

## Meeting Transcription

**Person interviewed:** Chris Trubshaw

**Date of interview:** 21.04.2022

**Time commenced:** 13:25.

**Interviewer:** NAME REDACTED (X1), NAME REDACTED (X2)

	Person speaking	Commentary
<b>PART 1</b>		
00 00 00	<b>X1</b>	So, it's 13.25 on Thursday 21 <sup>st</sup> April 2022 and we're at the airbase in Lydd and this is the interview with Chris Trubshaw, present in the room, <b>NAME REDACTED</b> , MAIB.
	<b>X2</b>	<b>NAME REDACTED</b> , MAIB.
	Chris Trubshaw	Chris Trubshaw.
	<b>X1</b>	OK, Chris, so first of all, can you tell me about yourself and your role for Bristows?
	Chris Trubshaw	I'm one of the search and rescue captains here, which means that I'm a pilot, part of the crew, but also when required I'm the, inverted commas, lead crew for the shift. I'm responsible for the running of the shift, maintenance of state, i.e., can we perform to the required specifications, safety and welfare of crew, engineers, the building, and security, etc. Although, it is a team effort. In the air, my primary responsibility as the captain is the safe and efficient running of the mission. That's about it really.
	<b>X1</b>	OK, and so how do you get your tasking?
	Chris Trubshaw	Tasking is telephoned through from the NMOC UK Aeronautical Rescue Centre in Fareham. It comes through on a, inverted commas, hotline, but we also have a standard BT line to them. They will phone through, give us details of a job, what they want us to do. And it's also our opportunity then to ask questions as to amplifying information, medical, what is required, etc., etc., other assets. From there we can form a plan. If it's anything outside of a standard operation, then we can make allowance for that and plan accordingly.
	<b>X1</b>	So, when that comes through there's a bit of planning on your part and is there a feedback loop to say we'll take the tasking or?

	Chris Trubshaw	There is yes, and ultimately as captain of the aircraft it is down to me whether I say yes or no as with any of the other captains here. But everything is considered weather, fuel, possible diversions. We look ahead obviously if we're out for three hours what's it going to be like in three hours' time.
00 02 38	Chris Trubshaw	And options and all this is tends to be verbal planning so, I think we're going to do this take information for the rest of the crew, it's always better to have more ideas than just one. And then we made the decision from there to go or not.
	<b>X1</b>	OK. I think, I'd like to ask in more depth about various areas.
	Chris Trubshaw	Sure.
	<b>X1</b>	But I'm conscious of the fact that you could be called away at any time. So, I think we'll go into what happened last November and then we'll go into the other detail, other areas in more detail.
	Chris Trubshaw	Sure.
	<b>X1</b>	If that's all right, <b>NAME REDACTED</b> is there anything?
	<b>X2</b>	No, that's a good idea, that's fine.
	<b>X1</b>	So, I appreciate it's quite a long time ago now but if you could tell me sort of in as much detail as you can remember about what happened on the shift on the 23 <sup>rd</sup> , 24 <sup>th</sup> November last year.
	Chris Trubshaw	Sure. We do have training requirements. So, we'd been out the day before doing a standard training sortie, I can't remember exactly what we did. And then had gone in to our at extended readiness for 22.00 which is 45 minutes at night. Last thing I do normally as the aircraft commander is check the weather. Look at any upcoming notices to us as airman or especially events for the next day to make a mental note/plan. And then most people tend to not necessarily got to sleep but turn in from 22.00 because we are mandated to have a quiet period 22.00 to 08.00 at extended readiness. I went to bed, got the call early the next morning, can't remember the exact time, requesting a search. Now, this has not been unusual, certainly with the increased migrant activity we've seen over the past two years. The weather was questionable and I believe the controller said, do you want to get up and have a look at the weather and then call me back and we can talk

		<p>about it, which I did. Initially, delayed the, I delayed getting the rest of the crew up and also delayed the decision to launch on discussion because the weather predicted here and along the south coast was not particularly good in terms of aviation.</p>
00 05 14	Chris Trubshaw	<p>And the main thing I think, was visibility getting back into Lydd. My co-pilot, although he is another qualified captain was <b>NAME REDACTED</b>, so eventually after discussions with the ARCC I decided to get him up and we discussed it and at that point then got the rest of the crew up, which caused a delay in launching based on weather prediction. We then had a brief and the task was to search for migrant activity and I can't remember if there was a specific number of boats we were looking for. So, we launched, however the aircraft went US on start. This is an electric aircraft and there was an electrical fault which could only be cleared by like doing with a computer, turn it off, turn it back on again. So, it happens occasionally. So, that's what we did, which again further delayed the launch and then we got airborne. And the weather was not as bad as predicted. You can get local effects here where the fog just sits over the coast but it wasn't as bad as we thought. So, we went off to conduct the search. I think Dover Coastguard were coordinating. I don't know what it was. So, we got our search instructions, went out to the point, and carried out the search. We found a number of migrant vessels. Three I think it was which were reported back, video footage was taken as we always do and we carried out the search as directed. Out for about 2 hours, I think and then obviously fuel endurance was running low which completed the directed search, found these vessels with fuel running low, we said right we'll come back. Came back called the ARCC on the land line and said what you want us to do and were stood down. There was an issue with potential crew fatigue as well at that point having, you appreciate getting up at silly hours in the morning to go and do the task and it's quite intensive to come back. It's quite fatiguing. And one crew member said I'm not performing properly due to fatigue. So, we stated that to the ARCC and were stood down and then went back to bed for a bit. They did ring us back at one stage. I think I was in the shower and so, we took the call and then it was decided that we weren't going to launch for that one. I can't remember there was not required to go and do another activity and that was the input. We</p>

		then handed over, just as we were handing over which for us starts at 12.45 to be new crew on state by 13.00. But they were all ready and in early so, I think they took it about 12.40, something I can't remember the exact time it was.
00 08 46	Chris Trubshaw	And then that was the conclusion of our involvement basically.
	<b>X1</b>	OK. Well, so, we'll rewind back into the beginning there. So, you were called sometime in your quiet period.
	Chris Trubshaw	Yes, it was post-midnight so, yeah 1 o'clock maybe, I don't remember the exact time.
	<b>X1</b>	And initially you know, you're a bit unsure about the weather, you woke up <b>NAME REDACTED</b> .
	Chris Trubshaw	After discussions with the ARCC who, who have they have Met data presented to them as well. And it's the same data that we have basically, it details visibility wind etc. etc. but it's all automated that time of night as you can imagine. It's not always accurate but you have to make a decision based on A, local knowledge, B, what is presented with you at the time. But yes, sorry carry on.
	<b>X1</b>	No, it's all right and so you, then so you had a discussion with the ARCC then you had a discussion with <b>NAME REDACTED</b> . And then woke the rest of the crew, went out, you had the technical issue.
	Chris Trubshaw	Yep.
	<b>X1</b>	With the, did you say the electronics?
	Chris Trubshaw	Well, I can't remember it was a specific caution that we get, that normally you can clear it down, you can get the engine engineers to come out and they interrogate the aircraft electronically and can clear it by using what are virtual circuit breakers within the aircraft. It didn't. So, the only way to clear it, then therefore have a serviceable aircraft to go and do the task, is to shut it down, let it reset all its logic, restart it, and on restart it didn't return. So, it was one of those things.
	<b>X1</b>	And how long does it take to shut down and restart the aircraft?
	Chris Trubshaw	It takes two minutes to shut it down and then you wait two minutes and then to start it again takes a little bit longer. The engines have to have a cooling down period because they're operating sort of 600, 700 degrees. So, you then have to, what's called vent the engines, run air through them just to cool them down enough to start. And then you flash up all the equipment. So, about

