced.

The primary reason for this is to protect the internal lithium-polymer battery



In the event one of the above displays on the iPad screen, crew should:

- Remove the iPad from direct sunlight
- Consider removing its case if fitted
- Aim air vents towards the device

G.7.7.3 Battery Overheating

AvSax should be used to contain a device in the event of a battery overheat (hot to touch). If no AvSax is carried then the following steps should be taken (Company Lithium battery onboard fire kit should be utilised if carried):

- Remove device from Flight Deck
- Douse the device with water (or other non-flammable liquid). Liquid may turn to steam when applied to the hot battery
- Obtain a suitable empty container
- Fill the container with enough water (or other non-flammable liquid) to submerge the device
- Using protective equipment, place the device in the container and completely submerge in water (or other non-flammable liquid)
- Stow and (if possible) secure the container to prevent spillage
- Monitor the device and the surrounding area for the remainder of the flight

G.7.7.4 Smoke or Fire

In the event of smoke or fire, a fire extinguisher must first be used and then follow the steps above.



G.8 EFB System Changes

G.8.1 Addition of a New Aircraft Type. From time to time 2EA may wish to add additional types to the EFB operational approval. The addition of a new aircraft type is unlikely to change these processes, it will however require the following checks to be documented:

EMI check

Hardware integration – particularly suitability of mounts

Carriage of AvSax or similar

Human Factors assessment

G.8.1.1 The first 6 months of operating the new type are critical, particular attention is to be paid by operating crews to Human Factors and ensuring the EFB is suitable. Crews are to use the SMS reporting system when adverse issues are identified.

G.8.2 Additional Type B Software Apps. Due to the continuous improvement process 2EA may wish to change and/or add additional Type B software apps. This is detailed within the Management of Change process described in the SMS Manual, Section 8. A full change case is to be completed when necessary (for example using digital performance and M&B data validated by comparison with traditional paper methods). This change case is to be audited by the CMM, approved by the Fleet Captain and DFO. When considered necessary by the DFO, a trial alongside the currently approved apps will be conducted. Addition of Type B Software apps will require additional approvals from the Authority in [order to amend the AOC approval certificate EFB entry](#).

G.8.3 Additional Operating Locations. Due to the nature of 2EA's business it is likely that additional operating locations will be added. The Management of Change process is to be used to identify hazards associated with the new location. Particular attention is to be paid to EFB operating procedures and Local Instructions produced to manage the system.

G.8.4 Safety Case Review. Any change to the EFB System requires a review of the EFB Safety Case held on Centrik. This case is reviewed on annual, or case by case basis by the Safety Manager.



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Section 9

Dangerous Goods

9.1 Policy on the Transport of Dangerous Goods

9.1.1 Approval for the Transport of Dangerous Goods (CAT.GEN.MPA.200, SPA.DG.105).

Dangerous goods can only be carried according to the International Civil Aviation Organisation's Technical Instructions for the Safe Transport of Dangerous Goods by Air (Technical Instructions) and in lieu, the corresponding IATA Dangerous Goods Regulations (IATA DGR), irrespective of whether the flight is wholly or partly within or wholly outside the territory of a State. An approval must be granted by the State of the Operator before dangerous goods can be carried on an aircraft, except as identified in 9.1.3 and 9.1.5 below. An additional approval or an exemption may be required to permit the transport of some dangerous goods – see 9.1.2 below. When more restrictive requirements than those specified in the Technical Instructions are adopted, 2Excel Aviation will notify ICAO at **PD**@icao.int to enable Operator Variations to be published. **2Excel Aviation holds an EASA approval for the transport of dangerous goods by air. 2Excel Aviation policy prohibits the carriage of radioactive material.**

The following Company Staff are assigned responsibility for the Approval held:

Primary	<input type="text" value="Name"/>	<input type="text" value="Personal Data 500"/>
Secondary	<input type="text" value="Name"/>	<input type="text" value="Personal Data 500"/>

9.1.2 Forbidden Dangerous Goods (CAT.GEN.MPA.200 (c), GM1 CAT.GEN.MPA.200).

Certain dangerous goods, which are normally forbidden, may be specifically approved for air transport by the State of Origin and the State of the Operator:

- to transport dangerous goods forbidden on passenger and/or cargo aircraft where Special Provision A1/A2 applies; **or**
- for other purposes as specified in the IATA DGR;

provided that in such instances an overall level of safety in transport which is at least equivalent to the level of safety provided for in the IATA DGR is achieved.

In instances of extreme urgency or when other forms of transport are inappropriate or full compliance with the prescribed requirements is contrary to public interest, the States concerned may grant an exemption from the provisions of the IATA DGR provided that in such instances an overall level of safety in transport which is at least equivalent to the level of safety provided for in the IATA DGR is achieved. For the purposes of exemptions, "States

concerned” are the States of Origin, Operator, transit, overflight and destination. For the State of overflight, if none of the criteria for granting an exemption are relevant, an exemption may be granted based solely on whether it is believed that an equivalent level of safety in air transport has been achieved.

Additionally, since controls exist for the quantities of some explosives which may be carried to or from specific airfields in the United Kingdom, operators must seek advice from the Civil Aviation Authority as to the suitability of the intended airfield of loading and unloading when Class 1 dangerous goods are being carried under an A2 approval.

Note: Application for approvals should be submitted to the CAA Dangerous Goods Office at least 10 working days prior to the proposed flight date.

Dangerous goods carried in accordance with an exemption or approval must comply with the conditions on the exemption or approval, as well as those on the permanent approval unless these have been varied by the exemption or further approval.

Note: Company Operations are to ensure all relevant personnel are made aware of the details of short-term approvals and exemptions regarding the dangerous goods (if necessary this may also be achieved through the issue of Flight Crew Notices). When dangerous goods are carried under a specific exemption or approval, a copy of that document is to be carried on board the aircraft.

9.1.3 General Exceptions

9.1.3.1 Airworthiness and Operational Items (CAT.GEN.MPA.200 (b)(1)). An approval is not required for dangerous goods which are required to be aboard the aircraft such as:

- a. items for airworthiness or operating reasons or for the health of passengers or crew, such as batteries, fire extinguishers, first-aid kits, insecticides, air fresheners, life rafts, escape slides, life-saving appliances, portable oxygen supplies, tritium signs, smoke hoods, passenger service units;
- b. aerosols, alcoholic beverages, perfumes, colognes, liquefied gas lighters and portable electronic devices containing lithium metal or lithium ion cells or batteries (provided that the batteries meet the provisions applicable when carried by passengers and crew) carried aboard an aircraft by the operator for use or sale on the aircraft during the flight or series of flights, but excluding non-refillable gas lighters and those lighters liable to leak when exposed to reduced pressure; and
- c. dry ice intended for use in food and beverage service aboard the aircraft; and
- d. electronic devices such as electronic flight bags, personal entertainment devices, credit card readers, containing lithium metal or lithium ion cells or batteries and spare lithium batteries for such devices carried aboard an aircraft by the operator for use on the aircraft during the flight or series of flights, provided that the batteries meet the provisions applicable to the carriage of portable electronic devices containing lithium or lithium ion cells or batteries by passengers (see the entry for ‘Batteries’ in the table produced at para 9.1.5). (Spare lithium batteries for laptops and other devices used on-board Company trials aircraft must be individually protected so as to prevent short

circuits when not in use, by placement in the original retail packaging or by otherwise insulating terminals, e.g. by taping over exposed terminals or placing each battery in a separate plastic protective pouch (supplies of which are held in Company Operations), and carried in carry-on baggage only. In addition, each installed or spare battery must not exceed the following:

- (a) for lithium metal or lithium alloy batteries, a lithium content of not more than 2 g;
or
- (b) for lithium ion batteries, a watt-hour rating of not more than 100 Wh.

Lithium ion batteries exceeding a watt-hour rating of 100 Wh but not exceeding 160 Wh may be carried as spare batteries in carry-on baggage, or in equipment in either checked or carry-on baggage. No more than two individually protected spare batteries per person may be carried.)

2Excel Aviation Operations are to collect and retain evidence that any lithium cell/battery carried in accordance with 9.1.3.1 b or d is of a type which meets the requirements of each test in the United Nations UN Manual of Tests and Criteria, Part III, subsection 38.3.

Note: Dangerous goods intended as replacements for those referred to in para 9.1.3.1 a, b and c above may not be carried without the approval referred to in para 9.1.1 and unless consigned and accepted for transport in accordance with the IATA DGR.

9.1.3.2 Veterinary Aid (CAT.GEN.MPA.200 (b) (1)). An approval is not required for dangerous goods which are carried for use in flight as veterinary aid or as a humane killer for an animal. Such dangerous goods must be stowed and secured during take-off and landing and at all other times when deemed necessary by the pilot-in-command. The dangerous goods must be under the control of trained personnel during the time when they are in use on the aircraft. Dangerous goods may be carried on a flight made by the same aircraft before or after a flight for which they are required as veterinary aid or as a humane killer for an animal, (e.g. training flights and positioning flights prior to or after maintenance), when it is impracticable to load or unload the dangerous goods immediately before or after the flight, subject to the following conditions:

- a. the dangerous goods must be capable of withstanding the normal conditions of air transport;
- b. the dangerous goods must be appropriately identified (e.g. by marking or labelling);
- c. the dangerous goods may only be carried with 2Excel Aviation's approval;
- d. the dangerous goods must be inspected for damage or leakage prior to loading;
- e. loading must be supervised by the 2Excel Aviation (nominally the Aircraft Captain);
- f. the dangerous goods must be stowed and secured in the aircraft in a manner that will prevent any movement in flight which would change their orientation;

- g. the pilot-in-command must be notified of the dangerous goods loaded on board the aircraft and their loading location. In the event of a crew change, this information must be passed to the next crew;
- h. all personnel must be trained commensurate with their responsibilities; and
- i. the provisions of Part A, Section 11, (Dangerous Goods Accident and Incident Reports) apply.

9.1.3.3 Medical Aid for a Patient (CAT.GEN.MPA.200 (b) (1)). An approval is not required for dangerous goods which:

- a. are placed on board an aircraft with the approval of 2Excel Aviation; or
- b. form part of the permanent equipment of the aircraft when it has been adapted for specialised use, to provide, during flight, medical aid for a patient, such as gas cylinders, drugs, medicines, other medical material (e.g. sterilising wipes) and wet cell or lithium batteries, providing:
 - i. the gas cylinders have been manufactured specifically for the purpose of containing and transporting that particular gas;
 - ii. the drugs and medicines and other medical matter are under the control of trained personnel during the time when they are in use;
 - iii. the equipment containing wet cell batteries is kept, and when necessary secured, in an upright position to prevent spillage of the electrolyte; and
 - iv. proper provision is made to stow and secure all the equipment during take-off and landing and at all other times when deemed necessary by the commander in the interests of safety.

These dangerous goods may also be carried on a flight made by the same aircraft to collect a patient or after that patient has been delivered (e.g. training flights and positioning flights prior to or after maintenance), when it is impracticable to load or unload the goods at the time of the flight on which the patient is carried.

Note: The dangerous goods carried may differ from those identified above due to the needs of the patient. These provisions apply both to dedicated air ambulances and to temporarily modified aircraft.

9.1.3.4 Excess Baggage Being Sent as Cargo. An approval is not required for dangerous goods contained within items of excess baggage being sent as cargo provided that:

- a. the excess baggage has been consigned as cargo by or on behalf of a passenger;
- b. the dangerous goods may only be those that are permitted by and in accordance with para 9.1.5 to be carried in checked baggage; and
- c. the excess baggage is marked with the words “Excess baggage consigned as cargo”.

With the aim of preventing dangerous goods, which a passenger is not permitted to have, from being taken aboard an aircraft in excess baggage consigned as cargo, any organisation or enterprise accepting excess baggage consigned as cargo should seek confirmation from the passenger, or a person acting on behalf of the passenger, that the excess baggage does not contain dangerous goods that are not permitted and seek further confirmation about the contents of any item where there are suspicions that it may contain dangerous goods that are not permitted.

9.1.4 Instructions on the Carriage of Employees of the Operator (AMC2 CAT.OP.MPA.160).

There is no restriction of the carriage of employees on an aircraft carrying dangerous goods which are permitted on a passenger aircraft, providing the requirements of the IATA DGR are complied with. When an aircraft is carrying dangerous goods which can only be carried on a cargo aircraft, employees of the operator can also be carried provided they are in an official capacity. It is intended this be interpreted as meaning they have duties concerned with the preparation or undertaking of a flight or on the ground once the aircraft has landed, although not necessarily in connection with an aircraft. See also 9.3.4.

9.1.5 Items That May Be Carried by Passengers and Crew (CAT.GEN.MPA.200 (b)(2))

9.1.5.1

- a. International standards permit the carriage of the dangerous goods listed below by passengers or crew members either as or in carry-on baggage or checked baggage or on their person. Additional restrictions implemented by countries in the interests of aviation security may, however, limit or forbid the carriage of some of these items.
- b. Certain items listed are permitted only with 2Excel Aviation's approval. Requirements apply to some items regarding the means by which they are prepared for transport (e.g. wheelchairs and battery-powered mobility devices) or the professional status of the passenger (e.g. Chemical Agent Monitoring Equipment). As part of the flight booking process passengers should be made aware of those types of goods that are not permitted. Any passenger request to carry an item of potentially dangerous goods must be referred to Company Operations and the Aircraft Captain on a case-by-case basis, who should then ascertain exactly what the passenger wishes to carry. The tables below should be used to determine whether the goods are permitted. If the goods are not listed then they can only be carried if they are packed, marked, labelled and declared before then being subject to a dangerous goods acceptance check. Reservation staff must then be firm that carriage is not permitted without such procedures and the Aircraft Captain informed in order to alert him to the chance of non-permitted dangerous goods being secreted in cargo or baggage. Any permitted dangerous goods requiring Operator approval (as listed in the following tables) should be notified on the manifest in the SCP / Load information section to inform the pilot in command of carriage.
- c. An approval is not required for those dangerous goods which, according to the IATA DGR, can be carried by passengers or crew members.

Passengers or crew are forbidden to carry dangerous goods either as or in carry-on baggage, checked baggage or on their person unless the dangerous goods are permitted in accordance with the table below and:

- a) carried by passengers or crew for personal use only;
- b) contained in baggage that has been separated from its owner during transit (e.g. lost baggage or improperly routed baggage); or
- c) contained within items of excess baggage sent as cargo as permitted by 9.1.3.4.

The entry in the table that most appropriately describes the item or article must be selected. For instance, electronic cigarettes must meet the requirements of the entry for “Battery-powered portable electronic smoking devices” not the entry for lithium batteries or non-spillable batteries.

An item or article that contains multiple dangerous goods must meet all applicable entries. For instance, the restrictions and conditions for entries 1) and 14) apply to an avalanche backpack that contains lithium batteries and gas cartridges.

Active devices must meet defined standards for electromagnetic radiation to ensure that the operation of the devices does not interfere with aircraft systems.

Where an entry requires compliance with specific UN tests or Special Provisions, if considered necessary (e.g. to grant the operator’s approval for carriage), passengers should be able to confirm that the applicable requirements have been met. For items such as batteries, the passenger should be able to obtain confirmation from the manufacturer or distributor of the item.

Baggage intended to be carried in the cabin that is placed in the cargo compartment must only contain dangerous goods permitted in checked baggage. When baggage intended as carry-on is taken by the operator and placed into the cargo compartment for carriage, the operator must confirm with the passenger that dangerous goods which are only permitted in carry-on baggage (e.g. lithium batteries, including power banks) have been removed.

Note 1: The following dangerous goods may be commonly carried by passengers on other modes of transport, however, they are prohibited either as or in carry-on baggage or checked baggage:

- personal medical oxygen devices that utilize liquid oxygen;
- electroshock weapons (e.g. tasers) containing dangerous goods such as explosives, compressed gases, lithium batteries, etc.;
- “strike anywhere” matches;
- lighter fuel and lighter refills;
- premixing burner lighter without a means of protection against unintentional activation; and
- battery-powered lighters powered by a lithium ion or lithium metal battery (e.g. laser plasma lighters, tesla coil lighters, flux lighters, arc lighters and double arc lighters) without a safety cap or means of protection against unintentional activation.

Note 2: Exceptions found in the IATA DGR from the restrictions on carriage by passengers and crew (e.g. by application of a Special Provision) are not reproduced in the tables below. The following dangerous goods are not subject to the IATA DGR:

- Radio-pharmaceuticals contained within the body of a person as the result of medical treatment; and
- Energy efficient lamps when in retail packaging and intended for personal or home use

Note 3: Air Cylinders for purposes such as scuba diving: if empty or at a pressure less than 200 kPa at 20° (2 Bar or 29 PSI) air cylinders are not classified as dangerous goods so are permitted for carriage by passenger or crew.

9.1.5.2 Loading of battery powered mobility aids – general requirements:

A battery powered mobility aid with installed batteries must be secured, by use of straps, tie-downs or other restraint devices.

The mobility aid, the batteries, electrical cabling and controls must be protected from damage including by the movement of baggage, mail or cargo.

