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FRENCH REPUBLIC

MARITIME PREFECTURE OF ENGLISH CHANNEL AND THE NORTH SEA

MINISTRY OF ECOLOGICAL TRANSITION AND SOLIDARITY

Division "State action at sea"

*"ORSEC maritime" office*

N° 0-22422-2017/PREMAR MANCHE/AEM/NP
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28 June 2017

Mr Thierry Coquil
Director of Maritime Affairs

and

Vice-Admiral Pascal Ausseur
Maritime Prefect for the Channel and North Sea

To

Recipients "in fine"

SUBJECT: Study on the objectification of maritime risk in the Channel - North Sea and its economic impact.

REFERENCES: a) Order No 50/2015 of 09 June 2015 approving and implementing the ORSEC Maritime scheme for the Channel and North Sea (Annex I - identification of dangerousness and risks);

b) letter 0-13536-2017 PREMAR MANCHE/AEM/NP and 81/2017/ASM DIRM MEMN/NP dated 20 April 2017 relating to the objectification of the maritime safety risk in the Channel - North Sea.

ATTACHMENTS: five appendices.

Please find attached a study carried out jointly by the Maritime Prefecture and the East Channel – North Sea Interregional Maritime Directorate on the objectification of maritime risk in the Channel - North Sea and its economic impact.

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The study uses an innovative analytical approach based on the classification of marine events according to different levels of seriousness, and a detailed presentation of the preventive measures implemented by the State when these events occur.

It highlights the exceptional financial cost that can result from events at sea - a cost that is generally amplified by the social and environmental impact of maritime disasters.

It provides useful information on the potential frequency of such events, objectively demonstrating the permanent nature of the risk and therefore the need for constant vigilance.

The study introduces an original method for assessing the cost-effectiveness of the public maritime safety policy implemented in a region highly exposed to maritime risks.

The value of the damage avoided in 2016 is estimated at €3.9 billion, and the budgetary cost of the maritime safety measures implemented by the State over the same period is around €20 million. While the absence of actual accidents is also linked to endogenous parameters (tightening of ship safety standards) and exogenous parameters (specific environmental conditions), the analysis carried out makes it possible to assess the multiplier effect of the State's investment: €1 committed by the State contributes directly to preventing damage amounting to €200.

The study shows that in 2016, 10 serious accidents and 11 major accidents were avoided in the Channel and the North Sea thanks to the complementary nature of the various levels and actions of maritime risk prevention. This is equivalent to the cost of two "*Exxon Valdez*" or almost two *Costa Concordia*".

The study provides a useful basis for reflection, which can be enriched to aim for the best match between the level of risk on the one hand and the prevention measures implemented by the State on the other.

In addition to the particular risk posed by commercial shipping in the Channel and North Sea, which is the main focus of the study given its prevalence and impact, the development of new uses of the sea (renewable marine energy), new risks affecting passenger transport activities in particular (terrorist threat, increase in the size of ships, etc.), and environmental issues (atmospheric emissions from ships) must also be taken into account. This global reflection must be carried out in conjunction with the other States bordering the Channel, which are themselves engaged in a rationalisation process and facing particular challenges (Brexit).

The State's response must be able to deal with all these threats in an efficient and appropriate manner. In addition to the capability dimension, this response must incorporate the new possibilities offered by technological and organisational innovation.

Thierry Coquil
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INTRODUCTION



**INTRODUCTION**

1. THE CHANNEL - NORTH SEA AREA: A MARITIME AREA WITH A HIGH CONCENTRATION OF USES

The Channel and North Sea maritime area concentrates a wide range of maritime activities in a restricted zone shared by several coastal states.

**Commercial shipping plays a major role here**. Between 20% and 25% of the world's commercial traffic passes through the Channel and the North Sea, meaning that some 60,000 ships and 500 million tonnes of dangerous goods pass through the Casquets and Pas de Calais Traffic Separation Schemes (TSS) every year. More than 17 million passengers a year cross the Channel and the Strait of pas de Calais, with a daily average of around 100 ferry rotations for the French ports alone. Commercial shipping is further complicated by the fact that the French ports of Le Havre, Dunkirk, Rouen, Boulogne-sur-Mer and Calais handle over 50% of France's freight traffic.

**In addition, more than 800 professional fishing vessels operate in the area throughout the year**, some of which work in and around the Casquets and Pas de Calais DSTs, in the middle of major commercial shipping routes**. Finally, around 135,000 pleasure craft** are registered in the French ports in the area (i.e. 10% of pleasure craft registered in France) and 600 to 700 water-based leisure events are organised there every year.

Alongside these nautical activities, the area is home to **industrial activities such as the extraction of marine aggregates and the laying and maintenance of submarine cables**, and will soon be home to offshore wind farm and tidal turbine farm projects.

Finally, it should be emphasised that these activities take place in **restricted environmental conditions**: 150 days a year of dangerous sea conditions (special weather bulletin: wind equal to or greater than 7 Beaufort), a sea temperature of between 07 and 10°C from October to March, 40 to 50 days of fog a year and a western zone marked by strong tidal currents, including that of the Raz Blanchard, which is one of the strongest currents in Europe.

**Despite these accident-prone conditions, there were no shipwrecks in the Channel - North Sea in 2016, despite 241 vessels being reported damaged and 720 close-quarters situations that could have led to more or less serious incidents, or even major accidents.**

Over and above the reactions of the crews of ships in difficulty, **it would appear that the combined action of the State's resources, coordinated by a tried and tested organisation, makes it possible overall to prevent and reduce maritime safety risks in the area**. The following examples illustrate this.

***"Kalliopi R.C."***
On the evening of 1 March 2016 at 8:50 pm, the container ship "*Kalliopi RC* ", flying the Liberian flag, reported total electrical damage to CROSS Jobourg at the exit of the channel in the port of Le Havre with 24 people on board.

The 294-metre container ship, containing almost 2,100 tonnes of heavy fuel oil, was drifting just 4 nautical miles (NM) off Cap de la Hève. After drifting for 50 minutes, she regained her electrical autonomy and manoeuvrability and reached waiting area no. 3 in Le Havre, where she suffered a second electrical failure at 11.10pm. The vessel was again adrift with no manoeuvrability and came within 300 metres of an anchored chemical tanker at around 11:30 pm. At 11:50, she regained her manoeuvring capabilities and anchored at 00:20 in holding zone 3, 14 NM (26 kilometres) from Cap de La Hève, with the agreement of the port of Le Havre and under the supervision of CROSS Jobourg. Meanwhile, the Maritime Prefect for the Channel and North Sea preemptively set sail the "Abeille Liberté ", stationed in Cherbourg.
Subsequently, the ship lost her main power supply again and remained on emergency generator power. During the night, the "*Abeille Liberté*" returned to the ship to prepare for any difficulties.

4/79

In view of the difficulties encountered by the "*Kalliopi RC*" in following the recommendations given by CROSS Jobourg, and given the weather conditions in the area (sea 5, west-south/west wind at 35 knots, gusting to 45 knots) which drove the vessel from its anchorage, the Maritime Prefect decided to give formal notice to the shipowner to put an end to the danger by carrying out repairs or towing the vessel to the port of Le Havre.

Early the next afternoon, the French Navy's EC-225 helicopter deployed an assessment and response team (ERT) appointed by the Maritime Prefect on board the "Kalliopi RC". With the container ship still damaged and unable to hold its mooring due to the wind and sea conditions (peak drift in excess of 6 km/h), the need to tow it was urgent. The "*Abeille Liberté* " proceeded to tow the "*Kalliopi RC*" after a delicate tow. With the vessel anchored with electrical damage, the response team then had to cut the anchor line so that the "*Abeille Liberté* " could set up a back-and-forth with her tow in the absence of an operational windlass on the "*Kalliopi RC* ". After a night under tow at sea, the vessel was taken to safety in the port of Le Havre, in coordination with the port authority.

***"Musketier"***

On Thursday 06 August 2016 at around 10:40, a cargo vessel was travelling up the DST rail north of Calais in the wrong direction. The vessel did not declare itself to the British "Dover Traffic" service and did not respond to its requests for identification. Having entered the French zone, the vessel also failed to respond to VHF calls from the Gris-Nez Centre Opérationnel Régional de Surveillance et de Secours (CROSS, Regional Operations Centre for Surveillance and Rescue). However, the AIS enabled "*the Musketier*" to be identified, having left Saint Petersburg and transiting towards the port of Bermeo in Spain. The 88-metre vessel was loaded with steel.

The "Musketier" remains silent and is still on a collision course with the French coast, despite multiple attempts to call out the various resources available to CROSS Gris-Nez. Given the proven danger to shipping in this very dense traffic zone, CROSS Gris-Nez, in liaison with the Cherbourg maritime operations centre (COM), called in the French Navy's Dauphin helicopter stationed at Le Touquet. The helicopter arrived on site at 11:30 pm and tried to make contact with the crew of the "*Musketier*". When the ship failed to respond, the helicopter diver was winched aboard the cargo ship. It was only after he had arrived in the ship's living quarters that the crew made themselves known.

After explaining the danger of the situation to the crew, the diver was airlifted to safety. The vessel then carried out an emergency manoeuvre to get back to the right lane as quickly as possible (downbound track in the British zone). The intervention tug (RIAS) *Abeille Languedoc*, with five maritime gendarmes on board, escorted the cargo ship. It was relayed a few hours later by the patrol vessel *Pluvier* as far as the exit of the Casquets DST. At the request of the Maritime Prefect, the vessel was inspected by the Spanish maritime authority on arrival in Bermeo. An infringement report was sent to the shipowner and the flag State by CROSS Gris-Nez. The Maritime Prefecture obtained reimbursement from the shipowner of the sums incurred by the State to put an end to the danger.

## 2. THE ORGANISATION AND PLAYERS INVOLVED IN EMERGENCIES AT SEA

### 2.1. An interdepartmental framework

In mainland France, this organisation is based on the maritime prefect, who is responsible for defending sovereign rights, safeguarding people and property and protecting the environment[1]. In this capacity, he coordinates the action of the various administrations concerned and the deployment of their resources: the French Navy, Maritime Affairs, Gendarmerie, Civil Security, Customs and the National Police.

Of the seven missions relating to maritime safety[2], **intervention at sea on vessels in difficulty or danger and surveillance and policing of maritime navigation cover more especially the study scope where**

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1 Under the decree of 06 February 2004 on the organisation of State action at sea.
2 Defined by the decree of 22 March 2007 establishing the list of missions at sea incumbent on the State.



**The French Ministry of Defence and the Ministry of Ecological Transition and Solidarity are the main suppliers of resources.** The French Navy hosts the maritime prefect's interministerial headquarters and provides military resources under the orders of the maritime zone commander. The Directorate of Maritime Affairs draws up and implements regulations on maritime traffic, ship safety and pollution prevention. It also

coordinates and supports the activities of the operational surveillance and rescue centres (CROSS) and the ship safety centres (CSN).

**2.2. A single authority: the Maritime Prefect**

As part of the ORSEC maritime contingency plan, the Maritime Prefect is the Director of Emergency Operations (DEO). He or she has a permanent staff to handle communications, legal and financial aspects and technical and operational advice. In the event of a major marine event, he activates a crisis team to advise him in his duties as DEO at sea.

Under normal circumstances, the centre responsible for coordinating assistance to ships in difficulty is the CROSS, as part of its maritime assistance service. However, in certain cases, the Maritime Prefect may decide to transfer the coordination of an assistance operation to the Maritime Operations Centre (COM) in Cherbourg.

**2.3. CROSS Jobourg and CROSS Gris-Nez: continuous monitoring of maritime safety**

CROSS Jobourg and CROSS Gris-Nez carry out their maritime safety monitoring missions respectively for the Casquets DST and the Pas de Calais DST. They carry out their maritime assistance and search and rescue coordination duties in their areas of respective responsibilities.

Reporting to the Ministry of the Ecological Transition and Solidarity, they perform four essential functions under the authority of the Maritime Prefect.

As part of their maritime rescue coordination duties, they receive and process alerts issued as part of the Global Maritime Distress and Safety System (GMDSS). In this capacity, the officer on duty coordinates search and rescue operations in the capacity of Rescue Mission Coordinator (RMC).

CROSSs are responsible for receiving and processing reports of marine incidents that ships are required to make as part of their international obligations. The CROSS, in its role as *Maritime Assistance Service* (MAS), is the point of contact for the coastal State of any vessel whose situation is likely to require assistance.

As a Vessel Traffic Service, the **CROSSs** ensures that the rules of navigation in the **DSTs are complied with, and endeavours to detect high-risk situations and prevent accidents by ensuring that ships take the appropriate steps to avoid collisions.**

Finally, CROSS Jobourg is responsible for monitoring marine pollution at national level. It centralises all information relating to marine pollution observed at sea, checks its authenticity and monitors it. It reports the incident to the maritime prefect (responsible for pollution response) and informs the public prosecutor (responsible for the repression of deliberate pollution) in the event of suspicion of illegal discharge.

**2.4. Cherbourg Maritime Operations Centre (COM)**
The Maritime Prefect's COM is continuously manned by a staff officer who ensures the permanence and continuity of the action of the Maritime Prefect and the Maritime Zone and District Commander. He is responsible at all times for informing and alerting the Maritime Prefect, organising the standby of the alert vessel for government action at sea (AEM), general coordination of the use of government resources at sea, informing and alerting the Coastguard Operations Centre (CoFGC) and the central military and civilian echelons.

As far as its military remit is concerned, it is responsible for the operational control of all military resources assigned or deployed in the Channel and North Sea maritime area.



Finally**, COM Cherbourg is the centre responsible for coordinating pollution response operations.**

**2.5. On-site resources**

For the perimeter of the sea events considered in the study, the State's response to safety risks is as follows:

- **by the detection and analysis of dangerous situations that could lead to a collision or grounding by the CROSS** as part of its mission to monitor shipping within the perimeter assigned by OMI resolutions;
- or **by deploying means of intervention at sea** as part of assistance under the MAS and/or for the protection of the environment and related State interests. **The resources deployed act under the coordination of CROSS, or COM Cherbourg if the transfer of coordination has been decided by the Maritime Prefect.**

*2.5.1. Intervention, assistance and salvage tugs (RIAS)*
Chartered by the French Navy and stationed in Cherbourg and Boulogne-sur-Mer, they are placed under the operational control of the maritime zone commander, on behalf of the maritime prefect. The Maritime Prefect can also call on the assistance of port tugs (Le Havre and Dunkirk) as part of one-off services activated by purchase order contracts.

*2.5.2. Assessment and intervention teams*
The Maritime Prefect can deploy personnel at sea to assess a ship in difficulty in situ as part of the coastal State's prerogatives to prevent a risk of pollution. The Maritime Prefect has a permanent on-call team from the French Navy for this task and the ship safety centres also provide qualified personnel to join these teams deployed at sea (ship safety and maritime occupational risk prevention inspectors). The Maritime Prefect can set up protean **assessment teams**, adapted to the risk to be assessed, by also mobilising port pilots, port officers, maritime gendarmes or any other government agent.

If the assessment has to be accompanied by an intervention on the ship, military personnel from the Cherbourg naval base form the first pool of intervention teams for the maritime prefect: firemen, sailors, radiological technicians. Firefighters from the departmental fire and rescue services can also be integrated into these teams[3].

*2.5.3. Maritime intervention helicopters*
The helicopters of the French Navy's Maupertus and Le Touquet detachments are the preferred vehicles for deploying assessment and response teams on the high seas, and also offer their own assessment and response capability, available at all times for the State's representative at sea. Civil security helicopters can also be used to deploy EEIs on behalf of the Maritime Prefect.

**2.6. Monitoring players**
The French Navy operates 14 semaphores along the Channel and North Sea coast. These military units keep a radio, optical and radar watch in the coastal zone and are likely to detect abnormal situations, which they report to COM Cherbourg and the CROSS.

The constant watch kept by CROSS and semaphores is also fed by information provided by all sea users, particularly shipping companies. Lastly, all government resources deployed at sea can be the source of the identification of a situation requiring a response from the public authorities, and ship safety centres and harbourmasters' offices are also involved in the ongoing monitoring of maritime safety risks.

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3 Subject to the provisions set out in the agreement on the contribution of the SDIS to search and rescue operations at sea, as part of the specific contribution to reinforcing the operational capacity of the Maritime Prefect.



