Report on the investigation

of a man overboard incident from

Atlantic Princess H90

in the English Channel

on 23 November 2000

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Regulations 1999

The fundamental purpose of investigating an accident under these Regulations is to determine its circumstances and the causes 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.

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GLOSSARY OF ABBREVIATIONS

°C	Degrees Celsius
LPG	Liquid petroleum gas
m	metre
MHz	Megahertz (frequency)
mm	millimetre
MRSC	Maritime Rescue Sub-Centre
MSN	Merchant shipping notice
PPE	Personal protective equipment
PVC	Polyvinyl chloride
SAR	Search and rescue
UK	United Kingdom
UTC	Universal co-ordinated time
VHF	Very high frequency (radio)

SYNOPSIS

Atlantic Princess is one of the largest fishing vessels registered in the UK. She is a 92m long stern trawler with a crew of 34, a mixture of British, Netherlands and Lithuanian nationals. During the evening of 23 November 2000, she was shooting her nets in the English Channel, about 17 miles south of the Isle of Wight, when one of her Netherlands deck crew fell overboard. It was dark and the sea was moderate, with a moderate to fresh breeze.

In spite of the alarm being raised promptly, and a relatively accurate position being used for the search, he was not recovered.

During the search and rescue operation, performed by a coastguard helicopter, several surface vessels and co-ordinated by MRSC Solent, the crewman's lifejacket was recovered. It was of the automatically inflating type and, although it had not been serviced according to manufacturers' recommendations, it was found fully inflated, with its automatic light illuminated and with its harness buckle fastened.

Another type of lifejacket was available to the deck crew. This was fitted with a beacon which is activated by sea water. Its signal activates an alarm in the vessel's wheelhouse and aids the electronic location of the wearer.

Although there was no witness to the crewman falling, it is concluded that he was probably dragged over the vessel's stern by the stern roller which rotates when the nets are being shot over the stern. It is also concluded that he had not properly donned his lifejacket, and as a result it slipped off after he fell.

The owner of *Atlantic Princess* is recommended to:

- give training demonstrations to all crew on the correct use of all types of lifejackets on board the vessel. These should be repeated routinely.
- compile and maintain a comprehensive inventory of all lifejackets on the vessel in order that their custodian, servicing and repair history can be clearly and reliably identified at any time.
- require the deck crew to use beacon-equipped lifejackets while shooting gear. The long-term objective should be that they are also worn at other times.
- consider fitting a short guardrail at the aft end of each small pound, just forward of the stern roller of the vessel.

Fv *Atlantic Princess* H90

Photograph courtesy of FotoFlite

SECTION 1 - FACTUAL INFORMATION

1.1 PARTICULARS OF VESSEL AND INCIDENT

Vessel details

Name	:	*Atlantic Princess* formerly *Maartje Theodora* ’93 formerly *Astrid* ‘92
Flag	:	United Kingdom
Port of registry	:	Hull
Type	:	Stern freezer trawler
Fishing number	:	H90
Registered length	:	92.04m
Built	:	1984
Builder	:	Welgelegen Scheepswerf and Machinefabriek BV Harlingen, Netherlands
Classification Society	:	Bureau Veritas
Owner	:	Valiant Trawlers Ltd. Croudace House Godstone Road Caterham Surrey CR3 6XQ
Gross tonnage	:	3229
Length overall	:	97.75m
Breadth	:	14.5m
Crew	:	34

Accident details

Time and date of accident	:	2038 UTC on 23 November 2000
Position	:	50°17.9’N 001°10.5’W (17 miles south of Isle of Wight)
Casualties	:	One person missing

All times quoted are UTC

1.2 NARRATIVE

Atlantic Princess left the Netherlands port of Ijmuiden on 20 November 2000 for a fishing voyage. During 23 November she spent about 12 hours searching for fish in the English Channel. The skipper was in the wheelhouse. At 2015 the fishing master decided to shoot the nets, and he rang the alarm bells three times to alert the deck crew. The skipper left the wheelhouse, leaving the fishing master in charge.

Four members of the deck crew went to the aft working deck to prepare for the shooting operation. The fishing master stood ready to work the winches from the control positions in the aft starboard corner of the wheelhouse. Two other crewmen were also assisting in the wheelho*use.*

The vessel was on a course of 210° at a speed of 2.5 knots. The wind was force 4 to 5 from the north-west; it was dark and cloudy.

Shooting the net over the stern began, and proceeded without difficulty for several minutes. Two of the deck crew clipped on the net's headline transducer at the aft end of the deck. The other two crewmen were at the forward end of the aft deck, by the winch. Shooting continued.

