MSC/Circ.655
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GUIDANCE FOR PLANNING THE ENHANCED PROGRAMME OF INSPECTIONS DURING SURVEYS OF BULK CARRIERS AND OIL TANKERS

(SOLAS reg. XI/2)

1 The Assembly, at its eighteenth session, adopted resolution A.744(18) - Guidelines on the Enhanced Programme of Inspections during Surveys of Bulk Carriers and Oil Tankers. In adopting these guidelines, the Assembly recognized the necessity of ensuring that effective surveys were carried out on bulk carriers and oil tankers, and that efficient planning was conducted prior to these surveys.

2 The guidance, set out at annex to this circular and approved by the Maritime Safety Committee at its sixty-third session (16 to 25 May 1994), is intended to assist Administrations and shipowners in the development of the survey programme specified in subparagraph 5.1.1 of the guidelines. The use of this guidance should result in the development of a comprehensive survey programme document which will enable shipowners, Administrations or organizations recognized by an Administration to plan and conduct thorough and efficient inspections to fulfil the requirements in the guidelines.

3 The guidance should be used in conjunction with resolution A.744(18): When used co-operatively between shipowners and Administrations or recognized organizations, the guidance should ensure that the required inspections are carried out in the most effective and consistent manner.

4 Member Governments are invited to use the attached guidance in developing a survey programme document for conducting the enhanced programme of inspections during surveys of bulk carriers and oil tankers specified in resolution A.744(18).

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PART A : BULK CARRIERS : SPECIAL SURVEY - HULL

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1 OBJECTIVE

1.1 The objective of this document is to provide additional guidance for planning an enhanced survey programme as required by paragraph 5 of Annex A of the Guidelines on the Enhanced Programme of Inspections during Surveys of Bulk Carriers and Oil Tankers (resolution A.744(18)).

1.2 It is not the objective of this document to offer guidance on the alternative method of determining close-up survey requirements as stated in subparagraph 5.1.3 of Annex A of the Guidelines on the Enhanced Programme of Inspection during Surveys of Bulk Carriers and Oil Tankers (resolution A.744(18)).

2 PRINCIPLES FOR A SURVEY PROGRAMME

2.1 General

The survey programme, which should be in a written format, is intended to identify conditions of survey, critical structural areas and to stipulate the extent and locations for close-up survey and thickness measurements with respect to transverse sections (sections) and internal structures as well as nominate suspect areas.

2.2 Minimum requirements

In all cases, the close-up surveys and thickness measurements required by annex 1 and annex 2 of Annex A of the Guidelines on the Enhanced Programme of Inspections

during Surveys of Bulk Carriers and Oil Tankers (resolution A.744(18)) should be conducted, as a minimum.

2.3 Timing

The survey programme should be developed by the owner or operator in co-operation with the Administration well in advance of the commencement of the special survey; i.e., prior to commencing the survey and normally at least 12 to 15 months before the completion due date.

2.4 Technical assessment

2.4.1 The basis for nomination of tanks and areas for survey should take the following elements of the particular ship into account:

.1 design features such as stress levels on various structural elements, design details and extent of use of high tensile steel;

.2 history with respect to corrosion, cracking, buckling and repairs for the particular ship as well as similar vessels, where available; and

.3 information with respect to type of cargo, corrosion prevention systems of tanks, and condition of coatings, if any, of holds and tanks.

2.4.2 The degree of criticality of these elements should be judged and decided on the basis of recognized principles and practices, such as may be found in the IACS publication "Bulk Carriers: Guidelines for Surveys, Assessment and Repair of Hull Structure".

2.5 Contents

The survey programme should contain:

.1 ship particulars;

.2 plan of holds and tanks;

.3 list of holds and tanks with information on use, corrosion protection systems and condition of coatings;

.4 corrosion risk nomination of holds and tanks;

.5 selected structural details where damages have been reported on the particular ship or, where available, similar vessels;

.6 selected holds and tanks and areas for close-up survey;

.7 selected sections for thickness measurements;

.8 acceptable corrosion allowances.

3 DEVELOPMENT OF A SURVEY PROGRAMME

3.1 General

3.1.1 There are three basic types of possible failures to be considered in connection with development of a survey programme; corrosion, cracks and buckling. Contact damages, however, would not normally be covered by the programme as indents are usually dealt with as a normal routine by surveyors.