The operator must verify that:

- a) the battery terminals are protected from short circuits (e.g. by being enclosed within a battery container); and
- b) the battery is either:
 - i. securely attached to the mobility aid and the electrical circuits are isolated following the manufacturer's instructions; or
 - ii. removed by the user, if the mobility aid is specifically designed to allow it to be, following the manufacturer's instructions.

Note: To check that electrical circuits are isolated (inactive), place the device into drive mode (i.e. not freewheel mode), see if the mobility aid will power up and if so whether use of the joystick results in the mobility aid moving. It must also be verified that the circuits of supplemental motorised systems such as seating systems have been inhibited to prevent inadvertent operation, e.g. by the separation of cable connectors. If an electric mobility aid has not been made safe for carriage, it must not be loaded.

9.1.5.3 Additional requirements for non-spillable wet battery powered mobility aids:

The passenger has confirmed that the battery is a non-spillable wet battery that complies with Special Provision A67.

A maximum of one spare battery may be carried per passenger.

Any battery(ies) removed from the mobility aid and any spare battery must be carried in strong, rigid packagings, protected from short circuit and stowed in the cargo compartment.

The operator must inform the pilot-in-command of the location of any mobility aids with installed batteries, removed batteries and spare batteries

9.1.5.4 Additional requirements for spillable battery powered mobility aids:

Where feasible, the battery is fitted with spill resistant-vent caps.

If the mobility aid cannot be loaded, stowed, secured and unloaded always in an upright position or if the mobility aid does not adequately protect the battery, the operator must remove the batteries and carry them in strong, rigid packagings, as follows:

- a) packagings must be leak-tight, impervious to battery fluid and be protected against being overturned by securing them to pallets or by securing them in cargo compartments using appropriate means of securement;
- b) batteries must be protected against short circuits, secured upright in these packagings and surrounded by compatible absorbent material sufficient to absorb their total liquid contents; and
- c) these packagings must be marked "Battery, wet, with wheelchair" or "Battery, wet, with mobility aid" and be labelled with a "Corrosive" label and with package orientation labels.

The operator must inform the pilot-in-command of the location of any mobility aids with installed spillable batteries and removed batteries.

9.1.5.5 Additional requirements lithium ion battery powered mobility aids

Any battery removed from the mobility aid and any spare batteries must be carried in the cabin and protected from damage (e.g., by placing each battery in a protective pouch) and the battery terminals protected from short circuit (by insulating the terminals, e.g. by taping over exposed terminals).

A removed battery must not exceed 300 Watt-hours (Wh). In addition, one spare not exceeding 300 Wh or two spares not exceeding 160 Wh are permitted.

The operator must inform the pilot-in-command of the location of any mobility aids with installed lithium ion batteries, removed batteries and spare batteries.

Note: The calculation used to determine watt hours is:

$$\text{Volts} \times \text{ampere hour (Ah)} = \text{watt hours}$$

Provisions for dangerous goods carried by passengers or crew

Dangerous Goods	Location		Approval of the operator(s) is required	Restrictions
	Checked baggage	Carry-on baggage		
Batteries				
1) Lithium batteries (including portable electronic devices)	Yes (except for g) and h))	Yes	(see c) and d))	<p>a) each battery must be of a type which meets the requirements of each test in the UN <i>Manual of Tests and Criteria</i>, Part III, subsection 38.3;</p> <p>b) each battery must not exceed the following:</p> <ul style="list-style-type: none"> — for lithium metal batteries, a lithium content of 2 grams; or — for lithium ion batteries, a Watt-hour rating of 100 Wh; <p>c) each battery may exceed 100 Wh but not exceed 160 Wh Watt-hour rating for lithium ion with the approval of the operator;</p> <p>d) each battery may exceed 2 grams but not exceed 8 grams lithium content for lithium metal for portable medical electronic devices with the approval of the operator;</p> <p>e) batteries contained in portable electronic devices should be carried as carry-on baggage; however, if carried as checked baggage:</p> <ul style="list-style-type: none"> — measures must be taken to prevent unintentional activation and to protect the devices from damage; and — the devices must be completely switched off (not in sleep or hibernation mode); <p>f) batteries and heating elements must be isolated in portable electronic devices capable of generating extreme heat, which could cause a fire if activated, by removal of the heating element, battery or other components;</p> <p>g) spare batteries, including power banks:</p> <ul style="list-style-type: none"> — must be carried as carry-on baggage; and — must be individually protected so as to prevent short circuits (by placement in original retail packaging or by otherwise insulating terminals, e.g. by taping over exposed terminals or placing each battery in a separate plastic bag or protective pouch); <p>h) baggage equipped with a lithium battery(ies) exceeding:</p> <ul style="list-style-type: none"> — for lithium metal batteries, a lithium content of 0.3 grams; or — for lithium ion batteries, a Watt-hour rating of 2.7 Wh <p>must be carried as carry-on baggage unless the battery(ies) is removed from the baggage, in which case the battery(ies) must be carried in accordance with g);</p> <p>i) no more than two spare batteries meeting the requirements of c) or d) may be carried per person.</p>

	<i>Dangerous Goods</i>	<i>Location</i>		<i>Approval of the operator(s) is required</i>	<i>Restrictions</i>
		<i>Checked baggage</i>	<i>Carry-on baggage</i>		
2)	Non-spillable batteries	Yes	Yes	No	<ul style="list-style-type: none"> a) must meet the requirements of Special Provision A67; b) each battery must not exceed a voltage of 12 volts and a Watt-hour rating of 100 Wh; c) each battery must be protected from short circuit by the effective insulation of exposed terminals; d) no more than two spare batteries per person may be carried; and e) if contained in equipment, the equipment must be either protected from unintentional activation, or each battery must be disconnected and its exposed terminals insulated.
3)	Battery-powered portable electronic smoking devices (e.g. e-cigarettes, ecigs, ecigars, epipes, personal vaporizers, electronic nicotine delivery systems)	No	Yes	No	<ul style="list-style-type: none"> a) if powered by lithium batteries, each battery must comply with restrictions of 1) a), b) and g); b) the devices and/or batteries must not be recharged on board the aircraft; and c) measures must be taken to prevent unintentional activation of the heating element while on board the aircraft.
4)	Battery-powered mobility aids (e.g. wheelchairs)	Yes	(see d))	Yes	<ul style="list-style-type: none"> a) for use by passengers whose mobility is restricted by either a disability, their health or age, or a temporary mobility problem (e.g. broken leg); b) the passenger should make advance arrangements with each operator and provide information on the type of battery installed and on the handling of the mobility aid (including instructions on how to isolate the battery); c) in the case of a non-spillable wet battery: <ul style="list-style-type: none"> i) each battery must comply with Special Provision A67; and ii) a maximum of one spare battery may be carried per passenger; d) in the case of a lithium ion battery: <ul style="list-style-type: none"> i) each battery must be of a type which meets the requirements of each test in the <i>UN Manual of Tests and Criteria</i>, Part III, subsection 38.3; ii) when the mobility aid does not provide adequate protection to the battery: <ul style="list-style-type: none"> — the battery must be removed in accordance with the manufacturer's instructions; — the battery must not exceed 300 Wh; — the battery terminals must be protected from short circuit (by insulating the terminals, e.g. by taping over exposed terminals); — the battery must be protected from damage (e.g. by placing each battery in a protective pouch); and — the battery must be carried in the cabin; iii) a maximum of one spare battery not exceeding 300 Wh or two spare batteries not exceeding 160 Wh each may be carried. Spare batteries must be carried in the cabin.

Dangerous Goods	Location		Approval of the operator(s) is required	Restrictions
	Checked baggage	Carry-on baggage		
Flames and fuel sources				
5) Cigarette lighter Small packet of safety matches	No	(see b))	No	a) no more than one per person; b) must be carried on the person; c) must not contain unabsorbed liquid fuel (other than liquefied gas); and d) if a cigarette lighter is powered by lithium batteries, each battery must comply with restrictions of 1) a), b) and g) and 3) b) and c).
6) Alcoholic beverages containing more than 24 per cent but not more than 70 per cent alcohol by volume	Yes	Yes	No	a) must be in retail packagings; and b) no more than 5 L total net quantity per person. <i>Note.— Alcoholic beverages containing not more than 24 per cent alcohol by volume are not subject to any restrictions.</i>
7) Internal combustion engines or fuel cell engines	Yes	No	No	Measures must be taken to nullify the hazard. a) for flammable liquid powered engines: i) the engine is powered by a fuel that does not meet the classification criteria for any class or division; or ii) the fuel tank of the vehicle, machine or other apparatus has never contained any fuel or the fuel tank has been flushed and purged of vapours and adequate measures taken to nullify the hazard; and iii) the entire fuel system of the engine has no free liquid and all fuel lines are sealed or capped or securely connected to the engine and vehicle, machinery or apparatus. b) for flammable gas powered internal combustion or fuel cell engines: i) the entire fuel system must have been flushed, purged and filled with a non-flammable gas or fluid to nullify the hazard; and ii) the final pressure of the non-flammable gas used to fill the system does not exceed 200 kPa at 20°C;
8) Fuel cells containing fuel	No	Yes	No	a) fuel cell cartridges may only contain flammable liquids, corrosive substances, liquefied flammable gas, water reactive substances or hydrogen in metal hydride;
Spare fuel cell cartridges	Yes	Yes	No	b) refuelling of fuel cells on board an aircraft is not permitted except that the installation of a spare cartridge is allowed; c) the maximum quantity of fuel in any fuel cell or fuel cell cartridge must not exceed: — for liquids 200 mL; — for solids 200 grams; — for liquefied gases, 120 mL for non-metallic fuel cell cartridges or 200 mL for metal fuel cell or fuel cell cartridges; and — for hydrogen in metal hydride, the fuel cell or fuel cell cartridges must have a water capacity of 120 mL or less;

Dangerous Goods	Location		Approval of the operator(s) is required	Restrictions
	Checked baggage	Carry-on baggage		
				<p>d) each fuel cell and each fuel cell cartridge must conform to IEC 62282-6-100 Ed. 1, including Amendment 1, and must be marked with a manufacturer's certification that it conforms to the specification. In addition, each fuel cell cartridge must be marked with the maximum quantity and type of fuel in the cartridge;</p> <p>e) fuel cell cartridges containing hydrogen in metal hydride must comply with the requirements in Special Provision A162;</p> <p>f) no more than two spare fuel cell cartridges may be carried by a passenger;</p>
				<p>g) fuel cells containing fuel are permitted in carry-on baggage only;</p> <p>h) interaction between fuel cells and integrated batteries in a device must conform to IEC 62282-6-100 Ed. 1, including Amendment 1. Fuel cells whose sole function is to charge a battery in the device are not permitted;</p> <p>i) fuel cells must be of a type that will not charge batteries when the portable electronic device is not in use and must be durably marked by the manufacturer: "APPROVED FOR CARRIAGE IN AIRCRAFT CABIN ONLY" to so indicate; and</p> <p>j) in addition to the languages which may be required by the State of Origin for the markings specified above, English should be used.</p>
Gases in cylinders and cartridges				
9) Cylinders of oxygen or air required for medical use	Yes	Yes	Yes	<p>a) no more than 5 kg gross mass per cylinder;</p> <p>b) cylinders, valves and regulators, where fitted, must be protected from damage which could cause inadvertent release of the contents;</p> <p>c) advance arrangements recommended; and</p> <p>d) the pilot-in-command must be informed of the number of oxygen or air cylinders loaded on board the aircraft and their loading location(s).</p>
10) Cartridges of Division 2.2 worn for the operation of mechanical limbs	Yes	Yes	No	Spare cartridges of a similar size are also allowed, if required, to ensure an adequate supply for the duration of the journey.
11) Cartridge of hydrocarbon gas contained in hair styling equipment	Yes	Yes	No	<p>a) no more than one per person;</p> <p>b) the safety cover must be securely fitted over the heating element; and</p> <p>c) spare cartridges must not be carried.</p>
12) Cartridges of Division 2.2 with no subsidiary hazard fitted into a self-inflating personal safety device such as a life-jacket or vest	Yes	Yes	Yes	<p>a) no more than one personal safety device per person;</p> <p>b) the personal safety device must be packed in such a manner that it cannot be accidentally activated;</p> <p>c) must be for inflation purposes;</p> <p>d) no more than two cartridges are fitted into the device; and</p> <p>e) no more than two spare cartridges.</p>

Dangerous Goods	Location		Approval of the operator(s) is required	Restrictions
	Checked baggage	Carry-on baggage		
13) Cartridges of Division 2.2 with no subsidiary hazard for other than a self-inflating personal safety device	Yes	Yes	Yes	a) no more than four cartridges per person; and b) the water capacity of each cartridge must not exceed 50 mL. <i>Note.— For carbon dioxide, a gas cartridge with a water capacity of 50 mL is equivalent to a 28 g cartridge.</i>
14) Cartridges and cylinders of Division 2.2 with no subsidiary hazard contained in an avalanche rescue backpack	Yes	Yes	Yes	a) no more than one avalanche rescue backpack per person; b) the backpack must be packed in such a manner that it cannot be accidentally activated; c) may contain a pyrotechnic trigger mechanism which must not contain more than 200 mg net of Division 1.4S; and d) the airbags within the backpack must be fitted with pressure relief valves.
Radioactive material				
15) Radioisotopic cardiac pacemakers or other medical devices	n/a (see restrictions)	n/a (see restrictions)	No	Must be implanted into a person or fitted externally as the result of medical treatment.
Mercury				
16) Small medical or clinical thermometer which contains mercury	Yes	No	No	a) no more than one per person; and b) must be in its protective case.
Other dangerous goods				
17) Non-radioactive medicinal articles (including aerosols), toiletry articles (including aerosols) and aerosols in Division 2.2 with no subsidiary hazard	Yes	Yes	No	a) no more than 0.5 kg or 0.5 L total net quantity per single article; b) no more than 2 kg or 2 L total net quantity of all articles (e.g. four aerosol cans of 0.5 L each) per person; c) release valves on aerosols must be protected by a cap or other suitable means to prevent inadvertent release of the contents; and d) the release of gas must not cause extreme annoyance or discomfort to crew members so as to prevent the correct performance of assigned duties.
18) Dry ice	Yes	Yes	Yes	a) no more than 2.5 kg per person; b) used to pack perishables that are not subject to the IATA DGR; c) the package must permit the release of carbon dioxide gas; and d) when carried as checked baggage, each package must be marked: i) "DRY ICE" or "CARBON DIOXIDE, SOLID"; and ii) the net weight of dry ice or an indication that the net weight is 2.5 kg or less.
19) Cartridges in Division 1.4S (UN 0012 or UN 0014 only)	Yes	No	Yes	a) no more than 5 kg gross mass per person; b) must be securely packaged; c) must not include ammunition with explosive or incendiary projectiles; and d) allowances for more than one person must not be combined into one or more packages.

	Location		Approval of the operator(s) is required	Restrictions
	Checked baggage	Carry-on baggage		
<i>Dangerous Goods</i>				
20) Permeation devices	Yes	No	No	Instructions on how to package permeation devices for calibrating air quality monitoring equipment are found in Special Provision A41.
21) Non-infectious specimens in flammable solutions	Yes	Yes	No	Instructions on how to package and mark specimens are found in Special Provision A180.
22) Refrigerated liquid nitrogen	Yes	Yes	No	Must be contained in insulated packagings (e.g. dry shippers) that would not allow the build-up of pressure and be fully absorbed in a porous material so that there is no free liquid that could be released from the packaging. Refer to Special Provision A152 for more information.
23) Dangerous goods incorporated in security-type equipment, such as attaché cases, cash boxes, cash bags, etc.	Yes	No	Yes	The security-type equipment must be equipped with an effective means of preventing accidental activation and the dangerous goods incorporated in the equipment must meet the conditions of Special Provision A178.

9.1.5.6 The Organization for the Prohibition of Chemical Weapons (OPCW) and government agencies listed in the table below may carry specified instruments containing dangerous goods when:

- a) carried by staff members on official travel;
- b) contained in baggage that has been separated from its owner during transit (e.g. lost baggage or improperly routed baggage); or
- c) contained within items of excess baggage sent as cargo as permitted by 9.1.3.4.

Provisions for instruments carried by OPCW and government agencies

	Location		Approval of the operator(s) is required	Restrictions
	Checked baggage	Carry-on baggage		
<i>Dangerous goods</i>				
1) Instruments containing radioactive material (i.e. chemical agent monitor (CAM) and/or rapid alarm and identification device monitor (RAID-M))	Yes	Yes	Yes	a) the instruments must not exceed the activity limits for 'excepted packages'; b) must be securely packed; and c) must be carried by staff members of the Organization for the Prohibition of Chemical Weapons (OPCW) on official travel.
2) A mercurial barometer or mercurial thermometer	No	Yes	Yes	a) must be carried by a representative of a government weather bureau or similar official agency; b) must be packed in a strong outer packaging, having a sealed inner liner or a bag of strong leakproof and puncture-resistant material impervious to mercury, which will prevent the escape of mercury from the package irrespective of its position; and c) the pilot-in-command must be informed of the barometer or thermometer.

