

**ANNEX I**

**PASSENGER VESSEL  
EVACUATION DESCRIPTIONS**

## FSA of HLA on PassengerVessels

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## I.1 CRUISE LINERS

### I.1.1 Lakonia

The *Lakonia* caught fire and sank off the Canary Islands on 22 December 1963. It was a 20,200 GRT, 185m long Greek passenger liner, built in 1930. There were 651 passengers and 385 crew on board. While the ship was 160 miles north of Madeira, a fire started in the barber's shop at 22:30 on 22 December. Within 10 minutes it had spread to the whole of the upper deck. The evacuation was disorganised due to lack of public announcements, but lifeboats were launched. The first passing merchant ships reached the liner at 04:00, and picked up survivors from lifeboats for several hours. At 9:30 some people were still on the liner. By 12:00 the ship was on fire along its whole length except for the after deck; many people were in the water. In total, 908 people were rescued by other ships. There were 128 fatalities. The ship was taken in tow on 24 December, but sank on 29 December.

[Comment: No reports of helicopters in attendance. Probably out of range. A helideck on the evacuated ship would have been impaired by smoke. No reports of other passenger ships in the area.]

Ref : Hooke, N. (1997) : "*Maritime Casualties, 1963-1996*", LLP, London.  
Watson, M.H. (1995) : "*Disasters at Sea*", 2nd edition, PSL.

### I.1.2 Yarmouth Castle

The *Yarmouth Castle* caught fire and sank in the Caribbean on 13 November 1965. It was a 5000 GRT, 116m long Panamanian cruise liner, built in 1927. There were 375 passengers and 174 crew on board. While the ship was 13 miles off the Bahamas, a fire started in a midships cabin used for storage at about 00:30 on 13 November. The fire spread along wooden companionways, affecting the bridge and several lifeboats. The master was not called for 40 minutes, and many passengers did not hear the subsequent abandon ship alarm. The evacuation was disorganised, with the master one of the first to leave the ship. Passing merchant ships picked up 489 from lifeboats and the water. At 6:00 the ship capsized and sank. There were 89 fatalities. The ship was taken in tow on 24 December, but sank on 29 December.

[Comment: No reports of helicopters in attendance. A helideck on the evacuated ship would have been impaired by smoke.]

Ref : Hooke, N. (1997) : "*Maritime Casualties, 1963-1996*", LLP, London.  
Watson, M.H. (1995) : "*Disasters at Sea*", 2nd edition, PSL.

### I.1.3 Viking Princess

The *Viking Princess* was damaged by fire in the Caribbean on 8 April 1966. It was a 12,800 GRT, 163m long Norwegian cruise liner, built in 1950. There were 235 passengers and 259 crew on board. While the ship was 60 miles off Cuba, a fire started in the engine room at 01:44 on 8 April. The fire could not be controlled, and the master ordered the passengers and crew to abandon ship. The evacuation was well organised, although one lifeboat descended too quickly, and another was temporarily stuck in mid-air and had to be freed with an axe. There were 25 minor injuries. However, 2 passengers died from heart attacks. When passing merchant ships arrived, fire had enveloped the superstructure. They picked up all the

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passengers and crew from the lifeboats. The ship was towed to port, but was a constructive total loss. There were 2 fatalities in total.

[Comment: No reports of helicopters in attendance. A helideck would have been impaired by smoke.]

Ref : Hooke, N. (1997) : “*Maritime Casualties, 1963-1996*”, LLP, London.  
Watson, M.H. (1995) : “*Disasters at Sea*”, 2nd edition, PSL.

### I.1.4 Blenheim

The *Blenheim* was damaged by fire in the North Sea on 21 May 1968. It was a 4,800 GRT, 114m long ferry, built in 1951. It was sailing from Newcastle to Oslo with vehicles in the hold. A fire in the superstructure damaged the restaurants, cabins and bridge. The passengers and crew abandoned ship. It was towed into port and later converted.

[Comment: No reports of helicopters in attendance. A helideck would have been impaired by smoke.]

Ref : Watson, M.H. (1995) : “*Disasters at Sea*”, 2nd edition, PSL.

### I.1.5 Fulvia

The *Fulvia* caught fire and sank in the North Atlantic on 19 July 1970. It was a 16,900 GRT, 176m long Norwegian cruise liner, built in 1949. There were 448 passengers and 271 crew on board. While the ship was 140 miles off the Canary Islands, a fire started in the engine room at 01:00 on 19 July. The fire spread over the whole length of the ship, but the passengers and crew abandoned by lifeboat and were picked up by a passing ship. The ship was taken in tow, but sank the next day. There were no fatalities.

[Comment: No reports of helicopters in attendance. Probably out of range. A helideck would have been impaired by smoke.]

Ref : Hooke, N. (1997) : “*Maritime Casualties, 1963-1996*”, LLP, London.  
Watson, M.H. (1995) : “*Disasters at Sea*”, 2nd edition, PSL.

### I.1.6 Antilles

The *Antilles* grounded and caught fire in the Caribbean on 8 January 1971. It was a 19,800 GRT, 182m long French cruise liner, built in 1953. There were 350 passengers and 300 crew on board. The ship grounded on an uncharted reef at Mustique Island at 16:30 in calm conditions, causing flooding of 2 holds. While waiting for salvage tugs, the ship discharged fuel to lighten it, but this ignited at 17:45, causing a fire in the engine room, which spread to the restaurant deck. At 19:00, the master ordered the passengers to abandon ship. Lifeboats and liferafts were towed away from the ship by its powered launches. Most reached nearby islands, but a passing merchant ship picked up 85 crew from a lifeboat at sea. The passenger liner *Queen Elizabeth 2* picked up 510 people from Mustique Island. After 10 days, the *Antilles* broke up. There were no fatalities.

[Comment: No reports of helicopters in attendance. A helideck would have been impaired by smoke.]

Ref : Hooke, N. (1997) : “*Maritime Casualties, 1963-1996*”, LLP, London.  
Watson, M.H. (1995) : “*Disasters at Sea*”, 2nd edition, PSL.

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### I.1.7 Heleanna

The *Heleanna* was damaged by fire in the Adriatic on 28 August 1971. It was a 11,700 GRT, 167m long Greek ferry, converted from a tanker built in 1954. The ship was sailing from Patras to Ancona with over 1000 passengers, 94 crew, 6 lorries and 180 cars on board. The ferry's safety certificate only allowed 620 people on board, although it had life saving equipment for 1500. Fire started in the galley (reported as either paraffin or a gas cylinder exploding) at about 05:30, while the ship was 12 miles off the Italian Adriatic coast. Fire spread rapidly, and the order to abandon ship was given after 2 hours. The evacuation was disorganised. Many people jumped into the sea. Several injured were taken to hospital by helicopter. Many small vessels took survivors to the shore. There were 25 fatalities and 150 injuries. The vessel was towed while still on fire, and the fire was extinguished on 30 August. It was a constructive total loss.

[Comment: Reports of helicopters in attendance do not specify arrival time. Possibly only picked up injured already on shore. A helideck on the ship would have been impaired by smoke.]

Ref : Hooke, N. (1997) : "*Maritime Casualties, 1963-1996*", LLP, London.  
Watson, M.H. (1995) : "*Disasters at Sea*", 2nd edition, PSL.

### I.1.8 Caribia

The *Caribia* grounded at Cannes on 23 September 1972. It was a 24,500 GRT, 192m long cruise liner, built in 1928. One of its diesel engines failed, causing it to drift and ground in Cannes Bay. Water entered the engine room. The 880 passengers were taken ashore by boats. The ship was refloated and towed into port.

[Comment: No reports of helicopters in attendance. Helicopter evacuation was not necessary]

Ref : Watson, M.H. (1995) : "*Disasters at Sea*", 2nd edition, PSL.

### I.1.9 Knossos

The *Knossos* was damaged by fire in the Mediterranean on 3 May 1973. It was a 10,900 GRT, 150m long passenger ferry, built in 1953. On a voyage from Piraeus to Limassol, fuel oil leaked onto a generator causing a fire that damaged the main switchboard. The 186 passengers and some crew transferred to another ship by lifeboat. The ship was towed into port and later scrapped.

[Comment: No reports of helicopters in attendance. Helicopter evacuation was not necessary]

Ref : Watson, M.H. (1995) : "*Disasters at Sea*", 2nd edition, PSL.

### I.1.10 Cunard Ambassador

The *Cunard Ambassador* was damaged by fire off Florida on 12 September 1974. It was a 14,200 GRT, 148m long British cruise liner, built in 1972. The ship was on a positioning voyage from Port Everglades to New Orleans with 290 crew but no passengers. While 40 miles offshore, fire started in the engine room due to a ruptured fuel line. It spread into 7 decks of accommodation. Most of the crew abandoned ship. The fire was later extinguished, and the ship was towed into port. It was a constructive total loss.

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[Comment: No reports of helicopters in attendance. Helicopter evacuation was not necessary. A helideck would have been impaired by smoke.]

Ref : Hooke, N. (1997) : “*Maritime Casualties, 1963-1996*”, LLP, London.  
Watson, M.H. (1995) : “*Disasters at Sea*”, 2nd edition, PSL.

### I.1.11 Princess Sissy

The *Princess Sissy* grounded in the Adriatic on 7 January 1976. It was a 4200 GRT, 113m long Panamanian passenger vessel, built in 1948. The ship was on a cruise from Genoa with 361 passengers and 115 crew on board. The ship grounded between 2 islands 30 miles from the Yugoslav port of Split. A passing merchant ship took off all passengers and 78 crew. The ship was later refloated and towed to port, but was a constructive total loss. There were no fatalities.

[Comment: No reports of helicopters in attendance. Helicopter evacuation was not necessary.]

Ref : Hooke, N. (1997) : “*Maritime Casualties, 1963-1996*”, LLP, London.

### I.1.12 Mecca

The *Mecca* was damaged by fire off Jeddah on 18 December 1976. It was a 3900 GRT, 108m long Saudi Arabian passenger vessel, built in 1951. The ship was leaving Jeddah for Port Sudan with 1105 pilgrims and 76 crew on board. While 17 miles offshore, fire started in 3 unoccupied cabins below the bridge. The passengers and crew abandoned ship. It drifted onto a reef, and capsized and sank on 20 December.

[Comment: No reports of helicopters in attendance. Helicopter evacuation was not necessary. A helideck would have been impaired by smoke.]

Ref : Hooke, N. (1997) : “*Maritime Casualties, 1963-1996*”, LLP, London.  
Watson, M.H. (1995) : “*Disasters at Sea*”, 2nd edition, PSL.

### I.1.13 Patra

The *Patra* was damaged by fire in the Red Sea on 23 December 1976. It was a 3900 GRT, 114m long Egyptian passenger vessel, built in 1946. The ship was sailing from Jeddah to Suez with 353 pilgrims and 88 crew on board. While 48 miles offshore, a fire started in the engine room at 22:00 on December 23. The passengers were at first reluctant to leave the ship as there were insufficient lifejackets, but the fire-fighting equipment was inadequate to control the fire. 230 survivors were rescued by passing ships. The ship sank at 12:15 on December 24. There were 102 fatalities.

[Comment: No reports of helicopters in attendance. Probably out of range. A helideck would have been impaired by smoke.]

Ref : Hooke, N. (1997) : “*Maritime Casualties, 1963-1996*”, LLP, London.  
Watson, M.H. (1995) : “*Disasters at Sea*”, 2nd edition, PSL.

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**I.1.14 Rasa Sayang**

The *Rasa Sayang* was damaged by fire in the Malacca Strait on 2 June 1977. It was a 18,600 GRT, 176m long Greek passenger vessel, built in 1956. There were 653 passengers, many of them school children, and 340 crew on board. While 48 miles off Port Dickson, Malaysia, a fire started in the upper deck. The passengers abandoned ship. The fire was controlled after 12 hours, but 5 crew were killed. The ship was towed to port for repairs.

[Comment: No reports of helicopters in attendance. A helideck would have been impaired by smoke.]

Ref : Hooke, N. (1997) : “*Maritime Casualties, 1963-1996*”, LLP, London.  
Watson, M.H. (1995) : “*Disasters at Sea*”, 2nd edition, PSL.

