CASUALTY REPORT

February 27 2003
Case 199924989
File 01.40.04
Division for
Investigation
of Maritime Accidents

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Fire in the engine room
PRINCESS OF SCANDINAVIA
17 May 2002
1. The Casualty

Type of casualty: Fire in the engine room and casing.
Location of casualty: North Sea. 56°02’N – 002°21’E
Date and time: 17 May 2002 at approximately 2230 hours.
Injuries: Two passengers were slightly shocked and they received medical treatment on board the ship. An engineer suffered slightly from smoke intoxication.

2. Summary

On 17 May 2002 at 2234 hours, a fire broke out in the engine room when the ship was in the North Sea en route between Newcastle, Kristiansand and Göteborg.

The fire was caused by a hydraulic oil leakage above a main engine where outflowing oil was lit by hot surfaces on the engine. The fire was concentrated above the engines in the main engine room and in the central casing. The fire was further nourished by outflowing oil from the hydraulic installations in the central casing, which was destroyed by the fire.

PRINCESS OF SCANDINAVIA sent a distress signal and Aberdeen MRCC prepared a comprehensive rescue.

The fire was fought and put out by the ship’s own crew by means of water.

The passengers were evacuated to two different muster stations on deck while the fire was put out – and later they were sent to two enclosed restaurants when the fire was under control. When the fire had been put out completely, the passengers could return to their cabins. No passengers were physically injured. Some passengers were slightly shocked and needed help.

A few hours after the fire had been put out, the engine crew could start one of the main engines and the ship could continue its voyage under its own power. In another few hours, an additional two main engines could be started and the ship arrived in Kristiansand on 18 May 2002 at 1630 hours.
3. Ship Particulars

<table>
<thead>
<tr>
<th>Name of Ship:</th>
<th>PRINCESS OF SCANDINAVIA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Registration No:</td>
<td></td>
</tr>
<tr>
<td>Home Port:</td>
<td>Copenhagen</td>
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<tr>
<td>Control No:</td>
<td>A 386 / OWEN 2</td>
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<tr>
<td>Type of Ship:</td>
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<tr>
<td>Construction year:</td>
<td>1976</td>
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<td>Tonnage:</td>
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<td>Length/breadth/draft:</td>
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<td>Engine Power:</td>
<td>33,538 kW</td>
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<tr>
<td>Crew:</td>
<td>123</td>
</tr>
<tr>
<td>Owner:</td>
<td>Scandinavian Seaways A/S, Copenhagen</td>
</tr>
<tr>
<td>Classification Society:</td>
<td>Lodge's Register of Shipping</td>
</tr>
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4. Collection of Data

The Division for Investigation of Maritime Accidents surveyed the ship on 19 May 2002 in Kristiansand and interviewed the master, the chief officer, the chief engineer and the hotel manager.

The Division surveyed the ship again on 22 May 2002 in Fredericia and interviewed two catering assistants, three passenger assistants, one engineer, two AB’s and one mate.

Through the British MAIB (Maritime Investigation Branch) and the MCA (Maritime and Coastguard Agency), the Division for Investigation of Maritime Accidents has received a SAR report and a search plan concerning the rescue operation from the rescue service in Aberdeen and on the Shetlands (Aberdeen MRCC).
The Division for Investigation of Maritime Accidents has received an explanation about the ship's CO\textsuperscript{2}-system from the technician in the service company, which examined the system after the fire.

5. Narratives

The following in this paragraph is based on information given to the Division for Investigation of Maritime Accidents by the ship’s crew members and officers supported by information in the report material from Aberdeen MRCC:

PRINCESS OF SCANDINAVIA maintains regular service between Göteborg, Kristiansand and Newcastle.

The ship departed from Newcastle on 17 May 2002 at 1607 hours with 758 passengers, 123 crew members and three guests.

The voyage proceeded without any problems until 2234 hours when alarms were released both on the bridge and on the engine room alarm boards to indicate the outbreak of a fire in the engine room.

On the bridge

When the fire alarm was released at 2234, the 1\textsuperscript{st} mate and the master were on the bridge. The 1\textsuperscript{st} mate was on duty on the bridge and the master was on the bridge to make an entry in the night order book.

The 1\textsuperscript{st} mate phoned the engine control room but received no answer because both the engineer on duty and the motorman were busy with the fire. The master signed for the alarm on the alarm board after which another fire alarm was released. The mate switched to another channel on the internal television in order to survey the engine room. Here he could see open fire in the main engine room above main engine no. 2. He told this to the master and then ran down the corridor behind the bridge to warn an engineer who had just been to the bridge.