9.1.6 Provision of Information to Passengers (CAT.GEN.MPA.200 (f)). Passengers will be presented with information (in text or pictorial form, both electronically and verbally) about the types of dangerous goods which they are forbidden to transport aboard an aircraft when receiving a booking quote or detailed itinerary.

- a. Information on prohibited dangerous goods is presented in quotation documentation (Annex A to this section) and the client confirms understanding of the restrictions on dangerous goods in baggage by the signing of a booking confirmation. Information is also verbally briefed and acknowledged prior to boarding the aircraft.
- b. 2Excel Aviation, or any third-party handling agents or airport operator must ensure that information on the types of dangerous goods which they are forbidden to transport aboard an aircraft is communicated effectively to passengers. This information must be presented, at each of the places at an airport where tickets are issued, boarding passes are issued, passenger baggage is dropped off and aircraft boarding areas are maintained, and at any other location where passengers are issued boarding passes and/or checked baggage is accepted. This information must include visual examples of dangerous goods forbidden from transport aboard an aircraft.
- c. 2Excel Aviation, as an operator of passenger aircraft, will have information on those dangerous goods which may be carried by passengers made available prior to the boarding pass issuance process on their website or other sources of information.

9.1.7 Marking and Labelling of Packages. Articles and substances meeting the dangerous goods classification criteria are assigned a 'UN Number' under the United Nations classification system. This consists of a four-digit number preceded by the capital letters 'UN'. Packages of dangerous goods must be marked with the UN Number(s) applicable to their contents. Packages containing dangerous goods can also be identified by labels indicating the hazard of the goods by their class or division or by the presence of certain handling labels/marks.

Note 1: When dangerous goods marks or labels are seen on items not declared as dangerous goods it is often an indication that they do contain such goods. Undeclared dangerous goods must not be loaded on an aircraft and reporting procedures must be implemented (see Part A, Section 11, Para 11.11.5).

Note 2: During the course of air transport, including storage, dangerous goods marks and labels must not be covered or obscured by any part of or attachment to the packaging or any other label or marking.

Figure 1 – Dangerous Goods Markings and Labels – On following pages.

CLASS 1 – EXPLOSIVE

Class 1 (with exploding bomb symbol) – explosives generally not permitted on an aircraft.



* Division and compatibility group

Class 1 (without exploding bomb symbol): Divisions 1.4B, 1.4F, 1.5 and 1.6 – explosives not permitted on an aircraft in normal circumstances.



** Compatibility group

CLASS 2 – GASES

Flammable gas (Division 2.1)



Non-flammable, non-toxic gas (Division 2.2)



Toxic gas (Division 2.3)



CLASS 3 – FLAMMABLE LIQUID



CLASS 4 – FLAMMABLE SOLIDS; SUBSTANCES LIABLE TO SPONTANEOUS COMBUSTION; SUBSTANCES WHICH, IN CONTACT WITH WATER, EMIT FLAMMABLE GASES

Flammable solid
(Division 4.1)



Substance liable to spontaneous combustion (Division 4.2)



Substance which, in contact with water, emits flammable gas (Division 4.3)



CLASS 5 – OXIDISING SUBSTANCES AND ORGANIC PEROXIDES

Oxidising substance
(Division 5.1)



Organic peroxide (Division 5.2) (flame may be black or white)



CLASS 6 – TOXIC AND INFECTIOUS SUBSTANCES

Toxic substance
(Division 6.1)



Infectious substance (Division 6.2)



The bottom part of the label should bear the inscription:

“INFECTIOUS SUBSTANCE — In case of damage or leakage immediately notify public health authority”

CLASS 7 – RADIOACTIVE MATERIAL

Category I



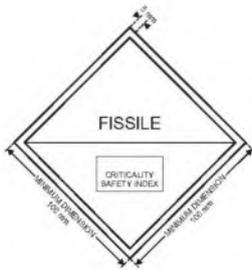
Category II



Category III



Criticality safety index label



CLASS 8 – CORROSIVE



CLASS 9 – MISCELLANEOUS

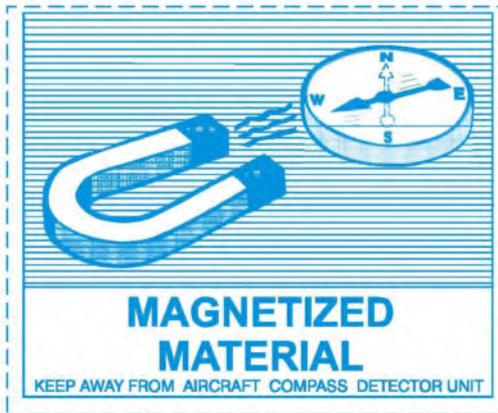
Class 9 label for Section I, IA and IB lithium battery shipments



HANDLING LABELS

Packages of dangerous goods may also bear labels providing handling information; these are:

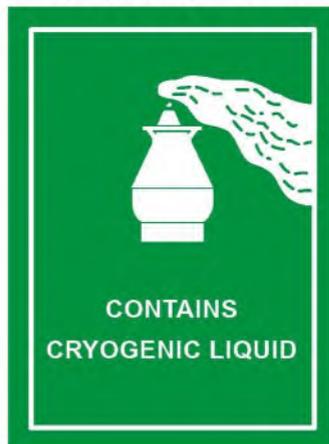
Magnetized material



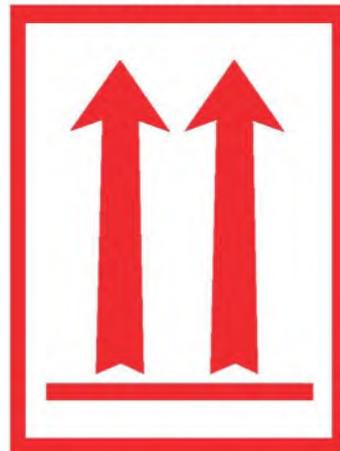
Cargo aircraft only



Cryogenic liquid label



Package orientation



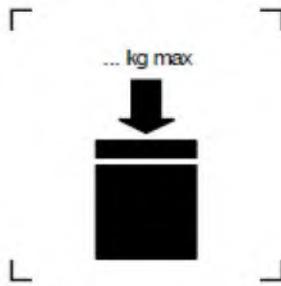
(red or black)

Keep away from heat

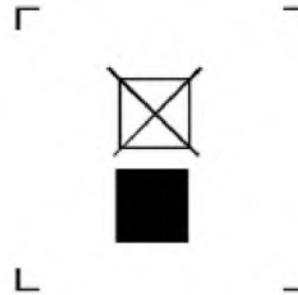


Intermediate Bulk Containers (IBCs) are only permitted for the transport of UN 3077 Environmentally hazardous substance, solid, n.o.s. The maximum permitted stacking load applicable when the IBC is in use must be displayed on a symbol as follows:

IBCs capable of being stacked



IBCs NOT capable of being stacked



LITHIUM BATTERIES MARK



* Place for UN Number(s)

** Place for telephone number for additional information

Application of the lithium battery mark to a consignment of lithium batteries (of any type) indicates that the Shipper has determined specific requirements have been met. Such consignments do not need to be accompanied by a dangerous goods transport document (Shipper's Declaration) and no acceptance check is required. Consignments bearing the lithium battery label must be accompanied with a document such as an air waybill with an indication that:

- the package contains lithium metal cells or batteries;
- the package must be handled with care and that a flammability hazard exists if the package is damaged;
- special procedures should be followed in the event the package is damaged, to include inspection and repacking if necessary;
- a telephone number for additional information; and
- when an air waybill is issued the applicable Packing Instruction must be stated together with the words 'not restricted'; and 'lithium ion batteries' or 'lithium metal batteries' as applicable.

EXCEPTED QUANTITIES MARK

Packages containing excepted quantities of dangerous goods can be identified from the following:



Hatching and symbol of the same colour, black or red, on white or suitable contrasting background.

* Place for class or, when assigned, the division number(s).

** Place for name of shipper or consignee, if not shown elsewhere on the package.

LIMITED QUANTITIES MARK

Packages containing limited quantities of dangerous goods can be identified from the following:



Many dangerous goods when in reasonably limited quantities present a reduced hazard during transport and can safely be carried in good quality packagings that have not been tested and marked as is required for UN Specification packagings required for larger quantities of dangerous goods. Packages containing limited quantities of dangerous goods must be marked with a diamond shaped mark. When presented for carriage by air, the mark must additionally include a “Y” which indicates compliance with the provisions of the IATA DGR / ICAO Technical Instructions, some of which are more stringent than those of the UN Model Regulations and of other modes of transport.

NOTE: The mark depicted here but without the ‘Y’ indicates that the package contains dangerous goods in limited quantities as permitted by surface transport regulations (ADR/IMDG) which may not be acceptable for air transport. A package so marked and offered for transport in the absence of a dangerous goods transport document must be reported to the appropriate authority where the goods are discovered as a discovery of undeclared dangerous goods (the CAA if discovered within the UK).

ENVIRONMENTALLY HAZARDOUS SUBSTANCES MARK



Packages containing environmentally hazardous substances (UN Nos. 3077 and 3082) must be durably marked with the environmentally hazardous substance mark with the exception of packages containing a net quantity per single or inner packaging of 5 L or less for liquids; or having a net mass per single or inner packaging of 5 kg or less for solids.

9.2 Duties of all Personnel Involved

9.2.1 Detailed Assignments of Responsibilities (CAT.GEN.MPA.200 (d)). The nature of 2Excel Aviation’s operation is such that the Captain may have detailed knowledge of the clients and will personally host them and supervise their baggage loading. For freight operations the Loadmaster will supervise loading however, the ultimate responsibility for confirming compliance with Dangerous Goods legislation is the Aircraft Captain’s. Again, the

nature of 2Excel Aviation’s operation means that passenger and baggage movement flows and check-in procedures may be ad hoc. Any processes will not be standard enough to preclude the carriage of dangerous goods and the final check must be at the aircraft.

9.2.2 Detailed Responsibilities for Company Personnel. The Table below details responsibilities for Company personnel (grouped generically by function). Where a third-party handling agent is used then they may carry out some or all of the functions listed.

<p>Flight Crew</p>	<ul style="list-style-type: none"> • Flight crews themselves are to be familiar with and obey the regulations in this Section. • Dangerous goods training requirements and procedures are detailed at Part D, Section 5, Para 5.5. • Flight crew while supervising the loading of the baggage in accordance with Part A, Section 8 are to question passengers as to the nature of their baggage and confirm that no prohibited dangerous goods are carried. They are to be particularly cognisant of the potential for, and recognition of undeclared dangerous goods. • If the flight is an authorised DG flight then Commanders are to sign the NOTOC to indicate receipt of information. • If an in-flight emergency occurs, as soon as the situation permits, passage of details of dangerous goods on board to the appropriate Air Traffic Services Unit. <ul style="list-style-type: none"> • i. Flight crew are responsible for responding to a dangerous goods incident or accident in the cabin (if operation does not have cabin crew). • ii. If there is a dangerous goods incident or accident, or if undeclared dangerous goods are detected a report is made to the appropriate Authority (see OM A Section 11). • The loadmaster (If carried) will conduct the dangerous goods acceptance check if not conducted by ground handling agent and in all cases: <ul style="list-style-type: none"> • 1. Study NOTOC, compare with expected load and ensure no radioactive material • 2. Investigate each type of DG in the IATA DGR manual • 3. Check compatibility and segregation • 4. Check CAO • 5. Confirm physical location of DG with loading staff, visually if possible. If contained within a ULD the appropriate labelling must be observed. • 6. If the DG is visible a check should be made of orientation labels, visible signs of leakage or damage and labelling. • 7. Items carried under CAO conditions must be easily accessible. • 8. Present NOTOC for signing with completed Loadsheets. • 9. Ensure 1 copy of NOTOC is returned to the handling agent and another kept on the flight deck • 10. Ensure the Dangerous Goods Emergency Response Guide is available on the flight deck.
<p>Person nominated as responsible for Company Dangerous Goods Approval</p>	<ul style="list-style-type: none"> • Oversight and control of the carriage of dangerous goods. • Ensuring all necessary permissions, approvals and exemptions are held. • Generation (or acceptance) of relevant procedures. • Responding to queries regarding the carriage of dangerous goods.

Cargo Department/ Cargo Sales Agents & Cargo Loading Personnel	<ul style="list-style-type: none"> • Arrangement of the carriage of dangerous goods in accordance with Company stated policies. • Recognition of undeclared dangerous goods. • Ensuring that notices, giving information about the transport of dangerous goods, are displayed in sufficient number and prominence at cargo acceptance points.
Persons receiving or handling dangerous goods	<ul style="list-style-type: none"> • Acceptance procedures for dangerous goods are carried out as required by the IATA DGR. • Inspection procedures during the processing of dangerous goods for transport are carried out as required by the IATA DGR. • Dealing with dangerous goods that are found damaged or leaking during processing for transport. • Dangerous goods are loaded, segregated, stowed and secured on an aircraft in accordance with the IATA DGR. • Generation of written information to the commander (NOTOC). • Provision of written information about dangerous goods loaded on board to the commander for signature. • Retention of documentation on the ground. • Recognition of undeclared dangerous goods.. • If there is a dangerous goods incident or accident, or if undeclared dangerous goods are detected, a report is made to the appropriate Authority (see Part A, Section 11).
Charter Department	<ul style="list-style-type: none"> • Ensuring that information is provided with the booking or passenger ticket or in another manner such that prior to or during the check-in process the passenger receives the information. • Considering passenger requests for approval of the operator for items of dangerous goods requiring such approval.
Persons handling passengers	<ul style="list-style-type: none"> • Ensuring that the provisions concerning passengers and dangerous goods are complied with. • Ensuring that notices are displayed in sufficient number and prominence at each of the places at an airport where tickets are issued, passengers checked in and aircraft boarding areas maintained, and at any other location where passengers are checked in. • With the aim of preventing dangerous goods which passengers are not permitted to have from being taken on board an aircraft in their baggage, seeking confirmation from a passenger about the contents of any item where there are suspicions that it may contain dangerous goods. • When baggage intended as carry-on is taken by the operator and placed into the cargo compartment for carriage, seeking confirmation from the passenger that dangerous goods which are only permitted in carry-on baggage (e.g. lithium batteries, including power banks) have been removed. • Ensuring that the discovery of prohibited dangerous goods (after a passenger has checked in) is reported to the appropriate Authority (see Part A, Section 11).
Cabin Crew	<ul style="list-style-type: none"> • Ensuring that the provisions concerning passengers and dangerous goods are complied with. • When baggage intended as carry-on is taken by the operator and placed into the cargo compartment for carriage, seeking confirmation from the passenger that dangerous goods which are only permitted in carry-on baggage (e.g. lithium batteries, including power banks) have been removed. • Responding to a dangerous goods incident or accident in the cabin. • Ensuring that a dangerous goods incident or accident in the cabin, or the discovery of prohibited dangerous goods (after a passenger has boarded), is reported to the appropriate Authority (see 11.10.4).

Operations Personnel	<ul style="list-style-type: none"> • Arrangement of the carriage of dangerous goods in accordance with Company stated policies (for standby contracts with ad hoc requirements) • Recognition of undeclared dangerous goods. • If there is a dangerous goods incident or accident, or if undeclared dangerous goods are detected, a report is made to the appropriate Authority (see OM Part A, Section 11). • If there is an aircraft incident or accident, information is passed to emergency services and state Authorities as required by the IATA DGR (OM A Section 11).
Trainers	<ul style="list-style-type: none"> • Provision of initial and recurrent dangerous goods training commensurate with the responsibilities of the personnel concerned.
Compliance Monitoring Manager, Auditors and Safety Manager	<ul style="list-style-type: none"> • Ensuring that activities are monitored for compliance with dangerous goods requirements and that these activities are carried out properly under the supervision of the relevant Head of Department. • Ensuring the initiation and follow-up of internal occurrence / accident investigations

9.2.3 Delegation of procedures. 2Excel Aviation has aircraft based at several airports across the UK and Europe. The infrequent, ad hoc nature of the dangerous goods cargo carried on 2Excel aircraft is best serviced by a mixture of 2Excel personnel and ground handling agents.

Sywell	Company Personnel
Doncaster	Company Personnel / Handling agent
Stansted	Handling Agent
Milan Malpensa	Handling agent

9.3 Guidance on the Requirements for Acceptance, Handling and Stowage (SPA.DG.105)

9.3.1 Acceptance Check. Before a consignment consisting of a package or overpack containing dangerous goods or a unit load device containing dangerous goods is first accepted for carriage by air, the operator must, by use of the standard IATA DGR Acceptance Checklist, verify the following:

- a. the documentation or, when provided, the electronic data is compliant with the applicable requirements
- b. the quantity of dangerous goods stated on the dangerous goods transport document is within the limits per package on a passenger or cargo aircraft as appropriate;
- c. the package, overpack or freight container marks accord with the details stated on the accompanying dangerous goods transport document and is clearly visible;
- d. where required, the letter in the packaging specification marking designating the packing group for which the design type has been successfully tested is appropriate for the dangerous goods contained within. This does not apply to overpacks where the specification marking is not visible;
- e. proper shipping names, UN numbers, labels, and special handling instructions appearing on the interior package(s) are clearly visible or reproduced on the outside of an overpack;
- f. the labelling of the package, overpack or freight container is as required for the consignment;
- g. the outer packaging of a combination package or the single packaging is permitted by the applicable packing instruction, and when visible is of the type stated on the accompanying dangerous goods transport document;
- h. the package or overpack does not contain different dangerous goods which require segregation from each other; and
- i. the package, overpack, freight container or Unit Load Device (ULD) is not leaking and there is no indication that its integrity has been compromised.