## 3. SUMMARY OF THE STUDY

This study, carried out jointly by the Maritime Prefecture Channel - North Sea and the Interregional Directorate for the Sea Channel East - North Sea, aims to analyse the risks associated with maritime

navigation in the Channel - North Sea in 2016 and to assess the impact of government resources (cost) involved in maritime safety in terms of the amount of damage avoided thanks to their intervention.

The scope of the study covers ships of more than 300 UMS that reported damage to the CROSS and ships that were the subject of a near miss report by the CROSS in 2016.

Based on the method described in Appendix I, the study identified 22 significant maritime safety events in 2016:

- **1 marine incident** avoided;
- **10 events** with aggravating factors that could **lead to a serious accident**[4];
- **11 events** with aggravating factors **that could lead to a major accident**[5].

To supplement the events selected in 2016, 2 major events from 2015 are included in the study (major accidents avoided).

The study is structured as follows:

- **the first appendix** explains the method adopted to select the sea events, and details the associated references;
- **the second appendix** presents a risk analysis matrix for the marine events studied;
- **the third appendix** sets out the actions taken by the various State resources involved in these events to reduce the risks analysed;
- **the fourth appendix** details the valuation of the damage avoided by the State's action;
- **the fifth appendix** contains the bibliography used by the working group.

However, the maritime safety risks in the Channel and North Sea are not limited to the cases studied, which are emblematic of the maritime safety risks in the area. The study cannot cover all the missions covered by the State resources committed to these events.

Over and above these reservations, it appears that the **costs incurred by the State for maritime safety surveillance and response amounted to around €20 million for 2016.**

The value of the damage avoided for the 22 cases studied in 2016 was €3.9 billion. The cost of State resources included in the study therefore corresponds to around 0.5% of the cost of avoided damage in 2016 in the Channel - North Sea. We can consider that the added value brought to the **blue economy by the preventive and reactive action taken by the State to ensure maritime safety in the Channel - North Sea represents each year almost the cost of two "Exxon Valdez" or more than two "Costa Concordia".**

4. Withheld according to the Vessel Triage analysis. "A situation involving aggravating factors that could lead to a serious incident requiring coordinated intervention by government resources to bring the situation under control".
5. Retained according to the Vessel Triage analysis. "Situation with aggravating factors that could lead to a major accident: all the consequences could not be controlled despite effective intervention by State resources"

In the letter referred to in reference b), the Maritime Prefecture of the Channel and the North Sea and the Interregional Direction of the Sea Channel East - North Sea appointed a working group to draw up a study on the objectification of maritime safety risks in the Channel - North Sea and the enhancement of hazard management by State resources.

The aim of the study is to quantify and materialise the shipping risks in the Channel - North Sea and to assess the value of the State resources (cost) involved in maritime safety in the Channel - North Sea in terms of the amount of damage avoided thanks to their action.

1. SCOPE OF THE STUDY

The scope of the study covers the following ships and events at sea:
- Vessels over 300 UMS reporting damage to CROSS in 2016 (calendar year);
- Vessels subject to a near miss report by CROSS in 2016 (calendar year);
- A selection of typical marine incidents in the area in 2015.

Based on a method inspired by the "*Vessel Triage* 6" presented to the OMI in 2016 (see below), the study made it possible to select significant events in terms of maritime safety risks. The list of marine occurrences is given in Appendix II.

**For 2016**, 22 events have been selected:
- **1 incident** at sea avoided;
- **10 events** involved aggravating factors **that could lead to a serious accident**;
- **11 events** involved aggravating factors **that could lead to a major accident**.

To complete the 2016 events, 2 major events from 2015 are included in the study (major accidents avoided).

However, the maritime safety risks in the Channel and North Sea are not limited to the cases studied, which in this case are emblematic of the maritime safety risks in the area. As part of their maritime assistance service, CROSS Jobourg and CROSS Gris-Nez have reported a large number of incidents of damage and close-quarters situations.

The study produced the following summary:

| Events 2016 | CROSS | Damages reported | Close Situations (DST) | Incident at sea avoided | Serious accident avoided | Major accident avoided |
|---|---|---|---|---|---|---|
| | **Jobourg** | 170 | 80 | / | 6 | 3 |
| | **Gris-Nez** | 71 | 640 | 17 | 4 | 8 |
| | Events 2015 | | | / | / | 2 |
| | | | | 1 | 10 | 13 |
| Total events selected | | | | **1** | **10** | **13** |

Inherently, damage reported to CROSS and close-quarters situations constitute an inherent risk for shipping and the environment. The permanent action taken by CROSS under the surveillance of shipping reduces these risks

6. The *"Vessel Triage"* method was developed by the Finnish Coast Guard. In spring 2017, it was discussed by the OMI-OACI working group with a view to its possible inclusion in the 2019 edition of the IAMSAR manual. The aim of this method is to save time in decision-making and improve the exchange of information between those involved in assistance operations.
7. This event is included in the study because of the notification of a near miss report sent by CROSS Gris-Nez to the shipowner and the interest it presents.



in the restricted areas of the Casquets and the Pas de Calais.

2. METHODOLOGY

**2.1. Determining the level of maritime safety risk: the inspiration and adaptation of "*Vessel Triage*"**

In order to determine the maritime safety risk on the basis of objective criteria, the GT has drawn up an analysis grid inspired by the "*Vessel Triage*" method mentioned above.

This experimental method consists of determining the status of a vessel according to the existence of "threat factors"[8]. When several threat factors are present, the most severe factor determines the final status.

However, the GT decided to add to the method in order to have a broader approach than just the risks generated by damage to a vessel.

**Adaptation of the " Vessel Triage" analysis grid:**
To this end, the **analysis grid has been expanded to include "close situation" and "abnormal situation"** to cover risk situations created by proximity to a risk zone, a dangerous collision route or even the cumulative addition of the transport of dangerous goods or the presence of passengers.

For these two lines, the grid operates cumulatively. So, a close situation classified as "Red" must meet the other "close location" criteria" set out in the bylaws "Green" and "Yellow".

Finally, the **four statutes of the 'Vessel Triage' have been redefined** to reflect the objective risk of maritime safety:

- "Green": **situation requiring immediate action** to prevent a maritime event: collision, grounding, pollution, accident, damage, loss;
- "Yellow": situation with **aggravating factors that could lead to a serious incident** : the need for a coordinated response from the State to bring the situation under control;
- "Red": situation with **aggravating factors that could lead to a major accident**, the consequences of which could not be controlled despite effective intervention by the State;
- "Black": situation in which **external intervention is no longer possible to prevent the intrinsic risk** to maritime safety. This status corresponds to that of a vessel declared a total loss (e.g. *Tricolor, Napoli, Levoli Sun, etc.*). State resources will be required to combat the pollution and reduce the risk of over-accident caused by the wreck.

This analysis grid was used to draw up the list of events detailed in Appendix II.

**2.2. Analysis of the role played by government resources at sea in reducing the maritime safety risk: counterfactual reasoning**
For each event listed in Appendix II, an analysis was made of the action taken by government resources to reduce the maritime safety risk and prevent the incident or accident from occurring.

For the purposes of this study, the method used is the so-called "scenarios" based on events that have already occurred. For each event considered, the risk of which was assessed as unacceptable (and which logically led to the use of government resources), the GT considered the consequences of the event (worsening or improvement) if the government resources had not been used. The marine events selected

8. threat factors.



were analysed in a counterfactual[9] manner to reflect *a contrario* on the need to use each means or tool used in the context of the sea event.

Appendix III sets out a detailed analysis of the success or vulnerability factors for each event and answers the question: what would have been the damage if the State had didn't act?

The actions of the shipowner or crew and the environmental conditions of the vessel in difficulty are also analysed using the same reasoning.

**2.3. Valuing the damage avoided by the action of the resources in relation to the investment made**

The GT has developed a cost analysis grid covering the following headings:

- value of the vessel;
- value of the cargo;
- clean-up costs;
- maximum amount of repairs to be paid by the shipowner, as set by the LLMC convention;
- valuation of economic and ecological damage, based on Professor Dagmar Schmidt Etkin's modelling of pollution control costs and induced damage [10].

A summary valuation of the State's resources directly involved in the management of events at sea makes it possible to compare the amount of damage avoided and the investment made by the State to reduce maritime safety risks.

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9. Counterfactual reasoning developed by American professor Larry Griffin (MIT Sloan School of management): *event structure analysis*
10. "*FSS 2004: Etkin, Damage Cost Modeling*", used by the US Coastguards.





**SEA EVENTS STUDIED**

For 2016, the accident analysis grid revealed 22 marine incidents with objectively proven maritime safety risks.

1. SCOPE

The study revealed that around half of the major events avoided were collisions or groundings ("Near-miss"[1] 1 N-M) or near-accidents reported to the shipowner and flag State by the CROSS). In 2016, "Near-miss" accounted for 10 incidents and accidents avoided.

**In 2016, 22 incidents or accidents were avoided in the Channel - North Sea:**

- 1 marine incident avoided (situation requiring immediate action to prevent a marine event);
- 10 serious accidents avoided (situation with aggravating factors that could lead to a serious incident);
- 11 major accidents avoided (situation with aggravating factors that could lead to a major accident).

The 22 cases studied in 2016 can be grouped into two categories of initial occurrence:

- **11 vessels in damage** (DEFREF or *Deficiency Report*), adrift in the traffic lane and with a high risk of collision or grounding due to their non-manoeuvrable nature. 11 cases were dealt with in 2016, in some cases requiring formal notice to the shipowner and/or the deployment of a response tug;
- **10 near-miss situations** ("near-miss") identified by the CROSS, due to the high initial risk of collision or grounding presented by these events. The near-miss character is defined by a sum of determining factors: anti-collision manoeuvre, infringement of helm rules, dangerous route.

Two significant events in 2015 have been added to the study.

| CROSS | Damages reported | Close Situations (DST) | Incident at sea avoided | | Serious accident avoided | | Major accident avoided | |
|---|---|---|---|---|---|---|---|---|
| | | | MAS | N-M | MAS | N-M | MAS | N-M |
| Jobourg | 170 | 80 | / | / | 4 | | 2 | |
| | | | 3 | / | | | | |
| Gris-Nez | 71 | 640 | / | 1 | 2 | | 2 | |
| | | | 3 | 5 | | | | |
| **Events 2016** | | | **1** | | | | **10** | |
| **11** | | | | | | | | |
| Events 2015 | | | / | / | / | / | | |
| / | 2 | | | | | | | |
| **Total events selected** | | | **1** | | | | **10** | |
| **13** | | | | | | | | |

2. USE OF THE SEVERITY CLASSIFICATION GRID FOR MARINE EVENTS

The working group drew inspiration from the "Vessel Triage" grid designed and submitted to the OMI by the Finnish coastguard.

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11 cf. OMI definition given in OMI circular MSC - MPEC.7/circ.7 of 10 October 2008 on *"Guidance on near-miss reporting": "Defining near-miss: a sequence of events and/or conditions which could have resulted in a loss. This loss was prevented only by a fortuitous break in the chain of events and/or conditions. The potential loss could be human injury, environmental damage or negative commercial impact".*



At the suggestion of the CROSSs, the original "*Vessel Triage*" grid has been supplemented by two additional accident-prone situations: close-quarters situations and abnormal situations. In order to be sufficiently characterised to constitute a maritime safety risk, these situations operate in a cumulative mode, unlike the other criteria. Thus, to qualify as a close-quarters situation "Red", an event must combine all the criteria "Green" and "Yellow" of the close-quarters situation.

Determining the overall colour of the sea event works as follows. In the case of several criteria, the highest colour reached by a criterion defines the overall colour chosen.

The classification grid developed and the sea event classification matrix are shown infra.



CLASSIFICATION GRID FOR MARINE EVENTS

**[translator note: in the source document this table in one page but it takes two pages here]**

| CRITERIA | GREEN | YELLOW | RED | BLACK |
|---|---|---|---|---|
| | | Cumulative conditions | | |
| **Close-up situation** | Evolution of the ship whose CPA and TCPA are inferior to the limits considered | Complex surface situation and faulty communications, | Proximity to a high-risk area (turning points, coastline, sandbanks and | Collision or grounding is unavoidable |

| | | | | |
|---|---|---|---|---|
| | dangerous in the defined zone and which generate a risk of collision. | **OR**<br>Vessel with poor manoeuvrability (GTE, weather conditions hampering manoeuvrability, not master of its manoeuvres, vessel with limited manoeuvring capacity). | shoals, concentration of vessels in fishing action) leading to a situation of confinement.<br>**OR**<br>Ships carrying dangerous goods (MARPOL, appendix I and II).<br>**OR**<br>Passenger ships | |
| **Cumulative conditions** | | | | |
| **abnormal situation** | Speed reduction for no good reason<br>**OR**<br>Sudden itinerary changes.<br>**OR**<br>exit from shipping lanes in unusual places<br>**OR**<br>Position announced uncorrelated by the STM.<br>**OR**<br>Unusual trajectory clearly indicating a collision or grounding. | accumulation of at least two abnormal behaviours from column 1<br>**OR**<br>No response to calls from the VTS.<br>**OR**<br>Grounding road.<br><br>**NB: An abnormal situation can pass directly to the "*yellow stage*" without 1st stage criteria.** | turning points, coastlines, sandbanks and shoals, concentrations of vessels in fishing action)<br>**OR**<br>Ships carrying dangerous goods (MARPOL appendix 1 and 2).<br>**OR**<br>Passenger ships. | Collision or grounding is unavoidable |
| Cumulative conditions | | | | |
| Invasiveness | Invasiveness affects a limited area and has no effect on stability or navigability. | Invasiveness can be controlled by means internal to the ship, but seaworthiness is reduced | Major uncontrolled Invasiveness threatening the integrity of the vessel and involving compartments not initially affected by the collision. | The Invasiveness is such that evacuation is no more possible.<br>**OR**<br>The ship has capsized or is sinking |
| Gite, loss of sinability | Heeling or loss of stability does not affect the seaworthiness of the vessel. | Major list and loss of stability restricting the vessel's seaworthiness. | Very large list. Navigability seriously affected, stability threatened. Rapid evacuation required. | Loss of stability such that evacuation is no longer possible.<br>OR<br>The vessel has capsized or sunk. |
| Loss of manoeuvrability | Limited manoeuvring capacity, but the vessel can make way. | Loss of manoeuvrability but vessel still capable of emergency | Total loss of manoeuvrability, vessel unable to anchor or set controlled drift. | NC |

| | | | | |
|---|---|---|---|---|
| | | anchorage or controlled drift. | | |
| Total electrical damage | The ship's essential functions are maintained during repairs. | Vessel's operational capabilities are limited: emergency systems are not functioning as intended.<br>**OR**<br>The essential functions of the vessel are rescued but the vessel cannot repair at sea. | Total electrical damage of long duration which cannot be repaired at sea and which endangers the vessel. | NC |
| Fire ; explosion | Fire extinguished with no risk of recurrence<br>AND/OR<br>Explosion with no consequences for the safety of the vessel. | Fire or explosion affecting a small area, the event can be brought under control using onboard resources. | Uncontrolled fire.<br>**OR**<br>Explosion endangering the integrity of the vessel. | Chances of survival on board are affected. The consequences of the fire or explosion directly threaten the integrity of the people on board the ship.<br>OR<br>Vessel destroyed. |
| Loss of hazardous substance | Loss of dangerous substances not threatening the integrity of the vessel. | Loss of hazardous substances threatens certain parts of the ship, but releases are controlled and limited to certain sections. | Loss of hazardous substances threatening the integrity of the vessel. | NC |



**[TRANSLATOR NOTE : Due to formatting issue I was not able to do the 5 following pages in this document itself; this is why I did it in the doc that I call Appendix 1]**

**APPENDIX III to letter no. 0- -2017/PREMAR MANCHE/AEM/NP of June 2017**
**n° /NP of June 2017**

## ANALYSIS OF THE ROLE OF STATE RESOURCES IN REDUCING MARITIME SAFETY RISK

The counterfactual analyses of each maritime event show that, overall, the **State's resources are helping to control maritime safety risks in the Channel-North Sea area**, thanks to careful monitoring by the players involved.

