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GOAL-BASED NEW SHIP CONSTRUCTION STANDARDS

Status report on the development and executive summary of the Ship Construction File (SCF) Industry Standard (IS) and the SCF Supplementary Guidance

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SUMMARY

Executive summary: This document provides a status report on the development of industry standard and guidance on interpretation and practical implementation of mandatory requirements of SOLAS regulation II-1/3-10 on Ship Construction File (SCF) and related *Guidelines for the information to be included in a Ship Construction File* (MSC.1/Circ.1343). This joint submission by the members of the cross industry working group also provides the Executive Summary of the SCF Industry Standard and SCF Supplementary Guidance. The text of the SCF Industry Standard and SCF Supplementary Guidance is provided in document MSC 96/INF.9. Both documents are for the time being presented as Interim Standard and Guidance and will be reviewed once experience has been gained in implementation.

Strategic direction: 10

High-level action: 10.0.1

Output: 10.0.1.2

Action to be taken: Paragraph 26

Related documents: MSC 87/3/5, MSC 87/5/4, MSC 87/5/5, MSC 87/5/5/Corr.1; MSC.296(87); MSC.1/Circ.1455; MSC 94/WP.5; MSC 96/INF.9; and MEPC.254(67)

Introduction and agreed principles

1 The Ship Construction File (SCF) provides ship information related to structural design and construction that is needed to facilitate the safety of the ship throughout its operational life.

2 The SCF Interim Industry Standard (SCF IS) and associated Interim Supplementary Guidance (SCF SG) (SCF IS and SCF SG being collectively called "IS") were jointly developed by a Tripartite joint working group (attended by shipowners, shipbuilders and classification societies) as industry guidance relevant to newbuilding, substantial repair, conversion or major modification to the structure of bulk carriers or oil tankers subject to the related SOLAS requirements for the SCF.

3 The IS serves as industry guidance and therefore does not oblige parties to fully follow the contents but rather provide principles, which will facilitate agreement on procedures for compliance being reached for each ship. Such agreements and the resulting commitments will reflect specific individual situations. In other words, the purpose of the IS is to promote common understanding of the industry issues involved, and to facilitate agreement on procedures for achieving compliance with the IMO requirements on individual projects.

4 It is to be noted that nothing in this guidance should be interpreted as providing any alternative to full compliance with the relevant requirements of IMO.

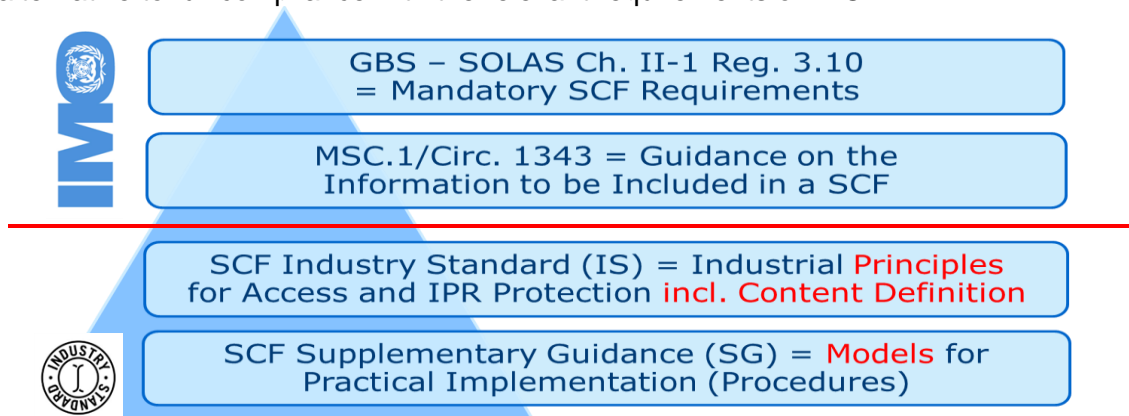


Figure 1: Four tier structure of SCF Provisions

Purpose and scope of SCF Interim Industry Standard

5 The main objective of the IS is to give practical guidance on the implementation of the IMO requirements for the SCF content and suggest operating principles for the "SCF Onboard and SCF Supplement Ashore" industry model (see figure 2).