Having attached the headline transducer, one of the crewmen moved to the aft port pound where he clipped a towing cable to the net's wing end. It was expected that the second crewmen would do the same on the starboard side.

However, he was not on deck and, thinking the other man had gone to the toilet, the first crewman moved from the port side to do this job. The remaining two men on deck were still forward, by the winches.

About three minutes after the transducer was attached, the fishing master noticed the second crewman was absent from the deck. He left the wheelhouse and went to the aft deck to investigate.

After making enquiries of the remaining three crewmen, who knew nothing of the whereabouts of the absent man, the fishing master concluded he had fallen overboard, so returned to the wheelhouse to raise the alarm.

The skipper and mate returned to the wheelhouse. The fishing master began recovering the gear, while the skipper recorded the position 50° 17.9'N 001° 10.5'W on the electronic plotter. The mate released the man-overboard lifebuoy from the port wheelhouse wing, and broadcast a "Pan Pan" alert on VHF Channel 16, reporting that a man had fallen overboard. The vessel maintained her course and speed while the gear was recovered.

At 2042 the "Pan Pan" was received by Maritime Rescue Sub Centre (MRSC) Solent who scrambled coastguard rescue helicopter India Juliet (IJ) at 2043, Bembridge Lifeboat at 2044, and requested all vessels in the vicinity to report.

While recovering *Atlantic Princess*'s net the man-overboard lifebuoy, earlier thrown overboard by the mate, was found fouled in the net. Once the net was on board, the vessel turned on a reciprocal course to return to the estimated position of the accident, about 4.5 cables away. All hands were called to act as lookouts and a search began.

City of Amsterdam, a car carrier, was on scene at 2110, and IJ arrived on scene at 2119.

At 2135 helicopter IJ located a lifejacket in the water in position 50°18.1'N 001° 07.49'W.

Gilden, a liquid petroleum gas (LPG) carrier in ballast, arrived on scene at 2143.

The lifejacket located earlier was recovered by IJ at 2143. It was found fully inflated, with its light illuminated and its harness buckle fastened. It fitted the description of the lifejacket worn by the missing man.

The lifejacket's position was then used as a datum for a search by *Atlantic Princess* and the other vessels on scene, line abreast on a course of 270° and its reciprocal.

Bembridge lifeboat arrived on scene at 2215. By 2255 four merchant vessels had arrived on scene and joined the search; one car carrier; one LPG tanker; one refrigerated cargo vessel; one oil tanker.

At 0001 on 24 November *Atlantic Princess* sighted what was thought to be the man's hard hat in position 50°17.9'N 001°15.10'W. She was unable to retrieve it.

IJ left the scene at 0013 to return to base for refuelling.

At 0022 the tidal stream was noted as being 2.5 knots at 260°.

A second fishing vessel joined the search vessels at 0115.

The hard hat's position was used as the datum for a search by surface units and IJ on its return from refuelling at 0133.

There were no further signs of the missing man and MRSC Solent released all search units at 0246. *Atlantic Princess* continued searching until 0543 before proceeding to Portland, UK.

1.3 SEA AND WEATHER CONDITIONS

Wind was force 4 to 5, increasing to force 6 from north-west; waves of less than 0.5m; slight swell. Water temperature was 11°C and air temperature 9°C. Although dark, the visibility was good. At the time of the accident the tide was running to the east, rate estimated at 1 knot. About four hours into the search the tide was recorded as to the west at 2.5 knots.

1.4 GENERAL ARRANGEMENT

Atlantic Princess is a stern trawler and one of the largest fishing vessels registered in the United Kingdom. The nets are handled over the stern and catches may be directed from the net's cod end into refrigerated sea water tanks, for later processing, or directly to the fish processing room. These tanks, and the processing deck, are below the level of the aft working deck which is open.

The net drum is positioned centrally at the forward end of the aft deck, with towing winches either side, all controlled at a station in the aft starboard corner of the wheelhouse. This control station overlooks the aft working deck. Leading aft from the net drum are two lengths of safety barriers with the net lane between. These pass beneath a gantry near the stern **(Figures 1 and 2)**.

Just aft of the stern gantry, and outboard of the safety barriers, are two small pound areas **(Figure 3)**. These are enclosed on their port, starboard and forward sides by safety barriers. Their aft boundary is formed by the vessel's transom and unpowered stern roller.

It is inside each of these two pounds that a crewman stands to clip the towing wires to the net wings as the net is shot over the stern.

