



## Investigation report

C 12/2001 M

**ms IRAN SARBAZ, emergency situation off Uusikaupunki,  
November 1, 2001**

This investigation report was written to improve safety and prevent new accidents. The report does not address the possible responsibility or liability caused by the accident. The investigation report should not be used for purposes other than the improvement of safety.





## SUMMARY

Iranian flagged bulk cargo vessel IRAN SARBAZ was involved in an emergency situation outside Isokari on November 1, 2001. The vessel lay at anchor in ballast and when the wind increased the anchors began to drag. The speed of the north wind was 24 m/s at worst.

The pressure on the anchor chain was eased by using the main engine. The ballast had been lightened and in the high waves the propeller of the vessel became exposed at times, which caused the engine to race. This caused a blackout on the vessel. The vessel began to drift quickly towards the Sandbäck light. The situation became a distress and the Maritime Rescue Co-ordination Centre reacted as if a distress signal had been sent.

Half of the crew was rescued by helicopter. Patrol vessels and a rescue tug arrived at the scene. An accident was avoided when the crew of IRAN SARBAZ managed to restart the engine. She lifted her anchors and sailed to Uusikaupunki on own propulsion power.

The focus of the investigation was on the fact that the crew of the vessel never sent a distress alert. Consequently, there was no distress traffic. If the distress situation had turned into an accident, the nature of the radio traffic would have resulted that the vessels nearby should have been unaware of the accident. Therefore, the investigation focused on observing the international Radio Regulations in practice.





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*Figure 1. Ms IRAN SARBAZ at anchor in the storm on November 1, 2001 outside Iso-kari. (Photo by The Finnish Coast Guard)*

## INTRODUCTION

MRCC Turku informed the duty officer of the Accident Investigation Board Finland about the emergency situation of Iranian ms IRAN SARBAZ off Uusikaupunki on November 1, 2001 at 06:00 o'clock. Ship's rescue operation was followed via the MRCC and media throughout the day until next morning. The emergency situation was threatening and lead to partial evacuation of the ship's crew.

The Accident Investigation Board decided on November 6, 2001 to appoint a board to investigate the emergency situation of the IRAN SARBAZ. As the members of the investigation board were appointed Kari **Larjo**, master mariner, Pertti **Siivonen**, major (ret'd), and Seppo **Rajamäki**, M.Sc.

The final draft of the report was sent for comments to maritime and rescue authorities, to the Finnish Communications Regulatory Authority as well as to the ship owner and the master. Comments were received from the Archipelago Sea Coast Guard, the South-western Maritime District as well as from the Finnish Communications Regulatory Authority and some text changes have been made accordingly.



## 1 GENERAL DESCRIPTION AND INVESTIGATION OF THE ACCIDENT

### 1.1 Vessel

#### 1.1.1 Vessel data

The vessel data is based on the maritime accident report filed by the master.

ms IRAN SARBAZ	Bulk cargo vessel
	Vessel has a double bottom
Year of construction	1983
Shipping Company	Islamic Republic of Iran Shipping Company, P.O.Box 15875-4646, Teheran, Iran
IMO no.	8113011
Identification code	EQPG
Home port	Bandar Abbas
Classification agency	Lloyd's Register of Shipping
Gross register	20576
Net	13342
Maximum length	197,6 m
Maximum width	24,2 m
Draught	11,19 m
Engine power	9810 BHP

#### Registration documents:

ISM certificate	issued on June 7,1998
General IOPP	valid until September 28, 2004
Radio safety certificate	valid until June 10, 2002
Equipment safety certificate	valid until January 5, 2003
Structure safety certificate	valid until February 19, 2004
Last inspection by classification	April 1, 2001 BZK / Iran
Last inspection by authorities	October 17, 2001 Morocco, J. Lasfa
Last docking	March 26,1999, Singapore, bottom in good condition
Last cleaning of oil tanks	October 19-30, 2001
Inspection of fire prevention equipment	June 6, 2001
Life rafts	valid June 6 – June 10, - March 22, 2002





### 1.1.2 Crew

The manning requirement for IRAN SARBAZ according to her crew list was 14 persons: master, three mates, three engineers, six engine/deck hands and cook. At the time of the incident the ship was carrying the master, four mates, four engineers, eight deck hands, six engine hands, a kitchen staff of five persons, two apprentice engineers and one apprentice officer, making the total of personnel 31. In other words, the vessel had a crew of more than twice the required manning. The qualifications of the crew had been last verified on June 7, 1998.

### 1.1.3 Bridge equipment

The equipment data is based on the maritime accident report filed by the master.

Equipment	Type	Notes
Radar	SAIT/SRH 1000	ARPA radar, S Band
Radar	JRC/JMA-850	ARPA radar, X Band
Gyro compass	SPERRY / SR – 220	
Magnetic compass	GEOMAR / PLATH	
Autopilot	SPERRY / SRP – 680	
Course deviation alarm	(GPS) KODEN / KGP-912	
Depth sound	JRC / JFE – 5705	
Satellite positioning	KODEN / KGP –912	

### 1.1.4 Radio equipment

The data on the radio equipment of the IRAN SARBAZ is based on the official List of Ship Stations for the year 2000 published by ITU. According to the list, the vessel had the following radio equipment:

Radiotelegraph station, including probable telex, on the following frequency bands:

110-	160 kHz	(LF)
415-	535 kHz	(MF)
1605-	4000 kHz	(MF)
4000-	27500 kHz	(HF)

Radiotelephone station on the following frequency bands:

1605-	4000 kHz	(MF-radiotelephone)
4000-	27500 kHz	(HF- radiotelephone)
156-	174 MHz	(VHF- radiotelephone)

According to the same list, the vessel keeps radio watch 24 h day at random intervals and there are no designated times for radio watch (HX).

The real-time data base of ITU offers identical data. It also shows that the last update to the data base concerning the IRAN SARBAZ was made on April 8, 1988.

The real-time ship register data base of Lloyds lists 1745344 as the satellite telephone number of the IRAN SARBAZ. The number points to Inmarsat-A service.

There was no radio officer on the ship.

On the other hand, the new maritime radio system GMDSS (Global Maritime Distress and Safety System) was taken into use on February 1, 1999, after a long transition period (February 1, 1992 - February 1, 1999). Therefore, it is likely, that also the IRAN SARBAZ was equipped with a radio station according to this system. In the new maritime radio system, the radio equipment of a vessel is determined by the sea area the ship is intended for. There are four sea areas, A1, A2, A3 and A4. Apparently, the radio equipment of the IRAN SARBAZ complied with either area A3 or A4, which would mean that the vessel was carrying at least the following radio equipment:

- VHF-radiotelephone including DSC function,
- VHF-DSC watchkeeping receiver
- MF-radiotelephone including DSC function,
- MF-DSC watchkeeping receiver,
- Inmarsat-A, B or C ship earth station or HF-radiotelephone and telex, including DSC function and separate HF-DSC watchkeeping receiver,
- NAVTEX-receiver 518 kHz, and when sailing outside of NAVTEX range INMARSAT EGC or HF/NBDP,
- EPIRB
- SART (2 units)
- 9 GHz (X Band) radar

In GMDSS, the ship shall keep constant radio watch using DSC (automatically) on VHF channel 70, at MF frequency 2187,5 kHz, and if the ship is equipped with a HF radiotelephone with DSC function, also at frequency 8414,5 kHz and, in addition, at least at one of the following frequencies: 4207,5 kHz, 6312 kHz, 12577 kHz and 16804,5 kHz. The possible Inmarsat ship station shall also be monitored continuously.

The radio traffic of the ship shall be managed by the master and the mates, who shall have a GOC certificate (General Operator's Certificate).

In the situation in question, the IRAN SARBAZ handled all of her radio traffic either by the VHF radiotelephone or by the satellite telephone.

## 1.2 Emergency Phases

An emergency refers to the definition of a danger situation in the Hamburg Convention (1979). According to this definition, the phases of an emergency are the uncertainty phase, the alert phase and the distress phase. The description of the situation is based on the maritime accident report, on the journals of the ship and on the registration and recording of the VTS centre.



### 1.2.1 Weather conditions

The information on the speed and direction of the wind at the Isokari observation point has been obtained from the Finnish Meteorological Institute.

