

Report of the Investigation  
into the loss of the Fishing Vessel  
**HEATHER BLOOM INS 110**  
with the loss of one life  
on 3 December 1994

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5/7 Brunswick Place  
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# CONTENTS

		Page
Section 1	Summary	1
<b>PART I</b>	<b>FACTUAL ACCOUNT</b>	
Section 2	Particulars of Vessel and Crew	2
Section 3	Narrative	4
<b>PART II</b>	<b>CONSIDERATION OF POSSIBLE FACTORS</b>	
Section 4	Emergency Communications & Distress Signals	8
Section 5	Design and Operation of Trawl Towing System	11
Section 6	Watertight Integrity and Downflooding	14
Section 7	Other Observations	15
<b>PART III</b>	<b>CONCLUSION</b>	
Section 8	Findings	16
Section 9	Recommendations	18
<b>PART IV</b>	<b>FIGURES</b>	
Figure 1	Extract of BA Chart No 219 showing location of incident	
Figures 2 & 3	General arrangement drawings	
Figures 4 to 8	FV HEATHER BLOOM - Photographs	

## 1. SUMMARY

During the evening of 3 December 1994 the United Kingdom registered fishing vessel HEATHER BLOOM, with a crew of six, snagged her fishing gear on an underwater obstruction whilst bottom trawling. The snagging caused her to heel heavily to port and to take on water. After sending a distress signal by MF radio, two inflatable liferafts were launched. The flooding continued and the vessel sank in a position 69 miles north of Cape Wrath in heavy seas and gale force winds.

Five of the crew were rescued by the United Kingdom fishing vessel AMBASSADOR, which had seen the distress flares fired from the liferaft. Two Coastguard helicopters, one from Sumburgh and one from Stornoway, assisted in the rescue but despite their efforts they were unable to recover the Skipper's body from the sea.

The immediate cause of the accident was an uncontrolled ingress of sea water into HEATHER BLOOM. Subsequently the main onboard electrical system failed which prevented release of the hydraulically operated brakes on the trawl winches and release of the tension in the snagged towing hawsers.

A significant contributory factor to the loss of the vessel was the lack of a safe operational procedure for manually releasing the winch after hydraulic power was lost.

A radio telephony distress signal was not sent until just before HEATHER BLOOM sank. At that stage the vessel was at a large angle of heel which effectively reduced the aerial height and produced a very weak "MAYDAY" signal. It took almost an hour before the significance of the signal was realised and a search and rescue operation was started.

## **PART 1 FACTUAL ACCOUNT**

### **2. PARTICULARS OF VESSEL AND CREW**

2.1	Type	:	Steel hulled stern trawler
	Built	:	1992, Campbeltown Shipyard
	Port of Registry	:	Inverness
	Registered Number	:	INS 110
	Length overall	:	24.35 metres
	Length registered	:	22.48 metres
	Beam	:	7.27 metres
	Depth	:	3.08 metres
	Draught (aft)	:	4.56 metres
	Freeboard aft (min)	:	1.04 metres
	Displacement	:	317.2 tonnes
	Gross tonnage	:	162.74
	Engine	:	Caterpillar type 3508TA driving a single variable pitch propeller
	Power	:	593 kW
	Speed	:	10.5 knots
	Owner	:	Heather Fishing Company Ltd

2.2 HEATHER BLOOM held a United Kingdom Fishing Vessel Safety Certificate, issued on 28 October 1993 and valid until 12 November 1996. She had been provided with a Freeboard and Stability booklet, approved by the Department of Transport Marine Directorate on 19 October 1993. An inclining test had been carried out on 26 October 1992.

2.3 There was a total crew of six, comprising the Skipper, Mate, Engineer, two deckhands and a deckhand/cook. The Skipper held a Skipper's (Limited) Certificate of Competency issued by the United Kingdom Department of Transport. He also held a Restricted Radio Telephony Certificate. The deckhand/cook held a Skipper's Full Certificate. None of the other crew members were certificated nor were they required to be.

2.4 The vessel's navigation equipment included:

- Robertson AP-45 auto pilot & WA9 with alarm
- Racal Decca Mk 53G navigator
- Racal Decca CVP 3500 plotter
- Racal Decca Bridgemaster 180/4 radar
- Loran C90 navigator
- Woodson's Quodfish 100 computer plotting system
- Raytheon JFC 200 colour sounder
- Raytheon MNKP-5-10 echo sounder
- Koden MD3600 radar
- Elac Mittel Lodar sonar

2.5 The vessel's communication equipment included:

- Main MF radio transmitter with two tone alarm - SAILOR T2031
- MF radio receiver - SAILOR R2022
- 2182 kHz watch receiver - SAILOR R501
- VHF transmitter and receiver - SAILOR RT 144C
- Portable VHF radio - ICOM IC-M12
- Emergency Position Indicating Radio Beacon - Tron 30-5

2.6 The vessel's engine-room bilge pumping arrangements included:

- Two Desmi SA80-220/17 electric pumps rated at 660 litres/min
- One hand operated whale pump rated at 91 litres/min
- Bilge alarms were fitted in the engine-room and fish hold with visual/audible alarm in the wheelhouse

2.7 The vessel's fishing gear included:

- Two split trawl winches type TWS-2520/43-06300, positioned on the shelter deck aft
- Warps, boards, spare trawl wires, and two nets on drums on the main deck aft

2.8 The vessel's lifesaving equipment included:

- Two Beaufort inflatable liferafts, each 10-person capacity, positioned on the shelter deck forward
- 12 Tyco lifejackets - (10 in cabin, 2 in wheelhouse)

### 3. NARRATIVE

All times are Universal Co-ordinated Time (UTC)

3.1 HEATHER BLOOM sailed from Peterhead on the east coast of Scotland at 2000 hrs on 27 November 1994, with the intention of fishing in an area approximately 60 miles north of Cape Wrath. The complete fishing voyage was expected to take about 10 days. The Skipper and five crew, which included the Skipper's two sons, were on board. The vessel was apparently well found and maintained and at the time of sailing she was properly manned and equipped for the proposed voyage.