3.1.2 The development of a survey programme should in principle be as shown schematically in figure 1. The approach is based on an evaluation of experience and knowledge basically related to:

- design;

- corrosion.

3.1.3 The structural design should be considered with respect to structural details which may be susceptible to buckling or cracking as a result of vibration, high stress levels or fatigue.

3.1.4 Corrosion is related to the age of a ship, and is closely connected with the quality of the corrosion prevention system and subsequent maintenance during the service life. Corrosion may also lead to cracking and/or buckling.

3.2 Methods

3.2.1 Collection of information

Before commencing the development of the survey programme, the following information should be collected:

- survey status and basic ship information;
- main structural plans (scantling drawings), including information regarding use of high tensile steels (HTS);
- previous survey reports;
- previous damage experience, including damage experience for similar ships, where available;
- typical hull damages for the particular type of ship (as applicable/available);
- acceptable corrosion allowances;
- information regarding the use of the ship's holds and tanks, typical cargoes, loading/unloading procedures, and other relevant data;
- information regarding the corrosion prevention system;
- information regarding the relevant maintenance level during operation.

Proper co-operation between the owner and the Administration is essential in order to collect the necessary information for those developing the survey programme.

3.2.2 Design details

3.2.2.1 Damage experience related to the ship in question and similar ships, where available, is the main source of information to be used in the development of the survey programme. In addition, a selection of structural details from the design drawings should be included.

3.2.2.2 Typical damage experience to be considered will consist of:

- number, extent, location and frequency of cracks; location of buckles.

This information may be found in the survey reports and/or the owner's files. The defects should be analyzed, noted and marked on sketches.

3.2.2.3 In addition, general experience should be utilized. For example, figure 2 shows typical locations in bulk carriers which experience has shown may be susceptible to structural damage or corrosion . Also, reference should be made to IACS publication "Bulk Carriers: Guidelines for Surveys, Assessment and Repair of Hull Structure", which contains a catalogue of typical damages and proposed repair methods for various bulk carrier structural details. Such figures should be used together with a review of the main drawings, in order to identify similar details which may be susceptible to damage. An example is shown in figure 3.

3.2.2.4 The review of the main structural drawings, in addition to using the above-mentioned figures, should include checking for typical design details where cracking has been experienced. The factors contributing to damage should be carefully considered.

3.2.2.5 The use of high tensile steel (HTS) is an important factor. Details showing good service experience where ordinary mild steel has been used may be more susceptible to damage when HTS, and its higher associated stresses, are utilized. There is extensive and, in general, good experience, with the use of HTS for longitudinal material in deck and bottom. Experience in other locations, where the dynamic stresses may be higher, is less favourable, e.g. side structures. In this respect, stress calculations of typical and important components and details, in accordance with the latest classification rules or other relevant methods, should be considered.

3.2.2.6 The selected areas of the structure identified during this process should be recorded and marked on the structural drawings which should be included in the survey programme document.

3.2.3 Corrosion

3.2.3.1 The following information should generally be considered in order to evaluate the corrosion risks:

- usage of tanks, holds and spaces;
- condition of coatings;
- condition of anodes;
- cleaning procedures for cargo holds;
- previous wastage;
- cargo hold/ballast tank usage (frequency/time);
- corrosion risks in cargo holds and ballast tanks;
- location of ballast tanks adjacent to heated fuel oil tanks.

The Tanker Structural Cooperative Forum (TSCF) publication "Condition Evaluation and Maintenance of Tanker Structures, 1992" gives definitive examples which can be used for judging and describing coating condition, for both bulk carriers and oil tankers.

3.2.3.2 The evaluation of corrosion risks for both bulk carriers and oil tankers should be based on information contained in the above-mentioned TSCF publication, together with relevant information on the anticipated condition of the ship as derived from the information collected in accordance with 3.2.1 and the age of the ship.

3.2.3.3 The tanks, holds and other spaces should be listed in a table with the risk of corrosion nominated accordingly.

3.2.4 Areas for close-up survey and thickness measurement

3.2.4.1 The areas for initial close-up survey and thickness measurement (sections) should be chosen on the basis of the table of corrosion risks indicated in 3.2.3.3 and an evaluation of historical structural experience.