*Table 1. Finnish Meteorological Institute and the MRCC, wind data, November 1, 2001. Wind direction and speed are 10-minute averages.*

*The maximum wind speed is the 10-minute average within the recorded hour.*

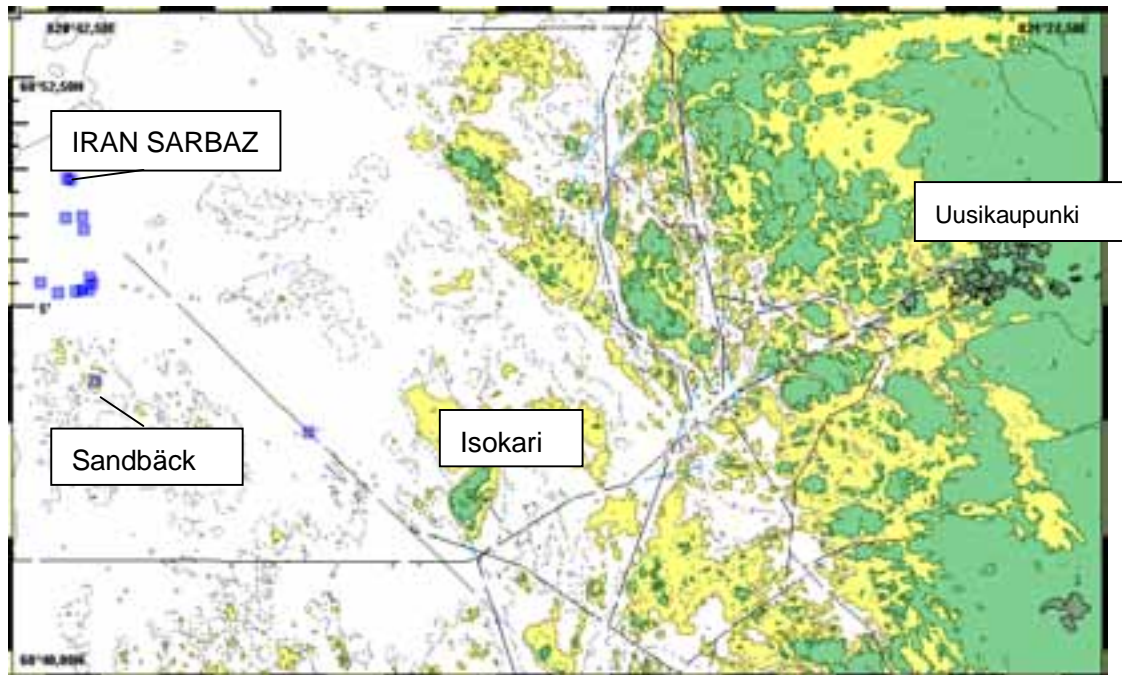
*The maximum gust speed is a momentary gust of 3-5 seconds within the recorded hour.*

Time	Wind direction	Wind speed m/s	Max speed m/s	Max gust m/s	MRCC Time	m/s
01.00	north		4	5	01.46	17
02.00	north	15	15	19		
03.00	north		17	21		
04.00	north		19	23		
05.00	north	20	20	26		
06.00	north		21	27		
07.00	north		25	31	07.19	21
08.00	north	23	25	31		
09.00	north		24	31		
10.00	north		24	30	10.00	27
11.00	north	22	23	29		
12.00	north		22	28	12.30	25-30
13.00	north		23	28		
14.00	north	21	22	28		
15.00	north		22	29		
16.00	north		23	30		
17.00	north	24	25	31		
18.00	north		24	29		
19.00	north		23	28		
20.00	north	20	22	29		
21.00	north		21	27		
22.00	north		21	26		
23.00	north	17	19	23		

The MRCC log has a note on the wave height:

November 1, 2001 at 10.00 and 12.30 wave height 6 - 8 metres.

### 1.2.2 Development of the situation into an alert situation



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Figure 2. The IRAN SARBAZ anchored north of the Sandbäck light on October 31 at 18.30.

Ms IRAN SARBAZ arrived at Isokari and anchored on October 31 2001 to wait for entrance into Uusikaupunki. According to the ship's log, the port anchor was dropped at 18.30 with five shackles on the windlass. 4,5 shackles were in the water at that time.

The loading was prepared by emptying ballast before the anchoring or during it. According to the ship's log, there were 16679,5 tonnes of ballast at noon time. After the dumping of ballast, only 8159 tonnes remained on the following day, November 1.

At midnight, the position of the ship was determined at 60° 50.3' N and 20° 43.34' E. The direction of the wind was still shifting at midnight according to the ship's log, and the wind speed was only 3 beaufort.

At half past one the wind speed had increased to 5 beaufort and the wind direction had stabilised to the north. At this time, it was discovered that the anchor was dragging. In other words, the vessel was drifting. The wind picked up speed quickly after one a.m. in the night. Anchor lifting began with slow ahead.

Repeated attempts between 01.25 – 01.42 to lift the anchor failed. At 01.52 the chain was lowered further until eight shackles were in the water. The entire chain was probably out at that stage. Engine was slow ahead for preventing the drift.



*Figure 3. Ms IRAN SARBAZ at anchor. The propeller is half visible. (Photo by The Finnish Coast Guard)*

The duty officer of the Archipelago VTS telephoned MRCC Turku at 01.46 on November 1, 2001 and reported that an Iranian cargo vessel, IRAN SARBAZ lay at anchor off the Isokari light. Despite the anchor and the use of engine power, the vessel was slowly drifting towards the shallow. This was the reason why the duty officer of the VTS had considered it necessary to express his concern about the situation to the Maritime Rescue Co-ordination Centre. At this stage, the crew of IRAN SARBAZ had not yet shown any concern about the development of the situation. Based on the incoming report and their own assessment of the situation the Maritime Rescue Co-ordination Centre immediately classified the situation as an ALERT PHASE, initiated the necessary activities and also informed the ship of these.

The MRCC alerted the Susiluoto coast guard station, open sea patrol vessel TURSAS, patrol vessel TELKKÄ and the coast guard rescue helicopter to stand by. After this, the Maritime Rescue Co-ordination Centre informed the ship of the actions and regularly inquired about the situation on board.

