Report 98-218

fishing vessel *Meridian 1*

grounding

Bluff Harbour entrance

15 December 1998

Abstract

On Tuesday, 15 December 1998, at about 1510, the Ukraine registered fishing vessel *Meridian 1* was steaming off Bluff when it grounded on Anchor Ridge close outside Bluff Harbour entrance. The grounding happened when the watchkeeping officer was distracted and failed to adequately monitor the progress of the vessel.

After the grounding a Southport (NZ) Limited pilot boarded *Meridian 1* and with the assistance of the 2 harbour tugs, *Meridian 1* was refloated and towed into Bluff to assess the damage.

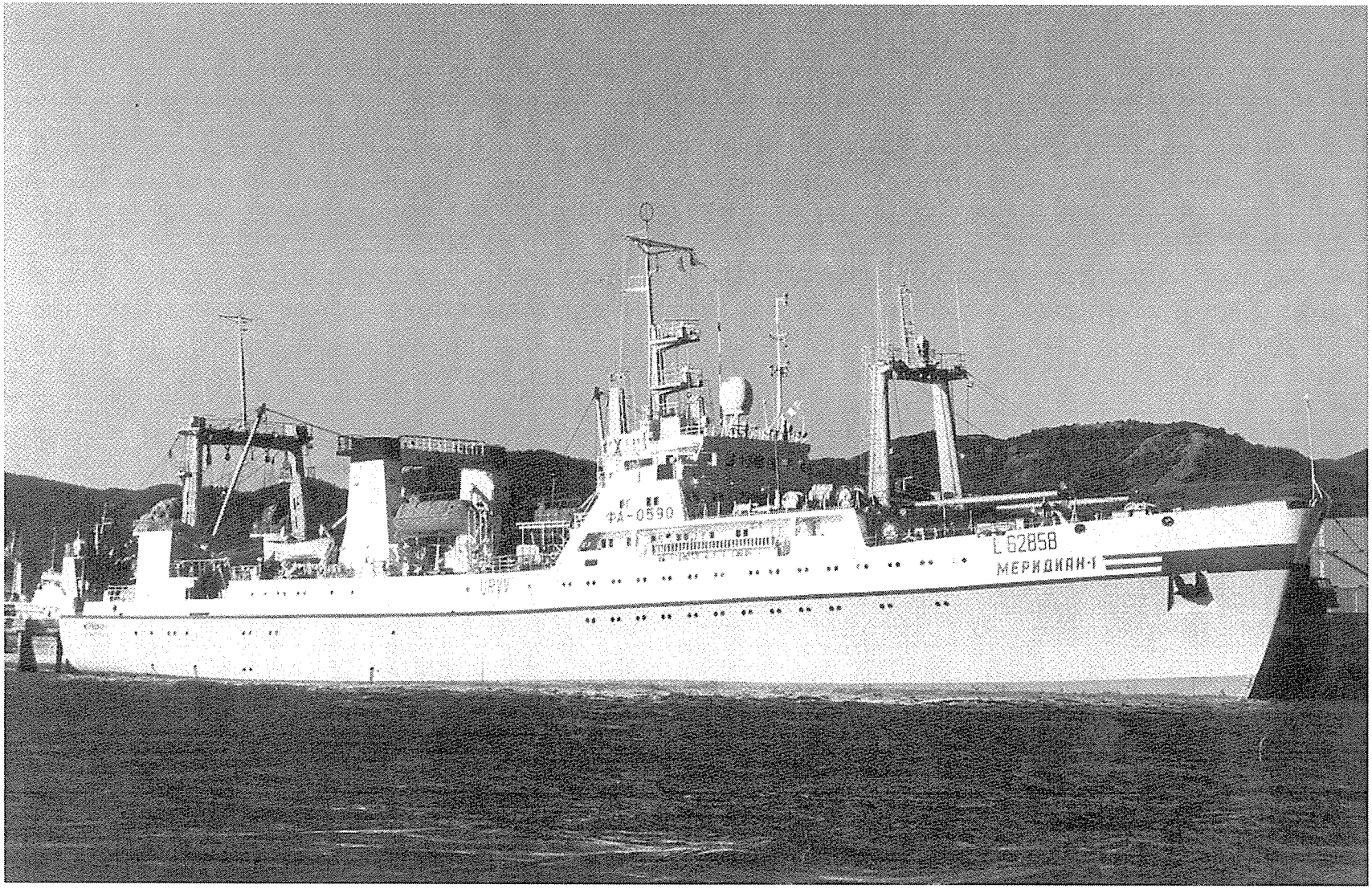
No one was injured due to the grounding but *Meridian 1* suffered minor damage.

Other factors contributing to the grounding were:

- poor passage planning
- poor navigational practices
- inadequate use of navigation aids.

Safety issues identified included:

- the low priority masters of fishing vessels often place on passage planning and crew resources for operations in confined waters compared to that when fishing
- poor understanding of the English language, leading to the mis-interpretation of instructions
- inexperienced watchkeepers being left in sole charge of the navigation of the vessel in confined waters.



Meridian 1

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List of abbreviations

ALC	automatic location communication
ARPA	automatic radar plotting aid
cm	centimetre
GPS	global positioning system
Inmarsat	international marine satellite organisation
m	metres
MSA	Maritime Safety Authority
NZDT	New Zealand Daylight Time (UTC + 13 hours)
t	tonnes
UTC	universal time (co-ordinated)
VHF	very high frequency

Glossary

amidships	middle section of a vessel, mid length
aft	rear of the vessel
beam	width of a vessel
bilge	space for the collection of surplus liquid
bridge	structure from where a vessel is navigated and directed
bulkhead	nautical term for wall
cable	0.1 of a nautical mile
chart datum	zero height referred to on a marine chart
command	take over-all responsibility for the vessel
conduct	in control of the vessel
conning	directing the course and speed of a ship
deckhead	nautical term for ceiling
draught	depth in water at which a ship floats
ebb tide	falling tide
even keel	draught forward equals the draught aft
flood tide	rising tide
gross tonnage	a measure of the internal capacity of a ship; enclosed spaces are measured in cubic metres and the tonnage derived by formula
knot	one nautical mile per hour
leeway	allowance applied to the course steered to counteract the effect of wind
nett tonnage	derived from gross tonnage by deducting spaces allowed for crew and propelling equipment
port	left hand side when facing forward
set	allowance applied to the course steered to counteract the effect of tide or current
sounding	measure of the depth of a liquid
spring tide	period of highest and lowest tides in a lunar cycle

