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<td>Rec 125</td>
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<td>Rec 126</td>
<td>Record of approved GMDSS radio installation</td>
<td>Nov 2015</td>
<td>HF</td>
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<td>Rec 127</td>
<td>A guide to risk assessment in ship operations</td>
<td>June 2012</td>
<td>HF</td>
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<td>Rec 128</td>
<td>Record of approved Ship Safety Equipment</td>
<td>Nov 2015</td>
<td>HF</td>
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<tr>
<td>Rec 129</td>
<td>Guidance on DMLC Part II review, inspection and certification under the Maritime Labour Convention, 2006</td>
<td>Mar 2013</td>
<td>HF</td>
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<td>Rec 130</td>
<td>Procedures for verifying that materials are asbestos free</td>
<td>June 2013</td>
<td>HF</td>
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<td>Res. No.</td>
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<td>Rec 131</td>
<td>Uniform application of SOLAS Ch.II-2 Reg. 4.5.7.3.2.1 for accepting a constant operative inerting systems (COIS) as an alternative to fixed hydrocarbon gas detection equipment in double hull and double-bottom spaces on oil tankers</td>
<td>July 2013</td>
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<td>Rec 132</td>
<td>Human element recommendations for structural design of lighting, ventilation, vibration, noise, access and egress arrangements</td>
<td>Dec 2013</td>
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<td>Rec 133</td>
<td>Guidelines for pilot schemes of extended interval between surveys in dry-dock – extended dry-docking (EDD) scheme</td>
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<td>Rec 134</td>
<td>Boat transfers safe practice</td>
<td>Mar 2014</td>
<td>HF</td>
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<td>Rec 135</td>
<td>Rooms for emergency fire pumps in cargo ships</td>
<td>June 2014</td>
<td>HF</td>
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<td>Rec 136</td>
<td>Guidelines for working at height</td>
<td>June 2014</td>
<td>HF</td>
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<td>Rec 137</td>
<td>Recommendation for protection of socket outlets for road freight units</td>
<td>Oct 2014</td>
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<td>Rec 138</td>
<td>Recommendation for the FMEA process for diesel engine control systems</td>
<td>Dec 2014</td>
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<td>Guidelines on Approval of Hull Steels with Improved Fatigue Properties</td>
<td>Feb 2015</td>
<td>HF</td>
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<td>Rec 140</td>
<td>Recommendation for safe precautions during Survey and Testing of Pressurized Systems</td>
<td>June 2015</td>
<td>HF</td>
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<td>Rec 141</td>
<td>Guidelines for the Assessment of Safety Aspects at Workplace</td>
<td>July 2015</td>
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<td>Rec 142</td>
<td>LNG Bunkering Guidelines</td>
<td>June 2016</td>
<td>HF</td>
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<td>Rec 143</td>
<td>Recommended procedure for the determination of contents of metals and other contaminants in a closed fresh water system lubricated stern tube</td>
<td>Oct 2015</td>
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<tr>
<td>Rec 144</td>
<td>Inspection of ship’s side valves</td>
<td>Feb 2016</td>
<td>HF</td>
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<tr>
<td>Rec 145</td>
<td>Recommendation for the Operation of Shore-Based Emergency Response Services</td>
<td>May 2016</td>
<td>HF</td>
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<tr>
<td>Rec 146</td>
<td>Risk assessment as required by the IGF Code</td>
<td>Aug 2016</td>
<td>HF</td>
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Recommendation No. 15
“Care and Survey of hatch covers of dry cargo ships- Guidance to owners-”

Part A. Revision History

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<td>11 September 1997</td>
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<td>Rev.0 (1986)</td>
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• Rev.3 (Aug 2013)

.1 Origin of Change:

☑ Suggestion by IACS Members

.2 Main Reason for Change:

a) UR Z4 was deleted in May 2013 as the requirements in UR Z4 were already incorporated in UR Z7.

b) During reviewing the deletion of UR Z4, GPG Member proposed to consider the revision of Recommendation 15 since the entire text of UR Z4 was reproduced and contained in Annex of Recommendation 15.

c) Tasked by GPG, Survey Panel further reviewed and deleted the reference of UR Z4 from the Recommendation 15.

.3 List of non-IACS Member classification societies contributing through the TC Forum and/or participating in IACS Working Group:

None

.4 History of Decisions Made:

Completed through mail correspondence.

.5 Other Resolutions Changes

None

.6 Dates:

Original Proposal: 22 May 2013 (9640_IgN)   Made by: GPG
Panel Approval: 9 July 2013 by Survey Panel (Ref. PSU13018)
GPG Approval: 21 August 2013 (Ref: 9640_IgP)
• **Rev.2 (1997)**

The existing “Annex to Care and Survey of hatch covers of dry cargo ships- Guidance to owners - IACS Requirement Z4” is replaced with current revision i.e. UR Z4 (Rev.2 1996, V2.1).

• **Rev.1 (1989)**

No records available.

• **Rev.0 (1985)**

No records available.
Part B. Technical Background

No Technical Background (TB) documents have been prepared for Rev.0 (1985), Rev.1 (1989), Rev.2 (1996) and Rev.3 (Aug 2013).
Recommendation No. 24 “Intact Stability”

Part A. Revision History

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<td>Rev.4 (June 2002)</td>
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<td>New (1988)</td>
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- **Rev.6 (July 2013)**

  .1 Origin:
  - ☑ Suggestion by IACS Statutory Panel

  .2 Main Reason for Change:
  Recommendation was revised by the Statutory Panel in the light of the entering into force of the New Intact Stability Code (MSC 267(85)).

  .3 List of non-IACS Member classification societies contributing through the TC Forum and/or participating in IACS Working Group:
  None

  .4 History of Decisions Made:
  IACS Rec.24 (Rev.6) initially developed by PT 30 and then finalized by the Statutory Panel under Task 36 - Maintenance of IACS Resolutions - UR L5, UR L2 and Rec.24. The revised Recommendation has been unanimously agreed by the Panel.

  .5 Other Resolutions Changes:
  None

  .6 Dates:
  Panel Approval: 27 June 2013 by Statutory Panel (Ref: SP11016c)
  GPG Approval: 23 July 2013 (Ref: 11160_Igh)

- **Rev.5 (May 2004)**

  Revision submitted to GPG56. No other records available.
• **Rev.4 (June 2002)**
Outcome of WP/SSLL Task 6. Revision submitted to GPG52. No other records available.

• **Rev.3 (June 2000)**
Amends references to IMO stability criteria. Revision submitted to GPG48. No other records available

• **Rev.2 (1994)**
No records available

• **Rev.1 (1989)**
No records available

• **Original resolution (1988)**
No records available
Part B. Technical Background

Note: No separate Technical Background (TB) documents are available for Rec.24 versions Original 1988, Rev.1 1989, Rev.2 1994, Rev.3 June 2000, Rev.4 June 2002, Rev.5 May 2004 and Rev.6 July 2013.
Recommendation 35 “Inspection and Maintenance of Electrical Equipment Installed in Hazardous Areas for Ships other than Tankers”

Part A. Revision History

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<td>Rev.1 (Mar 2006)</td>
<td>03 Mar 2006</td>
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</table>

- **Corr.1 (June 2015)**

  .1 **Origin of Change:**

  - ✓ Suggestion by an IACS Member

  .2 **Main Reason for Change:**

  This task is triggered to coordinate IACS Rec 35 with the new Rec 120 “Survey of electrical equipment installed in hazardous areas on tankers” being developed under PM5408.

  .3 **List of non-IACS Member classification societies contributing through the TC Forum and/or participating in IACS Working Group:**

  None

  .4 **History of Decisions Made:**

  This is a follow-up task of PM5408. Machinery Panel decided to issue the draft Rec 120 “Survey of electrical equipment installed in hazardous areas on tankers” being developed under PM5408 as a separate Recommendation applying to tankers and also to keep Rec 35 concurrently.

  At the 19th Panel Meeting held in March 2014, Machinery Panel concurred to re-phrase the title of Rec 35 to make the document standalone and independent from Rec 120 being developed under PM5408. On the grounds of this, Machinery Panel unanimously agreed to add “for ships other than tankers” at the end of the title, i.e. ‘Rec 35 Inspection and Maintenance of Electrical Equipment Installed in Hazardous Areas for Ships other than Tankers’.

  .5 **Other Resolutions Changes**

  Rec 120 (New, June 2015)
.6 Dates:

Original Proposal: 5 July 2010 Made by a Member
Panel Approval: 14 May 2015
GPG Approval: 04 June 2015 (Ref: 5029bIGm)

- **Rev.1 (Mar 2006)**
  
  No records of history

- **New (1992)**
  
  No records of history
Part B. Technical Background

List of Technical Background (TB) documents for Recommendation 35:

Recommendation No.36 “Recommended procedure for the determination of contents of metals and other contaminants in stern tube lubricating oil”

Part A. Revision History

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<td>New (1992)</td>
<td>No records</td>
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</table>

- **Rev.2 (Aug 2011)**

  .1 Origin for Change:

  ☑ Other (Task of reviewing Recommendations to be posted on the web)

  .2 Main Reason for Change:

  In the course of fulfilling the task of reviewing Recommendations to be posted on the web, the Machinery Panel Chairman submitted the revised Rec.36, which has been agreed by the Machinery Panel Members (PM5901c).

  .3 List of non-IACS Member classification societies contributing through the TC Forum and/or participating in IACS Working Group:

  None

  .4 History of Decisions Made:

  GPG agreed to the draft Recommendation submitted by the Machinery Panel, as well as to the proposal of a Machinery Panel Member to delete the Note in para.1 “Note :It is recommended to take lubricating oil sample and carry out analysis once in every month” for it's not according with Z21.2(d)“Where a lubricating oil analysis is carried out regularly at intervals not exceeding six months, and the oil consumption and bearing temperature are recorded and considered to be within permissible limits, drawing of the shaft to expose the aft bearing contact area of the shaft may not be required.”

  .5 Other Resolutions Changes

  None

  .6 Dates:

  Original Proposal: 11 July 2011, made by Machinery Panel
  GPG Approval: 05 August 2011 (Ref: 0140bIGi)
• **Rev.1 (1997)**

The word “shaft” in the title changed to “stern tube”. The title of section 3 changed to “Contaminants determination”. Metal and water content values in section 4 are refined as “Suggested upper limits”.

• **New (1992)**

No records are available.
Part B. Technical Background

List of Technical Background (TB) documents for Rec.36:

There are no separate Technical Background (TB) documents available for Rec.36 (New 1992), Rev.1 (1997) and Rev.2 (Aug 2011)
**Recommendation No.38 “Guidelines for the Survey of Offshore Mooring Chain Cable in Use”**

**Part A. Revision History**

<table>
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<th>Version no.</th>
<th>Approval date</th>
<th>Implementation date when applicable</th>
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- **Rev.1 (Oct 2010)**

  .1 **Origin of Change:**
  
  ☑️ Suggestion by an IACS member

  .2 **Main Reason for Change:**
  
  The main technical reason for the change is to update the recommendation in order to take into account current practice.

  .3 **List of non-IACS Member classification societies contributing through the TC Forum and/or participating in IACS Working Group:**
  
  When the revision first started IRS was an associate member. However, by the time it was finished, IRS has become a member of IACS.

  .4 **History of Decisions Made:**
  
  The revisions were made through discussions and e-mails within the Hull Panel. A Hull Panel Member incorporated the comments and drafted a final revision. Hull Panel members reviewed and accepted the revisions.

  .5 **Other Resolutions Changes**
  
  None

  .6 **Dates:**
  
  Original Proposal: 30 November 2007 Made by Hull Panel Member
  Panel Approval: 10 September 2010
  GPG Approval: 13 October 2010 (Ref: 10127_ICGc)
Part B. Technical Background

List of Technical Background (TB) documents:

Annex 1  **TB for Rev.1 (Oct 2010)**

See separate TB document in Annex 1.

Note: There are no separate Technical Background (TB) document available for New (1995)
Technical Background for
Recommendation No.38 Rev.1 (Oct 2010)

1. Scope and objectives

The revision is made to update the recommendation in order to take into account current practice. It includes specific information on the wear-down and movement of mechanical locking for use while conducting surveys on offshore mooring chain. The intent is to assist with consistent application of the recommendation.

2. Engineering background for technical basis and rationale

The main basis for the change is to simply take into account current practice. It is noted that satisfactory in-service performance has been experienced and this changed represents an improvement to the documentation on what is applied.

3. Source/derivation of the proposed IACS Resolution

The source of the information was obtained through the input of the Hull Panel members.

4. Summary of Changes intended for the revised Resolution:

Editorial changes are made as well as some clarifications to specific information on the number of samples, the wear-down measurements and movement of mechanical locking for use while conducting surveys on offshore mooring chain.

5. Points of discussions or possible discussions

The revisions were made through discussions and e-mails within the Hull Panel which involved mainly incorporating individual comments and accepting the consolidated text.

6. Attachments if any

None.
Technical Background

Recommendation 39, Rev.3 – March 2009

Survey Panel Task 1: Amendments to Recommendation 39 – Concerns related to Rule changes regarding rafting

1. Objective
Amend the Recommendation 39 for removing impracticality and risks in using rafts when surveyors survey cargo tanks.

2. Background
One member of IACS Survey Panel received an advice from field staff, which described concerns about an accident which can happen when water level is falling while surveyors are surveying cargo tanks using a raft. The advice from field staffs also introduced accidents which occurred due to air pockets in the water during deballasting operation. Field staff recommended that the level shall be stationary and the ballast system should be isolated to prevent any accidental ingress or outflow of water and pointed out that their rule, which states ‘The surface of water in the tank is to be calm and the water level either stationary or falling’, should be amended. The field staff also pointed out that the water level, which is provided to be allowed within 1 m of the deepest under deck web face flat, should be changed to be allowed within 0.5m. The reason for this is that, if we consider the web is allowed to be maximum 1.5m deep in case of bad coating condition, the distance for close up survey of the under deck structure is too much for most surveyors to reach it by hand. Based on above technical grounds, field staff asked if any amendments to UR Z10.1 and Recommendation No. 39 can be made.

3. Discussion
In the 8th Survey Panel meeting, Chairman, explained about the impracticality in using rafts when surveying cargo tanks - i.e., danger of air pockets when de-ballasting, impractical distance for reaching by hand, and height for easy maneuverability of raft. Also the relevant Panel member explained about the correspondence regarding ‘Concerns related to Rule changes regarding rafting’ which was sent by a field staff. Upon discussion, members consented to the first proposal on water level but not to the second part on the distance under deck. At the end, it was concluded that first one can be changed, but second one should remain unchanged. Members agreed to amend IACS Recommendation 39, 1.4 d) by removing “either”...“or falling” from the first sentence.

Submitted by Survey Panel Chairman
25 February 2009

Permanent Secretariat note (March 2009):
Rec.39 Rev.3 was approved by GPG on 18 March 2009 (ref. 9528_IGb).
Recommendation No.42
“Guidelines for Use of Remote Inspection Techniques for surveys”

Part A. Revision History

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<td>Rev.1 (May 2004)</td>
<td>26 May 2004</td>
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<tr>
<td>New (1996)</td>
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</table>

- **Rev. 2 (June 2016)**

  **.1 Origin of Change:**

  ☑ Suggestion by IACS member

  **.2 Main Reason for Change:**

  As outcome of the discussion held under Panel Task PSU14020, related to the possible use for the remote techniques of surveys for the close up surveys of the ships subjected to ESP regime, the revision of the IACS Recommendation 42 was proposed. The revision is included among the permanent tasks assigned to the Panel according to IACS Procedure.

  **.3 List of non-IACS Member Classification Societies contributing through the TC Forum and/or participating in IACS Working Group:**

  None

  **.4 History of Decisions Made:**

  Panel Members, by considering the advances made in the field of remote inspection techniques during the last 10 years (such as non-invasive inspection performed by miniaturized cameras), approached the revision of the recommendation under panel task PSU16005.

  During the 23rd Survey Panel meeting the various proposals have been discussed and the text revision 2 of the Recommendation was agreed by the members.

  It is worth to note that:

  1) The list of the remote inspection techniques more frequently used in the marine field has been introduced;

  2) The inspection fields have been enlarged by adopting the concept of the “Item to be inspected” which, in turn, encompasses the hull structures as well as internal inspection of machinery items and equipment.
Members discussed the possibility to adopt the remote inspection techniques as a possible support to the close up surveys of the ships subjected to the ESP Code (Oil Tankers and Bulk Carriers). The Panel concluded that since the ESP Code is matter of statutory duties, the use of remote inspection techniques shall be authorized by the Flag Administration.

No technical background has been expected for this revision.

.5 Other Resolutions Changes:

None

.6 Dates:

Original Proposal: 03 February 2016, Made by: IACS member
Panel Approval: 16 March 2016 (Ref: PSU16005)
GPG Approval: 22 June 2016 (Ref: 16103_IGb)

- Rev. 1 (May 2004)

GPG Approval: 26 May 2004 (Ref: 4053_).