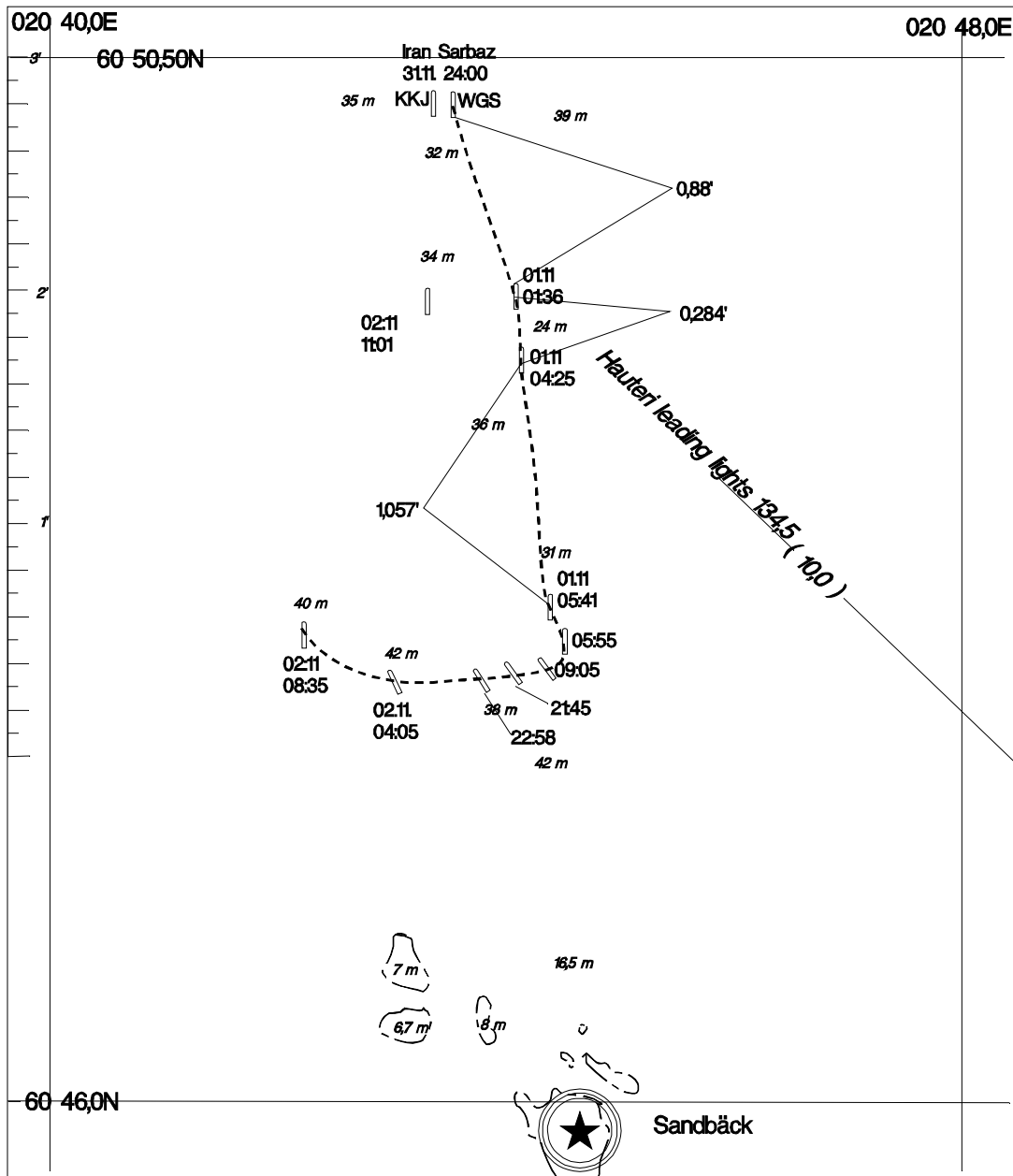


Figure 4. IRAN SARBAZ dropped anchor at 18.30 on October 31, 2001. The anchoring location was logged at 24.00. The chart is drawn in the Finnish National Grid Co-ordinate System (KKJ) and the symbols KKJ and WGS refer to the position of the vessel depending on which system is used for marking the position given by the GPS device.

According to the ship's log, the force of the wind approached a hurricane at 02.00. The engine was at slow, half and full ahead. The engine commands were carefully logged both on the bridge and in the engine room. Despite these actions, the vessel continued to drift towards the Sandbäck light (Figure 3). After four o'clock the "stopper" and the brake of the port anchor failed but the chain held. At this time, the starboard anchor was also dropped.



The brake and the teeth of the cogwheel of the starboard anchor were worn and the anchor gave in. The master then decided let all of the chain to run out of the port anchor to prevent the ship from drifting since the wind was still increasing. The lock and the brake of the port anchor sustained damage in the anchoring. Due to the heavy seas, the rounds per minute of the main engine fluctuated between 80 and 120 as the propeller rose to the surface water at times. Therefore, the engine power could not be increased in fear of damage to the main engine.

The pilot of the rescue helicopter reported:

” At lift off it was nearly calm at Turku airfield and it sounded somehow odd that anchors would be dragging off Uusikaupunki. Nevertheless, we proceeded to the target and noted that the wind force was increasing all the time. We inspected the target and found that it was a large cargo vessel. The lights were on in the ship and she seemed steady from the outside. The anchor chains were slack and pointing towards the stern.”

According to the radio traffic, the helicopter was at the ship between 03.31 – 03.33.

### 1.2.3 Emergency phase

#### Radio traffic

Turku Maritime Rescue and Co-ordination Centre was informed of the emergency situation of IRAN SARBAZ by Archipelago VTS by telephone on November 1, 2001 at 01.46 Finnish time. According to the activity log of Turku Maritime Rescue and Co-ordination Centre, the phase of the emergency was alert phase from 01.46 to 04.45 on November 1, 2001, whereafter the situation was classified as a distress situation.

Turku VTS reported that the ship was keeping watch on the VHF channels 71 and 13. Since MRCC Turku cannot use either of these channels Turku VTS promised to request the ship to channel 16.

MRCC Turku called the ship repeatedly on VHF channel 16 and established contact with her at 02.00. The traffic was handled as routine traffic on channel 16. At a later stage, the contact was briefly maintained by satellite telephone and on VHF channel 14. The rescue helicopter handled all traffic with IRAN SARBAZ and Turku Maritime Rescue and Co-ordination Centre on VHF channel 16 as routine traffic.

At 04.45 the IRAN SARBAZ reported on VHF channel 16 that they had a "black out". From here on, MRCC Turku interpreted the phase of the emergency as a distress situation (according to the activity log). However, this was not apparent in the radio traffic as all traffic was handled as routine traffic on VHF channel 16. At the same time the VTS radars went blank and the Susiluoto coast guard station suffered a power failure.

At one stage, a foreign ship was interfering the traffic on channel 16 by calling another ship. Also traffic on Stockholm Radio caused interference.

The following presents excerpts of the radio traffic of IRAN SARBAZ as recorded by Turku Maritime Rescue and Co-ordination Centre on November 1, 2001.

Turku Maritime Rescue and Co-ordination Centre first established contact with the IRAN SARBAZ at 02.00. The following dialogue shows that the master was aware of the danger to his ship:

Time	Method	Who	Issue
02.01	VHF-16	MRCC	The ship is not under command and you are drifting southwards to the Sandbäck lighthouse. Is that correct?
		IS <sup>1</sup>	Yes, that is correct.

After this, Turku Maritime Rescue and Co-ordination Centre requested the number of crew on board and information of the cargo. The radio traffic shows that there were 31 persons on board and that the ship had only ballast. The Maritime Rescue and Coordination Centre then told the IRAN SARBAZ that they had alerted the helicopter in case the situation becomes worse. The MRCC requested the ship to keep watch on channel 16. The end of the ship's reply is scrambled.

At 02.38 Turku Maritime Rescue and Co-ordination Centre placed an INMARSAT call to the vessel and inquired her situation:

02.38	INMARSAT call	IS	It is still, we are in the same position various time drift. I am full ahead, heading to the wind with the anchor in depth in the water, just trying to hold it, trying to hold it.
		MRCC	Yes, using engines, are you using..?
		IS	Yes, engine full ahead, engine full ahead.
		MRCC	Full ahead, yes, and for the information, that we are expecting strong gale, up to twenty-five meters to that area ...

The MRCC also reported that the wind was expected to develop into a gale. IRAN SARBAZ inquired about a tug from the MRCC:

02.40	INMARSAT call	IS	You cannot send me any tug, yeah, to help me?
		MRCC	Coast guard, coast guard tug will be there at eight o'clock, but if you need - Finnish time eight o'clock in after four hours - but if you, if you really need a tug boat, then you you have to contact to the salvage company. I know that they have in five hours readiness tug boats.
		IS	Aha, but how was the coast guard, coast guard then can help me?
02.41		MRCC	Yes, but it is, it is quite a small boat, it is not so strong.

The vessel reported to the MRCC that she could not lift her anchors. The conversation proceeded to determine the amount of oil on the vessel. In addition, the MRCC reported that a coast guard boat was on the way and that the helicopter was on standby:

02.42	INMARSAT call	MRCC	... And I have told you that the coast guard vessel will be there in four hours, but it is not a tug boat, it is a coast guard patrol boat. So if you need a tug boats, you have to take a, take a private company.
02.43	INMARSAT call	MRCC	And, and, for the information that we have helicopter in readiness in, in ten minutes for your position. If you, if you get in some troubles we have helicopter there very soon.

<sup>1</sup> IRAN SARBAZ.





At 03.31 the helicopter had arrived next to the vessel and described the situation:

03.31	VHF-16	Copter <sup>2</sup>	Yes, we are just hovering next to the ship. Pretty steady, she is pretty steady here. Conditions in this area the wind is according to our calculations from the north forty to fifty knots.
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MRCC reported the situation informed by the ship to the helicopter:

03.33	VHF-16	MRCC	Yes, Fox Delta, the ship said that they can hold the bow to the wind and at the moment are not drifting. But more wind is coming there.
		Copter	Yes, she looks to be quite steady in position, Viktor Fox.

The helicopter reported that it would stay at the ship for a while and then proceed to Susiluoto for landing and standby.

At 04.23 the MRCC requested the ship to VHF channel 14 and informed the vessel of the situation. The speech of the MRCC on this channel is not recorded on the same record as the speech of the vessel.

At 04.37 the MRCC inquired about the situation on VHF channel 14. IRAN SARBAZ replied that she had had problems with the main engine which was now running again.