		another 10 minutes after that, so, 20 minutes for the whole thing, maybe? Because normally with 15 minutes notice we're out the door, started and airborne within sort of 10, 12 minutes.
00 11 20	<b>X1</b>	We had a prime chance to witness this this morning and I was very impressed at the speed at which they were off the ground.
	Chris Trubshaw	Yeah. These things happen and the electronics and the computing system in this aircraft is amazing. Sometimes just like your own computer. The question comes, why is it doing that? And the only way to clear it is to shut it all down and restart it. But it's not an hour long evolution. So, there's a little bit of discussion while the engineers come out and repeat, why is it doing that? A bit flippant there, but that's really what it is because we have a number of cautions. It's like a modern car. It has lots of sensors. If the sensor fails, it tells you the sensor has failed. If something that the sensor has picked up has failed, it'll tell you. And sometimes these things can be spurious. It's a complicated piece of kit.
	<b>X1</b>	But you got it restarted. You got off in the air. The weather wasn't as bad as.
	Chris Trubshaw	No, it was a bit skoshy as a technical term. So, the visibility was around the coast was there was mist/foggy, low cloud. And you get it across the marsh here. Obviously the sea stays warmer than the land. You get a temperate difference and it can cause local effects that way. But it wasn't as bad as it was predicting on our computerised Met facilities.
	<b>X1</b>	So, you got up and then at this point, Dover gave you the search mission.
	Chris Trubshaw	Dover gave us it when we were airborne. So, that's normally what happens. The ARCC will give us the task. We will ask them for amplifying information. Quite a lot of the time, it's don't know, just go and we'll build it up. And then you'll have a coordinating authority. So Solent, Dover, Humber and that night it was Dover.
	<b>X1</b>	And can you remember anything about the search itself or the conditions when you were out searching?
	Chris Trubshaw	In terms of what?
	<b>X1</b>	Just, you know, what the viz was like, what the weather was like. How it felt?
	Chris Trubshaw	Oh crumbs. Nothing untoward. We were using a variety of searching apparatus, i.e. the FLIR. As pilots we use NVG, which are fantastic, not infallible. You know, there's a gap between the device and the human and

		that's where all the mistakes happen, if you want to call it that. No, I can't remember anything. No, that was a six month ago.
00 14 12	<b>X1</b>	Yeah, no.
	Chris Trubshaw	The search itself. The search itself was slightly unusual in that they had given us a specific search pattern. Normally it's, if you're just given a datum, you will conduct a sector search, which I'm not sure if you've seen it. It looks like a sort of butterfly pattern. This one was an expanding square search where you start at a specific point. You fly along a leg and then the next one is at 90 degrees and it's slightly longer. Next one 90 degrees to that. So, effectively you're paralleling the other one a little bit longer and you expand out from a position. Don't always get that, but we go with whatever we're told to do.
	<b>X1</b>	OK. So.
	Chris Trubshaw	Once you're given the search pattern, there is a little bit of interpolation between the information and the kit that we have just to put it in correctly. And then the aircraft will fly it for you effectively.
	<b>X1</b>	And I appreciate this may be more a question for the Coastguard side of things, but with the, you know, the difference between a sector search and an expanding square, is that different because of what you're looking for or the information you have?
	Chris Trubshaw	Yes. I mean, it's a good question. The sector search is the default search if you're just given a rough position because it covers out to a certain range, a greater area quickly. So, you're given an outbound heading, you'll then, the aircraft will turn you around through 60 degrees. Then you'll fly back to the datum point. and it'll fly you out again it'll turn you around another 60 degrees so, within three passes you've covered the 180 sorry, the 360 degrees because you're doing 180 each time you go around. You can then move it and saturate the area and what it does is based on, what they call the sweep width which is the distance either side of the helicopter. They reckon you can see given the sensors that you've got and that's all put into a computer model. So, the sector search is a quick way of getting coverage if you like. Expanding square search is a very specific pattern but it does the same thing, it covers the area might take a little bit longer to do because you're turning 90 degrees each time. The legs can be very

		short as well at times. So, there's a mixture there of flying the aircraft and looking out up front and the sensor operator down the back is concentrating on quite a small area.
00 17 12	Chris Trubshaw	You can expand out and close in with the FLIR, when it's closed in it's like looking at a pool table through a straw. You know, you need you need to have a very specific point you want to look at so, we'll start wide and then come back in. And it's an all sensor search at that point. We were told we were looking for migrant boats they can be anything from a kid's inflatable canoe, pink flamingo to larger vessels. We weren't necessarily given the detail that, I don't think at that point.
	<b>X1</b>	OK. So, you went out you did the expanding square search and you found three.
	Chris Trubshaw	I think it was three.
	<b>X1</b>	And once you've found the vessels what happens then?
	Chris Trubshaw	Well, the requests vary the intention is not to spook, in inverted commas, the boat, what we've been seeing is a lot of time if you fly close to them, they stop they start throwing things off the side of the boat etc. And wave an awful lot, I get it they've been at sea for a long time. But the idea is to stand off, if we found something we can look at it with the FLIR and monitor from a safe distance up to sort of five to six miles if necessary. However, sometimes you're asked for information like how many people are in the boat, what kind of boat is it, can you identify if there are minors, has everybody got life jackets, do they appear in distress etc. etc. Which might mean we need to fly over the top of it to look down on the boat to get a rough head count and then we'll stand off. At that point the intentions or the instructions were report position, rough course, and speed and how many people are on board if we can tell. You can't always tell because obviously at night, you're looking at black and white, thermal difference as opposed to in the daytime you can go 1 to 27 or whatever it is. So, the positions were passed as lat and longs back to Dover with a rough course and speed and then sort of nine times out of ten they ask amplifying questions if needed. Once you've done that, request intentions, they either say right carry on with your search pattern or shadow the boat or we believe

		there's something over here, can you go and have a look at it.
00 19 59	<b>X1</b>	So, it's Dover who sort of make that call as to whether you sort of stick around and shadow them or whether you go back to your search.
	Chris Trubshaw	Yes. I mean we can make recommendations but it's all based on their call and it's difficult, they're sat in a concrete room trying to think right, what's he looking at. They don't know what it's like in the helicopter necessarily and you have to report this information. So, the key points are position course and speed number of people in the boat, are they in distress.
	<b>X1</b>	Thank you and yeah, so you went out, you did the search, you found some targets and then looking at the fuel and the amount of time you've been out, you came back to, back to Lydd.
	Chris Trubshaw	Once so, we did actually complete the search that we were given.
	<b>X1</b>	You completed the search?
	Chris Trubshaw	Yes. Yes and then on the way back we were asked to fly a track that covered another bit of water between sort of mid-channel, traffic separation scheme and the coast. So, we then came back along the coast, I think it was daylight by then. So, I think, I can't remember it was November.
	<b>X1</b>	And when you say you completed the search you were given, how much expanded does an expanded square search get? Is there a set distance or...?
	Chris Trubshaw	No, it can be it can be as much as far as you want. So, basically you get given a set of parameters, let's say sweep width, direction of travel of the first leg. So, east say direction of turn. So, you can go left or right and that will affect where the search ends up. and um based on the sweep width the aircraft will work out how long the leg is each time to expand round. But if you can imagine flying 090 ten times each on an expanding bit and then 180, 27, 36, it takes a lot of time and fuel but it is it covers a very specific bit of ground.
	<b>X1</b>	Does it repeat the area of ground that you're covering or do you cover the same bits twice or does it just covers new bits each time?
	Chris Trubshaw	No. No. I can draw it for if you want but it won't help for the tape but it literally it looks like a digital spider. Oh there it is, yeah is that the one, yes. So, OK that's the datum position.