Transport Accident Investigation Commission

Marine Accident Report 98-218

Vessel particulars:

Name:	*Meridian 1*
Type:	Joint venture stern trawler and factory ship
Length overall:	104.5m
Breadth:	16.0 m
Depth:	10.2 m
Gross tonnage:	4407 t
Nett tonnage:	1322 t
Freezer capacity:	2219 cubic metres
Construction:	Steel
Built:	Nikolayev, Ukraine 1991
Propulsion plant:	2 Pielstick four stroke medium speed diesel engines, driving a controllable pitch propeller via a reduction gear box
Output:	5250 kW
Service speed:	12 knots
Owner:	Ocean Co Ltd. (Russia)
Charterer:	Sealord Group Ltd
Port of registry:	Sevastopol - Ukraine

Persons on board: Crew: 84
Technician: 1

Injuries: Nil

Location: Approaches to Bluff Harbour

Date and time: Tuesday, 15 December 1998, at about 1510[1]

Investigator-in-Charge: Captain Billy Lyons

[1] All times in this report are NZDT (UTC + 13 hours) and are expressed in the 24 hour mode.

1. Factual Information

1.1 History of the accident

1.1.1 On Monday, 14 December 1998, *Meridian 1* departed from the fishing grounds near the Snares Islands and steamed for 13 hours towards Bluff to effect repairs to the Automatic Location Communication (ALC) system, which had developed a fault.

1.1.2 The carriage of an ALC system was a requirement of the Ministry of Fisheries for all foreign registered fishing vessels and New Zealand registered fishing vessels over 28 metres long, when fishing within the New Zealand economic zone. The system provided the Global Positioning System (GPS) position of the vessels through the Inmarsat C satellite communication network.

1.1.3 If an ALC system developed a fault the Ministry of Fisheries required the vessel to cease fishing or apply for a dispensation. If granted, the dispensation required the vessel to transmit its position manually every 12 hours. *Meridian 1* had been granted a 48 hour dispensation, which had expired.

1.1.4 The local agent for *Meridian 1* had advised the Southport (NZ) Limited (Southport) duty pilot, that the vessel would be approaching Bluff Harbour. The intention was for the repairs to be conducted at sea, while the vessel stood of the port. He had arranged for a technician, contracted to conduct the repairs, to be taken out to the vessel on the pilot launch.

1.1.5 *Meridian 1* arrived off Bluff at about 0900 on Tuesday, 15 December 1998. The third mate, who was officer of the watch, called harbour control on Very High Frequency (VHF) radio to report their arrival and receive an update on the transfer of the technician.

1.1.6 The duty pilot advised *Meridian 1* that the pilot launch would first transfer a pilot to the inbound bulk carrier *Kite Arrow* at about 1230 then proceed to *Meridian 1* to transfer the technician. Meanwhile, he instructed *Meridian 1* not to proceed further north than the pilotage limit and to preferably stay outside the harbour limit. These limits were marked on chart NZ 6821 at a radius of 2 and 3 miles respectively, from Stirling Point light, (see Figure 1).

1.1.7 The master was on the bridge also. Both he and the third mate had limited command of the English language and they both mis-interpreted the pilot's message, thinking that they had been instructed to stay between the 2 limits.

1.1.8 As neither the master nor the third mate called the pilot back to question his instructions, the pilot assumed they had been understood.

1.1.9 *Meridian 1* steamed at slow speed in a north/south direction for the following 3 hours, keeping broadly between the 2 limits. At 1200 the second mate took over the navigational watch from the third mate, who passed on the master's verbal instructions as well as the mis-interpreted instruction from the duty pilot.

1.1.10 At about 1220, after transferring a pilot to the *Kite Arrow*, the pilot launch skipper called *Meridian 1* on VHF radio and instructed the master to proceed north of the pilotage limit to rendezvous and transfer the technician. The transfer took place at 1240 in a position about one mile north of the pilotage limit and to the east of the South Channel leads, (see Figure 1).

1.1.11 The master verbally instructed the second mate to continue steaming at slow speed in a north/south direction, but extended the southerly limit to 3 miles from the position which the technician had been picked up from. He also instructed the second mate not to proceed further north than the position the technician had been picked up from and not to cross the 15 m depth contour marked on the chart. He then left the bridge.

1.1.12 During the trip out to *Meridian 1* the technician made tentative arrangements with the skipper of the pilot launch to be picked up "late afternoon", on completion of the repairs. He also arranged to call and update his progress by VHF radio "mid afternoon".

1.1.13 Once on board *Meridian 1* the technician told the second mate that he estimated the repairs would take 2 to 3 hours to complete, after which he would test the system for about 30 minutes.

1.1.14 The bridge was manned by the second mate and helmsman. The technician and radio officer visited the bridge periodically while undertaking the repairs. A crew member was working on the starboard side of the bridge altering the position of a GPS plotter and an echo sounder. Other members of the crew were working in the vicinity, but the second mate was in sole charge of the navigation of *Meridian 1*. The helmsman was hand-steering the vessel to the second mate's orders.

1.1.15 Over the ensuing 2½hours the second mate navigated the vessel in a north/south direction at slow speed, keeping broadly to the master's instructions.

1.1.16 *Meridian 1* was on the second northward leg when the second mate noticed the bottom trace on the echo sounder was rising rapidly, and ordered the helmsman to put the wheel hard to port.

1.1.17 At about the same time a local fisherman, whose home overlooked the entrance to Bluff Harbour, telephoned the duty pilot and told him there was a vessel close to Anchor Ridge still heading north.

1.1.18 The pilot called *Meridian 1* on VHF and asked their position. He soon realised that the *Meridian 1* was the vessel the fisherman was referring to, so he advised the second mate to steer between 210 and 220 degrees true. The second mate replied "we are trying to turn".