At 04.45 the IRAN SARBAZ called the MRCC on VHF channel 16 and reported that the ship had a "Black Out":

04.45	VHF-16	IS	Now my power gone, the black out. I don't have any power on board, I don't have any power on board now.
		MRCC	No power on board, you have black out. Are you drifting or are you anchors?
		IS	I don't know if drifting. I have no radar, I don't have engine, I don't have anything.
		MRCC	Okay, we, we have radar, so we can, can watch out if you are drifting. And I send a helicopter to airborne immediately.
		04.46	IS

At 04.49 the MRCC informed the ship of the drift speed and reported that it would take about half an hour for the vessel to ground. The MRCC informed the ship that they would dispatch a helicopter. The following excerpt reveals that the master of IRAN SARBAZ had realised the gravity of the situation:

04.49	VHF-16	IS	Yes, three zero minutes, half an, half an hour, we are going to aground. Okay, we are totally without power, no radar not nothing and God help us.
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MRCC informed the ship of the situation and proposed evacuation of the crew:

04.54	VHF-16	MRCC	According radar you are drifting direction is one seven zero and speed is three to four knots. So it is really only three zero minutes before ( <i>unknown vessel starts to call another ship causing strong interference</i> ) you are aground in the Sandbäck lighthouse. So I suggest you to prepare to evacuate the most of the crew.
		IS	Roger, roger, you ask me to evacuate my crew. ( <i>continuing interference</i> )

<sup>2</sup> Helicopter.

IRAN SARBAZ requested her position from the MRCC and got the following reply:

05.08	VHF-16	MRCC	Situation is still same, you are drifting three point five knots to direction one seven zero, and it takes less than half an hour when it goes to hit aground.
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At 05.14 the rescue helicopter contacted the vessel. The parties agreed on the evacuation:

05.14	VHF-16	Copter	Helicopter on channel sixteen. We are approaching you and we have four miles to go, it takes some minutes. And prepare fifteen persons on deck for winching into helicopter.
		IS	Fifteen persons, roger, thank. What about the rest?

At 05.28 IRAN SARBAZ requested her position from the MRCC on VHF channel 16. The MRCC gave the position.

At 05.30 IRAN SARBAZ contacted the MRCC on VHF channel 16. It is obvious from the master's speech that he had become ill and he requested contacting a doctor. The rest of the speech is unclear. The rescue helicopter also contacted the vessel but they could not understand the master's speech either.

At 05.32 it appeared that the master recovered. The helicopter and the ship agreed about the winching arrangements. When fourteen evacuees were in the helicopter and the helicopter was leaving, the master requested them to pick up yet one elderly person. He was winched up and the fifteen evacuated crew members were transported to Turku.

#### 1.2.4 Distress situation

The vessel reported to the MRCC at 04.45 that they had a "Black out". The Maritime Rescue Operation Commander then defined the situation as a DISTRESS SITUATION. Upon receipt of this information he immediately commanded the rescue helicopter airborne from Susiluoto where it had been on standby. At the same time, the MRCC and Archipelago VTS continued to monitor the drift of the vessel. The MRCC informed the vessel that she would end up on the Sandbäck shallow in about half an hour. Despite the fact that imminent danger was obvious from the master's message, it was not judged necessary to initiate distress traffic. The drift assessment ten minutes later revealed that the drifting speed was three to four knots in heading 170 degrees. The MRCC recommended preparation for evacuation.

### 1.3 The rescue operation

#### 1.3.1 Rescue of human lives

The Super Puma maritime rescue helicopter OH-HVF that had been in Susiluoto on standby received an evacuation task at 04.58 and was airborne in five minutes. The MRCC tried to agree with the master about the most favourable spot for winching but



the master said that the evacuation could be carried out from whichever location the rescuers thought best.

When the helicopter was four miles off the ship, the ship agreed by radio to winch 15 persons and the helicopter reported that the rest of the crew would be picked up later. In the interview, the helicopter crew stated that they were under the impression that cooperation with a helicopter had not been rehearsed previously. Nevertheless, the evacuees acted in a disciplined manner after being briefed and had prepared for the evacuation as well as possible.

When the surface rescuer reached the deck of the vessel he realised that it was so slippery and the jet stream of the helicopter so strong that the crew of the vessel would not be able to emerge from the sheltered corridor to the winching spot. The surface rescuer then went to the persons to be evacuated and made them form a human chain by linking arms. In this way, the crew members were able to proceed to the winching spot. There they waited for their turn by holding on to a pipe on the deck of the vessel. From this position, the surface rescuer then prepared each person for the winching by showing them what to do and by explaining in English. The winching was begun at 05.15 and finished at 05.55.

Nine persons were lifted in the first group and five and the surface rescuer in the other group. The winching proceeded as planned but for the loss of one protective helmet during the winching. After reaching the helicopter the evacuees started a praying ceremony immediately, but the helicopter crew gesticulated them to minimise the interference caused by this. Finally, it remained only a curiosity.

When the helicopter was leaving the master requested a pickup of one elderly person. The helicopter returned to winch up the fifteenth crew member and started towards Turku.

When the helicopter arrived at the winching spot, the MRCC informed IRAN SARBAZ that her drifting speed had been reduced by half. At the end of the winching the surface rescuer experienced a sensation based on which he assumed that the vessel had stopped and that the anchors had found a strong hold. He reported feeling as if all motion of the vessel had ceased for a while.

Shortly before the start of the winching there was a situation in the radio traffic where the master requested medical assistance. It could be concluded from the radio traffic that the master had suffered a heart attack that had passed relatively quickly. He immediately continued to look after his vessel and his crew.

Turku had been prepared to receive the evacuated crew members. An ambulance and a medical helicopter had been requested to the airfield. The Coast Guard requested official assistance from Turku police for the identification of the evacuees and for the entry formalities, although the normal procedure would have been to leave this at the responsibility of the Coast Guard. The police patrol acquired an interpreter and proceeded to the airfield to meet the incoming persons. All evacuees were Iranian nationals. The Fin-

nish Red Cross refugee reception organisation was also called to the scene as a part of the arrangements. They took care of the initial lodging and feeding of the evacuees together with the Coast Guard. The medical checks of the evacuees did not reveal any injuries that would have required a hospital visit.

After the helicopter evacuation, ms SEA FRANCE RODAN that was on a sea trial from the Rauma wharf, arrived at the scene and tried to provide IRAN SARBAZ protection against the waves to the best of her ability. The trial vessel observed that the situation was already relatively stable. The Maritime Rescue Co-ordination Centre nevertheless commanded the vessel to maintain position until the open sea patrol vessel would arrive.

To ensure the rescue of human lives, another Super Puma maritime rescue helicopter, OH-HVI, arrived at Isokari, but due to the risk of icing it moved to Turku for standby. Another evacuation round was not necessary.

### **1.3.2 Rescue of the vessel**

The crew of IRAN SARBAZ located the faults that had caused the "Black Out" and the auxiliary machines that generated power for the lights were already operative at the time the helicopter came at the scene for the winching. Thus, evacuation from a dark ship could be avoided. At 06.30 local time, the vessel reported that her main engines were running again.

The tug PORIN KARHU, owned by salvage company Alfons Håkans, set off from Naantali with the aim of participating in the rescue of IRAN SARBAZ already before the situation reached the distress phase. PORIN KARHU reported that she would arrive at the scene at 09.20. Later she reported she would arrive at 11.00. Tug KRAFT was reported to arrive at 10.00. PORIN KARHU once more amended her time of arrival to 12.00.

When tug KRAFT arrived in the area, she reported to PORIN KARHU that the weather was too harsh for any operation and that she would proceed to the lee of Isokari to wait for the weather to improve. PORIN KARHU reported the situation to the ship in distress and to the MRCC. Tugs KRAFT and PORIN KARHU and patrol vessel TELKKÄ were on the leeward side of Isokari sailing around in small circles since they could not make their anchors hold in the prevailing conditions. It can be stated that in this area, the anchors of four vessels did not hold.

Open sea patrol vessel TURSAS received a command to prepare for towing. The high seas broke the bridge window. This was repaired with 12 mm sheet plywood. According to the wind gauge of TURSAS, the wind speed was 30 m/s. The crew was under the impression that the waves were growing. The glass was broken at 12.00 on November 1.

According to the journal of the MRCC Turku, the situation at 12.00 was as follows:

"After 09.02 IRAN SARBAZ has remained at the same location. TURSAS is next to her monitoring the situation. The helicopter will arrive in half an hour if summoned.



The representative of the salvage company stated that they cannot do anything in this weather and they will remain in the lee of Isokari and wait for the weather to improve. The operative plan at this stage: Will keep the ship under surveillance until the weather improves and the salvage company can tow her to safety. If the ship starts to drift again we will propose evacuation of the rest of the crew to the master.”

