Bulletin

CCS Australian Office, No. 048, 2015 Issue 008

AMSA Ship Safety Information

--- Free fall Lifeboat Safety

Marine Notice (No. 09/2015) was released from AMSA recently, mentioning two free fall life boat accidents occurred in Australian and New Zealand water area in 2014 and arousing high attention of vessel manager and crew staff to free fall lifeboat safety operation.

The first accident (as indication of "Case 1" in this context) occurred when crew staff did routine maintenance inspection to lifeboat's on-load release mechanism, during which hook device was activated accidently while crew carrying out test procedure. When the crew cycled the hydraulic system, the retaining hook was inadvertently released allowing the lifeboat to move down the launch ramp. The second accident (as indication of "Case 2" in this context) came through after a routine launching exercise (i.e. abandon ship drill), one of total four wire slings for the ship's free-fall lifeboat failed catastrophically, then the rest three wire slings failed during recovery of the lifeboat, causing lifeboat fell into water from the deck height into water. Some crews were seriously injured in both cases. Refer to attachment to this Bulletin for more details.

Australian Transport Safety Bureau (abbreviation as ATSB) and New Zealand Transport Accident Investigation Commission (abbreviation as TAIC) investigated to the two accidents.

With reference to above mentioned information source, we established this issue of Bulletin and expected company and crew to think highly of safety operation of free fall lifeboat with especial focus on hook device and wire slings.

1. SOLAS requirements for free fall life boat launching operation

Following our ever issued <CCS Bulletin (Issue No.06)> regards lifeboat inspection on

board, free fall life boat operation should comply with following SOLAS requirement:

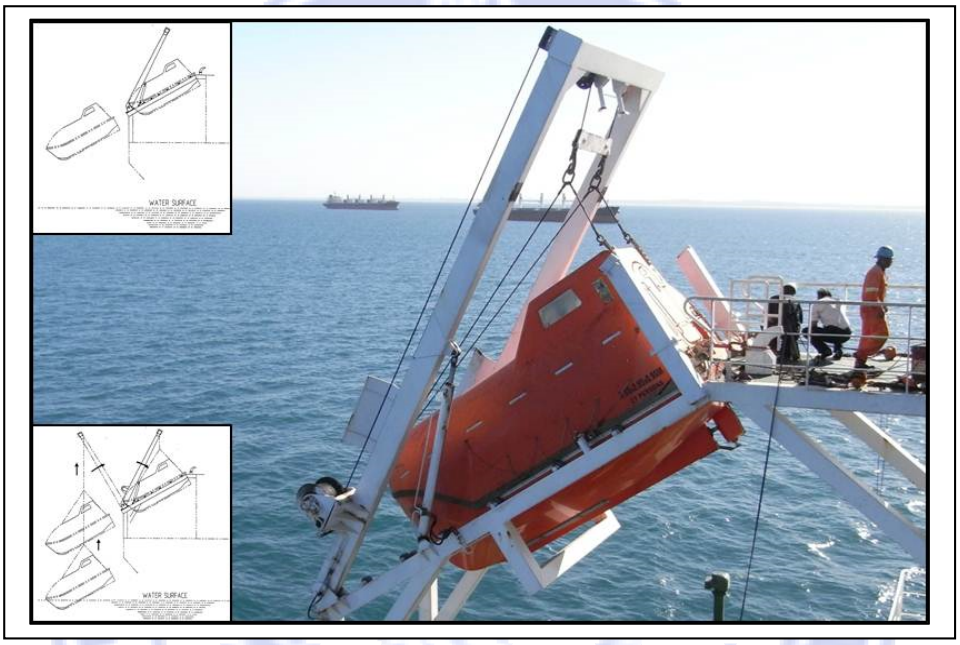
- Free fall lifeboat to be released and manoeuvred in the water by assigned crew at least once every months during abandon ship drill.
- At least once every three months during an abandon ship drill, the crew shall board the lifeboat, properly secured themselves in their seats and commence launch procedures up to but not including the actual release of the lifeboat (i.e., the release hook shall not be released). The lifeboat shall then either be free-fall launched with only the required operating crew on board, or lowered into the water by means of the secondary means of launching with or without the operating crew on board.
- At intervals of not more than six months(i.e., the second "three months" for above), the lifeboat shall either be launched by free-fall with only the operating crew on board, or simulated launching shall be carried out. During simulation launching, once the on-load release tripped, the lifeboat should travel some distance some distance down the guide rail as per indication from lifeboat Manufacturer Manual. If travel distance found unavailable on board, it can be collected from lifeboat manufacture.
- All above lifeboat launching operation to be recorded in Log book.