**I.1.15 Angelina Lauro**

The *Angelina Lauro* was damaged by fire in the Caribbean on 30 March 1979. It was a 24,400 GRT, 205m long Italian passenger vessel, built in 1939. The ship was at its berth in St Thomas, and most of the 650 passengers and 350 crew were ashore. A fire started in the galley and quickly spread. The remaining passengers and crew on board were taken off by lifeboat. Tugs were unable to tow the ship away, and due to the firewater it heeled and grounded at the berth. There were no fatalities. The ship was later refloated, but sank under tow on 24 September.

[Comment: No reports of helicopters in attendance. A helideck would have been impaired by smoke.]

Ref : Hooke, N. (1997) : “*Maritime Casualties, 1963-1996*”, LLP, London.  
Watson, M.H. (1995) : “*Disasters at Sea*”, 2nd edition, PSL.

**I.1.16 Prinsendam**

The *Prinsendam* caught fire and sank off Alaska on 4 October 1980. It was a 8600 GRT, 130m long Netherlands Antilles registered cruise liner, built in 1973. There were 320 passengers and 204 crew on board. While the ship was 120 miles off Alaska, a fire started in the engine room around 00:30 on 4 October. The CO<sub>2</sub> system was discharged but failed to extinguish the fire. Passengers were assembled in the lounge. The fire continued to spread, causing failure of power and fire water supplies. The Master ordered the passengers to abandon ship at 06:15, leaving 40 crew on board to fight the fire. The passengers and non-essential crew were rescued from the lifeboats by US Coast Guard helicopters, which transferred 359 of them to a passing tanker that had a helideck. However, many elderly passengers had to wait in the lifeboats for up to 13½ hours before being picked up, due to worsening weather, darkness and delays for refuelling. There were no fatalities, but 24 people suffering hypothermia were taken direct to hospital ashore. By 16:00 the fire on board was out of control and the remaining crew had to abandon ship. A US Coast Guard vessel rescued 18 passengers and 2 air crew from a lifeboat at 01:00 on 5 October. By 7 October, the fire had largely burned out, and the ship was re-boarded and taken in tow. The following day, the fire restarted and the salvage crew were taken off by helicopter. The weather then worsened, causing the ship to flood through broken port holes, and it capsized and sank on 11 October. It was insured for £8m. There were no fatalities or serious injuries.

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[Comment: USCG S61s were in attendance, but arrival time is unknown. If the ship had had a helideck, this might have been used for the evacuation, and would have avoided hypothermia injuries. Since no lives were lost, no extra would have been saved. The helideck on the nearby tanker was a significant benefit, reducing flying time to unload. Without it, there may have been some fatalities among people in the lifeboats.]

Ref : Hooke, N. (1997) : “*Maritime Casualties, 1963-1996*”, LLP, London.

Watson, M.H. (1995) : “*Disasters at Sea*”, 2nd edition, PSL.

### I.1.17 Syria

The *Syria* grounded in the Mediterranean on 20 August 1981. It was a 4400 GRT, 108m long Egyptian passenger ship, built in 1962. During a voyage from Piraeus to Alexandria it grounded on Crete. The 300 passengers were evacuated. The ship was refloated 8 days later and towed into port.

[Comment: No reports of helicopters in attendance. Helicopter evacuation was not necessary]

Ref : Watson, M.H. (1995) : “*Disasters at Sea*”, 2nd edition, PSL.

### I.1.18 Mediterranean Star

The *Mediterranean Star* was damaged by fire in the Mediterranean on 28 August 1982. It was a 16,300 GRT, 181m long Greek passenger ferry, built in 1953. On a voyage from Patras, Greece, to Ancona, Italy, the ship had a fire in its engine room. The 1000 passengers and some crew abandoned ship by lifeboat. The remaining crew stayed on board and extinguished the fire. The ship sailed into port under its own power.

[Comment: No reports of helicopters in attendance. Helicopter evacuation was not necessary]

Ref : Watson, M.H. (1995) : “*Disasters at Sea*”, 2nd edition, PSL.

### I.1.19 Scandinavian Sea

The *Scandinavian Sea* was damaged by fire off Florida on 9 March 1984. It was a 10,700 GRT, 149m long Bahamian registered cruise liner, built in 1970. It was returning to Port Canaveral after a dinner and gambling cruise with 946 passengers. An electrical fire started at about 19:30. The ship berthed at 22:00, still on fire, and the passengers and crew disembarked. There were only a few minor injuries. Eventually, 30% of the vessel was gutted before the fire was extinguished at 16:30 on 11 March. The ship, which was insured for £8m, was declared a constructive total loss, but was later repaired.

[Comment: No reports of helicopters in attendance. Helicopter evacuation was not necessary. A helideck would have been impaired by smoke]

Ref : Hooke, N. (1997) : “*Maritime Casualties, 1963-1996*”, LLP, London.

Watson, M.H. (1995) : “*Disasters at Sea*”, 2nd edition, PSL.

### I.1.20 Columbus C

The *Columbus C* flooded after an impact on a breakwater at Cadiz on 29 July 1984. It was a 16,300 GRT, 182m long Panamanian cruise liner, built in 1953. While docking, the ship was blown against an underwater breakwater spur, flooding its engine room. Tugs took the vessel

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to a jetty, where the 620 passengers disembarked. Subsequently the ship listed and sank. It was later refloated and broken up.

[Comment: No reports of helicopters in attendance. Helicopter evacuation was not necessary]

Ref : Hooke, N. (1997) : “*Maritime Casualties, 1963-1996*”, LLP, London.  
Watson, M.H. (1995) : “*Disasters at Sea*”, 2nd edition, PSL.

### I.1.21 Chidambaram

The *Chidamburam* was damaged by fire in the Indian Ocean on 12 February 1985. It was a 17,200 GRT, 174m long Indian passenger ship, built in 1966. It was sailing from Singapore to Madras with 702 passengers and 186 crew. While 300 miles off Madras, a fire started in the galley, and spread into the dormitory passenger accommodation. The crew controlled the fire after 16 hours, and the ship entered port under its own power. There were 40 fatalities.

[Comment: No reports of helicopters in attendance. Probably out of range. A helideck would have been impaired by smoke]

Ref : Watson, M.H. (1995) : “*Disasters at Sea*”, 2nd edition, PSL.

### I.1.22 Mikhail Lermontov

The *Mikhail Lermontov* grounded and sank in the Cook Strait, New Zealand, on 16 February 1986. It was a 20300 GRT, 176m long Russian passenger vessel, built in 1972. There were 409 passengers and 329 crew on board. The ship scraped over a rock while passing through the Cook Strait, due to a fatigue-induced error by the pilot. Water entered faster than the pumps could remove it, flooding the refrigeration compartment and other spaces, and producing a starboard list that had increased to 12° after 1½ hours. One crew member was trapped in the engine room, and drowned. Water seeped from the refrigeration compartment into the auxiliary engine room via a sliding door. The master attempted to beach the ship, but water entered the main switchboard room, causing power failure and hence loss of propulsion. The passengers and crew abandoned ship in lifeboats, which was completed in 3 hours with no panic but with difficulty due to the list and the moderately rough weather. After 5 hours, 20 minutes after the evacuation completed, the ship sank with a list of 85°. There was only 1 fatality and no injuries.

[Comment: No reports of helicopters in attendance. A helideck might have helped the evacuation, but may have been impaired by the heel.]

Ref : Hooke, N. (1997) : “*Maritime Casualties, 1963-1996*”, LLP, London.  
Watson, M.H. (1995) : “*Disasters at Sea*”, 2nd edition, PSL.  
Safety at Sea, May 1987  
Lloyd’s List, 17 July 87

### I.1.23 Admiral Nakhimov

The *Admiral Nakhimov* sank after a collision in the Black Sea on 31 August 1986. It was a 17000 GRT, 174m long Russian passenger vessel, built in 1925. There were 888 passengers and 346 crew on board. It was leaving Novorossisk at 12 knots when it met the 18,600 GRT bulk carrier *Petr Vasev*. The ships had agreed by VHF that the *Petr Vasev* would give way, in

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contravention of the collision rules. The master of the *Petr Vasev* was concentrating on his ARPA radar, and tried to reduce speed rather than change course. The *Admiral Nakhimov* tried to avoid the collision by turning to port, in contravention of the collision rules, but this was unsuccessful. The ships struck at right angles at 23:15, with the bow of the *Petr Vasev* hitting the *Admiral Nakhimov* between the engine room and boiler room, causing damage 80m long, including a 90 m<sup>2</sup> hole. The *Admiral Nakhimov* capsized and sank within 8 minutes. There was no time to launch any lifeboats. 423 people died, together with 2 divers searching the wreck for survivors. Three fuel tanks were damaged, and the rescue operation was hampered by oil from the wreck. Two years later the ship was still leaking oil, and the wreck was covered by a 5 tonne rubber mat weighted with rocks.

[Comment: No reports of helicopters in attendance. A helideck would have been impaired by smoke.]

Ref : Hooke, N. (1997) : “*Maritime Casualties, 1963-1996*”, LLP, London.  
Soviet Shipping No 3, 1987  
Safety at Sea, Jan 1988

### I.1.24 North Star

The *North Star* grounded off Alaska on 8 August 1986. It was a 3100 GRT, 89 m long Bahamian registered passenger vessel, built in 1966. It was on a cruise from Prince Rupert to Vancouver when it grounded near Prince of Wales Island, Alaska. The ship started to flood. As a precautionary measure, most of the passengers and crew were taken off by the USCG. After repairs, the ship was towed into port. It was a constructive total loss.

[Comment: Not clear whether helicopters were used in the evacuation.]

Ref : Hooke, N. (1997) : “*Maritime Casualties, 1963-1996*”, LLP, London.

### I.1.25 Turkmeniya

The *Turkmeniya* was damaged by fire off Nakhodka, USSR, on 11 November 1986. It was a 5100 GRT, 122 m long Russian passenger vessel, built in 1961. It was conducting an educational cruise, out of Vladivostok, with over 300 children on board. A fire in the engine room while the ship was 60 miles offshore spread to one of the cabin decks. The passengers were evacuated by lifeboat, and picked up by fishing vessels 2 hours later. The fire was extinguished later the same day, and the vessel towed into port. It was a constructive total loss.

[Comment: Helicopters were involved in rescue attempts, but no details on arrival time. A helideck on the casualty would have been no use due to the rapid capsizing. It is not clear whether any rescue vessels were large enough for a helideck.]

Ref : Hooke, N. (1997) : “*Maritime Casualties, 1963-1996*”, LLP, London.

### I.1.26 Priamurye

The *Priamurye* was damaged by fire at Osaka on 18 May 1988. It was a 4870 GRT Russian passenger ship, built in 1961. There were 259 passengers and 129 crew on board. The ship was berthed in port. The fire started around 01:00 in a cabin on the bottom passenger deck due to improper use of a household electrical heater. Passengers attempted to extinguish the

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fire themselves, and failed to alert the crew promptly. The fire spread to the bridge and crew accommodation, and shore fire services were not called for nearly an hour. Most of the passengers and crew left via the gangway to shore within 15 minutes of the alarm. Some could not escape from the lower decks and jumped through portholes into the harbour. The fire was controlled by fireboats and shore appliances after 12 hours. 11 people died (10 trapped on the bottom passenger deck and one found on the upper deck) and 35 were injured.

[Comment: No reports of helicopters in attendance. A helideck would have been impaired by smoke.]

Ref : Lloyd's List

### I.1.27 Jupiter

The *Jupiter* sank after a collision with the car carrier *Adige* off Piraeus on 21 October 1988. It was a 6300 GRT 126 m long Greek school cruise ship, built in 1961. There were 391 children, 84 adults and 110 crew on board. The *Jupiter* was leaving port at 18:20, and was struck in its engine room and heeled quickly, causing power failure and preventing the use of the lifeboats. Most of the passengers and crew were transferred directly to small craft as the upper decks came level with the waterline. About 25 children were left after 40 minutes, when the ship sank, and most were picked up within about a minute. One crew member died from a heart attack while trying to help people in the water, and another died after striking his head against a tug involved in the rescue. Two passengers were missing, giving a total of 4 fatalities.