	<b>X1</b>	Yeah.
00 22 45	Chris Trubshaw	And then, so, the first leg would have been coming this way, what's that about 070 something then turn left, on to 34, 25, 16 and as you can see it gets bigger each time, as you as you come round. Are those the positions of boats are they? I don't know. So, you cover an expanding piece of the ocean based on this sweep width and your search speed. And those are parameters we're given, the speed is the one we have a little bit of leeway too. But also we can recommend back to the control room authority you might want to expand it or contract it based on the conditions we have out. In the, at the search area at the time.
	<b>X1</b>	I want to sort of go into more areas about searching for migrants and things.
	Chris Trubshaw	Yeah.
	<b>X1</b>	But before we sort of move of the specifics of last November, I'm just going to pass over to <b>NAME REDACTED</b> . And ask if there's anything he...
	<b>X2</b>	Just a couple, when you received the tasking from the ARCC.
	Chris Trubshaw	Yeah.
	<b>X2</b>	What information do they give you, do they tell you this is a distress situation or what, it's a migrant situation?
	Chris Trubshaw	Yes. Normally they'll say, hello this is the ARCC, we've got a wet job or a dry job which means land or sea.
	<b>X2</b>	Yeah.
	Chris Trubshaw	Request from Dover for migrant activity.
	<b>X2</b>	Yeah.
	Chris Trubshaw	I don't know what the words were on that night specifically, migrant activity within the area of X.
	<b>X2</b>	OK.
	Chris Trubshaw	OK, where is it, if it's a buoy in the channel for example, where is that?
	<b>X2</b>	OK.
	Chris Trubshaw	We have maritime maps and we can find the buoys.
	<b>X2</b>	Yeah.

	Chris Trubshaw	We don't always know which one is where, you know we're getting to know when the Sandettie Light is and etc. etc. But you don't always know where it is. So, the initial task is, wet job, migrant tasking. You're tasked to this position and they'll either give it as a lat and long or a grid position
00 25 17	Chris Trubshaw	Dover coordinating, what do you think? Right. OK. Is there any specific intelligence? Is there definitely a boat there?
	<b>X2</b>	Yeah.
	Chris Trubshaw	Quite often it's, we don't know just find out when you go, OK, number of people involved, don't know, OK, what are we looking for is it more than one or what do you want us to do?
	<b>X2</b>	Yeah.
	Chris Trubshaw	And that is the big question is, what do you want us to do? Because there's a difference between patrolling.
	<b>X2</b>	Yeah.
	Chris Trubshaw	There's a difference between searching and there's a difference between getting to a position with the intent to rescue
	<b>X2</b>	Yeah.
	Chris Trubshaw	So, if it's a migrant task, you're sent out to search for, we know there's three boats coming along somewhere in the channel.
	<b>X2</b>	Yeah.
	Chris Trubshaw	Correct. So, you have to search the whole channel. So, they'll give you search instructions, you then put it in and away you go. And it can be as little as that. As in we think there are three boats somewhere. If it, if there has specific intelligence they would say yes, there's a boat sinking definitely 35 people on board this is an issue. That can affect equipment we carry, can affect fuel planning, obviously if you're picking up 35 people, it's going to be two trips there's just not room to put 35 people in the back at one go. Where are we going to put them? So, if there's injured, where we, what hospital are we going to take them? Have we got enough fuel? Can we land there? So, there's that sort of stuff. Sorry, I'm going on a bit from your original question but that's the sort of process that we go through because you want to be two three steps ahead of the aircraft at least. Because if you get there pick 35

		people up and go oh, right where do we go now. Oh, it's foggy over there, the only thing we can do is land back in the sea.
00 27 15	<b>X2</b>	Yeah.
	Chris Trubshaw	Not much good. So, you've got to got to think along those lines, if it was a definite, like the job they've just gone off on now. The report was person in the water.
	<b>X2</b>	Yeah.
	Chris Trubshaw	That's all you need. You can't say yeah, yeah, yeah, let's go of course there is. You go, right person in the water this is the standard reaction, we get there if it's not a person in the water. OK. So be it
	<b>X2</b>	Yeah.
	Chris Trubshaw	There's a, the migrants have been using certain key words. And we've seen a definite pattern of that over the past two or three years. Where they will use trigger words like not enough life jackets, women and children on board or we're sinking. And you go right, OK if that's the case, we're responding to a sinking vessel, it doesn't matter if it's migrant or not. On that night, the request was just to try and find.
	<b>X2</b>	OK.
	Chris Trubshaw	Contacts.
	<b>X2</b>	Yeah.
	Chris Trubshaw	And that's the, that's all the information that probably Dover had at the time. So, it's very difficult as I say to give a specific instruction when the information is not there.
	<b>X2</b>	Yeah. But if you receive it they tell you as migrants, you're just going to search. Does that affect your decision making to go or not? Do you still go?
	Chris Trubshaw	Yes, yes, it can do because if it's a search.
	<b>X2</b>	Yeah.
	Chris Trubshaw	And it is unsafe to do so, then I'd say no.
	<b>X2</b>	Yeah.
	Chris Trubshaw	However, if it was a rescue and it was unsafe to do so, you have to be pretty bad.
	<b>X2</b>	Yeah.

	Chris Trubshaw	I would also say no. So, you know that happens very, very, rarely. Very, very, rarely.
00 28 58	<b>X2</b>	OK.
	Chris Trubshaw	Because you will always go and give it, a give it a shot. With the intention of planning to get back somewhere safely, that's a beach.
	<b>X2</b>	Yeah.
	Chris Trubshaw	If it's into France. Back of a boat if necessary, top of a cliff. That's the sort of process you're looking at but there is no pre-judgment based on the tasking that is given, apart from planning for what is.
	<b>X2</b>	Like (inaudible)?
	Chris Trubshaw	Yeah.
	<b>X2</b>	Yeah, that makes sense. Thank you.
	Chris Trubshaw	Yeah.
	<b>X2</b>	Just one other thing, when you said about the weather conditions on the day.
	Chris Trubshaw	Yes.
	<b>X2</b>	About visibility. Is that visibility in terms of, you being able to navigate the craft or is it in terms of visibility of finding people in the water?
	Chris Trubshaw	It was mainly visibility for getting back on that occasion.
	<b>X2</b>	Yeah.
	Chris Trubshaw	The FLIR is good but it won't see through cloud. NVGs are good again are degraded in cloud or poor visibility and at night you're not going to see anything.
	<b>X2</b>	OK.
	Chris Trubshaw	Does it affect it? Yes, it does. If it's a search, can we wait an hour or two until the weather reprieves, is the first response. If we go and it's for a patrolling search if you want to call it that or locate, find, fix of AN vessel.
	<b>X2</b>	Yeah.
	Chris Trubshaw	Not just migrant, but AN vessel, then you've got to look at all of those conditions as to, right, what's my response going to be at the end of the day? And it comes back to that captaincy bit as I said at the beginning, part of my job as the captain, is to look at that as a whole. And make a decision based on that.

	<b>X2</b>	Yeah.
00 30 46	Chris Trubshaw	So, out of 100 jobs, 99.9 we would say, yes we will go and given it a go. There's a very small minority of it that we will say, it is just not feasible.
	<b>X2</b>	Yeah. OK. That's fine.
	Chris Trubshaw	All right.
	<b>X2</b>	That's clear. Thank you.
	<b>X1</b>	Cool. So, thank you for telling us what you could remember about 24 <sup>th</sup> and again I do appreciate it's a while back. I think, you know, some interesting things have come out of that, so, let's talk now sort of migrant operations in general. For you as a captain, how has the sort of migrant situation evolved with your role?
	Chris Trubshaw	In what respect?
	<b>X1</b>	As in, your role as a search and rescue captain. As the migrant situation has gone on, how has that sort of changed how you do things?
	Chris Trubshaw	It hasn't changed at all. The tactics if you want to call it that have changed, our instructions have changed but in terms of response and planning. It hasn't changed at all. It is another, you have to look at it very coldly. And say it's another task and by coldly I mean, non-judgmentally. So, you respond to what you're given doesn't matter who they are or where they've come from and ours is not to judge on that at all. So, that has not changed. In terms of planning, yes it has changed slightly because of the change of tactics of the migrants crossings. Before used to be single boats driven by people trafficking as much as we understood in discussions with Border Force etc and then the boat would go back. And our job was to try and covertly track so, that we could then report back but the numbers crossing were a lot smaller. It then changed to boats being provided and generally enough fuel to get across but the migrants were then on their own. We understood that price had dropped from the other side. I don't have the specific intelligence that but that's what we were working on. Now, it has come to almost swarm tactics where they are given these very large inflatable tubes which aren't really boats from what we can see. They're given an engine but they're also told these keywords to trigger the response. So, is there frustration, yes there's a bit of frustration of course