3.2 HEATHER BLOOM fished in the intended area during the week. The fishing was good and the weather was reasonable for the first few days but deteriorated towards the weekend.

3.3 On Friday, 2 December 1994, the Skipper went to bed at about midnight having been on the towing watch all day. On 3 December at about 0300 hrs the net was found to have been damaged and the entire crew were called out in order to repair it. When the repair was completed the Skipper took over the towing watch again.

HEATHER BLOOM continued fishing throughout 3 December and at about 1600 hrs a catch was landed on deck. Having stowed the fish, the crew, except for the Skipper and cook, turned in to sleep. Sea conditions were rough with a force 8-9 south westerly wind.

3.4 At about 1800 hrs, the crew were awakened by the sound of the propeller thrashing through the water and the noise of the hydraulic clutch to the winches being engaged in readiness to haul in the nets. The fishing gear had become snagged on an underwater obstruction and, as was the normal practice on HEATHER BLOOM, the Skipper heaved on the trawl wires to see if the gear would release itself.

3.5 The cook was the first to reach the shelter deck and noticed that the starboard trawl wire was leading across the after deck to port. Before he went to inspect the area he signalled to the Skipper to stop heaving but HEATHER BLOOM lurched suddenly to port. When the cook arrived aft he found the situation to be much worse than he had anticipated with seas coming on board through the transom door openings.

The cook was joined by the two deckhands on the shelter deck followed by the Mate. At this stage more seawater was collecting on the port side of the after deck, unable to flow overboard because the freeing ports had been blocked by the spare net.

An attempt was made to pull the spare net away from the freeing ports by hand but this was not successful, so the Mate told the crew to use the power block (a hydraulically operated arm) to haul it through the transom door openings to the upper deck. By then sea water was downflooding into the engine-room through the ventilation trunk. Water was also flooding into the deckhouse through the after toilet window. The power block had been lowered almost to the main deck when main electrical power was lost.

- 3.6 The Mate and a deckhand went to the engine-room to try to re-establish main electrical power and to transfer fuel across from the port tank to the starboard tank to counteract the vessel's list. Main power was re-established for one or two minutes but was lost again; only essential services were provided by the vessel's 24 volt emergency power system. It was not possible to transfer fuel across the vessel using the hand pump as the vessel's angle of heel was too great.

There was more than a metre of water over the top of the port wing fuel tank, and the main switchboard on the forward port side of the engine-room was saturated with water. When water started coming down the main hatch into the engine-room the two men left and went to the upper deck.

- 3.7 Because the trawl winches were hydraulically operated and controlled by the main 240 volt electrical system it was not possible at this stage to operate them or to release their brakes. The crew tried to release the winch brakes manually, but were unable to. Attempts were made to cut the port towing wire with a hacksaw and also to break the hydraulic pipes using a hammer and cold chisel to release the hydraulic pressure. Again the crew's efforts were unsuccessful.

- 3.8 During their attempts to release the hydraulic pressure, the upper port shelter deck edge and the winch became immersed in the sea. Three deckhands went forward to launch the starboard liferaft which was thrown overboard and inflated; they and the engineer boarded it.

- 3.9 Whilst this was going on the Skipper was on the fore deck and the Mate was in the wheelhouse. At 1821 hrs the Mate sent a "MAYDAY" call on MF radio 2182 kHz and on VHF Channels 10 and 16. When the wheelhouse became awash the Mate escaped through the starboard side window and joined the Skipper forward.

- 3.10 The Mate had just launched the second liferaft, which only partially inflated, when a heavy sea washed him and the Skipper over the side.

It took the Mate three or four minutes to pull himself into the partially inflated liferaft and to cut the painter. This was at about 1831 hrs. The Mate saw the Skipper's hand as he came out of the water, managed to grab it and tried to pull him onto the liferaft but the Skipper was too heavy. Within minutes the Skipper

went limp and stopped moving. The Mate continued to hold on to him for about 15 minutes and then tied the liferaft's painter around the Skipper's hand to stop him from drifting away.

Sometime later the Mate located the liferaft's survival pack and set off one of the distress flares. Shortly afterwards he saw a flare from the first liferaft.

3.11 From his position in the first liferaft the cook saw that the Mate had launched the second liferaft and so he cut the painter holding his raft to HEATHER BLOOM - this was his last sighting of the vessel. Initially a rocket flare was fired from the liferaft but it did not function properly, so a second rocket flare and later two hand flares were set off.

3.12 Between 1800 hrs and about 1900 hrs on 3 December 1994 the Skipper and crew of the fishing vessel AMBASSADOR were repairing the fishing gear block on her after deck.

Just before they were about to shoot the fishing gear at about 1900 hrs the Skipper thought he saw a red light or flare. The crew were told not to shoot the net, and four or five minutes later the Skipper saw another red flare, and ordered the crew to take the net back onboard. Once that had been done a course was set in the direction of the red flare. After a further five minutes had passed the Skipper saw a third flare and then he contacted Wick Radio station and told them that he had sighted some red flares.

3.13 Although the HEATHER BLOOM's MAYDAY message had been sent at 1821 hrs it was not until 1916 hrs that the British Telecom (BT) Distress Watch Radio Officer (DWRO) at Stonehaven Radio contacted Aberdeen Coastguard and informed them that a MAYDAY signal, timed at 1821 hrs, had been located on one of their radio signal monitoring tapes. At 1919 hrs a MAYDAY relay message was broadcast via Hebrides Radio. At 1920 hrs Aberdeen Coastguard acknowledged the distress relay and said that they would co-ordinate the search and rescue operation.

At 1927 hrs the Stornoway rescue helicopter R119 was tasked and at 1928 hrs AMBASSADOR told the Coastguard that her position was 59° 51'N 004° 49'W, that she had sighted three red flares and was heading towards the area at 6 knots. One mile further south, at 1935 hrs, she found one of the liferafts and reported that there appeared to be someone on board it. A ladder was put over the port side and with AMBASSADOR making a lee, the four crew in the liferaft were able to embark safely on board AMBASSADOR.