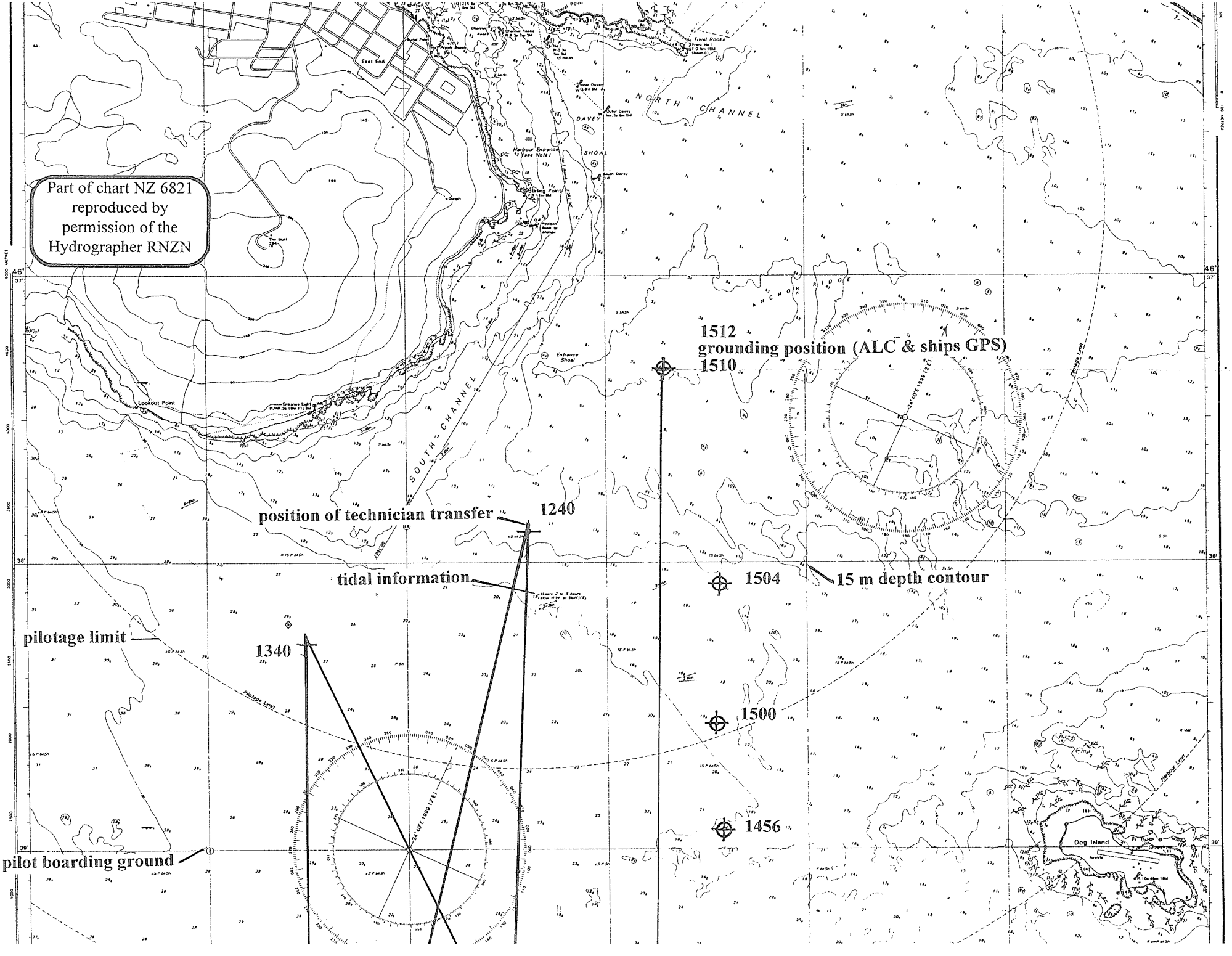
1.1.19 At 1510 *Meridian 1* ran aground on Anchor Ridge, at a speed of about 4 knots, 7 cables north east of where the technician had boarded.

1.1.20 Before the grounding the master had been monitoring the progress of the repairs, alternating between the bridge, the radio room and his cabin. While on the bridge about 10 minutes before the grounding he had made a cursory glance at the position of the vessel, but did not give the second mate any further instructions regarding the navigation of *Meridian 1*.

1.1.21 Immediately after *Meridian 1* ran aground the master went to the bridge and reduced the propeller pitch to zero. He then applied astern pitch for about 7 minutes in an attempt to free the vessel, but it remained hard aground. He then set the pitch to zero and de-clutched the engines.

1.1.22 At 1520, under instruction from the master, the second mate called Bluff Harbour Control on VHF radio and reported their situation. He also requested the assistance of tugs. The duty pilot requested detailed information about the vessel, but the crew were having problems understanding his questions, so the technician was called to the bridge by the master to pass on the details.

1.1.23 After the grounding the crew of *Meridian 1* sounded the tanks. The soundings indicated that the hull was intact. They also checked for any indication of oil pollution around the vessel, but found none.


Part of chart NZ 6821 reproduced by permission of the Hydrographer RNZN
1512
grounding position (ALC & ships GPS)
1510
position of technician transfer
1240
tidal information
1504
15 m depth contour
pilotage limit
1340
1500
1456
pilot boarding ground
NORTH CHANNEL
SOUTH CHANNEL
DAVEY SHOAL
ANCHOR RIDGE
East End
Lookout Point
Entrance Shoal
Dog Island

