Report on the investigation

of broaching of fast rescue boat

while being launched from

Commodore Clipper

on 18 February 2001

Marine Accident Investigation Branch
First Floor Carlton House
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Southampton
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Extract from

The Merchant Shipping

(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.

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GLOSSARY OF ABBREVIATIONS

AB	-	Able seaman
CP	-	Controllable pitch
DETR	-	Department of Environment Transport and the Regions (now DTLR – Department of Transport, Local Government and the Regions)
FRB	-	Fast rescue boat
GRP	-	Glass reinforced plastic
Hp	-	Horsepower
IMO	-	International Maritime Organization
ISM	-	International Management Code for the Safe Operation of Ships and for Pollution Prevention
kW	-	kilowatt
LSA	-	Life saving appliances
M	-	metre
MSC	-	Maritime Safety Committee
MSN	-	Merchant Shipping Notice
ro-ro	-	Roll-on roll-off
rpm	-	revolutions per minute
SOLAS 74	-	Safety of Life at Sea Convention 1974
STCW95	-	Standards of Training, Certification and Watchkeeping (convention) 1978 (as amended in 1995)
UK	-	United Kingdom
UTC	-	Universal co-ordinated time
°C	-	Degrees Celsius

SYNOPSIS

At 1748 on 18 February 2001, the MAIB received a report from DETR's duty officer that the fast rescue boat (FRB) on the Bahamian-registered ro-ro passenger vessel *Commodore Clipper* had broached while being launched in the Solent. An investigation began the following day.

As *Commodore Clipper* approached her Spithead anchorage she launched her 6.1metre FRB. With a three-man crew the boat was in the water, her painter and suspension hook were still attached and the boat was being towed, at about 5knots, by the vessel.

As the painter was released the boat broached and one of its occupants was thrown into the water.

Commodore Clipper promptly stopped and, using her other rescue boat, recovered the three men. There were no injuries, but the man who had been pitched into the water suffered from the effects of cold water immersion.

The FRB broached because the painter was let go before the suspension hook was released. Two of the boat's crew made assumptions about painter release procedures which resulted in the painter being released before the suspension hook. Their incorrect assumptions were the result of a lack of briefing for the crew.

Recommendations have been made to the UK's Maritime and Coastguard Agency, the Bahamian Maritime Authority and the vessel's owners, which should assist in improving the safety of FRB operations from ro-ro passenger vessels. A recommendation is also made to the vessel's owners to obtain clarification from the manufacturers on the correct use of the davit's wave compensating system.