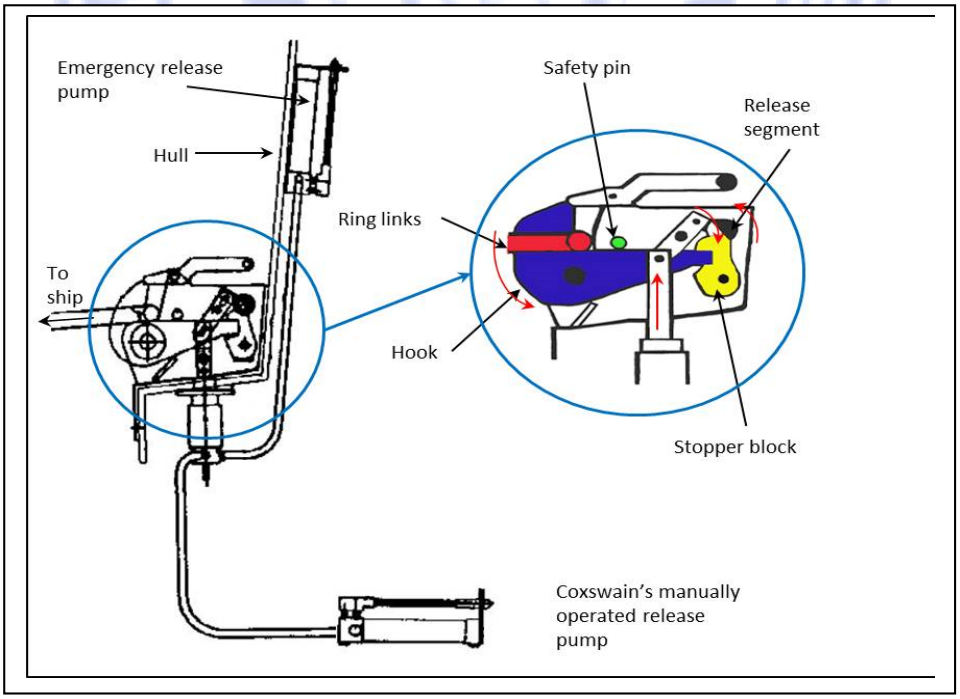
2. To reset on-load hook release system properly.