The State's response has a number of strengths, but there are a number of points worth highlighting.
1. FORCE FACTORS
An analysis of the 24 maritime incidents highlights the strengths of the State's response, which is helping to reduce maritime safety risks

**1.1. the combination of MRCC, MAS and VTS functions by CROSS** Jobourg and CROSS Gris-Nez makes a major contribution to the responsiveness and efficiency of the coastal State's response. It provides the Maritime Prefect with a comprehensive overview of maritime safety in his zone;
**1.2. the "IED / formal notice / RIAS trinity"** gives the Maritime Prefect an efficient and coherent emergency response capability. The government delegate at sea has solid detection, assessment and intervention tools, reinforced by coercive legal prerogatives. Finally, the performance of navigation surveillance missions by the RIAS helps to reduce response times for certain events at sea: **in 2016, a third of emergency tows14 were carried out when the RIAS was already at sea (on patrol or pre-positioned at anchor for weather warning);**
1.3. each DST is monitored by a CROSS with a RIAS and a Maritime Intervention Helicopter at its disposal;
1.4. the presence of a semaphore chain to support CROSS in coastal surveillance.

**ATTENTION FACTORS**

***2.1. The possible simultaneous deployment of the 2 RIAS in the Channel-North Sea***

**The coverage provided by the 2 RIAS is satisfactory, as it makes it possible to reach any point in the French Channel-North Sea area of responsibility in less than 06h00**. In addition, it means that a response towing capacity is available for the rest of the zone in the event of a RIAS being engaged (4 hours to place the available means in a position equidistant from the "Greenwich buoy". **However, accidents in the area in 2016 show that 2 RIAS can be engaged simultaneously**15. This deprives the Maritime Prefect of an additional response tug in the event of a new incident at sea, in an area characterised by high risks (density of maritime traffic, proximity of the coastline, prevailing winds towards the French coast), where the State's response must be immediate, as the risk of grounding on the coast can be counted in hours.
from grounding to shore is counted in hours.

***2.2. Capability limits of EEI***

**The case analyses reveal the relevance and quality of the EEI deployed in the event of a marine event. However, analysis reveals certain limitations:**

- **the lack of EEI personnel on call in the north of the coastline**: although EEI resources are generally assured, the north of the coastline suffers from a lack of EEI military skills that can be deployed at very short notice. The Maritime Prefect's ability to mobilise and deploy

14 2 sea rescue tugs on the 6: "Flinter America" and "SBI Flamenco"
15 In this case, a comparative analysis of the "*Lizrix*", the "*Kalliopi R.C.*" and the "*Amadeus Amethist*" reveals that the two RIAS of the coastline were engaged at the same time and that two assessment teams were deployed almost simultaneously

civilian staff to supplement the on-call personnel of the French Navy, since all the ports of the coastline can partially compensate for this deficit. The partnership developed with SDIS 62 will help to make up the shortfall.

- **offshore deployment, which is highly dependent on Navy helicopters**: in the events selected in 2016, **6 out of 7 EEI deployments (85%) were carried out by helicopter,** for most of them offshore (14.4 NM off the French coast). The EEI asset is highly dependent on French Navy helicopters, which also significantly reduce the transit time between the recovery site and the vessel in difficulty. What's more, most of the EEI teams and their equipment are stationed in Cherbourg. The helicopter is therefore a key asset for deployment at sea.

### *2.3. Shipowners take maritime safety risk into account*

**Commercial vessels transiting the Channel spend more than 45% of their sailing time in restricted areas16**, due to their proximity to the coast (3 NM at the narrowest point).

**Particular attention must be paid to the ability and willingness of shipowners and their interests to put an end to the danger to the environment and shipping.** Firm and early action by the coastal State from the very first hours of an incident at sea can significantly reduce the risk to maritime safety. The management of the container ship "Kalliopt R.C." by the maritime authority (ex officio action) is a good illustration of this.

### *2.4. Detection of abnormal offshore situations outside CROSS VTS zones*

The maritime traffic services mission assigned to the CROSS is only carried out within the areas declared to the OMI for the MANCHEREP and CALDOVREP systems. Outside VTS zones, the French Navy's semaphores can nevertheless detect abnormal situations in coastal areas thanks to their radar and optical surveillance, as illustrated by the case of the ferry "*Grande Francia*".

## 3. METHOD FOR ANALYSING SEA EVENTS

The classification of maritime events was the first step in establishing a relevant basis for the intervention of government resources to be analysed.

The aim of this analysis is to assess the quality of the State's resources involved in maritime safety in the Channel and North Sea. For each event, the aim is to analyse the part played by the State's resources in preventing an incident or accident from occurring.

**The working group therefore drew up an analysis grid to determine the role played by the State's resources** in relation to the endogenous and exogenous factors of the sea event.

| | **Exogenous factors** | **Endogenous factors** | **Factors linked to the State's response** |
|---|---|---|---|
| **Success criteria** | | | What role did the State's resources play in preventing the accident? |
| **Vulnerability criteria** | | | What didn't work or might not have worked? |
| Damage avoided by State action | | | |
| If the State had not acted, would the situation have developed in the same way? | | | |

16 DST, CALDOVREP and MANCHEREP reporting zones.



The following criteria should also be taken into account when completing the analysis grid for marine events:

- **exogenous factors**: weather conditions, proximity to the coast, traffic density, state of the seabed for anchoring, etc;

- **factors endogenous to the vessel**: total electrical damage, problematic targeted damage, state of fatigue of the crew, experience of the crew on this vessel, history of the vessel;

- **factors linked to the organisation of the State's response:** availability of resources, coordination and communication between the various departments and units, competence of the agents to carry out the task assigned to them, etc...

The results of this analysis are presented in Appendix III.1 for the MAS and "Near-Miss" selected.



**APPENDIX III.1 to letter no. 0- -2017/PREMAR ENGLISH CHANNEL/AEM/NP of June 2017**
**n° /NP of June 2017**

**ANALYSES CARRIED OUT FOR THE 11 MAS**

| Chemical tanker "ATLANTIS ARMONA" | | | |
|---|---|---|---|
| Date | 08/02/2017 | Cargo | On ballast |
| SRR | Jobourg | Hydrocarbons | 71 t Fo<br>16 t DO<br>5250 L LO |
| Length | 93 metres | Weather conditions | Sea 5 Wind 8 Beaufort |

| | |
|---|---|
| Players involved | "Abeille Liberté"<br>COM Cherbourg<br>EEI<br>Tugboat "*Boluda*" |

| **The facts** | |
|---|---|
| On 08 February 2016, the vessel *"ATLANTIS ARMONA"* reported propulsion damage to CROSS Jobourg. Due to this damage, it was anchored at a position approximately 4 nautical miles off the French coast. The weather conditions are particularly unfavourable (sea 5, wind 100 km/h and gusts up to 140 km/h). From 04:00 p.m. local time, the anchored vessel was observed to be gradually drifting towards the coast. A formal notice to stop the danger was sent to the shipowner. The deployment of a tug from Le Havre ("*VB Gascogne*") was requested.<br><br>The RIAS "*Abeille Liberté*" is on site to escort the vessel and take charge if the tug " *VB Gascogne*" fails.<br><br>The vessel regained propulsion at 08:00 p.m. (local time) and left its anchorage to head for the port of Le Havre. Further propulsion damage occurred at 09:30 p.m. (local time). The vessel regained propulsion at 9:55pm (local time). The state of the sea and the weather conditions did not allow the vessel to berth in the port of Le Havre following a negative opinion from the port pilot for night berthing. The vessel then moved to an anchorage in holding area no. 1 in the port of Le Havre. | |
| Risk content | Loss of manoeuvrability. |
| Performance criteria | Ability to deploy a large number of nautical resources and a response team on board a vessel within a few hours. |



Chemical tanker "ATLANTIS ARMONA"

| | Exogenous | Endogenous | Factors linked to State's response |
|---|---|---|---|
| Success criteria | - Proximity of potential means of intervention. | - Shipowner aware of the risk of grounding: requests the | - Mobilisation of a harbour tug from Le Havre to await the arrival of the "*Abeille Languedoc*"; |

| | | | |
|---|---|---|---|
| | | mobilisation of a private tug;<br>- Small, ballasted vessel;<br>- Final capacity of the vessel to repair by its own means. | - Deployment by helicopter of a response team "towing team" on board the vessel to facilitate the passage of a trailer;<br>- Formal notice sent to the shipowner to speed up commercial towing; Smooth CROSS / RIAS/COM/EEI exchanges;<br>- EEI expertise |
| Vulnerability criteria | - Worsening weather conditions (wind 7-8 // sea 5) pushing the vessel towards the coast:<br>- Proximity to the coast (6 kilometres). | - Non-manoeuvring vessel: propulsion damage;<br>- Poor anchoring, initial holding of the anchoring<br>- Tangle of the two anchor lines in the water. | - The RIAS "Abeille Languedoc" was delayed by 06 hours from Boulogne-sur-Mer due to the simultaneous engagement of the "*Abeille Liberté*" due to weather conditions;<br>- The 2 RIAS in the Channel and North Sea area are simultaneously engaged in two different events ("*Abeille Liberté*" engaged on the "*Kalliopi RC*" off Le Havre), depriving the maritime authority of a reserve means of intervention in the event of a new event at sea:<br>- CROSS and La Hève semaphore failed to detect the presence of a vessel in a lightly frequented area. |

Damage avoided by the State's action

**Thanks to the action of the State's resources, the risk of the vessel running aground on the coast was considerably reduced. The clean-up and dismantling of this vessel at the foot of the cliffs south of Antifer would have been much longer and more difficult than that of the "TK Bremen", a similar cargo ship that ran aground on a beach in Morbihan in 2011. It took 1 month to dismantle and 3 months to rehabilitate the site.**



Container ship"KALLIOPI"

| Date | 1st to 03/03/2016 | Cargo | Lège |
|---|---|---|---|
| SRR | Jobourg | Hydrocarbons | 2,100 tonnes of FO, 99 tonnes of DO, 26,000 litres of LO |
| Length | 294 metres // Tonnage: 53,833 UMS | Weather conditions | Wind W 8-Sea 6 |

| Players involved | |
|---|---|

| | |
|---|---|
| COM Cherbourg<br>CROSS Jobourg<br>RIAS "Abeille Liberté"<br>EC 225 Maupertus helicopter<br>IEE (Leader: LV Invernizzi)<br>GPMH port VTS and pilots | |

| The facts | |
|---|---|
| On 1 March 2016, the container ship "*Kalliopi RC*", flying the Liberian flag, suffered total electrical damage as it left the channel in the port of Le Havre (in the presence of the harbour pilot and a harbour tug) at 8.50 pm.<br><br>The vessel found itself adrift just 4 NM from Cap de la Hève. She regained her electrical autonomy and manoeuvrability at 9.40pm and reached holding area no. 3 in Le Havre, where she suffered a second electrical failure at 11.10pm. The vessel was again adrift without any manoeuvring capacity and came within 300 metres of an anchored chemical tanker at around 23:30. At 23:50, she regained her ability to manoeuvre and anchored at 00:20 in holding area n°3, 14 NM from the cape of La Hèvre. She subsequently lost its main power supply again and remains on emergency power.<br><br>During the night, the "Abeille Liberté" rally the ship to prepare for any difficulties.<br><br>In the early afternoon of 02 March 2016, as a result of worsening weather conditions, the container ship began to chase her anchor, with peak drifts in excess of 3.2 knots. At 3:20 pm, she again suffered total electrical damage.<br><br>After giving formal notice to the shipowner to put an end to the danger during the night of 1 March, the Maritime Prefect ordered an assessment team to be sent on board the vessel. It found that the crew had no control over the vessel and that it would be impossible to regain manoeuvrability without carrying out repairs alongside the quayside. The maritime authority then decides to take the ship under tow to put an end to the danger. In coordination with the port authority, the vessel was welcomed alongside the quayside in the port of Le Havre on 03 March. | |
| **Risk content** | Loss of manoeuvrability / Total electrical failure / Close quarters. |
| **Performance criteria** | The electrical damage to the vessel en route did not result in grounding or collision, despite the unfavourable weather conditions and the proximity of ships at anchor.<br><br>The trio of formal notice / IED / RIAS, and the constant monitoring of the vessel by the CROSS, have significantly reduced the risk of maritime accidents. |



| "KALLIOPI" Container-ship | | | |
|---|---|---|---|
| | Exogenous | Endogenous | Factors linked to the State response |
| Success criteria | - Early warning thanks to the responsiveness | - Recovery of the ship's manoeuvring | - Helicopter essential for high seas and at sea projection formed by the IED and the RIAS "towing team" projected onto the ship;<br>- Ability to send an assessment |

| | | | |
|---|---|---|---|
| | of the Le Havre port environment (GPMH port VTS + pilots). | capacity after its first two electrical breakdowns. | team out to sea to analyse the risk *in situ*;<br>- The assessment team was made up of a multi-disciplinary team: an engineering officer from the French Navy, a ship safety inspector, a pilot from the port of Le Havre and a port officer from Le Havre;<br>- Continuous monitoring of the vessel by the CROSS and the Maritime Prefecture from the time of the first damage;<br>- Ability and speed of the RIAS to intervene in very poor conditions (taking a tow by going back and forth and in very rough seas and cutting the mooring line):<br>- Keeping the vessel under tow and away from the coast during adverse weather conditions;<br>- CROSS puts the captain of the "*Kalioppi RC*" in contact with his shipowner. |



| "KALLIOPI" Container-ship | | | |
|---|---|---|---|
| | Exogenous | Endogenous | Factors linked to the State's response |
| Vulnerability criteria | - Very poor weather conditions: downwind on the coast and heavy swell;<br>- Proximity to the coast (4 NM for the first total | - Inexperienced crew unfamiliar with the ship (embarked a week before departure for the sole purpose of transporting the ship to a | - Redundant reporting from RIAS to coastal authorities (CROSS and COM);<br>- It was considered too long to obtain permission to |

| | | | |
|---|---|---|---|
| | electrical failure (TED);<br>- Proximity to commercial traffic (1st AET: at the exit of the GPMD access channel and 20m AET: uncontrolled drift with a chemical tanker at anchor 300 metres away). | dismantling yard);<br>- Captain of the ship overwhelmed by the situation;<br>- Succession of damage to an old ship (25 years old);<br>- Shipowner difficult to contact at the start of the event (change of shipowner only one week before departure from Le Havre);<br>- The total loss of electrical power severely slowed communications between the shipowner and the ship's captain (total loss of means of communication);<br>- Fast drift due to the ship's dunnage:<br>- Vessel at anchor without the ability to turn or spin its used anchor line, while the other anchor line is inoperative. | enter the port of Le Havre. The RIAS was released only 24 hours after the "*Kalliopi RC*" was taken in tow;<br>- Good EEI coordination, formal notice and towing). |
| Damage avoided by the State's action | | | |
| Upstream of her anchorage, the vessel presented two major risks during her first two total electrical failures. Without the crew's action to recover propulsion, the risk of running aground in less than 2 hours off Le Havre was extremely high, despite the possibility of an emergency anchorage. Similarly, the risk of collision with a chemical tanker at anchor in holding zone 3 could have had serious consequences for the crews and the marine environment.<br>The action taken by the State enabled the danger posed by a vessel with no manoeuvring capacity and poor anchoring with a wind sector pushing it towards the coast to be brought to an end (drift time at the coast 07 hours). | | | |



| Bulk carrier "AMADEUS AMETHIST" | | | |
|---|---|---|---|
| Date | 03/03/2016 | Cargo | On ballast |
| SRR | Gris-Nez | Hydrocarbons | 100 tonnes of HFO |
| Length | L: 88 m, JB: 1898 UMS | Weather conditions | Wind NW 7-8 then W 3-5-/sea 3-4 |

| | |
|---|---|
| Players involved | COM Cherbourg<br>CROSS Gris-Nez<br>RIAS "*Abeille Languedoc*"<br>Tug "*Gascogne*" ("*Boluda*") |

| | |
|---|---|
| | Tug "Rasant"<br>EC 225 Maupertus helicopter<br>EEI towing (EEI leader: MJR Philippe - AMS CBG) |

| The facts | |
|---|---|
| On 3 March 2016 at 05:10, the cargo ship "AMADEUS AMETHIST" suddenly lost propulsion and electrical power after setting sail from Fécamp. In rough seas with winds of nearly 80 km/h, it made an emergency anchorage around 4 kilometres off the coast. Despite dropping its two anchors, the vessel drifted.<br>At the suggestion of the CROSS, which was closely monitoring the situation, the Maritime Prefect ordered the RIAS "*Abeille Languedoc*" and a port tug from Le Havre to take action if the situation worsened. Given formal notice to put an end to the danger, the shipowner ordered the private tug "Rasant ", then in transit in the Channel, to be brought in for possible towing.<br>In order to prepare for a possible tow and to assess the situation in situ, the Maritime Prefect decided to send a towing team of 6 sailors from the Cherbourg naval base on board the vessel. The team boarded the ship at 10.55 am.<br>At 11:30 am, less than 3 kilometres from the shore, the vessel regained propulsion and managed to haul in her anchors. She will anchor further offshore as the weather conditions improved and docked in the port of Fécamp at 4.30pm. | |
| Risk content | Loss of manoeuvrability. |
| Performance criteria | Ability to deploy a large number of nautical resources and a response team on board a vessel within a few hours. |



| Bulk carrier "*AMADEUS AMETHIST*" | | | |
|---|---|---|---|
| Success criteria | Exogenous | Endogenous | Factors linked to the State response |
| Success criteria | - Proximity of potential means of intervention. | - Shipowner aware of the risk of grounding: asks for the mobilisation of a private tug;<br>- Small, ballasted vessel; | - Mobilisation of a harbour tug from Le Havre to await the arrival of the "*Abeille Languedoc*".<br>- Deployment by helicopter of a "towing" response team on board the vessel to facilitate the passage of a tow;<br>- Formal notice sent to the shipowner to accelerate |

| | | | |
|---|---|---|---|
| | | - Final capacity of the vessel to repair by its own means. | the completion of a commercial towage:<br>- Smooth CROSS/RIAS/COM/EEI exchanges;<br>- EEI expertise. |
| Vulnerability criteria | - Worsening weather conditions (wind NW 7-8 then W 3-5 // sea 3-4) pushing the vessel to the coast;<br>- Close to the coast (3.7 kilometres). | - Non-manoeuvring vessel: propulsion damage;<br>- Poor initial mooring;<br>- Both mooring lines in the water. | - The RIAS "*Abeille Languedoc*" was delayed by 06 hours from Boulogne-sur-Mer due to the simultaneous engagement of the "*Abeille Liberté*" due to weather conditions:<br>- The 2 RIAS in the Channel and North Sea zone are simultaneously engaged in two different events ("Abeille Liberté" engaged on the "*Kalliopi RC*" off Le Havre), depriving the maritime authority of a reserve means of intervention in the event of a new event at sea. |
| Damage avoided by State action | | | |
| Thanks to the action of the State's resources, the risk of the vessel running aground on the coast was considerably reduced. The clean-up and dismantling of this vessel at the foot of the cliffs on the Alabaster coast would have been much longer and more difficult than that of the "TK Bremen", a similar cargo ship that ran aground on a Morbihan beach in 2011. It took 1 month to dismantle and 3 months to rehabilitate the site. | | | |