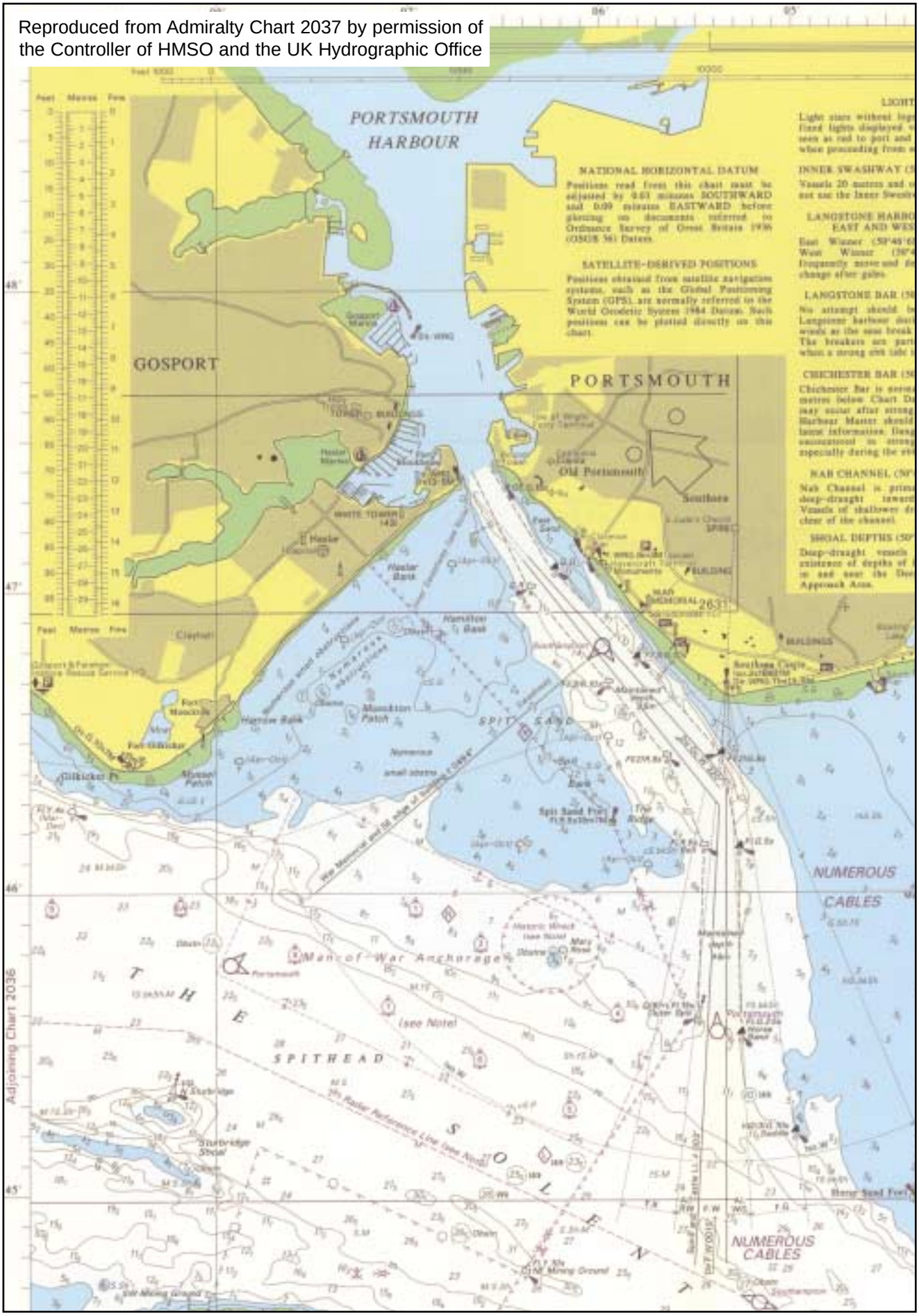
Figure 1

Commodore Clipper

SECTION 1 - FACTUAL INFORMATION

1.1 VESSEL AND ACCIDENT PARTICULARS

Vessel name	:	*Commodore Clipper*
Port of Registry	:	Nassau
Type	:	Ro-ro passenger
Official number	:	732230
Gross tonnage	:	14,000
Length (overall)	:	129.14m
Propulsion	:	Two x 4320kW at 600rpm, MAK main engines, each driving a CP propeller via reduction gearbox and clutch
Builder	:	van der Giessen-de Noord B.V.- Krimpen a/d Ijssel
Date built	:	1999
Managers	:	Condor Marine Services Condor House PO Box 3000 New Harbour Road South Hamworthy Poole Dorset BH15 4AJ UK
Position of accident	:	The Solent
Date and time	:	18 February 2001 at 1640
Injuries	:	One crewman affected by immersion in cold water
Damage	:	Damage to fast rescue boat, its engine and davit



Chartlet of Portsmouth Channel and Spithead Anchorage

1.2 NARRATIVE (Note: All times quoted are UTC)

Commodore Clipper sailed from No 5 Linkspan, Portsmouth Harbour, at 1603 on 18 February 2001. She had no passengers or cargo units on board and her intention was to lay-up for a few hours at the Spithead anchorage before resuming commercial service **(Figure 2)**.

The master decided that once she had cleared the Portsmouth Channel, her crew would undertake an exercise to launch the fast rescue boat (FRB). This was stowed on the starboard side of the boat deck.

The FRB was crewed by three men: a second officer, as coxswain, and two ABs. All three were regular FRB crew members. Another second officer controlled the davit standing on the boat deck. All three members of the FRB's crew were wearing self-inflating lifejackets.

With the master on the bridge, *Commodore Clipper* had cleared the main Portsmouth approach channel and was on a course of 215° at 5knots.

The FRB was launched, cleared away and recovered successfully. However, during this operation the chief officer observed that the davit's wave compensator had not been used correctly. The master, therefore, ordered a repeat exercise using the compensator system correctly. The chief officer briefed the second officer controlling the davit on the desired technique for using the davit's compensator.

The other second officer remained as coxswain of the FRB, but the two ABs were replaced by two other ABs.

The vessel's speed was maintained at 5knots, but course was changed to 300° to remain within the boundaries of Spithead anchorage.

By pulling the remote control wire of the davit's winch, the coxswain lowered the FRB. It was afloat at about 1640, with its engine running and with the suspension hook still connected. It was being towed by the ship via the painter, as intended. The davit's compensator system was engaged.

The AB, in the bows of the FRB and in charge of the painter release, looked aft at the second officer, awaiting an instruction to release the painter.

Assuming the AB on the painter could also see the suspension hook, which was behind the coxswain's position, and further assuming the suspension hook had been released, the second officer indicated that the painter should be released. This was done.

However, the suspension hook was still attached. Realising the error, the AB at the suspension hook immediately attempted to release the hook but could not, because the safety pin was still in place. The FRB began to broach under the influence of the force in the fall wire.

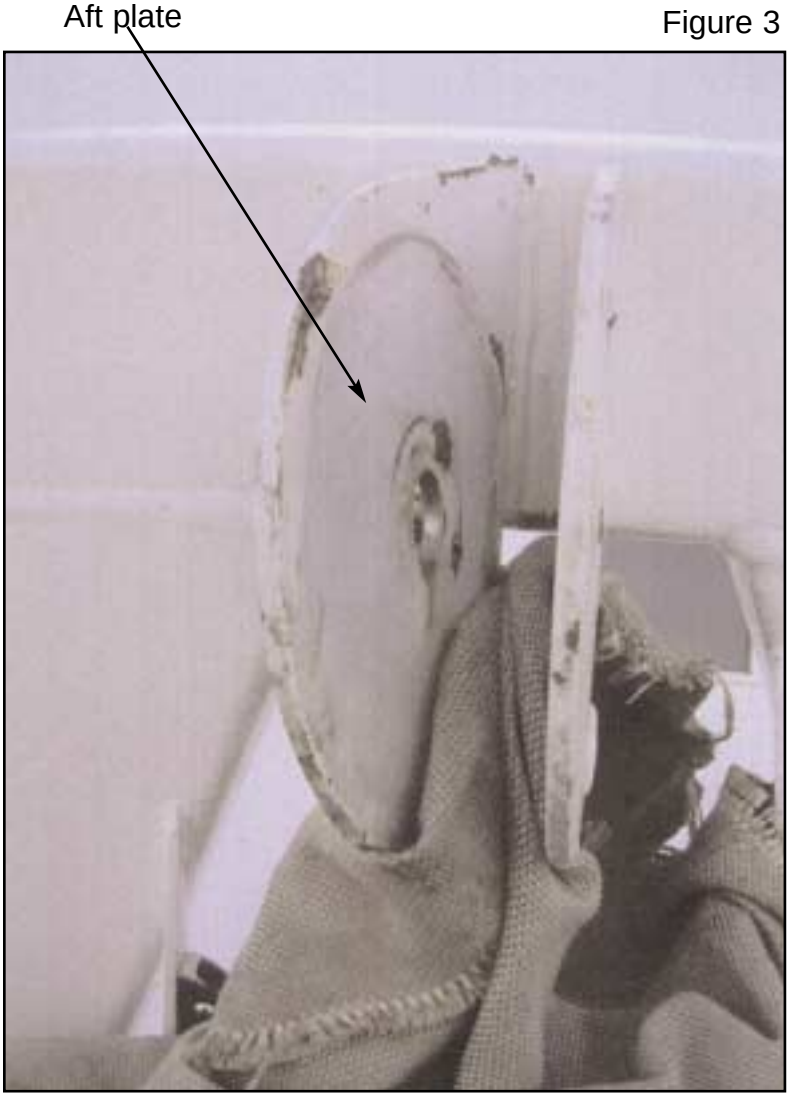
On observing the operation, the master put both of *Commodore Clipper* 's engines to astern to take way off the vessel. The coxswain and one AB managed to stay with the FRB as it broached. However, the second AB was swept into the water. Recognising the danger to the AB in the water, the master of the vessel de-clutched the starboard propeller.