The MRCC contacted salvage company Håkans to inquire about the readiness of a tug to be dispatched to help IRAN SARBAZ if necessary. The salvage company dispatched the tug PORIN KARHU immediately from Naantali and simultaneously initiated contact with the shipping company and the operator of the vessel in distress. As a result, a rescue agreement was concluded with the company and the operator based in Hamburg. The salvage company then dispatched also tug KRAFT from Pori.

After IRAN SARBAZ had a 'Black Out' the salvage company could no longer establish contact by the satellite telephone. The contact was maintained by the maritime VHF radio from this point on.

In the morning the wind had calmed down to less than 20 metres per second and the vessels moved to IRAN SARBAZ to assist. At this time it was noticed that one anchor had already been lifted but the other could not be raised. The master of IRAN SARBAZ asked the salvage company for welding gear and a welder to repair the damaged anchor system. Since the only way to transport a welder and gear to the ship under the prevailing conditions would have been by helicopter the master withdrew his request. Whereas the problem was skidding of the cogwheels of the anchor system, the anchor could be raised by manually feeding extra material between the cogwheels during the lifting. Thus, the crew managed to lift the other anchor as well although the intention had already been to drop it with the chain and pick it up later.

The first intention was to tow IRAN SARBAZ to Rauma where preparations had already been made to receive the ship. However, the salvage company negotiated enough space for the vessel to tie to the pier of Hanko island, north of Uusikaupunki, at which point the shipping company approved the motion of the salvage company to move the ship to Uusikaupunki for loading and repairs.

When the pilot boarded IRAN SARBAZ at Isokari, her master announced that she would not require towing. The salvage company ensured that an outside party had heard the announcement of the vessel and aborted the rescue operation after this announcement. Therefore, the assistance to IRAN SARBAZ at Uusikaupunki was normal port assistance. After this, the tugs, PORIN KARHU and KRAFT, set off for Mäntyluoto.

When IRAN SARBAZ was still at anchor, her master requested a compass heading for his ship from the tug of the salvage company. PORIN KARHU steered behind the stern of IRAN SARBAZ parallel to her keel line and gave the heading.





## 2 ANALYSIS

### 2.1 Anchoring and engine commands

According to the maritime accident report, IRAN SARBAZ dropped anchor 4,65 miles north of the Sandbäck light. 4,5 shackles of the chain were lowered into the water as the water depth was more than 30 metres. The length of the chain was enough in the prevailing conditions where the force of wind was yet weak. However, the wind force increased rapidly after midnight making the chain now too short. At midnight, the coordinates of the GPS device were logged. According to them, the distance to the Sandbäck light was 4,41 miles. In other words, the vessel had travelled about 0,24 miles south in six hours.

The Admiralty Manual of Seamanship<sup>3</sup> recommends that the number of shackles in the chain should be twice the square root of the water depth in English fathoms. For a water depth of 30 metres or 16,4 fathoms, the length of the chain should have been eight shackles according to the manual. The maritime accident report gives the impression that the crew tried to lift the anchor when they realised the anchor was not holding. The lifting failed and apparently the rest of the chain also ran out making it eight shackles. Nevertheless, the anchor was dragging although there was enough chain in the water.

Deck notes and engine notes were kept on the vessel in addition to the ship's log and engine log. The deck notes started on November 1 at 01.25 by the following engine commands:

Time	Command	Source
01.25 - 01.35		Ship's Logbook: Wind northerly 5 bf. Heaving up port anchor due to anchor dragging.
01.52	Slow Ahead	<b>Engine manoeuvres log and Deck notebook:</b> 8 shackles in the water. Not heaving up. <b>Ship's Logbook:</b> port anchor 8 shackles in the water and anchor not heaving up. Vessel manoeuvred different speed as per movement because vessel keeping anchor position by engine and port anchor. RPM (80 ~ 120) Hurricane storm / very high sea, VHF watch keep continuously on channels 16 and 13 (Rescue Center).

The engine commands show that the master was trying to control the drift by running the engine against the wind. The drifting stopped at about half past one (Figure 4). The use of the main engine was crucial for controlling the drift.

The drift of the vessel was on average 0,55 knots between 00.00 – 01.36. In the image registered by the VTS, IRAN SARBAZ drifted at 01.36 for a moment in heading 151° at a speed of 2,6 knots.

<sup>3</sup> Admiralty Manual of Seamanship III, Chapter 13, page 288.

Lifting of the anchor was attempted between 01.35 – 01.42. According to the deck notes the tension on the chain was too great and the anchor could not be lifted. The engine commands show moderation. They varied between STOP and SLOW AHEAD.

The drift between 01.36 – 04.25 was only 0,1 knots.

The engine commands show moderation. According to the engine notes, full power was used only for one minute between 01.53 – 03.04.

Time	Engine command	Time	Engine command	Time	Engine command
01.53	Slow Ahead	02.36	Dead Slow Ahead	02.59	Dead Slow Ahead
01.58	Half Ahead	02.37	Slow Ahead	03.00	Slow Ahead
02.05	Slow Ahead	02.40	Dead Slow Ahead	03.03	Dead Slow Ahead
02.06	<i>Full Ahead</i>	02.52	Slow Ahead	03.04	Slow Ahead
02.07	Half Ahead	02.56	Dead Slow Ahead		
02.11	Slow Ahead	02.57	Slow Ahead		

No engine commands had been logged in the engine notebook between 03.04 – 04.20 but the deck notes contain the following:

Time	Engine command	Time	Engine command	Time	Engine command
03.02	Slow Ahead	04.16	Half Ahead	04.18	<i>Full Ahead</i>
04.08	Half Ahead	04.16½	<i>Full Ahead</i>		
04.15	<i>Full Ahead</i>	04.17	Half Ahead		

The command "full ahead" was given by the bridge at 04.15 and full power was mostly used after this time.

The drifting of the vessel was stopped by efficient engine commands. According to the engine notes, the following commands were given between 04.20 – 04.42 when the engine was mostly at full ahead:

Time	Engine command	Time	Engine command	Time	Engine command
04.20	<i>Full Ahead</i>	04.40	<i>Full Ahead</i>	04.42	<i>Full Ahead</i>
04.38	Half Ahead	04.41	Half Ahead		

The following table with data from the ship's log and the engine log on the watch conditions between 04 - 08 focus on the external conditions in the ship's log and on the fluctuating rpm of the main engine in the engine log. Due to the high seas, the propeller was exposed at times which caused the engine to race and violent jumps to the rpm. The dumping of ballast had weakened the efficiency of the propeller.





Figure 5. IRAN SARBAZ at anchor in the waves. The propeller was fully exposed at times. The rudder was turned to port. (Photo by the Finnish Coast Guard)

Time	Engine command	Data of ship's log and engine log on the watch between 0400 - 0800
04 - 08 Watch		<p><b>Ship's Logbook:</b> Heavy tension on both anchors. Port anchor brake and stopper failed. Starboard anchor let go to prevent the ship from drifting.</p> <p>Violent storm / .... wind, high seas, sea spray all over the ship.</p> <p>Reduced visibility, due to heavy rain / .... anchor position.</p> <p>Controlled by ship's eng. RPM (81 ~ 120)</p>
04 - 08 Deck Watch	Full Ahead	<p><b>Engine Logbook:</b></p> <p>MANOEURED DUE TO ROUGH WEATHER.</p> <p>ALL Press and Temp maintained.</p> <p>ME ON FULL AHEAD BUT RPM FLUCTUATING FROM 80 TO 120 RPM.</p> <p>UNABLE TO INCREASE MORE RPM DUE TO HEAVY FLUCTUATION.</p> <p>ALL Press and Temp maintained.</p>

According to the Finnish Meteorological Institute it is possible that the 'Low Level Jet' streams coming down from the upper atmospheric layers increased the gusts in the extremely strong wind. The brake and the stopper of the port anchor windlass broke. The starboard anchor was dropped and the engine was at full ahead for driving against the wind and the waves. The engine raced because the propeller was momentarily exposed in the high seas.

