DNV MANAGING RISK

Cargo safety

The overall objective of the Classification Societies is to ensure the safe operation of the ship in all sea and weather conditions. As long as the seaworthiness of the ship is ensured, limited attention has been given to the cargo by class. However, DNV has introduced an additional service, the 'Fitness for Cargo Programme', an inspection and follow-up programme focusing on cargo safety.

Hatch covers on bulk carriers have two basic functions: In open position hatch covers provide access to the holds for loading and discharge of cargo. In closed position hatch covers seal the hatchway in a weather-tight condition when at sea, meaning that in any condition, there should be no leakage into the cargo hold. This is in compliance with the Load Line Convention.

Approximately a third of all P&I claims are cargo-related. Numerous of these cases are related to ingress of seawater via the hatch covers of dry cargo vessels. Ingress of a small amount of seawater into the cargo hold does not usually represent any risk to the safety of the ship, but even small amounts of water may do extensive damage to cargoes sensitive to seawater, e.g. steel and paper cargoes. According to P&I clubs, reports of leaking hatch covers are the most frequent cause for selecting a vessel for an unscheduled condition survey.

For endorsement of Load Line Certificate and Classification Certificate covering vessel's hull, hatch covers on bulk carriers are subject to annual inspection by the Classification Societies surveyors. The scope of the annual inspection is covering the structural parts of the coamings and the hatch covers, in addition to examination of closing, sealing and securing devices.

Extended requirements for examination of hatch covers, including coamings, are given in the 'Guidelines on the Enhanced Programme of Inspection during Surveys' (ref. IMO Res. A744(18) as amended, applicable from 1 January 2007). The Resolution states that at least the hatch cover sets wholly or partly within the forward 25 per cent of the ship's length, and at least one additional set, such that all sets on the ship are assessed at least once in every five-year period, shall be surveyed open, closed, and in operation to the full extent in each direction at each annual survey, including:

- stowage and securing in open position;
- proper fit and efficiency of sealing in closed condition, and;
- operational testing of hydraulic and power components, wires, chains and link drives.

In addition to surveys performed by the Classification Societies surveyors, SOLAS Ch. XII states that all bulk carriers shall comply with the maintenance requirements provided in the Standards for owner's inspection and maintenance of bulk carrier hatch covers (ref SOLAS XII, Regulation 7 amended by MSC Res. 170(79) on December 2004, replacing the 1997 version, entering into force on 1 July 2006). The hatch cover maintenance plan shall also form a part of the ship's safety management system as referred to in the ISM Code.

In order to ensure that the cargo carried is safe from the ingress of water through the hatch covers, tightness testing has to be performed. Tightness testing is performed by class at renewal surveys, and the three most common tightness tests are water hose testing, ultrasonic testing and chalk testing. However, chalk testing is not considered to be a leak detection test, as it will only give an indication of poor compression and potential leaks. If hatches are found to be leaking during the test, necessary repairs shall be made, and the hatches shall be tested again.

The latest and most accurate way of testing hatch covers is by ultrasonic testing. Ultrasonic testing is also an easy test to perform, using a transmitter box and a detector. The transmitter box, emitting ultrasound, is placed inside the cargo hold and the inspector can register 'leakages' of ultrasound by leading a portable detector alongside the hatch cover edges and in way of the connection of the panels. Another advantage of the ultrasonic method is that the tightness testing can also be performed when the ship is loaded, as long as it is possible to get into the cargo hold placing the transmitter box.

The 'Fitness for Cargo Programme' is designed for Bulk Carriers and General Cargo Carriers. In the programme, the ship is assessed relative to a set of minimum requirements for cargo fitness and safety by review of documents, visual inspection, function testing, and tightness testing. The tightness testing performed in the 'Fitness for Cargo Programme' is done by the ultrasonic method, and if the vessel is free of non-compliances, a 'Fitness for Cargo Statement' will be issued. The Condition Assessment & Emergency Response department is responsible for the Fitness for Cargo Programme. For more information, MTPNO868 may be contacted directly.

In order to maintain weather tightness of hatch covers over the life of the ship, regular maintenance and repair of gaskets, seals, retaining channels, resting pads, etc. should be expected due to wear and tear.

When leakages occur, the rubber gaskets of the hatch covers are usually hardened, compressed, chafed, or loose. The gasket manufacturers' rule of thumb is to replace the packing when a permanent impression reaches half the design value. The design value is usually in the range of 10–15 mm. When replacing rubber gaskets it is highly recommended to use original gaskets and to seek the hatch cover manufacturer's advice. Cheap rubber gaskets will rapidly become permanently compressed, and the loss of resilience may cause lack of tightness after a few months of service. To ensure a well functioning and effective rubber gasket, the maintenance of the retaining channel and the compression bar is of importance. The gasket retaining channels are among the weakest parts of the hatch cover structure, and maintenance may be cumbersome and often neglected. If highly corroded, the retaining channels are often not able to provide sufficient support of the gaskets.

Insufficient maintenance of the steel-to-steel contact between cover and coaming may result in over-compression of rubber gaskets impairing the weather tightness of the hatch cover. If this steel-to-steel contact is not achieved, good and original gaskets may be rapidly damaged by over-compression. To achieve a correct design pressure of the gaskets, renewal of pads may be required. In addition, wear and tear of resting pads may restrict the free sliding of the hatch cover related to the ship. Subsequently the imposed stresses may result in hatch cover cracking as shown on the picture.

Securing devices, e.g. quick-acting cleats, heavy duty automatic hook cleats, auto cleats etc., are often damaged and not functional, or simply not engaged by the crew. The most common problems are seriously weakening of the cleat by corrosion, or hardened and loss of elasticity of the rubber disc. All securing devices should always be well maintained and engaged.

The responsibility for maintaining the ship's hatch covers and locking devices lies with the owners and operators, not with the Classification Societies. Increased investment and attention to hatch cover maintenance and repairs may save the shipowners' money from cargo claims.

As an easy guide to inspection and maintenance of hatch covers the following can be considered 'best practice':

- Rectify any steel-to-steel contact before renewal of rubber gaskets
- Replace missing or damaged rubber gaskets immediately (minimum length of replaced gasket should be one metre)
- Keep retaining channels and compression bars in good condition
- Keep hatch coaming tops clean, and the drainage channels free for any obstructions
- Keep cleats and wedges in serviceable conditions and correctly adjusted

- Keep hauling wires and chains adjusted correctly
- Attach locking pins and chains to open doors and hatches
- Keep wheels, cleats, hinge pins, haul wires and chain tension equipment well greased
- Test hydraulic oil regularly for contamination and deterioration
- Keep hydraulic systems oil -tight
- Ensure the oil tank of the hydraulic system is kept filled to the operating level and with the correct oil
- Clean up oil spills
- Engage tween deck hatch cover cleats when the panels are closed
- Give notice that maintenance is being performed so that no one tries to operate the hatch
- Remember that continuing and regular maintenance of hatches is more effective and less expensive than sporadic inspection and major repair.

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