The port side rescue boat was launched, and it recovered the AB at about 1700. He was suffering from cold. The rescue boat then returned to recover the two men still on the FRB.

The FRB was secured to the starboard side of the vessel adjacent to the pilot door. Since it was impractical to assess the full extent of any damage to the FRB at the pilot door, after the vessel anchored at No 6 anchorage, the FRB was towed into Portsmouth Harbour for examination. It was found to have suffered damage to its engine, self-righting device and hull.

The davit was also rendered unserviceable owing to the davit head having opened out in way of the sheave **(Figure 3)**.

Figure 3



Damaged cheek plates at davit head

1.3 WEATHER AND SEA CONDITIONS

At about 1625, the wind was recorded as easterly force 2, and the sea slight to smooth. Visibility was good.

Air temperature was about 7°C and sea water temperature about 8°C.

1.4 THE FAST RESCUE BOAT (FRB) AND DAVIT

Commodore Clipper is fitted with a Type FRB 600 S, 6.1metre, GRP fast rescue boat manufactured by Ernst Hatecke, Germany. This is mounted on a davit on the starboard side of the vessel, on the boat deck, two decks below the wheelhouse, about 24metres above the waterline **(Figure 1)**.

It is equipped with a 37kW (50hp) petrol outboard motor. Helm and engine controls are at the coxswain's position approximately amidships. The FRB is given a self-righting capability by a buoyancy chamber mounted at the top of a gantry frame aft.

The davit is an electro-hydraulically powered swinging frame design with a single block and fall wire leading from its head **(Figure 4)**. A stored energy system allows the frame to swing out in the event of a loss of electrical power. Power for the remainder of the launching operation is supplied by gravity.

The lowering process can be controlled from within the FRB. Two separate remote control wires are used to swing out the davit frame and operate the winch to pay out the fall wire. The 'D' shaped rings on the ends of these wires are referred to as '*grips*' in the operating instructions. The 'D' ring for swinging out the davit frame is within reach of the FRB's crew only while the FRB is at the davit head, before lowering starts. However, during the lowering operation the other 'D' ring, which controls the davit's winch, lowers at the same rate as the FRB so that it remains within reach of the FRB's crew.

The davit is fitted with a wave compensating or self-tensioning system engaged at the davit control panel. This system is intended to maintain the fall wire under slight tension while the FRB is in the water with the suspension hook attached. This system prevents the fall wire going slack and becoming fouled. In particular, it eases recovery of the FRB during poor sea conditions.

