

Report on the Grounding of the British Ro-Ro Vessel

EARL GRANVILLE

off Cherbourg on 19 August 1989

May 1991

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ALL TIMES IN THIS REPORT ARE BST

Section 1 SUMMARY

The EARL GRANVILLE is a British ro-ro vessel holding a Passenger and Safety Certificate for 862 persons. The vessel was operated and managed by Sealink UK Ltd at the time of this accident, and was carrying 707 passengers and about 170 vehicles from Portsmouth to Cherbourg.

The vessel struck a charted rock off the entrance to Cherbourg Harbour at about 0448 hrs on 19 August 1989, which was almost exactly the time of low water, with a spring tide. She did not strand, and was able to continue her passage into Cherbourg unaided. She was, however, very seriously damaged and spent several months undergoing repair. There were no injuries to personnel as a result of the accident.

Section 2 NARRATIVE

- 2.1 MV EARL GRANVILLE was built in 1973 by J L Meyer of Papenburg, as Viking 4. Brief details are as follows:-

Length	108.72m
Beam	17.25m
Loaded Draught	4.80m
Gross	4657 tons
Net	2018 tons

- The vessel is a ro-ro ferry with two controllable pitch propellers. She has two Crossley Pielstick diesel engines developing 11,600 BHP and giving a speed of about 18 knots.
- 2.2 The EARL GRANVILLE sailed from Portsmouth at 2320 hrs on 18 August 1989 bound for Cherbourg carrying 707 passengers, 162 cars, 2 mobile homes and 6 trailers and articulated vehicles. The drafts were forward 4.51m, aft 4.77m. The vessel was sagged and the maximum draft was reported as 4.8m.
- 2.3 The Master went below at about 0100 hrs on 19 August, leaving instructions that he was to be called 20 minutes before reaching the breakwater. His voyage plan required the vessel to pass through the Eastern Entrance at Cherbourg at 0445 hrs; this required a speed of 14 knots and for the first part of the passage the vessel used her port engine only. The weather was fine, with light airs, bright moonlight and good visibility.
- 2.4 The Master left the navigation of the vessel in the care of one of the vessel's two Second Officers. It is the usual practice on this service to plot Decca positions until the breakwater at Cherbourg is identified on the radar; the ARPA is then referenced on the buoy of La Pierre Noir for the final run to the breakwater entrance. The Second Officer steered 180° T&G to make good 200°T. The positions he plotted at 0330 hrs, 0345 hrs and 0400 hrs indicate the EARL GRANVILLE made good a course of 201°T at 16.8 knots; it follows the vessel was experiencing a tidal current setting to the west at about 6 knots. At 0330 hrs the starboard engine was brought into use and from then until the grounding the vessel was at full speed.
- 2.5 At 0400 hrs the ship's other Second Officer took over the watch. He plotted one position at 0417 hrs and another at 0435 hrs when referencing the ARPA on the buoy mentioned. He was steering 170° gyro; and the two positions he plotted indicate that the vessel made good a course of 190°T and experienced a tidal current setting 244° at 8 knots.
- 2.6 The tidal diamond (N) on Admiralty Chart 1106 is about 10 miles to the east of the position plotted for 0417 hrs and indicates that during spring tides currents setting 296° at 5.6 knots may be experienced in that area. The Admiralty Tide Tables for Cherbourg during 1989 show that on 19 August one of the greatest ranges for Spring Tides in 1989 would be experienced:

HW	2159	BST	6.6m	(18.8.89)	MHWS	6.3m
LW	0442	BST	0.7m	(19.8.89)	MLWS	1.1m

It follows that abnormally strong tidal currents were to be expected and that the EARL GRANVILLE was due to reach the breakwater at the time of an unusually low tide.