IRAN SARBAZ suffered a complete power failure at 04.45. The anchor started to give in again since the engine was no longer available for counteracting the drift. There is a clear description of the situation in the ship's log and the engine log:

Time	Engine command	Source
04.45		<b>Deck notebook:</b> Black Out. Engine failed. Drifting toward the lighthouse. Vessel controlled by shore radar. Vessel completely lost power. <b>Ship's Logbook:</b> Engine running to control ship's position. Black Out, Engine failed - drifting toward lighthouse. (Stand By Anchor).
04.45	Slow Ahead	<b>Engine manoeuvres log:</b> Black Out.
04.45		<b>Engine Logbook:</b> Power supply failed and M.E. stopped. Emergency generator failed to come on load and experienced complete Black Out. Investigated and found leaks to battery feeding to the M.E. automation and the generator failed to provide D.C. Supply checked and found loose. Connection of PCB and cable due to heavy vibration of the vessel. Tightened the connection, regained the battery supply and emergency generator started @ 0500 press and M.E. started @ 0515 press.
05.00		<b>Deck notebook:</b> Emergency generator running. <b>Ship's Logbook:</b> Emergency generator running.
05.15		<b>Engine manoeuvres log:</b> Engine failed. <b>Deck notebook:</b> Engine tried (D.S. Ahead). <b>Ship's Logbook:</b> Engine tried ahead.
05.22	Half Ahead	<b>Engine manoeuvres log and deck notebook.</b>

The engine command "full ahead" was executed at 05.52 and the drift was stopped. The deck notes do not mention turning the rudder to port but the ship's log has a note on the use of manual steering. IRAN SARBAZ started to move decisively to the west, away from the shallows (Figure 4).

The vibration had damaged the power feed but the chief engineer managed to repair the faults quickly. After a little more than half an hour the main engine was running again at half ahead. The vessel had drifted 1,05 miles towards the Sandbäck light meaning that the drift of IRAN SARBAZ had been 1,7 knots during the power failure.

The "Black Out" on the ship was probably caused by hull vibration resulting from a wave shock to the hull. This caused the 24 volt control voltage to be cut off. The chief engineer and the electrician located the fault to a loose circuit board of the 24 V transformer/charger in the battery room. Testing of the joints of the circuit boards restored the power feed. The main engines could then be started again. The cut off of the control voltage also caused the switches of the main generator board to go off, since the direct voltage in question kept them on. The failure of the emergency generator was caused by a damaged cogwheel in the pressure air operated starting motor of the emergency generator. In the tests performed after the repairs the generator started without problems. According to the chief engineer the emergency generator had operated during the "black out" power failure at sea even though the master claimed in the radio traffic that he had no power at all.



It should be noted that the main engine was at full ahead for more than 24 hours. No engine commands were given from the bridge on November 1 after 05.52. The situation was probably handled by setting a safe rpm in the engine room so that the engine could no longer race if the propeller became exposed. It is possible that the rpms were also agreed by telephone. The ship's log and the engine log quote several times that the rpm varied between 81 – 120. The power failure did not recur.

Time	Machine command	Source and notes
05.52	F. Ahead	<b>Engine manoeuvres log.</b>
08 - 12 Watch	RPM (81 ~ 120).	<b>Ship's Logbook:</b> Two salvage tugs and rescue vessel sea force and coast guard tug stand by for the case of emergency (RPM 81 ~ 120).
09.45	STOP	<b>Engine manoeuvres log,</b> (Last engine manoeuvres log entry to this date 1.11.2001)
12 - 16 Deck Watch	F. Ahead (According to ship's log the ME was not stopped)	<b>Ship's Logbook:</b> Rescue Sea .. and Coast Guard tug making around ship and two salvage tugs in vicinity of ship. Vessel anchor position maintained by port and stb. Anchor and running the <i>engine Full Ahead speed</i> . Vessel drifting at times towards the lighthouse. Vessel on hand steering. VHF watch kept continuously on 16 / 06 / 13. Rescue vessel - Rescue center ashore and salvage tug). Phenomenal sea, very high swell, hurricane, vessel rolling and pounding very heavily.
16.17		<b>Deck notebook</b> and <b>Ship's Logbook:</b> Heaving up starboard anchor.
16.46		<b>Deck notebook</b> and <b>Ship's Logbook:</b> Cased heaving up due to motor tripped.
16.53		<b>Deck notebook</b> and <b>Ship's Logbook:</b> Resumed heaving starboard anchor up.
17.20		<b>Deck notebook</b> and <b>Ship's Logbook:</b> Ceased heaving up anchor due to high tension on the chain.
18.03		<b>Deck notebook</b> and <b>Ship's Logbook:</b> Resumed heaving up stb anchor.
18.06	F. Ahead	<b>Deck notebook</b> and <b>Ship's Logbook:</b> Stb, anchor aweigh. (Vessel keeping on Full ahead) <b>Ship's Logbook:</b> From 18.06 vessel riding on her port anchor with the full length of cable up.
16 - 20 Deck Watch	RPM (81 ~ 120)	<b>Ship's Logbook:</b> Coast Guard tug making rounds in vicinity of the vessel. Two salvage stand by at the Isokari island. RPM (81 ~ 120)
1.11.noon to 2.11.noon		<b>Engine Logbook:</b> Experienced heavy vibration of the vessel. Battery room and al other electronic and electrical apparatus kept under special watch. Could not increase fuel ..... than 41 due to heavy fluctuating.
20 - 24 Deck Watch	RPM (81 ~ 120)	<b>Ship's Logbook:</b> Rescue vessel (Sea force and two salvage tug and coast-guard (tug Tursas) rounding the vessel for emergency help. RPM (81 ~ 120) Vessel's anchor position maintained by running the engine, on Full Ahead and her port anchor. Clearance from Sandback lighthouse maintained vessel drifting. Occ'ly VHF on 16 / 06 / 18. (Rescue center, salvage tugs). Strong gale phenomenal.

00 - 04 Deck Watch	RPM (81 ~ 120) Probably as on previous watch	<b>Ship's Logbook:</b> Port anchor, 8 in water. Rescue vessel Tursas in the vicinity. Vessel maintained anchor position by port anchor and engine running <b>on Full Ahead</b> . Vessel on hand steering. Anchor position checked frequently by radar and visual bearings. Vessel on contact with rescue vessels. The ship on VHF 16 - 06 - 13. New gale / high swell, cloudy sky, vessel pounding heavily at times, rolling madly.
04 - 08 Deck Watch	RPM (81 ~ 120)	<b>Ship's Logbook:</b> Vessel riding on her port anchor, using engine to maintain her position due to storm weather. RPM (81 ~ 120) 0400-0500 checking the port anchor location, it ... it's ... paid out by opening chain locker ... from inside, lubricating the heater end securing pin, making it ready for letting go. The anchor 0500-0600 fault fyyding of the windlass bearing additional to it's break. Bow stopper. 0600 ... repairing of windlass securing by assistant of Engine Room.
08 - 12 Deck Watch		<b>Ship's Logbook:</b> At 1020 hrs order writer inform that tug assistance terminated. No more grounded (?). 0920 COMPLXD TGMP. Repair of the port windlass gearing. Welded S/E for additional wading. Vessel steered variable courses and speed as per master's order and pilot's advice.
09.21		<b>Deck notebook and Ship's Logbook:</b> Commencing heaving up port anchor.
09.45	STOP	<b>Deck notebook and Ship's Logbook.</b>

**Evaluation of the anchoring and engine commands.** The anchor chain was not initially lowered enough but this was not a mistake since the chain could easily be lowered further if necessary. The wind force became too great, however, since two anchors did not hold although both had eight shackles out.

The prompt action of the engine personnel after the black out situation saved the ship from drifting aground. The engine commands and manoeuvring also showed that decisive measures were taken to steer the ship away from dangerous waters. The actions of the crew prevented the situation from developing into an accident.

**Evaluation of the documentation of IRAN SARBAZ.** The notes of the ship were relevant and precise. It should be noted that all notes were in English. The ship's log and engine log were printed in English. This had crucial significance for the Finnish accident investigation. The approach of the Iranian navigation authorities to documentation is commendable.

## 2.2 Radio traffic

IRAN SARBAZ did not at any stage initiate distress or urgency traffic nor did she contact the MRCC to report of a danger situation. The ship could have found the radio contact information of the Finnish MRCCs at least in the ITU "List of Coast Stations". According



to the international Radio Regulations, this list or its equivalent is required on all ships where a radio station is mandatory. Initiation of distress traffic would not have required information of any stations.

However, the vessel was in the area and control of Archipelago VTS and made contact on VHF channel 71 reporting about her problems. According to the VTS duty officer, the ship was keeping watch on channel 71 and on the pilot channel 13. According to the Radio Regulations the vessel shall, when at sea, constantly watch DSC channel 70 and distress, safety and calling channel 16 of the radiotelephone traffic on the VHF band. It is probable that the ship was monitoring these channels.