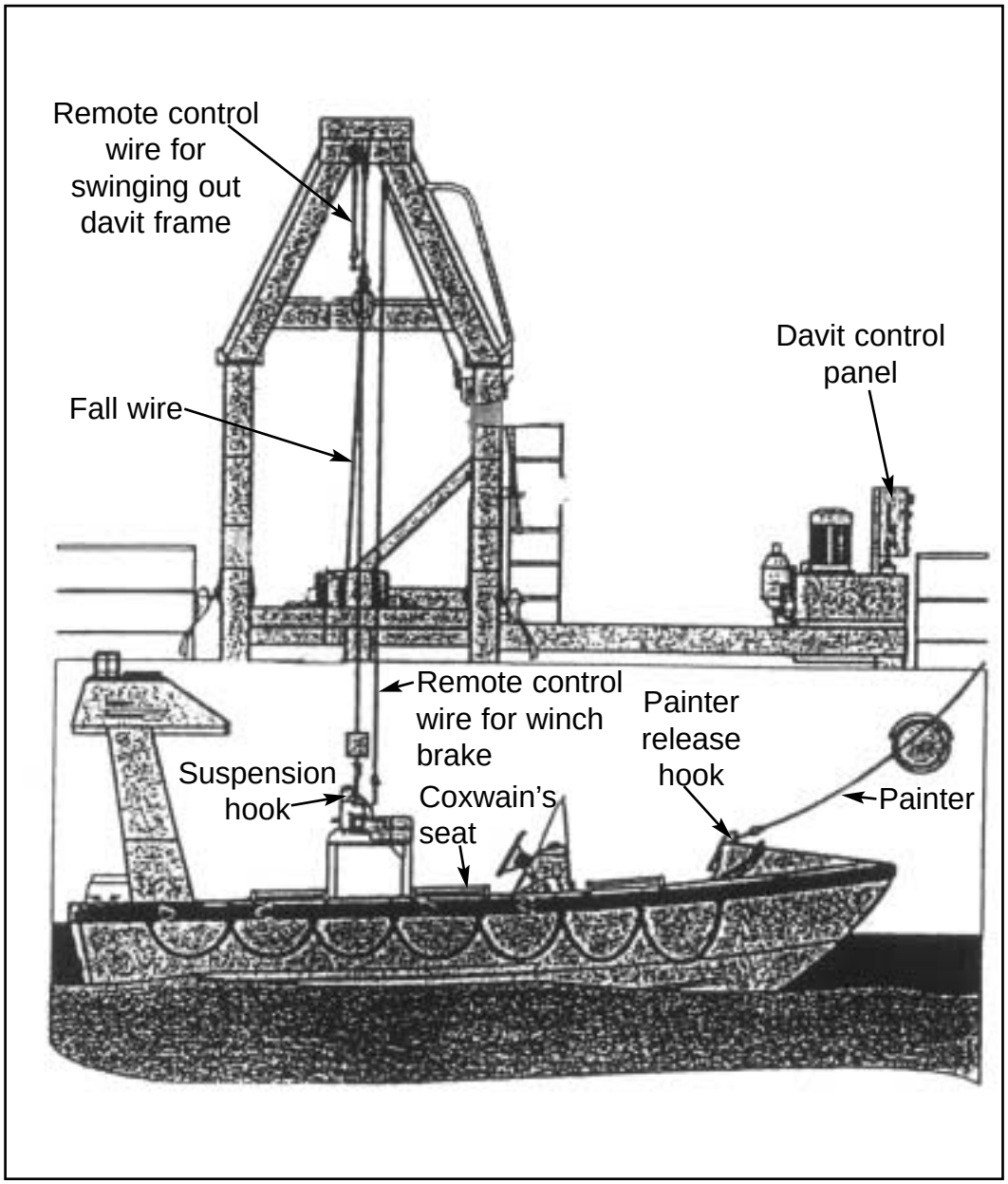
The FRB's suspension hook is of the on/off load release type **(Figure 5)**. Because it is positioned aft of the coxswain's seat, the hook is released under the control of a second crewman, rather than the coxswain.

To prevent inadvertent release of the suspension hook before the FRB has taken to the water, a hydrostatic interlock is fitted which prevents operation of the release lever. This interlock may be overridden by breaking a small glass panel covering the mechanism, and moving the interlock lever clear by hand before operating the release lever. A separate safety pin is also fitted, which prevents operation of the release lever until removed.

The painter release hook can be released while under load by movement of a directly mounted operating lever **(Figure 4)**. Although within sight of the coxswain, when at his controls, the release is beyond his reach and is normally controlled by a third crewman forward of him.

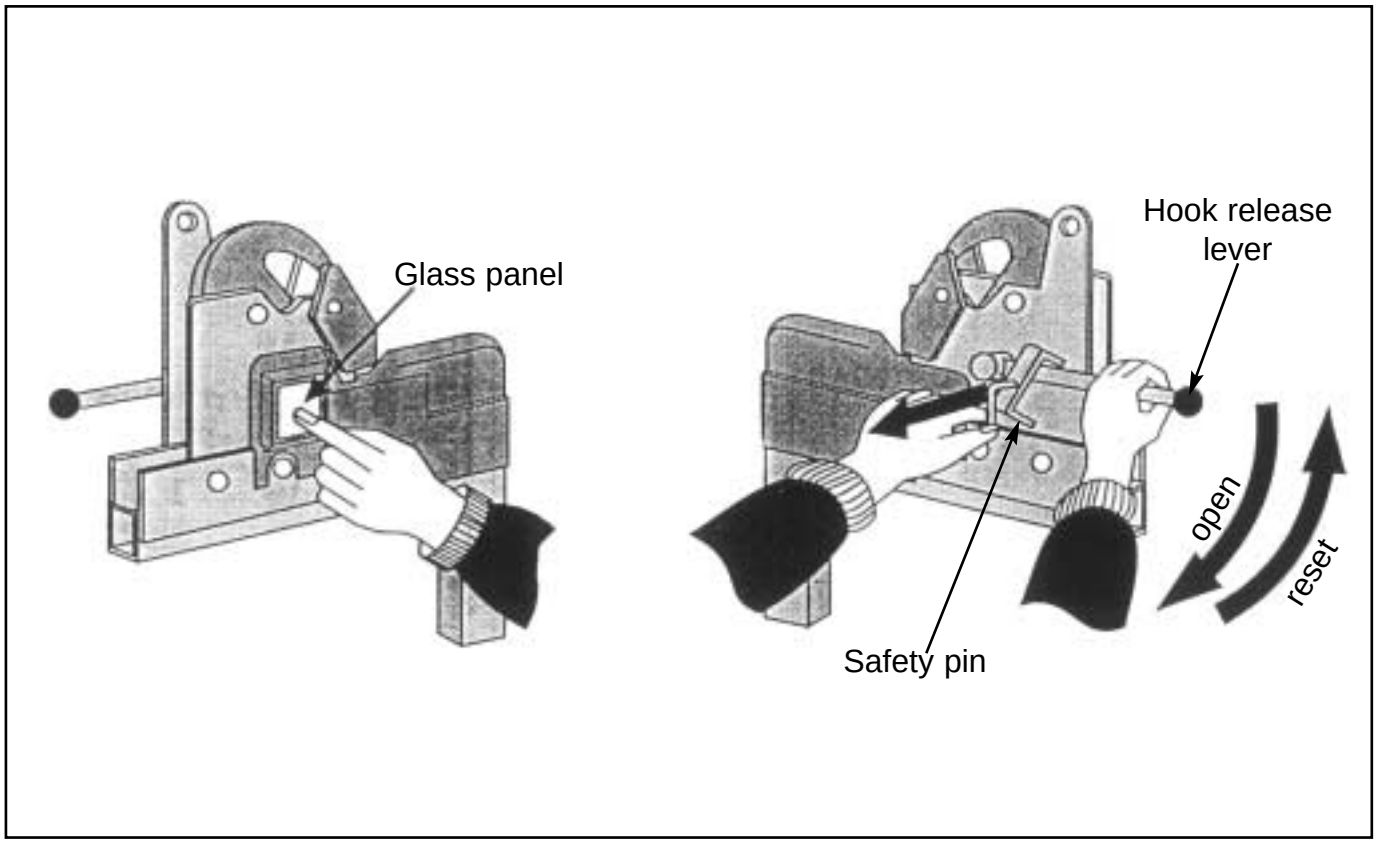
Commodore Clipper also has a rigid inflatable rescue boat mounted on the port side of the boat deck. This boat was used to recover the crew of the FRB after it broached.