- New (1996)

No records available.
Part B. Technical Background

List of Technical Background (TB) documents for Rec. 42:

Note:

1) There are no separate Technical Background (TB) documents for Recommendation No.42 New (1996), Rev.1 (May 2004) and Rev.2 (June 2016).
Recommendation No.47  
“Shipbuilding and Repair Quality Standard”

Part A. Revision History

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- **Rev.7 (June 2013)**

1 Origin for Change:

☑ Suggestion by IACS Members

.2 Main Reason for Change:

During discussion of an outside inquiry regarding the alignment of a t-longitudinal in Table 9.1, the Panel decided to review IACS Rec.47 against other standards currently followed by shipyards and accordingly, if necessary, update IACS Rec.47.

.3 List of non-IACS Member classification societies contributing through the TC Forum and/or participating in IACS Working Group:

None

.4 History of Decisions Made:

A Panel member suggested that Rec 47 should be revised since Rec 47 differs from other shipyard standards with respect to the alignment of a t-longitudinal as shown in Table 9.1. The Panel reviewed the standard practice of different shipyards and agreed to revise the text "grind corners to smooth taper over a distance of 50a" into "release and adjust over a distance of 50a".

A Member suggested that the bending radius given in Table 6.3 for corrugated bulkheads should be amended as per the provision of the CSR Tanker Rules, Sec. 6/4.2.2. The Panel agreed to put this requirement in Rec. 47 for CSR ships only.

The Panel also discussed existing requirements on welding and grinding of cracks in Part B of Section 6.8/6.9. The Panel included introductory text in Section 6.8(Welding
repairs for cracks) to clarify this section and agreed to delete section 6.9 (Grinding of shallow cracks) considering that this section is not relevant for a repair standard of existing vessels.

.5 Other Resolutions Changes

None

.6 Dates:

Survey Panel Approval: 21 February 2013
GPG Approval: 19 June 2013 (Ref: 13085_Igd)

• Rev.6 (May 2012)

.1 Origin of Change:

☒ Other (Based on Other Standard (SSC-443))

.2 Main Reason for Change:

Revise the Recommendation 47 with reference to SSC-443 and in light of experience gained so far for the use of doubling plates for ships in operation.

Also, references and titles of Rec 20, UR W13 and UR W14 were to be updated to current document titles.

.3 List of non-IACS Member classification societies contributing through the TC Forum and/or participating in IACS Working Group:

None

.4 History of Decisions Made:

The Task was triggered by GPG in light of the document SSC-443 by the Ship Structure Committee (U.S.A.) following a bilateral message of 11/1/11 from a Member. The expected benefit of undertaking the work was to have a technical discussion on the use of doublers aboard ship leading to a review of aspects of Recommendation 47 relating to doublers with a view to improving and enhancing current guidance in the Recommendation. Priority was given to discussion of the document SSC-443 vis-à-vis current IACS recommendations regarding doublers.

.5 Other Resolutions Changes

None

.6 Dates:

Original Proposal: 20 January 2012 Made by: Survey Panel
Rev.5 (Oct 2010)

.1 Origin of Change:

☑️ Other (Query from industry - DAEWOO SHIPBUILDING & MARINE ENGINEERING CO.,LTD.)

.2 Main Reason for Change:

It was agreed in the Panel that the acceptance criteria for minor imperfections is not clear without the definition of influenced area. The existing text is not in line with international standards which are applied by many shipyards and manufacturers. And the definition of limit gap between plates for butt welding is obscure in the relevant Table.

.3 List of non-IACS Member classification societies contributing through the TC Forum and/or participating in IACS Working Group:

None

.4 History of Decisions Made:

Lately some shipyards and manufacturers have received steel plates with pits and there has been discussion regarding how to interpret the extent and acceptance criteria for pitting. It was decided by the Survey Panel that the amendments to Rec.47 are necessary in order to improve the clarity of the document. And, there was a query from shipyards on the obscure definition of limit gap between plates for butt welding

.5 Other Resolutions Changes

None

.6 Dates:

Original Proposal: 07 April 2010 Made by: Survey Panel
Panel Approval: 24 August 2010
GPG Approval: 06 October 2010 (Ref: 10122_IGb)

Rev.4 (Aug 2008)

Revision based on Survey Panel Task 44. Ref: 8626_

See TB in Part B

Rev.3 (Nov 2006)

Revision based on comments from SAJ. Ref: 4109a_
No TB document available

- **Rev.2 (Dec 2004)**
  Revision proposed by WP/MW to GPG 52 (WP/MW Task 41). Ref: 4109_

No TB document available

  Revision based on the revised SARQS (Table 8.7). Ref: 9139_

No TB document available

- **New (1996)**

No TB document available
Part B. Technical Background

List of Technical Background (TB) documents:

Annex 1  **TB for Rev.4 (Aug 2008)**

See separate TB document in Annex 1.

Annex 2  **TB for Rev.5 (Oct 2010)**


Annex 3  **TB for Rev.6 (May 2012)**

See separate TB document in Annex 3.

Note: There are no separate Technical Background (TB) documents available for New (1996), Rev.1 (Aug 1999), Rev.2 (Dec 2004), Rev.3 (Nov 2006) and Rev.7 (June 2013).
TECHNICAL BACKGROUND

IACS RECOMMENDATION NO.47 (REV.4, AUG 2008)
“Shipbuilding and Repair Quality Standard”

1. Scope and objective
PT was formed by Survey Panel (Task No.44) to develop a proposal to amend IACS Rec.47, SARQS (Shipbuilding and Repair Quality Standard) in order to align with major national shipbuilding standards.

2. Background
During IACS meeting with JSA (Japan Shipowners Association) and SAJ (Shipbuilders Association of Japan) in Tokyo, September 2005, SAJ made a presentation of areas of concern with IACS Rec.47. IACS agreed to submit the concerns to Survey Panel for action. IACS adopted Rev.3 of Rec.47 in November 2006, which was proposed by PT (Project Team) under the Survey Panel. The amendments in Rev.3 were based on the concern of SAJ that only the construction quality standards should be specified in SARQS and that some impractical recommendations should be revised. Upon the completion of Rev.3, IACS decided to develop a proposal to further amend IACS Rec.47 in order to align it with major national shipbuilding standards.

The Technical Background documents of the previous versions 1 and 2 do not exist.

3. Points of discussions
PT commenced the work through correspondence. After making considerable progress in the work, one meeting was held in Tokyo on 19th and 20th February, 2008 to finalize the amendments. PT members reviewed Rec.47 Rev.3 from the viewpoint of shipbuilding standards in their territories and their own experiences as well.

Initially PM gathered the information and comments from PT members on the results of the comparison of the Rec.47 with major national and certain shipyard standards practiced in China, Germany, India, Japan, Korea and Russia.

PT agreed to amend Rec.47 Rev.3 after the following discussion.
- Rec.47 should not be conflicted with major national shipbuilding standards to the extent possible
- Scope should be defined where Rec.47 applies
- Standard range and limit range should be listed
- Welding procedures should be qualified in accordance with IACS UR W28 or other recognized standard accepted by Classification Society
Upon a comprehensive review of national standards, PT found that there are notable variations among the major national standards in some technical parameters/approaches, maybe due to the differences in their respective technical basis, which would make a complete alignment not feasible. However, PT tried to accommodate the best practices of each of the considered major standards to the extent possible in order to finalize the Rec.47 Rev 4.

To improve the clarity of the recommendations, PT introduced necessary editorial changes.

Recognizing the importance of short bead welding in remedial work, PT introduced a new Table 9.14 according to JSQS.

Table 6.4 was amended to include the ovality of cylindrical structure according to FS (Production standard of the German Shipbuilding Industry).

In revision 2, in Table 9.4 and Table 9.5 (Typical Butt Weld Edge Preparation Remedial (Manual Welding and Semi-automatic welding)), the gap value, based on which the remedial standard is decided, was a function of the plate thickness. But in Revision 3 the gap value was modified to absolute value considering the comments from SAJ. During the PT meeting on 19 and 20 Feb 2008, it was agreed that the gap value is to be related to the thickness values, considering the comments from shipyards in Korea and elsewhere, to deal with thinner plates.

To avoid duplications and contradictions with other IACS technical requirements, some parts of the Rec.47 are modified.

**4. Source and derivation of proposed standards**

IACS Recommendation No.47 Rev.3 and Rev.4

**5. Appendix**

N.A.

Submitted by Project Team Manager
March 2008

**Permanent Secretariat note:**

PT’s proposed amendments to Rec.47 were unanimously agreed by the Survey Panel and draft Rec.47 Rev.4 was submitted to GPG on 17 July 2008.

GPG approved Rec.47 Rev.4 on 4 August 2008 (ref. 8626_IGb).
1. Scope and objectives

To revise the Recommendation 47, Par.4.2.1 and 4.2.2 with the aim to eliminate uncertainties related to determining the imperfection surface area ratio and subsequently the acceptance criteria for minor imperfections which do not need to be repaired. And, to clarify the meaning of gap between edges of plates for Butt welding.

2. Engineering background for technical basis and rationale

While preparing a reply to the query from Daewoo Shipbuilding & Marine Engineering Co. Ltd. it was noticed that different societies have different interpretation of the acceptance criteria for minor imperfections without remedies. It was felt that including the definition of influenced area would improve the clarity of Recommendation 47 in this respect.

3. Source/derivation of the proposed IACS Resolution

The definition of the influenced area was adopted from European Standard EN 10163-1.

4. Summary of Changes intended for the revised Resolution:

New text defining the influenced area was added to Par.4.2.2.
A clear description on welding the gap with Butt weld plate was added to Table 9.5

5. Points of discussions or possible discussions

None

6. Attachments if any

None
Technical Background for Recommendation No.47 Rev.6, May 2012

1. Scope and objectives

Review of Recommendation 47 with reference to SSC-443 and in light of experience gained so far, update the Recommendation or identify needs to develop a set of requirements for the use of doubling plates for ships in operation, by Survey Panel.

2. Engineering background for technical basis and rationale

Technical discussion on the use of doublers aboard ship with reference to SSC-443 led to review and improvement of the current guidance in the Recommendation 47 relating to doublers.

3. Source/derivation of the proposed IACS Resolution

SSC-443 by the Ship Structure Committee (U.S.A.)

4. Summary of Changes intended for the revised Resolution:

Para 6.6 (Termination of straps) of Rec. 47 has been renamed and revised with following wordings:

6.6 Application of Doubling Straps

In certain instances, doubling straps are used as a means to strengthen and reinforce primary structure. Where this has been agreed and approved, particular attention should be paid to:

- the end termination points of the straps, so that toe support is such that no isolated hard point occurs.
- In the case of application of symmetrical or asymmetrical-ended straps, the corners at the end of the tapering should be properly rounded.
- any butts between lengths of doubling straps, so that there is adequate separation of the butt weld from the primary structure below during welding, and so that a high quality root run under controlled circumstances is completed prior to completing the remainder of the weld. Ultrasonic testing should be carried out on completion to verify full penetration.

Moreover, the corners are to be rounded for the symmetrical arrangement shown in Fig.6.6.

Also, references and titles of Rec 20, UR W13 and UR W14 were updated to current document titles.

5. Points of discussions or possible discussions

None

6. Attachments if any

None
Recommendation No.55
GENERAL DRY CARGO SHIPS - Guidelines for Surveys, Assessment and Repair of Hull Structure

Part A. Revision History

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- Rev 1 (June 2016)

.1 Origin of Change:

☑ Other (Periodical review of IACS resolutions)

.2 Main Reason for Change:

As outcome of the periodical review of the IACS recommendation 55.

.3 List of non-IACS Member classification societies contributing through the TC Forum and/or participating in IACS Working Group:

None

.4 History of Decisions Made:

Survey Panel discussed the revision of the Recommendation 55 by correspondence under Panel Task PSU15024. Several proposals of updating have been analysed and processed by the Members during the 22nd Survey Panel meeting. The proposals were mostly addressing:

- editorial comments,
- modification of some sketches of proposed repairs, for generic part of the ship, so that they are aligned to those contained in the other IACS Recommendations relevant to guidelines for surveys, assessment and repair of hull structure of other types of ships
- modification of some sketches of proposed repairs dedicated for the dry cargo ships
- updating of some photographs detailing the typical damages with new one which add more clarity.
- The removal of the reference to the Early Warning Scheme (paragraph 3.5) due to the fact that the recommendation is intended not only for IACS Members but also for ship’s superintendent and other personnel not working in a Class Society.
- The addition of a new paragraph relevant to the “Voyage repairs and maintenance”.

Panel Members agreed the modifications to be applied at the 22nd meeting and finalized the revision 1 by correspondence.
No TB has been expected.

5 Other Resolutions Changes:

None

6 Dates:

Panel Approval: 7 March 2016 (Ref: PSU15035)
GPG Approval: 17 June 2016 (Ref: 16060_IGd)

- New (Mar 1999)

No records available.
Part B. Technical Background

List of Technical Background (TB) documents for Rec.55:

Note: There are no Technical Background (TB) documents available for New (Mar 1999) and Rev.1 (June 2016).
Recommendation No.57
“Maintenance and inspection of electrical equipment on the ship”

Part A. Revision History

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• Rev.1 (Mar 2016)

.1 Origin for Change:
- Other *(Periodical review of IACS resolutions)*

.2 Main Reason for Change:

During the periodical review of the IACS recommendation 57 two members proposed to update maintenance schedule for electrical equipment.

.3 List of non-IACS Member Classification Societies contributing through the TC Forum and/or participating in IACS Working Group:

None

.4 History of Decisions Made:

Survey Panel discussed the two proposals under PSU15035 and during the 22nd Survey Panel meeting agreed to:
- line 7 of Table 1 by inserting the provisions requiring the examination of the computer equipment, where fitted, in accordance with the PAT testing (Portable Appliance Testing).
- insert the maintenance and inspection provisions for cooling system integrated within a switchboard enclosure to table 1.

It is also worth to note that Panel Members discussed by correspondence and agreed by the majority of Members the following two items:

a) to modify/update the reference standards related to the provision for qualification and training personnel appointed for the maintenance and inspection, so that also the technicians in charge of the verification of medium voltage systems, dynamic positioning systems (for example) and other new electrical systems are being covered.

b) to insert the requirement that the records for qualification and training of the personnel described in a) is made available on board.
Item b) was not agreed by GPG.

All the modifications agreed have been applied in the revision 1 of the recommendation.

No TB has been developed.

.5 Other Resolutions Changes

None

.6 Dates:

Panel Approval: 9 January 2016 (Ref: PSU15035)
GPG Approval: 9 March 2016 (Ref: 16004_IGc)

• New (May 1999)

No records available
Part B. Technical Background

List of Technical Background (TB) documents for Rec.57:

Note: There are no Technical Background (TB) documents available for New (May 1999) and Rev.1 (Mar 2016).
1. Scope and objective

To develop a UR or Recommendation for welding procedure qualification tests for aluminium alloys 5383 and 5059.

2. Background

Rec.70 was produced in 2000. In 2004 new important industrial accepted specifications of aluminium alloy 5383 and 5059 were added to UR W25. These should be incorporated into the Recommendation and at the same time it may be upgraded to a UR for welding procedure qualification tests for the alloys based upon elaborate considerations.

3. Points of discussions or possible discussions

- Hull Panel PT2 unanimously agreed that the revised document should be retained as a recommendation.
- It was therefore submitted as a revision to the existing Recommendation No.70 to the Hull Panel on 3 March 2006.
- Accordingly Hull Panel reviewed it and comments made by GL were sent back to the PT2 on 12 April 2006.
- With regard to GL’s comments, having received replies from PT2 on 25 July in addition to comments made by ABS and CCS, the Hull Panel further reviewed them and finally agreed unanimously to the final draft revision to Recommendation No. 70 at the 5th Hull Panel meeting held on 16-18 October 2006.

4. Source/derivation of proposed requirements

- IACS Recommendation No. 70 (Rev.2)

5. Appendix

N.A.

Submitted by Hull Panel Chairman
27 October 2006

Permanent Secretariat Note (December 2006):

- Rec.70, Rev.2 was approved by GPG and Council on 15 November 2006 (6187 _IGb), with the request that PermSec update the language to be a non-mandatory style, i.e. replacing terms such “are to be” and “shall” with “should”, etc., to avoid confusing the public domain about the non-mandatory nature of the Recommendation.
- Following approval GL proposed some additional editorial amendments to improve the readability of the document and emphasize the relation of Rec.70 to UR W28 (GLb). However after bilateral communication between GPG Chair and Hull Panel Chair it was proposed to deal with these amendments at the next appropriate revision of Rec.70. This proposal received no objections from GPG members.
Recommendation No. 71
“Guide for the development of shipboard technical manuals”

Part A. Revision History

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- **Corr.1 (Mar 2014)**

  **1 Origin for Develop:**
  - ✔️ Suggestion by IACS Permsec

  **2 Main Reasons for Develop:**

  To correct the reference to an ISO standard in Para 7.1.1.

