Report on the investigation of the

man overboard from

Koningin Beatrix

in the Irish Sea on

29 October 2000

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Southampton
United Kingdom
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(Accident Reporting and Investigation)

Regulations 1999

The fundamental purpose of investigating an accident under these Regulations is to determine its circumstances and the cause with the aim of improving the safety of life at sea and the avoidance of accidents in the future. It is not the purpose to apportion liability, nor, except so far as is necessary to achieve the fundamental purpose, to apportion blame.

CONTENTS

GLOSSARY OF ABBREVIATIONS, ACRONYMS AND TERMS

ETA	Estimated time of arrival
GPS	Global Positioning System
IMO	International Maritime Organization
ISM	International Safety Management
kW	kilowatt
LSA	Lifesaving Appliance
MAIB	Marine Accident Investigation Branch
MCA	Maritime and Coastguard Agency
mm	millimetres
MOB	Man Overboard
MOR	Means of Rescue
MSC	Maritime Safety Committee
OOW	Officer of the Watch
“Pan Pan	”The international urgency signal (spoken)
ro-ro	roll-on roll-off
RNLI	Royal National Lifeboat Institution
SOLAS	Safety of Life at Sea Convention
STCW	Standards of Training, Certification and Watchkeeping
UK	United Kingdom
UTC	Universal Co-ordinated Time
VHF	Very High Frequency radio
WP	waypoint

TERMS

Williamson turn	Where a vessel’s helm is put hard over towards the side from which a person has fallen. After the course has changed 60° from the original course, the rudder is put hard over to the opposite side. The vessel is then steadied up once the reciprocal course is reached. Speed is adjusted as necessary and the vessel should return to the original position at which the turn was commenced.

SYNOPSIS (Return to Index)

On Sunday 29 October 2000, the MAIB was informed of a fatal man overboard accident from the Stena Line ferry *Koningin Beatrix* in the Irish Sea. The investigation was originally an administrative enquiry and was upgraded to a full investigation on 27 November. MAIB inspector Andrew Clifton led the investigation and visited the vessel on 5 December, assisted by two other inspectors.

Koningin Beatrix departed from Rosslare at 1040 UTC on 29 October 2000 bound for Fishguard. She was carrying 1092 passengers and 105 crew. The weather was south-westerly force 7 to 8 with wave heights of around 4 metres. A south-westerly swell was causing wave heights of about 1.5 metres.

At 1145, the bridge was informed that three passengers had seen a man in the water. The vessel was turned and, with another nearby vessel, started a search and rescue operation. The master considered the weather too rough to safely lower a rescue boat. The man was sighted several times, and between 1230 and 1238 was reportedly very close to the vessel's starboard side.

At 1238, he passed around the vessel's bow and was then seen floating face down. At around 1300 he was picked up by an Irish coastguard helicopter and taken to Wexford hospital. He was declared dead at 1605.

The victim had fallen overboard from *Koningin Beatrix.* However, as there were no witnesses, it is not known if he fell accidentally or intentionally.

The investigation into the rescue attempt concluded that the master was justified in not lowering a rescue boat in the prevailing weather conditions. However there was no clear plan once the decision was made not to lower a rescue boat, and there were no detailed company procedures to cover this circumstance.

Recommendations are addressed to Stena Line concerning company procedures, bridge wing lifebuoy release arrangements, bridge resource management training for deck officers, risk assessment in respect of rescue boat unavailability and passenger access to the outside decks in adverse weather.

Photograph courtesy of FotoFlite

Koningin Beatrix

SECTION 1 - FACTUAL INFORMATION (Return to Index)

1.1 PARTICULARS OF *KONINGIN BEATRIX* AND ACCIDENT

Vessel details

Registered owner	:	Stena Line
Manager	:	Stena Line
Port of registry	:	London
Flag	:	United Kingdom
Type	:	Passenger ro-ro ferry
Built	:	1986 in the Netherlands
Classification society	:	Norske Veritas
Construction	:	Steel
Length overall	:	161.6 metres
Gross tonnage	:	31189
Engine power	:	4 engines, total of 19360kW
Service speed	:	21.0 knots
Other relevant info	:	Twin bow thrusters, twin screw

Accident details

Time and date	:	Approximately 1140 UTC on 29 October 2000
Location of incident	:	52° 10’ N 5° 53’ W (about 12 miles ESE of Tuskar Rock)
Persons on board	:	1092 passengers and 105 crew
Injuries/fatalities	:	1 fatality
Damage	:	None

1.2 BACKGROUND (all times UTC + 1 hour)

Koningin Beatrix was a passenger ro-ro ferry owned and operated by Stena Line. She was employed exclusively on the Fishguard to Rosslare service in the Irish Sea for over 3 years prior to the incident. This route serves both commercial and public requirements for the shortest crossing of the southern Irish Sea, from the south- western tip of Wales to the south-eastern tip of the Republic of Ireland. It is a busy route with two sailings a day from each port. The crossing takes about 3½ hours. Occasionally sailings are cancelled due to adverse weather conditions.

Koningin Beatrix was built in 1986 in the Netherlands and was originally registered in the Netherlands and owned by Stena Line Holland. In 1997 she changed ownership to Stena Line UK, and became UK-registered. At this time she started on the Fishguard to Rosslare service.

The vessel had two bars, two restaurants, 540 cabins, two cinemas, a casino, a crèche and shopping facilities. There was live entertainment on some crossings. She could carry up to 1800 passengers and 500 cars. She had a freight capacity of 984 lane-metres.

She was a manoeuvrable vessel with twin bow thrusters and twin screw engines. Being a high-sided vessel she was also very susceptible to the effects of the wind. The bridge deck was about 27 metres above the waterline at normal draught.

There were outside decks open for passenger use; these were decks 6 & 7 (aft only), 8, 9 and 10. Deck 10 was the highest deck and also the bridge deck. These decks were protected by steel handrails of heights between 1.05 and 1.07 metres, and were never closed to the public. However in extreme weather conditions passengers were advised not to use them.

The certification issued in respect of *Koningin Beatrix* was valid at the time she departed Rosslare, and the vessel was manned in accordance with her safe manning certificate. The vessel had full International Safety Management (ISM) certification with a safety management system in place.

1.3 THE CREW

The master was 52 years of age and had been at sea for 35 years. He had been master for 15 years and had served on *Koningin Beatrix* for 3½ years. At night, command of the vessel was handed over to the mate/night master.

The mate/night master was 49 years of age and had been at sea for 32 years. He had been serving in this rank for 4-5 years. He had worked on *Koningin Beatrix* for 3½ years.

The second officer who was officer of the watch (OOW) at the time of the incident was 52 years of age and had been at sea for 35 years. He had also served on *Koningin Beatrix* for 3½ years.

The first officer had been at sea for 16 years and had served on *Koningin Beatrix* for 3 years.

None of the deck officers had attended a bridge team management training course.

The vessel also carried a bosun and assistant, two quartermasters and 12 seamen.

1.4 THE DECEASED

Michael Davis was a 35 year old male. He was travelling with his wife and two children who were 4 and 7 years old. The family had its car on board. Mr Davis was a civil engineer and a British citizen who had been working and resident in the Republic of Ireland for the previous 14 months. The family was visiting the UK during the school holidays to see relatives and friends. They were regular travellers on *Koningin Beatrix*. Mr Davis had briefly suffered from depression a year before the accident but he had overcome the depression after a month off work, and was in good spirits and looking forward to his daughter's birthday a few days later. Apparently he was not suffering any financial or marital problems. He was pleased with his recent offer of a permanent position in his work. He was in good health, fit and a strong swimmer. At the time of the incident he was well rested, not taking any medication and had consumed no alcohol that day. He had recently given up smoking, but was still in the habit of walking on the outside decks of *Koningin Beatrix* where smoking was permitted. At the time of the incident he was wearing trainers, green trousers, a black T-shirt and a fine cord, fleece-like jacket.

1.5 LIFESAVING APPLIANCES (LSA) CARRIED ON BOARD

The following was carried on *Koningin Beatrix*:

Rescue boats:

Two fitted on deck 8 (forward, port and starboard). Manufacturer: Mulder & Rijke BV. Capacity 60 persons. Max weight limit 8.5 tonnes (lowering) 4.45 tonnes (hoisting). Fitted with on-load release mechanisms.

Lifeboats:

Six fitted on deck 8 (port and starboard). Manufacturer: Mulder & Rijke BV. Capacity 150 persons.

A risk assessment had been conducted in 1998 for launching the lifeboats. This did not specifically refer to the rescue boats or launching in adverse weather.

Liferafts:

56 davit-launched liferafts fitted at 14 liferaft stations. Each with a capacity of 25 persons.

Rocket line-throwing apparatus:

Four Pains Wessex Speedline 250 rocket line-throwing apparatus stowed on the bridge. Speedline is a self-contained line-throwing unit consisting of a weatherproof plastic casing with end caps. This incorporates the handle and trigger assembly and contains the rocket, striker and 275m of 4mm ready-flaked line. Speedline 250 is designed for use in extreme weather conditions. It can be used in all situations where a line is required to be passed accurately and quickly.

Lifebuoys

A total of 24 lifebuoys were carried, including two with light and smoke, five with line only, and one with line and light. Over half of the vessel's lifebuoys were on decks 8, 9 and 10. The two with light and smoke were on the bridge wings and could only be released from outside the bridge.