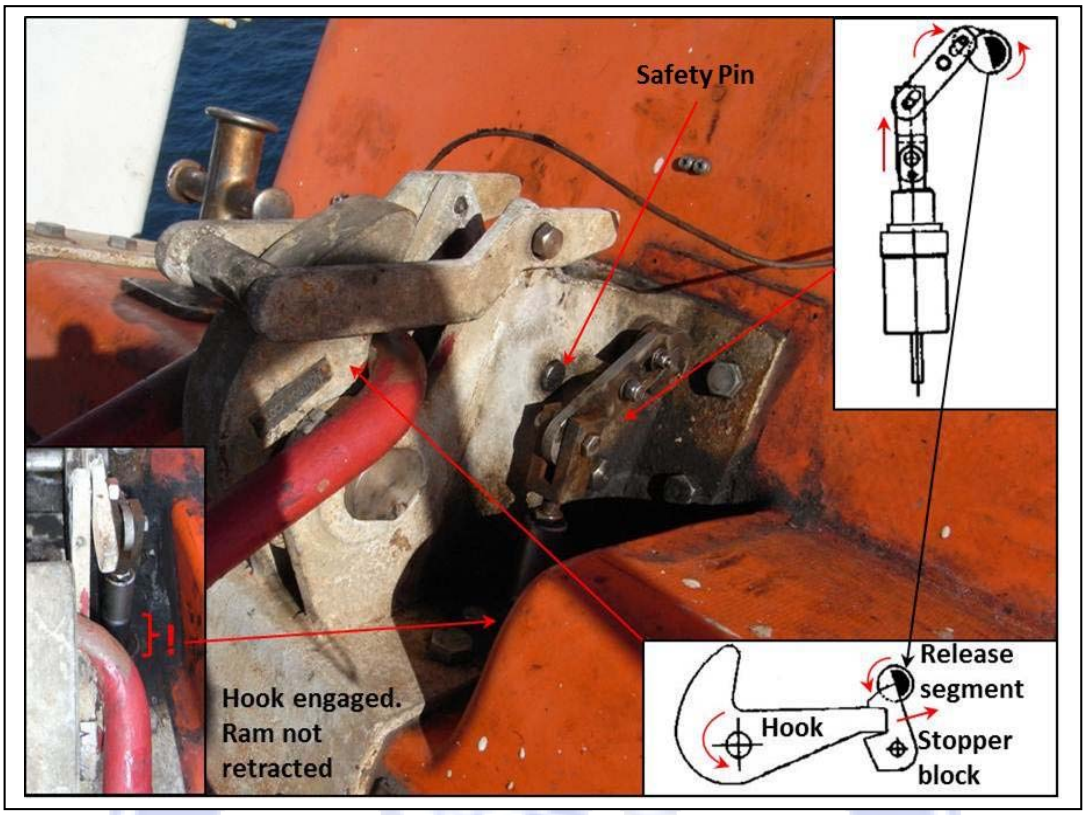
Different hook device design coming from different manufacture required duty crew staff MUST fully familiarize its operation procedure/requirement before his entering free fall lifeboat for operation.

In "Case 1", as demonstrated by picture on next page, the lifeboat on-load release system comprised the **hook device** located at the stern of the lifeboat, **the hook hydraulic activating cylinder** and **two hand-operated pumps**. One pump was adjacent to the coxswain's position. The second, emergency pump to be used in case the coxswain's pump failed, was located within arm's reach of the aft-most port-side seating position. A safety

pin was fitted through the on-load release's cheek plates and sat over the tail of the hook to prevent the hook from opening and the unintentional release of the lifeboat. The on-load release could still trip but the hook could not rotate far enough for the ring links to be let go, thus preventing the launch of the lifeboat. The safety pin was attached by a lanyard to the entrance door of the lifeboat, such that the pin had to be removed before the door could be opened. Therefore, its removal could not be forgotten in an emergency.







Note: All above quoted three pictures sourced from Australian Transport Safety Bureau

The operation of the hydraulic pump extended the activating cylinder ram which released the stopper block via a series of linkages. The hook was then free to rotate and release the ring links connecting the lifeboat to the ship.

Resetting the on-load release and securing the lifeboat in place required the ring link to be positioned over the hook and then rotating it until its tail engaged in the stopper block. The **release segment** then had to be rotated into position, locking the stopper block in place.

The ATSB found that the hydrostatic on-load release mechanism hydraulic cylinder ram had not fully retracted after use, preventing the stopper block from resetting correctly. This left the release hook in a partially disengaged position.

After incident, for good sake, additional **maintenance pin** provided on board, mounted on the outside of the lifeboat near the on-load release. While the maintenance pin reduces the risk of an inadvertent launch during maintenance, leaving the pin in can prevent lifeboat launch in an emergency. The control for this introduced risk is procedural instead of an

engineering control.

The ATSB noted that the design of the release mechanism with a **cover plate** (NOTE: the cover plate was already removed from its original mounting position in above the third picture) prevented visual confirmation that the hook was correctly reset.

REMINDER:

A). For the same design of hook device on your vessel, it was strongly suggested to remove aforementioned cover plate for double check whether all essential parts are already reset correctly as required by Manufacturer Manual.

B).Risk assessment should be carried out satisfactorily before entering free lifeboat each time. A tool box talk or job safety analysis should be carried out beforehand.

C).Personnel intending to inspect or maintain a lifeboat should always inform the duty watch keeping officer of their plans.

D).The lever of the hydraulic hand pump should never be operated unless launching the lifeboat or as part of a controlled test of the release mechanism, both of which should be authorized by the Master beforehand.

