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To:	All Surveyors/Auditors
Applicable to flag:	All Flags
	Deck structure inspection-4, General comments on repairs
Reference:	CONARINA class

Deck structure inspection-4
General comments on repairs

4.1 Material wastage
4.1.1 In the case of grooving corrosion at the transition between the thicker deck plating outside the cargo hatches and the cross-deck plating, consideration should be given to the renewal of part of, or the entire width, of the adjacent cross deck plating.
4.1.2 In the case of pitting corrosion throughout the cross-deck strip plating, consideration should be given to renewal of part of or the entire cross deck plating.
4.1.3 When heavy wastage is encountered on under-deck structure, the whole or part of the structure may be cropped and renewed depending on the permissible diminution levels applied by the Classification Society concerned.

4.2 Deformations
4.2.1 When buckling of the deck plating has occurred, although not in association with significant corrosion, appropriate reinforcement is necessary in addition to cropping and renewal.
4.2.2 Where buckling of hatch end beams has occurred because of inadequate transverse strength, the plating should be cropped and renewed, and additional panel stiffeners fitted.
4.2.3 Buckled cross deck structure due to loss in strength induced by wastage, is to be cropped and renewed as necessary. If the cross deck is stiffened longitudinally and the buckling results from inadequate transverse strength, additional transverse stiffeners should be fitted.
4.2.4 Deformations of cargo hatch covers should be cropped and partly renewed, or renewed in full, depending on the extent of the damage.

4.3 Fractures
4.3.1 Fractures in way of cargo hatch corners should be carefully considered with respect to the design details. Re-welding of such fractures is normally not considered a permanent solution. Where the difference in thickness between an insert plate and the adjacent deck plating is

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greater than 3 mm the edge of the insert plate should be suitably beveled. In order to reduce the residual stress arising from this repair situation, the welding
sequence and procedure is to be carefully monitored and low hydrogen electrodes should be used for welding the insert plate to the adjoining structure. Where welded shedder plates are fitted into the corners of the hatch coamings the deck connection should be left unwelded.
4.3.2 In the case of fractures at the transition between the thicker deck plating outside the line of cargo hatches and the cross-deck plating, consideration should be given to renewal of part or the entire width of the adjacent cross deck plating, possibly with increased thickness.

4.3.3 When fractures have occurred in the connection of transverse bulkheads to the cross-deck structure, consideration should be given to renewing and rewelding the connecting structure beyond the damaged area with the aim of increasing the area of the connection.
4.3.4 Fractures of hatch end beams should be repaired by renewing the damaged structure, and by full penetration welding to the deck.
4.3.5 To reduce the possibility of future fractures in cargo hatch coamings the
following details should be observed:
(a) Cut-outs and other discontinuities at the top of coamings and/or coaming top bar should have rounded corners (preferably elliptical or circular in shape).
Any local reinforcement should be given a tapered transition in the longitudinal direction and the rate of taper should not exceed 1 in 3 .
(b) Fractures, which occur in the fillet weld connections to the deck of radiused coaming plates at the corners, should be repaired by replacing existing fillet welds with full penetration welding using low hydrogen electrodes or equivalent. If the fractures are extensive and recurring, the coamings should be redesigned to form square corners with the side coaming extending in the form of tapered brackets. Continuation brackets also to be arranged transversely in line with the hatch end coamings and the under-deck transverse.
(c) Cut-outs and drain holes are to be avoided in the hatch side coaming extension brackets.
4.3.6 For cargo hatch covers, fractures of a minor nature may be veed-out and welded. For more extensive fractures, the structure should be cropped and partly renewed.
4.3.7 For fractures (and heavy corrosion) at the end of bulwarks an attempt should be made to modify the design in order to reduce the stress concentration in connection with general cropping and renewal.

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REFERENCES:

- **CONARINA class**

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