The 1\textsuperscript{st} mate called the engine crew. The master activated the fire alarm in the crew’s accommodation and made an announcement on the PA-system in the crew’s accommodation to inform them about the fire in the main engine room and to instruct the smoke divers to muster on the car deck on the port side of the ship.

The crew reacted promptly. The six persons who were to muster on the bridge came right away. The zone supervisors (heads of the evacuation) got their bags with crew-jackets for the crew, torches and posters showing the evacuation areas.

From the bridge wing, the 1\textsuperscript{st} mate observed a thick grey smoke coming out of the funnel, which he reported to the master. When the master saw this and saw that the funnel was changing colour from white to grey, he released the general alarm (seven short blasts and one long blast) to the entire ship.
The release of the general alarm initiated the evacuation of the passengers to the muster stations. The master made an announcement on the PA-system to the entire ship to inform all on board about the fire in the engine room and to instruct the passengers to go to the foremost muster station on open deck.

Subsequently, the master ordered the 1st mate – who was, according to the fire bill, to be in charge of the external communication – to send a distress signal. The mate asked the master to repeat the order, which he did firmly.

The 1st mate sent the distress signal MAYDAY on VHF channel 16 indicating the name of the ship, its position, the situation, etc. in English. Then, he activated the automatic alarm signal at 2249 hours on the GMDSS-equipment MF DSC. The mate received a prompt response on VHF channel 16 from a fishing vessel approximately 20 minutes' sail away from PRINCESS OF SCANDINAVIA. He asked the fishing vessel to sail to PRINCESS OF SCANDINAVIA and to be standing by. On MF 2182 KHz the mate could hear that Aberdeen MRCC was planning a rescue.

At 2304 hours the mate sent a filled-in form on Inmarsat-C with information of relevance to the emergency situation to the coast radio stations and to DFDS Seaways.

The 1st mate tried to call Aberdeen MRCC on MF 2182 KHz but he could not connect because of the many ships that were offering their assistance. Aberdeen MRCC phoned PRINCESS OF SCANDINAVIA via a Sat M-phone and the 1st mate informed them about the situation in the ship.

Aberdeen MRCC informed the mate – among other things – that they had eight ships and five helicopters standing by to assist and – if necessary – evacuate the ship and that they could send medical assistance by helicopter if needed. At this time, they had begun to have the fire in the ship under control and Aberdeen MRCC and PRINCESS OF SCANDINAVIA agreed to establish contact every 10th minute on the same SAT M-number and later every 15th minute.

The 1st mate contacted DFDS Seaways’ emergency organisation on the SAT M-phone to give a briefing on the situation after which he sent a new and more detailed form with information about the rescue via Inmarsat C.

During the entire operation Aberdeen MRCC was engaged with the rescue and the ship and Aberdeen MRCC were in frequent contact. When the fire had been put out at 0030 hours, Aberdeen MRCC wanted to know whether the ship could continue under its own power. Otherwise, they would call for a tugboat. The chief engineer informed Aberdeen MRCC that the ship would probably be capable of continuing its voyage under its own power. Later on, Aberdeen MRCC fixed a dead line of one hour for the ship to continue the voyage under its own power – otherwise they would call for a tugboat.

At 0230 hours they started the first main engine again and continued the voyage and there was no need for tugboat assistance. Later they were able to start an additional two main engines.
The fire fighting
When the fire broke out, the 2nd engineer and a motorman were on duty in the engine room. They immediately prepared to fight the fire by means of a fire hose and a fog jet nozzle. The chief engineer called the bridge and informed them about the fire above main engine no. 2 and he received permission to stop the engines. Then, he clutched out engines nos. 2 and 3 and stopped them from the engine control room. The motorman called the chief engineer, who was in his cabin, and reported that a fire had broken out in the engine room.

The chief engineer ran to the engine control room and on his way there he heard the fire alarm in the crew accommodation.

When the chief engineer entered the engine room, the 2nd engineer and the motorman had made a fire hose ready and they had closed the remote controlled valves in the fuel oil system to main engines no. 2 and no. 3. The chief engineer saw the fire above main engine no. 2 and ran to the main engine control room from where he called the bridge and agreed with the master to stop main engines nos. 1 and 4 as well in order to produce a calmer atmosphere in the engine room during the fire fighting.

Then the chief engineer stopped all fuel oil pumps and lubricating oil pumps for the main engines together with separators, etc. and ran to the auxiliary engine room (in front of the main engine room) and opened four sections in the open, manually controlled sprinkler system to the engine room. By the pressure gauge at the valve battery, he could see that the fire pump was active and that the pressure on the fire main was 11 bar at the valve battery. A little later, he started one more fire pump from the engine room.