- 2.7 The Second Officer had instructions to call the Master 20 minutes prior to reaching the breakwater but stated he only gave the Master 15 minutes warning because he was involved with traffic. For 0435 hrs he plotted a position with La Pierre Noir buoy bearing 106°T distant 3.4 miles and altered course to 180° to make 190°. At 0440 hrs he altered course to 200° gyro and allowed no set. He estimated that the Master came onto the Bridge at 0445 hrs and took over.
- 2.8 The Master said he was called at 0435 hrs and came to the bridge at 0440 hrs; he realised the vessel was too far to the East and made alterations of course to starboard using the automatic helmsman but stated he did not use too much helm partly because there was a yacht on the starboard bow and partly because the vessel was tender and heeled when turning at high speed. He did not reduce speed. The vessel struck the rocks of Roches du Nord Ouest at 0448 hrs while heading 220° true and gyro and still proceeding at about 18 knots.
- 2.9 Admiralty Chart 2602 shows a sounding of 3.7m near the western end of Roches du Nord Ouest. At 0448 hrs the predicted height of the tide was 0.7m therefore the height of tide over the shallowest part marked would be 4.4m.
- 2.10 After grounding at 0448 hrs the engines were stopped; at 0452 hrs it was realised that momentum had carried the vessel over and clear of the rock, she was still upright but known to be leaking. It was decided to proceed into the harbour where the EARL GRANVILLE berthed at 0505 hrs, after which passengers were allowed to go to their vehicles in the usual manner.
- 2.11 The watertight doors were already closed on local control, including those within the machinery spaces, but after the impact they were put on remote control from the Bridge to ensure that they remained closed.
- 2.12 The discharge of passengers and vehicles from the car deck commenced at 0510 hrs and was completed at 0535 hrs. Because of the flooding it was considered unwise to use the main engines, therefore tugs were employed to move the vessel to a layby berth at 0635 hrs. There a salvage pump was driven on board by the fire service (at about 0710 hrs) and from this time the flooding was brought under control.
- 2.13 The vessel was damaged in such a way that it appeared as if 3 giant talons had been dragged across the bottom, as indicated in Figure 2a. It appears this was caused by 3 rocks projecting from the sea bed.

The rock that ran along the keel caused the keel to be set up 10cm or more over much of the length resulting in very extensive damage to frames and floors within the double bottoms. Flooding within the double bottom was extensive and water also entered some machinery spaces and the carpenter's store; see Section 3.4 and Figure 2b.

Section 3 DISCUSSION

3.1 Approach to Cherbourg : Tide

- 3.1.1 At and near the time of low water Cherbourg there is a strong westerly tidal flow off-shore, but the effect greatly diminishes as the coast is closely approached. It is evident from the recorded positions and the courses steered that on 19 August, as would be expected with a spring tide, the stream was running very strongly indeed until EARL GRANVILLE was within about 4 miles of the entrance. After that it fell away rapidly.
- 3.1.2 The chartlet at Figure 1 shows a re-construction of the track of the vessel prior to grounding. It is intended for illustration only and does not purport to show the exact track followed.
- 3.1.3 One point which is clearly demonstrated by the reconstruction, even allowing for some error in it, is that the approach was made outside the white sector of Fort des Flamands light, which leads clear of all dangers.
- 3.1.4 The Admiralty Sailing Directions (Channel Pilot) do not recommend use of the eastern entrance to Cherbourg by night. However, the evidence is that ferries bound to or from Portsmouth customarily use that entrance, by both night and day. There appears no reason why it should not be used safely, at any rate in clear weather and by mariners with local knowledge, provided that full use is made of the navigational aids available.