[Comment: The ship sank too quickly for helicopter to arrive. A helideck would have been no use due to the large heel angle]

Ref : Lloyd's List

### I.1.28 Maksim Gorkiy

The *Maksim Gorkiy* was damaged by impact on an ice floe off Spitzbergen on 20 June 1989. It was a 25,000 GRT passenger liner, built in 1969. It was carrying 575 passengers and 377 crew. Conditions were calm with daylight, and temperature 2-3°C. It met an ice floe 12 miles long and 2-3m thick, which was unusual for the area and time of year. The ship was proceeding too fast for the conditions, and failed to see the ice, hitting it at 17 knots, causing holes of 2.5 x 0.8m and 6 x 0.01m in the bow, which was not ice-strengthened. The ship trimmed as water entered the bow. As a precaution, 325 passengers were evacuated by lifeboat and about 25 climbed onto the ice. A Norwegian Coast Guard vessel picked them up, and some were flown ashore by helicopter. 290 crew remained on board. Pumps were taken on board and the ship returned to port. There were no fatalities.

[Comment: The casualty was 90 minutes flying time from Spitzbergen. The first vessel to arrive was the Norwegian Coast Guard vessel *Senja*, which used its on-board (?) helicopter to take 13 passengers with health problems to hospital on Spitzbergen. Another report said 6 Norwegian Air Force Sea Kings and 2 Soviet helicopters lifted some of the 325 evacuated passengers onto the *Senja*, and a total of 70 were flown ashore. By the time helicopters arrived, the passengers had left the ship. A helideck on the casualty would have helped deliver pumps and salvage crews, but no lives were lost through winching. ]

Ref : Lloyd's List

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**I.1.29 Pegasus**

The *Pegasus* was damaged by fire at Venice on 2 June 1991. It was a 13,300 GRT, 153 m long Greek passenger vessel, built in 1975, previously a car ferry, but converted to an 800-berth cruise liner, and used as a floating exhibition ship. The ship was about to leave port with 38 passengers and 209 crew on board. The fire began in the exhibition area (previously the car deck), and spread rapidly causing extensive smoke and serious internal damage. All passengers and crew were evacuated, probably direct to shore via gangways. The fire was extinguished after 12 hours. Fire-water caused the ship to heel and sink to the sea bed. The vessel, which was insured for £21m, was declared a total loss, but was refloated and repaired.

[Comment: No reports of helicopters in attendance. Helideck would have been impaired by smoke. Not needed anyway as casualty apparently occurred at berth]

Ref: Lloyd's List

Hooke, N. (1997) : "*Maritime Casualties, 1963-1996*", LLP, London.

**I.1.30 Oceanos**

The *Oceanos* sank in rough weather off South Africa on 4 August 1991. It was a 7500 GRT 150 m long Greek passenger liner, built in 1951. It had 401 passengers and 180 crew on board. Conditions were the worst of the year, with 45 knot winds. At around 21:00 on 3 August, water entered the engine room through a damaged seawater pipe. The ship lost power and began to drift towards the shore. Watertight doors were closed, but flooding through pipes allowed other compartments to flood. The ship heeled to 20° and was rolling heavily.

The ship sent a Mayday at 23:00, but was advised to keep the passengers on board until daylight since there were no other vessels or helicopters in the area. However, the ship appeared to be about to sink, and the master was cut off while checking the stern of the ship. After 02:00, 2 of the ship's 8 lifeboats were launched, although with difficulty due to the lack of power and the severe weather. By about 06:00, about 400 people had left the ship in its 8 lifeboats and some liferafts. Many passengers jumped into the sea.

Passing cargo ships arrived after 05:45 and rescued about 400 people from lifeboats and the sea. One container ship used its enclosed lifeboat to pick people from the water and transfer them to an accommodation ladder, although with difficulty due to the cold. Helicopters arrived at 06:50 and winched the last 180 passengers and crew off the ship shortly before it capsized at 11:45 on 4 August, 1 ½ miles off the coast. There were no fatalities.

[Comment: 11 Puma helicopters from SADF were transported 1000 miles overnight to a temporary base near to the casualty. A helideck on board would have been useful to speed the evacuation, although the ship may have been rolling too much to have used it. Since no lives were lost, none could have been saved by this anyway. Helidecks on the rescue ships would have been no use because the shore base was very close.]

Ref: Hooke, N. (1997) : "*Maritime Casualties, 1963-1996*", LLP, London.

Lloyd's List

**I.1.31 Queen Elizabeth 2**

The *Queen Elizabeth 2* grounded off Cape Cod, USA, on 7 August 1992. It is a 69,000 GRT passenger liner, built in 1968. It was approaching New York with 1815 passengers and 1000

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crew. The ship struck an uncharted rock ledge at 22:20 while under the control of a pilot, puncturing 3 ballast tanks, an empty fuel tank and a tank containing 124 tonnes of fuel oil. The ship refloated itself and anchored 15 miles offshore. There were no injuries and minimal fuel leakage. The passengers were taken ashore in 4.5 hours the next day by 4 ferries and 6 of the ship's lifeboats.

[Comment: No reports of helicopters in attendance. Probably not needed]

Ref : Lloyd's List

### I.1.32 Seabourn Spirit

The *Seabourn Spirit* was damaged by fire in the Mediterranean on 14 August 1992. It is a 9980 GRT Norwegian cruise liner, built in 1989. It was on a cruise from Barcelona to with 178 passengers and 148 crew. Conditions were calm. Fire started in the engine room while 12 miles offshore. The ship sent a Mayday at 05:55. Launches, 3 fire-fighting tugs, fire service helicopters and 3 other vessels in the area arrived quickly. The passengers and most of the crew were transferred in lifeboats to the passenger vessel *Danae*, which brought them to Genoa. The fire was extinguished without spreading from the engine room. The ship was towed into port. There were no injuries.

[Comment: No reports of helicopter arrival time. Not needed for evacuation]

Ref : Lloyd's List

### I.1.33 Royal Pacific

The *Royal Pacific* sank after a collision with a fish factory vessel *Terfu 51* in the Malacca Strait on 23 August 1992. It was a 13,200 GRT cruise liner, built in 1965 as a Ro-Ro ferry but converted to have cabins in the vehicle deck. It was conducting a circular gambling cruise out of Singapore, with 355 passengers and 179 crew. At 02:20, it was rammed by the *Terfu 51*, causing damage above and below the waterline, flooding the engine room. The ship heeled and water entered the cabins above. All lifeboats were launched. Survivors were picked up by passing ships. The ship sank within 10-15 minutes. Three people drowned and 6 were missing, possibly trapped inside the hull.

[Comment: Helicopters (possibly including S61) were used to search for survivors but could not have arrived before the ship sank. In this area, passing ships probably arrived quickly, and are better than helicopter for rescuing people from lifeboats. Helideck on rescue ships might have helped take injured ashore, but no fatalities occurred after rescue, so there would have been no saving of life]

Ref : Lloyd's List

### I.1.34 Ocean Princess

The *Ocean Princess* grounded in the River Amazon on 1 March 1993. It was a 8500 GRT 150m long cruise liner, built in 1967. There were 280 passengers and 250 crew on board. While leaving Belem, the ship struck an unbuoyed sunken wreck, causing a rupture 9 m x 0.12 m in the hull, flooding the engine room and 2 decks of passenger cabins. The ship was beached. The passengers were ferried ashore. There were no injuries or fatalities. The ship

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was refloated on 20 March, but was a constructive total loss, with an insurance value of £16m.

[Comment: Unlikely to be any passenger helicopters in the area]

Ref : Hooke, N. (1997) : “*Maritime Casualties, 1963-1996*”, LLP, London.  
Lloyd’s Casualty Reports

### I.1.35 Sally Albatross

The *Sally Albatross* grounded off Helsinki on 4 March 1994. It was a 25,000 GRT passenger ferry, built in 1992 from the hull of an earlier Ro-Ro ferry. It was entering Helsinki from Tallinn with 1101 passengers and 158 crew. Conditions were severe wind and ice, with temperature  $-5^{\circ}\text{C}$ . The ship was off course due to the crew’s unfamiliarity with the ship’s new automatic chart system. The instruction manual was incomplete, the crew had received little training, and the officer of the watch was used to a different system. The ship struck a rock at 19 knots at 14:45, causing a 6 x 1m hole, which pierced the ship’s double skin and flooded the engine room. It tried to refloat under its own power and sent a Mayday at 16:35. The passengers and crew were then evacuated in 2 hours through the stern onto other vessels as the ship trimmed and reached a  $25^{\circ}$  heel. Two icebreakers transferred the passengers to the passenger/Ro-Ro ferry *Saint Patrick II*. Some hours later, the ship nearly sank and was towed further onto the rocks to prevent this. It was eventually refloated on 18 April and towed to port.

[Comment: 3 helicopters brought sea rescue staff but did not evacuate any passengers]

Ref : Lloyd’s List

### I.1.36 Regal Empress

The *Regal Empress* was damaged by fire at New York on 19 August 1994. It is a 14,500 GRT passenger vessel, built in 1953. It was approaching New York with 1200 passengers and 300 crew. Fire started in old cork insulation or air-conditioning pipes, which self-ignited. It had been overlooked when the vessel was converted in the 1980s. The vessel was 30 minutes from its berth when the alarm was raised at 07:40. Smoke spread through the vessel via ducts, and there were several injuries due to smoke inhalation. The ship docked and passengers disembarked. The vessel’s fire-fighting system contained the fire, but due to difficulties in locating its source it was not extinguished until 12:40. There were no fatalities.

[Comment: No reports of helicopter in attendance. Not needed for evacuation]

Ref : Lloyd’s List

### I.1.37 Achille Lauro

The *Achille Lauro* sank after a fire off Somalia on 30 November 1994. It was a 23,600 GRT, 196 m long Italian cruise liner, completed in 1947. There were 577 passengers and 402 crew on board. Conditions were calm. The fire started at 00:30 on 30 November, when the ship was 100 miles offshore. It was reported to have been due to a ‘burst piston head’ in one of the ship’s eight 2-stroke diesel engines that had been installed in 1944, but in fact may have been

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a crank-case explosion, allowing cooling oil to enter the exhaust. The engine room CO<sub>2</sub> system was discharged but failed to extinguish the fire. The fire then spread through the exhaust system, and progressively engulfed the entire ship. Sprinklers activated in the surrounding areas caused the ship to list to 20°.

The internal alarm system did not work. The master sounded the ship's horn, but most passengers were alerted by stewards banging on cabin doors. They gathered on deck until about 08:00, when the master decided to abandon ship. The ship had 9 lifeboats on each side, with a total capacity of 1516, and 15 liferafts. Some jammed while being lowered, but eventually all but one of the lifeboats were launched. The passengers complained about looting of cabins, and the crew members boarding the lifeboats first. About 900 passengers and crew were evacuated in the lifeboats and liferafts. The first rescue ship, a tanker, arrived at 10:30 and during the next few hours picked up 927 passengers and crew. The other survivors were picked up by a bulk carrier. At 13:00 the remaining 100 crew had to leave the ship, as the list increased to 30° and the fire continued to spread.

Helicopters from US Navy warships arrived at 21:00 and assisted by transferring supplies. The survivors had to remain on the tanker's deck that night, and on the following day most were shuttled in lifeboats to 9 other vessels heading for the coast. A fire tug tried to take the ship in tow, but it exploded, capsized and sank at 19:10 on December 2. The ship's hull was insured for £11m. There were 4 passengers aged 66 – 74 who died. One was missing; one was killed by a blow on the head while boarding a lifeboat; one had a heart attack; one died of a blocked intestine after falling ill on a rescue vessel.

[Comment: First helicopters arrived having flown ahead from approaching US Navy warships – guided missile cruiser *Gettysburg* and guided missile frigate *Halyburton*. All survivors had been rescued by this time. However, a lot of passenger transfers were done the next day, and helicopter capacity would have been very useful. This might have reduced the extra stress contribution to the death of one passenger on a rescue ship. But these helicopters probably had minimal passenger capacity and could not have done this work anyway]

Ref : Hooke, N. (1997) : “*Maritime Casualties, 1963-1996*”, LLP, London.  
Watson, M.H. (1995) : “*Disasters at Sea*”, 2nd edition, PSL.  
The Naval Architect, January 1995  
Lloyd's Casualty Reports

### I.1.38 Renaissance Six

The *Renaissance Six* grounded in the Mediterranean on 10 May 1995. It is a 4200 GRT cruise vessel, built in 1991. There were 110 passengers and 73 crew on board. The ship ran aground between the Greek islands of Kos and Kalymnos. The passengers and crew were taken off. The ship was refloated on 12 May. There were no injuries or fatalities.