## "WAASMUNSTER" gaz ship

| | | | |
|---|---|---|---|
| Date | 15/07/2016 | Cargo | 18,531T of butane |
| SRR | Jobourg | Hydrocarbons | N/C |
| Length | 294 metres // Tonnage: 53,833 UMS | Weather conditions | Weather: Wind WSW 4-sea 3. |

| | |
|---|---|
| Players involved | COM Cherbourg<br>CROSS Jobourg<br>RIAS "*Abeille Liberté*"<br>Mine hunter "*Croix du Sud*"<br>EEI (Leader: LV Lecomte and Fire Brigade)<br>Helicopter "*Cyclone*" - DET 33F Maupertus |

### The facts

| | |
|---|---|
| On 15 July 2016 at 03:00 a.m., the gas carrier "*Waasmunster*", loaded with butane and anchored 17 NM from Le Havre, was struck by the fishing vessel "Gros Loulou ". An hour later, the gas carrier's crew noticed a leak in the ballast tank and requested immediate assistance from divers to seal the breach and pump out the gas. COM Cherbourg deployed an assessment and response team, including firemen and divers from the French Navy, and ordered the RIAS "*Abeille Liberté* " and a harbour tug from Le Havre to return to the area. At 06:35 a.m., the gas carrier announced that her trim had stabilised. The EEI then sealed the breach and enabled the RIAS to be dewatered so that pumping could begin.<br>Thanks to the action of the State's resources, the ship sailed safely at 1pm to the port of Le Havre for repairs. | |
| **Risk content** | Invasion and close quarters. |
| **Performance criteria** | Rapid provision of assistance to a vessel that had been the victim of water ingress caused by a collision: underwater assessment and sealing of the breach in less than 5.5 hours after the water ingress was discovered, pumping out of the vessel using government resources. |



"WAASMUNSTER" gaz ship

| | Exogenous | Endogenous | Factors linked to state response |
|---|---|---|---|
| Success criteria | - Good weather conditions for the various operations:<br>- Close to the port of call. | - Condition and design of the vessel (flooding of 990 m³ of seawater in a dry mesh);<br>- Competent, responsive and cooperative | - Ability to assemble and deploy an assessment and response team by helicopter "waterway"; |

| | | | |
|---|---|---|---|
| | | crew and owner;<br>- Good anchorage;<br>- Vessel equipped with a supply crane for safe loading of dewatering equipment. | - Proximity of a French Navy mine hunter to provide divers;<br>- Ability to rapidly deploy intervention tugs (from Le Havre and Cherbourg) on behalf of the Maritime Prefect. |
| Vulnerability criteria | - None | - Butane cargo<br>- Large ingress of water below the waterline<br>- Damage beyond the control of onboard equipment alone. | - None. |
| | | Damage avoided by State action | |
| Without the State's action, the ship would have remained at anchor with no way of reaching the port of Le Havre on its own. It would have taken several days for the vessel to reach the port of Le Havre, and the shipowner would have had to mobilise resources to drain the empty mesh, leaving a damaged vessel at sea. The risk of further damage was nevertheless likely due to the flooding. | | | |



## "GRANDE FRANCIA" RORO

| | | | |
|---|---|---|---|
| Date | 18/11/2016 | **Cargo** | 6749MT |
| SRR | Jobourg | **Hydrocarbons** | 797T of FO, 336T of DO, 29m3 of LO |
| Length | 214 metres // Tonnage 56,738 UMS | **Weather conditions** | W-5 Bf Sea 4 to 5 |

| | |
|---|---|
| Players involved | COM Cherbourg<br>CROSS Gris-Nez<br>RIAS "Abeille Liberté"<br>EEI (including officer "*Abeille Liberté*") |

| The facts | |
|---|---|
| On 18 November 2016, the 214-metre Italian ro-ro vessel "*Grande Francia*", loaded with vehicles and containers, declared propulsion damage at 3:45 pm. She was outside the Casquets traffic separation scheme, slightly south of the upbound shipping lane to the Pas de Calais, 25 kilometres north of Cherbourg. In difficult weather conditions (heavy seas and winds of almost 50 km/h) and under the combined effect of a strong tidal current, the vessel drifted towards the coastal communities to the west of Cherbourg.<br><br>Alerted by the Barfleur semaphore, CROSS Jobourg and the Cherbourg maritime operations centre (COM) sent the "*Abeille Liberté* " to sail close by. The Maritime Prefect gave formal notice to the shipowner to put an end to the danger and decided to send an assessment team on board.<br><br>At 6:56 pm, the vessel regained propulsion after repairs by the crew. It was now 8 kilometres from the French coast. | |
| Risk content | Stranded on the coast. |
| Performance criteria | Ability to ensure the presence of a deep-sea intervention tug in the vicinity of a drifting vessel within a limited timeframe (01h30) and to deploy an assessment team on board. |



| "GRANDE FRANCIA" RORO | | | |
|---|---|---|---|
| | Exogenus | Endogenous | Factors linked to the State response |
| Success criteria | None. | - Ability of the crew to recover propulsion;<br>- Detection of the unusual drift of the vessel by the semaphore. | - Proximity to government intervention resources (Cherbourg);<br>- Ability to rapidly deploy response tug and onboard assessment team;<br>- The State's ability to make shipowners aware of the danger (formal notice) and to |

| | | | |
|---|---|---|---|
| | | | protect a busy coastline. |
| Vulnerability criteria | - Worsening weather conditions (W 5-6 and strong east-west tidal current of 1.6 to 2.6 knots) pushing the vessel towards the coast: drifting at up to 4 knots;<br>- Propulsion recovery of just 5.5 NM from the coast,<br>- An area with a rocky bottom that is not very suitable for anchoring;<br>- Vessel located outside a VTS zone. | - Assessment of the risk of grounding on the coast by the captain;<br>- Incorrect use of navigation aids on the ship's bridge;<br>- particular shape of ship causing an atypical drift towards land.<br>- failure of reporting of the damage to the CROSS by the ship before the intervention of the semaphore | - The maritime assistance service could have been more responsive (almost 20 minutes between the damage report to CROSS Jobourg and the information from COM Cherbourg). |
| Damage avoided by State action | | | |
| The State's response reduced the probable risk of grounding the vessel, which was no longer able to anchor.<br>**The road vessel contained almost 800 tonnes of heavy fuel oil. If the vessel had run aground on the coast, this could have led to a breach and a subsequent spill of heavy hydrocarbons, resulting in pollution requiring the deployment of major clean-up resources: 300 tankers and tippers, as well as a site to dismantle the vessel and restore the site.** | | | |



| "CAFE BON" Chemical Tanker | | | |
|---|---|---|---|
| **Date** | 19 to 22/12/2016 | **Cargo** | 32.239 tons of distillate (UN1268) |
| **SRR** | Gris-Nez | **Hydrocarbons** | 790 tonnes of HFO, 368 tonnes of MGO, 45,765 litres of LO |
| **Length** | 175 metres // Tonnage: 25108 UMS | **Weather conditions** | 19/12/2016-03:45 p.m. : Wind E/5kt; Sea 2; Visi 5 NM.<br>20/12/2016-03:45 pm: Wind E/5 kts; Sea 2; Visi 5 NM.<br>21/12/2016-02:20 pm: Wind S/14 kt; Raf. 21-25 kts; Sea 4; Visi 1-2 NM, Mist. |

| | | | |
|---|---|---|---|
| | | | 22/12/2016-07.15 am: Wind 160/5 kts, Raf. 07 kts; Sea 2; Visi 700 yds. |

| | |
|---|---|
| **Players involved** | COM Cherbourg<br>CROSS Gris-Nez<br>RIAS Abeille Languedoc<br>GW-DET 35 F Le Touquet helicopter<br>EEI (including Thomas Fournié - ABL LGD) |

| **The facts** | |
|---|---|
| On 19 December 2016, the chemical tanker "*Cape Bon*" carrying 32,000 tonnes of hydrocarbon residues, suffered total electrical damage in the Pas de Calais DST, 18 kilometres off Calais, following a fire on one of its electrical switchboards. It lost its ability to manoeuvre and proceeded to an emergency anchorage. Less than 10 NM from the coast in the middle of the Strait, the vessel drifted at up to 2.4 knots towards the Sandéttié bank. The Maritime Prefect decided to send an assessment and response team on board. Once on site, the team decided that a tow was necessary to put an end to the danger. The Maritime Prefect gave formal notice to the shipowner to have the vessel towed. The chemical tanker was towed to the Dyck holding area by the Dutch tug "*Multratug 20*" mobilised by the shipowner. Due to worsening weather conditions (BMS) during the night of 20 to 21 December 2016, a second formal notice was sent to the shipowner. The "*Abeille Liberté*" was kept close to the vessel until midday on 21 December, when it returned to Boulogne-sur-Mer. The ship will dock in Dunkirk on 22 December. | |
| Risk content | Risk of grounding and collision. |
| Performance criteria | State resources were used to speed up the towing of a damaged vessel in the Pas de Calais DST to a safe anchorage in a port waiting area, with a view to repairs in Dunkirk. The dispatch of an assessment team and two formal notices helped to speed up the vessel's berthing. |



| Chemical tanker "CAPE BON" |
|---|

| | Exogenus | Endogenous | Factors linked to the State response |
|---|---|---|---|
| Success criteria | - Favourable weather conditions until the night of 20 to 21 December. | - Ship at anchor;<br>- Fire quickly brought under control by the crew. The crew informed nearby vessels that they were adrift at 03:25 pm . After informing the CROSS of the situation, the | - Sending the EEI gave us a full picture of the ship's situation (information on the exact nature of the incident and the state of the ship's installations);<br>- Good quality of reports from the EEI (Ship Safety Inspector, officers of the "*Abeille Liberté*" and pilotage); |

| | | | |
|---|---|---|---|
| | | crew confirmed at 3:54 pm that the fire was out;<br>- Collaborative crew. The EEI's requests were met by the captain despite commercial pressure from the shipowner. | - Coordination of the EEI/notification/towing trio. |
| Vulnerability criteria | - Favourable weather conditions until the night of 20 to 21 December.<br>- Vessel not in control of its manoeuvre in the middle of commercial traffic in the Pas de Calais DST, at the level of the Calais-Dover ferry crossing. | - Inability of the vessel to repair by its own means;<br>- Slow decision by the shipowner to tow the vessel and slow initiatives to bring the vessel alongside in Dunkirk as quickly as possible. | - None |

| Damage avoided by State action |
|---|
| Without the EEI assessment and the obligation placed on the shipowner to take the vessel in tow and then bring it alongside, the Cape Bon would have remained in an area at high risk of collision with other vessels, or even grounding in the event of its anchorage breaking during the bad weather window.<br>In the event of a spill, the 800 tonnes of heavy fuel oil contained in the bunkers would have potentially polluted the beaches of the Pas de Calais region with more than 8,000 cubic metres of oil slicks. More than 300 tankers and tippers would have been needed to evacuate these pollutants to specialised treatment sites. |



| Chemical tanker " SAGA SKY" | | | |
|---|---|---|---|
| **Date** | 21/09/2016 | **Cargo** | On ballast |
| **SRR** | Gris-Nez | **Hydrocarbons** | 376 t of HFO 140 t of DO 25 337 1 of LO |
| **Length** | 199 metres // Tonnage: 25108 UMS | **Weather conditions** | SE wind force 10 to 12 (gusting to 80 knots), heavy to very heavy seas. |

| | |
|---|---|
| Players involved | COM Cherbourg<br>CROSS Gris-Nez<br>RIAS " *Abeille Languedoc*"<br>Helicopter GW-DET 35 F Le Touquet<br>EEI (including Antoine Guidon - ABL LGD) |

| The facts | |
|---|---|
| On 21 November 2016, the "*Saga Sky*", a 200-metre-long bulk carrier flying the Hong Kong flag, found itself adrift in British territorial waters a few kilometres south-west of Dover in heavy seas (waves of up to 4 metres) and gusts of wind of almost 160 km/hour. She struck an anchored barge less than 2.8 km from the British coast. The collision caused a breach several metres high and over 60 metres long. While some of the crew were evacuated by rescue helicopter, CROSS Gris-Nez offered the British authorities the support of an assessment team and the assistance of the "Abeille Languedoc".<br><br>The French assessment confirmed the ship's ability to reach the port of Dunkirk, which it reached the following day, escorted by the "*Abeille Languedoc*" at the request of the shipowner. | |
| **Risk content** | Shipwreck and pollution. |
| **Performance criteria** | The vessel was secured in a port/anchorage area under RIAS surveillance before being taken over by a repair yard. The EEI validated the fact that the vessel could be received in Dunkirk for repairs and eliminated the immediate danger of pollution. |