Jason's Cradle

One Jason's Cradle was stored in a locker close to the bridge. This is a simple to use ladder-like device made of polyethylene and stainless steel **(see section 1.13)**.

Fast rescue boat:

After the incident, Stena Line fitted a fast rescue boat on *Koningin Beatrix*. The decision to fit this boat was made before the incident to comply with new regulations. The boat is a Norsafe 7.5 metre rigid rescue boat with a carrying capacity of 13 persons. Maximum speed is 33 knots. It is launched from a davit with a single fall. It is designed and constructed for offshore use in rough weather and provides high sustained speeds in a harsh offshore environment. The boat is fitted on deck 9 port side midway between amidships and the bridge, about 25 metres above the normal condition waterline.

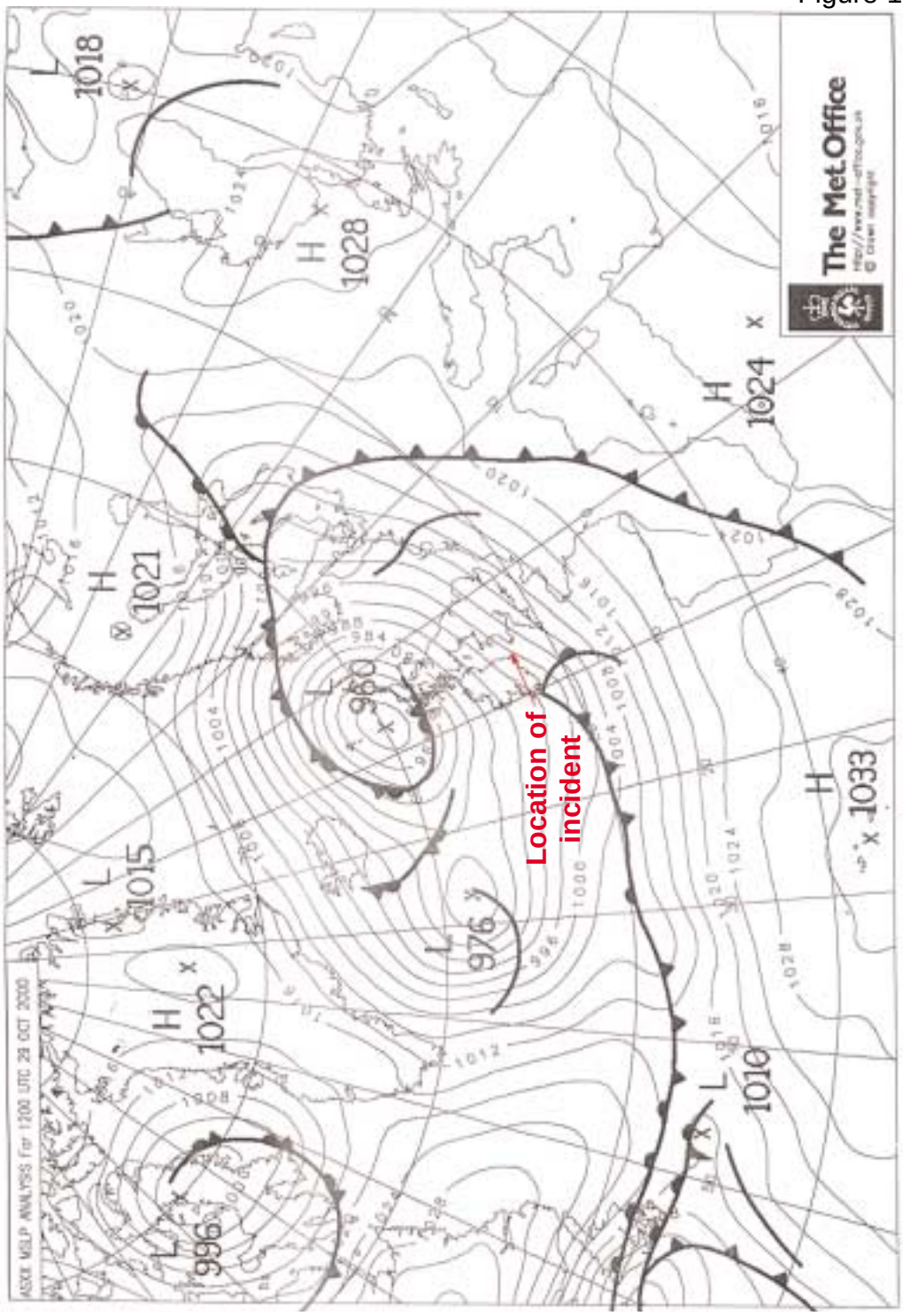
Koningin Beatrix complied with all statutory requirements for LSA at the time of the incident and was carrying other LSA, not mentioned above, such as lifejackets, which were not relevant to this incident.

1.6 ENVIRONMENTAL CONDITIONS

The weather had been poor in the week before the incident, with strong south-westerly winds and high seas.

At the time of the incident an area of low pressure of 960 millibars was located about 100 miles north of Scotland **(see Figure 1)**. This depression was causing strong winds over the whole of the UK. The wind at the location of the incident was south-westerly force 7 to 8 with wave heights of around 4 metres. There was also a south-westerly swell with wave heights of approximately 1.5 metres at a period of around 15 seconds. The visibility was about 7 miles. The air temperature was 8° Celsius and the sea water temperature about 12° Celsius. The barometric pressure was 996 millibars and falling quite fast. There was cloud cover present, but no rain.

Figure 1



Surface analysis at 1200 UTC on 29 October 2000

1.7 *CELTIC KING*

Celtic King, a UK-registered, 100 metre long container feeder vessel, was on passage from Belfast to Southampton. Her British master was on watch at the time of the incident.

She was fitted with a fast rescue boat on her port boat deck. The boat was an ML Lifeguard 455, 4.55 metres length, 1.88m beam with a capacity of six but a normal boat crew of three. It was launched on a conventional fixed davit, using a brake release operated on the boat.

The vessel had a freeboard of around 1.5 metres. She had a metacentric height of about 0.6 - 0.7 metre and was reasonably stable in poor weather. *Celtic King* was equipped with a Becker rudder and bow thruster. In poor weather the vessel could turn and use her rudder to “dampen” the sea to launch the rescue boat. For recovery in bad weather the rescue boat could be lifted on to the main deck by hand and deflated on deck. The boat could then be carried to its normal stowage position and reinflated. *Celtic King*’s Polish crew were mostly ex-fishermen and were very experienced in handling small boats in adverse weather conditions.

1.8 NARRATIVE (all times UTC, all courses are true)

Koningin Beatrix departed Rosslare at 1040 on Sunday 29 October 2000. This was 1 hour and 40 minutes behind schedule because of her late arrival in Rosslare after the adverse weather experienced on the passage from Fishguard.

She had 1092 passengers and 105 crew on board, and was carrying 299 cars and 29 freight vehicles. She sailed with a draught of 6.00 metres forward and 6.26 metres aft. The stabiliser fins were extended at 1050 and the vessel began her sea passage passing Tuskar Rock at 1110. The second officer had eaten his breakfast and was on the bridge with a lookout. The master was in his cabin.

Mr Davis was in the *Parrot* disco bar with his family at the after end of deck 6. They were sitting at a table on the port side close to the dance floor. They were regular travellers and, as they could see the ferry was quite busy, claimed a table when they boarded. The two children were playing on the dance floor. Just before sailing, Mr Davis’s wife took their son to the shop, also located on deck 6, to look for a present for their daughter’s birthday, a few days later. They could not find anything suitable. The vessel sailed while she was in the shop. She then made her way back to the *Parrot* disco bar, but met her husband before reaching the table. She asked him if he could take their son into the shop to see if he could find a suitable gift. She then returned to their daughter by the table and Mr Davis went into the shop with his son. He was carrying his daughter’s green transparent plastic bag containing the car keys, colouring books, a video and a jigsaw. After a few minutes, the son returned to his mother by himself and told her that his father had gone out on deck for a walk. Before going outside, Mr Davis asked his son if he wanted to go with him, but he preferred to stay inside. The time was about 1120.

On the bridge, the second officer was concentrating on a vessel on his port side, *Celtic King*. This vessel was southbound and was on a steady bearing, indicating that risk of collision existed. *Celtic King* was the give-way vessel under the International Regulations for Preventing Collisions at Sea and did not appear to be taking any action. The second officer realised that, as the distance was now down to about 2 miles, he should take avoiding action himself and, accordingly, altered course about 30° to starboard to about 133° to pass about 1.5 miles ahead of *Celtic King.* Once he had altered course, the second officer was content with the situation. The speed at the time was 18 knots. The water depth was around 90 metres.

Three passengers had been dining in the café located on the aft part of deck 7 and decided to go outside for a smoke. After about 5 minutes, one of them noticed an object in the water outboard and to port of the wake, about 30 metres astern of the vessel. He looked closer and realised that it was a man. He pointed him out to his friends and they could clearly see the man spinning around in the water drawing further astern. The passenger then went back into the café on deck 7 and told the nearest crew member he could find, who was working on the till. The crew member went to the outside deck with the passenger; however, he was unable to see the man in the water because he was, by then, well astern of the vessel. The other two passengers verified to the crew member that they had seen someone in the water. The crew member returned to the café and told his supervisor what had been reported. His supervisor told him to inform the bridge. The crew member telephoned the bridge and told the second officer that a passenger had reported seeing someone in the water. The time was 1145.