1.5 CREW

Atlantic Princess carries a total of 34 crew. Of these, 22 were British, one was Lithuanian and the remainder were from the Netherlands.

In common with a number of UK fishing vessels, she carries a skipper and a fishing master. The fishing master is responsible for fish catching operations. The skipper has overall responsibility for the vessel's navigation and management. The skipper on board at the time of the accident also sailed regularly as fishing master on the same vessel.

The missing man was 43 years of age and was one of the Dutch deckhands. He had sailed on this vessel previously, and this was his third voyage. During his first trip his alcohol allowance was withdrawn after he was seen on deck under the influence. His allowance had not been reinstated at the time of the accident.

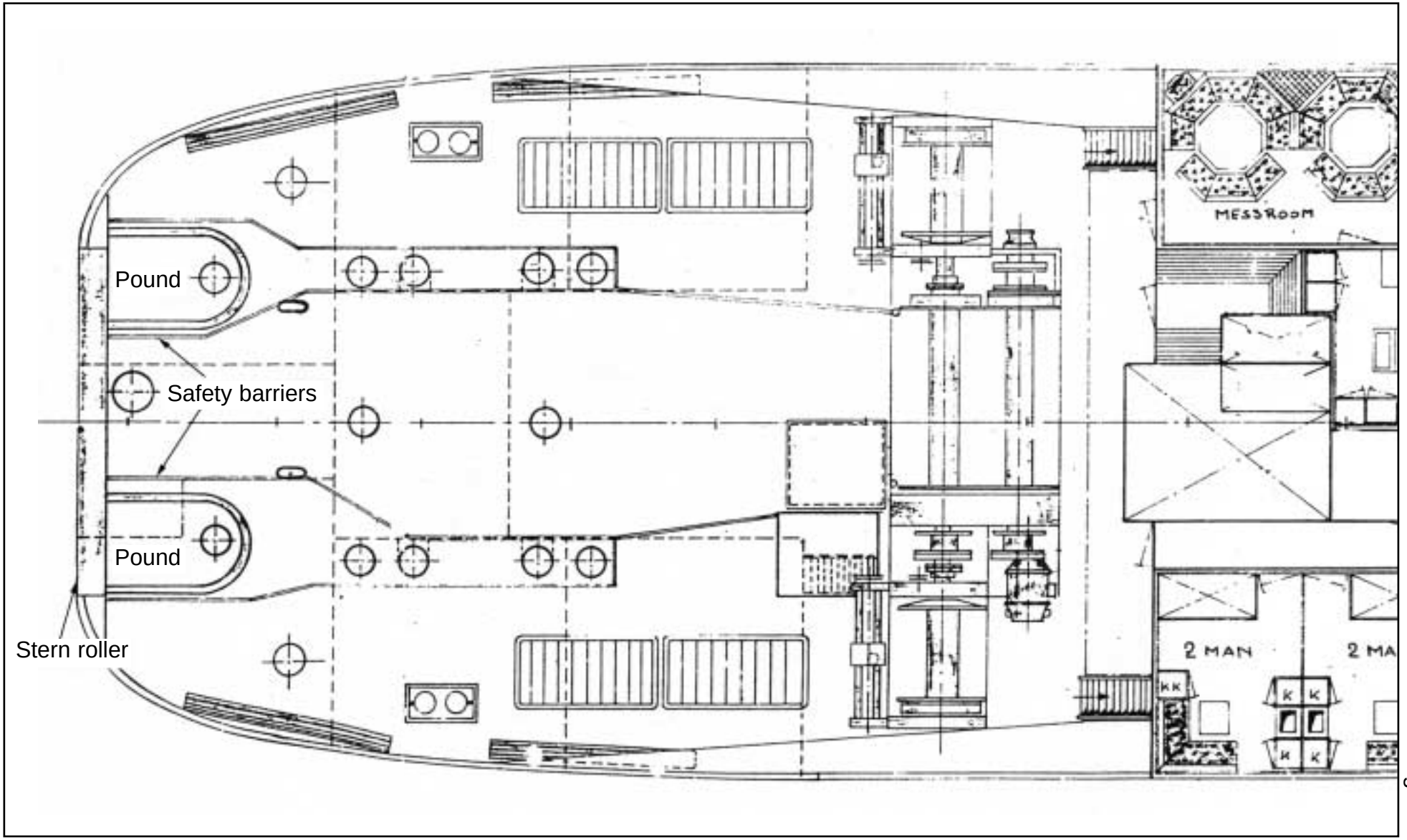


Figure 1

Plan of aft working deck

Figure 2

View of aft working deck from winch control station in wheelhouse

Figure 3

Starboard pound

1.6 ALCOHOL

The owner's policy allows each crewman an alcohol ration of 36 cans of beer per voyage. In addition, the Netherlands crew members are allowed a 1 litre bottle of gin.