[Comment: No reports of helicopters in the area. No need for helicopter evacuation]

Ref : Lloyd's Casualty Reports

### I.1.39 Albatros

The *Albatros* suffered a fire in the Red Sea on 22 May 1995. It is a 24,800 GRT cruise liner, built in 1957. There were 565 passengers and 311 crew on board. A flash fire broke out in one of the boilers at 23:00, when the ship was 60 miles off Yanbu, Saudi Arabia. The fire was

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quickly extinguished, but the engine room was partly flooded with firewater, and the other boilers were shut down, leaving the ship with only auxiliary power. The ship drifted for a day until a tug arrived to tow it into port, where the passengers disembarked. There were no injuries or fatalities.

[Comment: No reports of helicopters in the area. No need for helicopter evacuation]

Ref : Lloyd's Casualty Reports

### I.1.40 Celebration

The *Celebration* suffered a fire in the Caribbean on 18 June 1995. It is a 47,300 GRT cruise liner, built in 1987. There were 1760 passengers and 667 crew on board. A fire started in an electrical control panel in the engine room, which was extinguished after 45 minutes by the halon system, but left the ship disabled 35 miles off the Bahamas. Two merchant ships were nearby, but the vessel was in no immediate danger. Later a Coast Guard vessel towed the vessel further out. On 20 June another cruise liner arrived and tenders transferred the passengers to it in 7 hours. There were no injuries or fatalities.

[Comment: Coast Guard helicopters attended. No reports of arrival time. No need for helicopter evacuation]

Ref : Lloyd's Casualty Reports

### I.1.41 Star Princess

The *Star Princess* grounded off Alaska on 23 June 1995. It is a 63,500 GRT cruise liner, built in 1989. There were 1550 passengers and 600 crew on board. The ship struck a rock while waiting to enter Juneau with a pilot on board, causing flooding at the stern. The ship anchored 14 miles offshore. The passengers were taken ashore by motorboat. The hull was repaired and the ship sailed under its own power on 26 June. There were no injuries or fatalities. Repairs were estimated to cost \$20m.

[Comment: Coast Guard helicopters attended. No reports of arrival time. No need for helicopter evacuation]

Ref : Lloyd's Casualty Reports

### I.1.42 Regent Star

The *Regent Star* suffered a fire off Alaska on 22 July 1995. It is a 24,500 GRT cruise liner, built in 1957. There were 1284 passengers and crew on board. It was sailing from Seward to Valdez, Alaska. The fire started at about 03:40 in the vessel's engine room and spread to some passenger activity areas before being extinguished after 2 hours. At 06:10, another passenger vessel, *Rotterdam*, arrived, and the passengers transferred to it. There were 7 minor injuries to passengers in the evacuation, but no fatalities. The ship was towed into port on 9 August.

[Comment: USCG helicopters were sent, but the fire was extinguished before they arrived.]

Ref : Lloyd's Casualty Reports

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**I.1.43 Universe Explorer**

The *Universe Explorer* suffered a fire off Alaska on 27 July 1996. There were 732 passengers and 271 crew on board. It was sailing from Vancouver to Glacier Bay, Alaska. The fire started at about 03:00 in the vessel's main laundry room, possibly due to arson. Smoke entered the passageways because fire doors were closed too late. There was no co-ordinated search plan, and crew members searched smoke-filled passageways without breathing apparatus. Some crew were trapped in their cabins for 5 hours by the smoke. 5 crew were killed and 76 suffered smoke-related injuries. Passengers were left unattended at muster stations for up to 7 hours. The vessel anchored in Auk Bay, and the passengers were taken off.

[Comment: A USCG helicopter was sent, but no reports of arrival time. Possibly helicopter evacuation would have been useful, but could not have saved any lives.]

Ref : Lloyd's Casualty Reports

**I.1.44 Gripsholm**

The *Gripsholm* grounded in the Oresund off Sweden on 4 August 1996. It is a 25,000 GRT cruise liner, built in 1965. There were 600 passengers and 335 crew on board. The ship was sailing from Copenhagen to Kiel at a speed of 18 knots in good weather. It grounded in soft sand at 20:40, 2 miles off Landskrona. The next day, the passengers were taken off by the ship's own motor launch from an accommodation ladder, and ferried ashore, taking approximately 6 hours. A bunker vessel off-loaded 1750 tonnes of fuel oil. The vessel was refloated by 5 tugs on August 7, and towed into port. There were no injuries or fatalities.

[Comment: No reports of helicopters in attendance. Helideck might have been used, depending on cost, but since no lives were lost, none would have been saved.]

Ref : Lloyd's Casualty Reports

**I.1.45 Hanseatic**

The *Hanseatic* grounded off Northern Canada on 29 August 1996. It is an 8400 GRT cruise liner, built in 1991. There were 153 passengers and 115 crew on board. While cruising through the North West Passage from Alaska to Greenland at 10 knots, the ship grounded on a shingle bank 1 mile offshore near King William Island, puncturing 2 diesel fuel tanks. A tug and tank barge to offload bunker fuel were delayed by bad weather and did not arrive until 5 September. Once the weather improved, the passengers were taken off and most transferred to another cruise vessel. There were no injuries or fatalities. The ship was refloated on September 8.

[Comment: No reports of helicopters in the area. Assumed too remote from helicopter bases]

Ref : Lloyd's Casualty Reports

**I.1.46 Albatros**

The *Albatros* grounded off the Scilly Isles on 16 May 1997. It is a 24,800 GRT cruise liner, built in 1957. There were 504 passengers and 320 crew on board. Conditions were Force 3,

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with moderate visibility. The ship was leaving St Mary's anchorage at 14:30 following a pilot boat, as it was too rough for the pilot to board. It scraped over rocks (first thought to be a container), puncturing the hull and flooding machinery spaces. The ship returned to port and anchored. Passengers were taken off by the ship's launches from its accommodation ladder, and transferred to a chartered ferry. There were no injuries or fatalities.

[Comment: No reports of helicopters in the area. No need for helicopter evacuation]

Ref : Lloyd's Casualty Reports

### I.1.47 Hanseatic

The *Hanseatic* grounded off Spitzbergen on 14 July 1997. It is an 8400 GRT cruise liner, built in 1991. There were 145 passengers (average age 70) and 115 crew on board. The ship grounded while cruising in the Hinlopen fjord, causing slight damage to the hull. Plans to offload bunker fuel and tow the ship off were delayed when ice forced Norwegian Coast Guard vessels to withdraw. On 16 July, the passengers were transferred to a Coast Guard vessel. The plan was to use the ship's tender if the water was ice-free, or failing that to lower the passengers to a large ice floe at the stern and lift them by helicopter to the Coast Guard vessel. The ship was pulled free at 03:45 on 17 July, and passengers were allowed to re-board. There were no injuries or fatalities.

[Comment: Helicopters on Coast Guard vessel *Nordkap* were present well in advance of evacuation. Not clear whether they were actually used. A helideck would have made evacuation easier. Since no lives were lost, none would have been saved.]

Ref : Lloyd's Casualty Reports

### I.1.48 Romantica

The *Romantica* was damaged by fire in the Mediterranean on 4 October 1997. It is a 9500 GRT Cypriot cruise liner, built in 1939, with diesel-electric propulsion. There were 487 passengers and 186 crew on board. It was sailing from Port Said to Limassol. A fire started in the engine room at 04:24, while about 60 miles off Limassol, and smoke spread into the superstructure. The 14,600 GRT passenger ship *Princess Victoria* was following 12 miles behind at the time, and arrived at 05:30, 50 minutes after the Mayday call. All 10 lifeboats were lowered, and passengers and crew transferred to it by lifeboat. Others were winched off by helicopter. By 07:15, the evacuation was complete. Fire water caused the ship to heel to 10°, later 30°. The fire was extinguished the following day, and the ship towed into port. There were no casualties.

[Comment: 2 RAF helicopters from Cyprus arrived in less than 1 hour. Not clear whether they evacuated passengers or landed fire party. Photographs show the ship's bow and stern were clear of smoke. A helideck might have made evacuation easier, depending on its location. A helideck on the other passenger ship might have made evacuation easier. Since no lives were lost, none would have been saved.]

Ref : Lloyd's Casualty Reports

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**I.2 RO-RO PASSENGER FERRIES****I.2.1 Princess Victoria**

The *Princess Victoria* capsized after flooding in rough weather in the Irish Sea on 31 January 1951. It was a 2700 GRT British Ro-Ro passenger ferry, built in 1947, with a vehicle deck that was open at the stern, sailing from Stranraer (Scotland) to Larne (Northern Ireland). Soon after leaving Stranraer, a large wave burst open the stern doors to the car deck, damaging them and preventing them being re-closed. Further waves washed on board, causing a starboard list and shifting the cargo. Water seeped through a fireproof door into a lounge forward of the car deck, and also flooded the starboard engine room, increasing the list. An angle of 45° was reached after 4 hours. The passengers and crew abandoned ship using lifeboats and liferafts. The ship floated on its side and then upside down for a while, before sinking 5 hours after the start of the flooding. Rescue craft had been unable to find the ship, apparently due to an erroneous SOS message, and had been searching for 4.5 hours before any survivors were found. 134 died of the 172 on board.

Ref : Middleton, E.W. (1976) : "*Great Sea Rescues*", vol 2.

**I.2.2 Skagerak**

The *Skagerak* capsized after flooding in rough weather in the Skagerak on 7 September 1966. It was a 2700 GRT Norwegian Ro-Ro passenger rail/vehicle ferry, built in 1965, sailing from Kristiansand (Norway) to Hirtshals (Denmark). Conditions were Force 8-9. Heavy seas stove in the stern doors to the car deck (other sources say side doors). Water entered and seeped into the engine room, disabling the ship. It heeled suddenly and the cargo started to shift. The passengers and most of the crew abandoned ship by lifeboats, liferafts and jumping into the sea. 133 people were rescued by helicopters and passing vessels, but one elderly passenger died from exposure before reaching hospital. 11 crew remained on board in an attempt to tow the vessel into port, but escaped by liferaft 7 hours after the flooding started, and the ship capsized an hour later. There was no exact passenger list, but it was believed just the 1 died out of the 145 people on board.

Ref : Hooke, N. (1989) : "*Modern Shipping Disasters*", Lloyds of London Press, London.  
Lloyds List, 8-9 Sept 1966

**I.2.3 Heraklion**

The *Heraklion* capsized after flooding in rough weather in the Aegean Sea on 8 December 1966. It was a 8900 GRT Greek passenger/cargo ship, built in 1949, which had been converted in 1964 to a vehicle ferry with access doors in the hull, and was sailing from Crete to Piraeus (Greece). During a storm, a lorry broke free and smashed through a side loading door. The ship capsized and sank within about 10 minutes. Most of the passengers were asleep. Most of the 47 survivors were found clinging to rocks. 217 died of the 264 people on board.

Ref : Hooke, N. (1989) : "*Modern Shipping Disasters*", Lloyds of London Press, London.

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**I.2.4 Wahine**

The *Wahine* capsized after grounding in Wellington Harbour on 10 April 1968. It was an 8900 GRT New Zealand Ro-Ro passenger ferry, built in 1966, and certified to carry 924 passengers. It was entering Wellington harbour, with 125 crew and 610 passengers on board (another source says 822 people were on board). Its radar had broken. Conditions were the worst ever recorded in New Zealand, with Force 12 winds, restricted visibility and a severe following sea as the ship entered harbour. The ship suffered an unexplained loss of steering and suddenly turned to port. The Master tried to control the ship with the engines but became disorientated in the low visibility. The waves carried the ship onto a reef, breaching the double bottom fore and aft, snapping the starboard propeller shaft and flooding the motor room. The power-operated watertight doors were closed, keeping the other 4 machinery compartments dry. The anchor was dropped, but the ship was blown off the reef and dragged anchor, moving slowly astern into the harbour. The weather was too rough to evacuate. A tug approached, but was unable to tow the ship to shelter as it could not release the anchors.

About 3000 tonnes of water had entered, and the draught increased from 5.2m to 6.7m, but the ship remained upright. 1.5 hours after grounding, water began to enter the vehicle deck through ventilators from the flooded compartments beneath. The scuppers could not be opened because the deck was below the water level outside, and emergency drainage was hampered because the ship's tools were in the flooded compartments and the power had been lost. After 5.5 hours the ship began to heel, but the degree of danger was not realised, and rescue vessels were not fully alerted. After a further hour, the turning tide turned the ship to port. It now had a starboard list of 25° which was increased by the force of wind opposing the tide. The turn creating a lee, and the 4 starboard lifeboats were swung out. This may have accelerated the heeling, and the ship reached 45° in a further 1/2 hour. Nevertheless, all passengers and crew left the ship within 3/4 hour of the turn, by lifeboat, liferaft and by jumping into the sea. The ship continued to roll to 90°.