3.2 The Failure to call the Master and the Hours of Duty

- 3.2.1 The Second Officer called the Master some 15 minutes before he expected the ship to pass the breakwater, instead of 20 minutes as he had been instructed. As will have been seen, the Master recognised the ship as being too far to the East as soon as he came to the Bridge and it follows that this five minute delay may well have been critical. The exact time the Master reached the Bridge is uncertain; he recalls it as 0440 hrs while the Second Officer puts it at 0445 hrs. Taking into account the Master's evidence that the ship was only a mile and a half from the breakwater, it is likely that the time was in fact about 0444 hrs.
- 3.2.2 The Second Officer stated he did not call the Master because he was occupied with crossing traffic. The cabin of the Master is immediately behind the wheelhouse; it would take about 10 seconds to walk to the cabin door, knock and tell him the time and ETA and then return to the fore end of the wheelhouse; alternatively he could have instructed the lookout man on the Bridge to do so. However, it is possible that in dealing with the traffic the Second Officer became somewhat confused and did not realise that the proper time for calling the Master had passed.
- 3.2.3 An alternative possibility is that the Second Officer wished to allow the Master to have a few more minutes sleep. Considering the ship's schedule (see Annex 1) watch-keeping officers work six hours on and six hours off and do not turn out to moor the ship in their watch below, so their rest periods are reasonable. For Masters, on the other hand, the longest rest period is during the night crossing when up to about 3 hours sleep is possible, weather permitting.
- 3.2.4 In some respects it may be said the Master should have been more alert when reaching the Bridge and should have responded more positively to the danger. Similarly there seems to have been a lack of awareness of the danger of sending passengers down to the vehicle deck. It is not possible to know whether this was the result of his just having woken or of the cumulative effect of limited rest periods since the Master's tour of duty had begun on 15 August.

3.3. Emergency Procedures

- 3.3.1 While the double bottoms were flooding following the grounding, particularly Nos 14 and 22 tanks, the stability would have been very much reduced, until they were full, and it is not known how long this would have taken. In addition the flooding of the carpenter's shop would have created a fairly large waterplane area and flooding in this area was not brought fully under control until assistance was obtained from the local fire service at about 0635 hrs.
- 3.3.2 It follows that there was cause for grave concern for the safety of the vessel. The Master realised there was a real danger of sinking or capsizing, and at first had it in mind to beach the vessel in shallow water in the eastern part of the outer harbour if necessary. However, the vessel remained upright so passage was continued to the inner harbour and berth.
- 3.3.3 The only radio message broadcast was to the ship's agent in Cherbourg (on a frequency used by Sealink), who was told to advise the port authorities to obtain divers, pumps and a lay-by berth. No distress or urgency messages were sent.
- 3.3.4 On board the EARL GRANVILLE the deck crew were awake, the engine room crew were called out to plug leaks, but there is no record of the hotel staff being alerted. The Master stated that he did not make an announcement to the passengers at any time as he did not want to start a panic among 700 passengers.

3.4. Damage and Flooding

- 3.4.1 Figure 2b indicates the extent of the flooding and leakage. It can be seen that many double bottom tanks were laid open, and water in substantial quantity also entered the stabilizer room, the tunnel space and the carpenter's store. There was no flooding of accommodation, but some water, and oil from ruptured tanks, came on to the car deck through vent pipes. The Chief Engineer Officer realised that it was unlikely that his pumps could cope with this leakage and advised the Master that assistance would be required from the Fire Service. At 0635 hrs as it was not clear that the vessel would remain afloat, the harbour authorities, not wishing the linkspan to be blocked, decided to move the vessel by tugs to the Quai du France where access was easier for salvage pumps and divers and also to place a boom round the vessel to contain the extensive oil spillage that was taking place.
- 3.4.2 At 0855 hrs a further change of berth took place to the Quai Mielle, a shallow water lay-by berth. A divers' inspection was made which indicated severe damage to the keel and the port side shell. The shore Fire Service used four 90 cu metre pumps to pump out the carpenter's store and by 1900 hrs three pumps were still being used, although the level had been lowered to just above the deck. The engine room pumps were coping well as most of the engine room leaks had been stemmed. An oil boom was maintained round the vessel to contain oil leakage from the ruptured double bottom tanks and from the discharge of the engine room bilge pumps as no use could be made of the oily water separator.
- 3.4.3 At 2000 hrs the vessel was towed from Quai Mielle still with the fire service pumps attached and the oil boom round her to the French Naval Dockyard at Cherbourg Western Harbour and placed in drydock number 6.
- 3.4.4 By 2300 hrs the vessel was safely moored in dry dock and pumping down commenced. Due to the damaged keel divers were in attendance to fit wedges on the keel blocks to ensure adequate support. Problems were encountered with oil leakage and divers had to wedge several of the worse splits. As the oil contamination was considerable, pumping down was very slow and skimmers had to be used to clear the dock. The underside of the

keel was not revealed until late on Monday 21 August. A thorough inspection showed extensive damage to the keel extending from Frame 138 to Frame 16. Longitudinal splits occurred over a length of 1.5m from Frame 113-111 and over a length of 14.3m between Frame 68 to 46 which is in way of the machinery spaces.