The owner applies a system of penalties in the event of this allowance being abused.

1.7 RISK ASSESSMENT

The owner had prepared a manual of safety documents related to the working of *Atlantic Princess.* These were a safety policy statement, risk assessments and a set of safety instructions. Copies of the manual were available to all crew members.

The risk assessment has identified general hazards to crew working in exposed conditions. Some of the control measures specified as a result of the hazard evaluation are:

> Protective equipment to be used at all times:-
> Oilskin clothing to protect from water.
> Thermal waterproof clothing in cold conditions.
> Safety wellington boots with steel toe-caps to protect from objects crushing toes.
> Gloves, suitable for various tasks: rubber/PVC for handling fish and general use in wet conditions: tough leather for handling wires.
> Safety harnesses for working aloft or outboard.
> Lifejackets are to be worn by crewmembers at all times while using the rubber boat.
> A minimum of two crewmen should be in the boat at all times.
> Hard hats and lifejackets are to be worn on deck at all times.

Several possible hazards associated with shooting the gear are identified. Two of these are:

> Being dragged by netting.
> Drowning.

The evaluation identifies as 'moderate risk' the risk of hands being trapped in fouled gear, which suddenly frees, so dragging men with it.

1.8 CLOTHING

Two of the four crew working on the aft deck were wearing survival suits, one was wearing a wet suit, and one, the missing man, was wearing ordinary clothing. All were wearing hard-hats and inflatable lifejackets.

1.9 LIFEJACKETS

Two types of lifejacket were available to the crew who worked on the aft deck **(Figures 4 & 5)**. Both were self-inflating and fitted with lights. These were not part of the vessel's requirements for lifesaving appliances.

A number of the lifejackets of the type worn by the missing man were supplied to the vessel in July 1998. Of these, 21 were examined and serviced by a testing station in October 1999. The lifejacket worn by the missing man was not serviced at that time.

The other type was fitted with a man-overboard locator beacon able to activate the man-overboard alarm and location system automatically.

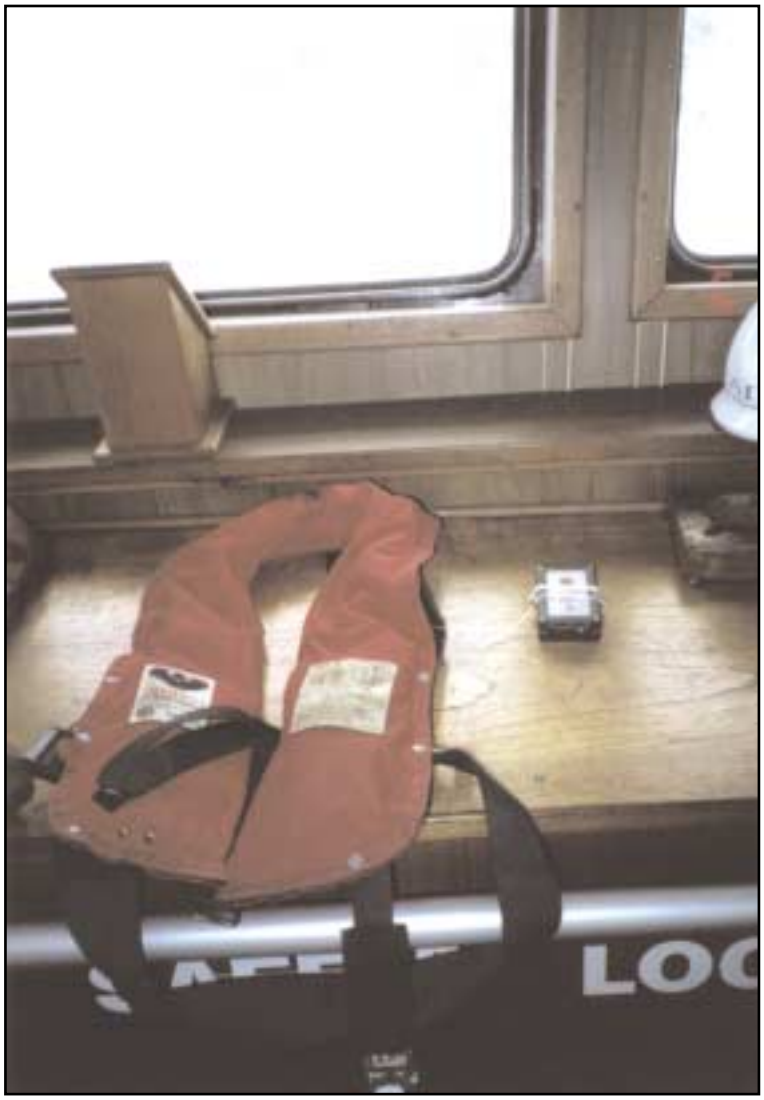
This type has a crutch strap as part of its harness arrangement. The other type, as worn by the missing deckhand, does not.