Chemical tanker " SAGA SKY"

| | Exogenus | Endogenous | Factors linked to the State response |
|---|---|---|---|
| Success criteria | - The timely presence of a cement barge prevented the ship from running aground on British beaches. | - Final capacity of the vessel to recover its autonomous manoeuvring capabilities; to<br>- Non-dangerous cargo. | - Presence of a state RIAS in the Strait of Pas de Calais;<br>- Reactivity and relevance of the French network of members of the Maritime Prefect's EEI;<br>- Reception of the ship by the port of Dunkirk;<br>- Involvement of the French maritime authority in support of the British authority; |

| | | | |
|---|---|---|---|
| | | | - Smooth CROSS/RIAS/COM/ EEI exchanges;<br>- Pro-activity of CROSS Gris-Nez outside its surveillance zone. |
| Vulnerability criteria | - The weather conditions are very bad: force 10/12 gusting to 80 knots, heavy to very heavy seas (storm warning);<br>- Near British coastline (2.8 kilometres);<br>- Communication and feedback problems with the British authorities. | - Vessel on ballast and on "the water skin", which caused overspeed leading to untimely stoppages of the propulsion engines;<br>- Intermittent loss of propulsion. ship not manoeuvring. | - Difficulty in understanding the Maritime & Coastguard Agency's management of the event's response priorities. |

| Damage avoided by State action |
|---|
| Thanks to the action of the State's resources, the risk of the vessel running aground on the coast was considerably reduced.<br><br>The sinking of the vessel would have potentially resulted in the release of almost 370 tonnes of heavy fuel oil. If the pollution had reached the beaches, more than 150 tankers and tippers would have been needed to remove the slicks of pollutant washed up on the coast. |



| "CALOOSA" BF |
|---|

| | | | |
|---|---|---|---|
| **Date** | 13/01/2016 | **Cargo** | On ballast |
| **SRR** | Jobourg | **Hydrocarbons** | 300 tonnes of HFO, 105 tonnes of DO 13,000 litres of LO |
| **Lenght** | 128 metres // Tonnage: 8407 UMS | **Weather conditions** | wind NNW 6-7-We 4 |

| | |
|---|---|
| **Players involved** | COM Cherbourg<br>CROSS Jobourg<br>RIAS "*Abeille liberté*" |

| **The facts** |
|---|
| On Wednesday 13 January 2016, at 03:26 a.m. (local time), the BF cargo vessel "*CALOOSA*" reported main engine damage to CROSS Jobourg. The vessel was transiting in the upbound traffic lane approaching the Pas de Calais DST. It is |

| |
|---|
| located north-north-west of Antifer for approximately 38 NM. The cargo ship is transiting empty. It estimates the repairs took several hours and the vessel remained under surveillance by the CROSS.<br>Unable to carry out repairs on her own, the BF "CALOOSA" requested assistance from the RIAS "*Abeille Liberté*" at 09:45 a.m., which was already at sea as part of an exercise. At 02:30 p.m., the "*Abeille Liberté*" took the vessel in tow and transited towards Cherbourg where the BF "*CALOOSA*" docked around midnight. |

| | |
|---|---|
| **Risk content** | Propulsion damage and loss of manoeuvrability. |
| **Performance criteria** | Rapid arrival of the RIAS in the vicinity of the vessel and taking it under tow, under the permanent coordination of CROSS Jobourg. |



"CALOOSA" BF

| | Exogenus | Endogenous | Factors linked to the State response |
|---|---|---|---|
| Success criteria | - The wind blows the vessel away from the upstream traffic lane;<br>- Vessel away from the coast: 38 NM off Cap d'Antifer. | - Ballast vessel (no dangerous or environmentally harmful cargo) of modest size;<br>- Ability of the vessel to be towed: deck gear in good condition, electrical autonomic, good behaviour of the vessel under tow;<br>- A cooperative crew, who played a large part in taking the tow on the foredeck; | - Presence of the "*Abeille Liberté*" on exercise not far from the position of the BF "CALOOSA";<br>- Rapid towing contract between the shipowner and the company "Les Abeilles";<br>- Rapid decision by the authorities to have the vessel taken in tow by the "*Abeille Liberté*";<br>- The presence on board the BF "*CALOOSA*" of an |

| | | | |
|---|---|---|---|
| | | - Mooring capacity retained. | officer from the "*Abeille Liberté*" was beneficial for all stages of the tow (assessment of the situation, taking over the tow, monitoring during transit and release). |
| Vulnerability criteria | - Wind SSW force 6 to 7,<br>- -Sea agitated;<br>- Tide coefficient 95;<br>- Proximity of traffic using the rising lane on the approach to the Pas de Calais traffic separation scheme (DST);<br>- BF "*CALOOSA*" adrift for 11 hours. | - Inability of the crew to repair by their own means. | - None |

**Damage avoided by State action**

- As the crew could not repair the vessel at sea, it remained adrift. It therefore constituted a danger to navigation (collision).
- The risk of grounding, despite the ship's inability to repair by its own means, was low, as the ship had its anchorage capacity. Without action by the crew, the vessel would have drifted for around thirty hours before reaching the French coast (Côte d'Albâtre sector).
- **Had it not been for the towing operation carried out by the "*Abeille Liberté*" and the action taken by CROSS Jobourg and the Maritime Prefecture the cargo ship could have remained adrift. In the event of a leak, the 300 tonnes of heavy fuel oil on board would have polluted the coastline of the Côte d'Albâtre with around 3,000 cubic metres of oil slicks, requiring the deployment of major clean-up resources, i.e. around 115 tanker trucks and skips.**



Bulk carrier "*FLINTER AMERICA*"

| | | | |
|---|---|---|---|
| **Date** | 21 and 22//01/2016 | **Cargo** | On ballast |
| **SRR** | Jobourg | **Hydrocarbons** | 327 tonnes of FO, 27 tonnes of DO, 15,000 litres of LO |
| **Length** | 133 metres // Tonnage: 6621 UMS | **Weather conditions** | Wind SSE 6-Sea 4 |

| | |
|---|---|
| **Players involved** | COM Cherbourg<br>CROSS Jobourg<br>RIAS Abeille Liberté<br>EEI (leader: LV Invernizzi and marine firefighters)<br>EC 225 Maupertus helicopter<br>Tugboat "MTS Victory" |

| The facts | |
|---|---|
| On Thursday 21 January 2016, the bulk carrier "*FLINTER AMERICA*", flying the Dutch flag, reported damage to CROSS Jobourg, while transiting the upbound lane of the DST des Casquets (18 NM from Aurigny, 29 NM from Cap de La Hague). A fire broke out in the separator room but was quickly brought under control by the crew. The damage caused deprived the vessel of propulsion and she found herself out of control, drifting in the middle of the DST upbound lane. The Maritime Prefect immediately decided to send a fire-fighting team on board and to bring the RIAS "*Abeille Liberté*" close to the vessel in difficulty. Given formal notice to stop the danger to navigation, the shipowner asked for the vessel to be towed by the RIAS, which came to anchor the vessel off Cherbourg, where it would be repaired by its appointed surveyors. | |
| **Risk content** | Collision following loss of manoeuvrability |
| **Performance criteria** | Rapid arrival of the RIAS close to the vessel and its taking in tow, under the permanent coordination of CROSS Jobourg. The action taken by the State enabled the end of the fire hazard on board the vessel (EEI) to be rapidly confirmed and the RIAS, which was on patrol at the time, to be brought to the scene in just one hour. The formal notice sent to the shipowner enabled the vessel to be taken under tow more quickly. |



**Bulk carrier "*FLINTER AMERICA*"**

| | Exogenus | Endogenous | Factors linked to the State response |
|---|---|---|---|
| Success criteria | - The wind blows the ship away from the upbound traffic lane. | - Small, ballasted vessel;<br>- Effectiveness of the fixed extinguishing system ($CO_2$) on board the vessel;<br>- Good cooperation from the crew to help pick up the trailer;<br>- Good behaviour of the vessel under tow;<br>- Mooring capacity retained. | - Projection of an assessment and intervention team by helicopter on the high seas at 01h30 a.m.;<br>- The "*Abeille Liberté*" on patrol near the DST, just 20 NM from the ship's position;<br>- Ability of the maritime authority to require the shipowner to have the vessel towed by the "*Abeille Liberté*"<br>- Possibility of sending an officer from the "Abeille Liberté" on board; |

| | | | |
|---|---|---|---|
| | | | - Ability to deploy an EEI and continuously monitor operations;<br>- Good EEI coordination, towing and formal notice. |
| Vulnerability criteria | - SSW wind force 6 to 7 bringing the vessel towards the centre of the DST;<br>- Towing through heavy traffic to exit the DST. | - Reluctance on the part of the shipowner and the captain to be towed before the formal notice expires and to accept the constraints;<br>- Inability of the vessel to repair itself<br>- Front manoeuvring range, which is unusual and less appropriate to the towing socket;<br>- Reluctance of the ship's captain to stop the power supply to the electrical panel;<br>- Residual hot spots: likelihood of new fires starting. | - Request from the helicopter pilot to change the route of the emergency towing convoy to recover the EEI. The vessel was then under tow in the middle of traffic. Lack of prior coordination between personnel recovery and towing requirements. |
| Damage avoided by State action | | | |
| As it was not possible for the crew to carry out repairs, the vessel would have remained adrift, exposing it to the risk of collision. Towing was essential to move the vessel away from traffic and tow it to a safe, sheltered place to allow a team of technicians to repair it.<br>**Without the towing by the "Abeille Liberté", the assessment of the projected EEI by helicopter, the monitoring by CROSS Jobourg and the formal notice from the Maritime Prefecture, the cargo would have remained adrift in the Casquets DST. In the event of a collision with another vessel, the ship could have sunk in the DST, potentially releasing more than 327 tonnes of heavy fuel oil on board. The coastline of the Channel Islands and the Cotentin peninsula could have been contaminated by almost 3,300 cubic metres of oil slicks. 127 tankers would have been needed to remove all the pollution from the coast.** | | |



## Bulk carrier "*SBI FLAMENCO*"

| | | | |
|---|---|---|---|
| Date | 29 and 30/01/2016 | Cargo | 76,000 T Coal |
| SRR | Jobourg | Hydrocarbons | 465 tonnes of FO, 90 tonnes of DO, 23,000 litres of LO |
| Length | 229 metres // Tonnage: 44,200 UMS | Weather conditions | Wind WSW 8-Sea 5 |

| | |
|---|---|
| Players involved | COM Cherbourg<br>CROSS Jobourg<br>RIAS "*Abeille Liberté*" |

### The facts

| | |
|---|---|
| On Friday 29 January 2016, at around 3:30pm (local time), the bulk carrier "*SBI FLAMENCO*" carrying the flag of the Marshall Islands, reported a problem with the valves of a cylinder to CROSS Jobourg. She was then in the downstream rail of the Casquets traffic separation scheme (DST), 35 NM (around 65 km) north-west of Cherbourg. The vessel, en route from Riga (Latvia) to Brazil, was carrying 76,000 tonnes of coal. The vessel was being monitored by the CROSS and posed no danger to shipping. The crew were unable to carry out repairs on their own. At 10.30pm, CROSS and COM Cherbourg decided to pre-position the RIAS "*Abeille Liberté*", which was already at sea off Cherbourg, on weather alert. The owner of the "SBI FLAMENCO" signed a contract for the towing of the "*Abeille Liberté*" at 00h40. At 01:15 a.m., the vessel was taken in tow by the RIAS, which took it to the anchorage in Le Havre waiting area. | |
| Risk content | Loss of manoeuvrability. |
| Performance criteria | Rapid arrival of the RIAS close to the vessel and taking it under tow, under the permanent coordination of CROSS Jobourg. |



Bulk carrier "*SBI FLAMENCO*"

| | **Exogenous** | **Endogenous** | **Factors linked to the State's response** |
|---|---|---|---|
| **Success criteria** | - Vessel a long way from the French coast (25 NM). | - The shipowner was quick to recognise the impossibility of his crew carrying out the repairs and to sign a towing contract with the company "Les Abeilles" ;<br>- Preservation of mooring capacity and electrical autonomy. | - Rapid intervention by RIAS, pre-positioned to the west of the Cotentin peninsula for a weather alert;<br>- RIAS's ability to operate safely in difficult conditions. |

| | | | |
|---|---|---|---|
| Vulnerability criteria | - Sea state: very rough to rough;<br>- Vessel located in the upbound traffic lane to the east of the Casquets DST. | - Inability of the vessel to repair by its own means;<br>- Inability of the vessel to manoeuvre (loss of propulsion);<br>- Vessel size (tonnage and draught of 14 metres) difficult for a harbour tug to tow;<br>- 10-hour drift with no ability to manoeuvre. | - No comments. |

**Damage avoided by State action**

- Without the tow by the "Abeille Liberté" and monitoring by CROSS Jobourg, the cargo would have remained adrift in the upbound traffic lane (mooring capacity retained).
- **In the unlikely event of grounding, the vessel would have released potentially more than 465 tonnes of heavy fuel oil on board, which could have polluted the coastline of the Channel Islands and the Cotentin peninsula with almost 4,700 cubic metres of oil slicks. A total of 178 tankers would have been needed to evacuate all the pollution that would have reached the coast.**



| Oil tanker "LIZRIX" | | | |
|---|---|---|---|
| **Date** | 02/03/2016 | **Cargo** | On ballast |
| **SRR** | Gris-Nez | **Hydrocarbons** | 100 tonnes of HFO |
| **Length** | 76.5 metres // Tonnage: 1343 UMS | **Weather conditions** | Wind WSW 8/9 gusting to 60 knots / Sea 4 |

| | |
|---|---|
| **Players involved** | RIAS "Abeille Languedoc"<br>COM Cherbourg<br>CROSS Gris-Nez |

**The facts**

On Wednesday 2 March, at around 06:00, the oil tanker "*Lizrix*" in transit in the upstream rail of the DST of the Pas de Calais, reported to CROSS Gris-Nez damage to her propulsion system. Located approximately 9 NM from Calais in the middle of the strait and the flow of upbound, downbound and ferry traffic. The vessel is not carrying any cargo. Due to the impossibility of repair at sea, the vessel anchored in heavy weather and requested the assistance of a tug. The offer of a port tug from Dover was quickly rejected by the shipowner, who signed a towing contract with the "*Abeille Languedoc*", which was on a preventive call to the

| | |
|---|---|
| ship at the request of the Maritime Prefect, who had also given the shipowner formal notice to put an end to the danger. At 11:45 am, the vessel was taken in tow towards Dover, where the "Lizrix >> anchored at 02:50 pm. | |
| **Risk content** | Collision following loss of manoeuvrability. |
| **Performance criteria** | Rapid arrival of the RIAS in the vicinity of the vessel and taking it under tow, under the permanent coordination of CROSS Gris-Nez. |



| ***Oil tanker "LIZRIX"*** | | | |
|---|---|---|---|
| | Exogenous | Endogenous | Factors linked to the State's response |
| Success criteria | - Proximity of potential means of intervention ("*Abeille Languedoc*"). | - Very cooperative ship and armament: towing contract quickly signed with the RIAS ("*Abeille Languedoc*").<br>- Small, ballasted vessel;<br>- Ship at anchor. | - "*Abeille Languedoc*" pre-positioned by the Maritime Prefect close to the vessel pending the commercial agreement;<br>- Formal notice to the shipowner to speed up the performance of a commercial towage;<br>- Rapid towage contract between the shipowner and the company " Les Abeilles". |

| | | | |
|---|---|---|---|
| Vulnerability criteria | - Poor weather conditions (WSW 8/9 and sea 4);<br>- Vessel located in the upstream lane of the DST in the middle of the commercial traffic zone;<br>- Proximity to the Flanders banks in the event of anchor failure. | - Inability of the vessel to repair by its own means (damage to the electrical system automation system). | - The 2 RIAS in the Channel and North Sea zone were simultaneously engaged for two different events ("*Abeille Liberté*" then engaged on the "*Kalliopi RC*" off Le Havre), depriving the maritime authority of a "reserve" means of "intervention" in the event of a new event at sea. |
| **Damage avoided by State action** | | | |
| **The State's response reduced the possible risk of the tanker being boarded by vessels transiting the two DST lanes and the ferry crossing.** | | | |



| **Chemical tanker "AMONITH"** | | | |
|---|---|---|---|
| **Date** | 11 to 13 July 2016 | **Cargo** | 1,963 tonnes of Toluene and 2,000 tonnes of distillate (UN1268) |
| **SRR** | Gris-Nez | **Hydrocarbons** | 100 tonnes of HFO |
| **Length** | L: 92 m, JB: 3218 UMS | **Weather conditions** | Wind WS 5 Wed3 |

| | |
|---|---|
| **Players involved** | COM Cherbourg<br>CROSS Gris-Nez<br>RIAS "Abeille Languedoc" |

| **The facts** |
|---|
| On 11 July 2016 at 09:00 p.m., the chemical tanker "AMONITH" in transit in the upbound lane of the Pas de Calais DST reported total electrical damage to CROSS Gris-Nez. The vessel is 29 NM from the coast. Weather conditions are mild. The maritime authority was informed before midnight that the shipowner wished to have his vessel towed by the "*Abeille Languedoc*".<br><br>At 02:45 a.m., the chemical tanker was towed by the RIAS. The convoy headed for Boulogne-sur-Mer to anchor the vessel. As the vessel could not be accommodated in Boulogne-sur-Mer due to its cargo, the convoy finally headed for the Dyck area |

| | |
|---|---|
| off Dunkirk, where the chemical tanker was anchored on 12 July. At 10.20am on 13 July, the ship set sail after repairs were carried out by technicians sent by the shipowner. | |
| **Risk content** | Total electrical failure and loss of manoeuvrability. |
| **Performance criteria** | Rapid arrival of the RIAS close to the vessel and taking it under tow, under the permanent coordination of CROSS Jobourg. |



| **Chemical tanker "AMONITH"** | | | |
|---|---|---|---|
| | **Exogenous** | **Endogenous** | **Factors linked to the State's response** |
| **Success criteria** | - Vessel located far from the coast (29 NM). | - A very cooperative ship and fleet: a towing contract was quickly signed with the RIAS "*Abeille Languedoc*";<br>- Modest-sized vessel. | - Rapid towing contract between the shipowner and the company "Les Abeilles".<br>- Ability to take the drifting vessel in tow within a tight timeframe (4h40);<br>- Deployment of a RIAS team on board the towed vessel to pass the towline. |
| Vulnerability criteria | - Poor weather conditions (SW 5 and sea 4); | - Long drift (04h40) with no room to manoeuvre; | - None. |

| | | | |
|---|---|---|---|
| | - Vessel located in the upstream lane of the DST, traffic zone. | - Inability of the vessel to repair by its means (damage to the electrical system automation system);<br>- Dangerous cargo | |

| Damage avoided by State action |
|---|
| **The State's response made it possible to reduce the probable risk of grounding or collision with other vessels, knowing that it had the capacity to anchor.**<br><br>**Given the environmental conditions of the vessel, the risk of grounding or collision was low. However, the State's intervention further reduced the residual risk presented by this drifting vessel with total electrical damage.** |