  **3 List of non-IACS Member classification societies contributing through the TC Forum and/or participating in IACS Working Group:**

  None.

  **4 History of Decisions Made:**

  A typographical error was found in Para 7.1.1 of recommendation 71. ISO 8879 was wrongly referenced as ISO 8779. The correction has been made by Permsec.

  **5 Other Resolutions Changes**

  None.

  **6 Dates:**

  Original Proposal: 18 February 2014 by IACS Permsec
  GPG Approval: 04 March 2014 (Ref: 14026_IGb)

- **New (Sep 2000)**

  Developed by WP/HE in September 2000 (Ref: 0085aIGb)
Part B. Technical Background

Note: No Technical Background (TB) document has been prepared for Recommendation No.71 (New, Sep 2000) and Corr.1 (Mar 2014).
Technical Background

IACS Recommendation 72, Rev. 2 (April 2007)

Survey Panel Task 46 – Safe Entry into Tanker Double Hull Spaces

1. Objective

Update as necessary IACS recommendation 72 to include Safe Entry Practices for Surveyors into Double Hull Spaces when adjacent cargo tanks are empty but inerted or the cargo tanks are loaded.

2. Background

ABS Panel member raised this issue to the Survey Panel at the Spring 2006 Panel meeting due to no current guidelines being available.

3. Methodology of Work

Survey Panel members through Project Team and correspondence

4. Discussion

Survey Panel Project Team members at the spring 2007 meeting discussed the amendments to Recommendation 72 based on the initial draft proposed by DNV PT member.

All survey panel members agreed to the amendments which consisted of two parts, i.e., Recommendation 72 and Annex to the Recommendation.

Submitted by Survey Panel Chairman
27 March 2007

Permanent Secretariat note (August 2007):
- Amendments agreed by GPG 14 April 2007 (6079_JGh).
- Owing to the extent of the amendments, including a change to the document layout, Rev.2 of Rec.72 has been treated as a complete revision and as such no underlined document is available.
For Technical Background (TB) file of Recommendation No. 73, please refer to the TB file of UR E16.

This TB for UR E16 was issued retrospectively in Feb 2007 following evaluation of Petrobas Brasil query on UR E16 and Rec.73 by Machinery Panel (ref. 6097__).
The ISM/ISPS Expert Group has made a number of changes to Recommendation 74. These changes do not alter the document substantially but are intended to emphasise the following two aspects of maintenance management that the Group felt had not been sufficiently addressed in the original version.

1. The need for companies to be concerned not only with the rectification of technical defects and hazardous situations but also with the identification and resolution of the underlying management systems failures that led to the problems in the first place.

2. The importance of a systematic approach to the assessment of risk when planning an effective maintenance management system.

At the same time, the opportunity was taken to clarify the wording of the introduction.

17th April 2008
Michael Molloy, LR

17th April 2008
Michael Molloy, LR

Permanent Secretariat note (June 2008):
Rec.74, Rev.1 approved by GPG 30 May 2008 (ref. 8582_lGc)
TECHNICAL BACKGROUND (External)

IACS Recommendation 74, Rev.1 (May 2008)

“A Guide to Managing Maintenance in accordance with the Requirements of the ISM Code”

The ISM/ISPS Expert Group has made a number of changes to Recommendation 74. These changes do not alter the document substantially but are intended to emphasise the following two aspects of maintenance management that the Group felt had not been sufficiently addressed in the original version.

1. The need for companies to be concerned not only with the rectification of technical defects and hazardous situations but also with the identification and resolution of the underlying management systems failures that led to the problems in the first place.

2. The importance of a systematic approach to the assessment of risk when planning an effective maintenance management system.

At the same time, the opportunity was taken to clarify the wording of the introduction.
Recommendation No.75
“Format for Electronic Exchange and Standard Reports”

Part A. Revision History

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- **Corr.1 (Feb 2016)**

1 **Origin for Develop:**

☑️ Suggestion from an IACS Member

.2 **Main Reasons for Develop:**

To correct DNV GL’s details and codes.

.3 **List of non-IACS Member classification societies contributing through the TC Forum and/or participating in IACS Working Group:**

None.

.4 **History of Decisions Made:**

Following suggestion from DNV GL, Permsec reviewed Rec.75 and updated DNV GL’s details and codes. The new revision has been confirmed by DNV GL before being circulated to GPG for information.

.5 **Other Resolutions Changes**

None.

.6 **Dates:**

Original Proposal: Feb 2016, made by DNV GL
Circulate to GPG for information: 17 February 2016 (Ref: 16041_IAa)

- **Rev.1 (Feb 2015) (Complete Revision)**

1 **Origin for Develop:**

☑️ Suggestion by IACS GPG (GPG 71 (FUA 26))
.2 Main Reasons for Develop:
To review Rec.75 and develop a standard set of data to be provided to Flag States.

.3 List of non-IACS Member classification societies contributing through the TC Forum and/or participating in IACS Working Group:
None.

.4 History of Decisions Made:
EG/Data reviewed Rec.75 under task No.1 (Form A approved under subject no: 13101a) and proposed a complete revision to Rec.75.

.5 Other Resolutions Changes
None.

.6 Dates:

  Original Proposal:  November 2011 (GPG 71 FUA 26)
  EG Approval: 24 December 2014 by EG/Data
  GPG Approval: 10 February 2015 (Ref: 14209_IGc)

- New (June 2001)

  Developed by AHG/EACSD in April 2001 (Ref: 0071aLRb) and adopted by Council on 4 June 2001.
Part B. Technical Background

List of Technical Background (TB) documents for Rec.75:

Note: There are no separate Technical Background (TB) documents for Recommendation No.75 New (June 2001), Rev.1 (Feb 2015) and Corr.1 (Feb 2016).
Recommendation No: 79
“Guidance for Anchoring Equipment in Service”

Part A. Revision History

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- Rev.1 (July 2014)

1 Origin for Change:

☑️ Suggestion by IACS Member

2 Main Reasons for Change:

To clarify guidance/requirements for loose studs in anchor cable, looseness and diminution criteria in kenter and other joining links, and looseness criteria for anchor pins. Accordingly, update Rec. 79 or UR A1 as deemed appropriate.

3 List of non-IACS Member classification societies contributing through the TC Forum and/or participating in IACS Working Group:

None.

4 History of Decisions Made:

The task was triggered by an IACS member following imposition of a Condition of Class on loose studs in anchor cable on a tanker, leading to chartering difficulties and an owner complaint on the lack of criteria for such looseness.

The task was augmented by members to include kenter and other cable links’ acceptance criteria, and anchor pin clearances.

Panel discussed and agreed to update Rec. 79 to clarify the acceptance criteria of anchoring equipment in service. Accordingly, Panel revised the title of the Rec 79 in order to make it consistent with the guidance additionally included to this revised IACS Recommendation. Panel also concluded to include terminologies of different anchoring equipment with figures as an annex to this guidance for better clarification.

5 Other Resolutions Changes

None

6 Dates:

Original Proposal: 6 October 2011 by Survey Panel Member
Survey Panel Approval: 8 March 2013 during 17th Survey Panel Meeting  
GPG Approval: 15 July 2014 (Ref: 12007_IGg)

- **New (July 2003)**

Proposed by WP/MW and approved at GPG 54.
Part B. Technical Background

No Technical Background (TB) documents are available for Rec.79 New (July 2003) and Rev.1 (July 2014).
Recommendation No.80
“Containers “In One Door Off” Operation”

Part A. Revision History

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• Del (Jan 2013)

.1 Origin for Change:
- Suggestion by an IACS Member (refer GPG 73 FUA 8)

.2 Main Reason for Change:

IMO resolution MSC.310(88), which entered into force on 1 January 2012, now clearly indicates the information to be provided on the CSC Safety Approval Plate in case of ONE DOOR OFF OPERATION relating to stacking and racking tests (new section 8 of Annex II of CSC 1972, as amended). It is also noted that DSC 17 agreed further draft amendments to CSC 1972, as amended, which were approved at MSC 91, with a view to subsequent adoption. These new draft amendments, inter alia, update the CSC provisions in such a way that it is considered that IACS Recommendation 80 is no longer considered necessary.

.3 List of non-IACS Member Classification Societies contributing through the TC Forum and/or participating in IACS Working Group:

None

.4 History of Decisions Made:

GPG 73 discussed the matter and tasked Statutory Panel to consider this further. Statutory Panel proposed the deletion of Rec.80. GPG accepted the proposal.

.5 Other Resolutions Changes

None

.6 Dates:

Original Proposal: October 2012 made by a Member
Panel Approval: 11 December 2012 by Statutory Panel
GPG Approval: 30 January 2013 (Ref: 12220_IGc)

• New (July 2003)
No records available
Part B. Technical Background

List of Technical Background (TB) documents:

There are no separate technical background (TB) documents available for New (July 2003) and Del (Jan 2013).
Recommendation 87 “Guidelines for Coating Maintenance & Repairs for Ballast tanks and Combined Cargo/Ballast tanks on Tankers”

Part A. Revision History

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- **Rev.2 (May 2015)**

  .1 Origin for Change:
  
  ☑ Suggestion by IACS member

  .2 Main Reason for Change:
  
  IMO Res.A.744(18), which is recalled in recommendation 87(Rev.1), had been revoked by IMO Res.A.1049(27)- ESP Code.

  .3 List of non-IACS Member classification societies contributing through the TC Forum and/or participating in IACS Working Group:
  
  None.

  .4 History of Decisions Made:
  
  During the discussion under Panel task PSU14041 a Member noted that the Recommendation 87 has not been updated with the new IMO resolution A.1049(27)- ESP code.

  Panel agreed that the Recommendation 87 shall be amended.

  No technical background has been expected for this revision.

  .5 Other Resolutions Changes
  
  None

  .6 Dates:
  
  Original Proposal: 21 October 2014 made by IACS Member
  Survey Panel Approval: 07 February 2015 (Ref: PSU14041)
  GPG Approval: 05 May 2015 (Ref: 15022_Igd)
• **Rev.1 (June 2006)**
  No records for this revision are available.

• **New (June 2004)**
  No records are available.
Part B. Technical Background

Note: No Technical Background (TB) documents are available for Rec.87 New (June 2004), Rev.1 (June 2006) and Rev.2 (May 2015)
Recommendation No. 91 “Guidelines for Approval / Acceptance of Alternative Means of Access”

Part A. Revision History

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* Rev.2 (May 2014)

.1 Origin for Change:

☑ Suggestion by an IACS member

.2 Main Reason for Change:

One Member during the revision of the provisions of paragraph 5.6.2, relevant to the safety routines about the use of portable ladders for inspections, recognizes that this were not consistent with the provision of IACS Recommendation 78 (Safe Use of Portable Ladders for Close up Surveys). The Member proposed the modification of paragraph 5.6.2 by eliminating the figure 2 and by specifying that that the minimum raising angle (of the ladder) should be referred to the horizontal plane.

.3 List of non-IACS Member classification societies contributing through the TC Forum and/or participating in IACS Working Group:

None

.4 History of Decisions Made:

The matter was discussed by the Survey Panel at the Spring Meeting 2014 under item PSU14003.

.5 Other Resolutions Changes

None.

.6 Dates:

Original Proposal: February 2014, made by Survey Panel
Panel Approval: March 2014
GPG Approval: 08 May 2014 (Ref: 14058_IGb)
• **Rev.1 (Jan 2011)**

.1 Origin for Change:

☑ Suggestion by an IACS member

.2 Main Reason for Change:

One member introduced a notification from shipbuilders in the Far East, related to Wire Lift Platform (WLP) and suggested Survey Panel to discuss the issue with respect to safety. One other member confirmed they had received details and approved a wire lift platform for shipboard use, accommodating one person. This would be for survey use in large tanks and cargo holds. It would be incumbent upon the surveyor, occupying the platform, to operate it, in addition to survey tasks. The purpose of the proposed change to the Recommendation is a safety concern that surveyors may not be equipped or knowledgeable to operate such machinery.

.3 List of non-IACS Member classification societies contributing through the TC Forum and/or participating in IACS Working Group:

None

.4 History of Decisions Made:

The matter was discussed at length by the Survey Panel, by correspondence and at the Spring Meeting 2010 under item PSU9022.

.5 Other Resolutions Changes

None.

.6 Dates:

Original Proposal: *August 2009, made by Survey Panel*
Panel Approval: *August 2010*
GPG Approval: *11 January 2011 (Ref: 10053_IGe)*

• **Rev.0 (Oct 2005)**

New recommendation Re-categorized from UI SC191.
Part B. Technical Background

List of Technical Background (TB) documents for Recommendation No.91:

Annex 1. **TB for Rev.1 (Jan 2011)**

See separate TB document in Annex 1.

**Note:**

1) There is no separate Technical Background (TB) document for Recommendation No.91 Rev.0 (Oct 2005) and Rev.2 (May 2014).
Technical Background for Recommendation No.91 (Rev.1, Jan 2011)

1. Scope and objectives

IACS Recommendation No. 91 ‘Guidelines for Approval / Acceptance of Alternative Means of Access’ for compliance with SOLAS II-1/3-6 indicates various alternative (non-permanent) methods that may be used to establish access to ship’s structure. The Ship Structure Access Manual prepared in accordance with SOLAS II-1/3-6 indicates permanent means of access aboard the ship and any alternative means of access that may be provided. Recommendation No. 91 contains Guidelines on these alternative means of access.

2. Engineering background for technical basis and rationale

Recommendation No. 91 Para 5.2. gives Guidelines on the use of Wire Lift Platforms. It does not, however, preclude the use of single-person operated Wire Lift Platforms, which would be operated by the surveyor for the purpose of access to survey. The Survey Panel were in broad agreement that they would not permit their staff to use these single-person operated machines, for reasons of safety. Given that the surveyor may have little or no familiarity with the given machine, which may vary between ships and indeed tanks, there is a safety concern that the surveyor may not be able to satisfactorily carry out his task while operating the wire lift platform.

3. Source/derivation of the proposed IACS Resolution

NA – the original document was produced as a result of SOLAS II-1/3-6.

4. Summary of Changes intended for the revised Resolution:

One sentence is to be added to Para 5.2 Wire Lift Platforms Para. 5.2.1 - “Such equipment should be rated for more than one person and be operated by suitably authorised personnel.”

The Safety Routines Para 5.2.2 have been enhanced by the addition of four further safety considerations, referring to (a) Lift controls, safety devices and brakes (b) Load limitations (c) Working within the basket, and (d) Body belts/harnesses and lanyards.

Additionally, it was considered that the text under Para. 5.1.2 applied more generally to other types of Alternative Means of Access, and it has, accordingly, been re-sited under Para 5 with minor modification.

Furthermore, Survey Panel Task 53 – Annual Review of UI SC 191, highlighted an amendment to be made to Para 5.6.1 of Recommendation No. 91. Since this amendment is concurrent to the amendments of the same document under this Task, the amendment has been added. This is concerned with the use of portable ladders equipped with top-end securing devices for close-up survey use.

5. Points of discussions or possible discussions
The matter of surveyor-operated single-person Wire Lift Platforms was discussed at length in the Survey Panel, with many concerns being raised about the safety of surveyors operating these in addition to carrying out surveying duties.

6. Attachments if any

None
Recommendation No. 95 “Recommendation for the Application of SOLAS Regulation V/15 Bridge Design, Equipment Arrangement and Procedures (BDEAP)”

Part A. Revision History

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<td>New (Oct 2007)</td>
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- **Corr.2 (July 2011)**

  .1 Origin for Change:
  
  ☑ Suggestion by an IACS member

  .2 Main Reason for Change:

  The reference to 2.6.1, UI V/22 in paragraph B 6.5.1 in REC 095 is a reference to a paragraph in a UI that was never adopted. Therefore the reference was deleted.

  .3 List of non-IACS Member classification societies contributing through the TC Forum and/or participating in IACS Working Group:

  None

  .4 History of Decisions Made:

  The Statutory agreed with the following detailed explanation offered by DNV:

  QUOTE

  The reference to 2.6.1, UI V/22 in paragraph B 6.5.1 in REC 095 is a reference to a paragraph in a UI that was never adopted.

  Please refer to 6023bIGa of 8 August 2006 to IACS GPG Members from IACS GPG Chairman at the time, Mr. Mo Jianhui, and the subsequent correspondence regarding the same subject.

  The following is an extract from the document DraftUISOLASV22forGPGapproval300706.doc that was attached to 6023bIGa:

  UNIFIED INTERPRETATIONS
  IACS Unified Interpretation of requirements in SOLAS V, Regulation 22, taking into account applicable aims of regulation 15 - Submitted by the International Association of Classification Societies (IACS)
2.6.1 Sunscreens of roller blind type with minimum colour distortion, heavy duty blade type wipers,* fresh water window washing and efficient de-icing and de-misting system or other means shall be installed as required to help maintaining a clear view through windows. A catwalk or other means shall be provided if required to help maintenance of window wipers and manual cleaning of bridge front windows.

