

No. 15 Care and survey of hatch covers of dry cargo ships - Guidance to owners -

1. Introduction

- 1.1 Loss of weathertight integrity continues to be a constant factor leading to cargo damage which could result in a threat to the safety of the crew, the ship and its cargoes, despite advances in modern shipbuilding technology, construction, navigation and means of preventing ingress of water into hold spaces.
- 1.2 We need only to look at cargo insurance claims to recognise the continued prominence of this problem and the vigilance required from crews to ensure that instances of cargoes being spoiled as a result of water ingress through hatch openings are minimised.
- 1.3 Although condensation can cause water to collect in holds, it is the problem of water entering into cargo holds through the hold openings as a result of badly maintained or damaged closing arrangements that this paper addresses.
- 1.4 The Classification Societies are concerned with this problem in particular through the Load Line Convention. The experience of the Classification Societies confirms the importance of hatch cover weathertightness and the reports of survey - class surveys as well as Load Line surveys - contain frequent references to lack of maintenance of weathertightness of hatch covers.
- 1.5 Where there is any doubt in applying this Guideline, clarification should be obtained from the individual Classification Society. Attention is directed to the separate published Rules of each Society. This Guideline is not meant as a substitute for the Society's Rules or the independent judgement and experience of Owners and Surveyors.



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2. Contributing factors to leaking covers

Lack of weathertightness may be attributed to several causes, which can be classed within two different types:

- 2.1 Those which result from the normal use of the hatch cover system, such as deformation of the hatch coaming or hatch cover due to impact, or the normal wear-and-tear of the cleating arrangement, which may be corrected only through extensive repairs or overhauls.
- 2.2 Those which result from the lack of proper maintenance: corrosion of plating due to lack of protection against corrosion, lack of adequate lubrication of moving parts, non-replacement of old gaskets, use of cleats and gaskets which do not comply with the standards specified by the hatch cover manufacturer and inappropriate repairs.

3. What can be done to reduce leakages of hatch covers?

- 3.1 The Classification Society Rule requirements for the construction and inspection of hatch covers, cannot, alone, ensure that the hatch covers will be adequate at all times; improvement in the performance of hatch covers can be achieved only through an effort by all parties concerned, which will involve:
 - (a) owners, masters and crew in effective maintenance;
 - (b) feed back to the manufacturers and Classification Societies for improvement in original design specifications;
 - (c) close and detailed inspections by Classification Society Surveyors.
- 3.2 The hatch covers designers should, perhaps, give less thought to the sophistication of the systems and more to the sturdiness of the equipment, the ease of operation and the convenience of maintenance. Adequate protection of the steel work should be ensured with high quality coatings, or, alternatively, corrosion-resistant materials should be used.
- 3.3 The shipowners and their crews should apply a programme of maintenance to ensure that the steel is not allowed to corrode, gaskets are periodically replaced, movable parts are kept properly lubricated and fittings periodically overhauled. The crew should also make sure, at each operation of the hatch covers, that the covers are sufficiently clean, especially at bearing surfaces, and that the drainage holes are clear.

Since most problems occur at the peripheral and cross-joint gaskets, very strict control of the condition of the components involved must be applied. This will involve not only the rubber but the compression bars, the locking devices, the cleating, load bearing surfaces, and the general condition of the coaming top plate.

In addition, in cases where the hatch panels are moved by hydraulic means then the manufacturer's maintenance procedures must be adhered to in all respects.

When hydraulic cleating or securing is arranged, means are to be provided to ensure that the covers remain closed and weathertight in the event of hydraulic failure.

- 3.4 The crew should however bear in mind that in extreme cases hatch cover protection may have to be complemented by means of tarpaulins or adhesive tapes. This is a decision to be made by the Master taking into account the nature of the cargo, expected sea-conditions, uneven load-distribution on hatch covers and, above all, previous experience in similar circumstances. The use of tarpaulins on mechanically operated steel covers must be considered an emergency temporary measure.
- 3.5 Containers and cargoes should not be stowed on hatch covers unless they have been designed for such carriage.



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Additionally, correct and adequate lashing systems are to be used at all times when stowing cargoes; this is equally important for cargoes stowed on tween deck covers and that battening down devices are correctly used to the hatch covers at the same time.

- 3.6 All securing devices should be checked and tightened by the crew as appropriate especially in case where their ships may be subjected to unusually rough seas.
- 3.7 The crew should also make sure that not only the deck cargo, but also the derricks, etc. are properly stowed and secured so that they will not be dislodged in a seaway and cause damage to hatch covers.
- 3.8 The appropriate manufacturer's instructions with respect to the safe operation, inspection, maintenance and repair of the type of the hatch cover fitted on the ship should be complied with in all respects.

To this end a "Record of the Maintenance of Hatch Covers" should also be provided by the Manufacturer together with the operation and maintenance manual to assist owners to carry out the appropriate maintenance.