**APPENDIX III.2**

**in Annex III to letter no. 0-. -2017/PREMAR MANCHE/AEM/NP of June 2017 n° /NP of June**

**ANALYSES CARRIED OUT FOR THE 12 NEAR MISS**

| General Cargo "MUSKETIER" |
|---|

| "MUSKETIER" | | | |
|---|---|---|---|
| **Date** | 07/08/2015 | **Cargo** | 2563 T of steel |
| **SRR** | Gris-Nez | **Hydrocarbons** | 100 t HFO |
| **Length** | 89 metres-2545 UMS | **Weather conditions** | SW2 Sea 1 |

| The facts |
|---|
| On Thursday 6 August 2015, at 10:40 pm, the Gris-Nez Regional Operational Centre for Surveillance and Rescue (CROSS), spotted a cargo vessel travelling the wrong way up the rail north of Calais and not responding to the VHF. The AIS made it possible to identify the "*Musketier*", loaded with non-hazardous products (steel). Despite several attempts to call the vessel using all the means available to CROSS Gris-Nez, the cargo vessel remained silent. CROSS Gris-Nez, in liaison with the Cherbourg Maritime Operations Centre (COM), engaged the French Navy's "DauphiN" helicopter stationed at Le Touquet. Arriving on the scene at 11:34 p.m. and after several calls and lighting by the helicopter without any reaction from the crew of the "*Musketier*", a diver was winched on board. He entered the bridge and the living quarters to alert a crew member to the dangerous situation. The diver was airlifted by the helicopter and the cargo ship's captain then began a manoeuvre to reach the downward rail, which he reached at 00:11. For safety reasons and to avoid any further navigation faults by the cargo vessel, Cherbourg COM decided to |

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| engage the Response, Assistance and Salvage Tug (RIAS) "*Abeille-Languedoc* ", with five gendarmes from the Vedette Côtière de Surveillance Maritime "Scarpe" on board. After midnight, the cargo ship maintained a correct course. Surveillance was maintained until the cargo vessel left the Casquets DST by the Public Service Patrol Boat (PSP) "*Pluvier*", which had taken over from the RIAS "*Abeille-Languedoc* ". |

| | |
|---|---|
| **Type of risk** | Risk of running aground and collision (5 NM / ship going against the direction of travel in the rising rail). |
| **Performance criteria** | COASTAL STM FUNCTIONS:<br>- detection of a dangerous situation (close-up or abnormal situation);<br>- analysis of the CPA/TCPA (vessel characteristics, prior contact between vessels, visibility, compliance with helm rules, proximity of hazards);<br>- analysis of the surface situation (vessels in fishing action, ferry traffic, traffic density, turning points, traffic lane ends, the area around the DST);<br>- preventive actions (consistency of kinematics, provision of relevant information to vessels, checking vessels' intentions, etc.). |



| General Cargo "MUSKETIER" |
|---|

| | Exogenous | Endogenous | Factors linked to the State's response |
|---|---|---|---|
| **Success criteria** | - Vigilance of other vessels in the vicinity. | - Emergency manoeuvre to rejoin the down track. | Anticipation of the situation, effective communication, securing the area, good coordination with the COM, GW and the "*Abeille Languedoc*". |
| **Vulnerability criteria** | - Heavy traffic. | -The crew's attention span visibly impaired;<br>-Scale setting of electronic chart software unsuitable (diver's observation);<br>-Report fault on entering the CALDOVREP monitoring zone;<br>- Crew absent from bridge when diver boarded. No visual watch; | - None. |

| | | | |
|---|---|---|---|
| | | - Radio standby fault;<br>- Dangerous integration manoeuvre in the descending track. | |

**Benefits of State action**

Cargo ship grounded on the Pas de Calais coast. Collision with ships located in the upstream rail of the Pas de Calais DST.

Preventive action: Near accident notified by CROSS Gris-Nez to company and flag state. Vessel held by flag state in port of call, suspension of patents.



"MARAKI" - "IVORY ARROW"

| *"MAKARI"* | | | |
|---|---|---|---|
| **Date** | 05/12/2015 | **Cargo** | 16,901 T of sunflower seed |
| **SRR** | Gris-Nez | **Hydrocarbons** | 300 t HFO |
| **Length** | 170 metres // Tonnage: 2545 UMS | | |

| **"IVORY ARROW"** | | | |
|---|---|---|---|
| **Date** | 05/12/2015 | **Cargo** | 7,299 T of cars |
| **SRR** | Gris-Nez | **Hydrocarbons** | 300 t HFO |
| **Length** | 200 metres // Tonnage: 57718 UMS | | |

| **The facts** | |
|---|---|
| **Type of risk** | Collision - Injuries - Pollution CPA ONM/TCPA Omin (collision). |
| **Performance criteria** | COASTAL STM FUNCTIONS:<br>- detection of a dangerous situation (close-up or abnormal situation);<br>- analysis of the CPA/TCPA (vessel characteristics, prior contact between vessels, visibility, compliance with helm rules, proximity of hazards);<br>- analysis of the surface situation (vessels in fishing action, ferry traffic, traffic density, turning points, DST extremities, DST outskirts);<br>- preventive actions (consistency of kinematics, provision of relevant information to vessels, ascertaining vessels' intentions, etc.). |

**"MARAKI" - "IVORY ARROW"**

| | Exogenous | Endogenous | Factors linked to the State's response |
|---|---|---|---|
| **Success criteria** | - None. | - Collision on the starboard stern, several metres above the waterline.<br>- No waterways, no pollution. | - None. |
| **Vulnerability criteria** | - Heavy traffic.<br>- Dangerous crossing;<br>- Very rapid developments in the CPA/TCPA situation. | - Ship "Maraki" classified "high risk profile" in the Paris MOU;<br>- No prior radio contact between the ships, difficult communication;<br>- Non-compliance with COLREG.<br>- | - Situation outside the VTS zone not detected by the VTS. |

**Damage avoided by the State's action**

Preventive action: accident notified by CROSS Gris-Nez to the companies for investigation and to the port State control authorities.

| "M/V LYNDA VICTORY" - "M/V KARMEL" |
|---|

| *"LYNDA'S VICTORY"* | | | |
|---|---|---|---|
| **Date** | 03/02/2015 | **Cargo** | 24,799t of vegetable oil |
| **SRR** | Gris-Nez | **Hydrocarbons** | 300 t HFO |
| **Length** | 180 metres // 26218UMS | | |

| **"KARMEL"** | | | |
|---|---|---|---|
| **Date** | 03/02/2015 | **Cargo** | 2,0891 of wood bark |
| **SRR** | Gris-Nez | **Hydrocarbons** | 100 t HFO |
| **Length** | 89 metres //3183UMS | | |

| **The facts** | |
|---|---|
| On 3 February 2016 at 02h55 while in transit in the North-East lane of the DST the "*M/V LYNDIA VICTORY*" flying a Norwegian flag was travelling at 12.1 knots and 019°. The "*M/V Karmel*" flying the Maltese flag and arriving from Wandelaar was preparing to cross the North-East lane of the Pas de Calais DST at 9.7 knots and 295°. In accordance with COLREG 1972, rules 10 and 15, the preferred vessel was the "*M/V Karmel*". The radio communication record showed that neither vessel had made contact with the other before the call made by CROSS Gris-Nez at 2.55am. At 03:00 a.m. they found themselves very close with a CPA/TCPA of 0.02 NM and 2.6 minutes. Finally the "*M/V Linda Victory*" passed close astern of the "*MV/Karmel*".<br><br>Situation: dangerous manoeuvre at Hinder 1 crossing. Infringement of COLREG Rules 10 and 15.<br>Aggravating factors: lack of communication between gangways.<br>Emergency evasive manoeuvre, collision avoided. | |
| **Type of risk** | Boarding CPA 0.02NM / TCPA 2.6min. |
| **Performance criteria** | COASTAL STM FUNCTIONS:<br>- detection of a dangerous situation (close-up or abnormal situation); |

| | |
|---|---|
| | - analysis of the CPA/TCPA (vessel characteristics, prior contact between vessels, visibility, compliance with helm rules, proximity to hazards);<br>- analysis of the surface situation (vessels in fishing action, ferry traffic, traffic density, turning points, ends of traffic lanes, approaches to the DST);<br>- preventive actions (consistency of kinematics, provision of relevant information to vessels, checking vessels' intentions, etc.). |



| ***"M/V LYNDA VICTORY" - "M/V KARMEL"*** | | | |
|---|---|---|---|
| | **Exogenous** | **Endogenous** | **Factors linked to the State's response** |
| Success criteria | - None. | - Emergency manoeuvre, fast radio contact CROSS - ships. | - Anticipating the situation, effective communication. |
| Vulnerability criteria | - Heavy traffic. | - No prior radio contact between the ships.<br>- Non-compliance with COLREG.<br>- Dangerous anti-collision manoeuvre. | - Outside the VTS zone. |
| **Benefits of government action** | | | |
| Collision avoided by the urgent action of the non-privileged vessel.<br><br>Preventive action: Near accident notified by GN to the company. | | | |

Chemical tanker " CARONI PLAIN " - General Cargo "THORCO SVENDBORG"

| *"CARONI PLAIN"* | | | |
|---|---|---|---|
| **Date** | 04/02/2016 | **Cargo** | 35,000t methanol |
| **SRR** | Gris-Nez | **Hydrocarbons** | 300t HFO (estimated) |
| **Length** | 185 metres // Tonnage: 26,459 UMS | | |

| **Cargo "THORCO SVENDBORG"** | | | |
|---|---|---|---|
| **Date** | 04/02/2015 | **Cargo** | 2,500t General Cargo |
| **SRR** | Gris-Nez | **Hydrocarbons** | 300t HFO (estimated) |
| **Length** | 124 metres // Tonnage: 10,021 UMS | | |

| **The facts** | |
|---|---|
| On 4 February 2016 at 05h36 a close-quarters situation was reported by CROSS Gris-Nez, between the M/V "*Caroni Plain*" sailing at 12 knots and 012° and coming close to the M/V "*Thorco Svendborg*" making way at 10 knots and 296° to cross the North-East lane of the Pas de Calais DST.<br>In accordance with COLREG 1972 rules 10 and 15, the preferred vessel was the M/V "*Thorco Svendborg*".<br>The radio communication record shows that the two vessels made contact with each other at 05:34, but the M/V "*Caroni Plain*" maintained her course at 012° and forced the M/V "*Thorco Svendborg*" to carry out an emergency evasive manoeuvre at 05:43 a.m.. She resumed her course at around 05:50 a.m.<br>Dangerous manoeuvre at Hinder 1 junction (outside the VTS zone of Dover Trafic and Gris-Nez Trafic).<br>Infringement of COLREG Rules 10 and 15, failure to communicate between gateways.<br>Emergency evasive manoeuvre by the preferred vessel, collision avoided. | |
| **Type of risk** | Boarding/CPA 0.04NM / TCPA 5.8min. |
| **Performance criteria** | COASTAL STM FUNCTIONS:<br>- detection of a dangerous situation (close-up or abnormal situation);<br>- analysis of the CPA/TCPA (vessel characteristics, prior contact between vessels, visibility, compliance with helm rules, proximity of hazards); |

| | |
|---|---|
| | - analysis of the surface situation (vessels in fishing action, ferry traffic, traffic density, turning points, ends of traffic lanes, approaches to the DST);<br>- preventive actions (consistency of kinematics, provision of relevant information to vessels, checking vessels' intentions, etc.). |



Chemical tanker "CARONI PLAIN" - General Cargo "THORCO SVENDBORG"

| | Exogenous | Endogenous | Factors linked to the State's response |
|---|---|---|---|
| **Success criteria** | - Low traffic | - Emergency manoeuvring of the preferred vessel. | - Good anticipation of the situation, alerting ships to the situation. |
| **Vulnerability criteria** | - None | - No prior radio contact between the ships.<br>- Non-compliance with COLREG. | - Location outside the VTS zone, VTS communication difficult. |

Benefits of government action

Collision avoided by the action of the preferred vessel.

Preventive action: Near accident notified by CROSS Gris-Nez to the company.

**General cargo ship "PHOENIX" - Chemical tanker "STOLT GREENSHANK"**

| *"PHOENIX"* | | | |
|---|---|---|---|
| **Date** | 08/10/2016 | **Cargo** | 13,169 t of petroleum coke |
| **SRR** | Gris-Nez | **Hydrocarbons** | 300t HFO |
| **Length** | 147 metres // Gross tonnage: 11927 UMS | | |

| *"STOLT GREENSHANK"* | | | |
|---|---|---|---|
| **Date** | 08/10/2016 | **Cargo** | 4,140 t of styrene (IMO 3) |
| **SRR** | Gris-Nez | **Hydrocarbons** | 100t HFO |
| **Length** | 90 metres // Gross tonnage: 3327 UMS | | |

| **The facts** | |
|---|---|
| On 8 October 2016 at 19:00, while crossing the north-east lane of the Pas de Calais DST, a near-accident situation was detected by the CROSS VTS department.<br>Gris-Nez between the vessels *"Phoenix"* and *"Stolt Greenshank"*. At 6.46 pm the cargo vessel "*Pheonix*" was on its way to the Netherlands, when it crossed with the "Stolt Greenshank" not far from the Basurelle buoy forced the chemical tanker to take evasive action.<br>At 07:03 pm the "*Pheonix*" also changed course to keep a safe distance. On several occasions the Gris-Nez VTS service tried to contact the "*Phoenix*" on VHF channel 16 to find out her intentions and ask her to keep her distance. The radio readings show that the vessels had not made contact before the calls from the VTS department of CROSS Gris-Nez. Aggravating factors: Dangerous manoeuvre in a cluster of 7 vessels at a turning point in the Pas de Calais DST. | |
| **Type of risk** | Boarding CPA 0.18NM/TCPA 4min. |
| **Performance criteria** | STM COSTAL FUNCTIONS<br>- detection of a dangerous situation (close-up or abnormal situation)<br>- Analysis of the CPA/TCPA (vessel characteristics, prior contact between vessels, visibility, compliance with helm rules, proximity of hazards)<br>- Analysis of the surface situation (vessels in fishing action, ferry traffic, traffic density, turning points, lane ends, etc.)<br>- Preventive actions (consistency of kinematics, provision of relevant |

| | |
|---|---|
| | information to vessels, checking vessels' intentions, etc.) |



***General cargo ship "PHOENIX" - Chemical tanker "STOLT GREENSHANK"***

| | Exogenous | Endogenous | Factors linked to the State's response |
|---|---|---|---|
| **Success criteria** | None | Good radio surveillance of the vessels concerned, anti-collision manoeuvre by the preferred vessel. | Good anticipation of the situation, alerting ships to the situation. |
| **Vulnerability criteria** | Heavy traffic at a turning point on the DST. | No prior radio contact between vessels. Non-compliance with COLREG. | Outside the VTS zone. |
| **Damage avoided by State action** | | | |
| Collision avoided by the action of the non-privileged vessel.<br>Preventive action: Near accident notified by CROSS Gris-Nez to the company. | | | |