The second officer put the telephone down, went out the portside bridge door, and released the port bridge wing “man overboard” lifebuoy. This lifebuoy had light and smoke attachments which automatically activated once the lifebuoy had been released and was in the water. The lookout was in the bridge toilet at the time of the telephone call. The second officer then altered course to starboard and started a form of “Williamson turn”.

The vessel started turning at about 1149. The second officer altered course to starboard, rather than to port, due to *Celtic King*’s presence on the port beam and the fact that his brief telephone conversation with the crew member did not mention which side of the vessel the person in the water had been seen.

The helmsman returned from the toilet and took the wheel. The second officer sounded three long blasts on the ship’s whistle. This is the internationally recognised signal for a man overboard. The engine room was informed, the engines placed on stand-by and power switched on to the bow thrusters. When the vessel was about 60° off course, port helm was applied and the vessel turned through north on to the reciprocal course.

The first officer arrived on the bridge and broadcast a “Pan Pan” urgency message at 1150. The night master arrived on the bridge followed by the master. The second officer briefed the other officers about what had happened. The night master went to the GPS and pressed the man overboard button. He then made an announcement to the passengers that possibly there had been a man overboard, the vessel was turning, and might start rolling. The passengers were advised to remain seated if possible and to inform a crew member if they had any information about the man overboard.

The wife of the victim, having heard the announcement, became concerned, knowing her husband was on the outside decks and she had not seen him for a while. She went to the information desk to get more details. She told the receptionist that her husband had been on the outside decks and she had not seen him for about 30 minutes. At least two announcements were broadcast for the husband to contact the information desk. A member of staff sat with the children while another member of staff went with the wife to search the interior of the vessel in case her husband had fallen asleep somewhere on board.

Celtic King’s master had just altered course to starboard to avoid *Koningin Beatrix* when he saw her start the Williamson turn. He heard the man overboard broadcast, slowed his vessel down, sounded the general alarm and made arrangements for lookouts to be posted. He spoke with the first officer on *Koningin Beatrix* by VHF radio. *Celtic King* began preparing her rescue boat and the rescue boat crew began donning immersion suits.

On the aft end of deck 7, more crew members had gathered around the three passengers who reiterated what they had seen. A security guard arrived and took all three to the bridge, where they told the master and the night master what they had seen.

The speed was reduced, the stabilisers were withdrawn, and, once the turn was completed, the master took over the conduct of the navigation with the second officer assisting.

The night master and the master had briefly discussed the validity of the report and the problem of locating a person in the water in the prevailing conditions. They both agreed that in the prevailing weather conditions launching the rescue boat was not an option.

Having completed searching the interior of the vessel, the victim’s wife started looking on the outside decks. She heard another passenger shout and saw her pointing out to sea. She saw no one in the water herself and was then taken, with the children, to a cabin. A member of staff sat with her there until the vessel berthed at Fishguard.

The vessel was steadied up on a heading of about 310°. The speed at this time was around 10 knots. A crew member reported that passengers and crew on the starboard side of deck 9 had seen someone in the water. The master pressed the man overboard button on the GPS again. However, it was reported that this sighting might have been a fishing buoy or lobster pots. The time was about 1208.

At 1207 helicopter R116 took off from Dublin. At 1208 Rosslare lifeboat was launched.

The master decided to turn the vessel a second time. The night master was standing by the GPS, reading off the bearing and distance to the MOB position. However the bearing was changing very quickly, somewhat faster than the vessel could turn.

Celtic King was about 5 cables on the port bow of *Koningin Beatrix* at around 1208 and spotted the lifebuoy and orange smoke canister. No smoke was seen at this time. She was slowly crossing the bow of the ferry.

The two vessels made numerous alterations of course and speed over the next few minutes, as they searched the area around the lifebuoy.

The crew on *Celtic King* then saw a man in the water just abaft her starboard beam, about 100 metres away. The master informed the ferry. There are differing reports of the time *Celtic King* sighted the man, but it is thought to have been between 1220 and 1225.

The man was sighted by those on the bridge of the ferry at about 1229 and the master stopped the vessel. The man was seen to be treading water and waving. He came on to the starboard beam of the vessel about 80 metres away. Two crew members attempted to throw a lifebuoy and line from the starboard side of deck 9 but, due to the distance involved, the strength of the wind and problems with the line tangling, this was not successful. *Koningin Beatrix* was altering her course continuously over these few minutes and there are differing reports as to the heading, and therefore the relative wind direction.

The man drifted down the starboard side of the ferry and was seen by many passengers and crew. He was reported to have come within a few metres of the vessel off the starboard quarter. The man was seen to be treading water and moving his arms quite freely. One crew member claims to have had a brief conversation with him.

In addition to several crew members, many passengers were on the outside decks. Conversations were made between passengers and crew, and several passengers were becoming both agitated and excited at seeing the man, clearly still alive, in the water.

At about 1234, *Celtic King* was around 5 cables away and was preparing to launch her rescue boat. The night master went down on to the car deck with three seamen and took some rope with him.

Helicopter R116's estimated time of arrival (ETA) was given as 1250, and Rosslare lifeboat was expecting to be on scene at 1300.

The master attempted to manoeuvre his vessel closer to the man. The man drifted forward along the vessel and began to pass around the bow. The second officer and a seaman went forward with a lifebuoy and arrived on the forecastle just as the man passed around the bow at 1238.

As the second officer arrived on the forecastle he looked over the port bow and could see the man was now lying face down. The personnel on the bridge also noticed this, and told those on board *Celtic King* who decided not to deploy her rescue boat.

Koningin Beatrix's night master on the car deck asked the master if he should open the bunker door on the starboard side or the pilot door on the port side. The master told him the man was on the port bow and to open the pilot door. The team on the car deck had to pass under a trailer to access the pilot door and open it. The weather conditions hindered their visibility, so they asked the bridge for the man's location. The bridge told them the situation and the pilot door was closed.

The master of *Koningin Beatrix* kept the man in sight and when R116 arrived on scene at 1254 the master guided it towards the man. His body was recovered from the water at 1300. The victim had taken in a large amount of water, making it difficult for the aircrew to establish an airway. It was not considered safe to use the onboard defibrillator due to the man being saturated.

R116 arrived at Wexford hospital at 1315. No pulse was found and continued attempts were made to warm the man and revive him.

Celtic King was released, and *Koningin Beatrix* resumed passage with the master making an announcement about the expected time of arrival in Fishguard.

The child's bag and contents, which were reportedly found on deck 8 port side, were handed in to the reception office. This has not been confirmed as the passenger could not be traced.

Koningin Beatrix arrived at Fishguard at 1520. On arrival, police interviewed the crew on board and spoke to passengers as they left the vessel.

The man was declared dead at 1605.

1.9 COMPANY PROCEDURES FOR MANOVERBOARD

The following are extracts from Stena Line's company standing orders and operational procedures manual:

Chapter 3. Sea Operations

Section 3.9 Man Overboard

3.9.1 The procedure for man overboard differs depending on whether the man was observed to fall over or if he is missed and after a subsequent search is not found and assumed to have gone overboard.

3.9.2 If the man has been observed to fall over the following procedure should be followed:-

3.9.2.1 *Action by the officer of the watch:-*

1/ Rudder hard over to swing the stern away from the person.

2/ Release bridge wing life buoy on the side the person has fallen over. NB Make sure the buoy actually goes in the water and does not hang from the light/smoke float which might not have released from its bracket.

3/ Press "Auto WP"/"Event" on Decca Navigator, Loran or GPS unit. Note WP number.

4/ Sound man overboard signal. (Accident boat signal – THREE LONG BLASTS on the whistle and alarm. Announce on PA "Accident Boat Crew close up"

5/ Commence "Williamson Turn" (see OPS. 3.9.3).....

6/ Put the main engines at Stand By and inform the machinery control room. Reduce pitch on combinators to "Full Manoeuvring".

7/ Post two lookouts with binoculars.

8/ Plot position of ship relative to person overboard.(Auto WP/Event position)

9/ Hoist Interco flag "O" if near shipping traffic. Display NUC lights at night.

3.9.2.2 *Action by the ship's company*

1/ Muster at Accident boat stations, Accident Boat crew wearing protective clothing, lifejacket and equipped with portable radios.

i Accident boat crew to consist of:

a/ a deck officer

b/ an engineer officer

c/ 4 ratings (Seamen grade 1)

The lowerer shall be the Bosun or other designated Petty officer and the Chief officer shall supervise the launch.

ii On vessels equipped with dedicated rigid-inflatable rescue boats e.g. Atlantic 21 the crew shall consist of at least two properly qualified crew members preferably SG1As. All other procedures remain the same.

2/ Accident boat party prepare accident boat.

3/ Machinery party to Machinery Control Room.

4/ First Aid Party to provide stretcher. Nominated caterer to provide blankets.

5/ The master will take charge when he arrives on the bridge and manoeuvre the ship as required.

6/ nearby shipping alerted by VHF.

7/ "XXX" or "PAN" message sent if required.

8/ When the accident boat is prepared for launching 120 fathoms gantline attached to a lifebuoy with a spare smoke float can be towed astern (the master is to be aware of this line in the water when manoeuvring, to prevent fouling of the propellers). In rough weather or darkness the ship can be manoeuvred such that the trailing line will form an arc in which the man overboard can be gathered and on to which he can hold until recovered by boat or winched into the ship.