3. To ensure Simulation Wire kept good working condition.

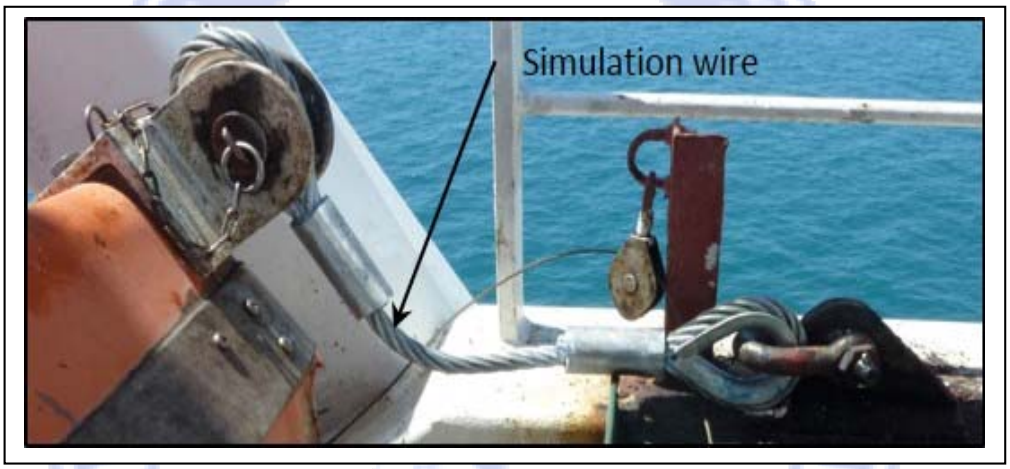
Simulated launching is a means of training the crew in the freefall release procedure of freefall lifeboats and in verifying the satisfactory function of the freefall release system without allowing the lifeboat to fall into the sea. Therefore, a simulation system must be designed to allow for the release of the freefall lifeboat from its housed position without actually launching the lifeboat into the sea.

All lifeboat launch simulation equipment (in “Case 1” , called as Simulation Wire) need to stop the moving lifeboat before it is launched clear of the ship, for which the simulation equipment designed with enough **break load** MUST be utilized.

The longer simulation wire resulted that the speed of the lifeboat when arrested was much

greater, with a proportional increase in the magnitude of the shock load imposed on the simulation wires. DULY, the free fall lifeboat manufacturer stipulated restriction for simulation wire break load and its length.

The simulation system in “Case 1” relied on two simulation wires, acting in parallel and an equal distribution of energy between them, one of which was as indicated in below picture. Wire slings (simulation wires) were attached and secured to eye plates that were welded onto the lifeboat launching frame’s deck. When the lifeboat was in its stowed position (secured via the release hook and links) the simulation wires were slack.



Sourced from” Australian Transport Safety Bureau

In incident of “Case 1”, when hook device was inadvertently activated, the simulation wires failed, which allowing the lifeboat to move down the guide rails into the sea.

The ATSB found that the simulation wires failed due to a combination of incorrect installation and cumulative internal wear from numerous shock loading events that resulted from previous lifeboat launching drills. The further investigation indicated the longer simulation wires and additional shackle attached to the wire high impact the simulation wire safety.

The wire rope used for the simulation wires was a rotation-resistant wire. The use of an extra shackle meant that when the boat’s travel down the ramp was arrested, a twist of about 90° was forced into the wires. This another affect the simulation wire safety.

REMINDER:

A). Duty crew MUST maintain the simulation equipment timely as required. More attention should be paid to concealed wire sling (simulation wire) after removing the plastic sheathing .