3.14 Rescue helicopter R117 from Sumburgh was tasked at 1938 hrs and proceeded immediately towards AMBASSADOR's position.

- 3.15 At 1939 hrs AMBASSADOR reported that four survivors had been recovered from the liferaft and the indications were that there were two more people on another liferaft, the position of which was not known. AMBASSADOR's Skipper had intended leaving the liferaft in the sea and using its drift as a means of estimating the position of the second liferaft, but the Coastguard advised him to recover it so that it would not distract the pilots of the helicopters searching for the second liferaft. At 2029 hrs AMBASSADOR recovered the first liferaft and took it on board, and at 2039 hrs both helicopters arrived on the scene.
- 3.16 Rescue helicopter R119 located the second liferaft at 2110 hrs and directed AMBASSADOR towards it. On approaching the liferaft the AMBASSADOR's crew saw one survivor who was holding on to a body.
- 3.17 At 2120 hrs rescue helicopter R119 reported that she would have to return to base to refuel, consequently she was released from further search and rescue duties.
- 3.18 AMBASSADOR was able to make a lee for the second liferaft and to come alongside it. The survivor, the Mate of HEATHER BLOOM, managed to get on board AMBASSADOR but had to leave his Skipper's body still attached to the liferaft by the painter. One of AMBASSADOR's crew volunteered to go aboard the liferaft to try to recover the body using a rope. A line was attached to the crewman who went down on to the liferaft but he was unable to pass the rope around the body because it drifted under the liferaft and then under AMBASSADOR. Also, he was unable to hold on to the painter which was still attached to the body because heavy seas were making the liferaft rise and fall rapidly. The crewman was obliged to return to the safety of the AMBASSADOR without having retrieved the body.
- 3.19 It was then decided that the liferaft would be streamed about 50 metres clear of AMBASSADOR to allow the winchman from rescue helicopter R117 to be lowered to the liferaft to secure a recovery harness to the body. When the winchman reached the area he could see that the body was face down in the water, bent over double and attached to the submerged painter. Despite the very rough sea and gale force wind, the winchman managed to get hold of the body but in order to attach the harness he had to cut the liferaft painter which had become wrapped around the body's arms. When the winchman cut the painter the body started to sink and was swept away by a large wave and was not recovered.
- 3.20 Because of the weather conditions the survivors were not taken off by the helicopter, which returned to base, but remained on board AMBASSADOR. The next day, 4 December, at 1028 hrs AMBASSADOR arrived at Scrabster with the five survivors and both of HEATHER BLOOM's liferafts on board. None of the survivors required medical attention.

## PART II CONSIDERATION OF POSSIBLE FACTORS

### 4. EMERGENCY COMMUNICATIONS AND DISTRESS SIGNALS

4.1 HEATHER BLOOM first snagged her gear at about 1800 hrs. At 1821 hrs the Mate transmitted a distress message on 2182 kHz giving the vessel's position as 59°47' 04" 51'. This was recorded on tape at Stonehaven Radio but was not heard by the operators there. The Mate also sent distress messages on VHF Channels 10 and 16, but as far as can be ascertained these were not received by any vessels or rigs in the vicinity.

Under normal circumstances AMBASSADOR's VHF radio was set to the VHF working Channel 10, but during the period from 1800 hrs to about 1900 hrs the AMBASSADOR's Skipper and crew were repairing the fishing gear block on the after deck where they would have been unable to hear any radio calls received in the wheelhouse.

4.2 The 2182 kHz distress message was not relayed to the Coastguard until 1916 hrs. The circumstances which caused this delay are as follows:

- At 1821 hrs the HEATHER BLOOM's "MAYDAY" call was heard briefly on board the oil rig SOVEREIGN EXPLORER by one of the crew who had been in the radio room collecting a weather forecast while the Radio Officer was having his meal break. During the Radio Officer's meal breaks it was normal practice for the rig's standby vessel to take over the listening watch.
- At 1835 hrs the crew member told the Radio Officer that she had heard the word "MAYDAY" repeated twice followed by the numbers 59 47 04 51, shortly before the silence period marked by the green segment on the radio room clock.
- At 1840 hrs the Radio Officer contacted the officers of CAM SENTINEL, the rig's standby vessel, on VHF Channel 5 but they had not heard any "MAYDAY" calls.
- At 1842 hrs the Radio Officer contacted CAM VIPER, the standby vessel for the rig SONAT ARCADE FRONTIER, on VHF Channel 16, but no "MAYDAY" calls had been heard on that vessel. Two minutes later he tried to contact SONAT ARCADE FRONTIER on VHF Channel 16 first and then on VHF Channel 14 but there was no reply.
- At 1845 hrs he managed to contact the operators at Stonehaven Radio by land line and asked them if they had heard a "MAYDAY" call on 2182 kHz. They had not, but asked if the Radio Officer could give them an approximate time of transmission. They were told that the crew member had said she had heard the signal just before the "green silence period" which is between 30 and 33 minutes past each hour.

- The Distress Watch Radio Officer (DWRO) at Stonehaven Radio told the Radio Officer on the rig that he would check the monitoring tape recording and call back. The recordings on the Hebrides and then the Wick tapes made between about 1827 hrs and 1833 hrs were played back and checked but no "MAYDAY" calls were heard. The DWRO then contacted the rig on 2182 kHz and asked for further communications between them to be by telephone line. This was done and the DWRO told the Radio Officer on the rig that he had played back the tapes from the indicated time of 1827 hrs but that nothing had been heard.
- It was then suggested that the DWRO should listen to the Hebrides tape starting at 1815 hrs recording time. The "MAYDAY" call from HEATHER BLOOM giving her position as 59°47' 04°51' was heard when the tape recorder clock read 1821 hrs.