## Cargo "AMISOS"

| Amisos | | | |
|---|---|---|---|
| **Date** | 21/12/2016 | **Cargo** | 8,050t of marble "marble cheap" |
| **SRR** | Gris-Nez | **Hydrocarbons** | 108 t of HFO<br>29 t of DO<br>7691 litres of LO |
| **Length** | 122 metres // Gross tonnage: 5857 UMS | | |

| The facts | |
|---|---|
| On 21 December 2016 at around 04:20 a.m., a near-accident situation involving the "*M/ Amisos*" was spotted by a VTS operator from CROSS Gris-Nez then in charge of traffic surveillance in the Pas de Calais DST.<br>At 04:17 a.m. the vessel was positioned at 51°09.2N 001°45.75E, sailing at 9.5 knots and 035°, preparing to enter the DST near the Sandettié bank. At 04:20 a.m. the vessel left the north-east lane and entered the separation zone. The Gris-Nez VTS contacted it on VHF channel 16 to ask it to follow the normal direction of traffic in the separation lane. After making contact with the captain, the vessel changed course and entered deep water at 04:26 a.m. | |
| **Type of risk** | Grounding. |
| **Performance criteria** | STM COSTAL FUNCTIONS<br>- detection of a dangerous situation (close-up or abnormal situation)<br>- Analysis of the CPA/TCPA (vessel characteristics, prior contact between vessels, visibility, compliance with helm rules, proximity of hazards)<br>- Analysis of the surface situation (vessels in fishing action, ferry traffic, traffic density, turning points, lane ends, DST surroundings, etc.)<br>- Preventive actions (consistency of kinematics, provision of relevant information to vessels, checking vessels' intentions, etc.) |

| "AMISOS" Cargo | | | |
|---|---|---|---|
| | **Exogenous** | **Endogenous** | **Factors linked to the State's response** |
| **Success criteria** | - Low traffic levels. | - Shallow vessel draught, good vessel radio watches, emergency vessel manoeuvres. | - Good anticipation of the situation, reporting the situation to the ship. |
| **Vulnerability criteria** | - Near the Sandettié bank. | - Leaving the shipping lane and running aground on the Sandettié bank. | - None. |
| **Benefits of government action** | | | |
| Grounding avoided by the action of the ship.<br><br>Preventive action: Near accident notified by CROSS Gris-Nez to the company. | | | |



"M/V PACIFIC PIONEER" – "M/V CONSTANTINE"

| "M/V PACIFIC PIONEER" | | | |
|---|---|---|---|
| **Date** | 15/12/2016 | **Cargo** | On ballast |
| **SRR** | Gris-Nez | **Hydrocarbons** | 370 t of HFO-155 t of DO-30 360 1 of LO |
| **Length** | 179 metres // Gross tonnage: 23857 UMS | | |

| "M/V Constantine" | | | |
|---|---|---|---|
| **Date** | 15/12/2016 | **Cargo** | 7,678 t of containers, including 297.40 1 of IMO 3 |
| **SRR** | Gris-Nez | **Hydrocarbons** | 317 t of HFO-46 t of DO-19,000 1 of LO |
| **Length** | 138 metres // Gross tonnage: 9627 UMS | | |

| **The facts** | |
|---|---|
| On 15 December 2016 at 07:30 a.m. a close-quarters situation was reported by CROSS Gris-Nez, between the "*M/V Pacific Pioneer*" sailing at 12.5 knots and 013° and being close to the 'M/V Constantine' making way at 12.4 knots and 296° to cross the north-east lane of the DST at As de Calais. At the most critical moment, the CPA was equal to 0.47 NM and TCPA 4.5 minutes.<br>The radio communication record shows that the two vessels did not make contact with each other until CROSS Gris-Nez did so at 07:35 a.m.<br>In accordance with COLREG 1972, rules 10 and 15, the preferred vessel was the "*M/V Constantine*", in view of the information picked up by the CROSS radars and AIS data, the "*M/V Pacific Pioneer*" never altered course to give way and passed the "*M/V Constantine*" ahead of her.<br>Dangerous manoeuvre at Hinder 1 junction. Infringement of COLREG Rules 10 and 15.<br>Failure to communicate between gangways.<br>Emergency evasive manoeuvre by the preferred vessel, collision avoided. | |
| **Type of risk** | Boarding: CPA 0.47NM/TCPA 4.5min. |
| **Performance criteria** | COASTAL STM FUNCTIONS:<br>- detection of a dangerous situation (close-up or abnormal situation;<br>- analysis of the CPA/TCPA (vessel characteristics, prior contact between vessels, visibility, compliance with helm rules, proximity to hazards);<br>- analysis of the surface situation (vessels in fishing action, ferry traffic, traffic density, turning points, ends of traffic lanes, approaches to the DST);<br>- preventive actions (consistency of kinematics, provision of relevant information to vessels, checking vessels' intentions, etc.). |

| | Exogenous | Endogenous | Factors linked to the State's response |
|---|---|---|---|
| Success criteria | - None. | - Non-preferred ship acceleration manoeuvre. | - Good anticipation of the situation, reporting the situation to the non-preferred vessel. |
| Vulnerability criteria | - None. | - No prior radio contact between vessels;<br>- Non-compliance with COLREG | Outside the VTS zone. |
| Damage avoided by State action | | | |
| Collision avoided by the action of the non-privileged vessel.<br><br>Preventive action: Near miss accident notified by CROSS Gris-Nez to the company. | | | |





“THIRA"

| | | | |
|---|---|---|---|
| **Date** | 22/06/2016 | **Cargo** | 400 T general cargo |
| **SRR** | Jobourg | **Hydrocarbons** | 100t HFO |
| **Length** | 205 metres// Gross tonnage: 21053 UMS | | |

| **"MINERVA TYCHI "** | | | |
|---|---|---|---|
| **Date** | 22/06/2016 | **Cargo** | 35000 T *Steel Product* |
| **SRR** | Jobourg | **Hydrocarbons** | 300t HFO |
| **Length** | 184 metres/ Gross tonnage: 24,090 UMS | | |

\

| **The facts** | |
|---|---|
| On 22 June at around 09:00 p.m., the container ship "Thira" leaving the Le Havre channel, after the tug pilot had disembarked, found herself on a collision course with the "*Minerva Tychi* ", on the inbound lane of the channel. The collision was avoided thanks to an emergency manoeuvre. The CROSS highlights the decisive action taken by the Le Havre pilots to overcome the communication difficulties between the two gangways. The two | |
| **Type of risk** | Collision (Le Havre channel). |
| **Performance criteria** | STM COASTAL FUNCTIONS:<br>- Detection of a dangerous situation (close-up or abnormal situation);<br>- Analysis of the CPA/TCPA (vessel characteristics, prior contact between vessels, visibility, compliance with helm rules, proximity of hazards);<br>- Analysis of the surface situation (vessels in fishing action, ferry traffic, traffic density, turning points, lane ends, DST outskirts).<br>- Preventive actions (consistency of kinematics, provision of relevant information to vessels, checking vessels' intentions, etc.). |

| | Exogenous | Endogenous | Factors linked to the State's response |
|---|---|---|---|
| **Success criteria** | - Exiting the channel. Attentive vessels and reinforced teams on the various gangways. | - Emergency manoeuvre allow to avoid collision. | - The Le Havre pilots played a key role in overcoming the communication difficulties;<br>- Vessel still under Port STM control. |
| **Vulnerability criteria** | - Heavy traffic in the channel. | - Relaxation of attention after the pilot disembarks | - None. |
| **Benefits of State action** | | | |
| No action. Decisive action by both ships. | | | |

| "VALIANT" | | | |
|---|---|---|---|
| **Date** | 14/09/2016 | **Cargo** | 400 T general cargo |
| **SRR** | Jobourg | **Hydrocarbons** | 100t HFO |
| **Length** | 75 metres// Gross tonnage: 1513UMS | | |

| "SEA QUEEN 2" | | | |
|---|---|---|---|
| **Date** | 22/06/2016 | **Cargo** | 35000 T Steel product |
| **SRR** | Jobourg | **Hydrocarbons** | 300t HFO |
| **Length** | 190 metres// Gross tonnage: 33044 UMS | | |

| **The facts** | |
|---|---|
| On 14 September 2016 at 7:03 pm, the vessel "*Valiant*" and the "Sea Queen 2" were in a near miss situation, (CPA of 330 metres and TCPA of 6 minutes). CROSS Jobourg noted via VHF that the vessel "*Valiant*" had contacted another vessel, the "*Xin Qin Huang Dao* " on channel 16 about the close-quarters situation, resulting in a misunderstanding between the gangways. The "*Sea Queen* 2 " was forced to make an emergency manoeuvre, and made a 360° turn to avoid collision with the "*Valiant*" on her starboard side. | |
| **Type of risk** | Collision CPA 0,16/TCPA 6 min (21 NM from Cap de la Hague). |
| **Performance criteria** | COASTAL STM FUNCTIONS:<br>- detection of a dangerous situation (close-up or abnormal situation);<br>- analysis of the CPA/TCPA (vessel characteristics, prior contact between vessels, visibility, compliance with helm rules, proximity of hazards);<br>- analysis of the surface situation (vessels in fishing action, ferry traffic, traffic density, turning points, ends of traffic lanes, approaches to the DST);<br>- preventive actions (consistency of kinematics, provision of relevant information to vessels, checking vessels' intentions, etc.). |

Commented [FA1]: Put risk type everywhere



**Cargo general "VALIANT" - Bulk carrier "SEA QUEEN 2"**

| | Exogenous | Endogenous | Factors linked to the State's response |
|---|---|---|---|
| **Success criteria** | None. | Emergency manoeuvre averted collision. | Vessel under coastal VTS control. Decisive preventive action. |
| **Vulnerability criteria** | Heavy traffic in the DST. | Failure to keep a proper lookout and incorrect manoeuvre (speed reduction should have been preferred). | None. |
| **Benefits of State's action** | | | |
| Decisive action by the two vessels after a pre-emptive call from the coastal STM.<br><br>Real risk of collision. | | | |



**Ro-Ro "*MORNING CAROL*" - Refrigerated Cargo "*CROWN JADE*"**

| "MORNING CAROL" | | | |
|---|---|---|---|
| **Date** | 05/10/2016 | **Cargo** | 262t: 25 cars |
| **SRR** | Gris-Nez | **Hydrocarbons** | 300t HFO |

| | |
|---|---|
| **Length** | 199 metres// Gross tonnage: 57542 UMS |

| "CROWN JADE" | | | |
|---|---|---|---|
| **Date** | 05/10/2016 | **Cargo** | 4.290 t lemon |
| **SRR** | Gris-Nez | **Hydrocarbons** | 300t HFO |
| **Length** | 151 metres// Gross tonnage: 10519 UMS | | |

| **The facts** | |
|---|---|
| On 5 October 2016 at 11:48 p.m. a close-quarters situation was reported by CROSS Gris-Nez, between the ro-ro vessel "*Morning Carol*" sailing at 15.3 knots and 353.4° and finding herself close to the cargo vessel "*Crown Jade*" heading at 19.4 knots and 306° to cross the North-East lane of the Pas de Calais DST at Hinder 1 junction. The CPA was 0.27 NM and the TCPA 10.9 minutes.<br><br>At 11:48 p.m., the VTS department at CROSS Gris-Nez contacted the ro-ro "*Morning Carol*" to find out its intentions. The "*Morning Carol*" indicates that she will modify her course and make a U-turn in the traffic lane. At 11:51 p.m. the vessel "*Crown Jade*" asks the "*Morning Carol*" to change course in view of the zero CPA and TCPA of 4 minutes. The Dover coastguard station made contact at the same time and advised the vessels to take evasive action. At 11:52 p.m. the "*Morning Carol*" finally undertook a U-turn manoeuvre before resuming her initial course. Radio communication records show that the vessels had not made contact with each other before the Gris-Nez VTS service was called at 11:48 p.m.<br>Emergency evasive manoeuvre by the non-privileged vessel, collision avoided.<br>Aggravating factors: lack of communication between gateways. | |
| **Risk type** | Collision CPA 0.27NM/TCPA 10.9min. |
| **Performance criteria** | COASTAL STM FUNCTIONS:<br>- detection of a dangerous situation (close-up or abnormal situation);<br>- analysis of the CPA/TCPA (vessel characteristics, prior contact between vessels, visibility, compliance with helm rules, etc.), proximity of hazards);<br>- analysis of the surface situation (vessels in fishing action, ferry traffic, traffic density, turning points, extremities of traffic lanes, approaches to the DST);<br>- preventive actions (coherence of kinematics, provision of relevant information to vessels, ensuring the ships intentions…) |



**"MORNING CAROL" Ro-Ro - "CROWN JADE "refrigerated cargo"**

| | **Exogenous** | **Endogenous** | **Factors linked to the State's response** |
|---|---|---|---|

| | | | |
|---|---|---|---|
| **Success criteria** | Low traffic levels. | Large anti-collision manoeuvre for the non-privileged vessel. | Good anticipation of the situation, alerting ships to the situation, good cooperation with Dover Coastguard. |
| **Vulnerability criteria** | Complex nautical situation, presence of fishing vessels. | No prior radio contact between the ships;<br><br>Non-compliance with COLREG. | Outside the VTS zone. |
| **Benefits of State action** | | | |
| Collision avoided by the action of the non-privileged vessel.<br><br>Preventive action: Near accident notified by CROSS Gris-Nez to the company. | | | |



**General cargo "DC EEMS" - Bulk carrier "PANORMOS"**

| "DC EEMS" | | | |
|---|---|---|---|
| **Date** | 07/10/2016 | **Cargo** | 4.111t steel |
| **SRR** | Gris-Nez | **Hydrocarbons** | 100t HFO |
| **Lenght** | 90 metres// Gross tonnage: 2973 | | |

| "PANORMOS" | | | |
|---|---|---|---|
| **Date** | 07/10/2016 | **Cargo** | 169.9401 charbun |
| **SRR** | Gris-Nez | **Hydrocarbons** | 500t HFO |
| **Lenght** | 292 metres// Gross tonnage: 91373 UMS | | |

| The facts | |
|---|---|
| On 7 October 2016 at 01:57 p.m. a close-quarters situation was reported by CROSS Gris-Nez, between the merchant vessel DC EEMS / PFCE sailing at 9.8 knots and 133.5° and the merchant vessel "*Panormos*"/9HWW9 sailing at 13.1 knots and 298.5° at Hinder 1 junction. At 1:48 p.m. the DC EEMS was forced to deviate from its course to follow the general direction of traffic to the North. Radar and AIS data showed that the vessel wanted to pass the "*Panormos*" ahead. At 01:57 p.m. the "*DC EEMS*" had a course of 34° and 9.5 knots. At the most critical moment, the CPA between the two vessels was 0.09 NM and 5.2 minutes of TCPA. At 1:54 p.m. the Gris-Nez VTS service tried to make contact with the "*DC EEMS*" on VHF channel 16 to find out its intentions regarding the crossing manoeuvre. At 1:56 p.m. contact was established and CROSS asked the vessels to consult each other. At 1:56 p.m. the "DC EEMS" indicated to the "*Panormos*" that she was going to pass behind her. Radio readings indicate that the two vessels had not made contact with each other prior to the call from CROSS Gris-Nez. In accordance with COLREG 1972 rules 10 and 15, the preferred vessel was the M/V "*Panormos*". | |
| **Risk type** | No CPA/TCPA collision. |
| **Performance criteria** | COASTAL STM FUNCTIONS:<br>- detection of a dangerous situation (close-up or abnormal situation);<br>- analysis of the CPA/TCPA (vessel characteristics, prior contact between vessels, visibility, compliance with helm rules, proximity of hazards);<br>- analysis of the surface situation (vessels in fishing action, ferry traffic, traffic density, turning points, extremities of vessels, DST outskirts).<br>- preventive actions (consistency of kinematics, provision of relevant information to vessels, ascertaining vessels' intentions, etc.). |



| Cargo general "DC EEMS " - Bulk carrier "PANORMOS" |
|---|

| | Exogenous | Endogenous | Factors linked to the State's response |
|---|---|---|---|
| **Success criteria** | | | |

| | | | |
|---|---|---|---|
| | - Low traffic levels. | - Anti-collision manoeuvre for the non-privileged vessel. | - Good anticipation of the situation, alerting ships to the situation. |
| **Vulnerability criteria** | - None. | - No prior radio contact between the ships.<br>- Non-compliance with COLREG.<br>- Misunderstanding between the ships. | - Outside the VTS zone. |
| **Benefits of government action** | | | |
| Collision avoided by the action of the non-privileged vessel.<br>Preventive action: Near missed accident notified by CROSS Gris-Nez to the company. | | | |