		there is but it doesn't affect the outcome of planning, response planning and duty care of you want to call it that.
00 33 55	Chris Trubshaw	So, it would respond as normally.
	<b>X1</b>	Has it affected the way you're tasked? Oh sorry, the type of tasking you're given.
	Chris Trubshaw	Yes, yes, we've seen a seen a change in that. So, up until recently we've seen an increase in the amount of tasking for migrants activity that we've had to deal with but the type of response has been very much, find, fix, track, report back, as opposed to actually interacting with. I've got to be careful here up until that night, I've never had to interact with the rescue situation, with migrants in the water, personally. There was a point again where we were told to stand off, so that we didn't probably agitate a situation where people would jump into the water deliberately. The increased use of lifeboats has been noticeable to pick up these people because they're big numbers. But they're also in you know, two or three in a canoe or as I say one of these little kiddies' beach boats. But because of the increased numbers our tasking has changed. So, predominantly we will patrol in inverted commas, that's my word not anything indoctrinated. Where we will fly a search pattern that covers a large expanse of water, find vessels, as I say, report them back. And then be asked oh, can you move on and see if you can find another one. But not actually interact with the vessel itself.
	<b>X1</b>	Ok. And you said up until that night, did you have any interaction with vessels on that?
	Chris Trubshaw	No, I mean, that's with hindsight and subsequent information of what happened but we've not had to do it. I did go across to a reported sinking in French waters at their request, where we went and there was a French lifeboat there who picked up everybody and we just patrolled around but that was at the French request. So, that's the actual closest interaction to rescue that I've had with the migrants.
	<b>X1</b>	So, the situation you're describing to me there is that you know, over time that the migrant operations have evolved from kind of covert small numbers of people in a, driven by the people smugglers, up to sort of slightly larger vessels and then on again to these really large craft or...
	Chris Trubshaw	Well, anything nowadays, anything.

00 36 50	<b>X1</b>	Where they're sort of, you described as a swarm.
	Chris Trubshaw	Yeah.
	<b>X1</b>	Tactic.
	Chris Trubshaw	Yeah.
	<b>X1</b>	But they're looking to be found.
	Chris Trubshaw	I can't give that as a definitive but that's what it would appear as. And that is based on when we find them they stop, they wave and they wait. And then if we go off then they'll start the engine on again and go a bit closer. It does seem that their tactic is now to get picked up as opposed to make landfall but I again, I can't comment on that from any official doctrine or source that's just what it appears to happen as we have seen over the years.
	<b>X1</b>	And you mentioned that you know it's changed the planning has changed how much do you, as the air crew, get involved in planning for no migrant activity?
	Chris Trubshaw	Not at all, not at all. We are reactive, totally reactive. We are given a guide, if I think it's the best thing, produced by the MCA that says what their assessment they think of potential crossing is going to be. Does it affect day-to-day operation? No, it just gives us a heads up. So, we are primed and cocked, ready to go to respond to whatever is given us throughout the 24-hour period.
	<b>X1</b>	And your sort of information loop is with the ARCC. So, I think you mentioned on the 24 <sup>th</sup> you came back and you felt that one member of the crew was feeling fatigued. And that information, you would relay that to the ARCC?
	Chris Trubshaw	Yes, that was passed when they tried to task us again later on in that shift. What the tasking was, I can't remember. I think it was back out to reaffirm a search.
	<b>X1</b>	And things like your fuel levels or your flight hours and things, who's keeping overall control of that?
	Chris Trubshaw	We have. The reason we train so much is we have very generous alleviations from the Air Navigation Order given to us by the CAA. Within that is the flight crew time. And managing that is, again, it's the responsibility of the crew. Ultimately, there has to be a focus point, and that's the captain within the shift. So, if you get to your 12-hour flying limit, that's actually in the air, then

		you have to say, I'm sorry, I'm not legally allowed to fly anymore.
00 39 48	Chris Trubshaw	If you got to 12 hours and you could see somebody in the water, you're not going to turn around and come back. And then you justify it afterwards. If you get to a point, though, and fatigue is very high within the safety risks, A, within the company, but B, within the CAA, then we are taught to recognise signs, implement practical policies to adjust for that and make sure it doesn't happen. But, again, if you needed to fly 23 hours out of 24 and you were rescued, say there's a ferry and you just had to keep going, then you would, until the point where somebody's falling asleep at the controls and it's like, we need to have relief. And that's when other assets are brought in. And that becomes a whole communication piece within, the ARCC, because they control the whole country. So, they would pull in another aircraft from Lee-on-the-Solent, from Wales, maybe even up from Cornwall to help with that incident.
	<b>X1</b>	OK, so that all feeds into that. And you mentioned there you justify it later. And I think you mentioned when you were talking about the technical issue on the 24 <sup>th</sup> that you make a note of the delay. What are you making a note on?
	Chris Trubshaw	We record it by voice. I say to the ARCC, we've had a technical issue, or we can come in and give them a quick phone call. And then the ISAR report afterward, if there's a delay, there should be a reason for delay put on their onto the report. So, if it's over 45 minutes, when you're filling in the ISAR report, it flashes up and says there's a delay. Why is that? And you can annotate within comments about weather, planning, technical issues, whatever it may be.
	<b>X1</b>	And ISAR is?
	Chris Trubshaw	It's Intelligence Search and Rescue, I think. I don't know, actually. I don't know if it's ISAR. It is the recognised recording tool that we use in conjunction with the MCA to record our training, our jobs, our currencies. It's used for planning to make sure that you are current within this. It's a great piece of kit and does an awful lot and helps us as a company monitor, predict and protect. It helps us as a unit to report and is accepted by the MCA and the CAA as an accredited tool to do so.
	<b>X1</b>	And I want to move on in a minute to talk more about the aircraft itself and also about searching specifically.

		But before we move off migrants, I'll hand over to <b>NAME REDACTED</b> in a second.
00 43 01	<b>X1</b>	I just want to ask, has there been any effect on crew morale or well-being with the migrant activity?
	Chris Trubshaw	I'm sure there has but I can't say with certainty. There is always, within an organisation like this, like road ambulance crews, like police, like fire, there is banter. And there is discourse. Nobody's ever happier than when they're grumbling. There is a certain amount of opinion that people say about migrant activity, but I would say it's probably less than, the man who lives down on the beach front of Littlestone, who has seen them coming up the beach and is frustrated with his MP, with a right wing view if you want to call it that with regards to migrants. For us, searching is a task that you have to put effort into because it is a low arousal initially activity. But to do it effectively and to do it properly which is why we use the equipment, which is why we use the modelling computers and we discuss it with experience it becomes effective because a person in the water at a mile and a half looks like an aircraft carrier at 10 miles. It's that sort of comparison that you're looking for so, you use experience, you use training and we use the parameters that we're given to do a search. Effect on morale yes, there's a little bit of chuntering I'm sure when crews get back and then it's gone and then you move on and prepare for the next one. But no, as I say, no more than any other person on the street who is aware through reporting of what is what is going. What is frustrating is that we get a little bit more information about what happens on the other side and you form your own opinion on that. But professionally you just respond to it as you would any other task.
	<b>X1</b>	And I mean for you here has there been any sort of effects on like other more traditional SAR activities, do you think?
	Chris Trubshaw	No but it has increased our activity. We've been involved for a number of years now and as I said to you earlier, I've seen these changes in tactics and etc. what's going on but it's part and parcel of being the social rescue unit on the south coast.
	<b>X1</b>	That's great. <b>NAME REDACTED</b> , is there anything on migrants that you want to add?
	<b>X2</b>	The ISAR report is that that's kept by the ARCC is it?