- 4.3 One of the DWRO's duties was to listen to the 2182 kHz loudspeaker outputs from both Hebrides Radio and Wick Radio. Signals received through these stations were also recorded on a multitrack tape recorder which indicated the precise time that messages were received. British Telecom, whose Maritime Radio Services at Stonehaven were contracted by the Coastguard, in their report on the incident stated that HEATHER BLOOM's distress message was not heard because the signal strength was too weak to be audible above the general background noise and other signals on 2182 kHz at the time. After the accident the loudspeakers were tested and found to be functioning correctly.

Stornoway Coastguard, although monitoring VHF Channel 16, and recording and listening to 2182 kHz, did not hear HEATHER BLOOM's distress call. However, as soon as Aberdeen Coastguard informed them of the incident they played back the recording tape and heard the weak distress message amongst a lot of background noise.

Shetland Coastguard also monitored VHF Channel 16 and recorded and listened to 2182 kHz, but the distress call was neither heard at the time it was made nor on the tape recordings.

- 4.4 It is accepted that the 2182 kHz distress signal strength was weak and that because of this neither the BT nor the Coastguard stations heard HEATHER BLOOM's original signal. A number of factors which could have contributed to the loss of signal strength in this case are considered below:

- The HEATHER BLOOM's distress transmission was received by Hebrides Radio, which was about 133 miles from the vessel and therefore within the 150 mile range requirement for an under 24m (Class III) fishing vessel, before being relayed to Stonehaven. When the transmission was made at 1821 hrs, the vessel had a large angle of heel, possibly up to 50°, which reduced the height of the antenna and consequently considerably reduced the signal strength. It is known that at an angle of heel of 45° the effective range is reduced by about 30% and at 60° it is reduced by 50%.

- The signal strength could also have been further reduced because the heavy sea spray conditions, as reported by the Skipper of AMBASSADOR, may have partially short-circuited the antenna.
- 4.5 Had an urgency (PAN PAN) signal been sent and/or had the two tone distress alarm been activated early on in the incident and before the vessel became heavily inclined, the possibility exists that HEATHER BLOOM's emergency communication would have been properly and effectively received.
  - 4.6 The Skipper held not only a Skipper's Certificate of Competency but also a Restricted Radio Telephony Certificate and therefore had been trained in radio procedures, yet he did not send any urgency or distress signal. The Mate, as well as trying to save the vessel, eventually sent a "MAYDAY" just before he was washed overboard.
  - 4.7 The Emergency Position Indicating Radio Beacon (EPIRB) failed to operate correctly after the vessel sank although its batteries had a July 1996 expiry date. The hydrostatic release unit (HRU) attaching the EPIRB to the vessel, which is designed to release the EPIRB at a depth of not more than 4 metres, was noted to have had an expiry date of July 1994 when the vessel was new and first surveyed in November 1992. It was not until the crew were in the liferafts that they considered manually releasing the EPIRB, and then it was too late.

## 5. DESIGN AND OPERATION OF THE VESSEL'S TRAWL TOWING SYSTEM

### 5.1 Bottom Trawling

HEATHER BLOOM was equipped to perform a type of stern fishing called "bottom trawling", which is carried out by a large percentage of new Scottish fishing vessels. The fishing gear employed is of robust construction, and the vessel needs to have a slow trawling speed and high propeller torque in order to drag the trawl across the sea bed. It is not unusual for a trawl to snag on a sea bed obstruction during this type of operation. The week before HEATHER BLOOM foundered she lost her net after it had become fast during a similar snagging incident. Efforts to free the gear on that occasion resulted in the wire sweeps breaking and the loss of the net.

### 5.2 Trawl Winch System

The winch system had been constructed by Rapp Marine in Norway, and was then shipped in sections to Scotland where it was assembled by Fishing Hydraulics Ltd. The complete trawl winch system was installed and operationally tested on HEATHER BLOOM by Fishing Hydraulics Ltd.

HEATHER BLOOM's fishing gear was operated using two split main trawl winches situated on the after shelter deck. These winches were angled slightly outboard in order to give a good lead to the towing sheaves on the outrigger gallows, (see Figure 2). Each trawl winch had a first layer pull of 13 tonnes at 33 metres/minute. Each warping drum was loaded with 600 fathoms (1098 metres) of 24mm diameter steel wire rope.

The winch positioning was satisfactory and could be seen clearly through the aft window in the wheelhouse where the control levers were operated. The control panel was mounted on the starboard side of the forward console in the wheelhouse, which allowed constant monitoring from the watchkeeper's position. The eight main controls were:

- |                    |   |
|--------------------|---|
| MAIN PUMPS         | - normally used for starting/stopping the main hydraulic pumps;                   |
| POWER STEP         | - used to obtain less speed on the trawl winches without reducing the pull;       |
| TWO SPEED          | - normally used to obtain more speed on the trawl winches at the expense of pull; |
| AUTO SPEED CONTROL | - offering automatic speed control during pay out up to a set speed;              |

- PAY OUT - kept the control valves for the trawl winches in pay-out position from 25 length units until set point was reached or the key was pressed once more;
- TOWING - used for stopping/restarting automatic towing;
- HAULING IN - kept the control valves for the trawl winches in haul-in position until 25 length units remained or until the key was pressed once more; and
- P1 - normally used as extra haul speed function, to operate extra pumps, to operate selector valves or for other functions.

The control panel also gave information on length of wires, speed of pay out, towing mode, etc. The winch system was capable of providing synchronized automatic pay-out and haul-in.

If the trawling gear became snagged when in the auto-trawl mode, the winches were designed to pay-out until a preselected load or trawl wire length was reached. HEATHER BLOOM normally operated in the auto-trawl mode. The system was also designed so that when HEATHER BLOOM was trawling, the load was taken by the winches and hydraulic motor and not by the brakes.

Should an electrical power failure occur, the clutch was designed to automatically disengage the hydraulic pumps from the vessel's main engine, and close down the entire hydraulic system which in turn would stop the winches and engage the mechanical band brakes in the "on" position.

Fishing Hydraulics Ltd reported that the HEATHER BLOOM's winch hydraulic system had suffered many failures during the two years since she was built.