The man lost overboard was wearing a lifejacket not fitted with a beacon. This lifejacket was recovered by rescue helicopter IJ during the SAR operation. It was found fully inflated, with its light illuminated and its harness buckle fastened.

Figure 4

Lifejacket of type without man overboard beacon

Figure 5



Lifejacket of type with man overboard beacon

1.10 MAN-OVERBOARD ALARM

The set of inflatable lifejackets fitted with man-overboard beacons is served by a dedicated receiver fitted in the wheelhouse.

This system operates at 433MHz and has an operating range in the order of 100m, depending on antenna efficiency. A beacon is immediately activated when the lifejacket to which it is attached is immersed, as would happen if its wearer fell overboard. In turn, its signal is received by the wheelhouse unit, which activates an audible alarm to alert the watchkeeper.

The wheelhouse unit also displays the beacon's position, and thus that of the man-overboard, as a latitude and longitude.

SECTION 2 - ANALYSIS

2.1 RAISING THE ALARM

About three minutes elapsed between the last sighting of the deckhand and the realisation that he might have fallen overboard. Within the next two minutes the vessel's position was marked on the plotter, a man-overboard marker released and the "Pan Pan" call to Solent MRSC made. Therefore, no more than five minutes elapsed between his falling, and the position being marked. Unfortunately the man-overboard marker became fouled with the net and was hauled on board as the net was recovered.

While shooting, the vessel was making about 2.5 knots. Therefore, she travelled a maximum of 250 to 350m between the deckhand falling and the position being marked on the plotter. The position recorded was thus probably within 350m of the accident and the man in the water.

Had his lifejacket been of the type fitted with a beacon, his position might have been known within a smaller radius. However, this beacon system has a limited range, in the order of 100m, and, as the vessel needed to maintain course until her nets were recovered, beacon contact with him would probably have been lost, at least temporarily.

2.2 THE SEARCH

This accident occurred in darkness. Although the visibility was good, most of the search units, such as merchant ships and fishing vessels, were not ideally suited or equipped to locate a person in the water in these conditions.

The crew of the coastguard helicopter, IJ, had the benefit of night vision goggles and an infrared camera. Once the missing man became separated from his lifejacket, with its light and retro-reflective surfaces, the helicopter was probably the only search unit with any reasonable chance of locating him. In spite of a comparatively accurate search datum, even this unit was unsuccessful, suggesting the search target had left the surface. Without his lifejacket, this is not remarkable.

Most of the other search units were relying on normal vision aided by searchlight. This combination, in some cases from high-sided vessels, would have been extremely fortunate to locate the missing person in a sea disturbed by a wind of up to force 6. Their difficulty was increased by the target having no retro-reflective surfaces, as normally found on lifejackets and survival suits.

The recorded positions of lifejacket, hard hat and the original man-overboard report are, within a quarter of a mile, on the same latitude **(Figure 6)**. This is consistent with the observations that the tide was running either to, or from, the east throughout the SAR operation. There is no reason to suppose that the tidal

stream affected the missing crewman any differently to the lifejacket and hard hat. Thus the latitude of the man-overboard report and the lifejacket sighting gave a very good datum for the search. In spite of this line being searched by several units, including helicopter IJ, no sign of the man was found. It is assumed that by that time he had drowned.

Figure 6

Reproduced from Admiralty Chart 2450 by permission of the Controller of HMSO and the UK Hydrographic Office

2.3 SURVIVAL

Any person falling overboard in European waters during winter faces two primary dangers. The obvious one is drowning and, provided this can be avoided, the other is hypothermia.

Reactions to total immersion in cold water vary from person to person, even under similar conditions. Many authorities publish expected survival times, based on an average adult.

All data show an increasingly rapid onset of hypothermia as water temperature drops.

Typical data, based on an average adult wearing normal clothing in water at 10°C, suggest that loss of consciousness is likely to occur after one hour, and survival time may be in the order of three hours. Naturally these figures assume that the subject has not succumbed to drowning.