The operator must be able to identify the person who performed the acceptance check.

Note 1: An acceptance check is not required for dangerous goods in excepted quantities, radioactive material in excepted packages and lithium batteries consigned in accordance with Section II of the applicable packing instruction.

Note 2: Company Personnel conducting dangerous goods acceptance checks must have received dangerous goods training commensurate with this responsibility. Acceptance checks conducted in the United Kingdom must only be conducted by a person who has successfully completed training applicable to this role from a CAA Approved Dangerous Goods Training Organisation.

9.3.2 Inspections for Damage or Leakage (SPA.DG.105). A package or overpack containing dangerous goods must not be loaded onto an aircraft or into a ULD unless it has been inspected immediately prior to loading and found free from evidence of leakage or damage. A ULD must not be loaded aboard an aircraft unless the device has been inspected and found free from any evidence of leakage from or damage to any dangerous goods contained therein. Packages or overpacks containing dangerous goods must be inspected for signs of damage or leakage upon unloading from the aircraft or ULD.

9.3.3 Prohibition on the Carriage of Dangerous Goods Within a Cabin Occupied by Passengers (SPA.DG.105). Dangerous goods must not be carried in the cabin of an aircraft occupied by passengers or on the flight deck, unless they were a person with duties in respect of a particular shipment of dangerous goods or other cargo on board, and except as provided for in the IATA DGR.

9.3.4 Prohibition on the Carriage of Passengers with ‘Cargo Aircraft Only’ Dangerous Goods (SPA.DG.105). Dangerous goods identified as suitable for transport only on a cargo aircraft must not be carried on an aircraft on which passengers are being carried. In this context “passenger” excludes a crew member, an operator’s employee (see 9.1.4 above), an authorised representative of an Authority and a person with duties in respect of a particular shipment of dangerous goods or other cargo on board.

9.3.5 Segregation, Separation and CAO Accessibility (SPA.DG.105).

9.3.5.1 Dangerous goods must be loaded, stowed and secured on an aircraft as required by the IATA DGR. This includes segregating packages from each other when they contain incompatible dangerous goods, the separation of explosives of different division numbers and compatibility groups (when required), securing packages in a manner that will prevent any movement. Dangerous goods must also be protected so they cannot be damaged by the movement of baggage, mail, stores or other cargo.

9.3.5.2 With certain exceptions (see Note 1) packages or overpacks of dangerous goods bearing the “Cargo aircraft only” label must be loaded for carriage by a cargo aircraft (see 9.3.4) in accordance with one of the following provisions:

- a) in a Class C aircraft cargo compartment; or
- b) in a unit load device equipped with a fire detection/suppression system equivalent to that required by the certification requirements of a Class C aircraft cargo compartment as determined by the appropriate national authority (a ULD that is determined by the appropriate national authority to meet the Class C aircraft cargo compartment standards must include “Class C compartment” on the ULD tag); or
- c) in such a manner that in the event of an emergency involving such packages or overpacks, a crew member or other authorized person can access those packages or overpacks, and can handle and, where size and mass permit, separate such packages or overpacks from other cargo

Note 1: the requirements of 9.3.5.2 do not apply to:

- i. flammable liquids (Class 3), Packing Group III, other than those with a subsidiary hazard of Class 8;

- ii. toxic substances (Division 6.1) with no subsidiary hazard other than Class 3;
- iii. infectious substances (Division 6.2);
- iv. radioactive material (Class 7);
- v. miscellaneous dangerous goods (Class 9);
- vi. UN 3528 — Engine, internal combustion, flammable liquid powered or Engine, fuel cell, flammable liquid
- vii. powered or Machinery, internal combustion, flammable liquid powered or Machinery, fuel cell, flammable liquid powered; and
- viii. UN 3529 — Engine, internal combustion, flammable gas powered or Engine, fuel cell, flammable gas powered or Machinery, internal combustion, flammable gas powered or Machinery, fuel cell, flammable gas powered.

Restraint can be achieved by filling volumetrically the compartment, the net section or the ULD, or by tie-down. Compartments, net sections and ULDs are considered to be volumetrically full when they are filled up to three-quarters (75%) of their height. Additionally, if dangerous goods are placed on top of a volumetrically full compartment or ULD there would still be the possibility of movement, this should be prevented by placing dangerous goods within the build, or by tying down.

When using pallets with nets the DG is to be held in position by surrounding cargo and or strapped into position with the cargo net over the top of it. Single large items of DG should be secured to the pallets using the cargo straps with or without the net. All pieces weighing 150 kg or more, when loaded as bulk in compartments or net sections, should be tied down, except on single sector flights when the compartments or net section is volumetrically full.

Items contained in a ULD must be prevented from movement by the surrounding DG. Pieces weighing 150 kg or more, when packed in certified ULDs should be individually tied-down except when the unit is volumetrically full. It is extremely important when using a ULD that the orientation labels are adhered to, as once filled the labels may not be so easily visible.

Segregation is achieved by separating packages horizontally and sometimes vertically. Packages should be spread throughout the load if possible, to ensure separation, but always at a minimum of 1m horizontal separation. The separation will ensure that no interaction of Incompatible DG will occur as a result of leakage. For example in a pallet containing both Liquid and solid DG that require Segregation, the liquid should be situated away from and below the solid.

When loading dangerous goods for open external carriage by a helicopter, consideration should also be given to the type of packaging used and to the protection of those packaging's, where necessary, from the effects of airflow and weather (e.g. by damage from rain or snow), in addition to the general loading provisions.

If dangerous goods are carried suspended from a helicopter, the Company must ensure that consideration is given to the dangers of static discharge upon landing or release of the load.

Further detailed loading advice is contained within 2Excel Aviation's Ground Operations Manual (GOM). The following tables provide further information on the segregation of incompatible dangerous goods:

9.3.5.3 Packages and Overpacks Containing UN 3480.

UN 3480 and UN3090 may only be carried on cargo aircraft. Lithium ion batteries prepared in accordance with Section IA or Section IB of Packing Instruction 965 and packages and overpacks containing UN 3090 — Lithium metal batteries prepared in accordance with Section IA or Section IB of Packing Instruction 968 must not be stowed on an aircraft next to, or in a position that would allow interaction with, packages or overpacks containing dangerous goods which bear a Class 1, other than Division 1.4S, Division 2.1, Class 3, Division 4.1 or Division 5.1 hazard label.

Table 1: Segregation of incompatible dangerous goods

Hazard Label	1	2.1	2.2, 2.3	3		4.1	4.2	4.3	5.1	5.2	8	9 See 9.3.5.3
1	Note 1	Note 2	Note 2	Note 2		Note 2						
2.1	Note 2											X
2.2, 2.3	Note 2											
3	Note 2								X			X
4.1	Note 2											X
4.2	Note 2								X			
4.3	Note 2										X	
5.1	Note 2			X			X					X
5.2	Note 2											
8	Note 2							X				
9 See 9.3.5.3	Note 2	X		X		X			X			

An “X” at the intersection of a row and column indicates that packages containing these classes of dangerous goods may not be stowed next to or in contact with each other, or in a position which would allow interaction in the event of leakage of the contents. Thus, a package containing Class 3 dangerous goods may not be stowed next to or in contact with a package containing Division 5.1 dangerous goods.

- Note 1: See the table below detailing the separation of explosive substances and articles.
- Note 2: This class or division must not be stowed together with explosives other than those in Division 1.4, Compatibility Group S.
- Note 3: Packages containing dangerous goods with multiple hazards in the class or divisions which require segregation in accordance with the above table need not be segregated from other packages bearing the same UN number.
- Note 4: UN 3528, Engines, internal combustion, flammable liquid powered, Engines, fuel cell, flammable liquid powered, Machinery internal combustion, flammable liquid powered and Machinery, fuel cell, flammable liquid powered need not be segregated from packages containing dangerous goods in Division 5.1.

Table 2: Separation of explosive substances and articles

Division and Compatibility Group	1.3C	1.3G	1.4B	1.4C	1.4D	1.4E	1.4G	1.4S
1.3C			X					
1.3G			X					
1.4B	X	X		X	X	X	X	
1.4C			X					
1.4D			X					
1.4E			X					
1.4G			X					
1.4S								

Class 1 dangerous goods other than Division 1.4S may only be carried on cargo aircraft.

An “X” at the intersection of a row and column indicates that explosives of these divisions and compatibility groups must be loaded into separate unit load devices and, when stowed aboard the aircraft, the unit load devices must be separated by other cargo with a minimum separation distance of 2 m. When not loaded in a unit load device, these explosives must be

loaded into different, non-adjacent loading positions and separated by other cargo with a minimum separation distance of 2 m. Explosive substances and articles carried under an exemption may be subject to additional separation requirements.

9.3.6 Loading of Dry Ice (SPA.DG.105). Dry ice (Carbon dioxide, solid; UN1845) may be carried on-board aircraft to keep food (galley or cargo) and medicine or biological materials (as cargo) in a frozen or chilled condition. Carbon dioxide gas produced by the sublimation of dry ice is an asphyxiant and will reduce the amount of available oxygen to breathe. Dry ice sublimation producing excess CO₂ gas may be dangerous in confined spaces where there is an absence of ventilation or ventilation rates are low. The signs and symptoms of CO₂ poisoning are similar to those that precede lack of oxygen, namely headache, dizziness, muscular weakness, drowsiness, and ringing in the ears. CO₂ poisoning does have a greater effect on breathing than simple lack of oxygen, causing a significant increase in the rate and depth of breathing as an early symptom. 10% carbon dioxide in air can be endured for only a few minutes whereas 12% to 15% would cause unconsciousness.

Note: Dry ice when shipped by itself or when used as a refrigerant for other commodities may be carried provided suitable arrangements are made dependent on the aircraft type, the aircraft ventilation rates, the method of packing and stowing, whether animals will be carried on the same flight and other factors. To prevent the incapacitation of ground and aircrew, 2Excel Aviation specifies maximum safe quantities of dry ice per compartment of the various aircraft types operated in accordance with the above criterion and information published by the applicable aircraft manufacturer(s).

The maximum safe quantities of dry ice for carriage on the B727-2S2F is 1000kg (2200lbs) (source FAA AC91.76A and Boeing SL 727-SL-21-020-D). The limit requires a minimum of 1 A/C pack to be operational. Ground staff must be informed that dry ice is being loaded or is onboard the aircraft.

The maximum safe quantities of dry ice for carriage on the B737-300 in passenger fit is 200kg (440lbs). This figure assumes all air-conditioning systems working normally. The individual limit of 2.5kgs per person should still be observed.

Dry ice carriage on King Air aircraft is to be limited to 20kg.

Dry ice carriage on PA-31 aircraft is to be limited to 10kg.

Dry ice is not to be carried on EA300 aircraft.

9.3.7 Loading of Magnetised Material (SPA.DG.105). Packing Instruction 953 allows the carriage of such material when the magnetic field strength at a distance of 4.6 m causes a compass deflection of not more than 2 degrees (equivalent to 0.418 A/m or 0.00525 Gauss measured at a distance of 4.6 m). Material with a magnetic field strength exceeding these limits may only be carried with the prior approval of the State of Origin and the State of the Operator.

Magnetised material must be loaded so headings of aircraft compasses are maintained within the tolerances prescribed by the applicable aircraft airworthiness requirements and, where practical, in locations minimising possible effects on compasses.

Note: Masses of ferromagnetic metals such as automobiles, automobile parts, metal fencing, piping and metal construction material, even if not meeting the definition of magnetised materials, may affect aircraft compasses. As may packages or items of material which individually do not meet the definition of magnetised material, but cumulatively may have a magnetic field strength of a magnetised material. Consignments of large quantities of ferromagnetic metals should be stowed as if they were classified as magnetised material. Consignments described above must be identified and loaded in a manner that will not affect aircraft instruments

9.3.8 Loading of Radioactive Material (SPA.DG.105). It is Company policy not to carry radioactive material.

9.3.9 Loading of UN 2211, Polymeric Beads, Expandable or UN 3314, Plastics Moulding Compound.

A total of not more than 100 kg net mass of expandable polymeric beads (or granules), or plastic moulding materials, referenced to Packing Instruction 957, may be carried in any inaccessible cargo compartment on any aircraft. If such materials are consigned the Loadmaster is to ensure that mass is checked and recorded.

9.3.10 Notification to Captain (NOTOC) (AMC SPA.DG.110(a)). As early as practicable before departure of the aircraft, but in no case later than when the aircraft moves under its own power 2Excel Aviation, as operator of an aircraft in which dangerous goods are to be carried shall:

- a) provide the pilot-in-command with accurate and legible written or printed information concerning dangerous goods that are to be carried as cargo; and
- b) provide personnel with responsibilities for operational control of the aircraft (e.g. the flight operations officer, flight dispatcher, or designated ground personnel responsible for flight operations) with the same information that is required to be provided to the pilot-in-command (e.g. a copy of the written information provided to the pilot-in-command). This is to facilitate notifying emergency services and authorities of the dangerous goods on board in the event of an aircraft accident or incident (see OM A Section 11).

Company Operations and handling staff must ensure that the Duty Operations Officer has accessibility of NOTOCs on the ground, taking into account relevant factors, such as the operational hours of the personnel concerned (in case these end before the completion of a flight). To ensure easy access to NOTOCs by the DOO then for aircraft departing base or other locations, the person compiling the NOTOC (normally the Loadmaster or Senior Load Controller) is to ensure that a copy of the signed NOTOC is emailed to **PD**@2excelaviation.com or faxed to **PD** 009, ops staff will then place a further copy in the Liveplans folder. Particular attention should be paid to the arrangements for ad hoc charters carrying dangerous goods where ongoing instructions to ensure the availability of the NOTOC may not be in place, e.g. through issuing appropriate instructions within the ground handling request.

Note: This includes information about dangerous goods loaded at a previous departure point and which are to be carried on the subsequent flight.

This information must include the following:

- a. the date of the flight
- b. the air waybill number (when issued);
- c. the proper shipping name (the technical name(s) shown on the dangerous goods transport document is not required) and UN Number or ID number;
- d. the class or division, and subsidiary hazard(s) corresponding to the subsidiary hazard label(s) applied, by numerals, and (in the case of Class 1) the compatibility group;
- e. the packing group shown on the dangerous goods transport document;
- f. the number of packages and their exact loading location.
- g. the net quantity, or gross mass if applicable, of each package, except that this does not apply to dangerous goods where the net quantity or gross mass is not required on the dangerous goods transport document. For a consignment consisting of multiple packages containing dangerous goods bearing the same proper shipping name and UN number, only the total quantity and an indication of the quantity of the largest and smallest package at each loading location need to be provided;
- h. whether the package must be carried on cargo aircraft only;
- i. the aerodrome at which the package(s) is to be unloaded;
- j. where applicable, an indication that the dangerous goods are being carried under a State exemption; and
- k. signed confirmation, or some other indication, from the person responsible for loading the aircraft that there was no evidence of any damage to or leakage from the packages or any leakage from the unit load devices loaded on the aircraft.

Note: For UN 1845 Carbon dioxide, solid (dry ice), the information detailed above may be replaced by the UN number, proper shipping name, class, total quantity in each cargo compartment on the aircraft and the aerodrome at which the package(s) is to be unloaded.

Note: For UN 3480 (Lithium ion batteries) and UN 3090 (Lithium metal batteries), the information detailed above may be replaced by the UN number, proper shipping name, class, total quantity at each specific loading location, the aerodrome at which the package(s) is to be unloaded and whether the package must be carried on cargo aircraft only. A full NOTOC is required when such batteries are carried under a State exemption.

Note: For consumer commodities, the information provided may be either the gross mass of each package or the average gross mass of the packages as shown on the dangerous goods transport document

Note: 2Excel Aviation's Operations telephone number where a copy of the information to the pilot-in-command can be obtained during the flight is additionally required on the

NOTOC to make it possible for the pilot-in-command to provide the appropriate Air Traffic Services Unit with a telephone number instead of details about the dangerous goods on board the aircraft in the event of an in-flight emergency.