In this accident four crew members including the Skipper tried to release the port winch brake, but without success. The weather conditions made the operation very difficult, it was dark and there was no deck lighting. No documented emergency safety procedures had been supplied by the winch manufacturers. The winches were supplied without the winch keys used for adjusting the brake cylinder, but which were illustrated in the manufacturer's publications and on the general arrangement plans (see Figure 2).

Fishing Hydraulics Ltd have confirmed that the winch system had been designed so that during normal operation the trawl winch brakes would be released hydraulically. However when no hydraulic pressure was available the winches should not have been operated, therefore there were no arrangements for releasing the brakes quickly under such circumstances, and the only way to release the brake was by using a wrench or spanner on the brake cylinder adjustment screw (piston rod). By turning the screw clockwise the brake band would be gradually lifted off the drum, but a large number of turns were required

before the winch would run free, and it would be very difficult to release the brake with high tension on the wire because of the increased load on the cylinder threads.

The winch manufacturers have now designed equipment, at present untested, which should enable the brakes to be released quickly in a dead ship situation. If the tests prove successful this equipment could be fitted to new and existing winch systems at owners' cost.

### 5.3 Crew Training

The fact that the trawl, when under tension and without hydraulic power, could not be released quickly in an emergency was not mentioned in the Operating Instructions. However, during commissioning of the winch system the vessel's engineer had been shown how to adjust the brakes, and the crew were given some basic instruction in the system's operation. Nevertheless they did not appreciate how difficult it would be to release the brake band screw after hydraulic power was lost and with the winch under tension.

## 6. WATERTIGHT INTEGRITY AND DOWNFLOODING

- 6.1 The report from the Skipper of AMBASSADOR is considered to be the most accurate and reliable estimate of the prevailing conditions. He reported that during the rescue operation the wind was South force 8 to 9 with wave heights of 4 to 6 metres. The visibility was poor with sea spray, and it was overcast but not raining.

The HEATHER BLOOM's survivors did not consider that the wind and sea conditions were too bad to operate their vessel safely.

- 6.2 The two large transom door openings (Figure 6) were used for shooting nets. Two split aluminium alloy weathertight doors were fitted to each opening. These transom doors, each weighing about 63 kgs, were hinged on their top edges and had to be opened and closed manually. Despite being constructed from aluminum alloy, doors of this type are considered by fishing vessel crews to be heavy and difficult to operate.

In this case the transom doors were not closed mainly because part of the spare net went through the open doorway on to the shelter deck (Figure 8). This allowed a considerable amount of sea water to collect on the after main deck.

At the time of the accident the main fish hatch on the forward shelter deck was secured and the small access hatch on it was closed but not secured. The upper hatch on the starboard side of the shelter deck was open, as was the escape hatch on the port forward end of the shelter deck.

Downflooding via the engine-room ventilation trunk and the toilet window was a result of sea water ingress through the transom door openings. The air pipes to the cabin and after spaces and the storm valves (gut chute) were also reported as being downflooding points. The doors (Figure 3, marked D20 fwd and D12 aft) to the space containing the galley were closed to prevent ingress of sea water from the shelter space forward and the after deck.

The construction and the height of the engine-room ventilation trunk above the deck, conformed to regulation requirements and would have presented no downflooding problem had the transom doors been closed and weathertight.

Had the switchboard been sited high up in the centre of the engine-room's forward bulkhead rather than on the port side of the engine-room, the main 240 volt power supply may have been maintained for a longer period during flooding. Alternatively, the space forward of the engine which housed the hydraulic power pack and tank would have been a more suitable area in which to site the main switchboard.

- 6.3 The lack of watertight integrity contributed to the rapid foundering of the vessel.

## 7. OTHER OBSERVATIONS

### 7.1 Underwater Obstructions

No submarines were reported to be operating in the area at the time of the accident, nor were any offshore installations such as pipes or well-heads known to have been in the vicinity of the accident, and the distance to the nearest known wreck from the recorded sinking position of HEATHER BLOOM was 1.5 miles.

Therefore it has been concluded that HEATHER BLOOM snagged on an unknown obstruction.

### 7.2 Crew Fatigue

Although it is known that it is normal practice for fishermen to work long hours interspersed with short periods of rest, it is considered that the Skipper may have been suffering from fatigue at the time of the accident. The previous day he had been on towing watch all day until midnight. He then had three hours sleep and apart from meal breaks he was then in the wheelhouse from 0300 hrs on 3 December until shortly before the vessel was abandoned at about 1825 hrs that evening.

### 7.3 Stability and Freeboard

#### Stability

A GZ curve, calculated using HEATHER BLOOM's load condition at the time of the accident, has confirmed that HEATHER BLOOM complied with the stability criteria required by the Rules.

#### Freeboard

The minimum freeboard required for HEATHER BLOOM as specified in her approved Trim and Stability Booklet was as follows:

Freeboard Aft = 1.04 metres measured from the main deck

Freeboard Fwd = 2.38 metres measured from the top of the shelter deck at the side

The vessel's calculated freeboards complied with requirements.

## PART III CONCLUSION

### 8. FINDINGS

- 8.1 HEATHER BLOOM's initial heel was caused by the bottom trawl snagging and by the hauling in of 60 to 70 metres of towing wire in heavy sea conditions. The vessel was effectively anchored to the bottom by her fishing gear and, with seas entering the transom door openings, extensive flooding to the main after deck occurred. The freeing ports there were blocked by the spare fishing net and the entrapped water caused HEATHER BLOOM to heel further to port.

The accumulation of this sea water caused downflooding into the engine-room through the ventilation trunk and also flooded the after deckhouse through the toilet window. Eventually water entered the engine-room through the hatch. Despite the efforts made by the crew to remove the spare net and to close the toilet window, the downflooding could not be stopped.

- 8.2 The downflooding increased the vessel's angle of heel and also caused the failure of main electrical power at the switchboard which resulted in the loss of hydraulic power.

Once the hydraulic power supply had been lost the winch brakes could not be released quickly by hand, and the load on the snagged trawl wires remained locked on.