MRCC Turku was informed of the emergency by telephone at 11.46 on November 1, 2001. The information was given by the duty officer of Archipelago VTS who was concerned about the problems of the vessel and of the increasing wind. The VTS promised to ask the vessel to VHF channel 16. MRCC Turku managed to establish contact with the IRAN SARBAZ on VHF channel 16 only at 02.00 after repeated calls.

The radio traffic between IRAN SARBAZ and MRCC Turku was handled as routine traffic mainly on VHF channel 16. Such traffic lasted 1-2 minutes at the most per exchange. According to the regulations, routine traffic shall be principally conducted on one of the working channels, not on channel 16. However, navigational safety transmissions and information about vessel movements when it is important for the safety of other ships trafficking in the area is allowed on channel 16. This kind of traffic may last up to one minute maximum. Since the traffic between the vessel and the MRCC was conducted as routine traffic, it should have taken place on the working channel of the MRCC, channel 14, which was used to a small extent.

MRCC Turku also placed one Inmarsat call to IRAN SARBAZ since it was impossible to make out the speech of the operator of the ship on VHF channel 16, probably in part because of language problems and partly because of the scrambled reception. The use of a satellite call under the circumstances had good grounds and was the right solution.

At 05.30 IRAN SARBAZ called MRCC Turku on VHF channel 16 and established contact. It could be concluded from the speech of the operator that he had suffered a seizure, possibly a heart attack. He requested medical advice but other than this his speech was almost impossible to understand. The rescue helicopter also participated in the exchange but they could not make out the speech of the operator either. A doctor could have been called only by Turku Radio but they were not contacted. A call to the doctor would also have required an operator on board with the ability to discuss with the doctor.

The radio traffic between the helicopter and MRCC Turku was conducted as routine traffic on VHF channel 16. The maximum duration of continuous traffic was 2 minutes. The traffic should have been handled as distress or urgency traffic in which case the use of channel 16 would have been appropriate and according to the regulations.

The radio traffic between the helicopter and IRAN SARBAZ that began at 05.14, was also conducted as routine traffic on VHF channel 16. At this time, the helicopter was already carrying out the rescue operation and evacuating the crew of the vessel. MRCC Turku had classified the situation of the vessel as a distress at 04.45. The traffic in question should have been conducted as distress traffic, which would have made the use of channel 16 justified by the regulations.

The international Radio Regulations do not stipulate when the vessel should initiate distress traffic. Instead, the regulations state that distress traffic can only be initiated when authorised by the master and only if the vessel and her crew are in serious and imminent danger, or, in the GMDSS, if even one person is in serious and imminent danger. Thus, the decision to initiate distress traffic rests always with the master of the vessel. In the case of IRAN SARBAZ, the requirements for initiation of distress traffic were fulfilled at the latest at 04.45 when even MRCC Turku defined the situation as a distress. Despite this, the vessel did not switch to distress traffic. The decision is perhaps understandable since the vessel already had contact with MRCC Turku and was receiving help from them.

According to the Radio Regulations, distress traffic may also be initiated on behalf of the vessel in distress if she is unable to do this herself. Usually such cases include vessels without radio stations or vessels with radio stations that are not functioning for some reason. It is also possible to initiate distress traffic for a vessel in distress if the distress is obvious but the master is unable to make the decision to initiate distress traffic. According to this interpretation, MRCC Turku could have and should have initiated distress traffic on behalf of IRAN SARBAZ at the latest when the centre defined the situation as a distress.

If the radio traffic is conducted as routine traffic between two stations even on the international distress, safety and calling channel 16, the traffic can be considered confidential. This means that any outsider stations, for example other vessels, that hear this traffic may not divulge the information further or use it. Thus, any third vessels cannot launch rescue activities either based on what they have heard. In the case of IRAN SARBAZ, SEA FRANCE RODAN was on a sea trial in the vicinity. She was listening to the traffic on channel 16, reported to MRCC Turku and proceeded to the scene of the incident. MRCC Turku ordered the vessel to remain at the scene until the outer sea patrol vessel would arrive.

Distress traffic offers several significant advantages compared to routine traffic:

1. The international Radio Regulations define the procedures for distress traffic applicable to all parties.
2. Distress traffic clears the radio channel for this traffic.
3. Distress traffic obliges any outside stations to listen to the traffic at least until help is secured.
4. Distress traffic obliges all parties to undertake any action called for by the situation.
5. Distress traffic is public and not restricted by confidentiality of messaging.



The calling traffic of another radio station, for example Stockholm Radio, could be heard as occasional interference in the traffic of IRAN SARBAZ. The cause of this interference may be that the disturbing station had not observed "distress traffic" on channel 16, since none was being conducted. Another more probable reason lies in the remotely controlled station network and the registration system of the MRCC which registers simultaneously on the disk the traffic heard by several radio stations on channel 16. It is likely that the interfering traffic was received by another remotely controlled station than that used for the traffic of IRAN SARBAZ.

According to the Radio Regulations, urgency traffic is used to indicate that the station has an urgent message to send concerning the safety of the vessel or a person. Normally, the master of the vessel decides about the use of urgency traffic. According to the regulations, urgency traffic can be conducted entirely on channel 16. The case of IRAN SARBAZ fulfilled the definition of urgency traffic from the beginning. Nevertheless, all traffic was conducted as routine traffic mostly on VHF channel 16.

It should be noted also that the Iranian authority for telecommunication had not updated the data of the radio station of IRAN SARBAZ on the ITU list. The last update had been made on April 8, 1988. The entire maritime radio system has changed after this as the GMDSS was finally adopted on February 1, 1999. The international Radio Regulations oblige the authorities to keep the data on the list up to date<sup>4</sup>.

### 2.3 The Rescue operation

The rescue operation were begun on November 1, 2002 at 01.46 and concluded on November 2, 2002 at 07.55.

The activities of the MRCC were proactive and sufficiently extensive in the circumstances. The commanding task turned worse by the black out of the VTS radar just when it was of vital importance to the commanding and the formation of an overall picture of the situation.

The lack of safe standby positions for the helicopters is another factor that clearly complicated the rescue activities. In this case, two maritime rescue helicopters were available on the national level. After one of them had performed the evacuation the other one was transferred to Isokari for standby. However, the conditions at Isokari were such that the helicopter crew had to return to base in Turku in order to ensure the safety and usability of their equipment. This meant that the standby base was at least half an hour further away than the base at Isokari, for example.

When MRCC defines the situation to be DISTRESS, they should make it public. This would make also outsiders aware of the powers invested in him by law making the judicial position of the persons assigned to the operation less controversial. At the same time, this would justify distress or urgency traffic. This has not been considered in the domestic maritime rescue directions.

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<sup>4</sup> Radio Regulations 20.16 and 32.5A and Resolution 340.

The reception arrangements for the evacuees represented exemplary co-operation between both voluntary and public organisations.

The crew of the vessel was approaching a life-threatening situation but the master considered the situation critical only to a point where no preparations for rescue of human lives were necessary. When the MRCC started these preparations, this was used to try to obtain economic gain. The master tried to change the rescue tow into a port tow.

If the master is only interested in saving the property, the situation can be left to be dealt by the VTS. However, the MRCC was concerned about the crew of the vessel and made the right decision. The centre initiated commercial rescue activities by notifying the rescue company so that it could start negotiations about a commercial rescue simultaneously with the operation aimed at the rescue of human lives. This procedure can be justified also from the point of view of environmental protection.





### 3 CONCLUSIONS

#### 3.1 Chain of events leading to the emergency situation

The following chain of events led to the emergency situation:

- The force of the wind was 3 beaufort when the IRAN SARBAZ anchored. It is not known what kind of a weather report the ship had received.
- The ballast had been lightened, which brought the propeller close to the surface and increased the wind surface of the vessel. This made the ship more wind sensitive.
- The force of the wind grew beyond what had been reported in the weather forecast.
- The wind and the waves grew more quickly than normal. This was probably caused by the 'low level jet' phenomenon where the gusts are extremely strong.
- The sea bottom in the area was poorly suited for anchoring. The anchors began to drag.
- The anchor windlass broke.
- The vessel suffered a power failure.
- The emergency diesel did not start and a emergency situation arose.
- The master started to direct the rescue operation but probably suffered a heart attack.