00 46 03	Chris Trubshaw	They do.
	<b>X1</b>	I'm just going to pause briefly here.
<b>PART 2</b>		
00 00 00	<b>X2</b>	So, the ISAR report, yeah, so those reports are held at the ARCC, is that...?
	Chris Trubshaw	They're electronically stored, whether it's an ARCC or versus, I don't know.
	<b>X2</b>	OK.
	Chris Trubshaw	But they are, and for how long they're kept I don't know, but they are a historical record.
	<b>X2</b>	Yeah.
	Chris Trubshaw	And some people put a lot in, some people put not a lot in, it depends what it is and the bearing on it. And sometimes when you're tired you miss things as well.
	<b>X2</b>	Yeah.
	Chris Trubshaw	You know, it is done after every flight though.
	<b>X2</b>	OK, that's fine. And just one last thing on fatigue.
	Chris Trubshaw	Yeah.
	<b>X2</b>	In terms of fatigue, does that, did that have any part on your morning search on the 24th? It only affected the second request.
	Chris Trubshaw	Subsequent.
	<b>X2</b>	The second task. The second tasking.
	Chris Trubshaw	The worst circadian rhythm time if you're into a get up at 7, go to bed at half 10, 11 o'clock is 2 to 2.30 in the morning.
	<b>X2</b>	Yeah.
	Chris Trubshaw	Which is about when we were called I think. So, you have to train yourself to compartmentalise bits to build yourself up to go.
	<b>X2</b>	Yeah.
	Chris Trubshaw	Because your arousal curve is right down here. You've got to get it back up to going. Safely. So, in terms of, what was the question? Did it affect our decision to go?
	<b>X2</b>	Well, did it affect any part of that morning flight?

00 01 42	Chris Trubshaw	No. We work as a team. And part of the brief is we have a phrase called threat and error management. So, if we can identify a possible threat beforehand, we'll discuss it and see what we're going to do to mitigate it. And in those cases, right, it's early in the morning. We've had a discussion about the weather. Is everybody fit to fly? Watch out for each other when you go.
	<b>X2</b>	Yeah.
	Chris Trubshaw	And just keep everybody. Because staring at a TV screen, looking for dots on the water in the dark is not easy. So, the back rear crew check it, change over and we'll operate the FLIR for example. And up the front, we check each other and make sure. So, you'll share the actual hands on the sticks.
	<b>X2</b>	Yeah.
	Chris Trubshaw	Monitoring the aircraft. You'll share the inputting into the equipment. And then you're monitoring what everybody else is doing in order to make sure that the content going out is the same as what's requested from coming in. If that makes sense.
	<b>X2</b>	Yeah. That does make sense. Yeah. OK. That looks clear.
	Chris Trubshaw	But there comes a, there does come a time in my flying career, I've had it where I've woken up at the controls of an aircraft to look across and the other guys are sleeping in the other seat. And then you say, right. Time to go home.
	<b>X2</b>	Yeah.
	Chris Trubshaw	At that point.
	<b>X2</b>	We see that on the ships quite often.
	Chris Trubshaw	Yeah. Yeah. Yeah. I'm sure. Yeah. Yeah. Well, exactly. I mean, you know, if you draw a comparison with the maritime, the changes in alcohol consumption, for example, and the, the, responsibility of the individual to, to maintain that they are fit for watch, fit for carrying out a safety critical exercise, it's been going on in aviation for a long time. It just happens a lot quicker if something does go wrong.
	<b>X2</b>	Yeah.
	Chris Trubshaw	So, you do have to monitor that. And if you are tired, cognitive error is, the potential for cognitive error can be huge.

00 03 34	<b>X2</b>	Yeah.
	Chris Trubshaw	Which is why cockpits are designed roughly all the same. So, that even if you reach down for the landing gear, you know, it's going to be there somewhere and you're not doing some other function.
	<b>X2</b>	OK.
	Chris Trubshaw	But you will end up yawning and saying something inappropriate. Within the intercom, just because it's your way of getting tired. So, there's the physiological, psychological aspects and we are trained in that.
	<b>X2</b>	Yeah.
	Chris Trubshaw	And you're trained to recognise it and cope with it.
	<b>X2</b>	Yeah. Plus you've got the team there, which will help deal with that.
	Chris Trubshaw	Very much so. Yeah. Very much so. Yes. That is a, is a critical point. It is a team effort.
	<b>X2</b>	Yeah. OK. That, that's all <b>NAME REDACTED</b> .
	<b>X1</b>	OK. So, I wanted to talk a bit about the aircraft itself.
	Chris Trubshaw	Yes.
	<b>X1</b>	And then sort of moving forward. Moving on into the search equipment and how the search works. So, tell me about the helicopter.
	Chris Trubshaw	It's a fabulous machine. It's what they call seventh generation aircraft. It's very, in inverted commas, intelligent. It has multi-functions based on a commercial design that, like an airliner, would take off at A, get to a cruising altitude, fly certain lines and land at B. And it will do it automatically. The weak bit, I suppose, is the human input, as it is with anything, because you do need to tell it what you want it to do. It's very powerful. It's modern. It's got a good communication suite, a good extra add-on kit to it, and flies like a helicopter. The good bits are the ability to interact with it and tell it what you want it to do. And it will take you from 5,000 feet with one push of a button down to the hover behind or at a specific position, for example. It does need monitoring, like any machine, and it will go wrong, like any machine. One of its characteristics is because it is electrical helicopter. The engines drive generators which power the rest of the

		systems, as well as driving the mechanical bits to the rotor head.
00 06 02	Chris Trubshaw	So, if you have an electrical failure, that can impact on your mission. If you have, put something in wrongly, the logic will go off and do exactly what you've told it to do, as opposed to saying, no, that's not right. Although it will flash up and tell you what to do. If you have done something wrong. It's fast, can cruise 135 to 145 knots, has good fuel endurance, and ergonomically is not too bad compared to earlier generations. But it's still a Leonardo da Vinci helicopter. You know, you put one input onto a control, you need to put inputs onto two others to maintain it going forwards. And in the right direction, the beauty of this one is that it will assist you with doing that an awful lot. And as long as you tell it those right things, it will do it automatically.
	<b>X1</b>	So, if you're flying a search pattern, what do you have to tell it versus what do you have to...?
	Chris Trubshaw	Sure. We have set algorithmically, not easy to say, driven parameters within there that are search patterns, expanding square, the sector search creeping line ahead, or ladder search as it's called, and a parallel track. So, these are mathematically set within the ones and noughts. But you have to say where you want it to start, which way you want it to turn, how fast you want it to go, and the width of it. Once you've done that, you can couple up that ones and noughts to the autopilot, which will then affect the flying controls in order to fly it. And it is very accurate and very good at flying that pattern once you've put it in there. So from the database, we will call up search patterns, select which one we want to do, and then there are a certain number of boxes, if you want to call those, that you put in parameters and the aircraft will then fly it. You then say, right. I want you to go from this point to that point over there. Select the navigation button and it will take you there. Additionally, within that, you can say, I want to fly the legs in relation to ground speed, i.e. speed over the ground, or in relation to air speed. The advantage of ground speed, if it's say 60 knots, is it will fly into wind at 60 knots over the ground and downwind at 60 knots over the ground.
	<b>X1</b>	Right.
	Chris Trubshaw	The difference is that the air speed going into wind to maintain at 60 knots might be 90 to 100 knots, depending on how strong the wind is, and going