At the same time, the 2nd engineer and the motorman – wearing their fire fighting equipment – had started the fire extinguishing/cooling by the use of water fog over main engine no. 2.

The electrician and a relief engineer went to the engine control room according to the fire drill. The electrician ran to the release unit central in the engine casing on deck 4 and closed all of the quick closing valves to the main engines.

The chief engineer had just gone to bed when he heard the fire alarm on the bridge. He went to the bridge and was told that a fire alarm had been released from the engine room and that they had seen open fire on the internal TV-system. At this stage nobody knew how comprehensive the fire was.

The chief officer who was the fire head of fire group ran to the car deck wherefrom he instructed the smoke divers. He called for a team of smoke divers with extensive knowledge of the engine rooms because the fire was in the engine room. The smoke divers went to the main engine room through the boiler room. There was no smoke in the boiler room. The first team of smoke divers entered the engine room and observed open fire in the starboard side and high up astern in the main engine room.

Everybody acted quickly. The motorman on duty in the engine room had made an additional fire hose ready. After that, the firemen began to fight the fire by cooling with water fog over main engines nos. 1 and 2 using two smoke diver teams at a time. The water-tight door between the main engine room and the auxiliary engine room was closed.
The chief officer and the smoke diver teams communicated by means of portable VHF-systems with a hearing aid with a built-in microphone. The communication was not fully efficient because there was a lot of noise on the line from the chief officer to the smoke divers, whereas the connection from the smoke divers to the chief officer was better. The communication was especially valuable to the chief officer when he gave the initial instructions. At a later stage, though, the smoke divers had problems with the hearing aids because they slipped out of their ears due to the effect of water and sweat. Subsequently it was difficult to replace them again because the smoke divers were wearing thick gloves and they had to handle the fire hoses and jet nozzles at the same time.

The communication between the chief officer on the car deck and the bridge was not quite efficient on VHF. That is why the chief officer established a relay station on deck 5, which worked well. The chief officer also used a stationary telephone in the engine shop on deck 2 when he communicated with the master on the bridge and the chief engineer in the engine control room.

The supply of fresh air bottles for the smoke divers was sufficient. Two crewmembers constantly brought filled air bottles from the ship’s compressor plant on deck 10 to the car deck and empty air bottles back to the compressor plant.

The fire spread from the main engine room up to the engine casing. The chief engineer sent observers to the accommodations and up to the funnel deck for the purpose of observing any smoke. Inside the ship, they observed exudation of smoke only in the galley.

The auxiliary engines and generators were running and the engine control room was in use during the entire operation as such. A little smoke penetrated into the engine control room, but it was nevertheless possible to stay in the room.

The chief officer asked the 1st engineer to close all the remote-controlled valves in the fuel oil system, which he did.

When the 2nd mate and the motorman returned to the engine control room at one point for the purpose of getting fresh air bottles, the 2nd engineer said that something was “completely wrong” because the fire broke out again heavily every time it seemed to have been put out. This was strange because they had closed and stopped everything in the fuel oil system to the main engines. The 2nd engineer also noticed that the fire broke out again in the casing. Therefore they also had to establish cooling there. The chief engineer reported this to the master, who ordered the chief officer to effectuate cooling in the casing. At this stage the chief engineer still believed that it was a fuel oil fire, just as did everybody else who was involved.

However, a motorman noticed that hydraulic oil was dripping on to main engine no. 2. They considered in which hydraulic system the leakage was and discovered that the pump for the hydraulic operation of one of the watertight doors was in function but the tank was empty. The leakage originated in a pipe in this hydraulic system. The pump was stopped and the flow from the leakage above the main engine was reduced.
They also found out that the tank to the hydraulic system for remote-controlled valves to the emergency bilge system was empty. The pump in this system had stopped automatically because of low oil level in the tank.

Smoke divers were sent to deck 3 (the only place except from the engine room and funnel deck from which access is provided to the engine casing) to start the cooling of the casing. But there were fierce sparks from bundles of cables in the casing. Therefore, the chief officer requested the engine control room to switch off all the supply of electricity from the main switchboard to the accommodation, etc. This was done because it was dangerous to enter the casing as long as there was voltage on the systems. They cooled by means of water fog, though, from the outside into the casing from deck 3. The master passed on the mate’s request to the chief engineer after which all unnecessary power supply from the main switchboard was disconnected.