9/ If possible a pilot ladder and gangway net should be placed over the lee side with manropes. If necessary the person overboard can be recovered up the ship's side using the pilot ladder and gangway net. Men wearing lifejackets and on lifelines must be prepared to go over the side on the ladder and net to assist the person in the water.....

Included among the Stena Line emergency checklists is one to be completed in the event of a man overboard, and is reproduced below:

Activity

Person sighted as they fell overboard

1. *Press GPS Man Over Board button*
2. *Rudder hard over to swing stern away from person*
3. *Release bridge wing lifebuoy/light/smoke float (& SART) on side man overboard.*
4. *Sound appropriate signal (three long blasts)*
5. *Call master*
6. *Make Williamson turn, given that there may be weather, navigational or helm restrictions (angle of heel due to turning)*
7. *Main engines to Stand-by and inform ER of situation*
8. *Post two lookouts with binoculars, use searchlights as reqd.*
9. *Reduce combinators to full manoeuvring*
10. *Plot position of ship relative to person overboard*
11. *Hoist INTERCO flag "O", at night display NUC lights*
12. *Master to take over watch*
13. *Call accident boat crew*
14. *PAN PAN message sent as appropriate and alert nearby shipping by VHF*
15. *Inform passengers by appropriate announcement*

A man overboard notice is by the helm position on the bridge of *Koningin Beatrix*. This appears to have been made up on board the vessel and is not part of a controlled document **(see Figure 2)**.

Figure 2

Man overboard notice by helm position

1.10 RESCUE BOATS

In accordance with the 1996 amendment to SOLAS 74 (Safety of Life at Sea Convention) regulation 111.26.3, passenger ro-ro ferries are required to carry a fast rescue boat. This regulation stems mainly from the aftermath of the *Estonia* disaster **(see section 1.12)**.

At the time of the incident, *Koningin Beatrix* did not have a fast rescue craft, but was equipped with two rescue boats which were similar to conventional ship's lifeboats, with twin falls and on-load releases.

The primary function of the fast rescue boat is to save lives, although it may serve other purposes. This broadly means that in the event of personnel in the water, and within a realistic response time, there should be a good prospect of rescue and recovery to a place of safety and first-aid in adverse weather. The fast rescue boat has to be capable of being launched within 5 minutes while the vessel is underway making 5 knots in a sea state associated with a wind force 6 on the Beaufort scale, in association with a significant wave height of at least 3 metres.

At least two crews of each FRC are required to be trained and drilled to the standard required by the Seafarers Training, Certification and Watchkeeping (STCW) Code. On *Koningin Beatrix* the selected crew members had attended a 3-day fast rescue boat course at Fleetwood offshore survival centre. This course was in excess of the requirements for the rescue boats as fitted and was in preparation for the fitting of the fast rescue boat. The course involves crewing of the boat in the weather conditions at the time of the course; if conditions are calm then the wake of passing ferries is used to simulate adverse weather.

The on board drills on *Koningin Beatrix* were limited to use of the rescue boats in calm conditions in harbour.

1.11 MAIB REVIEW OF LIFEBOAT AND LAUNCHING SYSTEMS' ACCIDENTS

The following are extracts from the MAIB Review of Lifeboat and Launching Systems' Accidents published in March 2001:

Force for major change has usually come from recommendations following high profile accidents where there has been heavy loss of passenger life, most notably the Titanic in 1912. Although lifeboats have been used on many occasions since then and, most noticeably, in two world wars, there have been very few changes to lifeboat design and equipment even though many professional seafarers have lost their lives while using them.

Since it was formed in 1989, the MAIB has received a number of reports about seafarers being injured, and sometimes killed, in accidents involving lifeboats. Scrutiny of the data held by the MAIB suggests that anyone using a lifeboat, be it in a drill or a genuine evacuation, runs a risk of being injured or even killed.

The MAIB database accumulated over a ten-year period indicates that lifeboats and their launching systems have cost the lives of 12 professional seafarers, or 16% of the total lives lost on merchant ships. Eighty seven people have been injured. These accidents all occurred during training exercises or testing, with experienced and qualified seafarers either performing, or supervising, the operations.....

The Safety Study has found that people using lifeboats are exposed to the greatest risk during embarkation and recovery. It argues that if the number of people involved during these times can be minimised, the risks to individuals will be reduced, as will the loading on equipment.

Although the designs of lifeboat launching systems have developed over the years, many manufacturers have felt unable to offer innovative changes in design. Ship-owners have, for their own reasons, been unwilling to implement or finance any fundamental changes. As a result, the development of lifeboat launching systems has been incremental, slow and usually in response to changes in legislation.....

Since the MAIB was established in 1989 there has been no incident reportable under UK regulations, of a merchant vessel using lifeboats to evacuate passengers or crew in an emergency.

One ro-ro ferry was partially evacuated following the outbreak of an engine room fire. Since she was operating as a ro-ro cargo ferry, very few passengers were on board. Sufficient lifeboats for a total evacuation were swung out and prepared for embarkation but were not, in the event, used. Passengers and non-essential crew were evacuated into tugs and RNLI lifeboats, by disembarking through a pilot door from the vehicle deck. Although the vehicle deck was slightly affected by smoke, and the deck plating was showing signs of heating by the fire beneath, the master judged his chosen evacuation route to be preferable to using the vessel's lifeboats.

He was unable to offer clear and considered reasons for making his choice. But it seemed that he did not have total confidence in the capability of his ship's lifeboats and their launching systems, to disembark personnel safely.

Other shipmasters report that to raise their crew's confidence in the systems, they regularly take an active part in launching a lifeboat. Privately they express a feeling of unease, both at taking part in the operation and the need for them to do so.....

Stand-by vessels in the UK's offshore industry use fast rescue craft extensively, but elsewhere the operating experience is still limited. Because of recently introduced SOLAS regulations, the number of fast rescue craft employed on SOLAS convention ships will increase, particularly on ro-ro passenger vessels. Owing to their many similarities with davit launched lifeboats, there are fears that the accident rate will be similar. Some parties which were consulted during the production of this report suggest the accident figures may well be higher, owing to the requirement for operation in poor weather and the use of single point suspension systems on high sided vessels. Pending fuller evaluation and trials of the use of fast rescue craft in merchant ships, especially in rough weather, the MAIB cannot argue with these views....

1.12 THE *ESTONIA* REPORT

Estonia was an Estonian-registered passenger ro-ro ferry which foundered in the Baltic on 28 September 1994 with the loss of 852 of her 989 passengers and crew. The weather conditions at the time were winds of force 8 and wave heights of 3 to 4 metres. The investigation into this accident resulted in an extensive report. The following are extracts from this report:

No lifeboats or rescue boats were launched from the vessels participating in the rescue operation. The possibilities of launching boats were discussed between some of the masters, but in the prevailing weather the operation was considered too risky. Instead liferafts were prepared for use and in some ferries the possibilities of using evacuation slides were discussed and the slides prepared.

The masters realised that the rescue operations would be difficult and the possibilities of rescuing people from the water were limited when lifeboats and rescue boats could not be used.

On the Mariella an inflated liferaft was placed at each end of the vessel's flat side. The vessel was manoeuvred with that side towards the wind and caught drifting rafts from the Estonia in between them. Another raft was lowered and used as a hoistable platform....

Two volunteers from the Mariella were lowered to a liferaft from which they managed to rescue two exhausted persons in another liferaft.

The Isabella also lowered a liferaft with volunteer rescuers on board....

The boat deck on the ferries, in most cases the only open deck, was situated more than 15 metres above the water and lifting the survivors on board proved both risky and difficult. The experience of the rescue highlights the importance of having appliances permitting large ferries to recover people and liferafts from the surface....

Systems should be developed for enhancing the ability of passenger ferries to rescue people from the sea in heavy weather....

1.13 OTHER RECOVERY METHODS IN ADDITION TO BOATS

The 1996 amendment to SOLAS 74 requires ro-ro passenger ships to be equipped with efficient means for rapidly recovering survivors from the water, and transferring them from rescue units or survival craft to the ship. The approved recovery method is called Means of Rescue (MOR).

The MOR may be part of a system designed for rescue purposes such as davit-launched liferafts and/or the fast rescue boat hoist. This was the case on *Koningin Beatrix* which had davit-launched liferafts at the time of the incident, but was later fitted with a fast rescue boat.

Other methods of recovering a man overboard, in addition to lifeboats, include, but are not limited to, the following:

Jason's Cradle

This is a simple to use ladder-like device made of polyethylene and stainless steel, and is used by coastguards and military units worldwide. It takes up minimum storage space and can be deployed in seconds. It is designed to lift the casualty in a horizontal manner. Its use is generally limited to vessels with freeboards of 1.5 metres or less unless an extension 'J' ladder is carried. A basic Jason's Cradle was carried on *Koningin Beatrix.*

Matesaver

This is an adjustable loop on the end of a stainless steel pole, which is passed over the head and shoulders of the survivor, and secured under the arms. The survivor is then moved alongside and recovered.

Markusnet

This is an Icelandic invention and consists of a container, a rescue net structure, a rear unit of knotline and a manual throw line. The line is thrown to the casualty who pulls the net structure towards him and holds on while the ship's crew pull it back to the rescue vessel. The casualty can then lie or sit in the net, or climb up it.