		downwind, it could be very, very low, and you have to be careful of that.
00 09 06	Chris Trubshaw	If you choose air speed, obviously going into the wind at say 60 knots, you're actually probably doing 40, 45 knots over the ground, and going downwind, you're going to be doing 90, 95 knots. It depends. So, you can play around with those parameters as well. You can also say how much angular bank you want it to use to get round in order to do the turns to meet the pattern, and if it says it can't do it, it'll tell you and you have to adjust it. On top of that, you can interrogate the kit and it will say how much fuel you'll have at the end of the search pattern, and from that you can plan how much fuel you're going to do it. Also, the feasibility of doing it. Have you got enough fuel within the conditions that you've set in there to do the whole search pattern? There are some that you won't be able to do all of it before you have to come back and get more fuel and go. On the fuel, we take a standard load because we don't want to be too heavy if we get to an incident where it's required to hover, and we're pulling too much power because we're too heavy that we can't actually do the rescue. And that, again, is different. It's dependent on wind, but there are certain times when we will change that fuel load. For example, if we were tasked to pick up somebody with a heart attack off a boat just outside Felixstowe or Harwich, we might take extra fuel because you'll burn it off by the time you get there, plus you haven't got many places to go and get fuel along the east coast, for example. But in terms of searching, it is very, very good because the aircraft will then fly very accurately, what you've told it to fly, based on this mathematical algorithm, and it's very clever. Does that answer the question?
	<b>X1</b>	Yeah. No, no.
	Chris Trubshaw	Rambling on a bit.
	<b>X1</b>	So for you, captain, as the pilot or co-pilot, when you're flying a search pattern, how hard is that for you? Is it harder than normal flying?
	Chris Trubshaw	No, it's not. As the captain, you will tend to put in the search parameters and get the co-pilot in the left-hand seat to fly it initially. That's how we operate. And then you can share the flying throughout, but you are monitoring the controls. So, that gives you capacity to

		look out the window as well, which is the most important thing in a helicopter.
00 11 42	Chris Trubshaw	So, once you've programmed it in and you've checked it. And we can preview it, i.e. see what it's going to get you to do. And as long as that's right, we'll engage the system and do what we call coupling up, i.e. the flight management system is telling the autopilot what to do. The autopilot then will translate that into mechanical movement to get the controls to move around.
	<b>X1</b>	OK. So, it's kind of a mixture. The Dover, say, let's say Dover are giving you, I want you to do an expanding square search, starting here with this gap, this track width. You're then adding additional inputs into that, which speed you want to use and things like that. And you're feeding all that information into the computer system and then that's feeding to the autopilot and it's doing the pattern.
	Chris Trubshaw	Yeah. You can't. We're aviators, don't trust a thing. So, you can't let it just go. You do have to monitor it because it can throw a mechanical wobbly or it can throw an electrical wobbly. Or you could have put in the wrong turn, the wrong speed, and you think, oh, that's not right. So, then you have to redo and interfere.
	<b>X1</b>	OK.
	Chris Trubshaw	The Coastguard give you that information based on information they put into their SARSIS [sic], I think it is, the computer system. And it will spit out these parameters. It doesn't exactly match what the aircraft wants. So, then you have to just interpret it a little bit.
	<b>X1</b>	And when you're flying a search pattern and you find something or you see a target, what do you do, do you pause it?
	Chris Trubshaw	There's several things you can do. You can do exactly that. It's called suspend. You can pause it. Manually investigate it. Hands on the controls and turn around and have a look, come down in height. And if it's nothing, you can then climb back up to height slightly before that position you left it at. Push resume. And the aircraft will then resume from that point that you suspended it from. It will then carry on with the rest of it. So, it's very accurate. And it will also record where you've been so you can see where it is. And we also use the iPads with ACAN's software on that will show the track that you've done. So, therefore you can be certain you have covered everything that you've been told to do.

00 14 29	<b>X1</b>	OK.
	Chris Trubshaw	You can also just grab the machine and override it. It still thinks it's doing the search pattern and will go, OK, there you go, carry on. And then once you've done that, you will then have to re-sort it out to get you back to get you back to the right position. And the third way is you disengage the search pattern completely. And it goes, OK, I forget it. And then you're on your own. But you can then resume back by re-inputting a search pattern back from where you were from. If that was to happen, then we'd say to Dover, right, we've had to do this. We're now resuming. Anticipate coverage is going to be 97% as opposed to 100%. Quality of search is going to be good, fair, bad, or whatever it may be.
	<b>X1</b>	So, you just mentioned there, you were saying about the quality of search. For each search, are you giving, say, the Coastguard a sort of probability of detection or a chance of success on that?
	Chris Trubshaw	We tend to do it in the form of a SITREP. So, if we're halfway around, say, we're halfway through. We're on leg 10. We're expanding our search. Conditions are good. Visibility is in excess of 10 kilometres. Sea state is, and this is opinion, obviously, but sea state could be 1 to 4 or whatever it may be. Probability detection using FLIR, 75%. And that probability is subjective, though. It's not the predictive quality has not come out of any computer because the information you're given will give you 100% coverage and quality of search, but it varies.
	<b>X1</b>	So, you're updating.
	Chris Trubshaw	Yeah.
	<b>X1</b>	So, let's talk about sort of you're in the search now, you've got your four crew on board. The co-pilot, you said, is flying. What's everyone else doing? How are they involved in the search?
	Chris Trubshaw	Well, both pilots will be looking out the window as much as possible. If they're not, then they come up with the phrase heads in or eyes in, which means they are doing something with the equipment, updating the log as we fly, etc., etc. And the guys in the back are either looking out the window if it's a visual search, or one will be on the FLIR screen if it's a mixture, and the other one will be looking out the window.

00 17 11	Chris Trubshaw	The visual search is by far the best one, but can't go out as far, and obviously, there is margin for error. However, we are taught visual search techniques, like just scanning across. It's almost a random pattern, but you cover around, and we have NVGs to back us up, although NVGs are not always the best for locating something, say, on the water. They're brilliant, fantastic bits of kit, but not infallible.
	<b>X1</b>	And what affects their sort of utility, the NVGs?
	Chris Trubshaw	The way it works is light levels go into the goggles, bounce off a plate that produces neutrons, which then enhance that light level. And it gives you contrast. So, if that light level is not good, or there in the first place, then it won't do that. So, cloud, no background lighting, no moonlight, or anything like that, will reduce the effectiveness of the goggles. Again, we are trained in that. And as I say, there's a gap between your goggle and your eye, and that's where most of the information is lost, because we're the weakest link in that, in the human response.
	<b>X1</b>	And that training, and I think you mentioned earlier, you need to say, where you get taught to search? That's part of the SAR training, is it?
	Chris Trubshaw	Yes, but also it comes from experience as well.
	<b>X1</b>	And what about the FLIR?
	Chris Trubshaw	What do you mean, what about it?
	<b>X1</b>	What are its limits?
	Chris Trubshaw	Moisture. It's badly affected by moisture. As I say, it can't see through cloud, so you can get a degraded picture. And there's a common misnomer with FLIR that it's, careful here, it's purely done on heat. It's not. It's done on heat comparison. So, you're looking at a differential between two elements. This can be affected by an effect called thermal crossover, which happens at dawn and at dusk, where everything's warm or everything's cold. So, you're looking for something that is warmer. You're looking for something to show up, and as time goes by, something in the water obviously cools down. You get less and less of a target. When you get great contrast, though, it is phenomenal. But again, you're looking at a camera lens that you can zoom out at and not quite see detail. So you can zoom in, get more detail, but not aware of the periphery.