Figure 4



Fast rescue boat and davit

Figure 5



FRB suspension hook

1.5 CREW DRESS

Each crewman wore an inflatable lifejacket, a waterproof jacket and normal working clothes. None was wearing a survival suit.

However, since this accident the vessel's owners have recognised the need for survival suits to be worn whenever an FRB is launched.

1.6 FRB AND DAVIT MAINTENANCE

On 11 February 2001, one week before this accident, a service engineer from the davit and FRB manufacturer visited the vessel to perform routine maintenance and repairs.

This work included fitting a replacement diaphragm to the hydrostatic interlock of the FRB's suspension hook, and checking the hook's operation. On completion of the work, the FRB was launched and recovered. The service engineer noted that the davit's compensating system was working correctly.

Once this maintenance work was finished, the service engineer remained on the vessel for the rest of the day to assist with crew training in the use of the FRB and davit. He also offered advice on the proper use of the davit's wave compensating system.

1.7 DAVIT OPERATING PROCEDURES

Because the operating instructions on board were unclear, ship's staff were uncertain of the recommended method for operating the davit's compensating system. During the service engineer's visit to the ship he was asked to clarify the procedures.

Following receipt of this advice, the procedure adopted for using the compensating system was to engage it while the lowering operation was paused briefly with the FRB slightly above waterlevel. At this stage, the FRB's engine was started and then the compensator system engaged, allowing the FRB to drop to the water.

The manufacturer's instructions for launching and recovery were set out on a panel at the davit control station. These instructions were:

Lowering (gravity)

1. *Enter the boat*
2. *Disengage the boat lashings*
3. *Turn the safety valve for the davit in "ON- position"*
4. *Pull the grip "DAVIT" to swing out the davit to its max. outreach*
5. *Pull the grip "WINCH" until the boat is waterborne*
6. *Release the hoisting hook and sail away from the ship.*

Recover the boat (motor operation)

1. *Start the hydraulic unit. Push the green button on the switchboard box*
2. *When the boat comes back from its mission, put the long link of the davit fall in the hoisting hook of the boat*
3. *Start the wave compensator. Push the mushroom key – the davit fall follows the motion of the boat*
4. *Close the wave compensator. Operate the joystick in direction "HOIST" – the boat will be hoisted out of the water*
5. *Hoist the boat to decklevel. Now, the crew can leave the boat.*

Under a separate heading of *Attention* in red print are other instructions. One of these refers to the use of the wave compensator other than during recovery of the FRB. It states:

With the active wave compensator, the boat can be released by the hoisting hook in the boat. The boat can sail away from the ship. At the same time the davitfall moves to its upper position.

1.8 FRB SUSPENSION HOOK INSTRUCTIONS

Instructions for the operation of the FRB's on/off load release hook were provided by the manufacturers. These instructions offer two methods of releasing the hook **(Figure 5)**:

Releasing on-load

Break glass panel on hydrostatic interlock cover and disengage by hand.
Turn safety pin and pull out.
Pull release lever down

Releasing off-load

While boat is in the water turn safety pin and pull out.
Pull release lever down

1.9 REQUIREMENTS FOR FRBs

A fast rescue boat is required to be fitted to ro-ro passenger ships by the 1996 Amendments to the Safety of Life at Sea Convention 1974 (SOLAS 74). This requirement was introduced on a rolling basis according to a ship's age. The period allowed for introduction was from 1 July 1998 to a ship's first periodical survey after July 2000. *Commodore Clipper* was built in 1999 and was equipped with an FRB from new.

In common with lifeboats and other rescue boats required by regulation, FRBs must be capable of being launched and towed when its ship is making headway at a speed of 5knots in calm water.

Following the introduction of FRBs on ro-ro passenger ships, and early operational experience of these systems, a number of administrations represented at IMO reported accidents, and near accidents, during trials and drills involving the launching and recovery of FRBs. Concerns were also expressed that the masters of these ships, and the crews involved with the launching and operation of FRBs, did not have confidence in the equipment, especially for their use in emergency conditions when the weather and sea state might be unfavourable.