**Trawler "LE PRECURSEUR" - Tug " PACIFIC HICKORY"**

| | | "*LE PRECURSEUR*" | |
|---|---|---|---|
| **Date** | 07/03/2016 | **Cargo** | Fish |
| **SRR** | Gris-Nez | **Hydrocarbons** | N/C |
| **Length** | 22 metres // 103 UMS | | |

**"PACIFICHICKORY"**

| | | | |
|---|---|---|---|
| **Date** | 07/10/2016 | **Cargo** | Empty |
| **SRR** | Gris-Nez | **Hydrocarbons** | N/C |
| **Length** | 43 metres // 880 UMS | | |

| **The facts** | |
|---|---|
| Situation: Dangerous manoeuvre at Hinder 1 junction. Infringement of COLREG. Rules 10 and 15.<br><br>Aggravating factors: lack of communication between gangways.<br>Emergency evasive manoeuvre by the preferred vessel. Situation: dangerous manoeuvre at Hinder 1 junction. Infringement of COLREG. Rules 10 and 15.<br><br>Aggravating factors: lack of communication between gangways.<br>Emergency evasive manoeuvre by the preferred vessel, collision avoided. | |
| **Risk Type** | Boarding CPA 0.1NM/TCPA 4min. |
| **Performance criteria** | COASTAL STM DUTIES<br>- detection of a dangerous situation (close-up or abnormal situation);<br>- analysis of the CPA/TCPA (vessel characteristics, prior contact between vessels, visibility, compliance with helm rules, proximity of hazards);<br>- analysis of the surface situation (vessels in fishing action, ferry traffic, traffic density, turning points, extremities of vessels, DST outskirts, etc.).<br>- preventive actions (consistency of kinematics, provision of relevant information to vessels, ascertaining vessels' intentions, etc.). |



**Trawler "LE PRÉCURSEUR" - Tug "PACIFIC HICKORY"**

| | **Exogenous** | **Endogenous** | **Factors linked to the State's response** |
|---|---|---|---|
| **Success criteria** | - None. | - Manoeuvring the preferred vessel. | - None. |
| | | | |

| | | | |
|---|---|---|---|
| **Vulnerability criteria** | - None. | - No radio contact between the ships;<br>- Non-compliance with COLREG. | - Outside the VTS zone. |

**Benefits of government action**

None: CROSS informed a posteriori Collision avoided by the action of the preferred vessel.

Preventive action: Near accident notified by CROSS Gris-Nez to the company.



**ANNEX V to letter No 0- -2017/PREMAR MANCHE/AEM/NP of /NP of June 2017 N° /NP of June 2017**

## VALUATION OF DAMAGE AVOIDED BY STATE ACTION

A study of the value of maritime safety losses was carried out in order to assess the financial implications of a shipwreck, loss or pollution caused by the cargo and propulsion hydrocarbons on board the ships included in the study.

In order to compare the economic damage to maritime safety avoided thanks to the action of the State's resources, a summary valuation of the costs of the State's surveillance and response resources in the Channel - North Sea working for the benefit of emergencies at sea has been drawn up.

It appears that the **costs incurred by the State for maritime safety surveillance and response amounted to around €20 million in 2016.**
**For the 22 cases17 studied in 2016, the value of avoided damage came to €3.9 billion,** or US$4.4 billion (conversion rate US$1 = €0.89).
**The cost of the State's resources** included in the study **therefore corresponds to around 0.5% of the damage avoided in 2016 in the Channel - North Sea.**
The added value provided to the blue economy by the preventive and reactive action taken by the State to ensure maritime safety in the Channel and North Sea can be considered to be equivalent to the cost of two

Exxon Valdez spills or almost two Costa Concordia spills each year (cost of the liner disaster: 2 billion US dollars). These figures are close to those published annually by the US Coast Guard.
The maritime economy is worth **270 billion euros, or 14% of France's GDP**18, and three times the size of the automotive sector.
The preventive action taken by government resources in the Channel and North Sea therefore **represents a tool with a particularly modest cost** in terms of the damage avoided, and even more so in comparison with the size of the blue water economy in France.
*On the other hand*, **the balance between the cost of the resources and the damage avoided reveals a very strong multiplier effect, with an investment benefit of 1 euro committed by the State for every 200 euros of damage avoided.**

| State Actor | Number | Staff | Total staff | Costs (with gross salary) | Operating costs | Related costs Infrastructure | Total costs |
|---|---|---|---|---|---|---|---|
| Semaphores | 14 | 10 | 140 | € 4 069 091 | € 138 043 | € 1 433 636 | € 5 640 770 |
| CROSS | 2 | 49 | 98 | € 4 800 000 | € 1 050 000 | | € 5 850 000 |
| Helicopter 33 F 19 | 1 | 20 | 20 | € 581 299 | € 19 720 | € 204 805 | € 805 224 |
| Helicopter 35F | 1 | 20 | 20 | € 581 299 | € 19 720 | € 204 805 | € 805 224 |
| RIAS "*Abeille Liberté*" | | | | € 5 700 000 | | | € 5 700 000 |
| RIAS "*Abeille Languedoc*" | | | | € 4 000 000 | | | € 4 000 000 |
| Boluda tugs | Interventions 2 | | | € 8 500 | | | € 17 000 |
| COM | 1 | 5 | 5 | € 145 325 | € 4 930 | € 51 201 | € 201 456 |
| PREMAR Channel | 1 | 4 | 4 | € 116 260 | € 3 944 | € 40 961 | € 161 165 |
| IED French Navy | 1 | 2 | 2 | € 58 130 | € 1 972 | € 20 481 | € 80 583 |
| **TOTAL categories** | / | 110 | 289 | € 20 051 404 | € 1 238 329 | € 1 955 889 | € 23 262 622 |

17 21 serious and major accidents avoided and 1 marine incident prevented.
18 The marine economy outweighs the car industry, Les Echos, Antoine Boudet, 20 February 2017
19 In 2016, 6 ANED operations required the use of helicopters for the projection of EEL, all of which were reimbursed by the shipowner.



**Summary table of damage avoided:**

The value of avoided losses was calculated using the sum of the following costs:

- value of the vessel7
- value of the cargo;
- cost of pollution clean-up at sea, on the shoreline and on the wreck21;
- the cost of any deconstruction of the vessel;
- impact of the sea event on the coastal economy (fishing and aquaculture, tourism, coastal industry, etc.);
- amount of ecological damage.

| Vessel Value | Cargo value | Depollution Cost | Deconstruction Cost | Impact on the coastal economy | Amount of ecological damage | Total |
|---|---|---|---|---|---|---|
| 279 MS | 265 MS | 693 M$ | 1 340 M$ | 1,639 MS | 168 MS | 4.4 bn S |
| 249 M€ | 236 M€ | 616 M€ | 1 192 M€ | 1 458 M€ | 150 M€ | 3.9 billion € |

| | | | | | | |
|---|---|---|---|---|---|---|
| value of property losses avoided per year | value of cargo losses avoided per year | cost of pollution control avoided per year | cost of deconstruction avoided per year | cost of economic damage avoided per year | cost of ecological damage avoided per year | |

1. INTRODUCTORY REMARK ON PUBLIC AND PRIVATE COSTS.

In principle, most of the costs of a marine incident are borne by the private sector, but if the private sector fails, the costs will be borne by the State. There is often a considerable gap between the losses estimated by the victims and the damages finally paid out by those responsible. According to data from the IOPC Funds22 , the amount payable after a court judgement is regularly five to ten times less than the estimated damage.

In the case of the sinking of the *Prestige* in 2002, the total cost of the incident alone for the autonomous region of Galicia (€762 million) was five times higher than the ceiling for damage cover under the 1976 London Convention (LLMC)23. The State therefore sometimes has to bear part of the costs of the accident directly24. In addition, any programmes to support the recovery of sectors affected by an oil spill are the sole responsibility of the public sector. For example, the "Galicia Plan" adopted in January 2003 by the Spanish government following the sinking of the PRESTIGE amounted to €12.5 billion.

2. METHODOLOGY FOR ASSESSING THE TOTAL COST OF A MARINE EVENT

Beyond the distinction between public and private costs, the total cost of a marine event should be considered as the sum of the following costs:

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20. Vessel values, cargo values and potential deconstruction costs were calculated by CROSS, *"Study relating to the economic valuation of the sea events prevention scheme of 09 February 2017."*
21. The depollution, socio-economic and ecological damage costs were calculated on the basis of the study by Etkin. D. S. (2004). *"Modeling oil spill response and damage costs".*
22. Compensation fund for oil pollution damage.
23. GARZA-GIL, Maria Dolores, *Estimating of the short-term economic damage caused by the Prestige oil spill to Galician and Spanish fisheries and tourism*, 2013
24. In the case of the *Amoco Cadiz*, those responsible were ordered to reimburse 50 to 60% of the clean-up costs and aid paid by the State to fishermen and fish farmers during the period when they were unable to carry out their activities, 25 to 30% of the costs of restoring roads and replacing public works equipment for local authorities, and 15 to 20% of the medium- and long-term economic damage to fishing, fish farming and tourism.



- Vessel value of the vessel;
- Cargo value;
- the cost of pollution clean-up at sea, on the shoreline and on the wreck;
- the cost of any deconstruction of the vessel;
- maximum amount of repairs to be paid by the shipowner, as set by the LLMC convention;
- impact of the sea event on the coastal economy: fishing and aquaculture, tourism, coastal industry, etc...;
- amount of ecological damage.

The valuation of economic and ecological damage is based on Professor Dagmar Schmidt Etkin's modelling of pollution response costs and induced damage25.

The damage caused by the marine incident to the reputation and volume of business of the company and charterer is not taken into account, nor are its possible systemic effects in the marine insurance field.

A summary valuation of the State's resources directly involved in the management of events at sea makes it possible to compare the amount of damage avoided and the investment made by the State to reduce maritime safety risks.

The GT has developed a cost analysis grid covering the following headings:

*2.1. The vessel value*

The vessel value is estimated on the basis of the market price, assessed by "shipbrokers" for vessels with similar characteristics (vessel type, length, tonnage, construction year).

*2.2. The cargo value*

The cargo value is calculated for the purposes of this study on the basis of data from mandatory reports (CRO) sent to the CROSS by ships over 300 UMS using the DSTs.

*2.3. The decontamination cost*

Estimating the cost of pollution clean-up is more complex insofar as there is no model applicable to all types of ship and most of the public data concerns ships carrying oil. Events at sea involving ships carrying oil have the greatest environmental impact and the highest media profile. They are therefore naturally the subject of more extensive literature.

Harvard University, for example, has compiled a list of the main oil spills since 1989 and calculated the **cost of cleaning up one tonne of spilled oil**26. The results show that clean-up costs vary widely from one region of the world to another. In the most developed regions, **the average cost is as follows**: **13 000 USD in 2017 in Europe**, 24 000 USD 2017 in Asia and 110 000 USD 2017 in North America.

The risk of oil pollution in the Channel-North Sea cannot be ruled out. In 2016, 65 million tonnes of crude oil passed through the upbound lane of the Pas de Calais DST, out of a total of 156 million tonnes of dangerous goods.

*2.4. The cost of ship dismantling*

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25 "FSS 2004: Etkin, Damage Cost Modeling", used by the US Coastguards.
26 Oil Spill Intelligence Report (OSIR) Oil Spill Database The total cost of oil spills in the United States is particularly high. For example, following the grounding of the EXXON VALDEZ in 1989, Exxon had to pay more than S$2 billion to the victims. BP estimates that the oil spill caused by the DEEPWATER HORIZON accident in the Gulf of Mexico cost it S$61 billion.



This cost can be extremely high. According to some estimates, the ***Costa Concordia*** disaster cost more than **$2 billion**: $513 million for the loss of the ship, **S$1.4 billion** for environmental protection and **$1 billion for refloating and deconstructing the wreck (824 MS and 100 MS respectively).** The cost of these operations, which took two years, exceeds the initial value of the ship.

As part of this study, particular attention was paid to calculating the cost of deconstruction.

Based on public data from the Lloyd's insurance company, a relationship can be established between the length of the ship and its dismantling cost27. The formula derived from this observation was used to estimate the cost of dismantling each ship. This estimate must obviously be treated with caution, as the cost of deconstructing a vessel grounded on the top of a beach is inevitably lower than the cost of deconstructing the same vessel submerged offshore or grounded on a shoal.

*2.5. Impact on the coastal economy*

Fishing and marine farming activities, tourism, agriculture and coastal industry can be disrupted by an accident over a period of several decades.

The impact on the coastal economy necessarily varies according to seasonality, the area affected, media coverage of the event and its consequences. In any event, a massive oil spill in the Channel and North Sea would have considerable economic effects because of the importance of the coastal economy.

In the case of the *Prestige*, an in-depth study of the effects of the shipwreck on Galician fishing and aquaculture showed a 17% drop in income in this sector between 2002 and 2003. Coastal tourism also suffered a 20% drop in revenue between 2002 and 2003.

**In the industrial sector, a massive oil spill could affect cooling water and lead to a temporary shutdown of a nuclear power plant**. For example, the Gravelines nuclear power plant supplies 9% of France's nuclear power. The cost of stopping production at this plant is estimated at **€6 million per day (€1 million per day per reactor).**

*2.6. Ecological damage*

The concept of ecological damage is a legal principle that makes it possible to claim compensation for purely environmental damage independently of the aforementioned material damage. It is defined by article 1247 of the law of 8 August 2016 for the reconquest of biodiversity, nature and landscapes as "*non-negligible damage to the elements or functions of ecosystems or to the collective benefits derived by man from the environment* ".

Estimating the amount of this loss is still a relatively unexplored area. The amount will depend on variables specific to the environment: protected marine areas, the presence of rare species, but also the vigour of the environment of the parties invoking this principle. In the case of the ***Erika***, the Paris Court of Appeal assessed the amount of damages at **13M€ the amount of ecological damage suffered**.

In the Channel and North Sea, the multiplicity of marine protected areas would certainly have an impact on the definition of the amount of ecological damage suffered as a result of an incident at sea.

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27. By plotting the cost of deconstruction as a function of ship length, it is possible to obtain a trend line whose equation is a polynomial of the second degree. This hypothesis was adopted for this study, along with the following formula: Deconstruction cost (in millions of dollars) =0.0031410086 L2-0.6303747441 +70.2169487369 with l. the length of the ship in metres



**Focus on the sinking of the Tricolor**

The most significant maritime event in the Strait of Calais over the last 15 years was the sinking of the ro-ro ferry *Tricolor* after it was collided with a container ship in the fog north of Dunkirk, at the Hinder 1 junction, in December 2002.

According to the insurers' calculations, **the total cost of the accident is at least €190m**. The market value of this complex ro-ro vessel was estimated at €35 million. At the time of the accident the vessel was loaded with 2862 cars and 77 containers with a total value of 100 Mε. Due to the danger to navigation posed by the ship lying on its side, the wreck had to be deconstructed on site. The total cost of this exceptional project was €54.7m.

The oil pollution, which was limited in scale (nearly 2,000 tonnes of bunker fuel were on board), did not have a serious impact on the coastline. On the other hand, the Ligue pour la Protection des Oiseaux (League for the Protection of Birds) counted 21,500 oiled birds, both dead and alive, with a very high proportion of common guillemots. Finally, major costs have been incurred by the authorities to ensure the safety of shipping in the vicinity of the wreck. Despite these measures, several ships collided with the wreck, resulting in repair costs and incidental pollution.

The *Tricolor* accident is emblematic of the large-scale maritime events that can impact the Strait of Calais, both in terms of its causes and its scale and cost. In its technical investigation report, the BEA Mer recommended at the time the definition of a caution zone and the setting up of a surveillance system for the DST at "Westhinder" equivalent to that of the DST at Pas de Calais. This surveillance, implemented by the CROSS Gris-Nez, is the backbone of the navigation safety system in the Pas de Calais and helps to limit the recurrence of such accidents, with their tragic consequences.

**The sinking of the cargo vessel *Flinterstar* off the coast of Zeebrugge in October 2015 served as a reminder of the ongoing risk of collision and the importance of maintaining a coastal system to prevent close-quarters situations.**



**APPENDIX VI to letter no. 0 -2017/PREMAR MANCHE/AEM/NP of /NP of June 2017**

**N° /NP of June 2017**

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