00 20 07	Chris Trubshaw	It is very, very good at locating things as I say, with its heat differential. But it does require a skilled operator to use it to its best capability. If you're searching a wide piece of sea, you are looking like that left, right, up, down. You might not see what's over here, and by the time you come round to it, something's changed. And you can miss it. However, the probability detection is very, very, good based on this this thermal comparison.
	<b>X1</b>	So, when you're, when you're searching for migrant boats, what is a sort of, two questions, no, we'll do one question at a time. What are the sort of ideal conditions for seeing those vessels?
	Chris Trubshaw	At night?
	<b>X1</b>	At night and in the day.
	Chris Trubshaw	At night would be a cloudless sky with a full moon and a rough position of seeing it. By day you want to be looking down sun, on a flat calm day with a rough known position. If you're searching along a line, I'll put it the other way, the worst conditions are during the day into sun, bright sunlight because you've got reflections and you're not always going to see it and your eyes naturally back down. And with a rougher sea then obviously a small grey boat, on a small boat on a big grey sea is harder to see. Lots of seas there. At night you want to be looking into the moon, so you get that light and you will then get the contrast of the contact on the water, because that's for night vision goggles and then FLIR you want to be slightly out of the moon's beam because again this, this thermal comparison within the IR range is what it works on. Not the fact that something is blazingly hot because if something next to it is also blazingly hot what you get is one thing. Does that make sense?
	<b>X2</b>	Yeah, yeah.
	<b>X1</b>	OK. And sort of migrant boats in in general, how easy are they to spot?
	Chris Trubshaw	Impossible to ask, answer sorry. But, if you, if you stick to your search, teachings i.e. moving around, you will see something and actually on the FLIR, it's quite high. When you go across and you can see something integrate it and that's, oh no, it's fishing boat and it is a process of elimination. It is good but it can be good one hour and poor the next hour. So, the senses we have

		the training we have increase the probability of detection I would say.
00 23 43	Chris Trubshaw	So, compared to an MSC cargo carrier with 900 cartons on and one guy with his feet on the wheel and the automatic collision alarm there. It's much, much better compared to a little Dutch freighter ploughing up and down, it's much, much better because they're not looking out compared to a boat at the same level. It's much, much, better. Plus we can cover more area, quickly.
	<b>X1</b>	So, you're sort of you know, what you're saying there is the combination of the equipment, the altitude, the speed and your experience means that.
	Chris Trubshaw	And the information given.
	<b>X1</b>	And the information your searching is better than a surface craft could achieve.
	Chris Trubshaw	Yes.
	<b>X1</b>	Thank you. Just, <b>NAME REDACTED</b> have you got anything sort of on the helicopter, I know we've gone into quite a bit of the helicopter and the searching.
	<b>X2</b>	You did mention on the visual search a random pattern. Could you describe what that is?
	Chris Trubshaw	If I'm flying in the right-hand seat.
	<b>X2</b>	Yeah.
	Chris Trubshaw	I've got responsibilities from 11 o'clock around to about 4 o'clock or as far as I can tilt my head.
	<b>X2</b>	Oh OK.
	Chris Trubshaw	So, rather than going, I'm moving my head between the two, you go right there. I'll have a look there. I'll have a look back there. I'll look back there. You're still covering your arc but if you stare at one piece of sea for too long. What you see is that one piece of sea. And again the things that will trigger the human response obviously, peripheral movement.
	<b>X2</b>	Yeah.
	Chris Trubshaw	Or if you're scanning as you're scanning across your little bit that you're looking at the time, you might just catch a glimpse which will then draw you back into it. Stuff far away, difficult to see, stuff really, really, close in, difficult to see because you're flying over it. But actually within a few yards of the helicopter's track, to then looking out which is why it's calculated as I said to

		you just now, the information that you're given, that's why the search widths, sweep widths are given.
00 26 11	Chris Trubshaw	I calculate, they're not random and they're not the same each time.
	<b>X1</b>	Because there isn't like a set you know, I'm looking for an X, the search the swept width will be this it's dependent on the conditions and the...
	Chris Trubshaw	Yeah, yeah, you're both right and wrong. Yes, if you're searching for a person in the water in a sea state two with the visibility of 20 kilometres at 4 in the afternoon, given the search it will work out what your sweep width is and what it does is again, if you have a sweep width of that, the next one will slightly overlap it. So, as you're going that way you're searching across that bit, as you're coming down this way, you slightly overlap that bit again. So, you're getting 100% coverage and what you want is a sweep width of 1 which it means the whole. If you get a sweep width of, sorry prediction of one, if you get a prediction of 0.75, it means you're actually only going to cover three quarters of those bits. So, you can then adjust the sweep width but those parameters we are given.
	<b>X1</b>	OK.
	Chris Trubshaw	So and it will range. The lowest we can get is 0.5 of a mile on our kit. We can recommend, say actually say vis is great. Our probability detection is a lot better we recommend so we can cover a greater area more quickly, a sweep width of say .8 .9
	<b>X1</b>	OK.
	Chris Trubshaw	Or a mile. Or whatever it is. And then that will always. I say always, they are designed to give you that ultimate coverage and so will change with whatever conditions you put in there.
	<b>X1</b>	OK.
	Chris Trubshaw	If I'm looking for a super tanker, then the sweep width may have gone, will go up. If I'm looking for a life raft, it will go up because it's orange. But if I'm looking for a black life raft, it will go down because it's harder to see. It's very, it is scientific. It's not just, all right, I'll put half a mile on that one.
	<b>X2</b>	Just one other question on that sort of area. I mean, obviously, the chance of detection will go down once someone enters the water, but just on your experience, are you able to detect people who are in the water

		without a life jacket, a flotation aid, something to identify them?
00 28 40	Chris Trubshaw	Yes, but it's a lot, lot, lot harder.
	<b>X2</b>	Yeah.
	Chris Trubshaw	Exponentially harder.
	<b>X2</b>	OK.
	Chris Trubshaw	Yeah, the recent campaign to get fishermen to wear life jackets, huge. Because after a while, someone will slip below the surface and if they go below the surface, and as I say, this thermal distinction decreases, you probably won't see them. A, visually, and B, thermally.
	<b>X2</b>	Yeah.
	Chris Trubshaw	And then after a while, they will go down and pop up a couple of days later.
	<b>X2</b>	Yeah, I guess their body temperature will also reduce, which will make it even more difficult.
	Chris Trubshaw	Yeah, there have been instances of people going in near piers, for example, and not just us, but others have flown over, and there's just a tiny, tiny pin brick of, you know, warmth, which is the back of the head.
	<b>X2</b>	Yeah.
	Chris Trubshaw	And they've managed to see it, and then I've seen it when I used to fly for the police. These shapes can then grow, but the longer they are in the water, especially in the wintertime,
	<b>X2</b>	Yeah.
	Chris Trubshaw	It very quickly decreases.
	<b>X2</b>	OK.
	Chris Trubshaw	But people in the water with flotation devices, better. You get a bigger surface area above the water. People correctly dressed, better. Because they retain heat and can survive for longer. You know all this from maritime, but it then translates to us and then how we can find them as well.
	<b>X2</b>	Yeah. And have you come across migrants in the water?
	Chris Trubshaw	No, personally, no.
	<b>X2</b>	OK.

00 30 18	Chris Trubshaw	Other people, yes.
	<b>X2</b>	Other people, not migrants.
	Chris Trubshaw	Yeah, not doing this part, no.
	<b>X2</b>	Yeah.
	<b>X1</b>	I just have one further question. I think we might have covered it, but on the, going back to, the search patterns, we've talked about the swept widths, sweep width, sorry.
	Chris Trubshaw	Yeah.
	<b>X1</b>	The speed that you're flying at and the altitude, is that something that you set or that whoever's tasking you set?
	Chris Trubshaw	Initially, it is given to us. And this all comes out of the SARSIS computer. And it's based on the, getting that highest predicted rate of detection, highest predicted, confirmation of detection. If we get there and we reckon it is better to reduce, expand, fly higher or lower, slower, whatever it may be, then we suggest it back because that's what we face with on the day. And then we can suggest it back to the ARCC. If they want us to continue with, sorry, to the controlling authority, if they want us to increase it or keep it as the same, we just keep it as is. But for example, if you're searching for a person in the water, as we were the day before yesterday, potentially, good day, 300 feet. If you're doing a FLIR search, you want to cover a bit of a bigger area. So, you might be up at 700, 800 feet to a 1000 ft. If you're doing a cliff search, you might want to be sitting halfway between the top and the bottom so you can cover top to bottom of the cliff. So, it can change as the conditions dictate.
	<b>X1</b>	So, you've got sort of three-dimensional set of parameters.
	Chris Trubshaw	Yes.
	<b>X1</b>	You start off with an initial set and then as the conditions change or you get more information and the Coastguard gets more information, then those things can be changed to optimise.
	Chris Trubshaw	Can be changed is a good description, yeah. OK.