The Maritime Safety Committee (MSC) of the International Maritime Organization (IMO), at its seventy-fourth session (30 May to 8 June 2001), noted these reports and concerns. As a result, the MSC agreed that the sub-Committees on Ship Design and on Standards of Training and Watchkeeping should be instructed to undertake a review of the arrangements, specification, testing and operation of FRBs, and the training of the relevant crew members, respectively, as a matter of urgency.

The MSC noted that this study would, of necessity, take at least two years to complete. Until that study is complete the MSC, in its circular 1016, dated 26 June 2001, recommended that due caution be exercised when installing, testing, launching and operating FRBs.

1.10 FRB CREW AND TRAINING

Before this accident, no previous launchings of the FRB on *Commodore Clipper* had been attempted with the vessel making way. Although all five of the crew involved, one second officer and four ABs, were qualified to the requirements of STCW 95, none had experienced a launch of this particular FRB from *Commodore Clipper* while making way.

However, during their courses to gain their certificates of proficiency in fast rescue boat, undertaken in Poland, they had experienced launching FRBs from a vessel making way. This is not an explicit requirement of the minimum standards set out in STCW 95

Guidance on training crews for launching lifeboats and rescue boats from ships making way is offered by the Maritime and Coastguard Agency and contained in Merchant Shipping Notice MSN 1722 (M+F). The guidance makes it clear that launching lifeboats and rescue boats from ships making headway through the water is not a requirement of UK regulations. It contains the following relevant advice:

> *For safety purposes, it is not necessary when training to exercise at the maximum design speed of 5knots headway. Drills should be carried out with a low relative water speed particularly where inexperienced personnel are involved.*
>
> *Instructions as to procedures should be given to the boat's crew by the officer in charge before the drill commences*.

SECTION 2 - ANALYSIS

2.1 AIM

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

2.2 DAVIT OPERATION

Training

During the first launching of the FRB on 18 February, the chief officer noticed that the procedure for engaging the davit's compensator was not being followed correctly. Recalling that this procedure had been modified following the service engineer's visit to the vessel one week earlier, this indicates that the uncertainty had not been resolved, and probably existed since the vessel first entered service.

The FRB's crews, for both launchings on 18 February, had undertaken the training required by STCW 95 in the use of FRBs. However, STCW 95 does not explicity require this training to cover the operation of launching devices. In common with many davits serving FRBs, a compensator or self-tensioning system is fitted to this davit. The majority of seamen are unlikely to encounter this type of system on any survival craft launching device, other than those serving FRBs. Therefore, crews are unlikely to gain experience in their use, other than when launching FRBs.

FRBs are comparatively recently introduced systems on ro-ro passenger vessels, so there is relatively limited experience of their use within the industry. Therefore, great reliance has had to be placed on the mandatory training given to crews. If syllabuses of the training courses are limited to the requirements of STCW 95, use of davits and compensating systems will not be covered. In view of the potential consequences to FRB crews, of incorrect davit operation, particularly with regard to compensating gear, training in the use of these systems should be made mandatory. The present STCW requirements should be extended to cover this matter. As part of the present review of requirements, the vessel's flag administration, the Bahamas Maritime Authority, and the MCA are recommended to progress a suitable amendment to STCW.

The two ABs in the FRB at the time of this accident had followed a mandatory training course which included the use of painters and suspension hooks. The reason why the AB at the painter release did not follow the procedure he had been taught cannot be identified with certainty. However, it was probably caused by a combination of unfamiliarity with this FRB, shortage of practice and lack of guidance on procedures and communications.

Instructions

Many investigations which the MAIB carries out, reveal incomplete, unclear, or confusing written instructions for operating life saving appliances (LSA). Ship's staff found the instructions for the davit's operation unclear, and it was because of this lack of clarity, particularly with regard to the use of the compensator, that the service engineer was requested to assist with some crew training.

However, the instructions for disengaging the suspension hook and painter, although brief, clearly set out the procedure to release the suspension hook before the painter. It is unlikely that there could be any substantial improvement in these particular instructions. From their mandatory training in the use of FRBs, the two ABs in the boat knew the proper sequence for the release of these items. Therefore, it is unlikely that improved written instructions would have caused them to have behaved differently.

2.3 RELEASE OF FRB PAINTER

During the first launching of the FRB on 18 February, the suspension hook and painter were released in the correct sequence. During the second launching the painter was released first. Indeed, the suspension hook was not released until the end of the accident.

The correct procedure called for the suspension hook to be released, followed by the painter. This ensured that the painter force was the last external force to be removed from the FRB. Because the painter's force is applied at the bow of the boat, it retains its heading and directional stability while being towed by the painter and the ship, itself under way. Release of the painter removes this stabilising force and, if the suspension hook is still attached, the boat will be towed through the water from a comparatively high point amidships. This is a directionally unstable condition. Immediately the boat deviates in direction, the transverse component of this towing force tends to heel the boat and, ultimately, will cause it to capsize, as in this case.

From the coxswain's perspective, the first launch went well. The main problem identified had been with the operation of the davit. Thus, the discussions that took place between the launchings, covered the procedures for davit operation, in particular the engagement of the compensator device.

As a consequence of these discussions it was decided to lower the FRB a second time, with two replacement ABs. These ABs were not briefed on their respective roles during this particular operation.