Further downflooding caused HEATHER BLOOM to roll to port and to sink by the stern shortly after 1821 hrs on 3 December 1994, in wind conditions of force 8/9 and wave heights of about 5 metres. Her last reported position was 59° 51'N 04° 49'W, about 69 miles north of Cape Wrath.

- 8.3 The crew had been unaware of any constraint on the release of the winch brakes when there was no hydraulic power.

- 8.4 No Urgency (PAN PAN) message was broadcast during the early stages of the incident. By the time the "MAYDAY" was broadcast HEATHER BLOOM had heeled to a large angle so that the signal received by the radio station was very weak and this contributed to the delay in initiating the shorebased rescue.

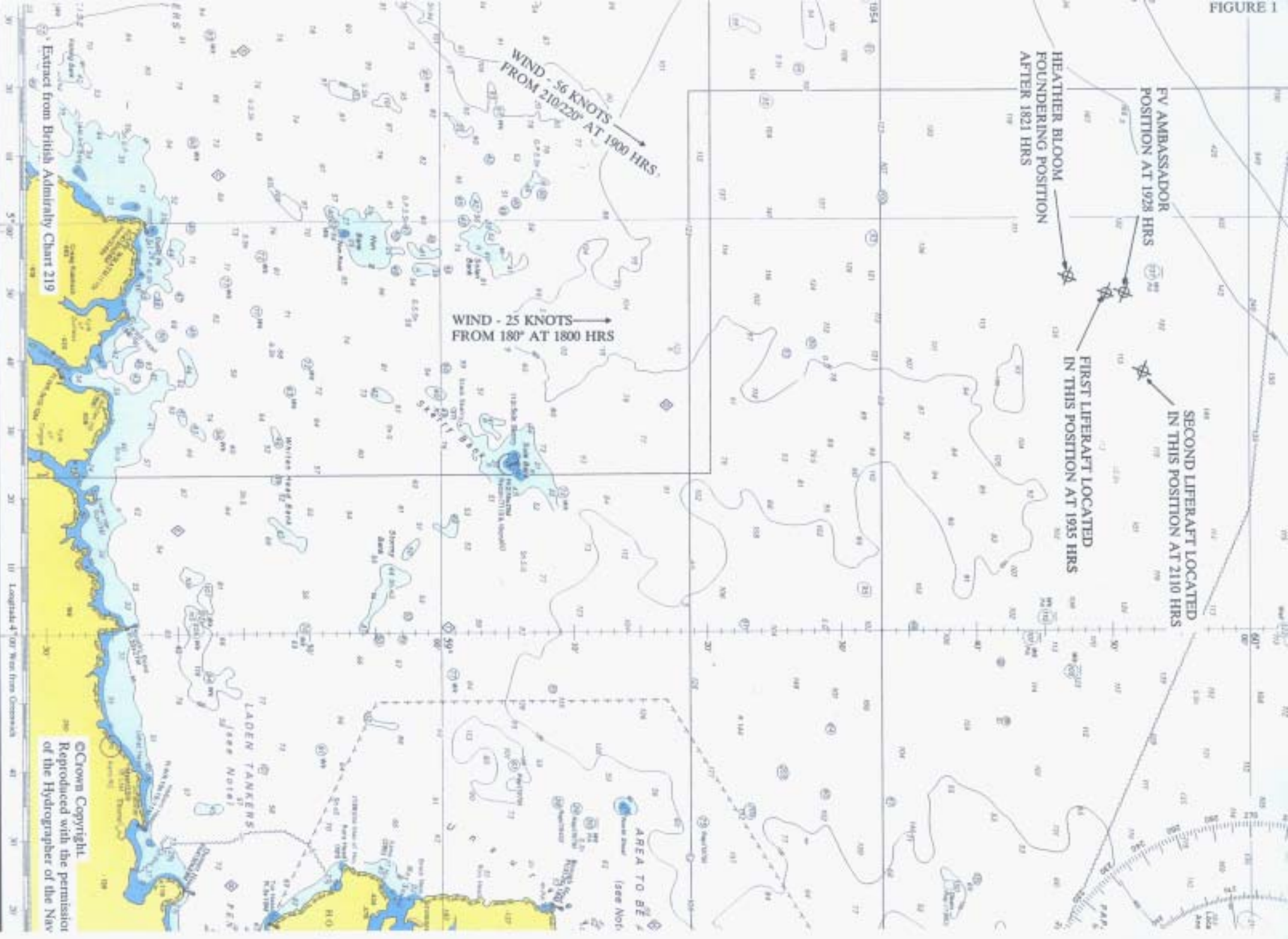
- 8.5 No signals were received from HEATHER BLOOM's EPIRB, possibly because the HRU had passed its expiry date and did not function.

- 8.6 The cause of the tragic loss of the Skipper's life has not been established but it is apparent that he died shortly after HEATHER BLOOM sank. His body has not been recovered.