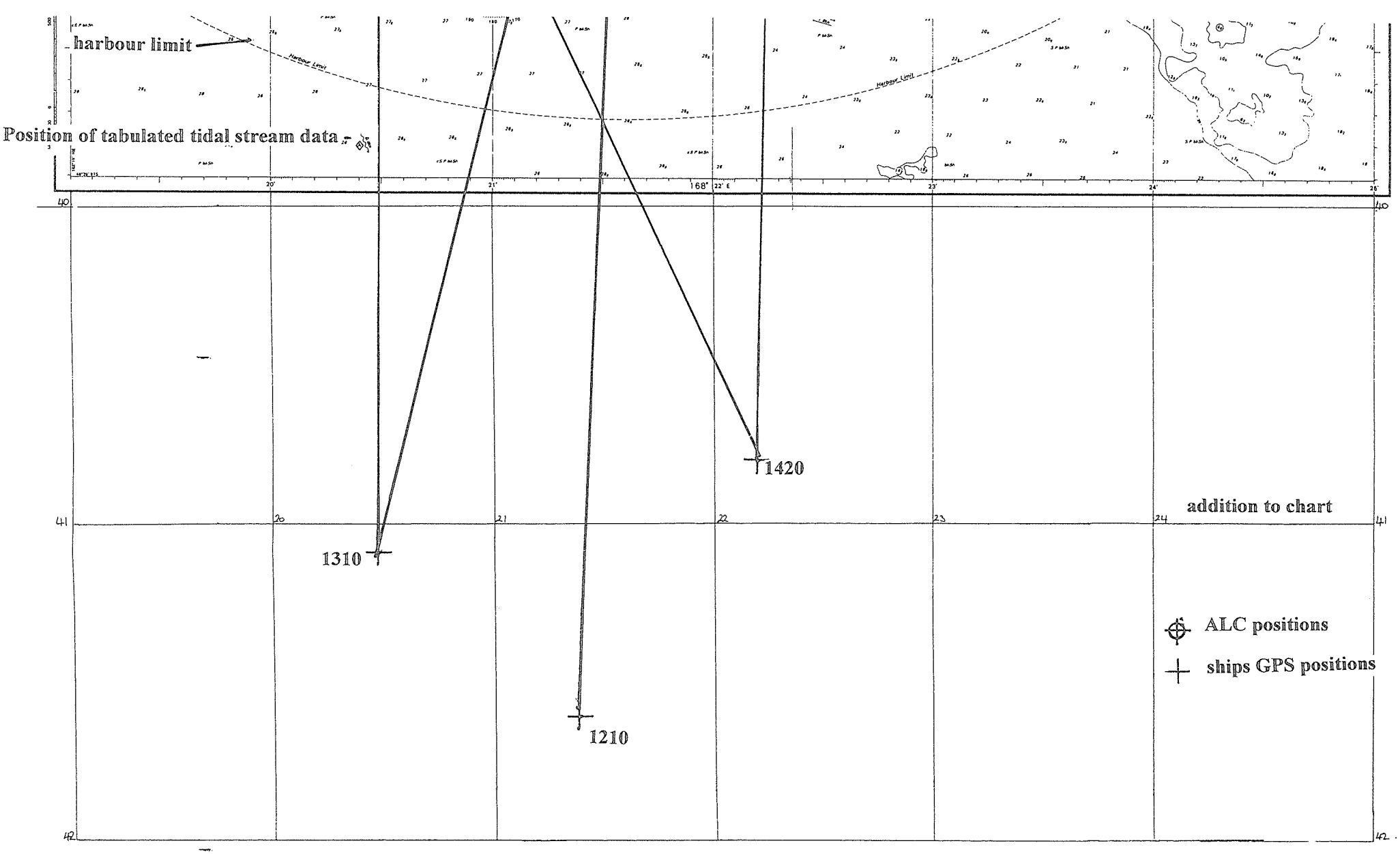


Figure 1
Part of chart NZ 6821, showing the plain paper addition and key information
(scaled down to 40% of original size)

1.1.24 At 1550 the two Southport tugs *Hauroko* and *Monowai* arrived and stood by. At 1620 a Southport pilot boarded *Meridian 1* and assessed the situation. He arranged for the anchors to be cleared and made ready for use. The crew of the pilot launch took soundings around the vessel to determine in which direction the deep water lay. It was determined that *Meridian 1* was aground amidships and the deepest water was ahead of the vessel.

1.1.25 The draught of *Meridian 1* before grounding was estimated to have been 4.8 m forward and 6.8 m aft, giving a mean draught of 5.8 m. The pilot noted the draught amidships was about 4.7 m when he boarded.

1.1.26 The *Meridian 1* was turning to port when it grounded. Reports of what the heading was at the time of grounding conflicted. At the time of salvage it was heading in a south-easterly direction. However, its heading might have changed somewhat after the grounding. *Meridian 1* was moving only slightly after the grounding, as the tide fell it began to roll through an arc of 20 degrees.

1.1.27 After assessing the situation the pilot and the master entered into an agreement for salvage. At about 1645 a line was passed from the *Hauroko* to the bow of *Meridian 1*. The *Monowai* then made fast to the bow of the *Hauroko* and both tugs applied power in tandem. During the initial pull the line between the tugs parted, but the *Hauroko* continued to pull on its own and at 1705 *Meridian 1* was refloated.

1.1.28 *Hauroko* towed *Meridian 1* to an anchorage to await slack water at low tide before proceeding into Bluff Harbour. The vessel anchored at 1720 and the tug was released.

1.1.29 At about 1920 that evening the master of *Meridian 1* weighed the anchor and the vessel was towed into harbour by the 2 tugs. The master was reluctant to use the engines until a diver had inspected the rudder and propeller for damage. *Meridian 1* berthed at 2115 and was inspected by divers for damage.

1.2 Damage to the vessel

1.2.1 The hull, propeller and rudder of *Meridian 1* were initially inspected in Bluff on 15 December 1998. Another video-taped inspection was made by divers on 13 January 1999 in Port Otago, the damage caused by the grounding was reported as:

> Rudder
> No damage was found to the rudder or the skeg. The rudder was securely attached and the plugs were in place.
>
> Propeller
> The propeller was visually in good condition with no major impact marks or bent blades. No rope etc. could be seen around the propeller shaft.
>
> Port bilge keel
> The bilge keel was damaged from approx. half way along the bilge keel to the fwd end of the bilge keel. The bilge keel was pushed up and some of the welds were torn open on the bottom edge.
>
> Hull plating port side
> There was an extensive dent in the hull plating just on the inside of the port bilge keel. The damage was approx. 9 frames long and was basically alongside the damage to the bilge keel. At its worst the dent was approx. 90-100 mm deep between the frames. It was difficult to tell whether the frames had buckled.