On average the keel area was set up at least 100mm.

On the port shell extensive damage occurred to A, B, C and D strakes within the area Frame 115 to Frame 30. Severe splits and heavy indentation (over 100mm) occurred mainly to B strake from Frame 107 to Frame 85.

On the starboard shell only indentation occurred, mainly in an area of A strake from Frame 138 to Frame 42.

Two blades of the port CP propeller were seen to be indented over a depth of about 50mm on their extreme outer edge, but the port rudder, mounted slightly inboard of the propeller, was unmarked.

- 3.4.5 The vessel was inspected in Cherbourg by Surveyors from the Department of Transport who identified the repairs which would be required before the vessel re-entered service. These have been carried out.

3.5 Stability

- 3.5.1 It will be noted that the Master was reluctant to use full helm even though he realized that the vessel was to the East of her proper approach, partly because the vessel was tender and heeled when turning at speed. As well as the Master, both Second Officers were specific in referring to the subject, saying that if more than 10° of helm was used the ship heeled to an unacceptable angle.
- 3.5.2 The tendency of some ro-ro ships to heel as a consequence of the prevailing weather and/or the helm angle is a recognised feature of this type of design, and has been the subject of research work. However, so far as is known no research on the extent of the operational problem and how it is dealt with has been carried out, and it is thought that examination on this practical level might be valuable.
- 3.5.3 It should be made clear that there is no evidence that a degree of heel, sufficient to endanger the ship, would have developed if more helm had been applied to avoid grounding. It must follow that although the Master realised that the vessel was not on her intended track he did not recognise the immediate hazard of her position.
- 3.5.4 Because of the very extensive repairs carried out following the accident, there are likely to be changes in the lightship weight. In addition, there is evidence that the allowances for weights of stores and other movable equipment require review. For these reasons, it is recommended that the ship should be re-inclined and revised stability information should be prepared.

Section 4 COMMENTS

- 4.1 The principal cause of the accident was that the vessel made her approach too far to the East. At least part of the reason for this was failure to appreciate in sufficient time the very rapid change in tidal flow as the Port was approached.
- 4.2 The accident would have been avoided if the vessel had made her final approach on a course of South, keeping within the white sector of Fort des Flamands light.
- 4.3 The accident might have been avoided had the Second Officer followed the instructions he had received requiring him to call the Master 20 minutes before reaching the breakwater at Cherbourg. The reason he gave, that he was involved in traffic, could not be confirmed nor does this reason seem very convincing because it would only have taken him about 10 seconds to call the Master.
- 4.4 The Master and deck officers claimed to be inhibited from altering course rapidly because the EARL GRANVILLE was known to heel to an uncomfortable degree when turning. This problem has not been quantified precisely; it is possible that it was a contributory factor though not a major cause.
- 4.5 The response to the emergency did not reflect the fact that the ship was in real hazard. It is accepted that the Master acted in good faith in not wishing to alarm the passengers, and in the event his judgement that the vessel would safely reach her berth was correct. Nonetheless, the safety of passengers should have been paramount, and he should have at least initiated basic emergency procedures, mustered the passengers and broadcast a PAN message. Although there is no doubt that Masters of cross-channel ferries are well aware in principle of the proper emergency procedures, increased participation in practical exercises would lead to them being more readily followed when actual emergencies arise.

ADDENDUM

RECOMMENDATIONS MADE AND ACTION TAKEN

1. **Standing orders in cross-channel ferries and other vessels on similar trades should clearly direct that passages must be planned so as to make full use of all available navigation aids, including visual aids such as sector lights and leading lights, even though those in charge of the vessel are very familiar with the routes being followed.**

This Recommendation is addressed generally to Masters and Owners, and also has been drawn to the attention of the Department of Transport Marine Directorate who will consider further publicising the advice in a Merchant Shipping Notice.