Rescue helicopter IJ sighted the casualty's fully inflated lifejacket about one hour after he fell overboard. Sea water temperature was 11°C.

This survival data, the sea water temperature and the time at which the lifejacket was recovered, suggest that the casualty might have had a significant chance of survival had he remained secured in his lifejacket. Other circumstances, such as early detection of his absence from the aft deck, and prompt location of the lifejacket by SAR units, were certainly favourable.

Having reached this conclusion, one must conclude that the deckhand's survival chances might have been further enhanced had he been wearing one of the lifejackets fitted with a man-overboard beacon. The three to five minute delay between his falling and the alarm being raised, which was possible in this case, would have been removed. The alarm would have been raised immediately he entered the water, so giving a very much more accurate position. However, even this improved data is of little value if the casualty cannot remain attached to his lifejacket, or find some other method of remaining afloat.

While predictions of likely survival time are subject to many uncertainties, available information identifies the value of wearing a lifejacket when working on deck. Indeed, this was recognised in the owner's own risk assessment and controls, which required that all crew working on deck wore, among other items, lifejackets. However, there is no specific reference to lifejackets in the safety instructions.

2.4 THE LIFEJACKET

The more popular lifejackets among the deck crew are those without a man-overboard beacon. Two reasons are offered for this preference. Firstly they have no crutch strap, making them slightly more comfortable, and secondly they are slightly lighter in weight. The lifejacket worn by the missing man was of this type.

The missing crewman's lifejacket had not been serviced since being supplied to the vessel 28 months before this accident. Manufacturers recommend servicing annually. Owner's records show that 21 other lifejackets of this type were serviced in October 1999, about 15 months after they were supplied. That worn by the missing crewman was not one of those. The reasons for this omission have not been established, but a need for better inventory control is indicated. With the objective of ensuring that future servicing of these important safety items is not overlooked, the owner is recommended to compile and maintain a comprehensive inventory of all lifejackets so that their custodian, servicing and repair history can be clearly and reliably identified.

Notwithstanding the lack of servicing, the lifejacket was found inflated and with its light illuminated. Presumably inflation and the light were activated shortly after immersion, as intended.

A set of instructions is supplied with each lifejacket. These cover the care, storage, fitting, repacking and operation. On a separate leaflet issued with each lifejacket of its type, are illustrations making it clear that the buckle should be adjusted to give no slack between the harness's waistband and the wearer.

The waistband was found adjusted to a girth of 1320mm, with its buckle closed. The missing man has been described as slim. A person fitting this description is, even when measured over everyday clothing, unlikely to have a waist or chest measurement approaching this figure. From this it is reasonable to suppose that the lifejacket was a loose fit on the missing man.

This slackness, apart from being at variance with manufacturers' donning instructions, makes it possible that the wearer involuntarily slipped free of the lifejacket in the water. However, this would have required the waistband of the harness to slip over his shoulders without being caught under his armpits. Although possible, this is considered unlikely, unless he entered the water feet-first and with his arms stretched above his head.

Following the lifejacket's recovery, it was noted that the webbing was folded where it passes through the buckle **(Figure 7)**. Creases in the material suggested this was a long term condition. This fold might have been the result of the webbing losing its elasticity with age and weathering, or the wearer might have folded it so that it maintained its adjustment. To support this possibility, it is noted that without this fold the webbing is able to slip through the buckle, particularly while donning the lifejacket, and when there is no tension on the

webbing. However, a simple trial showed that, with the buckle closed and adjusted to put the webbing under slight tension, as is the case when the lifejacket is correctly donned, slippage is unlikely. Thus, it is considered unlikely that the buckle slipped to cause the slackness found in the harness. The state of the webbing and buckle is, therefore, unlikely to have contributed to the lifejacket slipping from the crewman.

Alternatively, when he prepared for work on deck the crewman might simply have slipped the lifejacket over his head without having the harness around his waist. As the major part of the lifejacket is a horseshoe shape, this is very simple. This might have been a temptation as he expected to be on deck only briefly. Also this would, from a distance, have given the impression that he was wearing his lifejacket as required, particularly with the buckle fastened. However, in this state it would easily have slipped over his head as he fell and entered the water. This is considered the most likely explanation and suggests that a beacon-equipped lifejacket, if donned in the same fashion, would have been of no greater help in keeping this man afloat. Separation from his lifejacket would have been just as immediate.