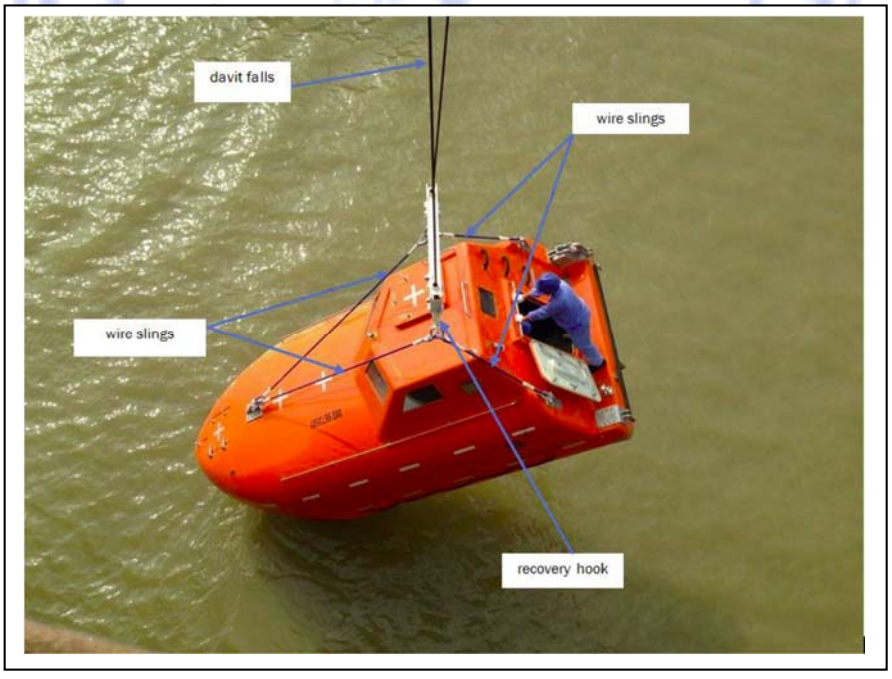
B).To ensure the length and connection of simulation wire comply with Manufacturer Mannual.

C).The length and mechanical performance of both simulation wires MUST be consistent with each other.

D).The simulation wires to be replaced with genuine spare parts of rotation-resistant wire from Manufacturer, certificate for which should be provided simultaneously indicating satisfied break load.

4.To ensure wire sling kept good working condition

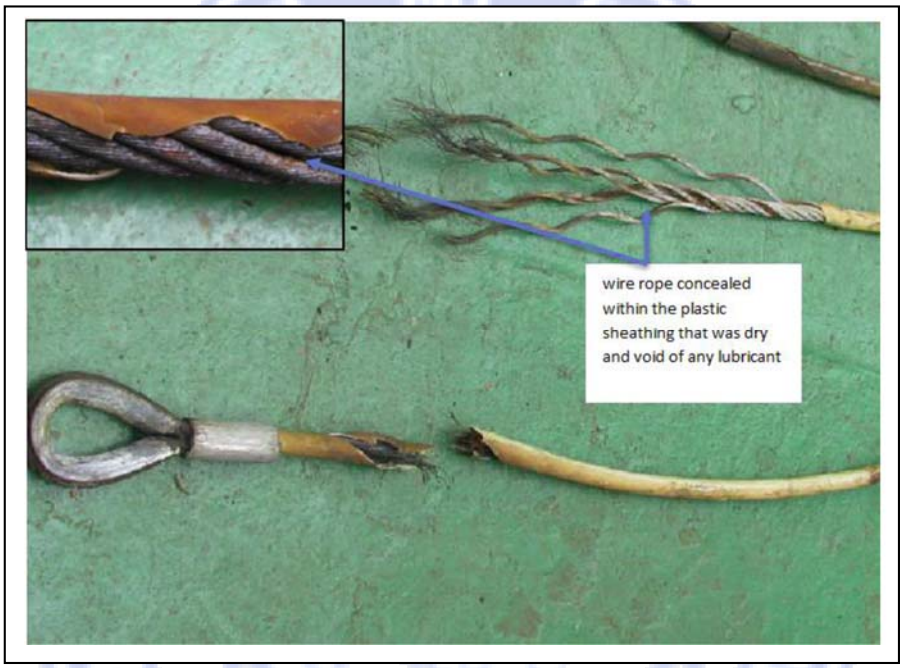
The wire slings will become stretched tight and effective when launching lifeboat by means of the secondary means of launching, or in course of lifeboat recovering.as demonstrated in below picture.



Sourced from: New Zealand Transport Accident Investigation Commission

New Zealand Transport Accident Investigation Commission(abbreviated as TIAC) made investigation to “Case 2”

TAIC identified that the wire pennants parted under tensile overload. Subsequent testing confirmed that the sling wires had been significantly weakened by severe corrosion. This corrosion had gone undetected inside a plastic sheathing that the manufacturer had fitted to the wire.