The following dangerous goods need not appear on the NOTOC:

- Dangerous goods packed in excepted quantities
- Biological substance, Category B
- Genetically modified micro-organisms
- Genetically modified organisms
- Lithium ion batteries (including lithium ion polymer batteries); Lithium ion batteries contained in equipment; and Lithium ion batteries packed with equipment when meeting the Section II requirements of the applicable Packing Instruction.
- Lithium metal batteries (including lithium alloy batteries), Lithium metal batteries contained in equipment, and Lithium metal batteries packed with equipment when meeting the Section II requirements of the applicable Packing Instruction.
- Magnetized material with field strengths causing a compass deflection of not more than 2 degrees at a distance of 4.6 m

9.3.11 Availability of NOTOC on the Ground for the Duration of Flight (SPA.DG.110). A legible copy of the information to the pilot-in command must be retained on the ground. This copy must have an indication on it, or with it, that the pilot-in-command has received the information

9.3.12 Retention of Documents (ORO.MLR.115 (b)(4), SPA.DG.110(f)). At least one copy of the documents appropriate to the transport by air of a consignment of dangerous goods (including consignments that fail their acceptance check) must be retained for a minimum period of three months, or such other period as specified by the States concerned, after the flight on which the dangerous goods were transported. As a minimum, the documents which must be retained are the dangerous goods transport document (Shipper's Declaration), the acceptance checklist (when this is in a form which requires completion) including identification of the person who completed it, and the NOTOC (if the goods were carried).

Note: Appropriate dangerous goods documents should be retained within the aircraft returned flight documentation file, or within the files of a handling agent(s).

9.3.13 Ad Hoc Charters (CAT.GEN.MPA.200 (a)) 2Excel Aviation may utilise ground handling agents to discharge certain duties with regards to the carriage of dangerous goods by air, e.g. conducting acceptance checks, NOTOC preparation and administration, aircraft loading, retention of documents, etc. Such ad hoc charters involving the carriage of dangerous goods between stations where ongoing ground handling agreements are not in place, require duties to be properly assigned to the agent(s) concerned in advance of the operation of flights. Furthermore, should the agent at the station of departure not operate 24 hours a day, it must also be ensured that a copy of the NOTOC is readily available on the ground in the event of an emergency, e.g. by instructing the agent to fax or e-mail a copy of the completed NOTOC to

the operator as soon as possible after the signature by the pilot-in-command has been obtained, (see also note to Para 9.3.10).

9.4 Recognition of Undeclared / Hidden Dangerous Goods (CAT.GEN.MPA.200 (e))

9.4.1 **'Hidden' Dangerous Goods.** Personnel must be alert to indications that undeclared dangerous goods are present within cargo, mail or stores. Personnel interfacing with passengers must be alert to indications that prohibited dangerous goods are carried by passengers or within their baggage.

NOTE: THE DISCOVERY OF UNDECLARED OR MIS-DECLARED DANGEROUS GOODS OR THE DISCOVERY OF DANGEROUS GOODS FORBIDDEN FOR CARRIAGE BY PASSENGERS (DISCOVERED AFTER THE CHECK-IN PROCESS) MUST BE REPORTED TO THE CAA – SEE PART A SECTION 11.

The following is a list of general descriptions that are often used for items in cargo or in passengers' baggage and the types of dangerous goods that may be included in any item bearing that description.

Aircraft on ground (AOG) spares — may contain explosives (flares or other pyrotechnics), chemical oxygen generators, unserviceable tyre assemblies, cylinders of compressed gas (oxygen, carbon dioxide or fire extinguishers), fuel in equipment, wet or lithium batteries, matches.

Automobile parts/supplies (car, motor, motorcycle) — may include engines (including fuel cell engines), carburettors or fuel tanks that contain or have contained fuel, wet or lithium batteries, compressed gases in tyre inflation devices and fire extinguishers, air bags, flammable adhesives, paints, sealants and solvents, etc.

Battery-powered devices/equipment — may contain wet or lithium batteries.

Breathing apparatus — may indicate cylinders of compressed air or oxygen, chemical oxygen generators or refrigerated liquefied oxygen.

Camping equipment — may contain flammable gases (butane, propane, etc.), flammable liquids (kerosene, gasoline, etc.) or flammable solids (hexamine, matches, etc.).

Cars, car parts — see automobile parts, etc.

Chemicals — may contain items meeting any of the criteria for dangerous goods, particularly flammable liquids, flammable solids, oxidisers, organic peroxides, toxic or corrosive substances.

Consolidated consignments (groupages) — may contain any of the defined classes of dangerous goods.

Cryogenic (liquid) — indicates refrigerated liquefied gases such as argon, helium, neon, nitrogen, etc.

Cylinders — may contain compressed or liquefied gas.

Dental apparatus — may contain flammable resins or solvents, compressed or liquefied gas, mercury and radioactive material.

Diagnostic specimens — may contain infectious substances.

Diving equipment — may contain cylinders of compressed gas (e.g. air or oxygen). May also contain high intensity diving lamps that can generate extreme heat when operated in air. In order to be carried safely, the bulb or battery should be disconnected.

Drilling and mining equipment — may contain explosive(s) and/or other dangerous goods.

Dry shipper (vapour shipper) — may contain free liquid nitrogen. Dry shippers are only not subject to the IATA DGR when they do not permit the release of any free liquid nitrogen irrespective of the orientation of the packaging.

Electrical/electronic equipment — may contain magnetised materials, mercury in switch gear, electron tubes, wet or lithium batteries or fuel cells or fuel cell cartridges that contain or have contained fuel.

Electrically-powered apparatus (wheelchairs, lawn mowers, golf carts, etc.) — may contain wet or lithium batteries or fuel cells or fuel cell cartridges that contain or have contained fuel.

Expeditionary equipment — may contain explosives (flares), flammable liquids (gasoline), flammable gas (camping gas) or other dangerous goods.

Film crew and media equipment — may contain explosive pyrotechnic devices, generators incorporating internal combustion engines, wet or lithium batteries, fuel, heat-producing items, etc.

Frozen embryos — may be packed in refrigerated liquefied gas or dry ice (solid carbon dioxide).

Frozen fruit, vegetables, etc. — may be packed in dry ice.

Fuel control units — may contain flammable liquids.

Hot-air balloon — may contain cylinders with flammable gas, fire extinguishers, engines (internal combustion), batteries, etc.

Household goods — may contain items meeting any of the criteria for dangerous goods. Examples include flammable liquids such as solvent-based paint, adhesives, polishes, aerosols (for passengers, those not permitted under IATA DGR / ICAO Technical Instructions 8;1.1.2), bleach, corrosive oven or drain cleaners, ammunition, matches, etc.

Instruments — may conceal barometers, manometers, mercury switches, rectifier tubes, thermometers, etc. containing mercury.

Laboratory/testing equipment — may contain items meeting any of the criteria for dangerous goods, particularly flammable liquids, flammable solids, oxidisers, organic peroxides, toxic or corrosive substances, lithium batteries, cylinders of compressed gas etc.

Machinery parts — may contain flammable adhesives, paints, sealants and solvents, wet and lithium batteries, mercury, cylinders of compressed or liquefied gas, etc.

Magnets and other items of similar material — may individually or cumulatively meet the definition of magnetised material.

Medical supplies/equipment — may contain items meeting any of the criteria for dangerous goods, particularly flammable liquids, flammable solids, oxidisers, organic peroxides, toxic or corrosive substances, lithium batteries.

Metal construction material — may contain ferro-magnetic material which may be subject to special stowage requirements due to the possibility of affecting aircraft instruments.

Metal fencing — may contain ferro-magnetic material which may be subject to special stowage requirements due to the possibility of affecting aircraft instruments.

Metal piping — may contain ferro-magnetic material which may be subject to special stowage requirements due to the possibility of affecting aircraft instruments.

Pharmaceuticals — may contain items meeting any of the criteria for dangerous goods, particularly radioactive material flammable liquids, flammable solids, oxidisers, organic peroxides, toxic or corrosive substances.

Photographic supplies/equipment — may contain items meeting any of the criteria for dangerous goods, particularly heat-producing devices, flammable liquids, flammable solids, oxidisers, organic peroxides, toxic or corrosive substances, lithium batteries.

Racing car or motorcycle team equipment — may contain engines (including fuel cell engines), carburettors or fuel tanks that contain fuel or residual fuel, wet and lithium batteries, flammable aerosols, nitromethane or other gasoline additives, cylinders of compressed gases, etc.

Refrigerators — may contain liquefied gases or an ammonia solution.

Repair kits — may contain organic peroxides and flammable adhesives, solvent-based paints, resins, etc.

Samples for testing — may contain items meeting any of the criteria for dangerous goods, particularly infectious substances, flammable liquids, flammable solids, oxidisers, organic peroxides, toxic or corrosive substances.

Semen — may be packed with dry ice or refrigerated liquefied gas (see also dry shipper).

Sporting goods/sports team equipment — may contain cylinders of compressed or liquefied gas (air, carbon dioxide, etc.), lithium batteries, propane torches, first aid kits, flammable adhesives, aerosols, etc.

Swimming pool chemicals — may contain oxidising or corrosive substances.

Switches in electrical equipment or instruments — may contain mercury.

Tool boxes — may contain explosives (power rivets), compressed gases or aerosols, flammable gases (butane cylinders or torches), flammable adhesives or paints, corrosive liquids, lithium batteries etc.

Torches — micro torches and utility lighters may contain flammable gas and be equipped with an electronic starter. Larger torches may consist of a torch head (often with a self-igniting switch) attached to a container or cylinder of flammable gas.

Unaccompanied passengers' baggage/personal effects — may contain items meeting any of the criteria for dangerous goods not permitted for carriage by passengers and crew.

Note: Excess baggage carried as cargo may contain certain dangerous goods (see 9.1.3.4).

Vaccines — may be packed in dry ice.

9.4.1.1 Identification of Dangerous Goods Through X-Ray Screening. Persons conducting security screening of cargo should be alert to the presence of dangerous goods within packages that are not marked and labelled as dangerous goods and/or not accompanied by a Shipper's Declaration. In particular, items such as aerosols, ammunition, gas cylinders (camping gas, cylinders attached to life-jackets, etc.), cigarette lighters and wet acid batteries can be readily identified from x-ray images. Information provided on an air waybill or marked on a package often indicates that a consignment contains no dangerous goods. In the absence of such annotation by the shipper, should suspicions be raised by the size and shape of the contents of a package, consideration should be given to opening and hand-searching the consignment to verify that no undeclared dangerous goods are present.

Consignments of dangerous goods that have been properly marked, labelled and declared to the operator (where approved for carriage) are commonly processed separately from general freight. Should consignments bearing UN numbers, proper shipping names or hazard labels be discovered within general freight, when separate arrangements exist, this should be queried. It may be that no shipper's declaration accompanies the consignment; as such the consignment of dangerous goods would be considered 'undeclared'.

9.4.1.2 Safety Data Sheets. REACH (Registration, Evaluation, Authorisation & restriction of CHemicals) is a European Union regulation controlling chemicals in Europe. REACH requires that for many substances and mixtures, a Safety Data Sheet (SDS) to be provided either before or at the time of first delivery. Section 14 of the EU format SDS provides basic classification information, i.e. UN number, proper shipping name, Class/Division and Packing Group.

9.4.1.3 Consumer Labelling (Overview).

9.4.1.4 Some everyday household items bear consumer warning labels which may or may not indicate they are classified as dangerous goods in air transport. All over the world there are different laws on how to identify the hazardous properties of chemicals (called 'classification') and how information about these hazards is then passed to users (through consumer supply labels and safety data sheets for workers). This can be confusing because the same chemical can have different hazard descriptions in different countries. For example, a chemical could be labelled for supply as 'toxic' in one country, but not in another. For this reason, the UN brought together experts from different countries to create the Globally Harmonized System of Classification and Labelling of Chemicals (GHS). The GHS has been implemented within Europe by the Regulation on Classification, Labelling and Packaging of Substances and Mixtures (known as the CLP Regulation).

GHS Labels. Products bearing the following GHS labels ARE classified as dangerous goods:



Note: A product bearing the GHS corrosive label (depicted far right above) is NOT classified as dangerous goods if the signal word 'Danger' and hazard statement 'causes serious eye damage' applies.

Products bearing the following GHS labels (and none of the above) are NOT classified as dangerous goods:



9.5 Emergency Situations (AMC1 SPA.DG.105(b))

9.5.1 Provision of Information for Use in Responding to In-Flight Emergencies (SPA.DG.110). For those dangerous goods for which a dangerous goods transport document is required, the commander of an aircraft carrying such goods must be provided with information which can be used on board to assist in planning the response to an emergency arising in-flight involving the dangerous goods.

Note: This information is provided by the 'Emergency Response Guidance for Aircraft Incidents Involving Dangerous Goods' (Doc 9481), which is published by the International Civil Aviation Organization.

9.5.2 For procedures for responding to emergency situations see Part A Section 11.

9.6 Conditions Under Which Weapons, Munitions of War and Sporting Weapons May Be Carried (CAT.GEN.MPA.155, CAT.GEN.MPA.160)

9.6.1 Need for Approval to Transport Munitions of War (CAT.GEN.MPA.155). Weapons of war and munitions of war can only be carried provided an approval to do so has been granted by all the States concerned before a flight. They must be carried in the aircraft in a place which is inaccessible to passengers during flight and, in the case of firearms, unloaded, except as specified in 9.6.2 below. ***2Excel Aviation holds CAA approval for the transport of Munitions of War by air.***

9.6.2 Stowage Requirements for Munitions of War (EC Regulation 300/2008). In exceptional circumstances, weapons of war and munitions of war may be carried other than in an inaccessible place on the aircraft and may be loaded, provided an approval to do so has been granted by all the States concerned before a flight. These exceptional circumstances are intended primarily to permit the carriage of law enforcement officers, protection officers, etc.

- a. UK Police Protection Officers hold an exemption from the Air Navigation Order that enables them to carry their weapons on their person when accompanying specific named VIPs. A condition on the exemption requires the police to provide the operator with a copy of the relevant exemption in advance of the flight to demonstrate that the exemption applies to them and the person they are accompanying. Official Record Series 4 approves the carriage of weapons by operators in accordance with the exemption issued to UK Police Protection Officers.
- b. Should 2Excel Aviation be asked to carry protection officers bearing weapons on their person and the Police do not/cannot provide a copy of the relevant exemptions (preferably when booking the flight), then their weapons must be stowed in a location that is inaccessible during flight. When the police officer is not accompanying any of the persons referred to in the exemption, the unloaded arms and ammunition shall be stowed in a location which is inaccessible to passengers on the aircraft. For the purpose of Company operations this is defined as the wing lockers (where fitted) and for the PA31 the nose locker. The exemption issued to UK Police Protection Officers and the Official Record Series 4 document each contain additional conditions with which operators must comply.
- c. There are some limited occasions when the UK CAA may grant one-off exemptions for persons not on the two exemptions held by the Police, such as visiting Heads of State, but these will generally only be when accompanied by UK Protection Officers. In such circumstances, or in the event of a request for non-UK protection officers to carry weapons in the cabin, the operator must apply to the CAA Dangerous Goods Office.

9.6.3 Notifying Commander of the Carriage of Munitions of War (CAT.GEN.MPA.155). The Aircraft Captain must be notified before a flight if weapons of war or munitions of war are to be carried on the aircraft.

9.6.4 Carriage of Sporting Weapons When Inaccessible to Passengers During Flight (CAT.GEN.MPA.160). Sporting weapons and ammunition for such weapons may be carried without an approval from an Authority, provided they are stowed in a place on the aircraft which is inaccessible to passengers during flight and, in the case of firearms, unloaded. For Company B737/B727 operations this stowage is in the hold after inspection by Company staff/handling agents. For the purpose of other Company operations this stowage is defined as the wing lockers (where fitted) and for the PA31 the nose locker.

2Excel Aviation will take all reasonable measures to ensure that any sporting weapons intended to be carried by air are reported, with passengers notified by Operations and booking staff of the requirement to furnish the 2Excel Aviation with details of any sporting weapon they intend to carry.

The CAA has agreed that in those Company PA31 and King Air aircraft, and EC135 helicopters not equipped with external cargo bays large enough to accommodate sporting weapons, such weapons may be carried in the rear baggage hold provided that:

- a. All sporting weapons are placed within a lockable container(s) belonging to 2Excel Aviation.
- b. The combination is known only to the crew or, if locked using keys, these are stowed during flight within an external compartment (such as an avionics inspections bay or nose locker).

Additionally in those Company PA31 and King Air aircraft, and EC135 helicopters not equipped with any external cargo bays, ammunition may be carried in a secure container in the rear baggage hold provided that:

- c. The secure container is fitted with a Company lock (managed by Ops).
- d. The combination is known only to the crew or, if locked using keys, these are stowed during flight within an external compartment (such as an avionics inspections bay or nose locker).

Note: Ammunition is subject to the conditions set out in 9.1.5.

9.6.5 Not used.

9.6.6 The passenger and 2Excel Aviation (or handling agent where applicable) must observe all regulations applicable to the export, import and transit of weapons and ammunition, applicable in the country of departure, transit and destination.

Note: 2Excel Aviation should consider all relevant legislation when formulating procedures for the carriage of weapons, munitions of war and sporting weapons.

9.7 **Dangerous Goods Accident and Incident Reports.** Reporting procedures for dangerous goods accidents, incidents and undeclared dangerous goods notifications to the CAA, and actions for removal of contamination from spillages are detailed at Part A, Section 11.