Note.

Clear view screens, if provided, should not be installed in windows in front of the manual steering position and radars, and not more than one to each side of the centre line, available for conning.

Paragraph B 6.5.1 in REC 095 is a sheer copy of paragraph 2.6.1 in the dismissed draft UI V/22. The corrective action would simply be to delete the reference to 2.6.1, UI V/22 in paragraph B 6.5.1 in REC 095.

At present, as you are well aware, the IMO NAV CG on vague expressions in SOLAS regulation V/22 is working on issues similar to the ones addressed in the dismissed draft UI V/22. This work, though, appears to take a slightly different direction.

UNQUOTE

.5 Other Resolutions Changes

None.

.6 Dates:

Original Proposal: April 2011, made by Statutory Panel
Panel Approval: 15 April 2011 by Statutory Panel
GPG Approval: 11 July 2011 (Ref: 11108_IGb)

• Corr.1 (Mar 2009)

Addition of missing labels from Fig B 7.6.
GPG reference: 6023b

• New (Oct 2007)

Previously UI SC181 which was withdrawn.
Draft version was submitted to IMO subcommittee Nav in Spring 2007.
GPG reference: 6023b
Part B. Technical Background

List of Technical Background (TB) documents for Recommendation No.95:

Note:

Technical Background

Recommendation 96 (NEW, April 2007)
“Double Hull Oil Tankers - Guidelines for Surveys, Assessment and Repair of Hull Structures”

Survey Panel Tasks 8 and 29

PART 1 – TB for Survey Panel Task 8

PSU Task 8: Surveyor Guidance for Assessment of Tanker Structural Conditions

1. Objective

To develop surveyor guidance addressing assessment of structural conditions on tankers including identification of defects which may contribute to serious structural failure of a vessel, such as grooving corrosion, loss of throat thickness of fillet welding, fatigue cracking, buckling, uneven corrosion of internal members, pitting in plating, etc.

2. Background

GPG 52 originally proposed this, as a result of IACS Ad-Hoc Audit AH 01 objective 3 recommendations following the casualty of the ERIKA.

This issue was part of the original Task 94 assigned to WP/SRC which GPG had subsequently added a second part for bulk carriers. WP/SRC subsequently decided to address this task in two parts. Part 2 addressing bulk carriers was completed by WP/SRC in 2004 and resulted in numerous changes being implemented for bulk carriers including the implementation of UR S31, changes to PR19, PR20, Recommendation 76 and Z10.2. The remaining Part 1 of WP/SRC Task 94 was reassigned to the Survey Panel and was listed as Task 8.

3. Methodology of Work

The Survey Panel has progressed its work through several meetings as well as a Survey Panel Project Team consisting of ABS (Chair), BV, DNV, LR and NK. The proposed scope of work as well as the draft recommendation by the Project Team was regularly circulated to all Members for comment and agreement. Furthermore as a result of coinciding work on PSU Task 29 the Hull Panel was given an opportunity to review and comment on the draft recommendation in 2006. In addition, the Survey Panel provided an opportunity in October 2006 for the Tanker Structure Co-Operative Forum to review and comment on the draft recommendation. Unfortunately no comments were received from the TSCF.
4. Discussion

The Project Team completed a comprehensive review of information and instructions obtained from Survey Panel Members respective Society’s with regards to assessment of structural conditions on tankers.

The Project Team took into consideration the current Industry Publication available:

- Guidance Manual for Inspection and Condition Assessment of Tanker Structures, 1986
- Condition Evaluation and maintenance of Tanker Structures, 1992
- Guidelines for Ballast Tank Coating Systems and Surface Preparation – The Tanker Structure Cooperative Forum
- Intertanko Corrosion Onboard Crude Oil Tankers – Cargo Tank Corrosion Awareness Guide Inspection, Repair and Maintenance of Ship Structures – Piero Caridis, Witherby

Project Team also took considered the following information:

- Review Japanese papers 48/3/1-3 submittal to DE with amendments to A.744(18), specifically Guidelines for major repair work of hull girders and guidelines for inspection requirements for fillet weld between deck plates and longitudinals, Guidelines on inspection requirements for fillet weld between deck plates and longitudinals and Guidelines for major repair work of hull girders.

In the course of the work the Project Team also spent some time considering all of the changes that have already been made with regards to tankers since Task 94 (old WP/SRC Task) was first assigned to the SRC Working Party:

- Z10.1 – Intermediate surveys equivalent to previous Special Survey
- Z10.1 – Drydocking required for ESP vessels over 15 years of age
- Implementation of Z10.4
- Recommendation 87 - GUIDELINES FOR COATING MAINTENANCE & REPAIRS FOR BALLAST TANKS AND COMBINED CARGO/BALLAST TANKS ON OIL TANKERS
- Recommendation 82 Surveyor’s Glossary Hull Terms & Hull Survey Terms
- Recommendation 77 Guidelines for the Surveyor on how to Control the Thickness Measurement Process
- PR 20 Procedural Requirement for certain ESP Surveys
- PR 19 Procedural Requirement for Thickness Measurements
- IMO Permanent Means of Access (PMA for new buildings)
- IMO Condition Assessment Scheme (CAS)
- Amendments to A.744 (18) which come into effect on 1 Jan 07 (parts of the CAS Survey Planning to be used for all ships)
Furthermore since this task has been under development for more than two years, several additional Tasks were assigned to the Survey Panel by GPG, which affected the development of Task 8. The additional tasks, which have been taken into account, are the following:

- Survey Panel Task 23: Revise Recommendation 54 ‘Guidelines for acceptance, application and survey of semi-hard coatings in ballast tanks’ to meet current characteristics and effective time period of the semi-hard coatings.
- Survey Panel task 29: Develop guidance for identifying significant failures caused by fatigue and the procedures to be followed when dealing with such cases.

The project team consideration the following aspects prior to proceeding:

- Apply Risk Based Approach
- Make additional changes to UR, PR, Rec to include additional text already in industry publications
- Add specific reference to industry publications in URs and/or PRs
- Since planning is key to survey, expand planning requirements
- Sum up key parts of industry and IACS members publications and issue a guidance notes
- Issue new publication for Double Hull tankers
- Is a new publication necessary for Single Hull tankers since no new designs and will eventually phase out by 2015

Three alternatives were discussed:

A. Combined guidance
   Appendix A: Double Hull Tankers
   Appendix B: Single Hull tankers

B. Separate Guidance for both Single Hull and Double Hull

C. Issue recommendation referring to TSCF Manual on Single Hull tankers and develop new guidance on Double Hull tankers.

Project Team agreed that team should avoid getting into:

- risk based surveys.
- Leave out remote inspection techniques, as this was not part of the task.

It was agreed to go with option C and since many members already refer to the TSCF publications no specific recommendation is necessary for the repairs for the single hull tankers.

The Project Team agreed that deliverable of this task should be a recommendation on Double Hull Tankers following the same format as that contained in the IACS recommendation 76, “IACS Guidelines for Surveys, Assessment and Repair of Hull Structure - Bulk Carriers”, by using applicable portions of the TSCF books on Double hull and single tankers, IACS publications and information from Members.
It was felt that due to the phase out of single hull tankers and the fact there have been no new designs of same it was not necessary to do anything more on Single Hull tankers other than to refer to the current TSCF publication.

A new recommendation was prepared based on the above, submitted to the Hull Panel in August 2006 and submitted to the Survey Panel at the Fall 2006 and Spring 2007 meetings. Comments were addressed as applicable and incorporated into the document.

Submitted by Survey Panel Chairman
March 2007

PART 2 – TB for Survey Panel Task 29

PSU Task 29: Develop guidance for identifying significant failures caused by fatigue and the procedures to be followed when dealing with such cases

1. Objective

Develop guidance for use by Surveyors to identify significant failures caused by fatigue and the procedures to be followed when dealing with such cases.

2. Background

The request for a guidance document was initiated by the EMSA report on Double Hull Tankers by the high level panel of experts. See following references:

1. EMSA Recommendation 6 from the EMSA report on Double Hull Tankers.
2. 3125_I Gh:EMSA Panel of Experts on Safety of Double Hull Tankers

3. Methodology of Work

The Survey Panel has progressed its work through several meetings as well as a combination Survey and Hull Panel Project Team consisting of ABS (Chair), GL (hull), KR, LR, NK, RINA (hull) and RS. The proposed scope of work as well as the draft recommendations by the Project Team were regularly circulated to all Members for comment and agreement. Furthermore the Hull Panel conducted a review in 2006. In addition, the Survey Panel provided an opportunity in October 2006 for the Tanker Structure Co-Operative Forum to review and comment on the draft recommendation. Unfortunately no comments were received from the TSCF.

4. Discussion

The Project Team completed a review of recommendations of the EMSA report on Double Hull Tankers in order to determine type of for development for the tasked guidance document. During this review the Project team also reviewed the draft recommendation being prepared by the Survey Panel under Project Team PSU Task 8, “Double Hull Oil Tankers, Guidelines for Surveys, Assessment and Repair of Hull Structures”.

Page 4 of 6
The project team felt that with some improvements this document being prepared under Task 8 would be suitable to identify typical failures found, including fatigue analysis and assessment, pro-active repairs, recommended repair methods and means of reinforcement. In particular the following sections were of interest to this project team:

3.4.2 – Structural Defects
3.4.3 - Fatigue
3.4.3.a – Typical locations for High Sensitivity to Fatigue Failure
3.4.3.b – The effect of Higher Tensile Steel
3.4.10 – Fractures
Section 5 – Structural detail failures and repairs.

The Project Team then proceeded to amend various parts of the text under 3.4.3, 3.4.10 and some areas of text under the different groups in Section 5. The Project Team also amended numerous sketches developed some new ones.

The PT reviewed the DNV presentation, “JTP – Double hull tanker damage experience”, Sketches and Photos of hull damages for DNV built double hull oil tankers dated April 2005. From this presentation it was agreed to develop new sketches showing the deck damages associated with the DNV hull damages.

The Project team also reviewed the IACS presentation Appendix I, “Summary of Damage Records”. The Project Team noted that the IACS presentation indicated a significant amount of upper deck plating and stiffener fractures but the supporting slides did not reflect significant fractures of the deck plating. Initially it was decided to make this Appendix part of the recommendation but later the majority of the Survey Panel felt that this appendix did not contribute to the overall document.

The Project Team spent a considerable amount of time trying to deal with the work specification no. 2 and 3 related to system of formal communications between owners, operators, class societies and builders and procedures to be followed when failures are found, including fatigue analysis and assessment, pro-active repairs and recommended repair methods and means of reinforcement.

Project Team developed some guidelines under new section 5.2 of the Recommendation following similar categories identified in the EMSA report. However it was agreed that the procedure for notification and communications be covered under PR2 which at the time was being revised by an expert group.

The Project Team considered if there was a need to detail the methodology of the fatigue analysis or structural assessment however it was agreed that each individual Society will have their own comprehensive, though different, methods of assessing fatigue strength of ship structures.

The Project Team also considered whether not the guidelines should include some references to fracture mechanics and predicting crack growth but decided against this as in most cases all Societies require fractures to be repaired on trading ships.
The Project Team agreed that as this document will only be a recommendation in IACS there is no need to suggest revisions to IMO Resolution A.774(18). Considerable discussion took place on whether this should also be a requirement in a Unified Requirement or a Procedural Requirement. Work Specification items 2 and 3 indicated the scope of the this task and it would seem that based on item 3 there did not appear to be a need to go beyond a recommendation. Project Team Chairman confirmed this with the Survey Panel.

The Project Team for this task then worked very closely with the Project Team on Task 8 to finalize the recommendation. It was submitted to the Hull Panel in August 2006 and submitted to the Survey Panel at the Fall 2006 and Spring 2007 meetings. Comments were addressed as applicable and incorporated into the document.

Submitted by Survey Panel Chairman
March 2007

PART 3 – Permanent Secretariat note (June 2007)

New Recommendation 96 was approved 28 April 2007 (ref. 7549_1Gb).
Recommendation No.98
“Duties of Surveyors under Statutory Conventions and Codes”

Part A. Revision History

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• Rev.2 (June 2016)

.1 Origin of Change:

☑ Other (GPG suggestion)

.2 Main Reason for Change:

To adjust the procedures in Rec. 98 to be in accordance with the IMO Resolution A.1104(29).

.3 List of non-IACS Member Classification Societies contributing through the TC Forum and/or participating in IACS Working Group:

None

.4 History of Decisions Made:

Following the issue of the IMO Resolution A 1104(29), Survey Guidelines under the Harmonized System of Survey and Certification (HSSC) 2015, and the revision of the Procedural Requirements PR12 (rev.2) and PR 28(Rev.1) Panel reviewed, under task PSU 14009, the text of the Rec. 98 with the view to harmonize the terminology with that used by the IMO Resolution itself.

During the correspondence rounds Members agreed to replace the definition of findings with the wording deficiency/defects according to those adopted in paragraph 4.8.3.1 and paragraph 4.7 of the IMO Resolution A.1104(29).

In addition, it has been modified the definition of the Statutory Condition and condition of Class in order to align them with the wording used in paragraph 4.8.3 of the IMO Resolution A.1104(29) and the definition of condition of class adopted in PR 35.

The paragraphs 5.2.1, 5.2.2 and 5.4 has been aligned to the text of paragraph 4.8.3.1 of the IMO Resolution A.1104(29).

Panel during the 23rd meeting discussed and approved unanimously all the modification.
For the present revision no technical background has been expected.

.5 Other Resolutions Changes:

None

.6 Dates:

Original Proposal: November 2015, Made by: GPG
Panel Approval: 04 April 2015 (Ref: PSU14009)
GPG Approval: 28 June 2016 (Ref: 14201_IGl)

• **Rev.1 (Mar 2012)**

.1 Origin of Change:

☑️ Suggestion by IACS member

.2 Main Reason for Change:

To adjust the procedures in Rec. 98 to be in accordance with today’s implemented practice among class societies.

.3 List of non-IACS Member Classification Societies contributing through the TC Forum and/or participating in IACS Working Group:

None

.4 History of Decisions Made:

A member raised a matter of unreasonable aspect in issuing a condition of class instead of withdrawing the applicable statutory certificate and issuing a short term certificate when the surveyor find the ship cannot be repaired during the survey. Although EMSA gave a non-compliance to this practice quoting IMO A. 997(25), there still seems to remain ambiguity applying the relevant requirements to reality due to large overlap of class and statutory. Various opinions including introduction of each IACS member societies’ practice have been exchanged within the Survey panel and trial to reinforce the relevant IACS resolution was carried out

.5 Other Resolutions Changes:

None

.6 Dates:

Original Proposal: August 2010, Made by: Survey Panel
Panel Approval: December 2011
GPG Approval: 06 March 2012 (Ref: 10004_IGe)
• New (Sept 2007)

Previously IG 3 (Rev.4 July 2006).
Changes to text at 1.3, 5.4 and the Reference note for re-categorisation.

GPG reference: 7543
Part B. Technical Background

List of Technical Background (TB) documents for Rec. 98:

**Note:**

1) **There are no separate Technical Background (TB) documents for Recommendation No.98 New (Sept 2007), Rev.1 (Mar 2012) and Rev.2 (June 2016).**
Recommendation No.99 “Recommendations for the Safety of Cargo Vessels of less than Convention Size”

Part A. Revision History

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- **Rev.1 (Apr 2013)**

  .1 Origin for Change:
  
  ☑ Suggestion by IACS member

  .2 Main Reason for Change:

  Entry into force of the INTERNATIONAL CODE ON INTACT STABILITY, 2008 (2008 IS CODE), IMO RES. Msc.267(85).

  Chapter III of Rec.99 was amended to bring it in line with UR L2 (Rev.2) and to clarify the applicability to ships having a length of less than 24m.

  .3 List of non-IACS Member classification societies contributing through the TC Forum and/or participating in IACS Working Group:

  None

  .4 History of Decisions Made:

  The Form A was approved by the GPG on 9 November 2011.

  .5 Other Resolutions Changes

  IACS UR L2 (Intact stability – matter of class)

  .6 Dates:

  Original proposal: 10 October 2011 Made by: Statutory panel
  Panel Approval: 14 March 2013 (Statutory panel)
  GPG Approval: 18 April 2013 (Ref. 11160_IGf)

- **NEW (Dec 2007)**

  New recommendation was developed as a result of re-categorisation of IACS Internal Guidelines 2 (Deleted in Dec 2007) (Ref: SP6011_PCI & 5142c).