Transducers
The transducer housing was securely attached to the hull but the transducer and the mounting plate had been torn off leaving an empty housing and bare wires.

1.2.2 The missing transducers were for the FC140 colour echo sounder. The other transducers had been retracted inside the hull at the time of grounding.

1.3 Bridge equipment and navigation

1.3.1 The navigational equipment on *Meridian 1* included:

- 2 Furuno 2120 radar sets, both fitted with guard zone alarm and Automatic Radar Plotting Aid (ARPA)
- 2 Furuno GPS plotters, (one GP1250 and one GP188)
- one standard echo sounder with paper trace
- one Furuno FCV 140 dual frequency colour echo sounder fitted with depth alarm function
- one Furuno scanning sonar
- one gyro compass with repeaters
- one Askold 34PMN027 course recorder
- 3 VHF radio sets.

1.3.2 The ALC system that the technician was repairing was installed in the radio room, one deck below the bridge. It was totally independent from the navigation equipment of the vessel.

1.3.3 The navigational equipment that was being used at the time of the grounding was:

- the starboard radar
- the GP1250 GPS plotter
- the FCV 140 echo sounder
- the course recorder and
- the gyro compass (no apparent error was observed).

1.3.4 The second mate was using the radar on the 3 and 6 mile ranges. Because the GP 188 plotter was switched off while a crew member relocated it, the GPS reference into the radar was not available to the second mate. The guard zone function was not in use at the time and the second mate was not using the radar to monitor the progress of *Meridian 1*. The radar was gyro stabilised.

1.3.5 The GP1250 GPS plotter was situated in the chartroom and showed the latitude, longitude, course, speed and track of the vessel. The position where the technician had been picked up was entered as a waypoint and displayed on the screen. Also shown on the screen was the bearing and distance from the current position of the vessel to the waypoint position. A waypoint arrival alarm was fitted but the second mate had chosen not to use it. No electronic chart was loaded onto the plotter.

1.3.6 Although the FCV140 echo sounder was being relocated also, it was still in operation at the time of grounding. It was fitted with a shallow water alarm, but the second mate had chosen not to use it.

1.3.7 The bridge equipment and steering gear had not been tested prior to *Meridian 1* arriving off Bluff. The anchors were not cleared and made ready for use.

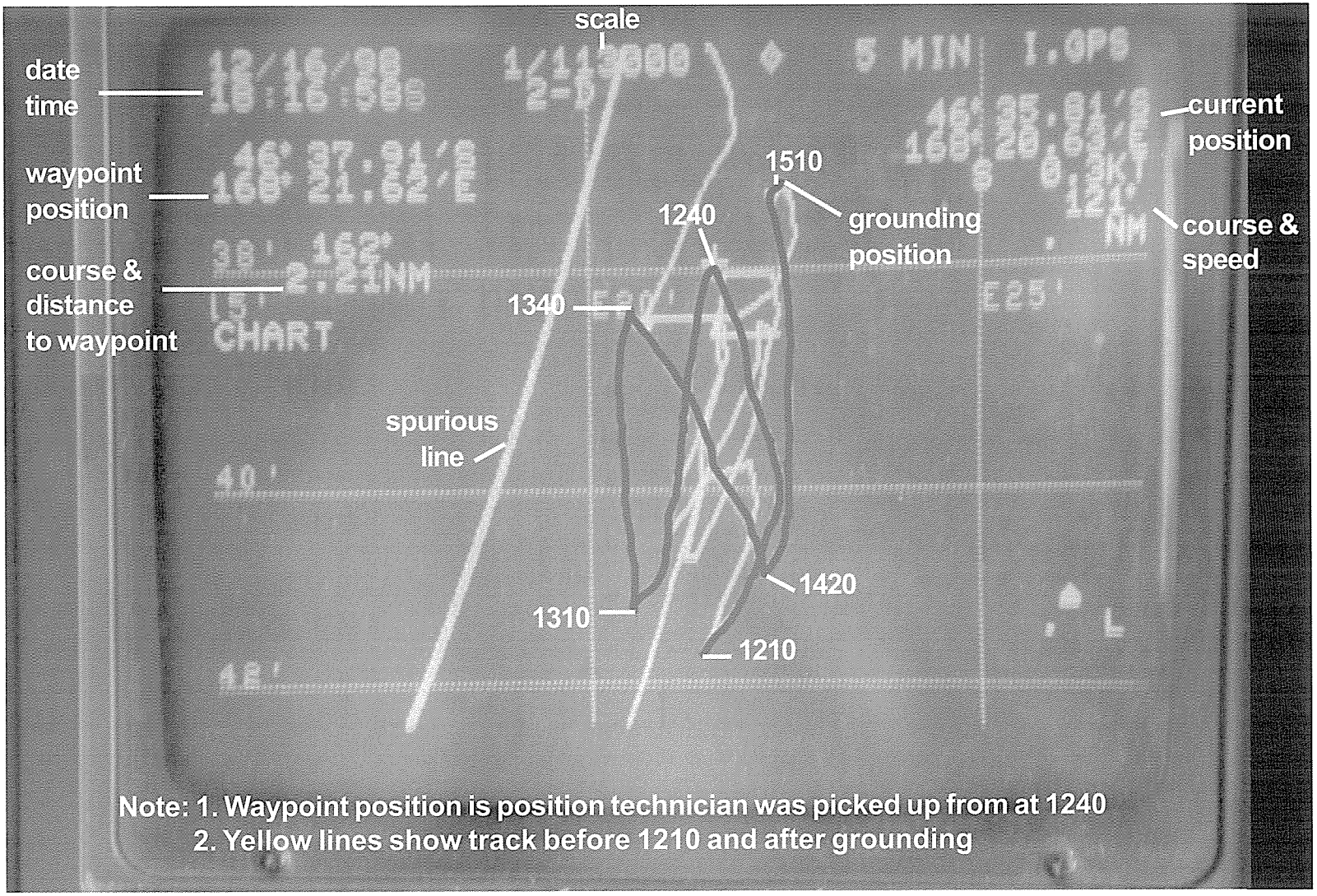


Figure 2
Photograph of GP 1250 GPS plotter screen showing track of *Meridian 1* between 1210 and grounding position

1.3.8 Although the course recorder was switched on, its reference had not been aligned with ships time. The trace that indicated from which quadrant the course should be read did not match the courses steered. Consequently, it could not be later used to re-create the passage of the vessel.