Fire was also observed in the engine casing from deck 10 (the funnel deck). Therefore, the chief officer sent smoke divers up to fight the fire from above. Smoke divers forced themselves into the casing from deck 10 and began the cooling from above. There were certain places with such a narrow passage that the smoke divers had to take off their fresh air bottles to come through.

The fire fighting continued with the fixed sprinkler system and with smoke divers using water fog. At 2345 hours, all fires had been extinguished in the main engine room but the chief officer (the head of fire group) reported that the fire was still active in the casing from deck 6 and upwards.

At a stage when it seemed as if the fire had been extinguished, the chief officer stopped the cooling from below and, at a later stage, the cooling was stopped on deck 10 as well – for the purpose of forming a general view of the situation.

The fire broke out again in the casing but was extinguished quickly. Then, they continued the cooling operations from deck 10, while they were still looking for smoke from bulkheads in adjacent areas until approximately 0030 hours when the fire had been completely extinguished.

At a relatively early stage, the master, the chief officer and the chief engineer decided not to use the CO₂ system to extinguish the fire. It seemed possible to fight the fire by use of water fog. They assumed that it would be faster to make the engine ready again after the usage of water fog instead of having to evacuate CO₂ from the engine room.

**Restarting of engine system, etc.**
The emergency switchboard’s supply cable from the main switchboard was destroyed in the fire and when the supply from the main switchboard to the emergency switchboard was disconnected, the emergency generator set started automatically and supplied the emergency switchboard as intended.
When the fire had been extinguished, they immediately began to examine in the engine room whether it would be possible for the ship to continue under its own power. At approximately 0230 hours, it was possible to start main engine no. 4 and continue the voyage towards Kristiansand.

At 0500 hours they started main engine no. 2 and at 0800 they started main engine no. 3. After this, the ship could continue at a speed of 21 knots.

Main engine no. 1 could also be started, but it was stopped automatically by the automatic monitoring system that was responding to the bearing temperature monitoring. The bearing had not been damaged though. The automatic system for the operation and monitoring of the propulsion machinery was, however, not capable of functioning so they had to continue the voyage with manual monitoring in the engine room.

Though the auxiliary motors and generators could operate during and after the fire, they disconnected the electricity supply to the galley, accommodation, etc. because of cables that had been damaged by the fire. At a stage, the chief engineer was asked whether it would be possible to establish power supply to the galley. This was of great importance in order to offer the passengers food after the evacuation. The electrician and an engineer drew cables for a temporary electricity supply to the galley. The electrician supplied the temporary power supply with an ampere metre and instructed the galley crew to pay attention to the ampere metre’s indications and to limit the power consumption because the temporary cable was of a small dimension.

The ship arrived in Kristiansand at approximately 1645 hours. The bow propellers and all systems that were necessary for the call and unloading of the ship had been examined, tested and found in order. It was not possible to use a mooring winch on the foredeck so instead the hawseres were handled manually at arrival.

**Evacuation of passenger accommodation etc.**

When the fire alarm sounded, the hotel manager was on his way out of the nightclub. He went to his office to get his radio and then he went directly to the information centre. Several different alarms and signals sounded and everything seemed to be a bit chaotic because of the many passengers.

The evacuation of the passengers to the muster stations began at 2240 hours and went well (with the exception described below). When the crew members who were to evacuate the passenger cabins had made sure that all the passengers in the respective sections had got out, they reported so to their zone manager. When a cabin had been examined for passengers and evacuated, a sign was affixed to the outside of the door showing to indicate that the cabin had been examined. Two muster stations on open deck were used, both located in the foremost part of the ship. The crewmembers handled the situation calmly and with assurance. The passengers were cooperative and generally handled the situation with composure and confidence, but a few passengers were very scared and had to be soothed by crewmembers.

At an early stage, the PA system stopped working in certain areas of the ship.
A male passenger had a weak heart and was helped, first by the 1st mate and subsequently by a doctor and a nurse who had been summoned from among the passengers over the PA system. The doctor got the ship's medical bag from the 1st mate. A rather young female passenger had convulsions, presumably because of the shock, and the 1st mate calmed her down.

At 2305 hours, the fire was under control to such an extent that it was possible to let the passengers go indoors again. At first, the hotel manager chose to keep the passengers in the pub and the discotheque to be able to control where the passengers were in the ship until the situation had been totally clarified. No passengers were allowed to return to their cabins. Crewmembers got the necessary medicine and aids in the cabins for the passengers who had a need for this. The catering staff also saw to it that the passengers could get water, soft drinks and – later when it became possible – sandwiches as well.