Marine rescue basket

This satisfies the SOLAS requirement for an MOR and consists of a rescue basket attached to a crane using a safety hook. The basket is manned, and can normally accommodate a total of seven to eight persons. It is relatively easy to get into from the water.

AB Welin's MOR

This is a floating rigid aluminium rescue platform, which is suspended by four individual wire falls from a pair of davit arms mounted on a deck above. It is fitted with foam-filled fenders, handrails and protection nets. The platform is stowed in the vertical position supported by the davits to take up minimum deck space. The system is ready for immediate use at all times, and can be deployed in less than a minute by one man. During a rescue operation, the platform is lowered to sea level where it can be embarked either from the water, from a small boat, or from a rescue craft.

Nets and lines

Most merchant vessels carry nets on board for gangways or securing/lifting cargo. A "scrambling" net deployed over the side has been used on many past occasions to allow personnel in the water to board rescue ships. As recently as January 2001, 13 survivors from a Maltese-flagged vessel, which had sunk in the Atlantic, boarded a rescue vessel from a lifeboat using a gangway net. This was considered the only means of boarding at the time.

Lines are among the oldest of traditional methods of rescuing a man in the water, and can be used to control the man in the water and bring him to the ship's side. They can also be used to raise him to the deck given sufficient lifting power, strength of line and proper securing means.

Marine escape system

The evacuation slides, similar to those used in the aviation industry, found on ferries and passenger vessels, can be used to assist those overboard with boarding. These devices are, however, primarily designed for personnel to evacuate a vessel rather than to board, and are of limited use in severe weather conditions.

Rocket line

Rocket line throwing apparatus is required to be carried on most sea-going merchant vessels. *Koningin Beatrix* had four such units on board **(see Figure 3)**. Each unit consists of 275m of 4mm ready-flaked line and is designed for use in extreme weather conditions. Deck officers have to demonstrate their knowledge of the use and operation of these units when taking their certificates of competency.

There have been further developments of the rocket line whereby a weighted buoyant head is used. An American company has also designed a compressed air-propelled rocket with a flotation device located in the rocket's nose, which inflates automatically on contact with the water. This provides a lifeline and flotation for a victim in the water.

Figure 3

One of the four rocket line throwing apparatus units stowed on the bridge of *Koningin Beatrix*

Lifebuoys

A lifebuoy is a buoyant ring designed to give flotation to a person in the water. It is thrown to the person in the water who can then put his head and arms through it or cling on to its lifelines until further help arrives. It comes with a variety of attachments, such as lines, lights and smoke, which may or may not be fitted.

Ladders

A ladder from the nearest deck or opening to the waterline can be used as a means of rescue. A pilot ladder which is designed for heights up to 9 metres, is strong and has anti-twist capability, is ideal for this purpose.

Swimmer

Unlike the Merchant Navy, the Royal Navy has for many years successfully used a “swimmer of the watch” in all weather conditions. A strong swimmer dons a dry suit with a small air bottle, flippers, and gloves. He is then secured to the mother vessel by a 16mm polypropylene line and jumps overboard. On reaching the man in the water he is reeled back by hand from the mother ship and the casualty is winched on board by the use of strops.

1.14 PASSENGER REACTION AND FEEDBACK

This incident was very traumatic and disturbing for the many passengers and crew who witnessed Mr Davis’s struggle to survive. MAIB has received considerable feedback and comment from a number of passengers. Several saw Mr Davis waving, and some claim they heard him shouting.

The apparent inability of the crew to be seen to be taking any steps to attempt a rescue caused anger and frustration among many. One passenger has reported recurrent nightmares; another says the experience has deeply affected his children; and another that he has no faith in ships or their crews to be able to look after his personal safety. The lack of an apparent sense of urgency shown by some crew members was reported by several passengers. Some commented that there appeared to be a lack of leadership among the crew on the outside decks.

When Mr Davis passed around the bow, some passengers were under the impression that he had gone under the vessel, or that the vessel had “run him down”, and accused nearby crew of killing him.

Several spoke to the crew during the incident and claim to have been harshly spoken to. One made a police statement that he was sworn at by a crew member.

Some passengers complained about the lack of information supplied by the vessel, and many made complaints to the information desk after the incident, before the vessel's arrival in Fishguard.

One passenger gave the MAIB a video recording he had made which showed the weather conditions and the helicopter's role in the incident.

Some passengers had sympathy and praise for the master and crew, and were irritated by other passengers' complaints.

SECTION 2 - ANALYSIS

2.1 AIM

The purpose of the analysis is to determine the contributory causes and circumstances of the accident as a basis for making recommendations to prevent similar accidents occurring in the future.

2.2 HOW THE VICTIM CAME TO ENTER THE WATER

In this case, nobody saw Mr Davis fall from the vessel, so it will probably never be known for certain why he did. It is known, however, that he left his family to go for a walk at 1120, and was seen in the water just before 1145.

The three passengers on the after end of deck 7 who first noticed him in the water saw him outboard and to port of the vessel's wake. This would indicate that he fell from the vessel's port side. The only decks on the port side open to passengers are decks 8 and 9, and a small section of the aft end of deck 10 port and starboard is accessible to the public. Deck 8, the boat deck **(see Figure 4)**, is the closest outside deck to the shop, where Mr Davis was last seen on board; it is also the deck where, reportedly, the bag he was carrying was found, although this could not be confirmed. Deck 9 is a promenade deck **(see Figure 5)** which, unlike deck 8, is visible from the decks above it, namely deck 10, the bridge deck. To see someone on deck 8 one would, for most parts of the deck, have to be on deck 8 itself as deck 9 and the lifeboats largely obscure it from above.

The port side was also the lee side at the time, and would have been the chosen side for most people wishing to go on to the outside decks in strong winds.

It is possible the man could have fallen from deck 9 or even the aft end of deck 10 but, for the reasons outlined above, it is considered probable that he fell from deck 8 port side.

Mr Davis managed to get over or through the handrails, all of which were over 1 metre high and satisfied statutory requirements. All of the outside decks were checked by the police on the vessel's arrival at Fishguard, and were also inspected and measured by MAIB inspectors in early December 2000. No defects were discovered, and none have been reported by the vessel's crew. These handrails are considered to be of sufficient construction and height to prevent personnel falling overboard in normal circumstances. The decks were wet at the time of the incident from spray, and the vessel had some motion because of the adverse weather.

Figure 4

Port side deck looking aft

Figure 5

Port side deck 9 looking aft

Someone is unlikely to accidentally fall over these handrails, but it is not impossible. Mr Davis might have been stepping on the bottom rung of the handrails looking at something and fallen over because of the motion of the vessel. He could have, rather unwisely, even been sitting on the top of the handrail and lost his balance, falling backwards. Such behaviour is not unknown on passenger vessels.

He might have been leaning against one of the several gates on decks 8 and 9, whose purpose is for lifeboat/liferaft embarkation. The gate might then have opened because it had not been secured properly, or had been opened by another passenger just before the incident. However, neither the vessel's crew, nor Fishguard police, reported seeing any gates unsecured, and it is the normal practice to keep these gates secured at all times. They are regularly checked by the crew.

There are sections of decks 8 and 9 where the handrails run inboard from the ship's side to avoid lifeboat boarding ladders and liferafts. It is possible he might have dropped the bag over the handrails on to the open deck between the handrails and the ship's side, and then climbed over the handrails to retrieve it. As it contained his car keys he would have wanted to retrieve the bag. While on the open deck he might then have lost his balance and/or slipped on the wet deck and fallen overboard.

If Mr Davis did not fall over the side accidentally it is possible he did so intentionally. There has been no suggestion or suspicion that a third party/criminal act was involved.

Mr Davis had been treated for depression 12 months previously, and had been off work for a month, after the death of his father. He had, apparently, made a full recovery later. He was looking forward to, and making plans for, his daughter's birthday a few days later and apparently, was not suffering any financial or marital problems. On the day of the incident, he appeared cheerful and happy. His wife could think of no reason why her husband would want to take his own life. Before leaving the shop Mr Davis had told his son he was going on to the outside decks, and asked him if he wanted to go with him. It is extremely unlikely, if Mr Davis had made a pre-meditated decision to throw himself over the ship's side, that he would take his son with him. He may, however, have made a spontaneous decision to do so while on the outside deck.

If someone wanted to climb over the handrails intentionally it would not be a difficult exercise and could be achieved quickly.

What is evident though, is that if Mr Davis did go overboard intentionally, he then endeavoured to survive, treading water for almost an hour in 4-metre waves without any flotation devices. This was a remarkable physical act.

As there were no witnesses, it will not be known if Mr Davis went overboard accidentally or intentionally.

2.3 THE RESCUE ATTEMPT

2.3.1 Initial response

The crew member working in the café on deck 7 who received the initial report, went out on to the deck to verify the report for himself. He then came back in and told his supervisor, who instructed him to call the bridge. This resulted in a delay of at least a minute, but probably more. Had he informed the bridge first, and then gone outside, this would have saved some time and might have minimised the search area and the time taken to locate the man overboard.

On receiving the initial report of a person being seen in the water, the second officer mentally went through the checklist for a manoverboard, carrying out actions such as releasing the lifebuoy, initiating a Williamson turn, sounding the correct signal and informing the engine room. He did so without referring to the company checklist or procedures **(see section 2.5)**. This resulted in the MOB buttons on the GPS set and the electronic chart not being pressed at the time of the initial turn.