1.3.9 The chart in use (NZ 6821) had a large scale (1:12 000). The southern border was 1 mile south of the pilot boarding ground. To enable the use of this chart while steaming further to the south off Bluff, the second mate had added a piece of plain paper to the southern border, to extend the coverage of the chart by another 2 miles.

1.3.10 The track of the vessel, as shown on the screen of the GPS plotter in use during this period, broadly coincided with the courses and distances recorded in the deck log book and with those plotted on the chart. The positions derived from the ALC during tests conducted by the technician also broadly coincided with those positions, (see Figure 2).

1.3.11 The positions plotted on the chart were: the position from which the technician was picked up, the alter course positions, and the position of the grounding, all of which were obtained by GPS alone.

1.3.12 The following table shows the courses steered, distances steamed and average speed on each north or south leg, as documented in the deck log book from the time of picking up the technician to the time of the grounding. No allowance was made for leeway or set on any leg.

Time	Course steered (true)	Distance (nautical miles)	Speed (knots)
1240	197	3.3	6.6
1310	353	2.8	5.6
1340	160	2.75	4.1
1420	350	3.45	4.1

1.4 Weather and tide information

1.4.1 On 15 December 1998, high water at Bluff was predicted for 1227 at a height of 2.4 m above chart datum. Low water was predicted for 1836 at a height of 0.7 m above chart datum. Spring tides were predicted for 19 December 1998.

1.4.2 The New Zealand Pilot (NP51), a copy of which was carried on *Meridian 1*, gave information on the tidal streams that could be expected at the entrance to Bluff Harbour. On chart NZ 6821 tidal information was given in the form of tidal stream tables, and ebb and flood arrows with rate of flow and expected duration.

1.4.3 The tidal flow between 1240, when the technician boarded, and 1510, when the vessel grounded, was predicted to have been setting *Meridian 1* to the west, at an average rate of about 2 knots.

1.4.4 The wind was south westerly at 25 knots, gusting to 35 knots. The sea was about 2 m with the tide against it causing a short wave period. There was no significant swell. The visibility was very good.

1.4.5 The sea was breaking on the north side of Anchor Ridge, causing a distinct line of white water. The second mate on *Meridian 1* said that he did not notice this line due to the whitecaps caused by the wind.

1.5 Charter and statutory information

1.5.1 *Meridian 1* was a foreign owned and registered fishing vessel, but was also registered as a fishing vessel under section 57 of the Fisheries Act 1983. The statutory documents for the vessel and the crew qualifications were recognised by the Maritime Safety Authority (MSA) under section 41 of the Maritime Transport Act 1994.

1.5.2 *Meridian 1* was chartered by the Sealord Group Limited (the charterer) and engaged in catching fish for quota owned by them. *Meridian 1* had been operating in New Zealand waters for 5 years continuously. The charterer had two other similar vessels operating under the same arrangement.

1.5.3 *Meridian 1* usually spent 5 to 8 weeks at sea between port calls, unless an unscheduled visit was necessary, as was the case when the grounding occurred. During scheduled port calls the vessel was unloaded, stored and any necessary repairs completed.

1.5.4 Repair and maintenance was undertaken by the crew where possible, but local contractors were employed when necessary. *Meridian 1* dry-docked in Lyttelton when required.

1.5.5 The Ministry of Agriculture and Fisheries placed observers aboard periodically. The charterer's own representatives sailed on the vessel for about six months of each year.

1.5.6 *Meridian 1* was not required to have a New Zealand safe ship management system in place, however, it did not have an equivalent system in place either.

1.5.7 On 1 February 1998, it became a requirement under Maritime Rules Part 21 for all New Zealand registered fishing vessels to operate under a safe ship management system. Foreign registered fishing vessels such as *Meridian 1* were not required to enter the system until after they had been continuously operating in New Zealand for 2 years after that date. If *Meridian 1* was to remain in New Zealand it would have had to comply by 1 February 2000.

1.6 Crew information and routines

1.6.1 *Meridian 1* carried about 84 crew, all from the Ukraine. They worked a 6-month-on and 6-month-off roster.

1.6.2 The master on *Meridian 1* at the time of the grounding held a Russian Diploma of Deep Sea Master, issued in 1973. He had sailed as master since 1976 and had previously completed 5 six-month trips in New Zealand waters. This was his first trip on *Meridian 1*.

1.6.3 The second mate held a Ukraine Diploma of Short Voyage Deep Sea Navigator issued in 1994. He had previously completed 4 six-month trips. He had been promoted to second mate at the start of the accident trip, but had sailed on *Meridian 1* as third mate on previous trips.

1.6.4 The master and second mate had sailed together on *Meridian 1* since the previous crew change on 20 October 1998. After the crew change the vessel remained in port for maintenance until 29 November 1998.

1.6.5 The charterer had little input with regard to employment of the crew. This was managed by the owner of *Meridian 1*. The charterer employed a locally based Russian national who acted as vessel manager and liaised with the Ukraine owner.

1.6.6 Each time there was a crew change the charterer informed the MSA, who checked the qualifications of the oncoming crew and issued a Notification of Recognition of Non New Zealand Crew Qualifications. The MSA also conducted a port state inspection of the vessel every 6 months. The last inspection of *Meridian 1* was dated 17 November 1998, and there were no deficiencies noted on the inspection report.

1.6.7 The deck officer complement on *Meridian 1* comprised of the master and 4 mates who all shared the conventional 4 hours-on-8-off watchkeeping system. The third mate kept the 8 to 12 watch and was usually assisted by the master. The chief mate kept the 4 to 8 watch and was assisted by the fourth mate. The second mate kept the 12 to 4 watch on his own. The master was on call at all times if required.

1.6.8 The manning of the watches was increased when navigating near the boundary of the fishing zones and on other occasions deemed necessary by the master.