6 The IS will provide transparency facilitating access by the classification society, shipowner and flag State to SCF information effectively, while demonstrating in a verifiable manner due consideration to IP protection, as required in the IMO GBS Standards (functional requirement 10) and the MSC.1/Circ.1343 (paragraph 4 of the annex).

- .1 The IS applies primarily to the operational phase of the ship and addresses the SCF information as required by MSC.1/Circ.1343. It does not affect the scope of and access to information related to the ship structure under construction, as referenced in part B of the annex to resolution MSC.296(87).
- .2 For example, summarized information on fatigue life calculation is available on board through documents such as Item 4-2 shown in the annex to the SCF IS (Plan showing areas prone to fatigue).
- .3 Full "Detailed strength calculation" and "Detailed fatigue life calculation", such as Items 3-2 and 4-1 shown in the annex to the SCF IS, are available to the shipowner during the ship design and construction period, and can

after ship delivery, be provided to the shipowner from the Archive Center subject to the procedures as defined in 2.1 of the SCF SG. If for some legitimate reason the full calculations have not been available to the shipowner before ship delivery, e.g. the shipowner not being involved in the project until the ship is already constructed, then the Archive Center will provide such information to the shipowner on request. The calculations may be only for internal use by the shipowner.

7 Full "Detailed strength calculation" and "Detailed fatigue life calculation" need to incorporate the following information for the purpose of demonstrating compliance with the structural design criteria, including, but not limited to those specified in the reporting requirements of Common Structural Rules for Bulk Carriers and Oil Tankers (CSR) issued by IACS for direct strength analyses.

Information related to direct strength analyses (CSR, part 1, ch. 7, section 1):

- a) list of plans used including dates and versions;
- b) detailed description of structural modelling including all modelling assumptions and any deviations in geometry and arrangement of structure compared with plans;
- c) plots to demonstrate correct structural modelling and assigned properties;
- d) details of material properties, plate thickness, beam properties used in the model;
- e) details of (assumed) boundary conditions;
- f) details of all loading conditions reviewed with calculated hull girder shear force, bending moment and torsional moment distributions;
- g) details of applied loads and confirmation that individual and total applied loads are correct;
- h) plots and results that demonstrate the correct behaviour of the structural model under the applied loads;
- i) summaries and plots of global and local deflections;
- j) summaries and sufficient plots of stresses to demonstrate that the design criteria are not exceeded in any member;
- k) plate and stiffened panel buckling analysis and results;
- l) tabulated results showing compliance, or otherwise, with the design criteria;
- m) proposed amendments to structure where necessary, including revised assessment of stresses, buckling and fatigue properties showing compliance with design criteria; and
- n) reference of the finite element computer program (software), including its version and date.

Information related to strength calculations other than direct strength analyses:

- o) hull girder ultimate capacity calculation (CSR, part 1, ch. 5, section 2);
- p) residual strength calculation (CSR, part 1, ch. 5, section 3); and
- q) any other strength calculations such as Hull girder section modulus calculation (CSR, part 1, ch. 5, section 1).

8 The scope and sample format of information to be included in the SCF are provided in the annex to the SCF IS.

SCF Onboard and SCF Supplement Ashore: appropriate formats and locations for different types of information

9 It was agreed that a shore-based Archive Center could be used to store the full scope of documents and drawings addressed by the SCF, which include certain documents that are recognized as being both highly IP sensitive and not needed to be kept on board the ship at all times.