Although the three long blasts were sounded on the ship's whistle, the internal alarm system was not activated. The off-duty second officer was not woken by the whistle and slept throughout most of the incident. His presence might have assisted the rescue attempt. The announcements were only made to the public areas and not to all areas of the vessel. Activating the internal alarm system has since been added to the checklist.

On *Koningin Beatrix*, a vessel with enclosed bridge wings, the person releasing the bridge wing lifebuoy has to do so by leaving the bridge and going outside. There is no advantage, besides ease of installation, in having the lifebuoy release outside the bridge. If the lifebuoy could be released from inside the bridge, this could save vital time, and may mean the difference between the lifebuoy being close, and therefore accessible to the man overboard, or being too far from him to be of any use. In this instance it didn't make any difference, since the man was well astern when the bridge was first informed.

2.3.2 Follow-up response

The master and bridge team found themselves in a situation which was unfamiliar to the majority of them; a man overboard who had been located but could not be recovered by the vessel's boats because the weather conditions prohibited them from being launched.

After the three passengers, who had reported seeing the man in the water, had explained what they had seen to the master, he discussed the validity of the report with the night master. They discussed whether this was likely to be a false alarm or not. They also discussed the chances of locating someone in the water in the prevailing weather conditions. They thought it was possibly a false alarm

and if it was not, then it was unlikely the person would be located. They also quickly agreed that it would not be possible to launch the rescue boats in the prevailing weather conditions.

There was a period of uncertainty when the bridge received reports of a sighting of a man in the water, closely followed by a report that it might have been a fishing buoy or lobster pots. The bridge team was still not sure, at this time, that there was definitely someone overboard. They did not expect to locate the man, obviously still alive, in the water.

The man-overboard signal was sounded and this alerted the master, night master and first officer who all quickly arrived on the bridge. The first officer took over the communications, the night master stood by the GPS, reading off the distances and bearings to the MOB point and, after completion of the Williamson turn, the master took over the conduct of the navigation. The second officer then stood by, assisting. This delegation of duties was made by personnel assuming their roles without being directly instructed which is, naturally, satisfactory as long as the roles assumed are acceptable to the master. What the bridge teamwork, in this instance, did not provide was someone in overall command, namely the master, without any other duties, but considering the whole scenario and all possible actions. It would have been an option to allow the night master or first officer to have the conduct of the navigation, to allow the master to concentrate fully on the scenario unfolding in front of him and the various options open to him.

The master was busy concentrating on the navigation during the period of the rescue. About 30 minutes elapsed from the man being sighted after the first turn, and between 13 and 18 minutes elapsed from *Celtic King*'s sighting to the man being seen floating face down. Frequent helm and engine orders were given as the bearing and distance to the MOB position on the GPS were called out. The master had little time to consider what other options were available to him. If another officer had had the conduct of the navigation the master would have been released to consider the wider picture of the situation. None of the deck officers had received bridge resource management training. Had they received this training, which is not a statutory requirement, the bridge responsibility structure might have been different.

Four master mariner certificate of competency holders, and some experienced crew members were on the bridge, during the course of the incident. The bridge team could have held a discussion, no matter how brief, as to options available. However, each member was busy, involved with his particular duty, and not all were individually polled for suggestions.

Once it was established that the man was still alive, the master attempted to manoeuvre his vessel as close to him as possible. There was no clear plan except to locate and rescue him. When the man was on the starboard beam an

attempt was made to throw a lifebuoy with a line attached, but this failed because of the distance involved and the strength of the wind. The man then drifted down the vessel's starboard side, apparently coming very close at times.

Koningin Beatrix had 24 lifebuoys on board; only one of these was thrown into the water during the rescue attempt - the port bridge wing lifebuoy released by the second officer when he received the first report. Even if the man was out of reach of a lifebuoy, he might have drifted down on to one, or been able to swim to it. There are varying reports of how close the man came to the vessel. However, he drifted around the bow, possibly contacting the vessel, which suggests he was well within lifebuoy range for some of the time. Personnel were sent forward with a lifebuoy, but by the time they arrived on the forecastle the man had passed around the bow. If he had the use of a lifebuoy this would have provided him with buoyancy, and enabled him to conserve his energy until the helicopter or Rosslare lifeboat arrived on scene.

The failed attempt with the lifebuoy and line suggests that the crew considered the use of a lifebuoy more of a rescue means, rather than a survival means. This is to suggest that they were intending to use the lifebuoy to pull the man to the vessel as opposed to providing him with buoyancy and therefore buying more time. People could have been stationed at intervals along the length of the vessel, at the start of the incident, with lifebuoys ready to throw if the man came within range.

The rescue attempt was unsuccessful. This was, in part, due to the bridge team having no clear rescue plan once the decision was made not to lower a rescue boat. This was a unfamiliar situation which developed quickly without any warning, and was over in a short space of time. The bridge team did well to locate the man in the water. After that they relied largely on *Celtic King*, the rescue helicopter or Rosslare lifeboat being able to rescue the man before he became too weak to keep himself afloat.

Most of the crew on deck were either not involved with the emergency or standing by awaiting further instructions, which could have given the impression of a lack of urgency and leadership. Passenger interference, suggestions, or opinions during a rescue operation can be a hindrance or even a source of provocation to the crew. However, during an emergency situation, all passenger vessel crews, regardless of rank, should respond to passenger comments with polite, authoritative and calm responses. On occasions, during this incident, this did not appear to be the case.

Some passengers complained that they were given insufficient information. However, the bridge team was very busy during the period of the rescue, and the reception desk knew little more than the passengers. After the incident, the master made an announcement with a revised ETA. He should have considered making a brief statement of events to the passengers. Instead it was left to the reception desk to fend off numerous passenger questions and complaints.

The wife was given a cabin, and a member of staff sat with her and her children until the vessel arrived in Fishguard. She was given little information throughout the period, and obtained news of the rescue attempt's progress through a satellite television news channel and a conversation from the alleyway outside the cabin which she overheard. The bridge team could have given the wife regular and honest information; this would have been of some assistance to her during this traumatic time.

2.3.3 Possible alternative responses

The four rocket line-throwing apparatus units, kept on the bridge, were not considered for use at the time of the incident. The line is strong and has a high breaking strain. To be of any use, the rocket would have had to be fired so that the line fell over, or very close to, the man in the water. The first attempt would have been a "sighter", to judge the effects of the wind, with a further three actual attempts being possible. Once the man had hold of the line, he could be pulled closer to the vessel or, if he had the energy, could pull a larger line to himself. The bridge team did not consider using this equipment, although they were all aware that it was on board and stowed on the bridge.

The team which was sent to the pilot door on the car deck found the access difficult initially because of a trailer being parked in the way. Once the door was open they found visibility limited because of the wave heights. The limited space because the trailer prevented the use of immersion suits or lifejackets. This door was the only means available to the master to remove the man from the water, but it was frequently blocked by trailers. If the car deck team had been able to wear immersion suits or lifejackets this would have made any rescue, using the pilot door, safe and more effective.

The master tried to get his vessel as close as possible to the man in the water, but the weather conditions made manoeuvring very difficult.

The master was aware of the ideal position to have manoeuvred his vessel into which would have been two or three ships' widths upwind and amidships of the man. He could then have allowed the vessel to drift slowly down on to him. Once the man was alongside, nets or lines could have been lowered to him, and access made to the waterline using the pilot ladder to bring the man on board.

During the *Estonia* rescue **(see section 1.12)**, in an almost identical sea state, the ferry *Mariella* placed an inflated liferaft at each end of the vessel's flat side, and was then manoeuvred with that side towards the wind, catching drifting rafts from the *Estonia* between them. Although this was on the windward side and not the lee side, as suggested for *Koningin Beatrix*, the required manoeuvre was fundamentally similar.

Koningin Beatrix had 56 davit-launched liferafts on board. One option would have been to lower one to the water and inflate it on the lee side. An extra line could have been attached to the painter and the liferaft allowed to drift down on to the man in the water. It would have taken great skill and some degree of luck to have drifted the raft directly to the man. He would also have needed to have reserves of energy remaining to have climbed on board. However, even if he just held on to the raft's lifelines, without climbing on board, it would have given him buoyancy and therefore more time. This method had no guarantee of success, but was certainly worth trying.

The master's plan was simply to locate and rescue the man from the water using the pilot door. An alternative plan could have been to provide the man with buoyancy, having regard to the ETA of rescue helicopter R116. Lifejackets, lifebuoys or anything else buoyant could have been thrown into the water during the course of the incident and might have drifted down on to him. If successful, this would have helped conserve his energy and given him more time.

The crucial period of the rescue attempt was when the man was on the starboard side of the ferry, between around 1230 and 1238. Before this, the rocket line could have been prepared, the liferaft made ready for launching, and crew members positioned with lifebuoys along the length of the vessel. The amount of time, if any, in which the man would be close to the vessel, and still be alive, would be small.

The severe weather being experienced would have seriously hampered any of the options discussed above, and it is likely that they would not have been successful. There was however the chance, albeit small, that they might have succeeded. The victim fought hard to stay alive, but his available time in the water without any flotation aids was limited. The amount of time he survived was, in fact, remarkable and he was only about 20 minutes away from being picked up alive by the helicopter; this after around 60 minutes in the water.