  No TB document available.
Part B. Technical Background

List of Technical Background (TB) documents for Recommendation 99:

Note: There are no Technical Background (TB) documents available for IACS Recommendation 99 New (Dec 2007) and Rev.1 (Apr 2013).
Technical Background

Rec. 100 (NEW, February 2008)

IACS recommended practice on the time requirement for thoroughly closing sea inlets and discharges below the waterline in case of influx of water

The Statutory Panel received an enquiry from the Finnish Maritime Administration who intends to seek IACS common practice for compliance with International Convention on Load Lines, 1966 Regulation 22 (3) in the amended protocol, MSC.143(77) and SOLAS II-1/48.3. FMA demonstrated its interpretation to this regulation, i.e. require 30 minutes for fulfilling this regulation.

The Statutory Panel initiated a discussion on this matter for achieving a common view in application of the regulation.

The panel reached a consensus that FMA mixed the requirement set out in ILLC 66 Reg. 22.3 (MSC.143(77)) and in SOLAS Reg. II-1/48.3.

The members of the panel rendered their practices in application of the regulation, which revealed that a common position can not be reached by the panel on this matter. As a result, the panel decided to develop a Recommendation rather than a UI, and forward this recommendation to FMA by means of a cover letter.

This Recommendation was developed to address the issue related to the application of both ICLL 66 Reg. 22(3) (MSC.143(77)) and SOLAS Reg. 48.3 in order to prepare an IACS recommended practice for applying the requirements set forth in the IMO Instruments above regarding the time requirement for thoroughly closing sea inlets and discharges below the waterline in case of influx of water.

The panel considered that it isn't practicable to request a fixed amount of time for the influx of water to reach the control as it is dependant on the ship size and the size and layout of the machinery space.

The panel therefore recommends that a calculation should be carried out to show that the time taken from alarm activation plus the time* to reach and fully close manually operated or powered valves, is less than the time taken for the influx of water to reach the control without submergence of the platform on which the person is operating the valve.

To achieve similar results of the same ship calculated by all Members, a note regarding the calculation of “the time” is agreed and added with reference to MSC/Circ.1033 and MSC.245(83) as follows:
The time it will take to reach and close the sea valves should be determined by multiplying the inverse of the nominal speed of travel of a person onboard (1.0 m/sec based on the values taken from MSC/Circ.1033) times the distance to be traveled from the platform in way of manually operated valves (or the actuator for valves controlled by stored mechanical energy) to either:
(i) the highest position of the control room for an ER under continuous manned supervision; or
(ii) from the navigation bridge for an unmanned ER.

The time it takes for the influx of water into the ER should be determined based on the fluid dynamic principles contained in MSC.245(83) applied to a breach in the largest diameter seawater line in the lowest and highest locations in the ER and the valve associated with that seawater line.

In the event calculations are not available, 10 minutes shall be regarded as adequate time for operation unless other requirements are specified by the flag Administration.

Submitted by Statutory Panel Chairman
13 March 2008

Permanent Secretariat note (April 2008):
New IACS Rec.100 was approved by GPG on 26 February 2008 (ref. 8517 IGc).
Technical Background

Recommendation No. 103 (New, Dec 2008)

Preamble: IACS Internal Guideline No. 13 (April 2006) provided guidance to surveyors for the compilation of the IOPP Supplement. Following GPG 62 (March 2007) it was decided to update the document and re-categorize it as a recommendation.

1. The Statutory Panel tasked the Project Team SP7005k (PT) with revising IG 13 based on the comments provided by the Statutory Panel (SP) members. For more detail see the section 'Development History' below.

2. In an effort to standardize the completion of section 5.8 of the supplement form B to the International Oil Pollution Prevention Certificate "Double-hull construction", and to ensure that the different categories of oil tankers described in the regulations of MARPOL Annex I are clearly identified in section 5.8, a document was submitted to IMO Marine Environment Protection Committee 58th session (MEPC 58/6/4) proposing amendments to the section in question.

3. Upon review of the regulations contained in MARPOL Annex I, revisions were proposed to identify the following categories of oil tankers in section 5.8:

   (a) tankers in compliance with MARPOL Annex I Regulation 19.6,
   (b) tankers not subject to a phase out date based on size,
   (c) existing tankers not subject to a phase out date because of compliance with double hull requirements as specified in MARPOL I/19,
   (d) tankers not subject to a phase out date based on the alternative protection distances specified in MARPOL I/20.1.3 and I/21.1.2.
   (e) tankers between 600 and 5000 deadweight tons which comply with double hull arrangements in accordance with MARPOL I/21.4.2.
   (f) tankers not carrying heavy grade oil (HGO).

During MEPC58, the proposed revisions were approved by the Committee and published as an annex to the meeting report (MEPC 58/23 Annex 19).

4. Recognizing that IACS cannot implement such changes before such revisions to a mandatory instrument enter into force, IACS released the Recommendation which, although it does not accomplish the precision of the proposed amendments mentioned above, it does provide some clarification as to the completion of the Form B. This Recommendation will be withdrawn upon entry into force of the above mentioned amendments.

Development History:

1. The PT reviewed 12 messages from the SP members and identified 13 proposals to revise the IG 13 draft version attached to message SP7005kPCd. The list of messages from the SP members and the proposals have been summarized in Annex 1 "SP7005k PT Proposals Summary". The Summary includes the agreement or disagreement to the proposals by the PT members.
and whether the proposal was incorporated to the IG 13 draft version selected as starting point. From the 13 proposals identified in the messages, the PT agreed to incorporate 10 proposals into the IG 13 draft version. We proceed to describe the reasoning to incorporate the 10 proposals:

(a) SP Comment 1: MARPOL I/19.2 describes that regulations in column 2 item 5.8.1 are applicable to oil tankers of 5000 DWT and above.
(b) SP Comment 2: It is consider a redundancy to label oil tankers in column 2 as “R19 Oil Tankers” when the tankers are required to comply with MARPOL I/19 because of their date of construction as defined in 1.28.6.
(c) SP Comment 4: It is consider necessary to maintain the label in column 3 “R19 Oil Tankers” to identify oil tankers that comply with MARPOL I/19, but are not required to.
(d) SP Comment 5: Column 3 item 5.8.4 to be marked with a dash “-” as the vessel complies with MARPOL I/19 and a phase out date is not applicable.
(e) SP Comment 6: Column 3 item 5.8.5 to be marked with a “X” as the vessel complies with MARPOL I/19.
(f) SP Comment 7: Column 3 item 5.8.6 to be marked with a dash “-“ as the vessel complies with MARPOL I/19 and a phase out date is not applicable.
(g) SP Comment 8: Column 3 item 5.8.7 to be marked with a “X” as the vessel complies with MARPOL I/19 and not subject to MARPOL I/21.
(h) SP Comment 9: Column 6: It is consider a redundancy to label oil tankers in column 6 “R19 Oil Tankers” as the heading of the column specifies compliance with MARPOL I/19 already, because of their date of construction.
(i) SP Comment 10: It is consider a redundancy to label oil tankers in columns 8 to 10 “R19 Oil Tankers”, as the sub-columns headings and footnote specify the exact type of hull construction.
(j) SP Comment 11: Footnote 1 was re-written to clarify the footnote.

2. For the messages from the SP members, the summary table was marked with a "C" to identify the message where the proposal was extracted from, an "A" to identify the message that agreed with the proposal and "✓" (a check) to identify the proposals that were incorporated into the IG 13 draft.

3. Additionally, the PT generated 6 proposals. The team agreed to incorporate 4 proposals into the IG 13 draft. The summary of these proposals is also in the attached file "SP7005k PT Proposals Summary". The team proposals have been identified with a "TP" before the number.

4. With regard to the 4 PT proposals incorporated into the IG 13 draft, please consider the following comments:

(a) TP3: We consider this an editorial revision.
(b) TP4: A sentence was added to clarify when footnote 1 is applicable.
(c) TP5: Footnote 2 "to be annotated with X if the ship complies" was deleted considering that the heading for the four columns to which the footnote was assigned indicate that the oil tankers comply with MARPOL I/19, even though compliance is not required. Therefore, it is the PT understanding that the phrase "if the ship complies" is redundant for oil tankers which voluntarily comply.
(d) TP6: It was noted that the current IG 13 draft version recommends to
complete section 5.8 (same items are "X") in the same manner for (i) oil tankers meeting double bottom requirements not carrying HGO, and (ii) oil tankers meeting the double hull requirements of MARPOL I/21.4.2. Furthermore it was noted that the supplement form B does not have provisions to identify oil tankers in compliance with MARPOL I/21.4.2. As it would not be possible to amend the supplement form B before the IACS Recommendation is published, the PT agreed to incorporate TP6 to make a distinction between oil tankers listed in (i) and (ii) above when section 5.8 of form B is completed.

Submitted by Statutory Panel Chairman
1 December 2008

Permanent Secretariat note (January 2009):
New Recommendation No.103 was approved by GPG on 17 December 2008 (ref. 7543aIGf).
## ANNEX 1 - Technical Background
### PT SP7005k - Recategorization of IG 13 to Recommendation
Rev. date: 5 June 2008

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C → Comment in the message to revise the matrix
A → Agreement with the comment
✓ → Comment incorporated in the draft from message SP7005kPCd
### ANNEX 1 - Technical Background
#### PT SP7005k - Recategorization of IG 13 to Recommendation
**Rev. date:** 5 June 2008

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### Footnotes

1. **Footnote (1):**
   *For clarity the following text should replace the current text:*
   “The appropriate sub-item(s) under 5.8.6 is(are) to be annotated with “X” if tanker carries HGO. If the tanker does not carry HGO, item 5.8.7 is to be annotated with “X”.*

2. **Footnote (1):**
   *Delete the footnote based on the proposal to add a proviso to the International Oil Pollution Prevention Certificate to indicate that the ship is prohibited from carrying HGO. Then, only item 5.8.6 should be marked.*

3. **Footnote (2):**
   *Delete the footnote based on the proposal to amend items 5.8.5 and 5.8.7 of Form B to explicitly describe the reasons the oil tankers are not subject to MARPOL I/20 and/or 21.*
   - The reasons included are:
     1. Compliance with MARPOL I/19 (Ref. MARPOL I/21.1.2, 20.4.1 or 20.4.2)
     2. DWT of the oil tanker
     3. Compliance with MARPOL I/20.1.3 or 20.1.2 (IBC Code distances)

- **C** → Comment in the message to revise the matrix
- **A** → Agreement with the comment
- **✓** → Agreement incorporated in the draft from message SP7005kPCd
### Comments

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#### TP1
Comment from SP7005kPTRSc
Column 1, item 5.8.2 – “(double bottom requirements) shall be added as indicated in Form B.”

#### TP2
Comment from SP7005kPTRSc
Column 5 Heading – the heading should be replaced by “Oil Tankers <R19 Date (DWT≥5000 t)”.

#### TP3
Comment from SP7005kPTABa (original 15a)
Column 7 Heading - replace "complies" with "in compliance"

#### TP4
Comment from SP7005kPTABa (original 15b)
Addition after the first sentence in footnote (3): “Footnote (1) is applicable when item 5.8.2 is "X".”

#### TP5
Comment from SP7005kPTABa (original 12)
Footnote 2 – Delete the footnote based on the understanding that the column headings indicate that the vessels comply with Reg. 19. Accordingly, the footnote can be deleted and an "X" is required in all four cases in the matrix:

- (a) Column 3 item 5.8.1
- (b) Column 6 item 5.8.1
- (c) Column 9 item 5.8.2
- (d) Column 10 item 5.8.2

#### TP6
Comment from SP7005kPTMNg
Footnote 4 – Add footnote "(4) Item 5.8.2 is to be annotated with the proviso: "(Complies with double hull requirements as per 21.4.2)".

---

C → Comment in the message to revise the matrix
A → Agreement with the comment
✓ → Comment incorporated in the draft from message SP7005kPCd
TECHNICAL BACKGROUND

Recommendation 104 (New, March 2009)
“Qualification scheme for welders of steels”

1. Scope and objective
To develop a new requirement for qualification scheme for welders who are engaged in welding works of hull structural steels in a shipyard or a manufacturer.

2. Background
No current IACS document exists with regard to welder qualification, today any construction requires that welder qualification tests are necessary and should be monitored. The IACS WP/MW recognised this and also noted that current guidance given to shipyards by individual classification societies often resulted in conflict between shipyards and classification society due to the varying requirements of individual societies. Therefore WP/WM raised the Form A but the work was not initiated until reorganisation of the old IACS working groups occurred. The work item was taken over by Hull Panel as their Task 24 and allocated to Project Team 2.

3. Points of discussions
The project team found common ground on the procedures to be followed.

It was unanimously agreed that the document should be developed as a recommendation to give time for experience of the use of the document before consideration of upgrading the document to a UR in the future.

At a very early stage it was also recognized that a single document to cover qualification of both steel and aluminium alloys was not practical and therefore two separate documents were produced.

A review was carried out between the societies to compare actual requirements against actual shipyard practice around the world, there were some obvious differences and a balanced approach was taken to satisfy the requirements appropriate to each society.

A number of points were raised by the Hull Panel on the first draft submitted. These were reviewed by PT2 and where appropriate amendments made or reasons for rejecting the suggestions given.

4. Recommendation
The Hull Panel and its PT2 recommends the adoption of the document “Qualification scheme for welders of steels” as Recommendation 104.

5. Source/Derivation of proposed interpretation
N.A.

6. Decision by voting
The draft had full agreement of the Hull Panel and PT2.

Submitted by Hull Panel Chairman
27 January 2009
Permanent Secretariat note (March 2009):

GPG approved new Rec 104 on 6 March 2009 (ref. 9520_IGc).

During GPG discussion the following comments were made by members:

1) It was suggested that 6G (pipe) position should be included in Rec 104 as test acceptable for qualifying welder's for plate welding. Three members disagreed with this suggestion mentioning that the proposed draft is about plate welding only.

2) It was suggested that GPG should task Hull Panel to review the possibility or need to include contents about pipe welding and ‘6G’ in the subjected draft recommendations (104 and 105) before the approval of GPG. Two members disagreed with this suggestion mentioning that they do not see the compelling need. One member added that this suggestion can be done later if and when it is considered the Recs should become URs.

3) One member raised the issue of inconsistencies between the new Recs 104 and 105 and ISO standards. However noting that the recommendations do not have a compulsory nature like URs, GPG Chair proposed that these inconsistencies were not a compelling reason to amend the Recs and proposed to revisit this issue at a later date if and when it is considered that the Recs should become URs. No members disagreed with this proposal.
TECHNICAL BACKGROUND

Recommendation 105 (New, March 2009)
“Qualification scheme for welders of aluminium alloys”

1. Scope and objective
To develop a new requirement for qualification scheme for welders who are engaged in welding works of aluminium alloys for hull structures in a shipyard or by a manufacturer.

2. Background
No current IACS document exists with regard to welder qualification, today any construction requires that welder qualification tests are necessary and should be monitored. The IACS WP/MW recognised this and also noted that current guidance given to shipyards by individual classification societies often resulted in conflict between shipyards and classification society due to the varying requirements of individual societies. Therefore WP/WM raised the Form A but the work was not initiated before reorganisation of the old IACS working groups occurred. The work item was taken over by Hull Panel as their Task 24 and allocated to Project Team 2.

3. Points of discussions
The project team found common ground on the procedures to be followed.

It was unanimously agreed that the document should be developed as a recommendation to give time for experience of the use of the document before consideration of upgrading the document to a UR in the future.

At a very early stage it was also recognized that a single document to cover qualification of both steel and aluminium alloys was not practical and therefore two separate documents were produced.

A review was carried out between the societies to compare actual requirements against actual ship yard practice around the world, there were some obvious differences and a balanced approach was taken to satisfy the requirements appropriate to each society.

A number of points were raised by the Hull Panel on the first draft submitted. These were reviewed by PT2 and where appropriate amendments made or reasons for rejecting the suggestions given.

4. Recommendation
The Hull Panel and its PT2 recommends the adoption of the document “Qualification scheme for welders of aluminium alloys” as Recommendation 105.

5. Source/Derivation of proposed interpretation
N.A.

6. Decision by voting
The draft had full agreement of the Hull Panel and PT2.

Submitted by Hull Panel Chairman
27 January 2009
**Permanent Secretariat note (March 2009):**

GPG approved new Rec 105 on 6 March 2009 (ref. 9520_IGc).

During GPG discussion the following comments were made by members:

1) It was suggested that GPG should task Hull Panel to review the possibility or need to include contents about pipe welding and '6G' in the subjected draft recommendations (104 and 105) before the approval of GPG. Two members disagreed with this suggestion mentioning that they do not see the compelling need. One member added that this suggestion can be done later if and when it is considered the Recs should become URs.

