

The Hamburg-based Federal Bureau of Maritime Casualty Investigation (BSU) has identified a safety risk in an ongoing investigation, the significance of which extends beyond the individual case. The following lesson learned is therefore being published:

SERIOUS MARINE CASUALTY: crash of a rescue boat

What happened?

In the course of launching a rescue boat manned by three crew members, the hydraulic brake of the launching appliance was released by means of a cable remote control located in the boat after the boat was swung over from deck to sea. If the launching device had been functioning correctly, the boat would then have been lowered to the surface of the water slowly. However, immediately after the brake was released, the boat, suspended from the launching appliance on a hook, descended much faster, i.e. more or less unchecked, and struck the water accordingly with considerable force. The three people in the boat suffered serious injuries as a result.



Figure 1: Launching appliance and rescue boat

Why did it happen?

After the accident, various tests and inspections were conducted on board the ship in the presence, inter alia, of the manufacturer of the launching appliance and a technical expert appointed by the BSU, during which the presumed technical fault could neither be reproduced nor its cause initially found. After all possibilities for an operating error or a fault in the hydraulic system could be ruled out during the discussed assessments, the only conceivable error source was a technical problem inside the winch unit mounted on the crane column of the launching appliance. This was therefore disconnected from the crane column on behalf of the BSU and sent to Germany for further assessment.



Figure 2: The launching appliance's winch unit



Figure 3: Disassembly of the winch unit

In the course of the inspection of the winch, which was led by the expert commissioned by the BSU and monitored by a representative of the manufacturer, it emerged that the torque transmission between drive and winch drum is ensured by a friction-locking freewheel clutch (a so-called sprag clutch).

The freewheel clutch's function is to enable load-free hoisting of the rope in manual mode. During normal hydraulic operation of the crane, the freewheel is always in the locked position. The freewheel and the surrounding bearings are sealed against environmental influences by radial shaft sealing rings; regular maintenance or inspections are extremely complicated due to the mounting conditions and therefore only possible on board with considerable effort.

When the freewheel module was disassembled, it became apparent that sea air and moisture had damaged the sealing material over the years. This made it possible for moisture and dirt to penetrate the innermost components of the freewheel and cause considerable corrosion there.



Figure 4: Weather-worn seal of the freewheel module

Due to the corrosion and associated rusting of the sprags, the function of the freewheel was restricted to such an extent that torque locking was only ensured by contact rust, but not by the normal clamping effect of the sprags. Accordingly, a failure in the form of slipping against the locking direction was possible at any time. In the present case, this was presumably facilitated or triggered by the jolt of the start-up when the boat was lowered.



Figure 5: Freewheel after disassembly; traces of heavy corrosion on the sprags and sprag cage

What can we learn from this?

This means that it is reasonable to assume that winches used in lifeboat or rescue boat launching appliances with friction-locked (or similar) freewheels in their torque flow can pose a corresponding risk of the load falling. This risk is facilitated by the system's age, exposure to

environmental conditions conducive to corrosion (sea air, sea water) and an infrequent use of the system, particularly in the freewheeling direction.

Accordingly, regular checks as to whether the freewheel of such a system is functioning properly (i.e. locking in the locking direction, releasing in the freewheeling direction) are strongly recommended. If such a performance test delivers evidence of a fault, then qualified personnel should inspect the system immediately and it must not be operated with people in the boat to be launched before that happens.

Who can implement/observe it?

ship commands, ship crews, ship operators, classification societies, manufacturers of launching devices and service companies commissioned with their inspection or maintenance

Issued by:
Bundesstelle für Seeunfalluntersuchung (BSU)
Federal Bureau of Marine Casualty Investigation
Bernhard-Nocht-Str. 78
20359 Hamburg
Germany



Director: Ulf Kaspera
Tel.: +49 40 3190 8300
posteingang@bsu-bund.de

Fax: +49 40 3190 8340
www.bsu-bund.de