2.4 RESCUE BOATS

2.4.1 The decision not to use the rescue boats

Very early in the incident the master and night master agreed that because of the prevailing weather conditions the vessel's rescue boats would not be used.

The master's decision was based on the risk to the boat's crew during launching. Once the boat was in the water it should have been able to handle the sea conditions. However, the recovery would have been another high-risk operation. The rescue boat does have recovery slings for adverse weather but their use is somewhat limited; but the boat could have been towed back to port by the Rosslare lifeboat. The risk during recovery could, therefore, have been avoided and the crew taken off the boat by other means.

In coming to this decision the master made a mental risk assessment concerning the launching of the boat and concluded the risk to the boat's crew was too high.

This risk assessment would have been likely to include some, if not all, of the following:

Risk factor = Likelihood x Consequence

The **likelihood** of an incident occurring based on:

- Historical evidence.

Although the MAIB review of lifeboat and launching systems' accidents (see **section 1.11)** was not published at the time, the master would probably have been broadly aware of many of its findings, if not the actual details.

The study supported the master's unease in the launching of lifeboats in such conditions. The injuries and deaths mentioned in the study all occurred during testing of the boats in still, sheltered conditions and certainly not in the sort of weather experienced during this incident. The study found that people using lifeboats are exposed to the greatest risk during embarkation and recovery.

The MAIB's database also shows that if *Koningin Beatrix* had lowered her rescue boat and successfully rescued the man overboard, it would have been the first recorded life saved by a ship's boat on UK vessels and vessels in UK waters, excluding fast rescue boats in the offshore industry, since the MAIB was formed in 1989.

The master was also aware that his boats had only been launched in still conditions in harbour, which was sufficient to comply with statutory requirements for lifeboat drills.

- Crew training.

The crew of *Koningin Beatrix* complied with the requirements for crew training. The rescue boat crews had attended a 3-day fast rescue boat course at Fleetwood offshore survival centre, which was in excess of the requirements for the rescue boats on board at the time. This course does involve some crewing in adverse weather, sometimes simulated by a passing ferry's wake, but not in the weather experienced at the time of the incident. This course is required to be attended every 5 years. The regular onboard drills are conducted in still harbour conditions. This means that crews are normally trained in adverse conditions about once every 5 years.

This leads to the conclusion that the rescue boat crew's training in adverse weather is not frequent enough for them to be able to launch the boat confidently and safely in the weather conditions at the time of the incident.

- Confidence in the release system

Some of the deck officers expressed a lack of confidence in the rescue boat's release system. Despite the boats being launched in the best lee possible, the 4-metre waves would probably give a rise and fall of almost double this. If one fall released with the other still attached, the boat would be at the mercy of the sea and the occupants would have a high chance of being flung overboard.

This release system was only tested in still weather conditions.

- Loose falls striking the boat's occupants

This is a common occurrence in still weather conditions. In adverse weather the likelihood is even higher.

The **consequence** of an incident occurring based on:

- Being thrown overboard, possibly from a height of several metres, in the weather conditions at the time would very likely result in the loss of the crew member.

- Being struck by a loose fall would be very likely to cause injury or even death.

The master's mental risk assessment very quickly determined a high likelihood and a high consequence of attempting to launch the rescue boat in the prevailing conditions. To safeguard the crew of the boat the master decided it was unsafe to launch.

A risk assessment had been conducted in 1998 for launching the lifeboats. This did not specifically refer to the rescue boats or launching in adverse weather. A written risk assessment for use of the rescue boats in adverse weather conditions would have been of assistance to the master in making his decision.

During the *Estonia* rescue, in almost identical weather conditions, no lifeboats or rescue boats were launched from the vessels participating in the rescue operation.

The MAIB considers the master's decision not to launch his rescue boats in the prevailing conditions was justified.

2.4.2 Suitability of the rescue boats

The rescue boats on *Koningin Beatrix* were more akin to traditional semi-enclosed lifeboats with twin falls **(see Figure 6)**. They were not fast rescue boats. They complied with the statutory requirements at the time.

Figure 6

Starboard side rescue boat

The master indicated he would not be happy launching the rescue boats in seas much above 2 to 2½ metres; this equates to winds of force 5 on the Beaufort scale.

The route on which *Koningin Beatrix* is employed has an average wind speed of force 5 or above for 47% of the time in October, the month of the incident. In January it is 55%. This means that during the winter, the weather conditions allow the master to launch the rescue boats about half of the time. During the period of adverse weather the vessel would have to use alternative rescue methods or rely on other vessels or helicopters to rescue someone from the water.

Since the incident, Stena Line has fitted a fast rescue boat on *Koningin Beatrix*. The decision to fit this boat was made before the incident, to comply with new regulations. It is launched from a davit with a single fall. The boat is fitted on deck 9 port side, midway between amidships and the bridge, about 25 metres above the normal condition waterline.

There is little indication that had the fast rescue boat been fitted it, too, could have been used in the weather conditions at the time. The legislation requiring the fitting of fast rescue boats to ro-ro passenger vessels, stems mainly from the *Estonia* disaster. The use of single-point suspension systems on high sided ro-ro's has led to fears that the safety of operating these boats may not be any better than the safety record of conventional lifeboats. Once the boats are launched, and are in the water, providing they are manned by a well-trained crew, they should be able to handle wave heights of 4 metres; the recovery, however, like the launching, is a high-risk operation.

The fast rescue boat is designed to withstand extreme weather, but the crew need to be trained to be able to handle it in those conditions. Regular and realistic drills in such conditions are necessary to keep the crew familiar with the requirements, launching procedures, controls and handling characteristics of the fast rescue boat. However, the legislative requirements fall somewhat below this, with training courses every 5 years. This leaves the operator to make its own voluntary provisions within the vessel's normal operating schedules if it wishes the boat crews to remain familiar. The crew must have confidence in the equipment and in their own training in the prevalent conditions to be able to safely use rescue boats.

In December 2000, the Maritime and Coastguard Agency (MCA) submitted a paper to the International Maritime Organization (IMO) for presentation in the Maritime Safety Committee (MSC) 74th session. This drew attention to a number of concerns regarding the practicalities of deploying fast rescue boats together with the means of rescue on ro-ro passenger ships. This includes concerns regarding rescue boat crews being untrained in adverse weather.

The MSC issued a circular in June 2001 (MSC/Circ. 1016) regarding the application of fast rescue boats and MOR systems on ro-ro passenger ships. A study is being undertaken into the arrangement, specification, testing and operation of fast rescue boats and MOR, and the training of relevant crew members. Until the study is complete, due caution is recommended to be exercised when installing, testing, launching and operating fast rescue boats and MOR.

2.4.3 *Celtic King*

Celtic King had a fast rescue boat fitted and was preparing to use it. Her set-up was somewhat different from that of *Koningin Beatrix.* The boat was being lowered from a relatively low height, having a freeboard of about 1.5 metres, and she was also an extremely manoeuvrable vessel. She had a small turning circle and was able to "dampen" the sea for launching the rescue boat.

For recovery in bad weather the boat was lifted on to the main deck by hand and deflated on deck.

Her crew had attended fast rescue boat courses, and were also generally experienced in handling small boats in adverse weather conditions.

For the reasons above, *Celtic King* was better able than *Koningin Beatrix* to safely launch a rescue boat, and was about to do so when the report reached her that the man was face down in the water.

2.5 MOB PROCEDURES

The *Koningin Beatrix*'s written procedures for a manoverboard were found in the Stena Line Company standing orders and operational procedures manual **(see section 1.9)**. Section 3.9.2.1 covers nine actions to be taken by the OOW if a person is seen to fall over the side. A further nine actions are to be taken by the ship's company under section 3.9.2.2.

Among the Stena Line emergency checklists is a manoverboard checklist **(see section 1.9)**. This lists 15 actions to be carried out.

The checklist actions, and the actions found in 3.9.2.1 and 3.9.2.2 are almost identical but appear in different orders; this may be confusing as to priority. On the checklist action 5 is *call master* and action 15 is *inform passengers by appropriate announcement.* These actions do not appear in 3.9.2.1 and 3.9.2.2.

If both sets of procedures contained the same actions and in the same order, there would be no ambiguity.

The internal alarm was not sounded and the off-watch second officer slept through most of the incident. Sounding the alarm is mentioned in 3.9.2.1 but not on the emergency checklist. Since the incident, sounding the internal alarm system has been added to the checklist.

A manoverboard notice was located by the helm position of *Koningin Beatrix*'s bridge. This appears to have been made up on board the vessel **(see Figure 2)**. This notice gives details of the Williamson turn and a list of actions. This list is again different to the two previous mentioned lists of actions.

There are, in effect, three different procedures for the OOW to refer to in the event of a man overboard; all slightly different and listed in different orders.

During the incident, the man overboard checklist was used, but not initially. The second officer failed to press the GPS MOB button during the initial turn. Had the checklist been followed from the beginning, this probably would not have been omitted.

The manoverboard notice by the helm position is a good reference to have to hand during an incident. However, it omits the GPS MOB button action and various other actions found on both the checklist and in the operational procedures manual.

A copy of the checklist, together with a Williamson turn diagram posted by the helm position, would cover all actions and avoid any omissions.