Figure 7

Buckle and webbing of recovered lifejacket

2.5 ACCEPTANCE OF SAFETY EQUIPMENT

The conclusion that the missing crewman would have had a significant chance of survival, if his lifejacket had remained secured to him, is a valuable repetition of the message for those in the industry who doubt the value of lifejackets to fishermen working on deck.

Even for the owner or skipper who is convinced of their value, a problem remains; acceptance by some crews. The owner of *Atlantic Princess* made significant efforts to provide safety equipment for her crew. In particular, the man-overboard alarm system is a substantial piece of equipment intended to address serious dangers. However, in the interests of comfort some of the deck crew chose not to wear the lifejackets fitted with the beacons.

UK regulations require the provision of personal protective equipment (PPE) but universal acceptance of some PPE in the fishing industry may still require a change of attitude. The use and acceptance of PPE by crews of larger fishing vessels has developed. In this context, *Atlantic Princess* is one of the largest fishing vessels in the UK fleet, and acceptance of PPE appears relatively well developed. Unfortunately even on this large vessel the culture of some individuals needs addressing. However, attitudes to safety and risk do change and can be changed.

Use of the lifejackets fitted with the overboard alarm beacons could improve the safety of those working on deck. Indeed, even the alternatives available would improve crews' safety, if worn correctly. Whichever type is worn, the importance of them being put on, and adjusted properly, should be emphasised to crews.

It is possible that, if the crew on *Atlantic Princess* can initially be persuaded to use the heavier, and less comfortable lifejackets for even brief periods, they may become accustomed to the practice. Of the routine operations carried out on the aft deck of the vessel, shooting gear is probably the most hazardous with respect to the chances of crew being dragged overboard. However, in comparison to hauling, this operation is quite brief and may be a prime example where the wearing of the less popular beaconed lifejackets could be required. As they would be in use during an operation where risk is high, crews might be ready to accept both their need, and the associated discomfort. From this, a greater acceptance might grow.

With the objective of developing increased acceptance of the beacon- equipped lifejackets, the owner is recommended to require the deck crew to use them while shooting gear. The long-term objective should be that they are worn also at other times.

Notwithstanding the likely potential benefits of using lifejackets fitted with the beacons, whichever lifejackets are used they will have no value whatsoever unless they are worn and adjusted correctly.

2.6 STATUTORY REQUIREMENTS

The *Merchant Shipping and Fishing Vessels (Personal Protective Equipment) Regulations 1999* are applicable to *Atlantic Princess*. The merchant shipping notice associated with these regulations (MSN 1731 (M+F)) identifies a number of work activities for which PPE should be provided. One of these is where there is a reasonably foreseeable risk of falling or being washed overboard, a lifejacket should be provided.

The crew of *Atlantic Princess* are provided with hard hats, survival suits, lifejackets fitted with man-overboard beacons and 'conventional' inflatable lifejackets. This provision exceeds the equipment set out in the regulations.

Crew also have an obligation to use any PPE, such as lifejackets, provided under these regulations. Further, their obligation extends to using the equipment according to the instructions and training given by the employer (owner).

It has been concluded that, had the missing crewman worn his lifejacket correctly, it would not have slipped off, and his chances of survival would have been increased as a result. This implies that he did not follow the instructions for the correct use of the lifejacket.

Some fishermen might consider that, because of their experience, they would not benefit from formal instruction and demonstration in the proper donning of lifejackets, as proposed in the regulations. The missing crewman was an experienced fisherman and yet had not worn his lifejacket correctly, which suggests that this view might not always be valid. Also, the regulations and the circumstances of this accident require, or suggest, that such instruction and demonstration would not be misplaced. The owner of *Atlantic Princess* is, therefore, recommended to give training demonstrations to all crew in the correct use of all types of lifejackets on board the vessel. These should be routinely repeated. The circumstances and consequences of this accident might be used as suitable material for reinforcing the importance of using the equipment correctly.

It is accepted that the majority of experienced fishermen probably do know the correct way to don most common lifejackets. The suggested demonstrations would, therefore, be aimed, not primarily at imparting knowledge but at modifying attitudes, and instilling a disciplined approach to the use of PPE.

2.7 CREW PROTECTION

While working on the aft deck of this vessel, the area where the risk of going overboard is greatest, is probably right aft by the stern roller. Here the stern roller effectively replaces a conventional static guardrail or bulwark. Anyone leaning on the roller as it rotates outboard would, in the absence of any restraint, be dragged overboard.

Although the missing man was not seen to fall, it is probable that he went over the stern as a result of this mechanism. Had a static guardrail been in the place of the roller, this fall would have been much less likely.