Sourced from：New Zealand Transport Accident Investigation Commission

The sheathing prevented the crew from identifying the corrosion and did not allow for lubrication or the application of other corrosion-inhibiting substances. The crew were also unaware of the necessity for greater vigilance and the application of anticorrosive substances during inspections.

REMINDER:

A).With restriction of wire sling mounting location, it is very hard for duty crew to do routine maintenance to free fall lifeboat wire sling. Crew MUST pay more attention when conducting routine maintenance.

B).Company should always ensure timely renewal to lifeboat wire slings as required.

Genuine and rotation-resistant sling wire MUST be utilized with supporting certificate.

C). For sling wire concealed in plastic sheathing, it is suggested to remove plastic for easy maintenance. Once abnormal detected, sling wire should be renewed immediately.

5.Ohters

It was captain and duty crew staff responsibility to ensure all essential maintenance job to free fall lifeboat to be carried out efficiently and timely as per Manufacturer Manual and SOLAS requirements.

Attachment No.1： AMSA Marine Notice 05/2015

CCS Australia Office

August 18, 2015

Announcement:

1. Intention is to assist and ensure owners to understand and well prepared, ensuring all updated requirements from AMSA can be met
2. For more information, please visit AMSA website at www.amsa.gov.au and CCS website at www.ccs.org.cn
3. The information contained does not and cannot supersede any AMSA or related governing parties requirements as well as CCS class rules and regulations.

Australian Government
Australian Maritime Safety Authority

MARINE NOTICE

Marine Notice 15/2015

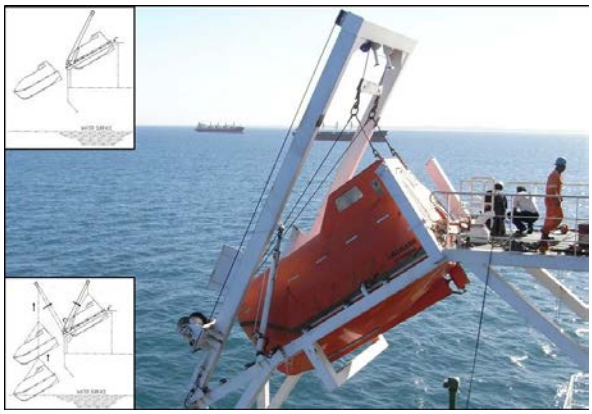
Free-fall lifeboat safety

Purpose

This Marine Notice alerts the maritime industry to findings of two recent accident investigations conducted by the Australian Transport Safety Bureau (ATSB) and the New Zealand Transport Accident Investigation Commission (TIAC). These investigations have highlighted ongoing safety issues related to free-fall lifeboats and identified maintenance issues that the maritime industry should be aware of.

The incidents

Aquarosa (IMO No. 9506708) - On 1 March 2014, Aquarosa's free-fall lifeboat was inadvertently released during a routine maintenance inspection while the ship was en route to Fremantle, Western Australia. One crew member was injured in the incident and it took 5 hours for the crew to recover the lifeboat.



Aquarosa's Free-fall Lifeboat arrangement

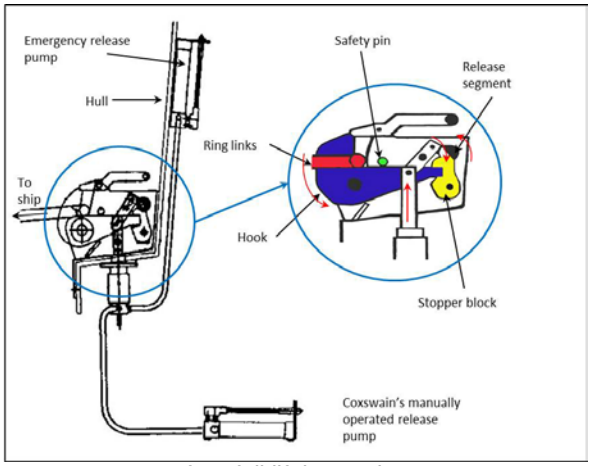
Da Dan Xia (IMO No. 9451290) - On 14 April 2014, the wire lifting sling for the ship's free-fall lifeboat failed catastrophically during recovery of the lifeboat after a routine launching exercise in Wellington, New Zealand. This resulted in the lifeboat falling several metres into harbour waters. One crew member was injured, and the lifeboat launching davit was rendered unserviceable.