Although the same second officer was the FRB's coxswain for both launchings, the ABs in control of the painter and hook releases for the second launch had not been in the boat during the earlier launching. Although they understood their fundamental roles, they had not been given any briefing to indicate how and when they would be expected to perform their tasks. Neither were they told how vital signals were to be passed between the three men in the FRB.

This failure to communicate was the direct cause of the premature release of the painter and the subsequent broach of the FRB. Contributing to this failure was the lack of any guidance or briefing for the two ABs.

Fitting a painter remote release system to the FRB, so the painter can be operated by the coxswain without the need for signals, is possible. Such systems commonly employ some type of motion-transmitting device, such as a morse cable. However, these systems can introduce their own problems of adjustment, maintenance and repair making their merits less obvious. There is no statutory requirement for an FRB's painter to be released at the coxswain's position so, particularly in view of the possibly uncertain advantages of remote operating systems, the decision whether or not to fit such a system is left to the shipowner. There is no obvious advantage in changing the system in the FRB on *Commodore Clipper*.

2.4 THE SUSPENSION HOOK

The FRB's suspension hook is designed to be capable of being released when under load. Had it been released as soon as it was realised the boat was broaching, the launch might have been completed without major incident. At that stage the boat was afloat, so the hydrostatic interlock would have automatically disengaged, allowing the suspension hook's release lever to be operated. However, the AB attending the release lever was unable to release the hook when he realised that the painter had been released and the FRB was beginning to broach. This was largely because the release lever's safety pin was still in place, which is in accordance with manufacturer's operating instructions.

Safety devices which prevent premature release of suspension hooks are important, particularly when FRBs, or other LSA, are lowered from high-sided vessels. This FRB is fitted with a hydrostatic interlock, designed to prevent the suspension hook being released until the boat becomes waterborne. However robust this interlock system might be, and there is no suggestion this system was in any way defective, a safety pin has the advantage of simplicity, both in design and operation and is likely to offer a high level of confidence to the operator while his boat is being lowered to the water.

Although prompt release of the suspension hook may have limited the consequences of this accident, a locking pin as a simple safety device probably has greater value in preventing premature release, and therefore potentially very serious accidents, than the ability to operate the release lever and prevent broaching. Thus, no change to the locking pin arrangements or procedures for its use is suggested.

2.5 THE COMPENSATING SYSTEM

The engagement of the wave compensating system had no direct influence on this accident. However, during the first launching of the FRB on 18 February, the chief officer observed that the compensating system had not been used according to the advice he understood the service engineer had given. This resulted in the FRB being launched again, with some different crew. Presumably, if the first launching had been performed according to the chief officer's understanding of the revised procedures, the second launching would not have taken place.

The launching procedure set out on the instruction panel at the davit control position makes no mention of the need to engage the compensating system when launching. These instructions require this system be engaged only after the suspension hook is reconnected, with the FRB still afloat, when recovering the FRB. This is a procedure commonly recommended by manufacturers of davits having a self-tensioning ability.

However, under the heading of *Attention,* the instruction panel suggests an additional procedure to the launching process where the compensator is engaged after the FRB is waterborne. It further states that, when the crew decide, the suspension hook may be released, so that the lifting hook and fall automatically and immediately lift clear of the craft. This is a useful safety feature, reducing the chances of the boat's crew being struck by a swinging hook.

Contrary to these instructions, the procedure adopted just before this accident, was to engage the compensator system with the FRB still clear of the water. This can allow the boat to drop down some distance to the water, which might be substantial in poor sea conditions, particularly if the judgment of the davit operator is poor, and result in injury to crew.

Following the service engineer's visit, this was the procedure adopted for engaging the compensating system. This appears not to be entirely in accordance with the instructions from the manufacturers. *Commodore Clipper*'s owners need to clarify with the manufacturers the correct procedures to ensure that the compensating system is used safely. Therefore, they are recommended to approach formally the manufacturers of the FRB and davit for clarification on the recommended use of the compensator system during launching.

2.6 PREPARATION

When an FRB is used for its primary emergency purpose, all associated crew should be able to perform their tasks with limited instruction. However, training sessions and drills should reinforce knowledge of procedures so that crews can perform them in emergencies without significant prompting. They also allow personnel to become familiar with the ways others perform, and so become confident in each other's abilities.

It has already been concluded that the lack of guidance or briefing given to the second pair of ABs, contributed to this accident. None of the ABs making up the FRB crews had previously taken part in launching the FRB with the vessel making way. This factor was significant, and indicated a need for some preparation.

It is accepted that these ABs had undertaken the training required by STCW 95, and were aware of the fundamental tasks expected of them. But it was not made clear who would be in control of the operations.

Because it is positioned behind the coxswain, the suspension hook is out of his line of sight. He places some reliance on the AB at the suspension hook indicating the hook has been released, and/or the AB at the painter waiting until he can see the hook has been released before he releases the painter. This was the second officer's expectation, and this had worked with the FRB's crew during the first launch.

During the second launch the AB on the painter release expected the coxswain to be in control. Similarly, the coxswain expected the AB on the painter to make his own check as to whether the suspension hook had been opened before releasing the painter. These expectations conflicted and resulted in confusion, which could have been eliminated at a pre-launch briefing.

The owners have recognised the need for, and have introduced, a pre-launch briefing for all training launchings of the FRB.

2.7 COLD WATER IMMERSION

Beyond their working clothes, waterproof jackets and lifejackets, none of the FRB's crew was wearing any form of thermal protection against the effects of immersion in the sea. Although a reason for this, on this occasion, was that it was a fine dry afternoon in sheltered waters, it was not standard procedure to wear survival suits, despite their availability.