10 The "SCF Onboard" is accessible on board the ship and in the shipowner's office ashore. The model procedures for management of the "SCF Onboard", either in a printed or digital format, are provided in the SCF Supplementary Guidance to facilitate customization in accordance with the principles of the IS to accommodate the different management style of each shipowner.

11 For shipowners who have chosen to carry the "SCF Onboard" in a digital format, a selected set of printed "SCF Onboard" for frequent use as shown in table 2 of the SCF IS, as well as a full set of "SCF Onboard" in a printed format for emergency use can also be provided. In addition, the electronic "SCF Onboard" is printable by equipment on board or in the shipowners' office ashore.

12 The "SCF Supplement Ashore" comprises only documents that satisfy two criteria: "high IP sensitivity" and "not needed to be kept on board the ship at all times". These documents are marked as "high IP level" documents in table 2 of the SCF IS.

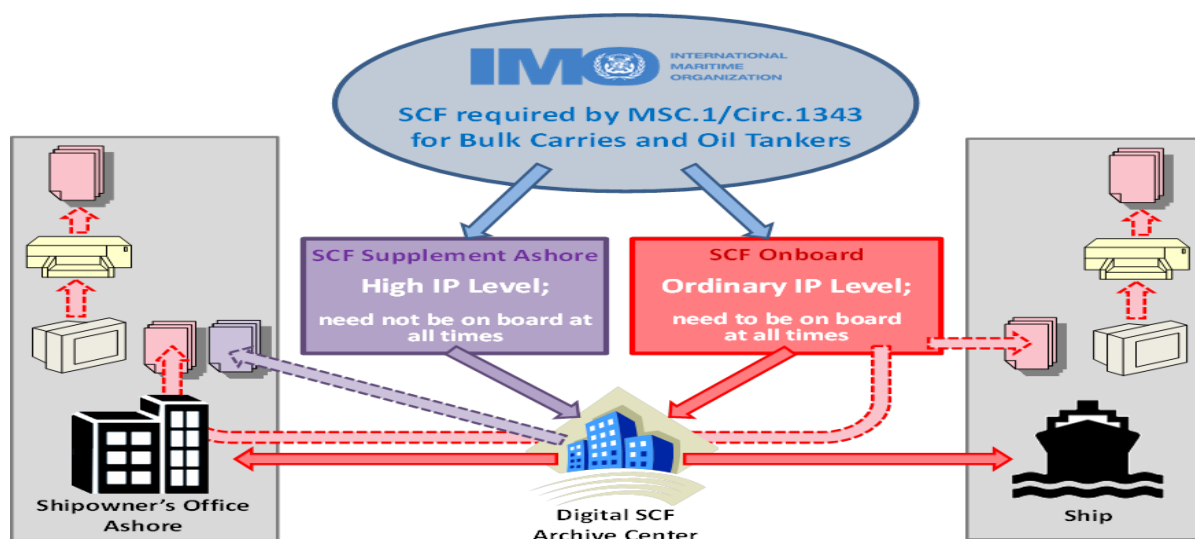


Figure 2: The "SCF Onboard – SCF Supplement Ashore" model

13 For conventional bulk carriers and oil tankers these criteria are only met by the following four items (noting that this may be different for other ship types which may in the future be subjected to other GBS):

- .1 full "Detailed strength calculation" document;
- .2 full "Detailed fatigue life calculation" document;
- .3 "yard plans" drawings; and
Note: "Yard plans" drawings – besides scantling information of structural members – contain also sensitive proprietary information on fabrication processes. The scantling information of structural members to fulfil the day-to-day needs on board is, however, available on board, by means of Item 3-5 (Key construction plans) and Item 3-6 (Net scantlings of structural constituent parts) defined in the annex to the SCF IS.
- .4 master "lines plan" drawing.
Note: Master "Lines plan" is a master drawing displaying the detailed hull form of the entire ship. Hull form information frequently required is readily made available on board, by means of Item 3-5 (Key construction plans) defined in the annex to the SCF IS. Hull form information needed in emergency situations is also encrypted and stored on ship loading computers on board as numerical data (Refer to Item 3-11 "Equivalent to Lines plan" defined in the annex to the SCF IS).