At 0130 hours, the passengers were allowed to return to their cabins but some passengers chose to stay outdoors where they got blankets from crewmembers.

**Failure of evacuation from a cabin**
When the passengers had been allowed to go indoors, a teacher, who was shaken, approached a zone manager and informed him that three pupils from his group of old school children were missing. A passenger assistant got a note from the zone manager with the names of the three missing pupils, a megaphone and a torch and was asked to search for the pupils. The passenger assistant looked for about half an hour on decks 7 and 8 without finding the pupils, which she went back to tell her zone manager. Then the passenger assistant was asked to have a look in the pupils' cabin, where she found them sound asleep. They had heard neither the alarms nor the announcements made over the PA system. The pupils in question were sober, but they had taken some seasickness pills, which can cause dullness.

The corridor in question in the passenger accommodation had been examined and evacuated by another crewmember that had not been aware of a cabin located around the corner at the end of the corridor. Hence, the cabin in question had not been examined and evacuated.

A few other nervous passengers also contacted the crew, and this led to an extra look into some cabins, but all passengers were found to be out of their cabins.

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**6. Additional information**

**Inconveniences caused by alarms during the fire fighting**
Many alarms sounded in the engine room and on the bridge during the fire extinguishing and they could not be stopped immediately. This was very stressful and disturbing to the persons involved in the fire fighting.
**The behaviour of the crewmembers**
The master, the chief officer, the chief engineer and the hotel manager have informed the Division for Investigation of Maritime Accidents that the crew members were very cooperative, efficient and conducted initiative and they had the ability to handle the situation. There were a number of situations where the crew members – after they had finished their tasks in connection with the fire and evacuation drill – on their own initiative minded the passengers' safety and comfort by talking to them, supplying them with blankets, foods, etc. The crew members supplied the smoke divers and others occupied with the fire fighting and the persons in the engine with something to drink.

**The reaction of the passengers**
According to the explanations that the ships officers and crew members have given to the Division for Investigation of Maritime Accidents, the passengers generally reacted calmly and in accordance with the instructions given over the PA system and with the instructions given directly by the crew members. A crew member found a group of passengers who, upon their own initiative, were putting on lifejackets which they were told not to do by the crew member. The passengers accepted this and seemed to be calmed by the calm behaviour of the crew member.

**CO₂-system**
In connection with the repair after the fire, the Danish Maritime Authority required a pressure test of the CO₂-system in the engine rooms to see if the fire had damaged the pipe system.

A service company carried out the pressure test and found several leakages in the pipe system. The leakage did not originate from the fire but from insufficient mounting.

Two distributive pipes to the separator room and the auxiliary engine (of 11/4” and 1½”, respectively) had been connected by means of welding sockets in a place that was not easily accessible – close to the exhaust pipe for auxiliary engines in the engine casing. The welding sockets had not been welded on in their full circumference, apparently because it was not practicable because of too little space. A small piece of the distributive pipe to the main engine room (2½”) had been dismounted (cut out) and had been remounted by welding. One of the weldings was not tight because of poor craftsmanship.

The pressure test was carried out hydraulically and a thin jet of water emanated from each one of the poorly made joints during the pressure test. Furthermore, water dripped from four screw fittings on distributive pipes in the main engine room during the pressure test.

None of these leakages could be registered visually, and it was possible to find them only by means of a pressure test of the system. They could not be found by blowing air through the pipes either, which is done to check the free flow. All the leakages were remedied professionally by the service company and subsequently the system was pressure tested at 25 bar.
7. Comments made by the Division for Investigation of Maritime Accidents

Poor craftsmanship caused the fire
A hydraulic oil pipe in the system for manoeuvring the waterproof doors had been mounted unfavourably, very close to a pipe holder for a start air pipe below deck above one of the main engines. The vibrations entailed that the hydraulic had been exposed to hard wear by its connection to the pipe holder. That is why a hole of 1-2 mm occurred in the pipe (see the detailed figure). The hydraulic system was under constant pressure and the hydraulic oil that was emitting from the pipe touched the hot engine components on the main engine and the oil was ignited.

The hydraulic pipe and the start air pipe had been mounted in a shipyard. The Division for Investigation of Maritime Accidents is of the opinion that the mounting can be characterised as poorly carried out. This cannot be revealed by the daily operation of the ship.