3.2.4.2 The sections subject to thickness measurement should normally be nominated in tanks, holds and other spaces where the risk of corrosion is judged to be the highest.

3.2.4.3 The nomination for close-up survey of tanks, holds and other spaces should be

based on the highest corrosion risk.

FIGURE 1 : SURVEY PROGRAMME

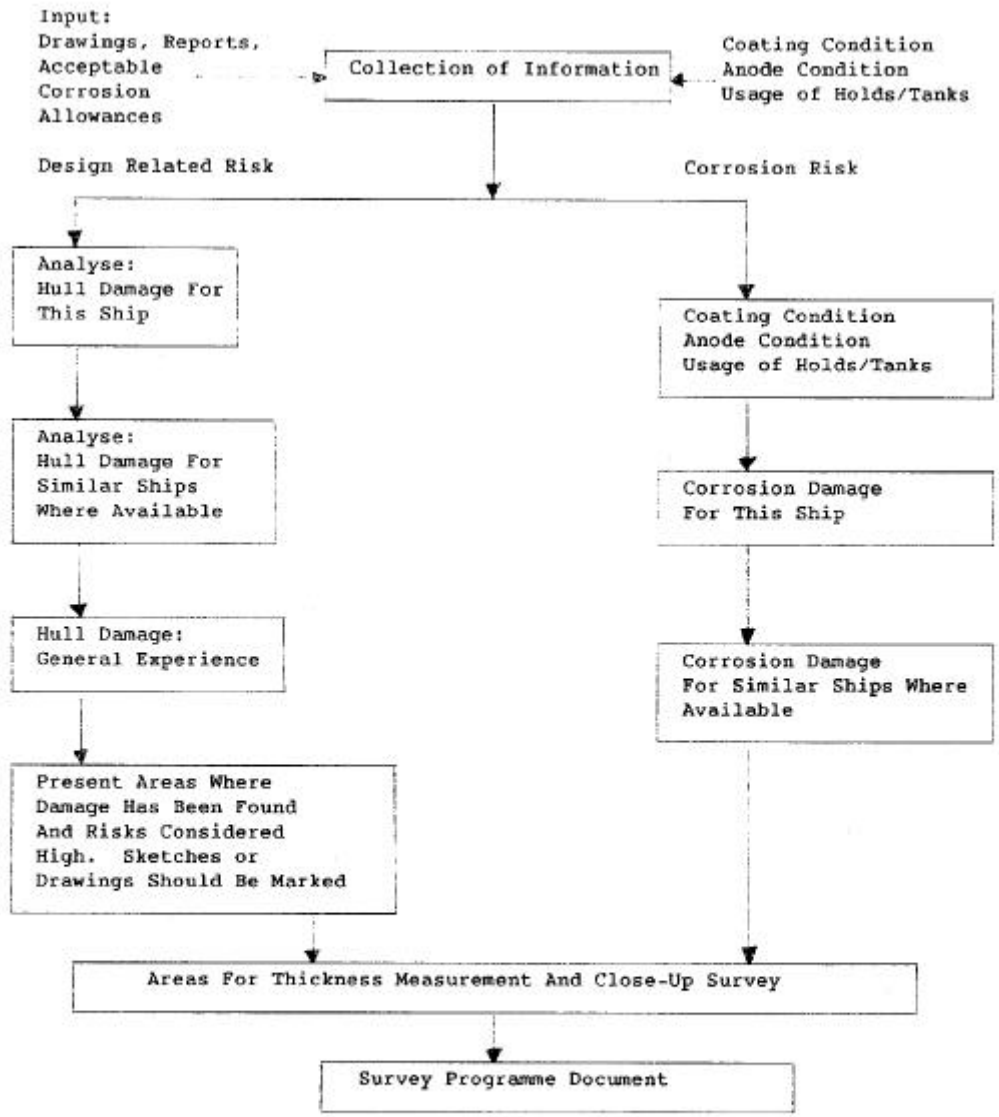