Permitted in cabin

On your person **only**

	
Cigarette lighters	Matches

Hand luggage **only**

	
Power banks & spare batteries	E-cigarettes

Not permitted anywhere

			
Flammables	Bleach	Toxic	Oxidisers
			
Corrosives	Compressed gas	Incapacitating sprays	Ignitable gas devices
		<p>Failure to comply is a criminal offence.</p> <p>Some exceptions apply - for further advice contact your airline.</p>	
Explosives	Fireworks		





Dangerous Goods Notification To Captain (NOTOC)

Flight Number	Date	Aircraft Reg	Prepared by	Station of Loading

DANGEROUS GOODS												
Station of Unloading (Destination)	AWB Number If used	UN Number	Proper Shipping Name	Class/ Division	Sub Hazard	PG	No of Packages	Net Quantity /M	CAO Y/N	Position Loaded	ERG Code	

There is no evidence that any damaged or leaking packages containing dangerous goods have been loaded onto the aircraft	
Loading Supervisor Name:	Captain Name:
Signature	Signature

Please email NOTOC to 2Excel Aviation Operations as soon as completed. ops@2excelaviation.com
 2Excel Aviation Operations Contact +44(0)1302 230501

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Section 10

Security

- 10.1 General.** The Company is required to ensure that all appropriate personnel are familiar, and comply with the relevant requirements of the National Aviation Security Programme.
- 10.1.1 Threats.** While the nature of the Company's operations mean that Company aircraft are unlikely to pose a significant security risk in National or local terms, all personnel are to guard against relevant security threats pertinent at the time. These threats include the terrorist threat, threats of unlawful interference but are more likely to comprise threats resulting from the carriage of unstable passengers, or of passengers with a disregard for Company safety procedures.
- 10.1.2 Company Security Officer.** The Company Security Officer has overall responsibility for matters affecting security. He reports directly to the Operations Director, on whose behalf he is responsible for the establishment and maintenance of security procedures within the Company. The Security Officer will keep the Operations department informed of all relevant security matters.
- 10.1.3 Operations Staff.** On duty Operations staff are responsible for informing the Security Officer of any relevant security matter. In addition they are responsible for ensuring that all Aircraft Captains are kept fully informed, at all times, of any security matter related to that Captains current operations or duties. To maintain appropriate confidentiality they should also ensure that passenger names and itineraries are not disclosed to any person who is not directly involved with the movement in question, and that passenger personal data is controlled.
- 10.1.4 Vigilance and Pre-emption.** Any Company employee who has a security concern, or believes that security may have been, or is likely to be, compromised should report the matter to the Company Security Officer. The nature of the Company's operation means that personnel may have time to assess passengers' state of mind, nature and, potentially, their intentions. Passengers will be (covertly) assessed by all staff on arrival, and if applicable during registration, familiarisation and briefings. If ground staff or flight crew suspect that the passenger could pose a security risk, they should supervise them closely at all times. If applicable, passenger's names and passports should be checked against the planned manifest by hosting or Operations staff, any changes must be verified and approved, and confirmation passed to the Aircraft Captain prior to departure. Staff are to confirm that there are no forbidden items in passengers' baggage. If any passenger is perceived to be posing a risk they

should also attempt to persuade the passenger not to embark and inform the Aircraft Captain who has the ultimate authority to refuse embarkation.

10.1.5 Lockers and Holds. Where lockable doors and baggage holds are provided, they are to remain closed and locked whenever the aircraft is off the operating base. If the aircraft contains sensitive items or equipment then the use of tamper seals should also be considered.

10.1.6 Security of Aircraft. The Company's aircraft are not to be left unattended in the open without taking all reasonable precautions for their safety. This is most important at sites where the general public have easy access.

10.1.7 Enhanced Security Measures. Enhanced security measures identify the need for screening of crew, passengers and their baggage, and the establishment of sterile areas once screened. Whilst the blanket application of these measures does not apply to [some of the aircraft](#) operated by the Company, national authorities or airport operators may apply these enhanced measures to all movements, and Company staff are to comply with any requests for additional screening.

10.1.8 CS25 Aircraft. [Full Part-CAT security procedures for CS25 aircraft are detailed in the Cabin Crew SEP Manual.](#)

10.2 Training. Training will be aimed at enabling Company personnel to act in the most appropriate manner to prevent threats or minimise their consequences. Training is completed as part of annual ground refresher training iaw OM Part D.

10.3 Search Procedures

10.3.1 Aircraft Searches. The nature of [much of](#) the Company's business means that Aircraft Captains will usually spend time with their passengers in a controlled environment before going flying; moreover, they will usually escort them to the aircraft. Considering the limited areas for stowage, and the lack of opportunity, it is unlikely that passengers will have had the time or the access to secret improper goods aboard. However, there may be opportunities during familiarisation for passengers to stow items such as improvised explosive devices (IEDs) aboard the aircraft, or for other persons who have airside access to the aircraft to do so. Therefore, in addition to the normal pre-flight checks, Aircraft Captains are to visually search the aircraft for any IEDs that might have been secreted in the aircraft and in particular: the cabin (including stowage drawers, catering containers and galley unit, under seats and the toilet area), engine cowlings, baggage lockers (nose and wing), undercarriage bays, heater access panel, and any external openings (control runs; balance arms).

10.3.2 Possible IED. If it is believed that an explosive device has been secreted on the airframe then no attempt should be made to remove the suspicious object and the Security Officer shall be informed. He, or if not onsite, the Aircraft Captain, will instigate the following action:

- a. Arrange a suitable cordon around the aircraft to prevent public access;

- b. Inform the Civil Police that an explosive device is believed to have been placed on a company aircraft and carry out any immediate instructions they issue;
- c. Continue to secure the area until the incident is handed over to the Civil Police.

10.4 Flight Crew Compartment Security. Other than on Company B737 aircraft no lockable flight deck door is provided. Procedures for those aircraft with lockable flight deck doors are written in OM A Section 8.

10.4.1 Reaction to Security Threats While Airborne.

10.4.2 Errant Passenger. Once airborne, when operating single pilot, there is little that the Aircraft Captain would be able to do to control an errant passenger. However, he should use his voice and actions to maintain control and:

- a. At once declare an emergency by appropriate means (radio and/or transponder);
- b. Calm the passenger in order to persuade him not to do anything rash;
- c. Use the aircraft's inherent manoeuvrability to keep physical control;
- d. Land as soon as possible.

10.4.3 Hijack. Any action to be taken will be at the Captains discretion having assessed the situation at first hand. The safety of passengers and crew must always be the prime concern - any other influencing factor is secondary. Therefore, faced with an armed threat:

- a. It is recommended that the crew comply with the demands presented.
- b. Do not attempt to disarm the hijacker or otherwise jeopardise the safety of the flight (there may be more than one hijacker on board)
- c. Extreme caution is urged prior to any attempt at deception, as a gunman may have been extensively trained for the operation, and have a good working knowledge of the aircraft systems and procedures.
- d. If possible, advise the nearest ATC unit of the situation and the demands being made, provided the safety of the flight will not be jeopardised in doing so.
- e. If possible select 7500 on transponder and pass position reports giving distance to two decimal places of a nautical mile.

10.5 Reporting. Any acts of unlawful interference are to be reported by the Aircraft Captain to the local authorities without delay to the designated local authority, the Competent Authority and the Company Security Officer. The Competent Authority in the UK is:

Department for Transport
Great Minster House
76 Marsham Street
London
SW1P 4DR

Transec Threats Office: Weekdays 0900 - 1730 (UK time)
Telephone: **Personal Data** 870 / 2872
Fax: **Personal Data** 873
Email: **PD** [@dft.gsi.gov.uk](mailto:PD@dft.gsi.gov.uk)

DfT Duty Office: All other times
Telephone: **Personal Data** 999
Fax: **Personal Data** 369
Email: **Personal Data** [@dft.gsi.gov.uk](mailto:Personal Data@dft.gsi.gov.uk) and
PD [@dft.gsi.gov.uk](mailto:PD@dft.gsi.gov.uk)

Section 11

Handling of Accidents, Incidents and Occurrences

11.0 Definitions. The European Coordination Centre for Accident and Incident Reporting Systems (ECCAIRS) uses the following definitions:

11.0.1 Accident

An occurrence associated with the operation of an aircraft which, in the case of a manned aircraft, takes place between the time any person boards the aircraft with the intention of flight until such time as all such persons have disembarked, or in the case of an unmanned aircraft, takes place between the time the aircraft is ready to move with the purpose of flight until such time it comes to rest at the end of the flight and the primary propulsion system is shut down, in which:

- a. a person is fatally or seriously injured as a result of:
 - i. being in the aircraft, or,
 - ii. direct contact with any part of the aircraft, including parts which have become detached from the aircraft, or,
 - iii. direct exposure to jet blast, except when the injuries are from natural causes, self-inflicted or inflicted by other persons, or when the injuries are to stowaways hiding outside the areas normally available to the passengers and crew; or
- b. the aircraft sustains damage or structural failure which adversely affects the structural strength, performance or flight characteristics of the aircraft, and would normally require major repair or replacement of the affected component, except for engine failure or damage, when the damage is limited to a single engine, (including its cowlings or accessories), to propellers, wing tips, antennas, probes, vanes, tyres, brakes, wheels, fairings, panels, landing gear doors, windscreens, the aircraft skin (such as small dents or puncture holes) or minor damages to main rotor blades, tail rotor blades, landing gear, and those resulting from hail or bird strike, (including holes in the radome); or
- c. the aircraft is missing or is completely inaccessible;

Note 1 For statistical uniformity only, an injury resulting in death within thirty days of the date of the accident is classified, by ICAO, as a fatal injury.

Note 2 An aircraft is considered to be missing when the official search has been terminated and the wreckage has not been located.

Note 3 The type of unmanned aircraft system to be investigated is addressed in ICAO Ann 13.

Note 4 Guidance for the determination of aircraft damage can be found in Attachment F of ICAO Ann 13.

11.0.2 Serious incident

An incident involving circumstances indicating that an accident nearly occurred.

Note The difference between an accident and a serious incident lies only in the result.
- Examples of serious incidents can be found in Attachment C of ICAO Annex 13 and in the ICAO Accident/Incident Reporting Manual (ICAO Doc 9156).

11.0.3 Incident

An occurrence, other than an accident, associated with the operation of an aircraft which affects or could affect the safety of operation.

N.B. The type of incidents which are of main interest to the International Civil Aviation Organization for accident prevention studies are listed in the ICAO Accident/Incident Reporting Manual (ICAO Doc 9156) and ICAO Annex 13.

11.0.4 Major incident

An incident in which:

- a. Safety may have been compromised either having lead to a near collision between aircrafts, with the ground or obstacles (i.e. safety margins not respected which is not the result of an ATC instruction).
- b. Assessment of the incident using a risk classification process has identified that this incident could have deteriorated into more serious situation.

11.0.5 Significant incident

An incident in which:

- a. An accident, serious or major incident could have occurred if the risk had not been managed within safety margins (one or more safety barriers remaining).
- b. or if another aircraft or vehicle had been in the vicinity during the incident.

11.0.6 Occurrence without safety effect (Eurocontrol).

A possibly safety related occurrence (not meeting the reporting requirements).

Eurocontrol: An incident which has no safety significance.

A possibly safety related occurrence not meeting the reporting requirements. This could be e.g. the result of downgrading the incident after review.

11.0.7 Observation

The observation of a potential safety issue or hazard that, if not rectified could cause or have caused an incident. The date and time of occurrence for an observation is that when it was first observed for the purposes of reporting and not an assessment of how long the safety issue might have been present.

11.0.8 Occurrence with No Flight Intended

A reportable Occurrence where there was no intention of flight, for example substantial damage found on aircraft during maintenance.

11.0.9 Not determined

The class of the occurrence has not been determined.

11.1 Post (Airborne) Accident Procedures.

11.1.1 Bail-out. After landing, aircraft captains should locate the passenger if possible, and then proceed from sub-para 11.1.2 b below.

11.1.2 Forced Landing / Ditching. In the event of a forced landing, the aircraft captain is to:

- a. Subject to safety considerations, make the aircraft safe as far as practicable (fuel off, batteries disconnected and survival packs, first aid kits and fire extinguishers removed)
- b. Locate (or account for) and evacuate the passenger(s) to a safe, sheltered position.
- c. Administer to injuries (setting apart and covering any bodies or any victims)
- d. Activate distress beacons and establish if aircraft communications facilities can be used to obtain help. Establish if mobile telephone communications can be used to obtain help.
- e. Promote being located by setting out pyrotechnics for immediate use, setting out appropriate SAR signals.
- f. Create suitable physical protection and distribute water and rations.
- g. Await rescue and carry out survival drills.
- h. Once rescued, arrange for the establishment of a cordon around the aircraft to protect evidence.

11.2 Accident Reporting.

11.2.1 Jurisdiction. Following an accident or incident involving Company aircraft the Aircraft Captain shall comply with the laws and regulations of the UK and the state in which the accident or incident occurred.

11.2.2 Accident Message. Following an accident, the aircraft captain is to inform the Company, the Authority and the State in which the accident occurred as soon as possible as follows:

- a. Inform the Company by the most appropriate means using the prefix ACCIDENT, in accordance with the format prescribed below.
 - i. Company Fax Number: Personal Data 535
 - ii. Company Telephone Numbers:
 - Ops Personal Data 500 or 24hr Mobile: PD 508
 - Ops Director Personal Data 180
 - DFO Personal Data 293
 - Chief Pilot Personal Data 155
 - iii. Message Format:

ACCIDENT

AA	Date
BB	Aircraft Registration
CC	Pilot's Name
DD	N/A
EE	Number of Passengers
FF	Location of Accident
GG	Time of Accident (local)
HH	Brief description of pilot's injuries
II	Brief description of passenger injuries
JJ	Brief description of accident, including flight phase and task
KK	Brief description of extent of damage
LL	Post accident procedures carried out
MM	Action taken on site to notify Authorities (British and local State)
NN	Immediate action requested on the Company's part

- b. Where necessary notify the Competent Authority of the State in which the accident occurs and which the aircraft is registered.
- c. The Company shall then inform the UK Civil Aviation Authority of the accident in accordance with EU REG 376/2014.

11.2.3 Consequent Company Actions. The Duty Operations Controller is to implement the 2Excel Emergency Response Plan.

11.2.4 Written Reports.

- a. The aircraft captain is to submit a completed Accident Report Form (Centrik OR form and any associated AAIB Accident Report Forms) to the Group Safety Manager as soon as possible (but in any case within 48 hours of the accident in the case of the CAA Form and 14 days of receipt in the case of the AAIB Form), classifying according to the definitions as detailed in sub-para 11.1. If there is any doubt as to the classification the occurrence should be reported as the more serious class. The Group Safety Manager will reclassify accidents and incidents if necessary.
- b. Where items of the Report cannot be completed due to lack of information they should be marked 'to be completed' and the missing information forwarded when obtained rather than delaying the Report.
- c. All sections of the Report shall be completed as accurately and as fully as possible expanding on statements where necessary or appropriate and not being constrained by the Form questions / headings.

11.3 Incident Reporting

11.3.1 Intent. The purpose of Incident Reporting is to improve the safety and reliability of aircraft and their operation and thereby to avoid accidents and serious incidents. An Incident Report is not designed to apportion blame but to prevent a similar incident recurring with potentially more serious consequences. A dim view would be taken by the Company of any failure to report any incident which subsequently came to light. Moreover, where there is clear evidence of serious negligence or incompetence, the Company has a duty to take any action that may be necessary to ensure the future safety of its aircraft and their occupants.

11.3.2 Classification. Classification of an incident as Serious will normally be decided by the senior person present, as soon as possible after the event and before the crew or aircraft fly again.

11.3.3 Procedure. The Company is to be notified asap using the procedure outlined above. The senior responsible Company Officer is to follow the procedure contained within the Company ERP as appropriate. Subsequently, the pilot(s) involved is/are to complete the appropriate incident report form (Centrik **OR**) within 48 hours of the occurrence and pass it to the **Group** Safety Manager for comment and onward transmission.

11.3.4 Timescale. The completed Incident Report should be despatched to the Authority within 72 hours of the occurrence.

11.3.5 Investigation Reports. The **Group** Safety Manager and Continual Airworthiness Manager should add their Investigation Reports together with their comments and recommendations stating any immediate preventative action which may have been or should be taken.

11.3.6 Not used

11.3.7 Insurance and Warranty Claims. **The Group** Safety Manager should anticipate that certain incidents may be subject to an insurance or warranty claim and will therefore need to complete page 7 of the Accident Report (Details Required for Insurance Purposes) in addition to the Incident Report.

11.3.8 Follow-Up Reporting. Once the Accident/Incident Report has been submitted, any information pertinent to the accident must be provided to the Company as soon as possible in order to decide what further action might be appropriate. Such information would include: anything material and new; any apparent mechanical failure; details of any investigations; and recommendations on pilots' returning to flying duty. Supporting information should also be submitted comprising (not exclusively or exhaustively): photographs; switch positions; sketch maps; eyewitness and passenger reports; post-accident medical reports; Technical Log data; weather reports; relevant local legislation; orders and instructions; and post accident / incident procedures carried out.