Disadvantageous placing of hydraulic valve batteries
Two valve batteries with magnetic valves for the remote control of the valves in, among other things; the emergency bilge pumping system had been placed in the engine casing. The natural spreading of the fire upwards from the engine room to the engine casing destroyed the magnetic valves after which approximately 400 litres of hydraulic oil emitted. The emitting hydraulic oil contributed to the continuing intensity of the fire. The remote control in the emergency bilge pumping system was inactivated because of the destroyed valve batteries. The Division is of the opinion that this incident strongly indicates that the placing of the valves was very disadvantageous because any fire in the engine could be expected to spread upwards to the engine casing.

Therefore, at an early stage after the fire, the Division has recommended the Owner to pay attention to this. In connection with the repair the valve batteries were moved. The Owner has informed the Division that they have acted upon the recommendation from the Division for Investigation of Maritime Accidents and altered the placing of the valve batteries to a practical place, which has been accepted by the Danish Maritime Authority.

Communication
The internal communication was not completely satisfactory. The chief officer had problems communicating directly from the car deck to the bridge by VHF. But the chief officer was aware of this and he handled the situation efficiently by use of fixed networks and relay station in the Division’s opinion.

The Division for Investigation of Maritime Accident finds it alarming and unsatisfying that the PA system on the ship failed in parts of the ship’s accommodation at an early stage during the fire.
**Distress signal and contact to shore**
The sending of the distress signal was done properly. At first, the mate chose to send MAYDAY on VHF channel 16 indicating, among other things, the name of the ship, its position and the kind of emergency (fire). He received a reply from, amongst others, a fishing vessel nearby.

The mate also sent an automatic distress signal on GMDSS MF/DSC 2187.5 KHz. Immediately after, Aberdeen MRCC acknowledged the distress signal and they prepared a rescue operation. The automatic distress signal also indicated the position of the ship because the position is updated on a regular basis.

According to the mate, the SAT-M phone of the ship was very useful during the entire course. The SAT-M phone is a commercial line, which is not part of the distress signal system. Everybody can use the line and the ship was disturbed by a call from a TV Company and a fax from a salvage company.

Aberdeen MRCC, who coordinated the rescue from ashore, chose to use the SAT-M phone. The Coast guard decides which connection to the ship is the most practical to use in a given situation. As an alternative, Aberdeen MRCC could have demanded silence on MF 2182 kHz and used this connection. In this situation MF 2182 kHz was used for the purpose of coordinating the many ships that offered their assistance.

**CO₂ system**
The requirement made by the Danish Maritime Authority for a pressure test of the CO₂ system after the fire revealed leakages in the system that had not been found earlier on.

The Division for Investigation of Maritime Accidents considers that the leakages have been caused by technically poor craftsmanship.

The service company that carried out the pressure test and repair of the system estimates that none of the leakages was of such a serious nature that they could compromise the efficiency of the system or be of any immediate danger to the safety if they had chosen to fight the fire with CO₂. The Division for Investigation of Maritime Accidents is of the same opinion.

**Organization and preparedness on board the ship**
The Division for Investigation of Maritime Accidents is of the opinion that the sequence of events proves that they are well organized on board the ship. The officers and the other crew members seem to be fully aware of where to be and what to do according to the fire drill – with the exception of the one failure in the evacuation. They acted efficiently, rationally and well trained. It is the opinion of the Division for Investigation of Maritime Accidents that the very prompt and efficient action has been of significant importance to the rather short duration of the fire and its relatively limited extent.

But the Division for Investigation of Maritime Accidents consider it a serious mistake and very criticisable that one of the passenger cabins was not examined and evacuated until approximately one hour after the fire had begun.
8. Conclusion

Cause
A hydraulic oil pipe below deck and above a main engine had been mounted wrongly, too close to a pipe holder for another pipe. Consequently, the pipe had been teared by touching the pipe holder and as a consequence a small hole had been made in the pipe. Emitting hydraulic oil hit the hot engine components on the main engine by which the oil ignited and caused the fire.

The magnetic valve batteries for remote-controlled hydraulic valves for, among other things, the emergency bilge pumping system was located in the engine casing through which the fire went. The magnetic valves were destroyed by the fire and thereby more hydraulic oil emitted that nourished the fire.

9. Measures:

The Division for Investigation of Maritime Accidents has recommended the Owner:

- To examine the possibility of improving the range of the portable VHF relay between the bridge and the deck.

The Owner has informed the Division that they have tested the range of the portable VHF relay in the ship. Not only between the car deck and the bridge but also between the bridge and other places in the ship. The necessary antenna amplifiers have now been mounted so that the range is complete all over the ship. The same tests have been made in all other passenger ships and the same routine will be followed as concerns the mounting of extra antenna cables to improve the VHF signal. They have also put up antenna amplifiers systems as such where needed.

- To examine whether the portable VHF equipment for the smoke divers can be improved to ensure more stable communication.