2. **Masters and watch-keeping officers of cross-channel ferries should have adequate rest periods laid down. The requirements should apply to all vessels irrespective of flag, so as not to place British ships at a disadvantage.**

Marine Directorate are developing regulations on hours of work.

3. **EARL GRANVILLE's stability data should be verified by re-inclining. Allowances for stores, provisions, etc should be re-assessed and carefully applied in making stability and dead-weight calculations.**

This Recommendation was accepted.

4. **Research should be undertaken into the extent of the problem of heel with ro-ro vessels and into practical methods of dealing with the same.**

Research has been carried out on "The Coupling of Transverse Stability and the Manoeuvrability of a Ro-Ro Ship" and it is expected that a paper on the subject will be published in 1991.

5. **Masters should not hesitate to alert crew and passengers, and to broadcast an urgency (PAN) signal, whenever an incident occurs which may imperil the ship. Undue alarm is far more likely to be caused if this is not done and then subsequently emergency procedures have to be pursued in haste than if preparatory action is taken in good time.**

This Recommendation is addressed to Masters generally.

6. **Serving Masters in ro-ro vessels should have more active participation in future marine disaster exercises.**

This has been agreed by Marine Directorate in principle, though there are practical limitations on how many Masters can take an active part in an exercise.

- 7. Compliance with the recommendations separately made by the Department of Transport's Engineer and Ship Surveyor following the accident should be verified by further inspection.**

This was done.

EARL GRANVILLE has now been sold and has left United Kingdom waters.

SCHEDULE

Monday	(0600-1045 hrs	Cherbourg-Portsmouth)	The longest voyage is the night crossing of 5 hours allowing the longest rest period of about 3 hours between 0100 hrs and 0430 hrs while outside pilotage waters and provided the weather is fine. The day crossing is about 1 hour shorter.
	()	
Tuesday	(1145-1630 hrs	Portsmouth-Cherbourg)	
	()	
Thursday	(1730-2215 hrs	Cherbourg-Portsmouth)	
	()	
Friday	()	
	()	
Saturday	(2315-0500 hrs	Portsmouth-Cherbourg)	
	()	
	(-0500 hrs	Portsmouth-Cherbourg)	
	()	
Wednesday	(0700-1000 hrs	Cherbourg-Guernsey)	----- " -----
	()	
	(1045-1345 hrs	Guernsey-Cherbourg)	
	()	
Sunday	()	
	(1445-1930 hrs	Cherbourg-Portsmouth)	
	()	
	(2315- hrs	Portsmouth-Cherbourg)	