FIGURE 1 : SURVEY PROGRAMME

FIGURE 2 : TYPICAL AREAS SUSCEPTIBLE TO STRUCTURAL DAMAGE OR CORROSION

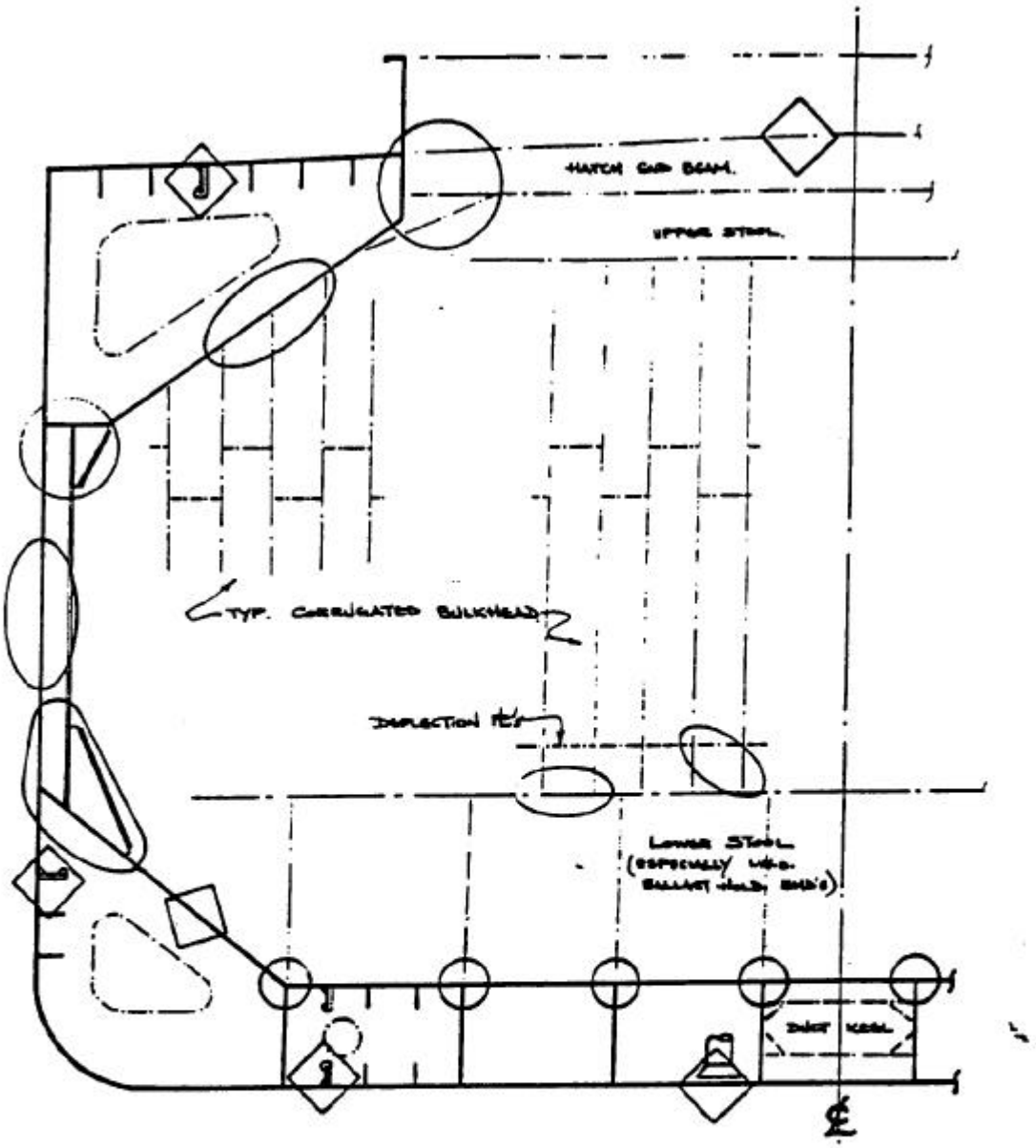

FIGURE 2 : TYPICAL AREAS SUSCEPTIBLE TO STRUCTURAL DAMAGE OR CORROSION

FIGURE 3 : TYPICAL DAMAGE AND REPAIR EXAMPLE (Reproduced from IACS publication "Bulk Carrier : Guidelines for Surveys, Assessment and Repair of Hull Structures)