The wind then dropped, allowing a fleet of small craft and the 4600 GRT ferry *Aramoana* to approach and pick up survivors from the water. The survivors were unable to climb the ferry's sides, so it lowered 2 lifeboats. However, one was capsized by a large wave and the other lost its rudder and was swamped near to the shore. One of the *Wahine's* lifeboats was overloaded and was swamped by waves and capsized. The other 3 reached shore safely. The wind also veered, blowing many swimmers and liferafts into rougher seas and onto rocky shores. One of the rescue fleet, a 10m long yacht, was swamped by waves. Other vessels rescued most of the swimmers. A total of 51 of the 735 people on board died, mainly of exposure.

Ref : Hooke, N. (1989) : "*Modern Shipping Disasters*", Lloyds of London Press, London.  
Lambert, M. & Hartley, J. (1969) : "*The Wahine Disaster*", AH & AW Reed, Wellington, New Zealand.  
Watson, M.H. (1987) : "*Disasters at Sea*", PSL.

**I.2.5 Nissos Rodos**

The *Nissos Rodos* was destroyed by fire in the Aegean Sea on 26 June 1978. It was a 6700 GRT Greek Ro-Ro passenger ferry, built in 1953. It was sailing from Rhodes to Piraeus, with a cargo of trucks and cars, 100 passengers and 58 crew. Near midnight on 25 June, an explosion

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and fire occurred in the engine room. The passengers and crew were evacuated by a passing vessel. 2 engineers suffered burns, but there were no fatalities. The vessel was taken in tow but developed a list and was beached. It was 95% gutted by the fire, and was scrapped.

Ref : Hooke, N. (1989) : "*Modern Shipping Disasters*", Lloyds of London Press, London.  
Lloyd's Casualty Database

### I.2.6 Saitobaru

The *Saitobaru* sank after a collision with the tanker *Chang Won* in the Japanese inland sea on 6 September 1978. It was a 6600 GRT Japanese Ro-Ro passenger ferry, built in 1972. It was designed to a two-compartment standard. It was sailing from Kobe to Hyuga with a cargo of trucks and cars, 193 passengers and 45 crew. It was damaged in a V shape amidships, flooding the engine and generator rooms, causing a list. All 238 people on board were evacuated by lifeboat and picked up by patrol vessels. While being towed for beaching, the ship capsized. It was recovered and scrapped.

Ref : Hooke, N. (1989) : "*Modern Shipping Disasters*", Lloyds of London Press, London.  
Boyce, J. et al (1980) : "*Ro-Ro Ships and their Market Role*", Fairplay, London.

### I.2.7 Santa Ana

The *Santa Ana* was damaged by fire off Venezuela on 7 May 1980. It was a 2600 GRT Venezuelan Ro-Ro passenger ferry, built in 1965. It was carrying a cargo of vehicles and 115 passengers. A fire in the engine room could not be controlled. The passengers and crew transferred to the Ro-Ro ferry *Cacica Isabel*, which also towed the ship and beached it. The ship was completely gutted and was abandoned as a constructive total loss.

Ref : Hooke, N. (1989) : "*Modern Shipping Disasters*", Lloyds of London Press, London.

### I.2.8 Zenobia

The *Zenobia* capsized in rough weather off Cyprus on 7 June 1980. It was an 8900 GRT Swedish Ro-Ro passenger ferry, built in 1979. It was sailing from Koper (Yugoslavia) to Tartous (Syria), with a cargo of trucks and trailers, 121 passengers/drivers and 30 crew. It had been ballasted incorrectly, giving low stability with GM of 0.9m. During a storm on 2 June, the autopilot failed while an officer was demonstrating its use, leaving the rudder hard to starboard, causing a 10° port list. The cargo of 3000 tonnes shifted due to poor lashing, causing a 40° list. 150 people evacuated by lifeboat, while the master remained on board. The vessel was towed into sheltered water, and the list was reduced to 4° by pumping water out and ballasting the starboard tanks, allowing the cargo to be discharged. After 16 hours, the vessel again listed to port due to failure of the stabilising tank control. It took in water through an open pilot door and capsized after 2 hours. No lives were lost.

Ref : Hooke, N. (1989) : "*Modern Shipping Disasters*", Lloyds of London Press, London.  
Boyce, J. et al (1980) : "*Ro-Ro Ships and their Market Role*", Fairplay, London.  
Lloyds List, 3-8 June 1980

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**I.2.9 Tampomas II**

The *Tampomas II* sank after a fire in the Java Sea on 27 January 1981. It was a 6140 GRT Indonesian Ro-Ro passenger ferry, built for service in Japan in 1971. It had been modified by converting the upper vehicle deck to passenger accommodation. It was sailing from Jakarta to Sulawesi with a cargo of cars, motor cycles, 1054 registered passengers and 82 crew. (The official estimate was 1442 people on board.) During a storm on the night of 25 January, some motorcycles overturned and spilled petrol. This was ignited, possibly by a lighted cigarette passing through the ventilation fan to the vehicle deck. The fire was seen by a crew member, and unsuccessful attempts were made to control it using portable extinguishers. The water drencher system was not used. The fire spread to other vehicles and drums of flammable materials stored in the vehicle deck. Smoke spread into the passenger spaces via the ventilation system, which was not shut down for 45 minutes. The fire spread into the machinery compartments, since the hatch from the vehicle deck was open, and after 2 hours the main power was lost, the emergency generator failed, and further fire-fighting was impossible.

About 30 minutes after the fire started, the passengers were ordered to board lifeboats. This was impeded because there was only one exit door from the accommodation. Attempts to lower the lifeboats were largely unsuccessful. Some passengers jumped into the sea, while others waited on the deck for rescue. During 26 January, heating of the deck by the fire underneath was counteracted by heavy rain, and the fire appeared to subside. On 27 January, the fire escalated inside the engine room, supplied by the main engine fuel supply, which had not been isolated. Explosions in the engine room allowed water to enter. The watertight doors were open, and the engine room, generator room and propeller room all flooded, followed by flooding of the vehicle deck, causing the ship to heel to 45° and sink about 30 hours after the fire started.

No distress call was made, but other vessels saw the smoke. They were prevented from approaching by the fire and the rough weather. Storms forced suspension of the search for survivors on 29 January, but 80 survivors were found after 5 days in lifeboats up to 100 miles away. One estimate was 431 dead (143 recovered and 288 missing), with 753 rescued. Another source (possibly from the official inquiry) was 666 dead.

Ref : Hooke, N. (1989) : "*Modern Shipping Disasters*", Lloyds of London Press, London.  
Cowley, J. (1994) : "*Fire Casualties and their Regulatory Repercussions*", IMarE Conference on Fire Safety on Ships, London, May 1994.

**I.2.10 Arion**

The *Arion* was damaged by a bomb off Haifa on 20 December 1981. It was a 7900 GRT Greek Ro-Ro passenger ferry, built in 1965. It was sailing from Limassol to Haifa with a cargo of vehicles, 250 passengers and 150 crew. A terrorist bomb explosion killed one crew member and started a fire which could not be controlled. The passengers and crew were taken off by boats. The engine room flooded, the ship listed and was beached to avoid sinking. After 3 days the fire burned itself out. The ship's upper decks and main deck were gutted and it was declared a constructive total loss.

Ref : Hooke, N. (1989) : "*Modern Shipping Disasters*", Lloyds of London Press, London.  
Lloyd's Casualty Database

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**I.2.11 Jan Heweliusz**

The *Jan Heweliusz* suffered severe flooding while discharging at Ystad, Sweden, on 19 August 1982. It was a 3000 GRT Polish Ro-Ro rail passenger/cargo vessel, built in 1977. While unloading rail wagons loaded with cement, the vessel became unstable due to a combination of slack fuel and ballast tanks and the fact that cargo was being discharged from the lower deck first. Earlier reports attributed it to faulty trim pumps (another report says a defect in its anti-heeling tanks). The vessel capsized onto the quay, coming to rest on the quay and the harbour bed at an angle of about 45°, damaging the passenger walkways, stern ramp and associated shore equipment. It flooded through the stern door, leaving the main deck, steering gear room, engine room and auxiliary engine room full of water. The heeling also caused a blackout, making the ship unable to reballast or pump out the water.

Ref : Lapper, R. (1987) : "*Ferries*", Financial Times Business Information, London.  
Seatrade, January 1984.  
Lloyd's List, 15 Jan 93

**I.2.12 European Gateway**

The *European Gateway* capsized after a collision with the Ro-Ro train ferry *Speedlink Vanguard* off Felixstowe on 19 December 1982. It was a 4300 GRT British Ro-Ro passenger ferry, built in 1975, with 2 vehicle decks, and certified to carry 300 passengers. It was sailing from Felixstowe (UK) to Europort (Netherlands) with a cargo of vehicles, 34 passengers/drivers and 36 crew. The collision resulted from confusion at a bend in the channel. The *Speedlink Vanguard's* bow struck the starboard side of the *European Gateway*, puncturing the main vehicle deck and the generator room below the waterline. The ships were locked together for a few seconds, and then drifted apart. The *European Gateway* immediately began to heel to starboard. The cause of the heeling remains unclear, but was attributed to transient asymmetric flooding. The 3 watertight doors connecting the 4 machinery compartments were all open, so 4 compartments below the waterline were able to flood. The doors could only be closed manually, and this was abandoned due to the increasing heel. The vehicle deck immersed at 10° heel, and the ship reached about 40° in 3 minutes, at which point its bilge grounded. It then rolled onto its side in 10-20 minutes. 6 of the 70 people on board drowned due to the difficulty of launching the lifeboats and liferafts. Others were rescued from the side of the ship which remained above the water. The ship was subsequently salvaged and repaired.

Ref : Department of Transport (1985) : "*MV European Gateway, MV Speedlink Vanguard*", Report of Court No 8072, Formal Investigation, HMSO.  
Spouge, J.R. (1986) : "*The Technical Investigation of the Sinking of the Ro-Ro Ferry European Gateway*", Trans RINA.

**I.2.13 Chrissi Avgi**

The *Chrissi Avgi* capsized in rough weather in the Aegean Sea on 23 February 1983. It was a 500 GRT Greek Ro-Ro passenger ferry, built in 1970. It was carrying 14 trucks including 9 gasoline tankers, 18 passenger/drivers and 24 crew. Conditions were Force 8-9. The ship listed and trucks shifted, leading to an explosion and fire which could not be controlled. The ship capsized 2 hours later. The crew were unable to lower the lifeboat due to the list, and had to jump into the sea. 28 of the 42 people on board died.

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Ref : Lapper, R. (1987) : "*Ferries*", Financial Times Business Information, London.  
Lloyds List, 25-26 Feb 83.  
Lloyd's Casualty Database

### I.2.14 Sweet Name

The *Sweet Name* sank after a collision with the fishing vessel *Cebu City* off Cebu on 8 March 1983. It was a 580 GRT Philippine Ro-Ro passenger ferry, built in 1944. It was sailing from Cebu to Tagbilaran (Philippines), with 20 drums of gasoline on board, as well as about 400 passengers and 43 crew. The collision ignited the gasoline drums, and the fire could not be controlled. The passengers and crew jumped overboard, and at least 27 died.

Ref : Hooke, N. (1989) : "*Modern Shipping Disasters*", Lloyds of London Press, London.

### I.2.15 Hua Lien

The *Hua Lien* grounded in Hualien harbour, Taiwan, on 19 April 1983. It was a 9700 GRT Taiwanese Ro-Ro passenger ferry, built in 1971. It was sailing from Keelung to Hualien, with a cargo of vehicles and 104 passengers. The engine room flooded, and it was beached by tugs. All passengers were taken off. After being refloated and taken to Hong Kong for repair, it broke adrift in Typhoon Ellen on 9 September 1983 and struck an oil jetty before going aground. It was later scrapped.

Ref : Hooke, N. (1989) : "*Modern Shipping Disasters*", Lloyds of London Press, London.