The ship was about to drift aground but the quick actions of the engineers restored the electricity and engine power, which saved the ship. The thorough English documentation of the vessel should also be noted.

Co-operation between the VTS centre and the MRCC was smooth. The alerts of the MRCC were proactive, in other words, several units were dispatched to assist.

SEA FRANCE RODAN acted responsibly and came to help when she heard the radio traffic between IRAN SARBAZ and the MRCC. SEA FRANCE RODAN was in no way obligated to react to the situation since no distress traffic was conducted.

#### 3.2 Underlying factors contributing to the emergency situation

Lightening of the ballast also had an effect on the development of the emergency situation but the master did not know that the wind would increase as much as it did. The quality of the sea bottom was not suitable for anchoring. Both anchors of IRAN SARBAZ were dragging. The anchors of the tugs and of the outer sea patrol vessel also gave in.

The quality of the bottom in the Isokari area is relatively level and apparently the seabed is covered by very coarse moraine. The currently used patent anchors do not dig into coarse moraine if the grain size is large enough.

The Finnish coastal waters are probably not charted outside the archipelago with regard to anchoring. The bottom at the anchoring points that are marked on the charts in the archipelago has been found suitable. In addition, the cover provided by the islands re-

duces the forces to the vessel to the extent that the anchoring problems discovered in this case have been marginal. Increasing vessel sizes and logistic development will reduce further the need to create anchoring point recommendations for the Finnish coastline based on the quality of the seabed even in the near future.

The suitability of the anchoring systems for the vessels presently in traffic should be viewed with a critical eye recognising the current shortcomings, since the anchor is after all one of the most critical pieces of safety equipment on board a ship.

The incompatibility of the anchor type with the quality of the seabed and the insufficient weight of the anchoring gear compared to the forces caused by the vessel in the prevailing weather conditions were central contributing factors to the emergency situation.

### 3.3 Radio traffic

The master of IRAN SARBAZ must have estimated that the situation might turn critical since he had informed Archipelago VTS of the problems of his vessel. The duty officer of the VTS centre acted correctly by passing this information and his concern over the problems of the ship and the increasing wind to MRCC Turku and by directing the radio contact between IRAN SARBAZ and MRCC Turku to VHF channel 16.

The fact that the main part of the traffic between IRAN SARBAZ and MRCC Turku and the helicopter was conducted as routine traffic on channel 16 violated the procedures stipulated by the international Radio Regulations. According to the Regulations, channel 16 may only be used for

- Distress traffic,
- Urgency traffic,
- notification of a warning message,
- vessel calls,
- calling of a coastal radio station if the call cannot be made directly on a working channel,
- broadcasting of bulletins of a maximum of one minute concerning the safety of navigation,
- traffic concerning the passage of vessels if the passage information is important for the safety of other ships trafficking in the area; this kind of radio traffic may last up to one minute.

Distress traffic may be initiated if the vessel, her crew or even one person is threatened by grave and imminent danger. Urgency traffic is used for indicating that the station has an extremely urgent message to transmit concerning the safety of a vessel or of a person. Based on this, the danger situation of IRAN SARBAZ would have required distress or at least urgency radio traffic.

The decision to initiate distress or urgency traffic always rests with the master of the vessel. However, in the case at hand, the master did not for some reason consider it necessary to utilise either of these traffic modes. Unfortunately, a similar pattern has



been observed in several other incidents in our waters as well, namely that the masters avoid initiating distress traffic or initiate it only at a rather late stage.

MRCC Turku could also have declared the danger situation an distress on channel 16 and used distress traffic procedures at the latest when the evacuation of the crew of the vessel was decided. On the other hand, initiation of distress traffic on behalf of a third party is a very difficult decision if there is radio contact with the vessel and her master does not observe the procedures of distress traffic. Nevertheless, MRCC Turku interpreted the situation as an distress within its own organisation. The MRCC also used the authority given by a distress situation by requesting a vessel on a sea trial, SEA FRANCE RODAN, to proceed to IRAN SARBAZ. SEA FRANCE RODAN had monitored the radio traffic and consequently decided to contact MRCC Turku on VHF channel 16. The actions of the vessel can be considered correct since she was observing maritime law although her actions may not comply with message confidentiality.

According to the Finnish radio act (517/188 7 §)<sup>5</sup> all communication that is not intended for public reception is confidential. Third parties may not record confidential messaging or use the information received in this way to their advantage. Judging by this, also routine traffic between two parties received on VHF channel 16 cannot result in any activities by a third party even if there is a clear need for help according to the radio traffic. On the other hand, all maritime radio traffic operators are certainly aware of the fact that the traffic on VHF channel 16 may be heard by numerous ears. A new Finnish radio act (1015/2001) follows the previous principal.

The correct way to handle the radio traffic would have been to conduct it either as distress or urgency traffic on VHF channel 16. This would have required a corresponding decision by the master of the vessel. Another option would have been for the MRCC to request IRAN SARBAZ to working channel 14 where the traffic would then have been conducted as routine traffic. In addition to this, the MRCC should have sent short notices of the situation as urgency messages on channel 16. In this case, the urgency traffic should have been initiated according to GMDSS by a digital selective call on channel 70.

Most of the radio traffic between IRAN SARBAZ and MRCC Turku was conducted on VHF channel 16, probably through the remotely controlled station in Uusikaupunki. This traffic was interfered by other traffic from time to time. It is possible that the interferences was received through another remotely controlled station, not through Uusikaupunki, since the system feeds all traffic received by the available remotely controlled stations to one audio channel. This is why the recording system also registers the possible interferences. In order to avoid the interferences it would be best if the remotely controlled station used for distress traffic or other important messaging could be separated from the rest of the system and that such traffic could also be recorded separately.

MRCC Turku, MRSC Helsinki and MRSC Vaasa and Turku Radio all share a common VHF remotely controlled station network. There are remotely controlled stations in more than 20 municipalities along the Finnish coast and archipelago. The MRCCs use chan-

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<sup>5</sup> This domestic act follows the international requirements.

nels 70 (international digital selective calling channel), 16 (international distress, safety and calling channel) and 14 (working channel). In watchkeeping the remotely controlled stations are categorised into three sectors: the Gulf of Finland, the Sea of Archipelago and the Gulf of Bothnia.

The remotely controlled station network includes a technical problem: If one remotely controlled station receives a bad interference signal, this station cannot be excluded but the interference is heard on the same audio channel as the other remotely controlled stations of the same sector. The interference is also recorded on the same audio channel together with the other traffic.

MRCC Turku called IRAN SARBAZ through the Inmarsat-A service. This course of action can be considered correct since the speech quality of the VHF radio contact was poor and the speech could not be understood from time to time. In addition, it could be expected that in the course of this call, the ship might reveal some things concerning the danger situation that they did not wish to make public on VHF channel 16. This did not happen, however.

The danger situation of IRAN SARBAZ had a happy end. If this had not been the case, it is probable that the ships in the area had no knowledge of the danger situation.



#### 4 RECOMMENDATIONS

Because the Accident Investigation Board has established work group for investigation of observed noted deficiencies in the radio traffic in Finland and the work group will introduce recommendations there are no distress radio traffic recommendations in this report.

Helsinki, January 14, 2003

Kari Larjo

Seppo Rajamäki

Pertti Siivonen



## LIST OF SOURCES

The following sources are on file at the Accident Investigation Board:

1. Copy of the ms IRAN SARBAZ's Marine Casualty Report by ship's Master.
2. Copy of the ms IRAN SARBAZ's Deck Log Book, October 31 – November 2, 2001.
3. Copy of the ms IRAN SARBAZ's Engine Log Book, October 31, – November 2, 2001.
4. List of actions, ms IRAN SARABAZ, Archipelago Coast Guard / MRCC Turku, November 2, 2001.
5. Transcript of the distress radio traffic of the IRAN SARBAZ's emergency situation.
6. Plots of the ms IRAN SARBAZ's situation, Archipelago VTS:n recording.
7. Ms IRAN SARBAZ Port State Control, Memorandum, November 9, 2001, Southwest Ship Inspection Division.
8. Wind information, Kustavi Isokari November 1, 2001, Finnish Meteorological Institute, November 10, 2001.
9. Archipelago Coast Guard, comment to draft of this report 178/404/2003.
10. Finnish Maritime Administration, Archipelago district, comment to draft of this report 6/502/2003.
11. Finnish Communications Regulatory Authority, comment to draft of this report 96/700/2003.