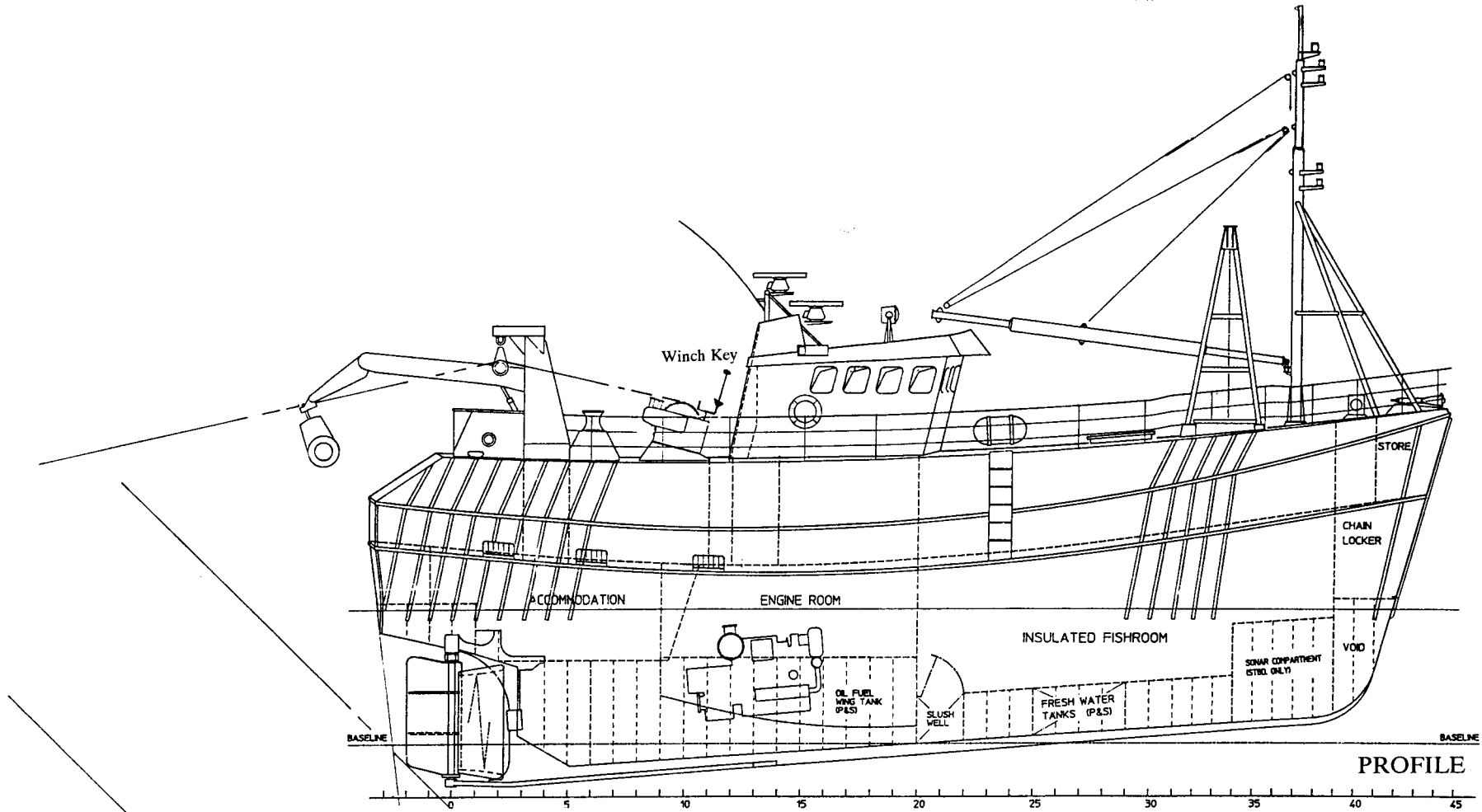
- 8.7 The use of liferafts was instrumental in saving the lives of the five remaining crew. The crew did not use the lifejackets provided on board HEATHER BLOOM.
- 8.8 The rescue was a combined effort by the crew of AMBASSADOR, who recovered four survivors from the first liferaft, and the crew of rescue helicopter R119 who sighted the second liferaft and were able to guide AMBASSADOR to its position to enable the fifth survivor to be recovered. The crew of rescue helicopter R117 endeavoured to retrieve the Skipper's body but were unable to do so because of the severe weather conditions.
- 8.9 This incident reinforces the importance of:
- fishing vessels keeping on board equipment which is capable of releasing the trawl towing wire should an emergency arise;
  - keeping a good radio listening watch on all types of vessels;
  - sending an early urgency or distress call, in accordance with M.1119 "Radiotelephone Distress Procedure" and M.1026 "Proper Use of VHF Channels at Sea" - and activating the two-tone alarm;
  - informing all ships and shore stations in range if distress signals are sighted;
  - ensuring that inflatable liferaft service schedules are maintained; and
  - ensuring that all hydrostatic release units replacement or service dates are adhered to.

## **9. RECOMMENDATIONS**

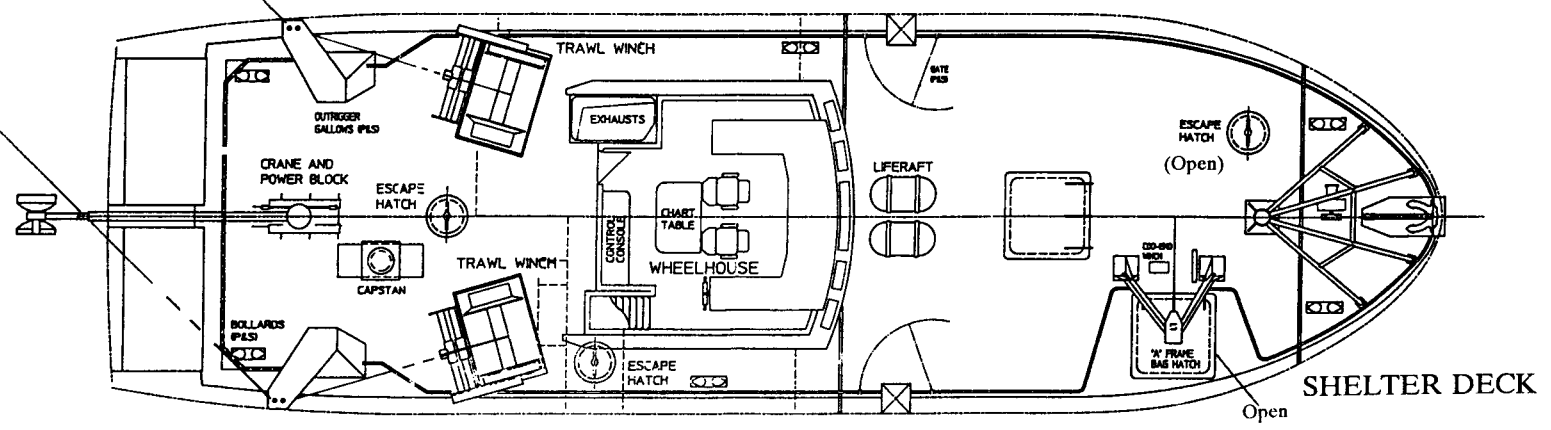
- 9.1 Fishing Hydraulics Ltd is recommended to advise all owners of vessels fitted with trawl winch systems of the type fitted on HEATHER BLOOM, that it is not possible to release the winch brakes quickly by hand when hydraulic power is not available and the trawl is in heavy tension. This warning should be clearly marked on the control panel of each such winch system.
- 9.2 The Marine Safety Agency is recommended to issue a Merchant Shipping Notice directed mainly at fishing vessel skippers, giving information about the effective loss in radio signal strength in certain weather conditions and at various angles of heel, and of the importance of sending urgency and distress signals, when necessary, at the earliest opportunity.
- 9.3 The Marine Safety Agency is recommended to take steps when conducting fishing vessel safety surveys, to ensure that any transom doors (section 6.2) fitted to fishing vessels can be opened and closed efficiently and easily.