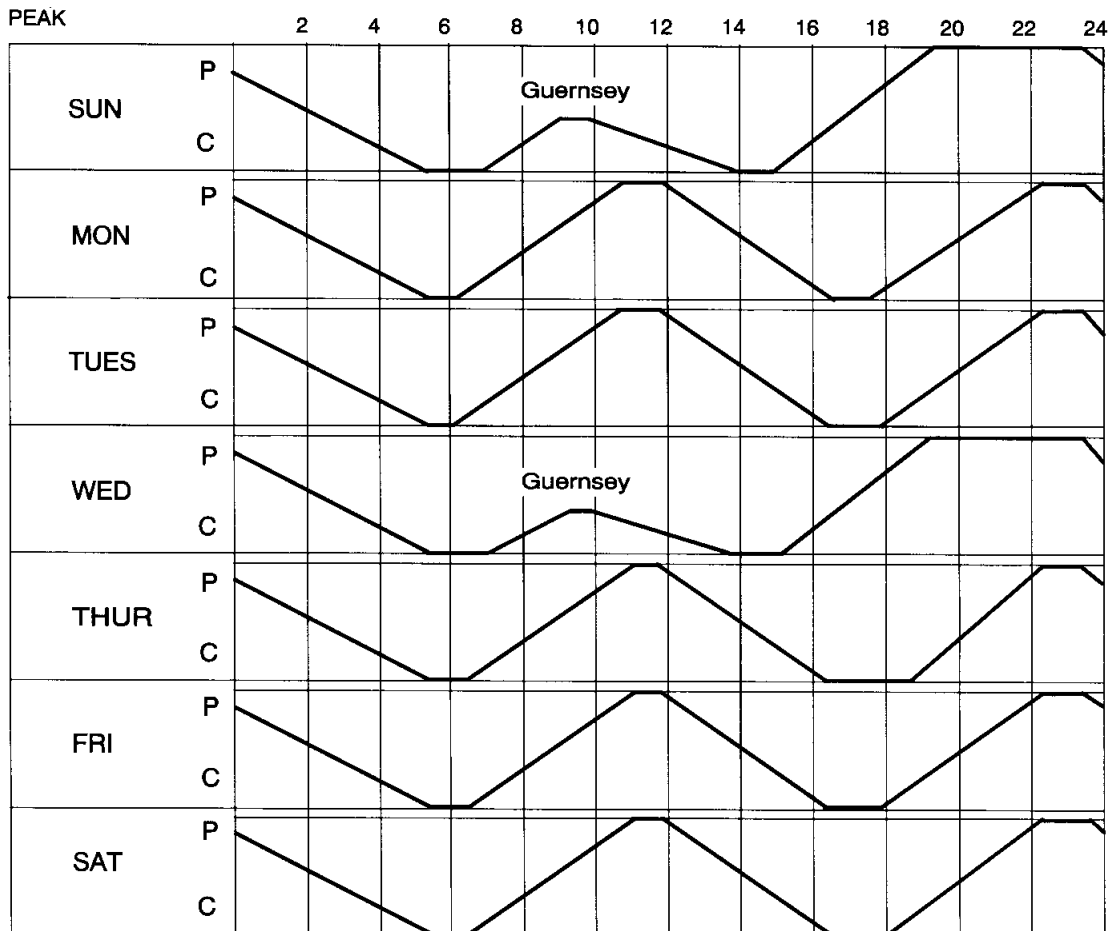