### I.2.16 Presidente Diaz Ordaz

The *Presidente Diaz Ordaz* capsized after contacting a mooring pile in Mazatlan, Mexico, on 10 August 1984. It was a 2900 GRT Mexican Ro-Ro passenger ferry, built in 1961. It was carrying vehicles, 439 passengers and 69 crew. It hit a pile mooring with its rudder, and capsized, lying on the bottom at an angle of 80°. One person died. The vessel was declared a constructive total loss.

Ref : Hooke, N. (1989) : "*Modern Shipping Disasters*", Lloyds of London Press, London.

### I.2.17 A Regina

The *A Regina* grounded off Puerto Rico on 15 February 1985. It was a 3700 GRT Panamanian Ro-Ro passenger ferry, built in 1967. After grounding the engine room flooded through bottom damage. The 143 passengers and 70 crew were taken off by helicopter. The vessel was abandoned as a constructive total loss.

Ref : Hooke, N. (1989) : "*Modern Shipping Disasters*", Lloyds of London Press, London.  
Lapper, R. (1987) : "*Ferries*", Financial Times Business Information, London.

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**I.2.18 Farah II**

The *Farah II* was damaged by fire at Neweiba, Egypt, on 6 March 1986. It was a 1700 GRT Panamanian Ro-Ro passenger ferry, built in 1963. A fire in the crew accommodation could not be controlled, and it spread through the whole accommodation and bridge. The passengers and crew disembarked. The vessel listed due to the water pumped on board to fight the fire. It was towed away from the berth and capsized in the Gulf of Aqaba.

Ref : Hooke, N. (1989) : "*Modern Shipping Disasters*", Lloyds of London Press, London.  
Lloyd's Casualty Database

**I.2.19 Dona Josephina**

The *Dona Josephina* sank in the Visayan Sea on 24 April 1986. It was a 1000 GRT Philippine Ro-Ro passenger ferry, built for service in Japan in 1968. It was sailing from Leyte to Manila with a cargo of copper cathodes, 364 passengers and 50 crew. In perfect weather, it flooded, heeled and sank within 15 minutes. 199 people died (29 recovered and 170 missing), and 220 were rescued.

Ref : Hooke, N. (1989) : "*Modern Shipping Disasters*", Lloyds of London Press, London.  
Lloyds List, 9 March 87.

**I.2.20 Herald of Free Enterprise**

The *Herald of Free Enterprise* capsized at the entrance to Zeebrugge harbour on 6 March 1987. It was an 8000 GRT British Ro-Ro passenger ferry, built in 1980, with 2 vehicle decks, and certified to carry up to 1400 people depending on its draught. It was sailing from Zeebrugge (Belgium) to Dover (UK), with a cargo of vehicles, approximately 459 passengers and 80 crew. In its loading condition, the ship satisfied a one-compartment standard. The ship had a bow trim of 0.8m due to loading restrictions at the terminal, and this trim could only be removed slowly. This gave a freeboard at the bow of about 2.5m. The bow doors were not closed on departure, because the responsible crew member had overslept, the supervising officer failed to check, and the master did not require a positive report and could not see the doors from the bridge. As the ship increased speed to around 16 knots on leaving the harbour, the combination of squat of about 1m in the shallow water and a bow wave of up to 1.5m caused water to flow onto the vehicle deck through the open bow doors. About 4 minutes after leaving the harbour, the free-surface effect of water on the vehicle deck caused the ship to heel to about 30° to port. The heel caused the ship to turn uncontrollably to starboard, capsizing to 90° within 90 seconds and grounding on a sand-bank out of the channel with the starboard side out of the water. There was no time to launch any lifeboats or liferafts. Survivors were lifted through the starboard windows and taken off by rescue vessels. At least 193 died of approximately 539 people on board. (The Inquiry report records at least 150 passengers and 38 crew.) The ship was salvaged and scrapped.

Ref : Department of Transport (1987) : "*MV Herald of Free Enterprise*", Report of Court No 8074, Formal Investigation, HMSO.  
Dand, I.W. (1989) : "*Hydrodynamic Aspects of the Sinking of the Ferry 'Herald of Free Enterprise'*", Trans RINA.  
Hooke, N. (1989) : "*Modern Shipping Disasters*", Lloyds of London Press, London.

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**I.2.21 Santa Margarita Dos**

The *Santa Margarita Dos* capsized while loading at Caracas on 3 November 1987. It was a 2240 GRT Venezuelan passenger.Ro-Ro ferry. It had nearly completed loading passengers and vehicles, including 4 large trucks each carrying 50 tonnes of cement. There was concern about overloading, and an attempt was made to transfer some of the trucks to another ferry. The ship started to list, and the passengers were ordered to leave the ship. As they were leaving, the ship capsized and sank in deep water beside the quay. Over 250 passengers escaped, but 5 people were trapped or missing including one crew member.

Ref : Lloyd's Casualty Reports

**I.2.22 Mazatlan**

The *Mazatlan* sank after a fire off Topolobampo, Mexico, on 20 August 1989. It was a 5010 GRT Mexican Ro-Ro passenger ferry, built in 1965. An engine was reported to have overheated and exploded, causing a fire in the engine room. The ship subsequently sank. All 299 passengers and 56 crew were rescued.

Ref : Lloyd's Casualty Database

**I.2.23 Scandinavian Star**

The *Scandinavian Star* was damaged by fire in the Skagerak on 7 April 1990. It was built in 1971, with a single vehicle deck which also had accommodation along its sides. It was sailing from Oslo (Norway) to Frederikshavn (Denmark) with 383 passengers and 99 crew. The fire was started deliberately at around 02:00 in a corridor in the unused accommodation on the starboard side of the vehicle deck. Within 2-8 minutes the fire had ignited the surface laminate on the corridor bulkheads. After a further minute, the whole cross-section of the corridor was on fire. Within 10 minutes, the fire flashed up a staircase for 2 decks, across a transverse corridor, and down the corresponding staircase on the port side. After this, the fire spread more slowly to the rest of the ship. Smoke containing carbon monoxide and hydrogen cyanide spread along corridors leading to the staircase. After about 30 minutes, the ventilation system was turned off, allowing smoke to seep into the cabins. Fire doors on the ship were designed to be closed from the bridge based on manually-activated alarms, but since the seat of the fire was on an unused deck no alarm was received and the fire doors between the affected zone and the staircase were never closed. Fire doors which did close were effective in blocking the spreading of the fire. 158 passengers died. 99 died in their cabins; about 50 died in the corridors trying to escape, including 20 trapped in dead-end corridors. The fire was not extinguished for 38 hours.

Ref : Safety at Sea, April 1993.

**I.2.24 Princess Mika**

The *Princess Mika* sank after a fire off Surigao in the Philippines on 18 February 1991. It was a 940 GRT Philippine Ro-Ro passenger ferry, built in 1970. It was sailing from Leyte to Surigao. It caught fire and sank. All passengers and crew were rescued.

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Ref : Lloyd's Casualty Database

**I.2.25 Dronning Margrethe II**

The *Dronning Margrethe II* was damaged by collision with the Ro-Ro cargo ship *Bore Britannica* off Rødbyhavn on 14 March 1991. It was a 6200 GRT Danish registered Ro-Ro passenger ferry, built in 1973. It was sailing from Puttgarden to Rødbyhavn (Denmark) with 14 passengers and 32 crew. It was night, with calm weather and thick fog (visibility 0 - 30 m). The *Bore Britannica* was passing through the Fehmern Bælt at 15 knots. Despite both ships having ARPA radar, it rammed the starboard side of the *Dronning Margrethe II* forward of midships, at an angle of about 50° leading aft at 03:55. The collision caused a large hole below the waterline at a transverse bulkhead, flooding a hold on one side, and puncturing a diesel oil tank on the other, causing a minor leak into the compressor room inboard, which eventually filled with water. Above the waterline, it caused a large indentation in the ferry's side in the area of a restaurant and supermarket. A shop assistant fell overboard and drowned. The search by the MOB boat and other vessels was hampered by the fog. After a few minutes, the steering motors stopped, preventing the ship from manoeuvring. About an hour after the collision, vapour from the leaking fuel oil was ignited by a short-circuit caused by floodwater, causing a fire in the cabins above the compressor room, immediately below the car deck. Fire-fighting was hampered by damage to fire water pipes caused by the collision, and the fire was extinguished several hours later with help from other vessels. The passengers and crew were evacuated onto other vessels, starting at 05:55. The ferry flooded further from fire-fighting water, the broken fire main and cabin sprinklers. The ferry's main generator stopped at 11:20 due to water in the diesel, and it was then impossible to control the heel and trim, and the ferry grounded off Rødbyhavn. It was later refloated and repaired.

Ref : Internal report of Danish Maritime Authority, 12 Aug 1991.  
Lloyd's Casualty Database

**I.2.26 Moby Prince**

The *Moby Prince* was damaged by fire after a collision with the tanker *Agip Abruzzo* off Leghorn, Italy on 10 April 1991. It was a 6190 GRT Italian Ro-Ro passenger ferry, built in 1968. It was sailing from Leghorn (Livorno) to Sardinia with 74 passengers and 68 crew. It had previously been criticised for poor fire safety standards by a German consumer group. The *Agip Abruzzo* was a 186,500 dwt Italian tanker, with 82,000 tonnes of crude oil, and was anchored outside the port. The *Moby Prince* was sailing at 18-19 knots, which the Inquiry considered excessive, and with the radar switched off. Fog patches partly hid the tanker, which failed to turn on its fog lamps. At 23:00, the ferry's bow struck the tanker's side near the poop deck, in way of a tank containing 2700 tonnes of crude oil, which was the only loaded cargo tank in that part of the ship. The other 19 cargo tanks were undamaged. The oil spill was ignited by sparks from the collision. The fire surrounded the ferry on the sea and destroyed its lifesaving equipment. The passengers gathered in the muster areas with lifejackets, and waited at least 20 minutes to be rescued, but all the exits were blocked by fire and smoke. The ferry broke free from the tanker and drifted a mile away into thick fog, and rescue was delayed because it had sent no Mayday and the tanker had reported being hit by a small barge. Only one person from the ferry survived - a 24-year old crew member, who jumped into the sea. The fire was extinguished within a day, and the ferry remained afloat. The stern of the tanker caught fire, but the 28 crew escaped by lifeboat. The fire continued for several days, being fed by bunker fuel

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tanks. Salvage tugs and harbour launches attended the fire, and anti-pollution vessels contained the spill.

Ref : Lloyd's Casualty Reports

### **I.2.27 Sol Phryne**

The *Sol Phryne* sank after a fire in the Adriatic Sea on 6 December 1991. It was a 6200 GRT Honduran registered Ro-Ro passenger ferry, built in 1948. It was sailing from Pula to Bar (Yugoslavia). After an explosion and fire, the ship sank. All passengers and crew were rescued.

Ref : Lloyd's Casualty Database

### **I.2.28 Salem Express**

The *Salem Express* sank after grounding in the Red Sea on 15 December 1991. It was a 4770 GRT Egyptian Ro-Ro passenger ferry, built in 1966, originally certified for 1384 passengers. It was sailing from Jeddah (Saudi Arabia) to Safaga (Egypt) with 578 passengers and 71 crew. While approaching Safaga at midnight in rough weather, the Master took a short-cut which was not authorised for night passage. The ferry struck a reef and sank within 20 minutes. There were 180 survivors and 117 bodies recovered. It was estimated that 464 people drowned in total, many of them trapped inside the ship.

Ref : Lloyd's Casualty Reports

### **I.2.29 Jan Heweliusz**

The *Jan Heweliusz* capsized and sank in rough weather in the Baltic Sea on 14 January 1993. It was a 3000 GRT Polish rail passenger/cargo vessel, built in 1977. It was sailing from Swinoujscie to Ystad with 34 passengers, 29 crew, 10 railway carriages and 29 lorries. Conditions were severe, with 105 knot winds and 3m waves, and the severity had not been forecast. At 03:38 the ferry reported a list of 30°. At 03:53, the list was 70°. A Mayday signal was not sent until 05:03. At 05:50, the vessel capsized. At 11:00 the ferry sank. Water temperature was 2°C. Only 9 people survived, one of whom spent 2 hours in the water. 52 people drowned.

Ref : Lloyd's Casualty Reports

### **I.2.30 New Orient Princess**

The *New Orient Princess* was damaged by fire in Junk Bay, Hong Kong, on 25 August 1993. It was a 4840 GRT Panamanian registered Ro-Ro passenger vessel, built in 1968. It was in use as a casino ship, making daily sailings into international waters. There were 332 passengers and 201 crew on board. The fire started in electrical installations in a sauna and spread to affect the whole superstructure. Two lifeboats containing 38 people were launched. Passengers and most crew were picked up by small launches. The fire was controlled by fireboats, but water application was limited to avoid capsizing the ship. The ship drifted and grounded, and was subsequently refloated.