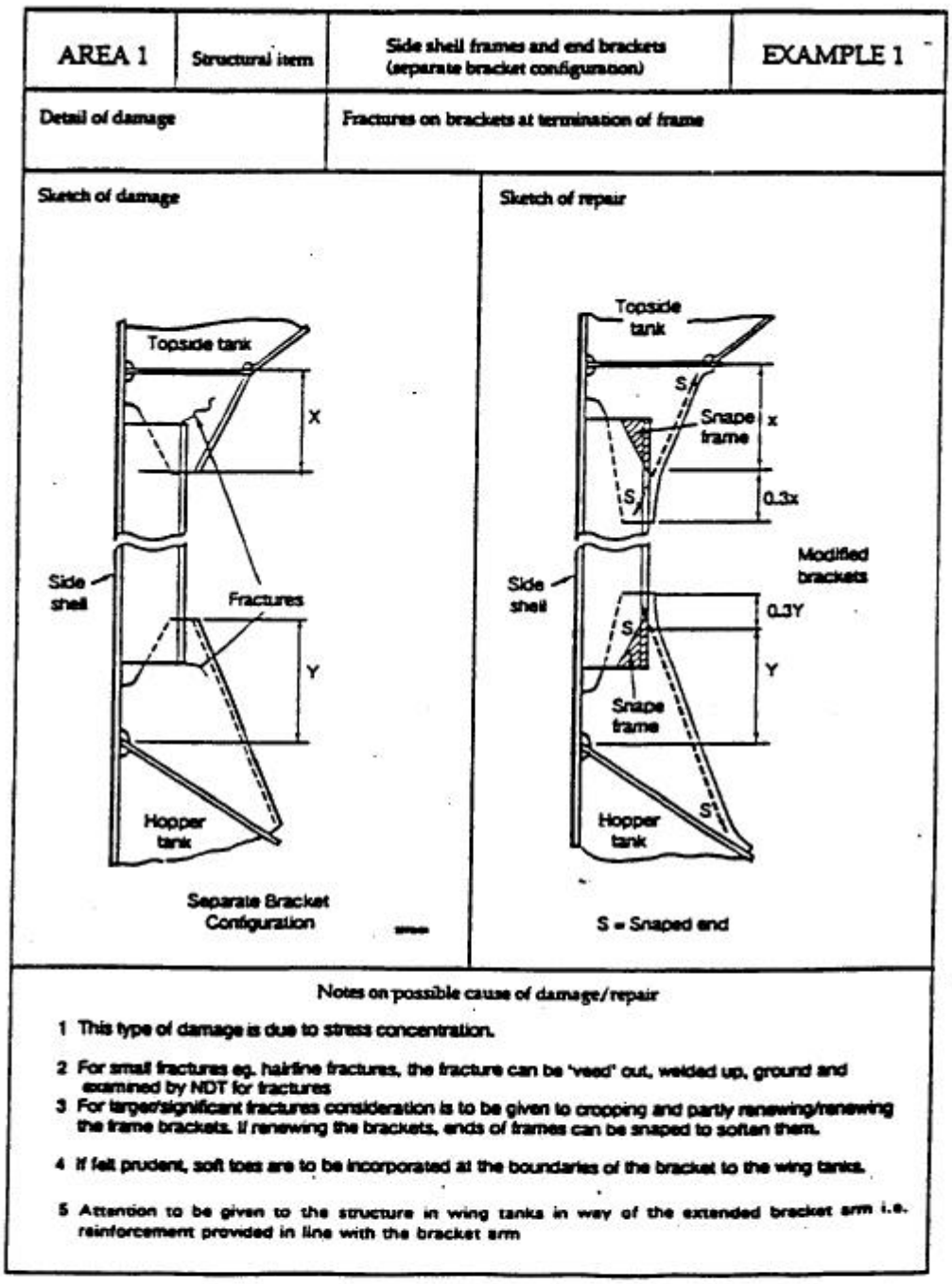

FIGURE 3 : TYPICAL DAMAGE AND REPAIR EXAMPLE

(Reproduced from IACS publication "Bulk Carrier : Guidelines for Surveys, Assessment and Repair of Hull Structures)