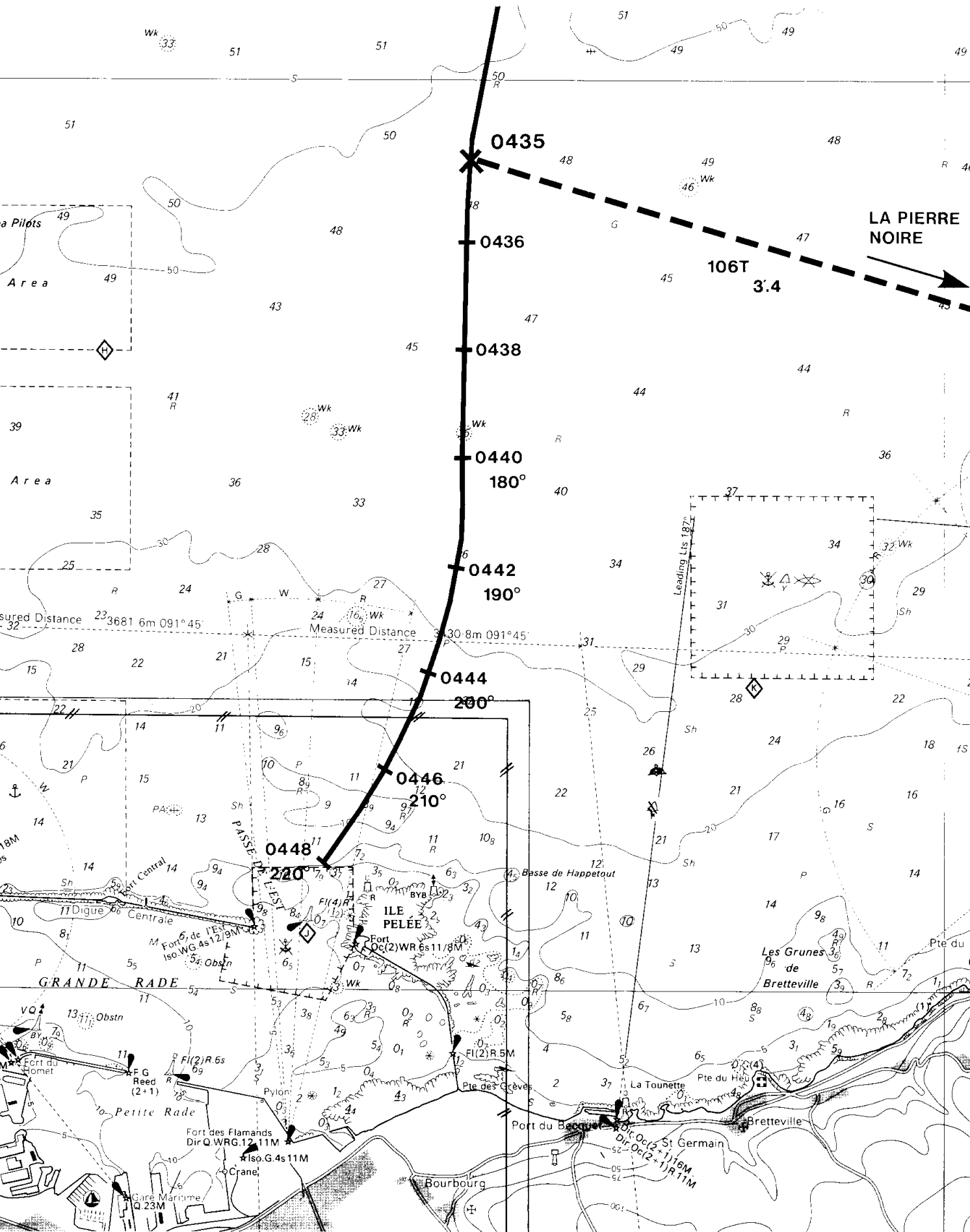