2) One member raised the issue of inconsistencies between the new Recs 104 and 105 and ISO standards. However noting that the recommendations do not have a compulsory nature like URs, GPG Chair proposed that these inconsistencies were not a compelling reason to amend the Recs and proposed to revisit this issue at a later date if and when it is considered that the Recs should become URs. No members disagreed with this proposal.
Technical Background

for

Recommendation No.106 (NEW, Jul 2009)
“IACS Guideline for Rule Development - Ship Structure”

IACS Hull Panel Task 47
PT47

TB Draft 0.2
20 April 2009
1 Introduction
The IACS Guideline for Ship Structure Rule Development was initiated as a consequence of recent rule development projects in IACS for the Common Structural Rules (CSR) and ongoing work in IMO related to Goal Based Standards (GBS) and Formal Safety Assessment (FSA).

Most parts of the guideline are self-explanatory, and do not require further explanation. Many parts are summarizing principles which are already established as best practice in ship design. However, some items which are considered to be of principal importance are mentioned in Chapter 3 of this Technical Background.

2 Scope and objective
The IACS Guideline for Ship Structure Rule Development is applicable for development of newbuilding structural rules for displacement-type ships intended for worldwide, unrestricted operation. The guideline is mainly intended to be used for development of new structural rules.

The guideline provides principles and recommendations to be followed during the rule development process, as well as general requirements that should be incorporated in the rules that are to be developed.

The objective of the guideline is to form a common basis for development of ship structural rules, by specifying general principles to be followed in the rule development process, as well as general design principles and requirements that should be incorporated into the rules. Having a common basis for rule development ensure that a systematic and unified process is followed in the rule development, and this will contribute to consistency and transparency of the rule requirements.

The guideline should be used to support new rule development, and is made with a view that the rules should be in compliance with the International Maritime Organization’s Goal-Based New Ship Construction Standards (IMO GBS), Tier I and Tier II.

3 Points of discussions or possible discussions

Scope
It was decided that the guideline should be as general as possible, and the scope of the guideline is therefore not limited to specific ships. Where needed, ship specific issues are dealt with in each chapter. However, planing high-speed vessels was excluded due to their special characteristics. It was also agreed that the guideline is mainly intended to be used for development of new rules, and not for minor rule changes.

Design life
While the design life is a design parameter, and in principle a ship could be designed for any chosen design life, it was decided to set 25 years as the minimum design life used as basis for the rules, which is in accordance with IMO GBS Tier II and is consistent with Common Structural Rules.
Scatter diagram for FLS
Although ships are typically not trading exclusively in the North Atlantic, it was decided to specify that fatigue loads should be determined under the North Atlantic wave environment, which corresponds to the requirement in IMO GBS Tier II and the Common Structural Rules.

Target safety level
This guidance is in compliance with the safety objectives set by IMO GBS, but it was considered outside the scope of the guideline to define a specific target safety level. Formal Safety Assessment (FSA) is referred to as a general method for defining a target safety level, by requiring that the identified risks are Tolerable and ALARP (As Low As Reasonable Practicable).

Rule format
While the partial factor format (PFF) makes it possible to obtain a more consistent safety level by applying several safety factors, the working stress design (WSD) format is considered as more easy to apply. It was agreed that the PFF format should as a minimum be used for safety critical cases, such as hull girder ultimate strength, while the WSD format may be acceptable for less safety critical cases.

Partial factors
The specific values of the partial safety factors are influenced by many parameters, and it was therefore not found appropriate to give any recommendation with respect to the values. These factors need to be determined from a calibration in each case, based on the choice of characteristic load and strength values, and other assumptions made during the rule development. Furthermore, the service experience of ships is to be taken into account.

Direct calculations
The relation between prescriptive requirements and direct calculations was discussed. It was agreed that in areas where direct calculations more accurately reflect the load and structural behaviour of the structure when compared to load-capacity prescriptive rule requirements, the results from the direct calculations should overrule the prescriptive requirements. However, the baseline minimum requirements defines the floor and scantlings are not to be reduced by any form of alternative calculations. The philosophy is that a coarse approach should be more conservative than a detailed approach. Hence, the prescriptive requirements are targeted to be more conservative than the requirement based on direct analysis.

Accidental Limit States
The scope of Accidental Limit State (ALS) assessment was discussed. While the scope of ALS assessment for most current structural rules is limited, the scope may be increased in future rules as a result of requirements in the IMO Goal Based Standards.

Springing and whipping
Springing and whipping loads were discussed, and it was agreed that these effects are difficult to assess precisely within the format of simplified rule criteria. The formulation of explicit springing and whipping loads were considered to be topics for future investigation.

Characteristic loads
It was difficult to decide on a fixed definition of characteristic load. The general principles used to derive characteristic values are described, but the value can either be chosen as the
most severe value that can be expected during the design life of the ship, or as a fractile in the probability density function for the load. Both approaches are acceptable, as long as the safety factors are calibrated to take account of the choice.

**Capacity models**
The guideline gives an overview of commonly used capacity models for the failure modes relevant to consider, as well as general principles for how to carry out the capacity assessment. The guideline is however not intended to be very specific, since new and improved methods may be developed in the future.

### 4 Source/derivation of proposed requirements

N.A.

### 5 Decision by Voting

N.A.

Submitted by Hull Panel Chairman
24 June 2009

**Permanent Secretariat note (July 2009):**
The Guideline was submitted to IMO as MSC86/INF.3 on 24 February 2009 and in March 2009 GPG agreed that it should be published as an IACS Recommendation.
This TB, prepared by the Hull Panel, was approved by GPG on 13 July 2009 (ref. 8646cIGf).
TECHNICAL BACKGROUND

Recommendation No. 109 (New Oct. 2009)
“Acceptance Criteria for Increased Cargo Tank Filling Limits Higher than 98%
- IGC Code 15.1.3”

INTRODUCTION

The IGC Code 15.1.3 permits Administrations to allow higher filling limits than the 98% maximum filling limit permitted by 15.1.1 provided it can be shown that such higher limit will not impair safety of the cargo containment taking into account shape of cargo tanks, location and arrangements of pressure safety relief valves, accuracy of instrumentation and other factors of importance.

A working group organized by SIGTTO for developing proposals for revision of the IGC Code decided to amend 15.1.3 so as to more precisely specify criteria under which higher filling limits may be accepted.

IACS INVOLVEMENT

The IACS Working Party on Gas Tankers did develop a draft interpretation of 15.1.3 giving acceptance criteria for increased filling limits in the mid 1980s. However, this draft was not formally adopted as an UI. The draft acceptance criteria have been used by the industry to some extent as a basis for getting acceptance for higher filling limits by Administrations for some ships.

The SIGTTO working group was made aware that an old IACS draft interpretation existed and asked IACS to propose final acceptance criteria for higher filling limits that could be included in a revised IGC Code.

IACS Statutory Panel agreed to develop such criteria as input to the SIGTTO working group and established a Project Team to carry out the task.

AGREED ACCEPTANCE CRITERIA

Compared to the old draft UI the following points may be noted:

- ‘Functional requirements’ were developed and included under a ‘General’ introductory paragraph.

- The formulae in the old draft for corrections due to tolerances of temperature gauges was an expression correlating gauge tolerances and loading temperature vs critical temperature for the product to give a resulting volume expansion. This has been changed into a formulae giving expansion as the product of gauge tolerance and the volumetric expansion factor for the product.
- The correction factor in the original draft for tank calibration error has been omitted since it was found that such error has no significant influence on filling limits expressed as percentage.

- A correction factor accounting for the volume expansion resulting from the pressure rise from opening pressure of pressure relief valves to full relieving capacity has been added. This pressure rise is taken to be 20% of the set opening pressure of the PRV’s according to IGC Code 8.5.

- Corrections for tolerances on PRV’s set opening pressure (IGC 8.2.5) were found not to be applicable for pilot operated PRV’s and were consequently not included.

- A factor expressing an operational margin to account for operator’s reaction time, valve closing time and product flow back from cargo piping has been added. This margin has been set to min. 0.1%.

- A specific requirement that under conditions of list and trim given in IGC Code 8.2.17 the suction funnels of the PRV’s shall be min. 0.4D of funnel diameter above the liquid surface and that no isolated vapour pockets shall be formed.

- After some discussions it was agreed to keep a maximum filling of 99.5% as in the old draft.

POINTS OF DISCUSSIONS

The old draft interpretation set a maximum permitted filling limit of 99.5% at reference temperature. With the detailed outline of correction factors in the revised acceptance criteria the necessity of having this upper limit was discussed.

After some discussions, and carrying out sensitivity studies which varied the Alpha (α) values, it was recognized that Alpha 4 (α₄) (operational margin) had a significant impact on the filling limit, but could not be defined precisely enough to control that limit. Accordingly, it was agreed to keep a maximum filling of 99.5% as in the old draft.

The Project Team completed the task by the end of April 2009 with the outcome including a draft UI. Meanwhile, the PT reported to the Statutory Panel that filling limits above 99.5% had been granted for some gas carriers. However, the PM thought that no rationale for this acceptance was given and consequently no discussions took place in the PT.

No consensus was reached as to whether the draft UI shall be retrospectively applied to existing gas carriers in the Statutory Panel. Taking into account the PT’s report as mentioned above, and considering that:

1) no consensus was reached as to whether the draft UI shall be retrospectively applied to existing gas carrier in the Statutory Panel;

2) some members suggested that this criteria should be implemented by members on voluntary basis; and
3) the benefit of having an IACS Technical Resolution available for the IGC Code review, in the end, the Statutory Panel agreed that this criteria should be a Recommendation at this stage and may be reinstated as an IACS UI depending on the outcome of the revision of the IGC Code.

Submitted by Statutory Panel Chairman
10 September 2009

Permanent Secretariat note (October 2009):
New Recommendation No.109 was approved by GPG on 8 October 2009 (ref. 8671_IgG).
Recommendation No.110 “Guideline for Scope of Damage Stability Verification on new oil tankers, chemical tankers and gas carriers”

Part A. Revision History

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• Rev.1 (Nov 2010)

.1 Origin of Change:

- Request by non-IACS entity (UK MCA)
- Suggestion by an IACS member
- Based on IMO Regulation (Outcome of SLF 52)

.2 Main Reason for Change:

To revise the Recommendation in accordance with the comments and proposals provided by UK MCA and IACS Statutory Panel and submit the revised Recommendation to SLF 53.

.3 List of non-IACS Member classification societies contributing through the TC Forum and/or participating in IACS Working Group:

None

.4 History of Decisions Made:

The Recommendation was revised by Project Team PT25 established by IACS Statutory Panel according to the results achieved by correspondence under Statutory Panel subject number SP10006i and the extensive comments made by UK MCA (see Form 1 approved by IACS GPG on 12 August 2010). Majority of work was accomplished by correspondence.

Kick-off meeting was held to consider/discuss the results achieved by correspondence under Statutory Panel subject number SP10006i and comments provided by MCA to IACS Rec.110, to consider the need to establish a cooperation with UK MCA, to agree on the scope of work to be carried out by the PT and to divide the agreed scope of work into the equal sets to be assigned to each PT Member.
PT Status Report was submitted to IACS Statutory Panel on 30th August 2010. The report was considered by the Panel at its 12th meeting. It was also agreed to submit the revised Rec. 110 to SLF 53 separately from the UK paper as an IACS information document.

The Recommendation was further revised by the PT as per the output from the 12th Statutory Panel meeting and submitted to the Panel for approval.

.5 Other Resolutions Changes

None

.6 Dates:

Original Proposal: 24 September 2010 Made by the PT25 of the Statutory Panel
Panel Approval: 25 October 2010
GPG Approval: 05 November 2010 (Ref: 10038bIGg)

• New (Nov 2009)

.1 Origin of Change:

☑ Based on IMO Regulation (Outcome of SLF 51)

.2 Main Reason for Change:

To submit the approval procedures used by IACS Members for damage stability calculations to SLF 52.

.3 List of non-IACS Member classification societies contributing through the TC Forum and/or participating in IACS Working Group:

None

.4 History of Decisions Made:

This Recommendation was developed by Project Team PT24 established by IACS Statutory Panel.

.5 Other Resolutions Changes

None

.6 Dates:

Original Proposal: 18 September 2009 Made by PT24 of the Statutory Panel
Panel Approval: 10 November 2009
GPG Approval: 20 November 2009 (Ref: 9559aIGh)
Part B. Technical Background

List of Technical Background (TB) documents:

Annex 1  TB for New (Nov 2009)
See separate TB document in Annex 1.

Annex 2  TB for Rev.1 (Nov 2010)
Technical Background for Recommendation No.110 New (Nov 2009)

1. Scope and objectives

Following extensive debate at SLF 51, the Sub-Committee noted IACS’s intention to submit the approval procedures used by its members for damage stability calculations to SLF 52. Subsequently, SLF Chairman invited IACS to provide the information on the scope of damage stability verification uniformly applied by its members to SLF 52.

2. Engineering background for technical basis and rationale

Bearing in mind the above IACS decided to develop a Recommendation in terms of Scope of Damage Stability Verification on new oil tankers, chemical tankers and gas carriers – with the aim to provide a guideline to obtain a reference uniform approach for verifying damage stability under the following IMO Instruments: SOLAS, ICLL, MARPOL Annex I, IBC Code and IGC Code.

3. Source/derivation of the proposed IACS Resolution

Outcome of IACS Statutory Panel 9th Meeting on the Approval Procedures used by IACS members for Damage Stability Calculation.

4. Summary of Changes intended for the revised Resolution:

Not applicable

5. Points of discussions or possible discussions

At the first stage the core of Scope of Damage Stability Verification on new oil tankers, chemical tankers and gas carriers was developed and unanimously agreed by all IACS Members. Then the regulations of existing IMO instruments (i.e. conventions, codes, guidelines and circulars) and IACS resolutions (i.e. Procedural Requirements, Unified Requirements, Unified Interpretations, etc) applicable to damage stability of new oil tankers, chemical tankers and gas carriers were identified. Finally the detailed content of the Scope of Damage Stability Verification on new oil, chemical tankers and gas carriers has been developed and approved in the form of IACS Recommendation No.110.

6. Attachments if any

None
Technical Background for Recommendation No.110 Rev.1 (Nov 2010)

1. Scope and objectives

Following the debate at SLF 52, the Sub-Committee invited interested Parties to provide their comments on the IACS Rec.110 with a view to develop the new IMO Guidelines. IACS’s intention to continue the work on improvement of Rec. 110 and submit the revised Recommendation to SLF 53 was noted by Sub-Committee.

2. Engineering background for technical basis and rationale

IACS Rec.110 was amended on the basis of IACS Members practical experience on damage stability verification on new oil tankers, chemical tankers and gas carriers.

3. Source/derivation of the proposed IACS Resolution

The results achieved by correspondence under Statutory Panel subject number SP10006i, comments provided by MCA to IACS Rec. 110, existing procedures used by IACS members for damage stability calculation and the outcome of 12th Statutory Panel meeting (Statutory Panel Task No.33).

4. Summary of Changes intended for the revised Resolution:

See the attached Summary of discussion on the comments to IACS Rec. 110.

5. Points of discussions or possible discussions

See the attached Summary of discussion on the comments to IACS Rec. 110.

6. Attachments if any

Summary of discussion on the comments to IACS Rec. 110.
Discussion on the comments to IACS Rec. 110 – Summary

<table>
<thead>
<tr>
<th>Comments to IACS Rec.110</th>
<th>PT/DSV remarks</th>
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<tbody>
<tr>
<td><strong>MCA Comment on IACS Rec.110</strong></td>
<td>PT agreed to submit the revised Rec. 110 to SLF 53 separately from the UK paper as an IACS information document.</td>
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<tr>
<td>1. Definitions required for clarification/uniform interpretation</td>
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<td>1.1 SOLAS</td>
<td>“SOLAS” should read “MARPOL”.</td>
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<td>1.1.1. Annex 1 regs 28.1.2 and 28.1.3 both rely upon an understanding of what constitutes the “machinery space”. In this respect the machinery space shall be that part of the vessel which contains the propelling engine and lies between main transverse watertight bulkheads located below the bulkhead deck, and shall be limited by the upper watertight boundary of this space. Consequently, separate accommodation which lies above this space should be considered prone to damage as prescribed in reg 28.4.3 and progressive flooding in the residual range should be applied up to the first boundary that meets reg 28.3.1. In addition, subject to application of reg 28.2.5.2 in the case of damage required by reg 28.1.3, trunks and extensions to the machinery space should be considered prone to damage where these lie above the bulkhead deck but fwd or aft of the main transverse watertight bulkheads which limit the extent of the machinery pace below this deck, and also in any case where an extension to the machinery space below the bulkhead deck is recessed by a distance less than the transverse extent of penetration of assumed damage. Progressive flooding in the residual range following damage to such a trunk or extension</td>
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should be applied up to the first boundary that meets reg 28.3.1.

| 1.1.2. | Annex 1 reg 28.1.2 excludes application of damage to the machinery space of tankers more than 150m but not exceeding 225m where the machinery space is “located aft”. In this context it is considered this means that all parts of the fwd watertight bulkhead bounding the machinery space (as defined above) should lie aft of midships where it bounds the shell.
Furthermore, the restriction on applying damage to a machinery space located aft does not remove the obligation to consider side and bottom damages of a lesser extent which occur within this portion of the vessel. |
| 1.1.3. | Annex 1 reg 28.3.4 requires that residual stability is assessed in the “intermediate stages” of damage and that the stability should be “sufficient” in all such stages.
We are in agreement with your proposals with respect to these issues, that six stages of primary flooding should be considered and that the final stage stability criteria should also be applied during intermediate stages. |
| 1.1.4. | Annex 1 reg 28.3.5 requires that where cross-flooding arrangements are fitted which do not meet the requirement for the flooded compartment to be considered common with the damaged compartment, full compliance with residual criteria should be met in all intermediate stages of flooding and at equilibrium without these being taken into account.
This is commonly interpreted as meaning that cross-flooding fittings are not permitted, so should be ignored completely. We are in agreement with your interpretation, that this |
requires all primary flooding stages to be completed before cross-flooding is evaluated, with all primary and cross-flooding stages required to meet residual criteria.