Stena Line's operational procedures manual, 3.9.2.2 **(see section 1.9)** makes reference to the use of a gantline being trailed astern to form an arc in which the man overboard can be gathered and held on to until rescue. It also refers to the use of a pilot ladder or net. There are no other written procedures to follow in the event of the weather preventing the boats from being lowered.

The possibility of a delay between a person falling overboard, being seen in the water, and the officer of the watch being notified, is not addressed in the company's written operational procedures. Had the delay been accurately accounted for, the time taken to locate Mr Davis might have been reduced.

The company's manoverboard procedures were potentially of only limited assistance to the master, after the decision was made not to lower the rescue boat. If procedures had been in place for this scenario, it would have given the master a list of options which would have helped him to optimise the small amount of time he had during the course of the incident.

2.6 VALUE OF ALTERNATIVE RECOVERY METHODS

The alternative recovery methods found in section 1.13, and not already discussed in 2.3.3, would have had varying chances of success in the incident.

The Jason's Cradle, as carried on *Koningin Beatrix*, was only for use with freeboards of up to 1.5 metres. The freeboard at the pilot door was about 2.5 metres. The 'J' ladder extension, allowing use with higher freeboards, might have been of assistance if the man had been brought to the ship's side.

The Matesaver would have had limited use, if any, in this incident due to the deck's height above the waterline. Its only possible use would have been from the car deck as with the Jason's Cradle.

The Markusnet might have been successful if thrown from the aft end of the vessel, the lowest outside deck, when the man was close and, apparently, within shouting range.

The Marine rescue basket and AB Welins MOR would both have had a good chance of success if the man had been alongside the basket/MOR or the vessel manoeuvred to bring the basket/MOR to him.

A net might have provided something for the man to hold on to. It is highly unlikely he could have boarded the vessel through the use of a net, although he might have been able to board the vessel using a net through the pilot door on to the car deck.

The marine escape system would have been of very limited use in the weather conditions, especially for embarkation. It might have provided him with something to hold on to and therefore extra buoyancy, but it would have had to have been brought close to him.

The use of a rocket line was discussed in 2.3.3 The weighted buoyant rocket line or the air-propelled rocket with the inflatable flotation device would have been very suitable for this incident, and would have stood a reasonable chance of reaching the man. However, the man would have needed the strength to make fast or, at the very least, hold on to the line.

The swimmer, as used by the Royal Navy, is only safe to use by properly equipped and trained personnel, or the swimmer will put himself at risk. It has never been the practice in the modern merchant navy to send a swimmer over the side. The only exception is when crewmembers or even passengers have dived overboard in a spontaneous act of rescue. With *Koningin Beatrix*'s high freeboard, and the weather conditions at the time, it would have been extremely unwise for anyone to have entered the water.

2.7 CLOSING THE OUTSIDE DECKS/CANCELLING THE SAILING

Koningin Beatrix does cancel sailings when weather conditions are poor for reasons of passenger comfort and safe berthing. The decision to sail lies with the master. The sailing at the time of the incident was close to the upper limits of acceptable weather for safe berthing.

If the vessel is unable to recover a man from the water during adverse weather it could be argued from a legal, duty of care, viewpoint that she should not sail when conditions would not permit lowering of the boat. This would, however, result in around half of the sailings being cancelled during the winter period **(see section 2.4.2)**.

Therefore, Stena Line should consider undertaking a risk assessment regarding passengers using the outside decks in adverse weather. This may produce control measures such as closing, but not locking, the outside passenger decks, adjacent to the ship's side, or making it very clear to passengers and crew the dangers and risks involved to anyone going on these decks, including the fact that it might not be possible to recover a man overboard in the prevailing conditions.

SECTION 3 - CONCLUSIONS

3.1 FINDINGS

1. *Koningin Beatrix* was correctly manned and had full valid certification at the time of the incident.[1.2]

2. *Koningin Beatrix* complied with all statutory requirements for LSA at the time of the incident.[1.5]

3. The weather at the time of the incident was poor with south-westerly winds of force 7 to 8 and waves of around 4 metres. There was also a south-westerly swell, causing waves of around 1.5 metres.[1.6]

4. *Koningin Beatrix* departed Rosslare at 1040 on 29 October 2000.[1.8]

5. The incident occurred in open waters with a depth of about 90 metres.[1.8]

6. Mr Davis was last seen alive at about 1120, when he said he was going for a walk alone on the outside decks. He was carrying his daughter's bag.[1.8]

7. The handrails on *Koningin Beatrix* were of sufficient height and construction to prevent personnel falling overboard in normal circumstances.[2.2]

8. Outside passenger decks are kept open in all weathers on *Koningin Beatrix*.[1.2]

9. Three passengers were the first to notice a man in the water from the outside after end of deck 7.[1.8]

10. It is not known how Mr Davis came to enter the water.[1.8,2.2]

11. There was a short delay before the bridge was informed.[1.8,2.3.1]

12. The second officer on the bridge was informed at 1145.[1.8,2.3.1]

13. The vessel was, at this time, altering course to avoid *Celtic King*.[1.8]

14. *Celtic King* assisted in the search and rescue and was preparing her rescue boat.[1.8,2.4.3]

15. The second officer went through the various manoverboard procedures mentally, without referral to company procedures or checklists.[1.8,2.3.1]

16. The second officer had to leave the wheelhouse to release the bridge wing lifebuoy.[1.8,2.3.1]

17. The company standing orders and operational procedures manual and man-overboard emergency checklist are not identical.[1.9,2.5]

18. The master and night master ruled out the lowering of a rescue boat because of the adverse weather conditions, shortly after arriving on the bridge. [1.8,2.3.2,2.4.1]

19. The company procedures had very little detail regarding action to be taken to recover a man overboard in adverse weather once the use of the ship's boats have been ruled out.[1.9,2.5]

20. The master took over the conduct of the navigation after the completion of the first turn until the end of the incident.[1.8,2.3.2]

21. The sighting of the man, after the first turn was complete, was subsequently reported to be possibly a fishing buoy or a lobster pot.[1.8]

22. *Celtic King* made the first sighting of the man in the water between 1220 and 1225.[1.8]

23. The bridge team on *Koningin Beatrix* first sighted the man in the water at about 1229.[1.8]

24. The man drifted along the starboard side of *Koningin Beatrix* between 1230 and 1238, apparently coming very close to the vessel on occasions.[1.8,2.3.3]

25. The crew members' attempt to throw a lifebuoy and line failed.[1.8,2.3.2]

26. The port bridge wing lifebuoy, released by the second officer, was the only lifebuoy thrown overboard during the incident.[2.3.2]

27. The bridge team were all aware that the rocket line throwing apparatus was stowed on the bridge; these units were not considered for use during the incident.[2.3.3]

28. The man drifted around the bow just before the second officer and a seaman arrived on the forecastle.[1.8]

29. The party which was sent to the car deck opened the port side pilot door, but wave heights limited their visibility.[1.8,2.3.3]

30. The man was seen floating face down shortly after passing around the bow at 1238.[1.8,2.3.3]

31. Comment was passed between passengers and crewmembers during the course of the incident.[1.8,1.14,2.3.2]

32. The man was picked up by Irish coastguard helicopter R116 at about 1300.[1.8]

33. He was taken to Wexford hospital where he was later declared dead.[1.8]

34. The victim was last seen conscious about 60 minutes after entering the water.[1.8,2.3.3]

35. Mr. Davis was in the water for a total of around 80 minutes.[1.8,2.3.3]

36. The wife and children of Mr Davis were given a cabin and a crew member stayed with them until arrival Fishguard.[1.8,2.3.2]

37. The bag Mr Davis was known to be carrying was handed in to reception by a passenger who reportedly found it on deck 8 port side.[1.8,2.2]

38. The victim's wife was kept informed of the rescue attempt's progress through television and by overhearing a conversation.[1.8,2.3.2]

39. The MAIB considers the master's decision not to launch the rescue boats to be justified.[2.4.1]

40. Once the decision was made not to launch a rescue boat due to the weather, there was no clear plan made for the rescue attempt.[2.3.2]

3.2 CAUSE

The incident was caused by the victim falling overboard from *Koningin Beatrix.* As there were no witnesses, it is not known if he fell overboard accidentally or intentionally.

SECTION 4 - RECOMMENDATIONS

Stena Line is recommended to:

1. Amend its company standing orders and operational procedures manual, sections 3.9.2.1 and 3.9.2.2 and manoverboard emergency checklist, to ensure the same actions are listed in the same order of priority.

2. Amend its company standing orders and operational procedures manual, sections 3.9.2.1 and 3.9.2.2 to include more detailed procedures to be taken in the event of a man overboard in conditions which do not allow the lowering of a rescue boat.

3. Modify its bridge wing lifebuoy arrangements, on company vessels with an enclosed bridge, so that the lifebuoy can be released from within the bridge.

4. Amend its company standing orders and operational procedures to include management of next of kin following a man overboard or other emergency incident.

5. Remind all crew, regardless of rank, to respond to passenger comments during an emergency situation, with polite, authoritative and calm responses.

6. Consider sending its deck officers on Bridge Team Management Training.

7. Undertake a written risk assessment regarding the use of the fast rescue boat and rescue boats in **adverse weather conditions**.

8. Undertake a written risk assessment regarding passenger use of the outside decks, which face overboard, during weather conditions which preclude the lowering of rescue boats.

Marine Accident Investigation Branch
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