Figure 1



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Scale 1:50,000

Extract from Admiralty Chart No. 1106

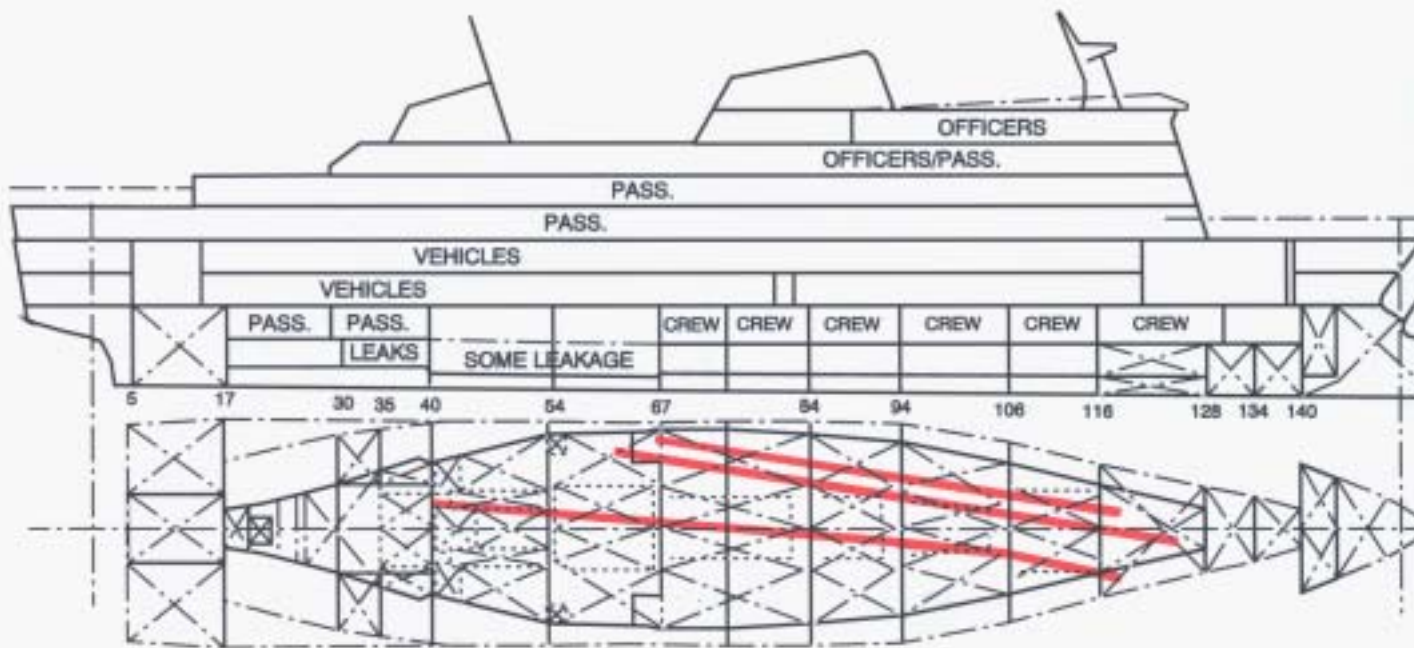


Figure 2A: APPROXIMATE LINES OF GROOVING IN BOTTOM

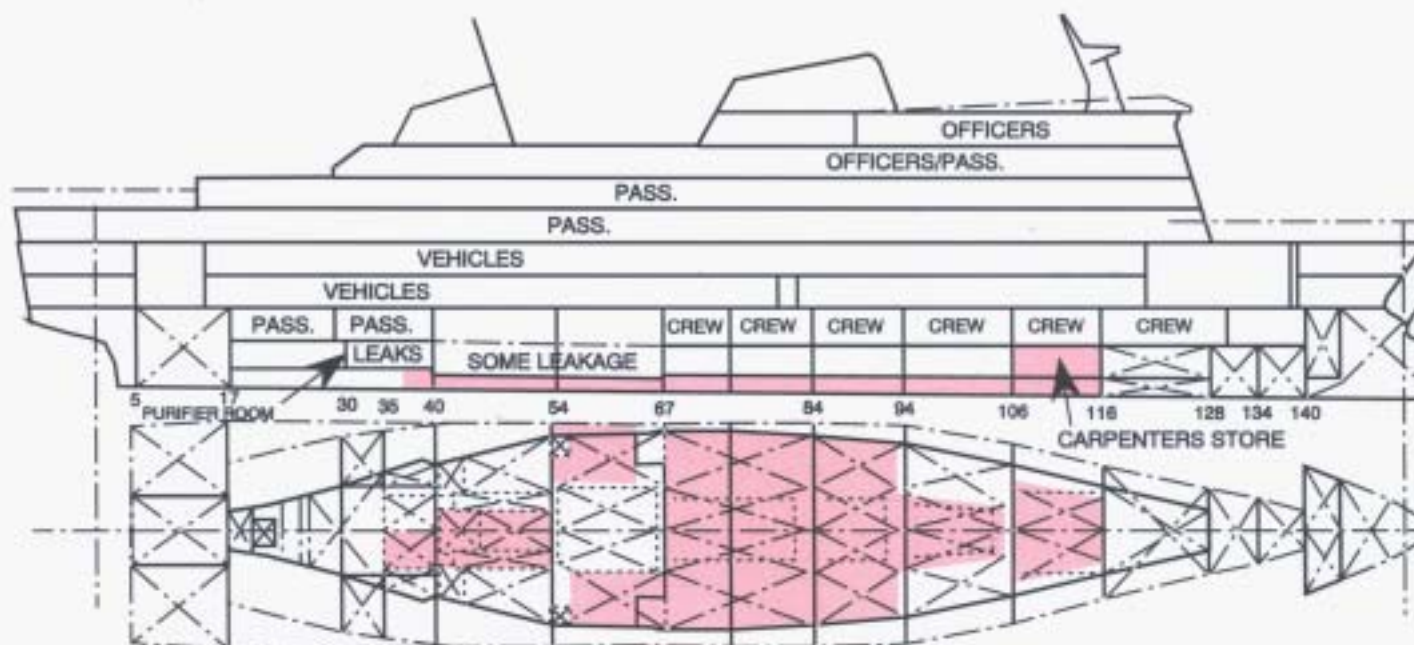


Figure 2B: DB₈ REPORTED LEAKING IN RED