4. What is IACS doing?

- 4.1 Traditionally, hatch covers and hatch coamings are inspected every year, as prescribed in Article 14 of the Load Line Convention of 1966. This inspection is normally carried out by the Surveyor of the Classification Society at the same time as the Class Annual Survey, the scope of which is not much different as far as the closing appliances are concerned.
- 4.2 These inspections are usually carried out in port, while the ship is in operation, and very often working cargo; their primary purpose being to ensure that no alterations have been made to the ship which may affect the load line, and that the fittings and appliances for the protection of openings are maintained in an effective condition.
- 4.3 This is only possible if a detailed examination of the hatch covers and fittings, which necessitate the actual operation (closing and opening) of hatch covers, is carried out by Surveyors. Hose testing should be carried out whenever the Surveyor is in doubt as to the weathertightness of a hatch cover. Alternative methods of tightness may be considered.
- 4.4 The Surveyor can only assess the actual condition of the hatch covers at the time of survey and, in between two inspections, the proper maintenance of the hatch covers must remain the responsibility of the owner, master and crew.
- 4.5 Confronted with an increase in the number of reported cargo damages, the Classification Societies, members of IACS, have decided to review the survey procedures issued to their Surveyors for the survey of hatch covers and coamings.
- 4.6 A unified requirement prepared and approved by the Council of the Association during their June 1985 Meeting has been revised. This revised unified requirement Z4 "Survey of Hatch Covers and Coamings", which will be updated as the necessity arises, is herewith enclosed for reference.

5. Defects to hatch covers and coamings

- 5.1 The purpose of this Section is to review the various types of defect found in hatch covers, which for the most part are caused by a lack of proper maintenance or by improper operation.
- 5.2 Some defects affecting the weathertightness of hatch covers can be attributed to their design. Such defects, a very small percentage of all defects found, are not dealt with here. The crew should be attentive to them and report accordingly for eventual discussion with the designers and the Classification Societies.



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5.3 Hatch cover design

A hatch cover design may be categorised as being one of three general types:

- mechanically operated steel covers, of folding, sliding, rolling, etc. types, fitted with gaskets and clamping devices;
- steel pontoon covers with tarpaulins and battening devices or with gaskets and cleats;
- portable covers with tarpaulins and battening devices (usually wooden covers).

All types of hatch covers are basically of robust construction; under normal conditions of care and operation they are fully adequate for their intended purpose.

5.4 Damages to hatch covers

5.4.1 Mechanically operated steel covers are affected by:

- corrosion, which attacks the integrity of the cover itself and which also affects the moving parts (wheels and rails, hinges between panels, cleats and batten screws, etc.);
- deformation caused by faulty handling, shocks from cargo being handled (especially logs and heavy loads), wear-and-tear on gaskets, and overloading with deck cargo;
- incorrect maintenance, inadequate maintenance, incorrect repair, lack of adjustment, incorrect operation;
- incorrect and inadequate maintenance of the power system of the hatch covers i.e. hydraulic and electric systems and safety devices.

5.4.2 Wooden covers, steel pontoons and tarpaulins are affected:

- mainly by poor handling and bad stowage.
Portable beams also are frequently deformed by rough handling and their locking devices have always been a source of considerable trouble due to lack of care in handling.

5.5 Damages to hatch coamings

Hatch coamings are affected by the following factors and defects:

- corrosion aggravated by the presence of piping systems, utilising coamings as protection and support, thus preventing normal access to the plating for painting;
- deformation, both of the plating and of the various supporting members and brackets, mostly due to cargo handling and aggravated by general corrosion;
- build up of scale, rust, and cargo debris causing the blockage of drains, and the incorrect support of the hatch covers;
- fret and wear caused by incorrect adjustment of battening devices which in turn causes side plate failures, cracking and stay buckling.

Consequences:

All such defects can be considered as due to repetitive accidental causes, which for various reasons - cost or lack of facilities for instance - are not immediately repaired.

6. Crew's examination of hatch covers and coamings

6.1 Routine checks by the crew of hatch covers, gaskets and hatch coamings is the responsibility of the Owner, master and crew. The inspections and surveys carried out by the Classification Society and/or the Administration at yearly intervals are not intended to and cannot replace these routine checks and proper maintenance.



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NOTE:

The hatch covers and hatch coamings of ships engaged in the trade of carrying timber or heavy parcels, also those of ships carrying deck cargoes such as containers on top of hatch covers, are likely to suffer very rapidly from excessive deformations. The Owners should be aware that the weathertightness of such hatch covers is difficult to maintain in service, and that, in consequence, the greatest care should be exercised in the periodical checking of these hatch covers and coamings, in particular when the vessel changes its trading pattern.

6.1.1 A thorough examination should include:

Checking that the Record of conditions of the freeboard assignment is available; the Record itself is used when necessary to guide the checking.

Checking that significant changes not approved by the Classification Society have not been made to the hatch covers, hatch coamings and their securing and sealing devices.