11.3.9 Report Distribution and Processing. All Accident and Incident Reports shall be addressed to the DFO with a copy being held on file at the Company's Headquarters. The

Accident Report must be kept intact; sections should not be separately posted to the respective departments. Likewise supporting information should be attached to the Accident or Incident Report and sent under the same cover if possible. An Accident file can only be closed by the Operations Director and any disciplinary measure which may arise from such events can only originate from or be authorised by him.

11.4 Subsequent Flying Duties. Following an accident / incident, the crew(s) shall not carry out any flying duties. The Chief Pilot is to relieve the crew from flying duties until they have been interviewed and assessed fit for duty. Crew members shall remain on site unless to undergo medical treatment or examination. Flying restrictions would be principally to preserve the crew's recollection of the incident or to ensure their fitness for duty rather than for disciplinary reasons. Nevertheless, crews may not be scheduled for flying duties until authorised by the Operations Director (after the preliminary findings of the investigation are known or apparent).

11.5 Investigations.

11.5.1 Applicability. All incidents must be investigated if the purpose of the incident reporting scheme is to be served; the depth of the investigation required depending upon the seriousness of the incident. It is important that all incident reports should include sufficient information for the incident to be fully assessed by the Company's Safety staff.

11.5.2 Task Organisation. The investigation of all incidents is a joint Operations/Engineering task and is to be carried out as a co-ordinated exercise by the Safety Manager and CAM or delegated to a suitably qualified pilot and engineer. In the case of Serious Incidents, the investigation is to be conducted formally and both the Operations and Engineering Investigators are to be senior members of the Operation. Both Investigators should be present at all interviews, component inspections etc and their reports should be jointly produced.

11.6 Mandatory Occurrence Reporting. The EASA Mandatory Occurrence Reporting Scheme (MORS) relates to all EASA registered commercial air transport aircraft. The company policy is that reports will be submitted for appropriate occurrences to all EASA registered company aircraft operating for commercial air transport, regardless of maximum certificated weight. Occurrences to non-EASA registered company aircraft will be reported by overseas operations if they relate to an aircraft type operated by the company on the British register, or of British manufacture. MORs are to be filed using Centrik, within 72 hours of the occurrence, in accordance with EU REG 376/2014. These occurrences should be reported to the [Group Safety Manager](#) –who will process the MOR.

11.6.1 Objectives of the Scheme

- a. To ensure that the CAA is advised of hazardous or potentially hazardous incidents and defects referred to as 'Occurrences'.
- b. To ensure that knowledge of these occurrences is disseminated so that other persons and organisations may learn from them.

- c. To enable an assessment to be made by those concerned, of the safety implications of each occurrence, both in itself and in relation to previous similar occurrences, so that they may take or initiate any necessary action. The overall objective of the MORS is to use the reported information to improve the level of flight safety and not to attribute blame.

11.6.2 Definition of a Reportable Occurrence. A reportable occurrence is:

- a. Any incident (not being a notifiable Accident under Section 5 of the current Civil Aviation (Investigation of Accidents) Regulations 1989)
- b. Any defect in or malfunctioning of the aircraft or any part of the aircraft or of its equipment, being an incident, malfunctioning or defect endangering, or which if not corrected would have endangered, the aircraft, its occupants, or any other person.
- c. Failure or inadequacy of facilities or services on the ground, used, or intended to be used for, or in connection with, the operation of the aircraft.
- d. Any incident arising from the loading or the carriage of passengers, cargo or fuel. The overriding criterion to determine whether an occurrence is reportable is if it: 'endangered, or if not corrected, would have endangered, the aircraft, occupants, or other persons.'

11.6.3 Informing Base of Occurrences. The following is intended as guidance to aircraft commanders experiencing a technical malfunction or other occurrence away from base. In all cases where the nature or extent of a problem is such that the flight cannot be continued normally, advice shall be sought from Managerial and Engineering staff at the operating base. Whenever possible, the first point of contact should be with the duty Operations personnel who will then alert the appropriate personnel for consultation. Whilst it is difficult to formulate a hard and fast rule to cover every possible situation, the general principle shall apply that unless the aircraft is judged serviceable to commercial air transport standards it shall not be ferried back to base until the problem has been fully researched. It follows that a return to base 'without passengers' will not normally be undertaken and then only when specifically authorised by managerial staff at base and with the concurrence of the aeroplane captain who will retain at all times the ultimate 'NO-GO' decision. Because of the attendant risk of misunderstanding due to poor communications, crews stranded away from base should arrange to discuss their problem by a radio/telephone link call if possible, having alerted the relevant base personnel to standby. In the case of crews experiencing in-flight unserviceability's which in the opinion of the Captain can be rectified on return to base, the symptoms must still be reported on by radio if possible. This will also enable the Engineering Department to prepare themselves to rectify the defects when the aircraft lands. It is mandatory that crews inform their operating base of occurrences such as bird-strikes, minor illnesses etc. as well as technical defects before continuing the flight, and if it is impractical, as soon as possible after take-off.

11.7 AIRPROX/Airmiss Reporting. For comprehensive detail see AIP ENR 1.14. An AIRPROX report should be made whenever a pilot considers that the distance between aircraft

as well as their relative positions and speed have been such that the safety of the aircraft involved was or may have been compromised. AIRPROX reports may be initiated by pilots or controllers and will be coordinated subsequently by the UK AIRPROX Board. An initial report of an AIRPROX by a pilot should be made immediately by radio to the ATS unit with which the pilot is on communication prefixing the message with the word AIRPROX. If the AIRPROX cannot be reported by radio at the time, an initial report should be made by the pilot immediately after landing by telephone or other means to any UK ATS unit but preferably to an ACC. Initial reports must be confirmed within 7 days by completing [the AIRPROX form available on the UKAIRPROX Board website](#).

11.8 Bird/Wildlife-strike Reporting. Any aircraft commander flying in UK airspace who believes his aircraft has collided with wildlife is to inform the CAA, using the Centrik [OR](#) form. The Safety Manager will ensure through internal processes that, the wildlife strike is cross fed into the MOR Scheme; all wildlife strikes necessitate an MOR. An assessment should be carried out before onward flight. If there is no damage, determined by the Captain/FE by carrying out an inspection in the same manner of a (full external) pre-flight check, then a Part-145 assessment is not normally required. The Captain may however, still determine that a Part-145 inspection is required prior to flight. In this respect the Captain should consider:

- Speed of impact and size of wildlife (energy)
- Angle of impact against surface
- Possible interference with pitot-static systems or flight instruments
- Impact in areas of composite structure (e.g. nose cone) that may not exhibit obvious damage but may be structurally diminished
- Damage that may have occurred to control components in the case of impact with a control surface.

If a wildlife strike resulted in damage to the aircraft, diversion, aborted take-off or loss/malfunction of an essential service a Part-145 inspection is required before further flight.

11.9 Lightning Strike Reporting. Lightning strikes should be reported through the MOR Scheme in accordance with EU REG 376/2014.

11.10 Wake Turbulence Reporting. All wake turbulence incidents should be submitted to the NATS Wake Turbulence Analysis Team, by completing the relevant Centrik [OR](#). Severe incidents, meeting the criteria for an MOR, should also be submitted as an MOR.

11.11 Special Notification Requirements in the Event of an Accident or Occurrence When Dangerous Goods are Being Carried or Have Been Offered for Air Transport without Having Been Prepared and Declared in Accordance with the ICAO Technical Instructions / IATA DGR (CAT.GEN.MPA.200(e))

11.11.1 Information to be Provided by the Pilot-In-Command in the Event of an In-Flight Emergency (AMC1 SPA.DG.105(b)). If an in-flight emergency occurs and the situation permits, the commander must inform the appropriate Air Traffic Services Unit of any dangerous goods on board. This information should include the proper shipping name, class/division, identified subsidiary hazard(s), compatibility group for explosives, quantity and location on board.

The Company Operations telephone number where a copy of the information to the pilot-in-command can be obtained during the flight is additionally required on the NOTOC to make it possible for the pilot-in-command to provide the appropriate Air Traffic Services Unit with a telephone number instead of details about the dangerous goods on board the aircraft in the event of an in-flight emergency.

11.11.2 Information to be Provided by the Operator in the Event of an Aircraft Accident or Serious Incident Where Dangerous Goods Carried as Cargo may be Involved. If a Company aircraft carrying dangerous goods as cargo is involved in an accident or serious incident where the dangerous goods may be involved, the Company must provide information, without delay, to emergency services responding to the accident or serious incident about the dangerous goods on board, as shown on the copy of the information to the pilot-in-command (NOTOC). The information must be sufficient to enable any hazards created by the dangerous goods to be minimised and include the proper shipping name, UN number, class/division, any identified subsidiary hazard(s), the compatibility group for explosives, the quantity and the location on board the aircraft. As soon as possible, the Company must also provide this information to the CAA Dangerous Goods Office and the appropriate authority of the State in which the accident or serious incident occurred. In the first instance, the Dangerous Goods Office should be alerted to the incident or accident by phone using the following number:

Telephone: Personal Data 915.

Contact details for appropriate authority of the state, are contained in IATA DGR Appendix D1 or via ICAO website:

<http://www.icao.int/safety/DangerousGoods/Pages/Dangerous-Goods-National-Authority.aspx>

11.11.3 Information to be Provided by the Operator in the Event of an Aircraft Incident (AMC1 SPA.DG.105(b)). In the event of an aircraft incident, the operator of an aircraft carrying dangerous goods as cargo must, if requested to do so, provide information without delay to the emergency services responding to the incident and to the appropriate authority of the State in which the incident occurred, about the dangerous goods on board, as shown on the copy of the information to the pilot-in-command (NOTOC). For aircraft accidents and serious incidents, see 11.11.2.

11.11.4 Dangerous Goods Accident and Incident Reports (CAT.GEN.MPA.200(e)). The Company is approved to carry dangerous goods. In addition, on non-dangerous goods flights it is feasible for materials other than those permitted by the general exemptions (details of which can be found in Part A, Section 9 of this manual) to be carried inadvertently. Consequently it is possible that an incident can occur where dangerous goods are involved either by approved carriage, inadvertent carriage, or caused by an item acceptable under the terms of the general exemptions. This sub-section details the reporting procedures, required under such circumstances.

- a. **Definition of Dangerous goods accident:** An occurrence associated with and related to the transport of dangerous goods by air which results in fatal or serious injury to a person or major property or environmental damage.

- b. **Definition of Dangerous goods incident:** An occurrence other than a dangerous goods accident associated with and related to the transport of dangerous goods by air, not necessarily occurring on board an aircraft, which results in injury to a person, property or environmental damage, fire, breakage, spillage, leakage of fluid or radiation or other evidence that the integrity of the packaging has not been maintained. Any occurrence relating to the transport of dangerous goods which seriously jeopardises an aircraft or its occupants is also deemed to be a dangerous goods incident.

Note: A dangerous goods accident or incident may also constitute an aircraft accident or incident as specified in ICAO Annex 13 — Aircraft Accident and Incident Investigation.

11.11.5 Reporting of Dangerous Goods Occurrences. The Company must report dangerous goods accidents and incidents to the appropriate authorities of the State of the Operator and the State in which the accident or incident occurred in accordance with the reporting requirements of those appropriate authorities.

Note: This includes incidents involving dangerous goods that are not subject to all or part of the ICAO Technical Instructions through the application of an exception or of a special provision (e.g. an incident involving the short circuiting of a dry cell battery that is required to meet short-circuit prevention conditions in a special provision).

- a. The Company must report to the State of the Operator and the State of Origin any occasion when:
- i. dangerous goods are discovered to have been carried when not correctly loaded, segregated, separated or secured.
 - ii. dangerous goods are discovered to have been carried without information having been provided to the pilot-in command (when required) or the information is inadequate.
- b. The Company must report any occasion when undeclared or mis-declared dangerous goods are discovered in cargo or mail. Such a report must be made to the appropriate authorities of the State of the Operator and the State in which this occurred.
- c. The Company must report any occasion when dangerous goods that are not permitted are discovered by the operator (or the operator is advised by the entity that discovers the dangerous goods) either in the baggage or on the person of passengers (after check-in) or crew members. Such a report must be made to the appropriate authority of the State in which this occurred.
- d. In addition to the requirements of the ICAO Technical Instructions for the reporting of dangerous goods occurrences (above), ORO.GEN.160 requires that any incident which endangers or which, if not corrected, would endanger an aircraft, its occupants or any other person is reported to CAA Safety Data. Dangerous goods occurrences reportable under the Mandatory Occurrence Reporting Scheme include:
- Dangerous goods found not to have been secured to prevent movement
 - Damage to packages of dangerous goods

- NOTOC errors where dangerous goods have not been stowed in accordance with loading instructions
- Failure to prepare electric wheelchairs in order to prevent accidental activation
- Electric wheelchairs found not to have been stowed and secured correctly
- Leakage of dangerous goods from passenger baggage

Note: Dangerous goods occurrences meeting the criteria of ORO.GEN.160 also meet the definition of a dangerous goods accident or incident (above), reportable in accordance with CAT.GEN.MPA.200 (e). Accordingly, the report must be made to CAA Safety Data within 72 hours (rather than 96), unless exceptional circumstances prevent this.

e. A dangerous goods accident or dangerous goods incident not meeting the criteria of ORO.GEN.160 must be reported to the CAA Dangerous Goods Office within 72 hours, unless exceptional circumstances prevent this. If necessary, a subsequent report shall be made as soon as possible giving all the details that were not known at the time the first report was sent. If a report has been made verbally, written confirmation shall be sent as soon as possible. Any type of accident or incident must be reported irrespective of whether the dangerous goods are in cargo, mail, stores, passengers' baggage or crew baggage.

f. Dangerous goods occurrences not meeting the Criteria of ORO.GEN.160 are to be reported to PD@caa.co.uk using the following forms:

CAA Form [SRG 2808](#) may be used to report a dangerous goods occurrence involving cargo or unaccompanied baggage.

CAA Form [SRG 2809](#) may be used to report a dangerous goods occurrence involving a passenger/crew member or their baggage.

g. The first and any subsequent report shall be as precise as possible and contain such of the following data that are relevant:

- Date of the incident or accident or the finding of undeclared or mis-declared dangerous goods.
- Location, the flight number and flight date.
- Description of the goods and the reference number of the air waybill, pouch, baggage tag, ticket, etc.
- Proper shipping name (including the technical name, if appropriate) and UN/ID number, when known.
- Class or division and any subsidiary hazard.
- Type of packaging, and the packaging specification marking on it.
- Quantity of dangerous goods.
- Name and address of the shipper, passenger, etc.
- Any other relevant details.
- Suspected cause of the incident or accident.
- Action taken.
- Any other reporting action taken.

- Name, title, address and telephone number of the person making the report.

Copies of relevant documents and any photographs taken should be attached to a report.

Note: IF SAFE TO DO SO, THE DANGEROUS GOODS INVOLVED IN THE ACCIDENT OR INCIDENT SHOULD BE HELD PENDING CAA INVESTIGATION.

11.11.6 Removal of Contamination (SPA.DG.105). In the event of a spillage or leakage of dangerous goods within an aircraft, the position where the dangerous goods or unit load device (ULD) was stowed on the aircraft must be inspected for damage or contamination and any hazardous contamination removed. The hazard of the dangerous goods within packages concerned may be established by checking the entry on the NOTOC for that loading position or from hazard labels applied to the packages. The hazard classes and divisions of dangerous goods within a ULD may also be identified from the NOTOC or otherwise, should package labels not be visible, from the ULD tag bearing red hatchings applied to the outside of the ULD. Persons responding in the event of damage to or leakage of dangerous goods from packages must:

- Identify the hazards and wear appropriate protective clothing;
- Avoid handling the package or keep handling to a minimum;
- Inspect adjacent packages for contamination and put aside any that may have been contaminated;
- Arrange for decontamination of the aircraft and equipment; and
- In the case of infectious material, inform the appropriate public health authority or veterinary authority, and provide information to any other countries of transit where persons may have been exposed to danger; and notify the shipper and/or the consignee.

11.11.7 Radioactive Spillages. Whilst it is Company policy not to transport radioactive material it is possible for undeclared material to have been loaded in error. If it is evident that a package containing radioactive material is damaged or leaking, or if it is suspected that the package may have leaked or been damaged, access to the package must be restricted and a qualified person must, as soon as possible, assess the extent of contamination and the resultant radiation level of the package. The scope of the assessment must include the package, the aircraft, the adjacent loading and unloading areas and, if necessary, all other material which has been carried in the aircraft. When necessary, additional steps for the protection of persons, property and the environment must be taken in accordance with provisions established by the relevant competent authority, to overcome and minimise the consequences of such leakage or damage. An aeroplane which has been contaminated by radioactive materials must be immediately taken out of service and not returned until the radiation level at any accessible surface and the non-fixed contamination are not more than the values specified in the Technical Instructions. In the event of non-compliance with any limit in the Technical Instructions applicable to radiation level or contamination, the operator must ensure the shipper is informed if the non-compliance is identified during transport; take immediate steps to mitigate the consequences of the non-compliance; and communicate the

non-compliance to the shipper and relevant competent Authority(ies), respectively, as soon as practicable and immediately whenever an emergency situation has developed or is developing.