The Owner has informed the Division that they are examining whether the portable VHF equipment for smoke divers can be improved to ensure more stable communication. As yet, they do not know the final solution.

- To carry out a pressure test of the distributor pipe of the CO2 system in the sister ship.

The Owner has informed the Division that they have tested the distributor pipe of the CO2 system in the sister ship and have ascertained that this system does not have the same defects as the system in PRINCESS OF SCANDINAVIA.
• To place the hydraulic valve batteries for the emergency bilge pumping system in another place in the sister ship.

The Owner has informed the Division that they intend to place the hydraulic valve batteries in another place in the sister ship very soon.

Furthermore, the Owner has informed the Division that they have changed the control procedure for evacuation of passenger cabins. Every crew member who is to check a certain number of cabins according to the fire bill is now provided with a number of control signs that correspond completely to the number of cabins that each member has to check. The control signs are to be placed on the outside of the cabin door when a cabin has been checked. Hence, it is obvious whether a cabin has been checked or not. The crew members have to make sure that all of the signs have been used after they have finished the check of the cabins.
10. Enclosures:

1. Hydraulic pipe with leakage and with tear mark
2. Summary of Search and rescue report from Aberdeen MRCC.

BRIEF SUMMARY OF PRINCESS OF SCANDANAVIA INCIDENT 17-18 MAY 2002

VESSLE DETAILS - PRINCESS OF SCANDANAVIA
C/S OWNZ, REGISTERED COPENHAGEN, DENMARK.
PASSENGER/RO-RO CARGO FERRY
GRT 22528
LENGTH OVERALL 187 METRES.
VESSLE ON PASSAGE FROM RIVER TIME TO KRISTIANSAND IN NORWAY WITH 858 PERSONS ON BOARD (758 PASSENGERS
100 CREW)

VESSLE SUFFERED A FIRE IN AN ENGINE ROOM AND FUNNEL IN POSITION 56.01
NORTH, 002 21 EAST, APPROXIMATELY MIDWAY ON HER VOYAGE AND ABOUT 160
MILES SE OF ABERDEEN.

WEATHER CONDITIONS - WIND OBE FORCE 3-4, MODERATE SWELL, GOOD
VISIBILITY.

172149 BST
VESSLE RAISED THE ALARM BY TRANSMITTING AN NF DSC DISTRESS MESSAGE
WHICH WAS ACKNOWLEDGED BY ABERDEEN MRCC.
VESSLE FIGHTING FIRES AND MUSTERED ALL PASSENGERS. VEYSSLE DRIFTING.

NAVTEX RELAY BROADCAST MADE ON MF AND NAVTEX.
VABLESSES OFFERED TO PROCEED AND WERE TASKED. THEY WERE A MIX
OF FISHING, STANDBY, MERCHANT AND SUPPLY VESSELS.

ARCC KINLOCH REQUESTED TO TASK RAF HELICOPTERS AND WINCH TO PROCEED.
TWO SAR HELICOPTERS STATIONED OFFSHORE IN THE EXOFISH FIELD ALSO
TASKED BY ABERDEEN MRCC. ONE NORWEGIAN SAR HELICOPTER ALSO TASKED.
STORNOWAY COASTGUARD HELICOPTER BROUGHT TO IMMEDIATE READINESS.

CONTACT MADE WITH THE VESSEL ON 2182 KHZ AND INNAREAT.
SAR CO-OPERATION PLANS FIXED TO ABERDEEN FROM YARNSHINE MRCC
MASTER OF VESSEL CONFIDENT THAT FIRE-FIGHTING OPERATIONS ON BOARD WOULD SUCCEED.

FIRST VESSEL ON SCENE WAS FISHING VESSEL ST. MATTHEW.

MCC AARHUS OFFERED 2 SAR HELICOPTERS IF REQUIRED.

RECEPTION PLATFORMS IN THE AREA, A MIX OF FIXED AND FLOATING OIL INSTALLATIONS, WERE ORGANISED FOR THE HELICOPTERS, TOGETHER WITH FUEL.

17238 BST

CASSUALTY REPORTS THAT THE ENGINE ROOM FIRE IS OUT AND THEY ARE NOW DEALING WITH THE FUMEL FIRE. VESSEL IN REGULAR CONTACT.

ONE TUG "HUSKY" HAD RESPONDED TO MAYDAY BROADCAST AND WAS PROCEEDING.