	<b>X1</b>	All right. I think, we're pretty much getting to the end of the questions I wanted to ask you, <b>NAME REDACTED</b> are you...
00 32 31	<b>X2</b>	I only have, there's one last thing on my notes which I wanted to ask. Presumably when you have a distress, you've got a fixed location and you zone into that. You go straight there. You're looking for something very specific. But with the migrant situation, do you have a clear picture when you're up in the air of what's going on and where everything is?
	Chris Trubshaw	Not always, no. So, and this is where the patrolling aspect comes in. And especially with the change of tactics that we touched on earlier.
	<b>X2</b>	Yeah.
	Chris Trubshaw	Intelligence driven, four boats left the French coast. We don't know where they are. OK, what do you want us to do? Well, we want you to fly up and down the channel and see what you can find. OK, that's what you want us to do. That's what you want us to do.
	<b>X2</b>	Yeah.
	Chris Trubshaw	And that is what we will do. Based on potential, any size of vessel. If there's no further intelligence other than four boats left, we don't know. Not being disingenuous to the other authorities because they haven't got that information either. They just know that potentially there is something moving this way. So, we will search accordingly to cover as much space as possible. If it's, we've received a mayday from a boat, they're in this position, that is what's called the datum.
	<b>X2</b>	Yeah.
	Chris Trubshaw	And then it depends on time late. So, sometimes we get called 5, 6 hours later. Oh, can you go and search for something? All right, you're then basing your search pattern on tide, wind conditions, clothing again, you know, are they in a life raft, etc. And then you discuss with the tasking authority or the controlling authority, which is Dover or the other coast guard unit, right? Is this the best position for the datum? And then the datum is where you start your search. And that's the whole idea of it, isn't it?
	<b>X2</b>	Yeah.
	Chris Trubshaw	You know, you're searching. If we knew where everybody was at the point, it would just be rescuing. So, we'd just go on and do it. But for the migrant piece,

		we know they're coming south to north-ish, but where they are, where they're going, we don't know.
00 34 47	<b>X2</b>	Yeah.
	Chris Trubshaw	Looking at some of the driving, I don't think they know either. They just go across.
	<b>X2</b>	OK, but does it make sense what's going on with all the different parties involved? Is it clear lines of communication?
	Chris Trubshaw	Oh, communications are the worst. It's the single point of failure, isn't it?
	<b>X2</b>	Yeah.
	Chris Trubshaw	In any campaign, in any military campaign, in any, you know, the cause of a lot of maritime accidents, people not talking to each other or getting the information wrong. No, it is always confused. There is a language barrier in, radio language, as in, we've reported it at this position. It's been designated x-ray. The lifeboat hears it was whiskey. Oh, so is that whiskey we're going to? No, you're going to x-ray. Right, OK. Well, we thought we were going to whiskey. OK, well, you go to whiskey then, and they'll go to the wrong place, for example. What we are able to do, and this is not being big-headed or discrediting anybody else, whatsoever, is we are able to see it from a different perspective.
	<b>X2</b>	Yeah.
	Chris Trubshaw	Hang on, no. That boat is empty. There's no point in going to that boat. Hello, Dover. I think you're sending Dover Lifeboat to the wrong place. Oh, right, OK, because they're in a concrete hut.
	<b>X2</b>	Yeah.
	Chris Trubshaw	We can see this. We've reported this one, or this is going this way. It's got a number of people on board. Again, that, as it wafts over the ether, can be misinterpreted anywhere else, as well. So, the voice communication is the weakest link, if you like, in this, and no two situations are the same, and it's always confused.
	<b>X2</b>	Yeah, and are there any communications with the French, if they're doing search and rescue and air operations, or is it completely separate?
	Chris Trubshaw	We, if it's air, we might try and talk to them on a frequency, but again, as long as we can see them on our transponder, it's quite often best not to speak, because

		again, it will confuse it all. What we have to be careful of is confusing the picture by saying, oh, speak to Cap Gris Nez, because this boat, we can see it's clearly in their waters. We don't know.
00 37 12	Chris Trubshaw	So, ours is purely report what we can see, what the facts are, request and suggest, as opposed to interfere, because it gets very frustrating, at times, you can see something unfolding, you think, no, that one. You've just got to let it happen to a point, because somebody's, if you mess in with it too much, that communication piece comes again, you can upset the whole apple cart.
	<b>X2</b>	Yeah, you've just got the one decision maker, and this is, for example in Dover.
	Chris Trubshaw	Yes, so our greatest thing, I firmly believe, is the use of a SITREP. SITREP, this is what we've done, this is what we've found, this is where they were, this is where Sabre, Scimitar, or whatever the boat is, suggest, or are they available, is there a unit to intercept?
	<b>X2</b>	Yeah.
	Chris Trubshaw	By the way, we've got 30 minutes left on task, then we've got to go back, we'll call you a landline when we get back.
	<b>X2</b>	OK, and Dover is calling the SITREPs, or anybody can call a SITREP.
	Chris Trubshaw	Well, we put out a SITREP, because it's the easiest thing, because we are tasked with the searching.
	<b>X2</b>	Yeah.
	Chris Trubshaw	The Lifeboats will put out to SITREP if they're doing a search.
	<b>X2</b>	OK.
	Chris Trubshaw	You can amplify it with probability detection, search conditions are good. And then, the clearer you can be, the easier it is for somebody there to go, right, got it, understand.
	<b>X2</b>	Yeah.
	Chris Trubshaw	Carry on.
	<b>X2</b>	OK, gotcha. That's it <b>NAME REDACTED</b> , I think.
	<b>X1</b>	OK, and so, is there anything we've not asked you about, Chris, that you're sort of surprised about, or you think we need to know about?

	Chris Trubshaw	No, it was 6 months ago for this, you know. I mean, the point you raise about the effect of the migrant crossings on the crew, as I say, it is just personal opinion. Professional opinion doesn't change, and professional response doesn't change at all.
00 39 18	Chris Trubshaw	And no two situations are the same, but no, no, I'm, I hope you've asked me a lot of stuff which is fairly non-specific to the night, actually. So, that's fine. But I hopefully given you as much as I can with regards to the way we operate, the way things are operated. It is such a difficult job. You know, even the channel is a big piece of sea, and searching across the sea. It's interesting that, you know, with all the programmes, that are out there all the public see is this the helicopter rock up or the lifeboat rock up in the last 20 seconds of it, to see there's an awful lot in between and an awful lot of it turns up nothing. It's the nature of the job.
	<b>X1</b>	I mean is there anything that really stands out from that particular night compared to another night. Is there anything sort of...?
	Chris Trubshaw	In terms of migrant searching or...?
	<b>X1</b>	Yeah.
	Chris Trubshaw	No, not really, you know I'm sure faced with that set of circumstances the considerations would be given somebody, well, might have done a different decision as I say my decision making process as the captain aircraft is like we delayed a bit, or the weather wasn't as bad, so we went, we did as we were asked to do. And as far as we were concerned that was all we were asked to do.
00 40 42	<b>X2</b>	Yeah.
	Chris Trubshaw	The fatigue aspect does come into it and it was one individual but you have to go with, that one individual is part of the team. So, you have to take it out and safety is paramount obviously. Rule one of SAR is don't become a victim yourself.
	<b>X1</b>	Absolutely. OK. Thank you Chris, we'll stop the tape now. It's about 6 minutes to 3.

End of interview. No further sounds.