We also consider 3 stages of cross-flooding to be appropriate for this purpose and that cross-flooded compartments may be considered common if a calculation made in accordance with Resolution MSC.245(83) shows equalisation within 60 seconds.

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<th>1.2. IBC/IGC Codes</th>
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| 1.2.1. Regulation 2.8.1 in both Codes relies upon an understanding of what constitutes a “machinery space located aft”.

In this respect the machinery space considered shall be that part of the vessel which contains the propelling engine and lies between main transverse watertight bulkheads located below the bulkhead deck, and shall be limited by the upper watertight boundary of this space. *This limited application contradicts the more general definition in reg 1.3.*

Separate accommodation which lies above this space should be considered prone to damage and any progressive flooding in the residual range should be applied up to the first boundary that meets reg 2.7.8.

In addition, subject to application of reg 2.7.4 in the case of damage required by regs 2.8.1.3, 2.8.1.5 and 2.8.1.6 of the IBC Code and regs 2.8.1.3 and 2.8.1.6 of the IGC Code, trunks and extensions to the machinery space should be considered prone to damage where these lie above the bulkhead deck but fwd or aft of the main transverse watertight bulkheads which limit the extent of the machinery space below this deck, and also in any case where an extension to the machinery space below the bulkhead deck is recessed by a distance less than the transverse extent of penetration of assumed damage.

Progressive flooding in the residual range following damage to such a trunk or extension should be applied up to the first boundary that meets reg 2.7.8.

As you are aware, we have had issues with this interpretation where trunks to the
machinery space have extended beyond the limiting main watertight bulkheads but have not been effectively separated by watertight bulkheads from the accommodation or other ancillary compartments as the openings were closed with fire doors and not weathertight or watertight doors as required.

1.2.2. With respect to the definition of “located aft” in the context of the excluded machinery space damage cases considered at 2.2.1 above, it is considered this means that all parts of the fwd watertight bulkhead bounding the machinery space (as defined above) should lie aft of midships where it bounds the shell.

Furthermore, the restriction on applying damage to a machinery space located aft does not remove the obligation to consider side and bottom damages of a lesser extent which occur within this portion of the vessel.

1.2.3. Reg 2.9.1.3 of both Codes requires that residual stability is assessed for “intermediate stages” of damage and that the residual stability standard to be applied should not be “significantly less” than that required for compliance in the final stage.

We are in agreement with your proposals with respect to these issues, that six stages of primary flooding should be considered and that the final stage stability criteria should also be applied during intermediate stages.

1.2.4. Reg 2.7.6 of both Codes require that where cross-flooding arrangements are fitted which do not meet the requirement for the flooded compartment to be considered common with the damaged compartment, full compliance with residual criteria should be met in all intermediate stages of flooding and at equilibrium without these being taken into account.

This is commonly interpreted as meaning that cross-flooding fittings are not permitted, so should be ignored completely. We are in agreement with your interpretation, that this requires all primary flooding stages to be completed before cross-flooding is evaluated, with all primary and cross-flooding stages required to meet residual criteria.

We also consider 3 stages of cross-flooding to be appropriate for this purpose and that
cross-flooded compartments may be considered common if a calculation made in accordance with Resolution MSC.245(83) shows equalisation within 60 seconds.

2. Items to change

2.1. At section 3.2 we think the wording may be confusing. We suggest the following modifications may clarify the intended meaning.

“…. In general, for non approved loading conditions (by the Administration or RO), approved KG/GM limit curve(s) from stability information or approved loading instrument software satisfying the stability requirements (intact and damage) for the proposed loading condition should be used to verify compliance on board.

Within the scope of the verification determined as per the above, all potential or necessary damage scenarios should be determined and assessed taking into account the damage stability criteria.

Damage stability verification and approval requires a review of submitted calculations and supporting documentation with independent check calculations to confirm damage stability calculation results comply with relevant stability criteria.

Examination and approval of the loading instrument software installed on board and to be used for assessing damage stability should also be carried out. ….”

The following revision have been agreed by the PT:

“…. In general, for non approved loading conditions (by the Administration or RO), approved KG/GM limit curve(s) or approved loading instrument software satisfying the stability requirements (intact and damage) for the draught range to be covered should be used to verify compliance on board.

Within the scope of the verification determined as per the above, all potential or necessary damage scenarios should be determined and assessed taking into account the damage stability criteria.

Damage stability verification and approval requires a review of submitted calculations and supporting documentation with independent check calculations to confirm damage stability calculation results comply with relevant stability criteria.

Examination and approval of the loading instrument software installed on board (and to be used for assessing intact and damage stability) should also be carried out. “….”

2.2. It would be our understanding that unenclosed superstructures would not be included in KN data except in the case set out at section 3.3, when we would expect flooding points (including windows) incapable of weathertight closure to be included in any list determined in accordance with paragraph 3.4.2.6.

PT agreed that the following should be added to the second paragraph of IACS Rec.110, Section 3.3:

Flooding points (including windows) incapable of weathertight closure to be included in any list
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<td>Full compliance with residual stability criteria must be achieved before any such point becomes immersed within the residual range.</td>
<td>determined in accordance with paragraph 3.4.2.6. Full compliance with residual stability criteria must be achieved before any such point becomes immersed.</td>
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<td>2.3. With particular reference to any submission which includes critical KG or GM data we suggest there should be an entry at paragraph 3.4.2.11 requiring that any initial conditions or restrictions which have been assumed in the derivation of such data, and which must therefore be met in service, should be stated.</td>
<td>Agreed by the PT.</td>
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<td>2.4. At paragraph 3.4.3.2 it is stated that intermediate stages only require to be considered where it is “obvious that there is some risk to achieve critical trim and/or stability parameters in the intermediate stages”. Consideration of intermediate stages is a requirement of the various international instruments. Whilst its evaluation may prove to be of no significance in the majority of cases it is not an optional consideration and this relaxation/interpretation is open to potential abuse.</td>
<td>To solve the matter it was agreed to replace the wording “intermediate conditions, as” with “intermediate flooding” in the first sentence of paragraph 3.4.3.2; to add the reference to paragraphs 6.8 and 9.2 into the first sentence of paragraph 3.4.3.2 after the words: “cross-flooding” and the reference to paragraphs 6.9 after the words “progressive flooding”; to amend the second sentence of paragraph 3.4.3.2 as follows: “The intermediate stages for cargo outflow and sea water inflow should be checked. If any stability criteria during intermediate stages shows more severe values than in the final stage of flooding this intermediate stages should also be submitted.”; to amend paragraphs 4.1.e) as follows: “Minimum tank filling levels required to achieve compliance with the applicable stability criteria; and” and to amend the second sentence of paragraph 9.1 as</td>
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2.5. We consider that section 4 constitutes advice to Class surveyors on what methods of operation are permissible, and what each one requires to be examined and approved. On this basis we would consider that a better title may be “Permitted Modes of Operation – Descriptions/Assumptions” and the following modifications to the text are offered for consideration:

“In considering the scope of the verification to be conducted, consideration of the intended mode of operation is required.

The following modes of operation are permitted:

a) Adherence to service loading conditions close to the approved loading conditions from the stability booklet (see paragraph[s 4.1 and] 4.2); or

b) Adoption of service loading conditions other than approved loading conditions which have been checked on board to show compliance with the approved [intact and] damage stability limiting curves (where provided) (see paragraph 4.3); or

c) Adoption of service loading conditions other than approved loading conditions which have been checked with an approved on-board stability software capable of [intact and] damage stability verification (Type 2 or 3 of IACS UR L5, Rev. 2, Corr.1 Nov 2006) based upon KG/GM limit curve(s) or direct calculation (see paragraph 4.5).

In the case of vessels which intend to operate by adherence to approved loading conditions only when in service, and for which no means has been submitted or approved in relation to verification of loading conditions other than the approved loading conditions, suitable instructions should be included in the stability booklet/loading manual that adoption of such unapproved loading conditions in service is prohibited unless these are submitted for the

PT agreed to keep the existing text. Because this is the responsibility of IMO to define the allowed deviation from the approved loading conditions.
specific approval of the Administration or RO.”

Note: clauses b) and c) refer to intact stability. As the guidance is supposed to refer to damage stability only, these references should really be deleted along with that at paragraphs 4.3 a), 4.5 a), 4.5 b) and any others identified. However, if the references to intact stability are to be retained the title of the document shall require amendment.

| 2.6. | Section 4.1 reflects the submission and approval of individual fixed loading conditions described in paragraph 4 a). We would suggest that the word displayed in the first line may better be replaced with presented. Given that the conditions are fixed and all require to be individually verified and approved as meeting damage criteria we would question some of the guidance included. At 4.1 a) we would question whether “alternate” is required as this is implied in “any intended condition”, and ballast conditions do not need to be considered for damage. At 4.1 c) a fixed loading condition cannot really apply or convey a restriction, just another alternative “intended condition”. At 4.1 d) we agree that the full range of operating SG should be covered but safe carriage in between these SGs cannot be inferred, particularly if the wording “identical to” is retained at paragraph 4 a). At 4.1 e) an approved fixed condition cannot be used to set a general limit, such as minimum filling levels for one or more tanks, as it is not permitted to load alternate conditions based upon this information. 4.1 f) appears to be and extension of 4.1 a) in that it constitutes another set of “intended conditions”. |

| PT revised Section 4.1 as follows: **“4.1 Specific loading patterns** Ship specific design loading patterns and loading restrictions should be clearly presented in the stability booklet. The following items should be included: a) Any required and intended loading conditions (including the ones corresponding to multiple freeboards when so assigned to the vessel), i.e. symmetrical/unsymmetrical, homogeneous/alternating or ballast/partial/full; b) Types (e.g. oil, noxious liquid substances and LNG) of liquid cargo allowed to be carried; c) Restrictions to different liquid loads to be carried simultaneously; d) Range of permissible densities of liquid loads to be carried; and e) Minimum tank filling levels required to achieve compliance with the applicable stability criteria. For the verification of damage stability all loading |
2.7. We would question whether the “matrix of loading conditions” described in section 4.2 constitutes a legitimate means of verifying damage stability for conditions which are not individually assessed and approved. Paragraph 4.5 a) implies that these conditions are previously approved and may be used as base data for a Type 2 loading program.

We would consider that practical application of such matrices of conditions would prove to be problematic in service as their accuracy depends upon the assumed input conditions, including draught, trim, initial GM, subsidiary tankage in way of the critical cargo tank for damage purposes (particularly for two compartment ships) and the cargo SG.

It is unclear how such conditions would be used in practice, but it is assumed that the closest approved condition to a live loading condition would be that with the same draught and trim, and then the closest tank fillings and intact GM. The problem comes with permitting variation in these items, as for any condition on the KG/GM limit a variation gives a 50% chance of non-compliance.

Selecting conditions in relation to their cargo tank fillings and initial GM, in preference to the displacement/draught and trim is problematic as this may lead to acceptance of conditions which would fail if examined directly for compliance.

Unless such matrices of conditions can be presented in such a manner that it is possible to demonstrate without any doubt to PSCI that a loading condition, which does not correspond with any of them directly, fully meets damage criteria we think this method should be removed.

There is no difference in principle between loading approximately to a matrix condition as there is to a fixed approved condition considered in paragraph 4.1.

“Matrix of Permissible Loading Conditions” in item 4.2 of the current Rec.110 should remain as Option such that it may be used by Member(s).
<table>
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<tr>
<th>Section</th>
<th>Text</th>
<th>PT's Position</th>
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<tr>
<td>2.8.</td>
<td>To more closely reflect the guidance in MSC/Circ.406/Rev.1, the first line of section 4.3 should refer to “… gas/chemical vessels which operate as parcel tankers,...”.</td>
<td>PT has no specific objection.</td>
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<td>2.9.</td>
<td>In section 9.3 there is reference to an alternative method “i)” of considering substitution of initial tank content with sea water. This method refers to Annex 5 but does not follow the guidance in Annex 5, which gives the calculation method proposed for the method which precedes alternative method “i)”. Annex 5 does not propose a linear transition for SG, so this reference and calculation method should be deleted.</td>
<td>PT agreed that the reference should be removed, but the calculation method should be kept.</td>
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<td>2.10.</td>
<td>It is noted however that the calculation method proposed at alternative method “ii)” solves the issue of treating an empty tank which is initially above the condition waterline, and only floods in the latter damage stages. We do not generally favour employing two alternate methods of calculation for considering the filling/transitional filling of tanks which lie on or below the waterline and see little purpose in employing one such as this, which only covers empty tanks when tanks may be full, part full or empty in any particular loading case, for this purpose. However, we do support use of this methodology to address the filling of a tank which immerses only in the last few flooding stages and is intersected by or below the initial waterline.</td>
<td>PT agreed to keep the existing text, i.e. alternative methods should be allowed as they may be equally as valid.</td>
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<td>3.</td>
<td><strong>Items to Add/Consider</strong></td>
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<td>3.1.</td>
<td>For the purpose of providing comprehensive guidance it shall be necessary to add a definition for the meaning of “approved loading condition” which should reflect that from the operational guidance presently under preparation by others.</td>
<td>PT agreed that there is no need to develop a new definition for the well understood term, i.e. an approved loading condition is one which has been directly examined and endorsed by Administration/RO. This definition “An approved loading condition is one which has been specifically examined and endorsed by Administration/RO” will be added to the end of</td>
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3.2. For the purpose of operating a vessel which has approved loading conditions alone, it is permitted to transition from the approved departure condition to the approved arrival condition required to be submitted and approved by the various international instruments. If this is not the case then vessels would be inoperable.

Where this transition involves substantial consumption of fuel and other consumables, and/or substitution with ballast on passage, each stage of the voyage should be separately considered and approved with an appropriate allowance made for free surface.

In this respect, no condition is fixed once the voyage commences and it is not expected to check stability throughout a voyage where no means to achieve this is provided. Consequently it is proposed that the wording of paragraph 4 a) is modified to that shown at 2.5 a) above.

3.3. Paragraph 4.2 introduces an apparent anomaly, as we are advising that vessels must always be loaded closely to an approved condition, otherwise the loading condition is invalid (unverified for damage stability in particular) and has to be submitted to the Administration or RO for prior approval.

Yet we are also indicating that the existing provisions must permit transition between approved departure and arrival conditions, otherwise the existing instruments and approvals make no sense.

To make any sense of this I think we need to differentiate between changes through usage of consumables, provided that significant ballast substitution is covered, and variation from approved loading conditions caused through significant changes to the initial level/distribution of cargo or ballast carried.

We need to provide a definition of the safe (maximum) deviation from an approved loading condition before it becomes invalid and the revised loading condition must be

<table>
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<th>Paragraph 4 (before paragraph 4.1)</th>
<th>PT agreed that this matter is properly covered by paragraph 6.5.</th>
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<tr>
<td>3.2. For the purpose of operating a vessel which has approved loading conditions alone, it is permitted to transition from the approved departure condition to the approved arrival condition required to be submitted and approved by the various international instruments. If this is not the case then vessels would be inoperable. Where this transition involves substantial consumption of fuel and other consumables, and/or substitution with ballast on passage, each stage of the voyage should be separately considered and approved with an appropriate allowance made for free surface. In this respect, no condition is fixed once the voyage commences and it is not expected to check stability throughout a voyage where no means to achieve this is provided. Consequently it is proposed that the wording of paragraph 4 a) is modified to that shown at 2.5 a) above.</td>
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<td>See the remark to comment 2.7.</td>
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considered and approved in its own right.

For this we have previously suggested a variation based upon a variation of cargo or ballast mass of 1% in any individual tank and variation of 2cm in the overall calculated fluid KG or GM.

It may be more flexible to expand these limits to reflect the permitted calculation tolerances (ie the allowed variation in the original condition from what has been calculated) of 2% variation in of cargo or ballast mass in any individual tank and 5cm or 1% x KG variation in the overall calculated KG or GM (whichever is less). It is difficult to justify limits beyond these values.