HELICOPTERS PROCEEDING AT THIS TIME WERE:-

2 DAUPHINS FROM EKOFISK PLATFORM.

3 RAQ - R137 FROM RAF LOSSIEMOUTH, R131 FROM RAF BOUGIES, R177 FROM RH FRESTWICK. (RAF ALSO RE-POSITIONING OTHER HELICOPTERS IF REQUIRED).

1 SC1 FROM NORWAY.

DUTY REGION INSPECTOR AND PCG SO INFORMED.

172352 BST

CASSUALTY CONFIRMS THE SECOND FIRE IS OUT AND THEY ARE NOW TRYING TO RE-START AN ENGINE. INCIDENT DOWNGRADED TO AN URGENCY (FAN) WITH THE AGREEMENT OF CASSUALTY. CASSUALTY PREPARED TO ORGANISE TOWING ASSISTANCE. THE ONLY MEDICAL ASSISTANCE REQUIRED ON BOARD WAS FOR 2 PERSONS SUFFERING FROM SHOCK. VESSEL ABLE TO TREAT THEM ONBOARD.

3 HELICOPTERS RELEASED BACK TO LAND. 3 KEPT ON OIL INSTALLATIONS IN THE AREA. HIMROD REMAINING IN AREA.

180150 BST

CASSUALTY RE-STARTED ONE ENGINE AND WERE HEADING FOR NORWAY AT 10 KNOTS. VESSEL WORKING ON ANOTHER ENGINE. HOURLY COMMUNICATIONS SCHEDULE COMMENCED.

ALL REMAINING HELICOPTERS AND HIMROD STOOD DOWN. ALL VESSELS RELEASED, PAN BROADCAST CANCELLED.

180449 BST

CASSUALTY IN NORWEGIAN SRK AND CO-ORDINATION FORMALLY HANDLED OVER TO RCC STAVANGER.
3. Summary of Search and rescue plan from Aberdeen MRCC.

All remaining helicopters and Nimrod released to return to station. All vessels released. Pan cancelled.

180349UTC - Casually enters Norwegian SSR and co-ordination formally handed to RCC Stavanger who continue hourly safety checks with the casualty.

180855UTC - Casually reports she has 3 engines running and she is making 21 knots.

Approximately 181700UTC PRINCESS OF SCANDINAVIA arrives safely in Kristiansand, Norway. SAROPS terminated.

NOTE - Breakdown of passengers/crew was equally divided between male/female. Total number of people assisted during rescue operation was 884.

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Summary Narrative

2051UTC-MF DSC distress received from SCANDINAVIAN PRINCESS, 88401, reporting engine fire, 149NM Southwest of Aberdeen. 29 vessels, 6 rescue helicopter and Nimrod respond. Engine fire was extinguished and funnel fire took hold. No casualties. 1 engine started and vessel proceeded to Norwegian waters. Hourly safety checks made until co-ordination passed to RCC Stavanger at 0145UTC.

Incident Narrative

172049UTC - PRINCESS OF SCANDINAVIA, 88401 in position 56 02N 002 21E (149NM Southeast of Aberdeen), contacted Aberdeen MRCC via land-mass telephone. Casualty fighting fire between 2 engines, disabled and drifting. 50 passengers and crew mustering to lifeboats.

Mayday relayed on MF and Navtex. 29 vessels in total responded with a mixture of fishing vessels, stand by vessels, merchant vessels, supply vessels and a cruise liner.

ARCC Kinross requested to task helicopters. R137, R131, R125, R128, R177 tasked.

Nimrod aircraft R31 also tasked.

EKOFISK, 1x2 Tasked. RCC Anibus put 2 rescue helicopters on stand by.

In total: 6 helicopters plus 1 Nimrod proceeded to the casualty. 5 helicopters on immediate readiness.

Duty district officer, duty regional inspector and PCPSO informed.

172113UTC - Reception platform rig set up in the vicinity of the casualty to refuel helicopters and receive passengers. Casualty reported that the engine room fire was out and they are dealing with fire in funnel.

Vessel in regular contact with Aberdeen MRCC. One tug HUSKY responded to Mayday and was proceeding.

172235UTC - Casualty confirms that second fire is now out and they were trying to restart one of the engines. No casualties.

In consultation with the captain the incident is downgraded to a PAN situation. Casualty and owners are pressed to organise a tug. Only medical assistance required onboard is for 2 passengers with shock. Vessel dealing with themselves.

3 helicopters released to return to UK. 3 helicopters plus Nimrod stay on scene.

180050UTC - Casualty re-starts one engine and proceeds to Kristiansand, Norway at 10 knots. Chief engineer conditions to try and re-start one other engine. Hourly safety checks begin with Aberdeen MRCC.