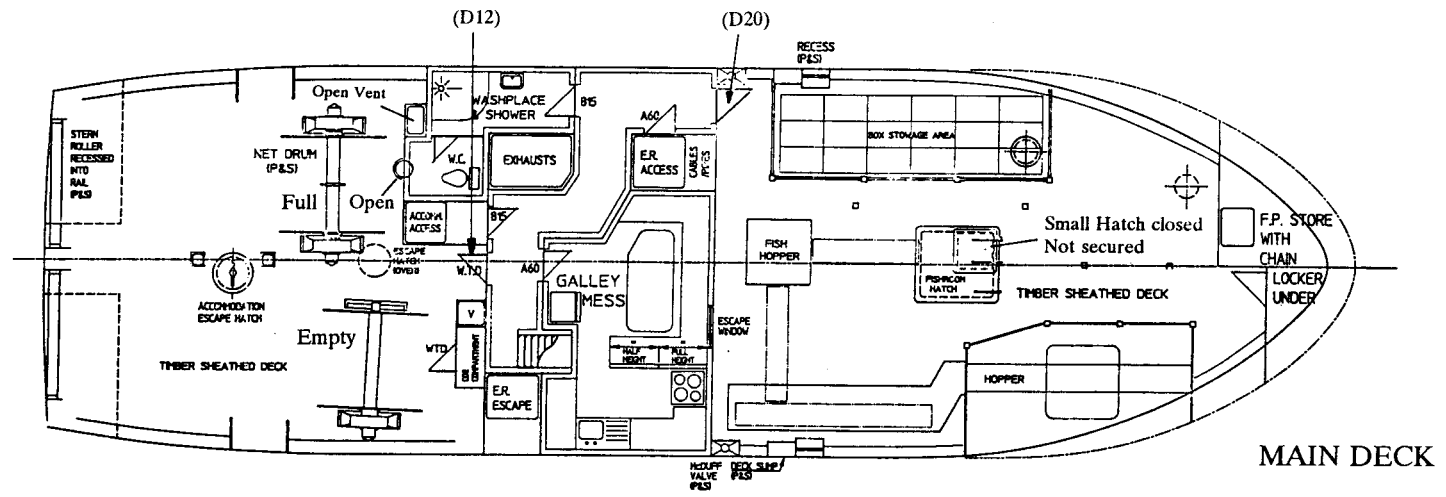
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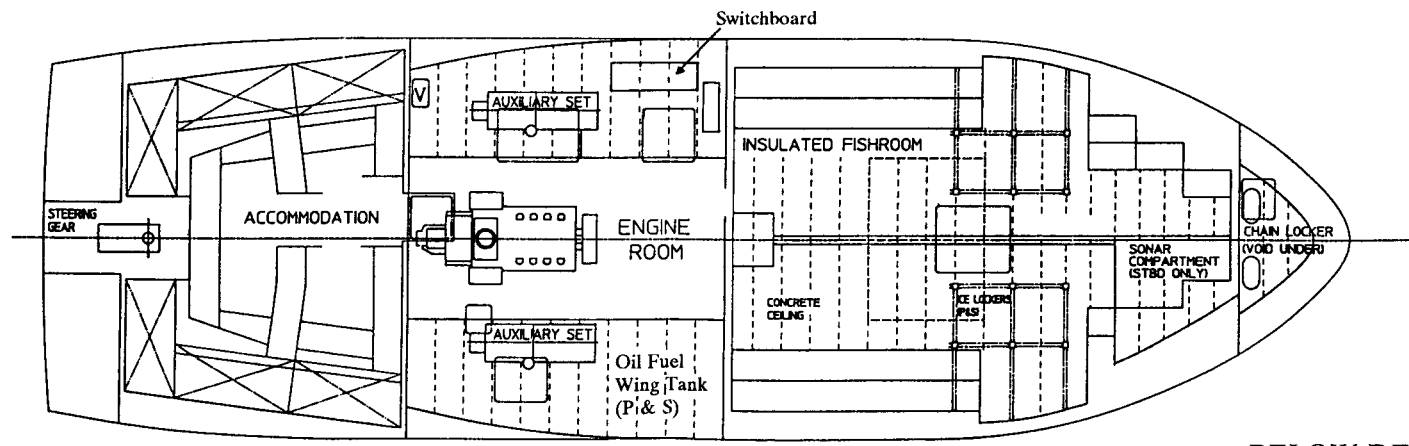
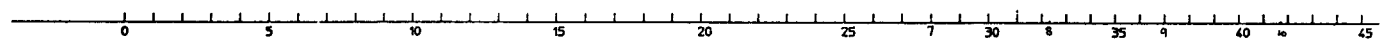
PROFILE



SHELTER DECK



MAIN DECK



BELOW DECK

FIGURE 4

Photograph courtesy of Fishing News, London



HEATHER BLOOM

FIGURE 5

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Wheelhouse and Forward Shelter deck

Photograph courtesy of Campbeltown Shipyard Ltd



HEATHER BLOOM near completion,  
showing the transom openings and doors

FIGURE 7

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View of After Shelter deck

FIGURE 8

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Transom door opening