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Ref : Lloyd's Casualty Reports

### **I.2.31 Monte Stello**

The *Monte Stello* grounded off Sardinia on 1 January 1994. It was a 4790 GRT French Ro-Ro passenger/cargo vessel, built in 1979. It was sailing from Marseilles to Porto Vecchio, Corsica, with 57 passengers and 26 crew. During a gale, the ship was 60 km off course. It grounded on rocks and was wedged in an upright position. Other vessels could not approach the ship. Helicopters lifted all people off. The ship was declared a constructive total loss, with a value of £9m, although it was refloated on 2 May and repaired.

[Comment: French helicopters from Corsica and Italian helicopters from Rome attended. No reports of arrival time. A helideck might have been impaired by spray. Since no lives were lost, none would have been saved.]

Ref : Hooke, N. (1997) : "*Maritime Casualties, 1963-1996*", LLP, London.  
Lloyd's Casualty Reports

### **I.2.32 Al-Qamar Al-Saudi Al-Misri**

The *Al-Qamar Al-Saudi Al-Misri* sank after a fire in the Gulf of Suez on 18 May 1994. It was a 7670 GRT Egyptian Ro-Ro passenger ferry, built in 1970. It was sailing from Jeddah to Suez with 527 passengers and 63 crew. A boiler explosion was reported to have caused an oil leak and fire in the engine room, which spread to the rest of the vessel. Passengers jumped into the sea and were rescued by naval and offshore vessels. The ship sank the next day. There were 21 fatalities (8 dead and 13 missing).

Ref : Lloyd's Casualty Reports

### **I.2.33 Saray Star**

The *Saray Star* sank after a fire in the Mediterranean Sea on 10 June 1994. It was a 7150 GRT Maltese Ro-Ro passenger ferry, built in 1967. It was sailing from Piraeus to Venice with 79 people on board. The fire started in the galley and spread to the accommodation. Passengers and crew were taken off by another ferry. Firefighting tugs were unable to control the fire, and the ship subsequently sank.

Ref : Lloyd's Casualty Reports

### **I.2.34 Al Loloa**

The *Al Loloa* sank after a fire in the Red Sea on 12 July 1994. It was a 2590 GRT Panamanian registered Ro-Ro passenger ferry, built in 1973. It was sailing from Suez to Jeddah with 62 crew but no passengers. The source of the fire is unknown. 61 of the crew abandoned ship in 5 liferafts. They were rescued by a warship, together with the one crew member left on board. The ship sank the next day.

Ref : Lloyd's Casualty Reports

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**I.2.35 Sally Star**

The *Sally Star* was damaged by fire in the English Channel on 25 August 1994. It was a 16800 GRT Bahamian registered Ro-Ro passenger ferry, built in 1981. It was sailing from Dunkirk to Ramsgate with 104 crew, 17 passengers and 24 vehicles, including 2 with dangerous goods. Conditions were wind force 3 with a calm sea.

On a 2-bolt flange in the fuel supply system of one of the main engines, one of the bolts failed due to fatigue where it had been repeatedly tightened, possibly due to repeated inspection of a leaking O ring seal. This allowed the release of fuel oil and vapour, which was ignited by a hot surface, such as imperfectly lagged exhaust pipes, within 5-10 minutes of the last watchkeepers' inspection. The engineers on duty were in the machinery control room in the adjacent generator room space, with the watertight doors closed. They were alerted by a fire alarm at 04:18, and were unable to enter the engine room due to smoke until fire parties with BA sets were mobilised. The engines were stopped and the fuel supply isolated, restricting the release to a maximum of 720 litres of fuel oil.

The general alarm was sounded at 04:22, but with an incorrect intermittent signal due to inability to lock it on. Nevertheless, passengers were mustered within 15 minutes. Main power was lost due to high cooling water temperature, and the emergency fire pump failed to restart on the emergency power supply, causing a loss of pressure in the fire main, and halting attempts to extinguish the fire manually. The engine room halon system was discharged at 04:51, but failed to extinguish the fire due to heat distortion of the ventilation flaps and premature discharge of one bottle due to fire impingement. Boundary cooling of the engine room bulkheads was performed using the ship's fresh water supply.

The lifeboat from Ramsgate, 7 miles away, arrived at 05:13. Starting at 05:37, 102 passengers and non-essential crew were transferred via the pilot door to the lifeboats in approximately 10 minutes. Shore-based helicopters arrived at 05:15, and a fire crew was on board with an emergency fire pump by 06:05, allowing boundary cooling to restart. The engine room was re-entered at 08:09, and the fire was extinguished by 08:36. Damage was confined to the engine room and funnel. The ship was towed into port.

Ref: Marine Accident Investigation Branch (1995): "*Report of the Investigation into Fire on Board Ro-Ro Passenger Vessel Sally Star*", HMSO.

**I.2.36 Estonia**

The *Estonia* capsized and sank in the Baltic Sea on 28 September 1994. It was a 15,600 GRT Estonian registered Ro-Ro passenger ferry, built in 1980, certified to carry 2000 passengers. It was sailing from Tallinn (Estonia) to Stockholm (Sweden) with a cargo of 100 vehicles and 989 people on board (803 passengers and 186 crew) (earlier estimates were up to 1049). On departure the ship had a 1° starboard list and a trim of 0.5m by the stern, giving a freeboard at the bow of at least 2.4m. It was night, with wind 25 m/s and significant waveheight 4.3m on the port bow. Such conditions had occurred 1-2 times before in the area in the last 1-2 years. The ship's speed was 14.5 knots, rolling a little and pitching heavily.

Around 00:45, the bow visor's 3 locking devices failed due to sea loads on the bow. The estimated loads were similar to the design loads, indicating that the locking devices had been

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built with less strength than required, due to lack of sufficiently detailed manufacturing and installation instructions, and the industry's general lack of experience of such hydrodynamic loads. The bow visor then swung repeatedly on its hinges, striking the bow structure and progressively working forward under successive wave impacts. It could not be seen from the bridge, but the noise was heard by crew and passengers although its significance was not appreciated.

The top of the inner ramp was located in a recess inside the top of the visor, so that as the visor worked forward it caused the locks on the ramp to fail. The vessel had no upper extension of the collision bulkhead as required under SOLAS, since this was not incorporated in the classification society rules. At 01:15, an engineer in the engine control room observed on the CCTV water entering the vehicle deck from openings along the side of the inner ramp. The vessel started to roll more severely, developing a starboard list. The bow visor then separated from the bow, dragging the bow ramp open and allowing large amounts of water to enter the vehicle deck.

Within a few minutes, the ship heeled 30° to starboard while turning to port, and the main engine and generators tripped due to lack of lubricating oil pressure. A Mayday signal was sent at 01:24. The vessel continued to heel, while drifting beam-on to the waves. The accommodation decks started to flood at 01:30, and 90° heel was reached at 01:35, less than 20 minutes after the bow ramp opened. The ship sank completely at 01:48.

Some passengers managed to reach the boat deck, but the crew were unable to launch any lifeboats. Many passengers were trapped in their cabins. Liferafts were released as the ship sank, and some people managed to get into them. The water temperature was around 10°C. Three other ferries and shore-based helicopters assisted in the rescue operation. 141 people were rescued alive, but only 137 survived. About 94 people died in waterlogged liferafts or in the sea. A total of 100 bodies were recovered. The remaining 752 people missing are assumed to have been trapped inside. A total of 852 people died.

Ref : Joint Accident Investigation Commission of Estonia, Finland and Sweden (1995) :  
"Part Report on MV Estonia", April 1995  
Lloyd's Casualty Reports

### I.2.37 Tallink

The *Tallink* grounded off Helsinki on 22 April 1995. It was a 8140 GRT Estonian registered passenger/Ro-Ro ferry, built in 1972. It was sailing from Helsinki (Finland) to Tallinn (Estonia) with 981 passengers and 120 crew and a pilot on board. Conditions were calm with fog. The ship struck a rock puncturing the side shell and flooding the auxiliary engine room, causing a blackout and engine failure. The ship heeled up to 10° and ran aground 1 km from the first rock. After 15 minutes, a Mayday was sent. Evacuation of the passengers and 83 of the crew was then completed in 1 hour, using the ferry's lifeboats, liferafts; lifeboats from a passing ferry; a helicopter and 34 small rescue vessels. Safety announcements were only in Estonian. One passenger was slightly injured. The vessel was towed back to port with a 10° list.

Ref : Lloyd's Casualty Reports

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### **I.3 HIGH-SPEED FERRIES**

#### **I.3.1 Apollo Jet**

The catamaran ferry *Apollo Jet* went out of control and collided with 2 vessels before grounding in Hong Kong in 1989. It was sailing from the China Ferry terminal to an overnight berth, with 7 crew, having completed the day's commercial operations. The crew shut down one of the generators on route, and inadvertently switched off the electrical power to the main engines and steering controls on the Master's console. The switches were labelled in English, but the engineer could only read Chinese. Deficiencies in the design and safety management of the vessel were subsequently identified as the underlying cause. As a result, while travelling at 30 knots, the craft lost steering and propulsion control from the bridge. It then veered to one side and entered the Yaumatei Typhoon Shelter, where it collided with 2 small vessels before running up onto the sea wall. There were 4 fatalities and 7 injuries on the vessels it struck. Several other vessels in the area were damaged.

Ref : "Fast ferries", Fairplay, 1995.

#### **I.3.2 Douro**

The hovercraft ferry *Douro* collided with the 500 tonne lighter *Zhong Ren 1501* in Hong Kong harbour on 26 June 1989. The hoverferry was travelling between Macao and Hong Kong in darkness south of Tsing Yi when it collided with the lighter. The hovercraft's bow was slightly damaged, and 13 passengers were injured. The lighter was not damaged.

Ref : Lloyd's Casualty Reports

#### **I.3.3 Sea Cat**

The 39m catamaran ferry *Sea Cat* grounded off Mongstad, Norway on 4 November 1991. It was sailing from Selje to Bergen with 146 passengers and 6 crew. Conditions were dark with heavy rain and strong winds. The craft needed to make an 80° turn into a 500m wide channel. The captain was navigating alone, and used a slow flashing light which was not a suitable for such a manoeuvre. By the time he saw the flash, it was too late to turn or stop, and the craft continued at close to its full speed of 36 knots into nearly vertical rock. The port hull was compressed by 5.5m, causing a small leak through the fore peak bulkhead, but no other damage to the hull. Deceleration was estimated to have been 4 to 7g, tearing passenger seats loose, and throwing people and loose objects forward, killing 2 passengers and injuring 74. The craft remained afloat with all main systems working, although the engines were shut down as a precaution. The craft was towed into a nearby harbour, and later repaired.

Ref : Ship and Boat International, March 1992

#### **I.3.4 Royal Vancouver**

The 40m catamaran ferry *Royal Vancouver* collided with the conventional Ro-Ro ferry *Queen of Saanich* off Vancouver, Canada, on 6 February 1992. The catamaran was sailing from Vancouver to Victoria with 61 passengers on a service which had only been inaugurated 4 days earlier. The Ro-Ro was on a reciprocal course. The area was covered by VTS. The 2

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vessels were not in sight of each other until the last minute due to fog patches and the nature of the channel. The 2 navigating crew on the catamaran were distracted by VHF traffic and changes in radar range, and mis-identified the radar echoes, resulting in an emergency turn across the bows of the Ro-Ro. The 2 vessels collided nearly bow-on. A crash stop had been executed from 36 knots just before the collision, and the speed of the Ro-Ro had been reduced to 5 knots at impact. The catamaran suffered extensive damage forward of the collision bulkhead. 19 passengers and 4 crew were injured, 9 seriously.

Ref : "Fast Ferries", Fairplay, 1995

### I.3.5 Discovery Bay 12

The fast monohull ferry *Discovery Bay 12* grounded in Yi Pak Bay, Lantau, Hong Kong on 17 March 1993. It was sailing from central Hong Kong to Discovery Bay with 123 passengers and 6 crew. In thick fog, it hit rocks several miles south of its destination, well outside its normal course. Passengers were transferred to another ferry by small craft. There were no injuries. The ferry was towed off the sandbank and returned to port under its own power.