Sea water temperature at the time of the accident was about 8°C. Commonly available survival data suggests that a reasonably fit person should not be seriously troubled by brief immersion in water at that temperature. However, this data generally refers to the fatal effects of hypothermia. There are other effects which, while not being directly fatal, may produce temporary undesirable symptoms: extreme muscle weakness, poor co-ordination, unconsciousness etc. The AB thrown into the sea certainly began to feel uncomfortable after only 15 or 20 minutes immersion. This was an unnecessary experience.

Any FRB on a vessel working in European waters is likely to be used in cold conditions many times during its working life. Management needs to recognise the dangers of cold water immersion, so that crew are prepared for these conditions.

In an emergency, there is no time to decide whether survival suits need to be worn; the crew must follow their rehearsed launching procedure with minimum discussion. It is prudent for the crew to prepare for these conditions for any launching and recognise the dangers of cold water immersion.

Another factor which influenced the decision not to wear survival suits on this occasion was difficulty of working while wearing them. The vessel's owners have recognised this issue, and are making efforts to obtain survival suits better suited to boat work, before making their use compulsory.

2.8 DAMAGE TO DAVIT HEAD

Following the accident, the cheek plates of the top sheave of the davit were found to have spread; the aft plate had suffered much more than the forward.

This damage is consistent with the fall wire being pulled aft, from the plumb condition, by the broaching FRB.

At the time of the broach, the davit's compensating system, which maintains a limited tension in the fall wire, was engaged. This load, even if applied at an angle from the vertical, is unlikely to have been sufficient to cause the cheek plate damage. However, the broaching load on the FRB would have been enough to cause the fall wire to run out until it was well off the vertical.

This suggests the possibility that the fall wire then became trapped, or partly trapped, between the sheave and the cheek plate. This would have introduced a much larger cheek spreading force. It is suggested that this is the reason for the damage. This mechanism is also consistent with the marks made on the inner face of the cheek plate, most probably by the trapped fall wire.

The cause and direction of this load is so exceptional that the failure does not indicate any need to modify the davit or its specification.

2.9 REVIEW OF STANDARDS

The launching of FRBs from ro-ro passenger vessels is a procedure which is relatively new to the industry. Conventional lifeboats and rescue boat are suspended from two fall wires, whereas FRBs use a single wire. Among other issues, the reduced control which results from lowering a boat on a single suspension point, particularly from a high sided vessel in poor weather conditions, has caused some difficulties and concerns.

The level of concern has been sufficient for IMO's Maritime Safety Committee to initiate a review of general FRB arrangements, and the training of their operators.

Until this review is complete, the MSC has recommended that due caution be exercised in the use of FRBs. Following this advice, it is necessary for owners and masters to make their own assessments of the dangers associated with FRB operation.

UK-flagged vessels are required by The Merchant Shipping and Fishing Vessels (Health and Safety at Work) Regulations 1997 to undertake a risk assessment of tasks arising during the normal course of workers activities or duties. Launching and recovery of FRBs could be seen as normal duties for certain crew members. These regulation do not apply to non-UK flagged vessels.

However, *Commodore Clipper* is certificated under the International Management Code for the Safe Operation of Ships and for Pollution Prevention (the ISM Code). One requirement of the ISM Code is that *the company should establish safeguards against all identified risks.*

Following this accident, and before the issue of the circular from the MSC urging caution, *Commodore Clipper*'s owners carried out a risk assessment of FRB use. One control measure introduced following this exercise is that the FRB should be launched only while the vessel is stopped in the water. This would clearly prevent a repetition of this accident.

SECTION 3 - CONCLUSIONS

3.1 CAUSES AND CONTRIBUTING FACTORS

1. The FRB broached during the launching operation because the painter was released before the boat's suspension hook was released. [2.3]

2. The boat's coxswain, and the AB at the painter release, both made assumptions about procedures which resulted in confusion among the boat's crew. [2.6]

3. These incorrect assumptions were the result of a lack of briefing and preparation for a crew. [2.6]

3.2 OTHER FINDINGS

1. On-board instructions for the use of the FRB davit were not clear. [2.2, 2.5]

2. The davit's wave compensating system had not been used correctly. [2.2]

3. STCW contains no mandatory training requirements for operators of FRB davits. [2.2]

4. At the time the FRB broached, the suspension hook could not be released because the safety pin was in place. [2.4]

5. Manufacturer's instructions require the safety pin of the suspension hook to be kept in place until after the FRB is in the water. [2.4]

6. One AB suffered from cold water immersion. [2.7]

7. None of the FRB's crew was wearing a survival suit. [2.7]

8. There was no standard procedure for FRB crew to wear survival suits. [2.7]

9. The survival suits provided caused some difficulty for the wearer while working. [2.7]

10. The dangers of cold water immersion in the prevailing conditions were not fully recognised. [2.7]

11. The davit head was damaged by the excessive fore and aft load generated by the FRB broaching. [2.8]

SECTION 4 - RECOMMENDATIONS

The Maritime and Coastguard Agency is recommended to:

1. Progress a suitable amendment to STCW to introduce requirements for the training of FRB launching equipment operators.

The Bahamas Maritime Authority is recommended to:

2. Progress a suitable amendment to STCW to introduce requirements for the training of FRB launching equipment operators.

Condor Marine Services Ltd is recommended to:

3. Formally approach the manufacturers of the FRB and davit for clarification on the recommended use of the compensator system during launching operations.

Marine Accident Investigation Branch
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