1.6.9 The master did not routinely write orders for the officers of the watch concerning the navigation of the vessel. He normally told them verbally of his requirements.

1.6.10 The charterer had translated its fleet standing orders into Russian and placed a copy of them on board *Meridian 1*. Section 2 stipulated the charterer's requirements for the navigation and safety of the vessel, which included sub-sections under the following headings:

- basic principles in keeping a navigational watch
- navigation
- electronic navigational aids
- taking over the watch
- calling the master
- wheelhouse orders
- charts and publications
- entering and departing port

1.6.11 The relevant extract under the heading navigation included:

> (i) The intended voyage shall be planned in advance taking into consideration all pertinent information and any course laid down shall be checked;
>
> (ii) on taking over the watch the ship's estimated or true position, intended track, course and speed shall be confirmed; any navigational hazard expected to be encountered during the watch shall be noted in the log;
>
> (iii) during the watch the course steered, position and speed shall be checked at sufficiently frequent intervals using any available navigational aids necessary to ensure that the ship follows the planned course;
>
> (iv) the safety and navigational equipment on board the vessel and the manner of its operation shall be clearly understood. The operational limits of this equipment shall be fully taken into account;
>
> (v) whoever is in charge of a navigational watch shall not be assigned or undertake any duties which would interfere with the safe navigation of the ship;
>
> . . .

1.6.12 Although it was not discussed before the grounding, the master later stated that he expected the officer of the watch to plot the position of the vessel every 30 minutes, at least, using all available means. He also expected them to apply leeway and set as necessary.

1.6.13 Although the second mate was not officially involved in any other activities while on watch he occasionally had to act as interpreter for the technician repairing the ALC system, and he was taking an interest in the job of relocating the navigational equipment.

1.6.14 The master and mates on *Meridian 1* all stated that they had sufficient periods of sleep and they were not fatigued.

1.7 Other information

1.7.1 Figures obtained from the MSA database indicate that between 1 April 1997 and 31 March 1999, 36 fishing vessels ran aground on the New Zealand coast.

At the time of grounding:

- 1 was fishing (retrieving crayfish pots)
- 5 dragged their anchor
- 30 were on passage.

2. Analysis

2.1 The second mate had been promoted to his rank at the commencement of the accident voyage on 20 October 1998. On previous voyages, while sailing as third mate, he had been under the supervision of the master. The grounding occurred on the first occasion that *Meridian 1* had approached port since the crew change, which was the first time since being promoted that the second mate had been in sole charge of a watch while navigating in confined waters.

2.2 While undertaking their prime function of catching fish, the master and mates utilised all of the navigational equipment to monitor the progress of the vessel and the surrounding environment. This equipment was vital to the overall efficiency of the operation, and as such the master and mates were well versed in its use.

2.3 During a 6 month trip, *Meridian 1* might only make 3 visits to port. Consequently, coastal navigation was rarely practised. The majority of the navigation would have been undertaken on small scale charts while the vessel was deep sea at the fishing grounds. Positions derived from the GPS were used, and were an acceptable method of navigation in that situation.

2.4 The unscheduled call to Bluff by *Meridian 1* to repair the ALC system was not afforded the same preparation and planning that was routinely applied to fishing operations.

2.5 The master and mates on *Meridian 1* had gathered minimal information to formulate a passage plan, and had not made full use of the information available to determine the conditions and dangers they could reasonably expect to encounter while steaming off the port.

2.6 Had the charterer's standing orders with regard to navigation and watchkeeping been followed, the grounding might have been avoided.

2.7 The New Zealand Pilot (NP51) and the local charts provided detailed tidal information for the area. The wind was gusting up to 35 knots and the *Meridian 1* was steaming at about 4 knots, but no allowance was made for set or leeway.

2.8 The positions of the vessel marked on the chart and documented in the deck log book were all derived using GPS alone. Latitude and longitude derived from GPS can be randomly in error by hundreds of metres. Such errors become critical when navigating in confined waters. Consequently, when navigating in coastal waters GPS should be used as an aid to navigation, not as the sole method of deriving the position of the vessel.

2.9 The Bluff Harbour and entrance chart (NZ 6821), in use at the time of the grounding, had a large scale of 1:12 000. One nautical mile was represented by 15.5 cm on the chart. This chart was designed as a harbour chart.

2.10 The next smaller scale chart for the area was NZ 681 (Approaches to Bluff), which has a scale of 1:100 000, and was represented by one mile measuring 1.8 cm on the chart. This chart, as its name suggests, was designed for navigating the approaches to Bluff. It would have been appropriate for the second mate to have been using this chart for navigating while the vessel was standing off Bluff.

2.11 Although it is considered good practice to use the largest scale chart available for the area, by extending the harbour chart to avoid using the Approaches to Bluff (NZ 681) chart, the second mate might have created for himself a false impression of the distance between the vessel and the navigational hazards. This could lead him to mis-judge the time it would take to reach the dangers.

2.12 The harbour chart only covered a small section of the area being navigated by the second mate. By extending this chart, using blank paper, the second mate deprived himself of valuable information, which probably reduced his situational awareness.

2.13 The lack of adequate passage planning, and the failure to test and prepare essential equipment before approaching confined waters, indicates that the master and watchkeepers placed little emphasis on the dangers that might be encountered while steaming off Bluff.

2.14 The master's verbal instructions to the officer of the watch with regard to the navigation of the vessel were vague. He effectively left the navigation of *Meridian 1* to the discretion of the watchkeeper. It would have been prudent for him to have left written instructions stating his requirements and identifying the dangers that might be encountered.

2.15 The master instructed the second mate to go no further north than the position the technician was picked up from. This position was almost one mile inside the pilotage limit and was too close to the harbour entrance and shallow water to allow an adequate safety margin.

2.16 Once the *Meridian 1* passed the latitude of the position where the technician had been picked up, it took about 8 minutes at 4.1 knots for the vessel to ground. This left little time for the second mate to turn the vessel, even if any of the shallow water or position alarms were activated, which they were not.