11.12 Confidential Human Factors Incident Reporting Scheme (CHIRP). Reports of incidents or occurrences involving human factors and/or errors which the reporter wishes to remain confidential should be reported online to the CHIRP charitable trust through their website at www.chirp.co.uk

11.13 Irregularities in Ground and Navigational Facilities and Hazardous Conditions. The Captain shall notify the appropriate ground station (ATC) as soon as practicable whenever a potentially hazardous condition is encountered during flight such as:

- a. An irregularity in a ground or navigational facility;
- b. A meteorological phenomenon;
- c. A volcanic ash cloud;
- d. A high radiation level.

11.14 Search and Rescue. When necessary, aircraft captains should call the local search and rescue organisation by making a radio call on frequency 121.5 MHz preferably before abandoning the aircraft or conducting a forced landing. If already on an ATC frequency, a MAYDAY call on the frequency in use may be more appropriate. If flying in formation it may be most appropriate for the non emergency aircraft to call on behalf of the emergency aircraft. The Company shall hold details of the flight and, in the event of overdue action, it should notify the SAR services giving all the pertinent details held on desk.

11.15 Confidentiality. Staff are not to discuss the circumstances concerning any accident/occurrence with anyone outside the Company other than authorised investigators.

11.16 Company Fatigue Observation Form. Part A, Section 7 of the Company Operations Manual details the Flight Time Limitations scheme used to regulate flight times and aid the avoidance of fatigue in crew members. Crew members have a responsibility for making optimum use of the opportunities and facilities for rest provided in order to minimise incurring fatigue. Furthermore, they must not fly if they know or suspect that their physical or mental condition renders them unfit to operate, or if they are in breach of the prescriptive parts of the FTL scheme. Additionally, good practice means that employees other than flight crew should actively manage duty hours to ensure that fatigue does not adversely affect their performance and subsequently impact on safe operations.

In order to allow hazard detection through data collection and monitoring processes, with subsequent causal analysis and classification, personnel may utilise a Company Fatigue Observation Form (FOF). Collection of data to understand the When, What, Where and Why of fatigue related events is key as the first step to intervention/mitigation strategies.

The form [available on Centrik](#), should be used to report openly or confidentially any fatigue related observation. It may be used in conjunction with, but not instead of a Company OR or MOR (for example "I awoke in the cockpit and was unsure of how long I had been asleep), or

independently to report events that may not warrant an OR (for example “I felt tired and run down, and had to stop on my drive home as I was finding it difficult to keep my eyes open”).

11.17 Cabin Crew Safety Reports. Cabin crew shall report any safety incident using the [Centrik OR Form](#). The Senior Cabin Crew Member will normally be responsible for filing the report, although any cabin crew member may submit a report under the Company scheme.

When a Cabin Crew member files a safety report he should inform the Aircraft Captain and where necessary use the Cabin Crew Defect Log to ensure a tech log entry is made to request rectification of any MEL defective item.

Cabin Crew [OR](#) reports must be filed if any of the following incidents occur:

- a. Any fire, smoke or hazardous situation involving aircraft ovens, water boilers or cabin equipment.
- b. Any medical emergency on board the aircraft.
- c. Any disruptive passenger incident as detailed in the Safety Equipment Procedures manual.
- d. Any accident or incident resulting in personal injury.
- e. Any failing is safety equipment below a standard expected of that equipment.
- f. Any potentially hazardous situation that was only mitigated through actions outside normal SOPs.
- g. Any other situation where a cabin crew member feels safety has been compromised.

Section 12

Rules of the Air

- 12.0 Rules of the Air.** The Company is required by EASA-IRs to include in the Operations Manual details of the Rules of the Air which are relevant to the duties of operations staff and crew members, including the information listed below. As this information is published in full in the Air Traffic Control and Emergency Sections of the Jeppesen Manual that is held in Ops and carried on all multi-engine flights, or the Pooleys VFR guide for Company VFR aircraft, it is not all duplicated here. The Standardised European Rules of the Air (SERA) as implemented by EU REG 923/2012, apply to every aircraft operating in EU airspace regardless of type or state of registration. But as the rules will not cover all aspects of the Rules of the Air, Member States may keep supplementary rules that complement SERA. They may also permit routine operations such as VFR flight at night, and grant exemptions from SERA's requirements. Permissions and exemptions relating to both SERA and UK Rules of the Air are found in the List of Official Record Series Publications series under ORS4. Details will also appear in the UK AIP.
- 12.1 Visual and Instrument Flight Rules.** The Visual and Instrument flight rules (VFR and IFR) are contained in Part A, Section 8, and the Jeppesen General Airway Manual Air Traffic Control Section.
- 12.2 Territorial Application of the Rules of the Air.** The rules referred to in Para 12.0 above are applicable within UK or European airspace under SERA. For flights outside this airspace commanders should ensure they familiarise themselves with the relevant national rules of the air which are normally contained within the National Air Pilot, or the relevant regional Jeppesen Manual.
- 12.3 Communications Procedures.**
- 12.3.1 General Communication Procedures.** ATC should be used for all flights whenever available. As a general rule commanders shall ensure that flights are planned within areas where communication with local ATC is possible. In those areas where ATC is unobtainable commanders shall ensure that they make all reasonable efforts to maintain two-way communications with a relevant agency.
- 12.3.2 Communication Failure Procedures.** Refer to Jeppesen General Airway Manual Emergency section.

12.4 The Interception of Civil Aeroplanes.

12.4.1 General. Under Article 9 of the Convention on International Civil Aviation, each contracting State reserves the right for reasons of military necessity or public safety, to restrict or prohibit the aircraft of other States from flying over certain areas of its territory. The Regulations of a State may prescribe the need to investigate the identity of aircraft. Accordingly, it may be necessary to lead an aircraft of another nation, which has been intercepted, away from a particular area (such as a prohibited area) or, an intercepted aircraft may be required to land for security reasons at a designated aerodrome. To avoid the interception of civil aircraft, adherence to flight plans and ATC procedures and the maintenance of a listening watch on the appropriate ATC frequency, make the possibility of interception highly improbable. If the identity of an aircraft is in doubt, all possible efforts will be made to secure identification through the appropriate Air Traffic Service Units. As interception of civil aircraft are, in all cases, potentially hazardous, the interception procedures will only be used as a last resort. The word 'interception' does not include the intercept and escort service provided on request to an aircraft in distress in accordance with Search and Rescue procedures. The procedure to be followed by the pilot-in-command of an intercepted aircraft and visual signals for use by intercepting and intercepted aircraft listed below.

12.4.2 Procedures and Signals for Intercepted Aircraft. Intercepted aircraft should act as follows:

- a. Immediately follow the instructions given by the intercepting aircraft, interpreting and responding to visual signals in accordance with the specifications in Tables 12.1 and 12.2;
- b. Notify the appropriate ATSU, if possible;
- c. Attempt to establish radio communication with the intercepting aircraft or with the appropriate intercept control unit, by making a general call on the emergency frequency 121.5 MHz, giving the identity of the intercepted aircraft and the nature of the flight. If no contact has been established, and if practicable, repeat this call on the emergency frequency 243 MHz;
- d. If equipped with SSR transponder, select Mode A, Code 7700 and Mode C, unless otherwise instructed by the appropriate ATSU;
- e. If any instructions received by radio from any sources conflict with those given by the intercepting aircraft by visual signals, the intercepted aircraft shall request immediate clarification while continuing to comply with the visual instructions given by the intercepting aircraft;
- f. If any instructions received by radio from any sources conflict with those given by the intercepting aircraft by radio, the intercepted aircraft shall request immediate clarification while continuing to comply with the radio instructions given by the intercepting aircraft.

12.4.3 Radio Communication during Interception. If radio contact is established during interception but communication in a common language is not possible, attempts shall be made to convey instructions, acknowledgement of instructions and essential information by using the phrases and pronunciations set out below:

a. By Intercepting Aircraft:

CALL SIGN	<u>KOL</u> SA-IN	What is your call sign?
FOLLOW	<u>FOL</u> -LO	Follow me
DESCEND	DEE- <u>SEND</u>	Descend for landing
YOU LAND	<u>YOU LAAND</u>	Land at this aerodrome
PROCEED	PRO- <u>SEED</u>	You may proceed

b. By Intercepted Aircraft

CALL SIGN	<u>KOL</u> SA-IN	My call sign is (---)
WILCO	<u>WILL</u> -KO	Understood, will comply
CAN NOT	<u>KANN</u> NOTT	Unable to comply
REPEAT	REE- <u>PEET</u>	Repeat your instruction
AM LOST	<u>AM LOSST</u>	Position unknown
MAYDAY	<u>MAYDAY</u>	I am in distress
HIJACK	<u>HI-JACK</u>	I have been hijacked
LAND (place name)	<u>LAAND</u> (---)	I request to land at (---)
DESCEND	DEE- <u>SEND</u>	I require descent

Notes: Syllable to be emphasised are underlined. Transmit each phrase twice.

The call sign required to be given is that used on radio communications with ATSU's and corresponding to the aircraft identification in the flight plan.

Circumstances may not always permit nor make desirable the use of the phrase HIJACK.

Series	Intercepting Aircraft Signal	Meaning	Intercepted Aircraft Responds	Meaning
1	<p>DAY or NIGHT Rocking the aircraft and flashing navigational lights at irregular intervals (and landing lights in the case of a helicopter) from a position slightly above and ahead of, and normally to the left of, the intercepted aircraft (or to the right if the intercepted aircraft is a helicopter) and, after acknowledgement, a slow level turn, normally to the left (or to the right if the intercepted aircraft is a helicopter) on to the desired heading.</p> <p>NOTE 1 Meteorological conditions or terrain may require the intercepting aircraft to reverse the positions and direction of turn given above.</p> <p>NOTE 2 If the intercepted aircraft is not able to keep pace with the intercepting aircraft, the latter is expected to fly a series of race-track patterns and to rock the aircraft each time it passes the intercepted aircraft.</p>	You have been intercepted. Follow me.	DAY or NIGHT Rocking aircraft, flashing navigational lights at irregular intervals and following.	Understood, will comply.
2	DAY or NIGHT An abrupt breakaway manoeuvre from the intercepted aircraft consisting of a climbing turn of 90 degrees or more without crossing the line of flight of the intercepted aircraft.	You may proceed.	DAY or NIGHT Rocking the aircraft.	Understood, will comply.
3	DAY or NIGHT Lowering landing gear, showing steady landing lights and overflying runway in use or, if the intercepted aircraft is a helicopter, overflying the helicopter landing area. In the case of helicopters, the intercepting helicopter makes a landing approach to hover near the landing area.	Land at this aerodrome.	DAY or NIGHT Lowering landing gear, showing steady landing lights and following the intercepting aircraft and, if after overflying the runway in use or helicopter landing area landing is considered safe, proceeding to land.	Understood, will comply.

Table 12.1 Signals initiated by Intercepting aircraft and Responses by Intercepted aircraft.

Series	Intercepted Aircraft Signal	Meaning	Intercepting Aircraft Responds	Meaning
1	DAY or NIGHT Raising landing gear and flashing landing lights while passing over runway in use or helicopter landing area at a height exceeding 300 m (1,000 ft) but not exceeding 600 m (2,000 ft) (in the case of a helicopter, at a height exceeding 50 m (170 ft), but not exceeding 100 m (330 ft)) above the aerodrome level, and continuing to circle the runway in use or the helicopter landing area. If unable to flash landing lights, flash any other lights available.	Aerodrome you have designated is inadequate.	DAY or NIGHT If it is desired that intercepted aircraft follow the intercepting aircraft to an alternate aerodrome, the intercepting aircraft raises its landing gear and uses the Table 2.11 Series 1 signals prescribed for intercepting aircraft. If it is decided to release the intercepted aircraft, the intercepting aircraft uses the Table 2.11 Series 2 signals prescribed for intercepting aircraft.	Understood, follow me. Understood, you may proceed.
2	DAY or NIGHT Regular switching on and off of all available lights, but in such a manner as to be distinct from flashing lights.	Cannot comply.	DAY or NIGHT Use Series 2 signals prescribed for intercepting aircraft in Table 2.11.	Understood.
3	DAY or NIGHT Irregular flashing of all available lights.	In distress.	DAY or NIGHT Use Series 2 signals prescribed for intercepting aircraft in Table 2.11.	Understood.

Table 12.2 Signal initiated by Intercepted Aircraft and Responses by Intercepting aircraft.

12.5 Radio Listening Watch. During all flights a radio listening watch is to be maintained on the most appropriate frequency and on 121.5 if possible, from engine start to engine shutdown and particularly in the following circumstances:

- a. During overflight (not penetration) of a MATZ when 2-way communication is not required by law.
- b. During flight through an AT during periods when the responsible ATC unit is not active.
- c. Operating out of hours at home base aerodromes.

- 12.6** **Signals.** Signals between ground and the air are detailed in the Jeppesen General Airway Manual Emergency section.
- 12.7** **Time System used in Operation.** The Company operates in UTC time.
- 12.8** **ATC Clearances, Adherence to Flight Plans and Position Reports.** Refer to Jeppesen General Airway Manual ATC section.
- 12.9** **Visual Signals used to Warn an Unauthorised Aeroplane Flying in or about to enter a Restricted, Prohibited or Danger Area.** Refer to the Jeppesen General Airway Manual Emergency section.
- 12.10** **Procedures for Pilots Observing an accident or Receiving a Distress Transmission.** Refer to the Jeppesen General Airway Manual Emergency section.
- 12.11** **The Ground/Air Visual Codes for use by Survivors, Description and use of Signal Aids.** The ground/air visual codes and signals for use by survivors are detailed in the Jeppesen General Airway Manual Emergency section.
- 12.12** **Distress and Urgency Signals.** Distress and urgency signals are detailed in the Jeppesen General Airway Manual Emergency section.

Section 13

Leasing Agreements

13.0 Terminology. Terms used in this paragraph have the following meaning:

- a. “Dry lease agreement” means an agreement between undertakings pursuant to which the aircraft is operated under the AOC of the lessee;
- b. “Wet lease agreement” means an agreement between air carriers pursuant to which the aircraft is operated under the AOC of the lessor;

13.1 Leasing of Aeroplanes

13.1.1 Any Lease-in.

a. Without prejudice to Regulation (EC) No 1008/2008, any lease agreement concerning aircraft used by 2Excel certified in accordance with Sub Part AOC, shall be subject to prior approval by the competent authority. Until the EASA SP FTL rules apply, 2Excel shall apply the provisions of the Company approved FTL scheme to any SP lease-in operation.

b. 2Excel shall only wet lease-in aircraft from an operator that is not subject to an operating ban pursuant to Regulation (EC) No 2111/2005.

i. In the event that 2Excel intends to lease-in an aircraft it shall provide the competent authority with the following information;(AMC1 ORO.AOC.110)

- a) The aircraft type, registration markings and serial number;
- b) The name and address of the registered owner;
- c) A copy of the valid certificate of airworthiness;
- d) A copy of the lease agreement or description of lease provisions, except financial arrangements;
- e) Duration of the lease; and
- f) In the case of a wet lease-in, a copy of the AOC of the third country operator and the areas of operation.

2Excel will provide the competent authority with a signed statement that the parties to the lease agreement fully understand their respective responsibilities under the applicable regulations.

13.1.2 Wet Lease-in

Before seeking approval of the wet lease-in of an aircraft of a third country, 2Excel shall demonstrate to the competent authority that:

- 1) The third country operator holds a valid AOC issued in accordance with ICAO Annex 6;
- 2) The safety standards of the third country operator with regard to continuing airworthiness and air operations are equivalent to the applicable requirements established by Regulation (EC) No 1321/2014 and this Regulation; and
- 3) The aircraft has a standard CofA issued in accordance with ICAO Annex 8.
- 4) Aircraft Registered in the Community but not in the United Kingdom from a Community Air Carrier must not be operated under the lease for more than 3 days cumulative and in total in any period of 12 consecutive months.

13.1.3 Dry lease-in

An applicant for the approval of the dry lease-in of an aircraft registered in a third country shall demonstrate to the competent authority that:

- (1) An operational need has been identified that cannot be satisfied through leasing an aircraft registered in the EU;
- (2) The duration of the dry lease-in does not exceed seven months in any 12 consecutive month period; and
- (3) Compliance with the applicable requirements of Regulation (EC) No 2042/2003 is ensured.

13.1.4 Dry lease-out

The operator certified in accordance with this Part intending to dry lease-out one of its aircraft shall apply for prior approval by the competent authority. The application shall be accompanied by copies of the intended lease agreement or description of the lease provisions, except financial arrangements, and all other relevant documentation.

13.1.5 Wet lease-out

Prior to the wet lease-out of an aircraft, the operator certified in accordance with this Part shall notify the competent authority.

13.2 Code Share Arrangements

Not applicable.

13.3 Differences Training. Any differences between the leased aircraft and the Company's own fleet are to be notified by means of a Crew Notice detailing the leased aircraft's registration, duration of the lease and the aircraft's specification - concentrating on items that have a direct impact on operations.