14 SCF Information that is required for Emergency Response Services (ERS) will be available for use by dedicated ERS providers subject to appropriate procedures for IPR protection being implemented by the ERS provider for example, by means of a confidentiality agreement.

The Archive Center provides availability and IP protection of SCF information: practical, user-friendly and safe

15 For the defined scope of the SCF, whether on board or ashore, availability to the shipowner is assured, taking into account the need for appropriately structured access procedures that consider both the IP sensitivity of individual documents/drawings and the need for practical operational access to the information. How to manage access procedures in practice is fully under the shipowner's control.

16 Where the "SCF Onboard" is in a digital format it should be directly accessible by the shipowner through the onboard standard IT systems and document management procedures. It is anticipated that shipowners will put in place appropriate IT security procedures to protect information held in a digital format. This should include procedures and systems for taking off a person from the registration list when the person is no longer qualified for access because of changeover or retirement, etc. and periodical renewal of passwords to be made by the shipowner to ensure maintenance of secure access to SCF information, and may include periodical renewal of information held in a digital format. This is intended to ensure that a full set of the latest SCF information is being used and that the information has not been compromised.

17 Records of the access to SCF information are to be kept by the shipowner, e.g. as a part of the ship's document management system or quality management system. Where information in a digital format is selected, this can be arranged to be automated.

18 For the "SCF Supplement Ashore", information should be provided by the shipowner to clarify the intended use of information in the four documents recognized as being of high IP sensitivity (table 2 in the SCF IS refers). The Archive Center will only use this information to verify that SCF information is being provided to a recognized representative of the shipowner for legitimate use related to the specific ship.

19 However, this does not oblige the shipowner to give away business sensitive information. The information provided will simply enable the shipbuilder to understand the specific part/extent of SCF Supplement Ashore information needed, so as to facilitate the relevant procedures and enable the Archive Center to deliver necessary and sufficient SCF Supplement information in a timely manner. Such exchange is based on trust and a spirit of good cooperation between the shipowner and the shipbuilder. The Archive Center and shipbuilder will operate under strict principles not to divulge for whatever reason the purpose given by the shipowner.

20 The Archive Center will function as the keeper of the "SCF Supplement Ashore" in a digital format, while also keeping a full digital copy of the "SCF Onboard" for back-up purposes. The Archive Center will keep a record of access to "SCF Supplement Ashore" and any back-up documents or drawings of the "SCF Onboard" that it provides to any party.

21 Qualification elements for becoming an Archive Center are defined in the IS, keeping in mind that independent services can be competitively achieved. Classification societies may be the most suitable and likely candidate. Not all classification societies, however, necessarily will provide Archive Center services.

22 However, the IS does not rule out other entities as long as the qualifications set in the IS are achievable. The selection and appointment of the Archive Center will ultimately be subject to agreement between the shipowner and the shipbuilder.

SCF Interim Industry Standard: open to modification and alternative purposes

23 The IS has been specifically developed to facilitate the SCF for bulk carriers and oil tankers. However, if an individual shipowner sees benefit in applying the same industry model for information beyond the current SCF scope, this could be arranged by agreement between the relevant parties.

24 It is intended that in the absence of significant issues arising, a general review will be initiated by the cross industry working group within 24 months to take account of experience gained in the initial use of the IS.

25 Some complementary fields of application have already been identified and noted in, e.g. *Guidelines for the approval of alternatives and equivalents as provided in various IMO instruments* (MSC.1/Circ.1455) and in resolution MEPC.254(67) specifically requesting IPR protection, which could be provided or improved by making use of the principles and models described in the SCF IS.

Action requested of the Committee

26 The Committee is invited to consider the information provided and take action as appropriate.