Incident analysis – *Aquarosa*

The ATSB identified that the Second Engineer accidently activated the lifeboat's on-load release mechanism while carrying out a test procedure. When the Second Engineer cycled the hydraulic system, the retaining hook was released allowing the lifeboat to move down the launch ramp.

The ATSB found that the hydrostatic on-load release mechanism hydraulic cylinder ram had not fully retracted after use, preventing the stopper block from resetting correctly. This left the release hook in a partially disengaged position.

The ATSB noted that the design of the release mechanism cover plate prevented visual confirmation that the hook was correctly reset.



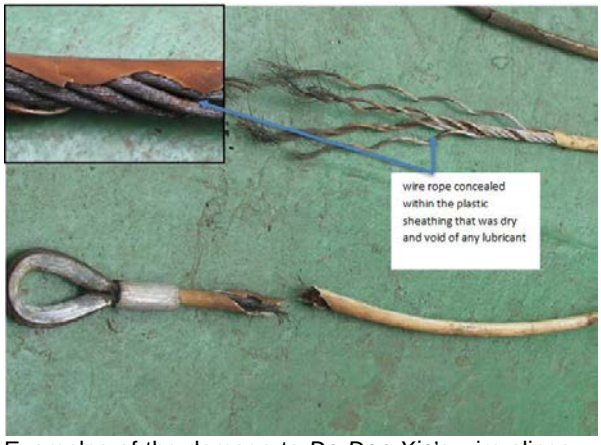
Aquarosa's free-fall lifeboat release system

The lifeboat was fitted with simulation wires to prevent it from launching under these circumstances. However, on this occasion, the simulation wires failed allowing the lifeboat to move down the guide rails into the sea. The ATSB found that the simulation wires failed due to a combination of incorrect installation and cumulative internal wear from numerous shock loading events that resulted from previous lifeboat launching drills.

Incident analysis – *Da Dan Xia*

TAIC identified that the wire pennants parted under tensile overload. Subsequent testing confirmed that the sling wires had been significantly weakened by severe corrosion. This corrosion had gone undetected inside a plastic sheathing that the manufacturer had fitted to the wire.

The sheathing prevented the crew from identifying the corrosion and did not allow for lubrication or the application of other corrosion-inhibiting substances. The crew were also unaware of the necessity for greater vigilance and the application of anticorrosive substances during inspections.



Examples of the damage to *Da Dan Xia*'s wire slings after failure (Courtesy TAIC)

TAIC found that the wires were of adequate strength when manufactured, but that the sheathing allowed saltwater ingress, aiding corrosion by retaining water, and prevented external observation.

IMO Convention requirements

Chapter III, Regulation 20 of the International Convention for the Safety of Life at Sea (SOLAS) requires operational readiness, maintenance, and inspection of lifeboats and rescue boats. Under applicable Australian law, owners and operators are responsible for implementing effective routines and procedures that meet SOLAS requirements. These incidents reinforce the need to ensure effective implementation of these processes.

On board safety management

AMSA continues to observe numerous defects and deficiencies related to ship's lifeboats and liferafts. This is difficult to understand given the IMO and AMSA focus on risks associated with the incorrect operation and maintenance of survival craft.

Wire failure was the critical factor in both the *Aquarosa* and *Da Dan Xia* incidents. This highlights the importance of:

- Ships' crews following established maintenance procedures and being vigilant and observant during all maintenance tasks.
- The examination of maintenance procedures to ensure they are effective.
- Effective crew familiarization and training, to minimise risk when crew are conducting test procedures and training drills.

AMSA inspections

Marine Notice 2/2014 highlighted the requirement for additional restraints to be installed on lifeboats during AMSA inspections. This requirement is a control mechanism that AMSA has implemented to reduce the AMSA inspector's exposure to risk. It is recommended that these restraints be used anytime maintenance is being carried out on lifeboats. The continued cooperation of all owners, operators and masters is appreciated.

More information regarding the details of each investigation can be found at:
www.taic.org.na/ReportsandSafetyRecs/
www.atsb.gov.au/publications/

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