6.1.2 Hatch covers and coamings

6.1.2.1 Where mechanically-operated steel covers are fitted, checking the satisfactory condition of:

- hatch covers (corrosion, cracks, deformations);
- tightness devices of longitudinal, transverse and intermediate cross junctions (gaskets, gasket lips, compression bars, drainage channels);
- clamping devices, retaining bars, cleating;
- chain or rope pulleys;
- guides;
- guide rails and track wheels;
- stoppers, etc;
- wires, chains, tensioners and gypsies;
- hydraulic system, electrical safety devices, and interlocks;
- end and interpanel hinges, pins and stools;
- ramp profiles, and stowage area;
- backup structure of wheels, guides and hinges.

6.1.2.2 Where portable covers or steel pontoons are fitted, checking the satisfactory condition of:

- Wooden covers and portable beams, carriers or sockets for the portable beams, and their securing devices;
- steel pontoons;
- tarpaulins;
- cleats, battens and wedges;
- hatch securing bars and their securing devices;
- loading pads/bars and the side plate edge;
- guide plates, and chocks;
- compression bars, drainage channels, and drain pipes.

6.1.3 Checking of the satisfactory operation of mechanically operated hatch covers:

- stowage and securing in open condition;
- proper fit, locking and efficiency of sealing devices in the closed condition;
- leakage of cylinders and hydraulic piping;

6.1.4 And checking the satisfactory condition of hatch coamings (corrosion, deformations of plating and supporting members and brackets, connection to deck).



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6.1.5 Spare parts

- 6.1.5.1 When hatches are fitted with mechanically operated steel covers checking the satisfactory condition and number of:
- spare rubber gasket material (sufficient to renew all cross-joints and peripheral joints of a single hatch);
 - spare wheels;
 - spare seal kits;
 - spare sealant/adhesive;
 - spare cleats;
 - spare for hydraulic systems.
- 6.1.5.2 When hatches are fitted with portable covers or steel pontoons checking the satisfactory condition and number of:
- spare wooden covers;
 - spare wedges;
 - spare tarpaulins;
 - spare cleats.

Annex to Care and survey of hatch covers of dry cargo ships - Guidance to owners - IACS Requirement Z4. (Rev. 2 1996, V2.1)

Z4.1 Hatch covers, hatch coamings and their securing and sealing devices shall be submitted to surveys as detailed in Z4.2 and Z4.3.

Z4.2 Annual surveys at yearly intervals (the Anniversary date according to the Class and Load Line Certificate plus or minus three months whether the ship is under continuous survey or not). They will normally be performed as part of the annual load line inspection.

The scope of annual surveys of hatch covers and the specific requirements to be satisfied are listed under Z4.4.

Z4.3 Special Surveys [*] at maximum intervals of five years. They will normally be performed as part of the hull Special Survey and/or renewal load line survey.

The scope of Special Survey [*] of hatch covers and the specific requirements to be satisfied are listed under Z4.5.

Z4.4 Annual Survey

This survey consists of:

1. General

Checking that no unapproved changes have been made to the hatch covers, hatch coamings and their securing and sealing devices since the last survey.

Note 1:

- * Some member Societies use the term “Special Periodical Survey”, others use the term “Class Renewal Survey” instead of the term “Special Survey”.

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2. Hatch covers and coamings

2.1 Where mechanically operated steel covers are fitted, checking the satisfactory condition of:

- hatch covers;
- tightness devices of longitudinal, transverse and intermediate cross junctions (gaskets, gaskets lips, compression bars, drainage channels);
- clamping devices, retaining bars, cleating;
- chain or rope pulleys;
- guides;
- guide rails and track wheels;
- stoppers, etc.;
- wires, chains, gypsies, tensioning devices;
- hydraulic system essential to closing and securing;
- safety locks and retaining devices.

2.2 Where portable covers, wooden or steel pontoons are fitted, checking the satisfactory condition of:

- wooden covers and portable beams, carriers or sockets for the portable beams, and their securing devices;
- steel pontoons;
- tarpaulins;
- cleats, battens and wedges;
- hatch securing bars and their securing devices;
- loading pads/bars and the side plate edge
- guide plates and chocks;
- compression bars, drainage channels and drain pipes (if any)

2.3 Checking the satisfactory condition of hatch coamings plating and their stiffeners.

2.4 Random checking of the satisfactory operation of mechanically operated hatch covers:

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

Z4.5 Special Survey

This survey shall, as a minimum, consist of:

- a thorough inspection of the items listed in Z4.4; and in addition:
- checking of the satisfactory operation of all mechanically operated hatch covers:
 - stowage and securing in open condition;
 - proper fit, locking and efficiency of sealing in closed condition;
 - operational testing of hydraulic and power components, wires, chains, and link drives;
- checking the effectiveness of sealing arrangements of all hatch covers by hose testing or equivalent as necessary;
- checking the residual thickness of coamings, steel pontoon or hatch cover plating and stiffening members as deemed necessary by the Surveyor.

Note 2: The entire text of UR Z4 is reproduced and contained in Annex of Recommendation No. 15. Any subsequent changes to UR Z4 need to be reflected with a corresponding change to the Annex of Recommendation No. 15.