Ref : Lloyd's Casualty Reports

### I.3.6 Urzela

The 267 GRT 24m passenger jetfoil *Urzela* collided with two 110m long floating towed pipelines off Macau on 11 July 1993. The jetfoil was leaving Macau for Hong Kong at 40 knots. It was dark with a rough sea. The lights on the pipelines were not working, and the visual augmentation system on the jetfoil was unable to detect them. The jetfoil's forward strut was bent back, and it came down suddenly onto the hull, puncturing a compartment and a fuel tank. 49 of the 264 passengers were injured. Tugs towed the jetfoil back to Macau.

Ref : Hong Kong Marine Department accident report

### I.3.7 Spirit of Success

The 41 GRT 14m passenger catamaran *Spirit of Success* collided with the 706 GRT 49m dumb steel hopper barge *Sang Hing 201* off Tuen Mun on 21 July 1993. The ferry was leaving Tuen Mun for Chek Lap Kok, accelerating at about 10 knots. It was dark with good visibility. The crew had only 3 hours sleep, and had woken at 04:15 to prepare for the first sailing of the day, and the collision occurred 1 hour later. The barge was at anchor and incorrectly lit, and was not seen in clutter on the ferry's radar. The collision damaged the forward end of the ferry's hulls. Both crew were knocked out and the 4 passengers were knocked over, receiving minor injuries. Some of the passenger seats broke loose. A passenger steered the ferry back to Tuen Mun.

Ref : Hong Kong Marine Department accident report.

### I.3.8 Condor II

The 78m catamaran ferry *Condor II* grounded off Hobart, Australia on 8 October 1994. The craft was on speed trials with 48 passengers on board. Conditions were dark with poor

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visibility. The radar filter had been set incorrectly and did not show the position of the rocks, which were used as a timing mark, but the main cause was considered to be navigational misjudgement, while hurrying to finish sea trails which were behind schedule. The craft ran onto half-submerged rocks at about 38 knots. It travelled 1.5 boat lengths before coming to a halt out of the water. One passenger was injured. The passengers were taken off the next day. The craft was extensively damaged over the bottom 1m from the bow to the front of the engine room on both sides. There was a small hole in one engine room. The craft was refloated after 3 weeks, by sealing the air vents to keep the hulls dry.

Ref : Lloyd's Casualty Reports  
Safety at Sea, March 1997

### I.3.9 Golden Navigator 2 - Tai Ping

The Chinese fast monohull ferry *Golden Navigator 2* sank after colliding with the Chinese catamaran ferry *Tai Ping* in poor visibility in Hong Kong waters on 8 December 1994. The *Golden Navigator 2* was travelling from Shekou to Zhongshan. It was cut in half by the collision and sank. 4 of the 24 people on board were drowned. The *Tai Ping* was approaching Hong Kong with 68 passengers and 8 crew. It was slightly damaged.

Ref : South China Morning Post, 9 Dec 94.

### I.3.10 Hai Chang - Tai Ping

The Chinese catamaran ferry *Hai Chang* collided with the Chinese catamaran ferry *Tai Ping* in poor visibility off Tsing Yi on 17 March 1995. The *Hai Chang* was travelling from Zhuhai to Hong Kong with 56 passengers at about 12 knots. 14 people were injured in the impact. The *Tai Ping* was leaving Hong Kong for Tai Ping with 99 passengers at about 12 knots. It was struck amidships and severely damaged.

Ref : South China Morning Post, 18 March 95.

### I.3.11 Saint Malo

The catamaran passenger ferry *Saint Malo* grounded off Corbiere Point, Jersey, on 17 April 1995. It was a 41m catamaran, propelled by twin water jets, with passenger capacity of 350 and maximum speed 34 knots, built in 1993. It was sailing from St Helier for Sark, Jersey, with 300 passengers and 7 crew. Most of the passengers were aged 40 - 70 years. Conditions were daylight with Force 5 wind and 1.3m wave height

The Master chose an inshore route for reasons of passenger comfort, and diverted from its normal track to avoid fishing nets. It grounded at 09:57, at a speed of 32 knots. The impact punctured 5 of the 6 port hull compartments and one of the starboard compartments. The craft slowed slightly and one engine failed. The Master was able to steer into open water before the other engine failed.

The craft heeled rapidly to approximately 19°. This placed the port side of the main deck in the water, and only the starboard side liferafts could be used. Some passengers slipped into the water and at least one was injured and required the constant attention of a crew member.

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The liferafts were all launched satisfactorily, although the forward pair on the port side could not be inflated because the door where the painter was secured was underwater. The boarding ladders were initially discarded because the crew considered them too slow, fearing that the craft would capsize, and also because they were too short. The passengers had to jump into the rafts, a drop of 2 - 3.7m, and up to 55 were injured.

Eventually, the St Helier lifeboat arrived and was able to take the remaining passengers off directly, including the most infirm. The last passenger was taken off after 1 hour 17 min.

During the evacuation, the lower superstructure slowly flooded through exit doors, drains and scuppers, increasing the heel to an estimated 28°. The weathertight integrity of the lower superstructure and the watertight cross structure were critical in keeping the craft afloat. It was subsequently towed and beached, and later repaired.

There were no fatalities, but 55 people were injured, 18 seriously (fractures); 34 detained overnight.

Ref : MAIB (1995) : "Preliminary Inquiry onto the Grounding and Evacuation of the High Speed Catamaran "SAINT MALO" off Corbiere Point, Jersey, 17 April, 1995", States of Jersey Harbours Department.

### I.3.12 Super Flyte

The 464 GRT fast monohull *Super Flyte* grounded off Kangaroo Island, South Australia, on 6 September 1995. It was sailing from Gleneig to Kinscote with 89 passengers at 30 knots in water depth of 1m. Due to a navigational error, it struck a sandbar outside the buoyed channel. 5 people were injured. The passengers were taken ashore by small craft. The craft was towed off the sandbank after 4 hours, and was not significantly damaged.

Ref : Lloyd's Casualty Reports

### I.3.13 Procida

The 262 GRT fast monohull hydrofoil *Procida* grounded and capsized off Naples, Italy, on 10 June 1996. It was sailing from Naples for Procida Island with 162 passengers and 7 crew. Conditions were thick fog. The vessel suddenly veered to one side, possibly due to a rope around one propeller. It struck rocks, puncturing the hull, and capsized. 4 passengers were trapped in the hull and drowned, and 15 were injured. The others swam ashore. The craft was a total loss.

Ref : Lloyd's Casualty Reports

### I.3.14 Trident 7

The 234 GRT catamaran ferry *Trident 7* suffered an engine room fire off Guernsey on 26 August 1996. It was sailing from Guernsey to Jersey with 111 passengers and 6 crew. 5 minutes after leaving port, a fire broke out in the port engine room. The engine was stopped and the inert gas system discharged. Rescue vessels arrived 8 minutes after the Mayday

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message, and all people were evacuated within a further 30 minutes, with only 1 minor injury. The fire was extinguished by the shore fire brigade after 80 minutes.

Ref : Lloyd's Casualty Reports

### **I.3.15 Hai Bin**

The 538 GRT Chinese catamaran ferry *Hai Bin* collided with a barge off Shek Kwu Chau on 9 April 1997. The *Hai Bin* was travelling from Hong Kong to Zhuhai with 194 passengers and 8 crew aboard. The collision caused a hole 2 x 1.5m in its bow above the waterline. One of the 6 people on the barge was injured, but it sustained only minor damage. The ferry's passengers transferred to another vessel, and the craft returned to Hong Kong under its own power.

Ref : Lloyd's Casualty Reports

### **I.3.16 Hai Yang**

The 514 GRT Chinese catamaran ferry *Hai Yang* collided with the 633 GRT Ro-Ro ferry *Man Boon* off Lantau on 15 April 1997. The *Hai Yang* was travelling from Hong Kong to Zhuhai with 132 passengers and crew aboard. It was punctured on the side by the ferry's bow, injuring 27 people, 3 seriously, and flooding the catamaran, which was beached and refloated 2 days later.

Ref : Lloyd's Casualty Reports

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**I.4 CONVENTIONAL FERRIES****I.4.1 Dona Paz**

The *Dona Paz* sank after a collision in the Philippines on 20 December 1987. It was a 2324 GRT 93m long Philippine inter-island ferry, built in 1963. It was sailing from Tacloban to Manila. The ship had an authorised passenger capacity of 1518, and the manifest showed 1493, but subsequent enquiries estimated 4341 passengers and 58 crew. It was overloaded with people returning to Manila for Christmas. At 22:00, the ship collided with the 629 tanker *Vector* in the Tablas Strait. The tanker was carrying 1130 tonnes of gasoline, diesel and kerosene, and was operating without a license, lookout or properly-qualified master. The collision ignited the tanker's cargo, and both vessels caught fire and sank, the *Dona Paz* after 2 hours and the *Vector* after 4 hours. Most passengers were unable to escape from inside the burning ship. Lifejacket lockers were said to have been locked. Only 2 of the *Vector*'s 13 crew and only 24 passengers from the *Dona Paz* escaped and were picked up by another ferry. The *Dona Paz* had no radio, and it was 8 hours before maritime officials heard of the accident, and it took a further 8 hours to organise a search and rescue operation, which proved futile. A total of 4386 people were estimated to have died.

[Comment: USAF helicopters arrived after the ship had sank and found no debris or survivors]

Ref : Hooke, N. (1997) : "*Maritime Casualties, 1963-1996*", LLP, London.  
Spouge, J.R. (1990) : "*Passenger Ferry Safety in the Philippines*", Trans RINA.

**I.4.2 Dona Marilyn**

The *Dona Marilyn* sank in the Philippines on 23 October 1988. It was a 2855 GRT 98m long Philippine inter-island ferry, built in 1966. It was sailing from Manila to Tacloban. The ship had an authorised passenger capacity of 1279, and the manifest showed 421 passengers and 60 crew on board. Although 46 survivors were not on the manifest, no higher passenger figure was established. In the Visayan Sea, the ship was struck by Typhoon Ruby, which had not been forecast, with 140 knot winds and 10m high waves. Passengers were reported to have pleaded with the master to take shelter, but the ship sheltered for only an hour and then continued. Then its engines failed, and it flooded, heeled and capsized. A passing ferry picked up 138 survivors, and 43 crew were found on nearby islands. A total of 248 people were estimated to have died.

[Comment: No reports of helicopters in attendance. Probably weather not suitable for flying]

Ref : Hooke, N. (1997) : "*Maritime Casualties, 1963-1996*", LLP, London.  
Spouge, J.R. (1990) : "*Passenger Ferry Safety in the Philippines*", Trans RINA.

**I.4.3 Neptune**

The *Neptune* sank off Haiti on 17 February 1993. It was a 256 GRT 45m long coastal ferry, built as a cargo vessel in 1954. It was sailing from Jeremie to Port au Prince. The vessel had an authorised capacity of 250 passengers and 10 crew, but 820 tickets had been sold, and it is thought that up to 2000 people may have been aboard. Photographs of previous voyages show passengers hanging from the side and sitting on the deck awnings. During the night, while the vessel was 3 miles off Petit Goave, a squall struck. It was reported that the vessel heeled

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when passengers moved to one side to shelter from rain, and when requested by crew to move back the vessel capsized. It had no lifejackets, liferafts or radio. There were 285 survivors, some of whom clung to floating debris for 31 hours before reaching the shore. Rescue vessels retrieved only bodies. The USCG estimated that there were 1800 fatalities.

[Comment: No reports of helicopters in attendance. Probably none in the area]

Ref : Hooke, N. (1997) : “*Maritime Casualties, 1963-1996*”, LLP, London.  
Lloyd’s Casualty Reports  
Safety at Sea, March 1993

### I.4.4 Cebu City

The *Cebu City* sank after a collision in the Philippines on 2 December 1994. It was a 2450 GRT Philippine inter-island ferry, built in 1972. It was leaving Manila for Tagbilaran with 528 passengers and 45 crew. At 04:25, it collided with the 12,500 GRT container vessel *Kota Suria* and sank. Another ferry arrived at 05:00, and was followed by fishing vessels. Together with the container ship, they rescued 451 survivors. A total of about 150 people died.

[Comment: No reports of helicopters in attendance.]

Ref : Hooke, N. (1997) : “*Maritime Casualties, 1963-1996*”, LLP, London.  
Lloyd’s Casualty Reports