Because the stern roller is unpowered, it is probably not viewed as a machine. However, it is a substantial component, which rotates and is unguarded. As with any rotating machinery it has the potential to cause harm and so, if practicable, needs to be separated from personnel.

As the stern roller is important to the efficient operation of the vessel, it is probably not practicable to replace it with a conventional bulwark. However, there appears to be sufficient space in each of the two small pounds just forward of the roller to fit a static guardrail. These could be at a similar height to the other safety barriers surrounding the pounds, and would separate the roller from any crewman standing in either of the pounds. Any crewman standing there would then be within an area totally surrounded by a guardrail or safety barrier. This is likely to improve the safety of the crew.

The vessel's owner is recommended to consider the fitting of a protective rail in these areas. However, it is recognised that consideration must also be given to the vessel's operational needs, and the requirement for the net to be free running as it passes over the stern. The position and size of the suggested guardrails need to take these considerations into account.

2.8 ALCOHOL AND FATIGUE

During the vessel's 12-hour search for fish, the missing deckhand had had an extended period available for rest. His activities during that time are not recorded, but his demeanour and behaviour during the brief period he spent working on deck gave none of his colleagues cause to suspect that fatigue prevented him from doing his work.

The alcohol allowance for this deckhand had been withdrawn two trips earlier. This was because he had been seen on the working deck under the influence. Presumably his colleagues were aware of this, and were able to recognise the effects of alcohol on this man again. However, none recall noticing any such symptoms in the brief period before he was lost.

Thus, there is nothing to suggest that either fatigue or alcohol had any significant influence on this man's behaviour during the period leading to his loss.

SECTION 3 - CONCLUSIONS

3.1 FINDINGS

1. The crewman fell overboard from *Atlantic Princess* at about 2038 on 23 November 2000, in approximate position 50° 17.9'N 001° 10.5'W. [1.2]

2. Up to five minutes elapsed between his falling and the position being recorded. [2.1]

3. His position was recorded within about 350m. [2.1]

4. The crewman became separated from his lifejacket after falling. [2.4]

5. The Maritime Rescue Sub Centre, (MRSC) Solent responded to the vessel's "Pan Pan" call on Channel 16 VHF at 2042. It initiated a search and rescue operation using a helicopter, lifeboat, merchant and fishing vessels. [1.1]

6. Without the aid of the retro-reflective surfaces of the lifejacket, most search units were poorly equipped to locate the missing man during darkness, except for the helicopter. [2.2]

7. The crewman's lifejacket was found fully inflated, and with its light illuminated, about an hour after he fell overboard. [2.3, 2.4]

8. The casualty might have had a significant chance of survival had he remained secured in his lifejacket's harness. [2.3]

9. The alarm could have been raised up to five minutes earlier if the crewman had worn the alternative lifejacket type available to him, fitted with a man- overboard beacon. [2.1]

10. Had he worn a lifejacket fitted with a man overboard beacon the position and time of the accident would have been more accurately known. [2.3]

11. Because the beacon-equipped lifejackets were less comfortable than other types, they were less favoured by the deck crew. [2.4]

12. The casualty and his lifejacket became separated because the lifejacket had been incorrectly donned. [2.4]

13. The casualty's lifejacket had not been serviced according to the manufacturer's recommendations, but its automatic inflation and lighting systems worked as intended. [2.4]

14. Personal protective equipment was provided in excess of statutory requirements. [2.5, 2.6].

15. Crew standing in the aft deck pounds were not separated from the stern roller. [2.7]

16. The missing crewman was probably dragged overboard by the rotation of the stern roller.[2.7]

17. There is no evidence to suggest that alcohol or fatigue contributed to this accident. [2.8]

3.2 CAUSES

1. The primary cause of this accident was the lack of a safety barrier or guardrail separating deck crew from the stern roller.

2. The missing crewman substantially reduced his chances of recovery because he did not wear his lifejacket correctly.

SECTION 4 - RECOMMENDATIONS

The owner of *Atlantic Princess* is recommended to:

1. Give training demonstrations to all crew on the correct use of all types of lifejackets on board the vessel. These should be routinely repeated.

2. Compile and maintain a comprehensive inventory of all lifejackets so that their custodian, servicing and repair history can be clearly and reliably identified at any time.

3. Require the deck crew to use beacon-equipped lifejackets while shooting gear. The long-term objective should be that they are also worn at other times.

4. Consider fitting a short guardrail at the aft end of each small pound, just forward of the stern roller of the vessel.

Marine Accident Investigation Branch
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