2.17 *Meridian 1* would have been away from the fishing grounds for at least 30 hours in order to effect the repairs to the ALC system; an unwelcome interruption to the planned fishing schedule. The master was aware that the repairs would take at least 2 hours to complete once the technician was on board. Although he might have felt that staying close to the pilot boarding ground would expedite his return to the fishing grounds, it would have been prudent under the circumstances to have either stood his vessel further off the coast, or arranged to have a more vigilant watch kept on its progress.

2.18 The mis-interpreted instruction from the duty pilot, requesting *Meridian 1* to stay outside the pilotage and harbour limits resulted from a poor understanding of the English language; however, the way the crew understood the instruction, should have appeared to them to have been an unusual request for a vessel the size of *Meridian 1*, as the limits are only one mile apart. This instruction was not verified by the master or third mate. If the master had understood the message he might of ordered the vessel to remain further to the south of the limits he had imposed.

2.19 The GPS plotter located in the chartroom was the only equipment used to plot the position of the vessel. The alarms on the radar, echo sounder and GPS were not activated. Any one of these alarms could have alerted the second mate earlier to the proximity of shallow water and the need to take evasive action.

2.20 The navigational equipment being relocated was used extensively when fishing, consequently it was being relocated while the vessel was away from the fishing grounds. Although this did not impair the second mates ability to adequately monitor the position of the vessel, it was the equipment he would have been most familiar with operating.

2.21 When asked, the second mate gave no explanation as to why the *Meridian 1* grounded in the middle of the afternoon on a clear day. The most likely cause was that he became distracted in some way by the activities of others in the vicinity of the bridge.

2.22 Low situational awareness, lack of adequate defences in place and the small margin for error allowed for in the passage planning, permitted such a distraction to cause the grounding.

2.23 The grounding of *Meridian 1* is the third involving large fishing vessels that the Commission has investigated in recent times. An element common to all three groundings is the ineffective use of the available resources and poor navigational practices when in transit to and from the fishing grounds.

2.24 The MSA statistics for all reported fishing vessel groundings over the previous 2 years, depicted in paragraph 1.7 of this report, show a similar trend. Many of the groundings have been attributed to fatigue, or poor watchkeeping practices, often when the vessel is heading back to port after a long and exhausting period at sea for the crew.

2.25 The period any vessel spends close to the coast is the most likely time for a grounding to occur. However, the high incidence of fishing vessel groundings during such periods indicates that a change in culture for the fishing industry will be necessary before the situation improves.

3. Findings

Findings are listed in order of development and not in order of priority.

3.1 The *Meridian 1* had valid Ukraine statutory certificates and was manned as required under section 41 of the Maritime Transport Act 1994.

3.2 Although registered in the Ukraine, *Meridian 1* was also registered in New Zealand as a fishing vessel under section 57 of the New Zealand Fisheries Act 1983.

3.3 The grounding occurred when the second mate became distracted by the activities of others in the vicinity of the bridge, and consequently failed to adequately monitor the progress of *Meridian 1*.

3.4 Although some navigational equipment was not available to the second mate, he still had adequate means to accurately monitor the progress of *Meridian 1*.

3.5 The second mate using GPS as the sole method to derive the position of the vessel when navigating close to navigational hazards was not appropriate, and reduced his situational awareness.

3.6 The use of the harbour chart to navigate the approaches to the harbour created for the second mate a false impression of distance and reduced his situational awareness.

3.7 By not using any of the warning alarms on the navigational equipment, the second mate deprived himself of an early warning to the proximity of shallow water.

3.8 The second mate did not have adequate coastal navigation experience to be left in sole charge of the watch under the circumstances.

3.9 The master's verbal instructions to the second mate with regard to the navigation of the vessel were vague, and left little margin for error.

3.10 The casual attitude that the master of *Meridian 1* applied to passage planning and preparation for approaching and navigating the vessel off Bluff is likely to have induced a similar attitude in the second mate, which may have led him to be easily distracted.

3.11 The lack of preparation and planning for the deviation to Bluff may have been a consequence of the master's frustration at having to cease fishing, his prime objective.

3.12 The master and crew's limited understanding of the English language is of concern, but did not contribute to the grounding. However, had the master clearly understood the duty pilot's instructions, he may not have allowed the second mate to navigate inside the harbour limits, so close to shallow water.

3.13 If the charterer's standing fleet instructions had been followed by the crew of *Meridian 1* the likelihood of such a grounding would have been substantially reduced. At the time of the grounding, there was no requirement that *Meridian 1* be entered into a safe ship management system. If the principals of safe ship management had been in place the fleet standing instructions would have been followed by the crew.

4. Safety Recommendations

4.1 On 12 July 1999 it was recommended to the director of the Sealord Group Limited that he:

4.1.1 negotiates an undertaking from the owners of all charter vessels in the Sealord fleet, that they will install a system based around the principles of safe ship management that ensures that the Sealord fleet standing instructions are used effectively by their vessel crews (042/99).

4.2 On 23 July 1999 the director of Sealord Group responded, in part, as follows:

4.2.1 Sealord Group Ltd confirms that the General Manager Sealord Fishing, a division of Sealord Group Ltd, will negotiate an undertaking from the owners of all charter vessels in the Sealord fleet, that they will install a system based around the principles of safe ship management that ensures that the Sealord fleet standing instructions are used effectively by their vessel's crew.

In terms of the recommendation, we note that our standard Fishing Charter Party already includes a provision and requirement for safe ship management systems.

We further note that crews and vessel owners are briefed thoroughly on the terms and conditions of the Charter Party and provisions of pertinent New Zealand Legislation including the fisheries Acts 1983 and 1996 and the Maritime transport Act 1994.

To that extent, Sealord considers that the substance of the safety recommendation is in fact already carried out by Sealord.

However given the unfortunate circumstances with the incident involving Meridian 1, Sealord Fishing will be taking all opportunities to reinforce the need for compliance with New Zealand legislation and requirements. To that extent I note that the General Manager Sealord Fishing together with the International Fishing Operations Manager will be visiting Russia and the Ukraine in late July/early August. They will be reinforcing the need for compliance with legislation and the principles of safe ship management with the charter vessel owners during their various meetings on that trip.

Approved for publication 11 August 1999

Hon. W P Jeffries
Chief Commissioner