Overall one would also have to set a maximum variation in total cargo and ballast tank content of 2% by mass, as a means of controlling the overall displacement and draught if tanks other than cargo or ballast are also varied.

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<th>3.4. Although it is accepted that critical KG/GM data are an accepted method for determining the stability of loading conditions other than approved loading conditions, and that their use is provided for and promoted in international instruments, their use does present some difficulty. In particular, we would recommend that their use is only permitted and approved if any initial conditions upon which their results rely can be readily understood and presented in the stability booklet and checked on board, using a calculation sheet or other check off list. Where on-board loading software is used to check compliance with critical KG/GM data stored for this purpose, the approval of the software should also ensure that all initial conditions (if any) which justify use of the critical KG/GM data are met for the loading condition under consideration, and for this to be confirmed in the printout. One initial condition to be fulfilled would be the maximum permitted initial heel variation from upright.</th>
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<td>PT decided to add the footnote against the title of section 4.3 “To avoid difficulties associated with developing suitable KG/GM limit curves and their restriction on operational capacity it is recommended that an approved Type 3 stability software is fitted on board.”</td>
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It is also essential to ensure that critical KG/GM data fully reflect the arrangement of the vessel, particularly if the centreline division is not directly on centreline (which may require port/stbd sets) and in cases where two compartment damage applies (where limiting data must also include one compartment damages and other lesser cases where these may be more severe).

3.5. At section 4.4, reference is made to the necessity of keeping the vessel upright as far as practicable, which is basic good seamanship.

Noting that a 20m beam tanker shall exhibit an additional immersion of 175mm at the deck edge for an initial heel of 1 degree, and the adverse effects such an initial heel shall have on restoring moment and immersion of air pipes after damage, we would prefer to see this limit reduced to no more than 0.5 degrees.

It is our opinion that loading programs of Type 3 should normally be arranged to calculate all damage stability scenarios for both sides of the vessel, to reflect the variations in typical parcel tanker operation, in which case any initial heel shall have an adverse effect on stability compliance to that side.

Accepting that it may not prove feasible to always bring a vessel upright prior to departure, we would suggest that any loading program which is approved to undertake calculations to one side only (on the basis that the loading shall always be symmetrical) should always be arranged to apply damage in the direction of heel where one is recorded, and also to give an error should the heel exceed the maximum permitted value.

The ability to consider vessel truly symmetric shall depend upon the disposition and arrangement of the internal compartments and any progressive flooding points within the poop accommodation and similar areas. Experience shows that these elements are rarely symmetric.

3.6. Section 6.1 makes a modification to the standard constant displacement damage PT agreed to amend the last sentence of paragraph 6.1

Please be referred to the tolerance indicated in L5 for equilibrium angles. The comments look like amendments to L5 (not to Rec.110).
consideration to reflect application for tank vessels with partially or wholly pre-filled tanks. In this respect the treatment of cross-connected tanks needs to be considered during primary and secondary flooding.

Where tanks are effectively connected in accordance with section 6.8 they are considered to be common and to flood together. Consequently any initial content should be deducted from both tanks to determine the final waterline and residual GZ.

Where tanks are cross-connected by small ducts, cross-flooding shall be delayed until after primary flooding and equalisation are complete. In this circumstance the final filling shall be an addition to the total ship displacement if the compartment floods, or there shall be a reduction in displacement if there is a nett outflow. However, there shall be no loss of buoyancy (KNs) as the cross-connected compartment is not opened to the sea directly.

3.7. Paragraph 6.6.2 does not appear particularly clear in its meaning and seems to cover two distinct issues. Firstly, that large trims may develop between depart and arrival conditions, in which case damage cases toward the immersed end may become limiting and, secondly, where ballasting is undertaken to counteract this effect the free surface allowances should be correctly considered and any distinct intermediate loading conditions with ballast should also be assessed for damage compliance.

PT agreed that paragraph 6.6.2 is intended to clarify on how to treat the significant operational trim. The matter related to the free surface effect is properly covered by paragraph 6.5 (see the remark to comment 3.2). So, no revision is needed.

3.8. Section 6.8 (3rd paragraph) requires that cross-flooding arrangements, being those arrangements which take more than 60 seconds to achieve equalisation, should complete equalisation in a maximum period of 10 minutes. It is implicit from this that cross-flooding arrangements which take longer than 10 minutes to complete equalisation should not be taken as effective and ignored.

PT agreed that the maximum period of 10 minutes is in line with SOLAS damage stability requirements. The final decision should be taken by the Administration/RO.

3.9. Section 6.8 details that compartments connected with cross-flooding arrangements which complete equalisation in 60 seconds or less should be considered as common, and to flood together in parallel during primary flooding stages, whereas those which complete equalisation between 1 and 10 minutes should be considered to cross-flood as a secondary stage as described in paragraph 9.2 2).

PT agreed that this is already covered by Resolution MSC.245(83) and no additional clarification is needed.

as follows:

“For the intermediate stages of flooding and the equalisation with compartments cross-connected by small ducts, i.e. not opened to the sea directly, the added weight method is used”.
In making any assessment of cross-flooding time using Resolution MSC.245(83), reference should also be made to the need to ensure that sufficient air pipe area is provided to enable such cross-flooding to complete effectively, and not to be restricted by increased air pressure above the waterline in the equalised tank. In this respect a minimum air pipe sectional area of 10% of the cross-levelling duct should be provided.

| 3.10. | Section 6.9 (2nd paragraph) describes treatment of compartments which are progressively flooded through immersion of a downflooding point which becomes permanently immersed. It is only logical to assume that such a space will flood during those primary stages of flooding up to and including equilibrium which occur after the downflooding point immerses, not over all six stages. | PT agrees with the view expressed by MCA, but sees no real need to amend Rec.110. |
| 3.11. | We would suggest rephrasing the wording of paragraph 7.2.1 to advise that all cases of lesser damage should be assessed to ensure they do not result in a more severe residual condition than that determined for a damage of full extent. In particular single compartment cases should be considered for two compartment ships and the possibility of lesser cases becoming critical at elevated trim levels should be assessed. Where it is apparent that lesser cases of damage are always less severe than a damage of full extent, then consideration may be given to omitting such cases from the standard damage cases run by a loading program of Type 3. | PT agreed to amend paragraph 7.2.1 as follows: “If any damage of a lesser extent than the maximum damage specified in 7.1 would result in a more severe condition, such damage should be considered (see paragraph 4.5).” |
| 3.12. | In relation to section 7.3 we would caution that surveyors are tempted to consider the possible effects of lesser damage cases before the event, as the consequences of individual damages cannot always be foreseen and may reverse with changes in the initial conditions, such as cargo SG or tank filling level, or the omission of deck tanks from a damage case. It is best practice to always define and evaluate lesser cases rather than to attempt to prejudge which ones may prove to be more severe and therefore worthy of examination. | Just noted. No amendments to Rec. 110 were approved by the IACS Statutory Panel. |
| 3.13. | In relation to consideration of homogeneous loading conditions and partial loading conditions described in section 8.1, it must be borne in mind that if there is no logical | See the remark to comment 2.5. |
progression in tank fillings as the SG or cargo mass increases, then the master cannot effectively interpolate between such conditions to determine compliance of an intermediate case. Interpolation between loading conditions in this way cannot generally be regarded as sufficient to meet statutory requirements and is not permitted.

| 3.14. | Similarly, the consideration of symmetrical or unsymmetrical loading patterns in section 8.2, and zig zag loading patterns in particular, determined for a narrow range of SG does not imply the ability to carry empty tanks under any circumstance and inferring compliance in this way, although currently seen to be common, should not be permitted. | The new paragraph 8.2 was proposed by the PT: “In general damage stability calculations should be performed for both ship sides. However, the damage stability calculation for one side of the ship may be accepted for symmetrical load (alternate, homogeneous, full, partial or empty), if the ship and all openings are also symmetrical and initial heel to portside or starboard is zero.” |
| 3.15. | In relation to section 8.2, particular attention should be paid to the size and type of vessel under consideration when a loading program approval is being undertaken. Any vessel which is likely to undertake parcel operations and for which there is no evidence that it shall operate on a fixed cargo operation on long term contract should not be considered for fitment of an approved loading program only capable of undertaking damage calculations on one side of the vessel. | See the remark to the comment 3.14. |
| 3.16. | It is noted that the methodology for considering the flooding of cargo and other tanks shall result in multiple free surfaces, and that these may have a significant effect on residual GZ where damaged compartments lie one above the other. Although we do not see any prohibition to this approach it is not in line with other IMO instruments and the effects of multiple free surface could be reduced if consideration were given to increasing the rate of flooding applied to tanks which lie wholly below the initial waterline. By flooding double bottom tanks in the first stage for example. | PT agreed to keep the text as it is because the requirement of IMO instruments referred by MCA seem to be applicable to the SOLAS probabilistic damage regulations. |
| 3.17. | We would exercise a note of caution in relation to the fitment of watertight means of closures to downflooding points. Where a closure is fitted to an underdeck escape it | It was agreed to amend the text of paragraph 10.1 as follows: |
must remain clear of the residual waterline irrespective of the means of closure. Fitment of a watertight closure is not a satisfactory means to address permanent immersion of such openings.

In addition, where escapes are fitted with weathertight means of closure particular attention should be paid to the residual freeboard and range to such openings as it may be necessary to return to them to ensure closure if left open after use, and they present a major downflooding risk in the open position in comparison with other progressive flooding points.

“...The mandatory instruments referenced in paragraph 2.1 require the final waterline, taking into account sinkage, heel and trim, shall be below the lower edge of any opening through which progressive flooding may take place. Such openings shall include air-pipes (irrespective of closing devices) and those which are closed by means of weathertight doors or hatch covers and may exclude those openings closed by means of watertight manhole covers and flush scuttles, small watertight cargo tank hatch covers which maintain the high integrity of the deck, remotely operated watertight sliding doors, and sidescuttles of the non-opening type.

Within the required range of residual stability, the immersion of any of the openings listed above and other openings capable of being closed weathertight may be permitted.

ICLL Protocol 88 permits, in the case of doors separating a main machinery space from a steering gear compartment, watertight doors may be of a hinged, quick-acting type kept closed at sea whilst not in use, provided also that the lower sill of such doors is above the summer load waterline.

In the final equilibrium condition watertight escape hatches should not be submerged below the equilibrium damage waterline and should be treated as weathertight openings 4).

Footnote:
4) This specification applies only to the escapes from spaces other than tanks.
For emergency generator room the lowest point of the room should remain above the final equilibrium damage waterline. Any opening leading to this room should be treated as unprotected or weathertight, as applicable.

The following exceptions may be permitted as per IACS UI-SC156, unless indicated otherwise by the Administration principles apply:

i) Watertight doors under the final waterline after flooding

All watertight doors under the final waterline after flooding should be remotely operated sliding watertight doors. Installation of a hinged watertight door (e.g. between the steering gear compartment and engine room) is subject to acceptance by the Administration. Doors under the final waterline after flooding should be remotely operated sliding watertight doors with an exception to doors separating a main machinery space from a steering gear compartment. Hinged watertight doors may be acceptable as an alternative subject to lower frequency of passage through the doors, agreement by flag administration concerned and other additional requirements.

ii) Progressive flooding due to damage or submersion of air pipes

Progressive flooding may be accepted subject to the air pipes leading to relatively small compartments which are progressively flooded in a predictable and sequential manner in which all intermediate stages of flooding...
(with the exception on no progressive flooding) and the final stage of flooding meet the required stability criteria.

iii) Watertight doors on the aft wall of forecastle under the final waterline after flooding

Hinged watertight doors at the aft bulkhead of a forecastle space are permitted to be submerged after damage only when possible progressive flooding is limited to one relatively small compartment which is progressively flooded in a predictable and sequential manner in which all intermediate stages of flooding (with the exception of no progressive flooding) and the final stage of flooding meet the required stability criteria. No further progressive flooding is permitted beyond the initial flooding of the forecastle. This approach is only permitted after all other options, such as increasing the sill height, relocating the door, only providing access from above, have been shown to be unworkable in practice.”

<table>
<thead>
<tr>
<th>4. Guidance on application to existing ships</th>
</tr>
</thead>
<tbody>
<tr>
<td>PT confirms that Rec. 110 should be applied to new ships only, but not to all new stability programs (see the application note of IACS UR L5. So, this issue may be raised under the topic “Maintenance of IACS Resolutions – UR L5”). PT agreed that the development of Guidance on the application to existing ships should be carried out by IMO based on the MCA comments and Paris MOU CIC results.</td>
</tr>
</tbody>
</table>

| 4.1. It is appreciated that IACS are providing this guidance for application on new vessels, constructed after it is adopted. We would question whether the standard applies to new |
ships only or to all new stability or loading program approvals made after this date, including those made for existing ships, and this interpretation would certainly assist any enforcement action taken on existing vessels.

Given that enforcement shall take place, certainly within Paris MoU and/or EC areas, what we are trying to avoid is the prospect that new software provided to show compliance can be approved to previous standards not covered by this guidance and be seen to be ineffectual.

4.2. Given our position at 4.1 above, we would consider it beneficial if the guidance could be expanded to indicate the application dates and criteria for compliance with Marpol Annex 1, IBC and IGC Codes and for additional aspects of damage stability such as the bottom raking damage now applied to some Marpol Annex 1 vessels. This information is essential in the approval of loading programs for existing vessels.

4.3. In terms of enforcement action, we are not seeking any changes to existing international instruments. Consequently there shall be no retrospective changes to legislation, or requirement to re-approve stability information or damage stability calculations or critical KG/GM data where this has previously been unsoundly approved.

Consequently, existing approved stability information shall remain the primary means for demonstrating compliance on existing ships.

Our position remains that the master must demonstrate compliance through one of the following options: Being loaded closely to an approved condition in the stability information; being otherwise loaded with on-board verification record vs critical KG/GM data; being otherwise loaded with on board verification record vs direct calculation by approved loading program; or being otherwise loaded with record of stability approval from the Administration or RO.

In the event that a vessel is loaded closely to a condition from the approved stability information, and dependent upon the quality of the approval of such information, there is a possibility that the vessel would fail if considered against a new approval made to
the revised guidance proposed. Whilst this may be anomalous, it is an inevitable consequence of enforcement action and reflects the primacy of the approved stability information.

Where such a vessel is retrofitted with a new approved loading program, and this showed non-compliance in the above case, the vessel would be permitted to sail as it meets one of the basic criteria for acceptance under PSCI. However, the master would be warned that such a decision to sail may have considerable consequences for financial liability should a damage event occur.

In reality we would not see this scenario to be a realistic event and most operators would require all conditions to be fully checked using the latest software within their SMS. The SMS would be checked for this guidance and an instruction to take advantage of this anomaly would be duly noted as an effective SMS failure.

The same reasoning would apply to reliance on existing KG/GM data. These may continue in use although they may not be soundly based, but there is no proposal to enforce any re-approval, we are just seeking to restore practice to what is provided for within present certification and approvals.

IACS may have a view on these thoughts as there are ISM aspects.

4.4. In relation to certification of tank vessels, it would be the intention of MCA to ensure that Marpol vessels carry a note in their approved stability information that the master must load closely to one of the approved loading conditions OR to load to another condition provided that this was i) checked for compliance with intact and damage stability by use of critical KG/GM data, and a verifiable record kept on board for inspection/audit purposes, or ii) checked for compliance with intact and damaged stability by direct calculation using an RO approved loading program, and a verifiable record kept on board for inspection/audit purposes. With i) or ii) applied as appropriate.

In either case, the verifiable records of other loading conditions which had been duly checked for compliance would be considered as additional approved conditions, and an
extension to the approved stability information, and would need to be retained for 3 years to ensure availability during ISM audits.

We would consider that for IBC and IGC ships, a similar note would be added as a schedule to the CoF by completing clause 5.2 in place of 5.1 and limiting carriage to “Conditions of loading close to one of the approved conditions in the stability information approved on …… or other loading conditions provided …… etc etc “.

<table>
<thead>
<tr>
<th>Annex A – Procedure for replacement of initial tank filling by sea water</th>
<th>This method is already included into Annex 5 of Rec.110 (see our remarks to comments 2.9 and 2.10).</th>
</tr>
</thead>
</table>

When considering individual damaged compartments which have an initial filling level in the intact condition a transition must be made between this initial filling and the final stage, where any initial content has been fully substituted by sea water up to the level of the equilibrium waterline.

Final filling levels of sea water may be determined from the lost buoyancy calculation used to determine the final equilibrium condition. Initial fillings may be determined from the input intact loading condition.

In considering such a transition it is recognised that a single calculation method cannot simulate real time effects particular to all individual damage scenarios, such as whether the damage opening is large or small or high or low relative to the level of the initial content or the external sea level.

However, calculations made in response to Marpol Annex 1 or the IBC and IGC Codes are all required to demonstrate how initial tank fillings are replaced by sea water, and any methodology proposed should be robust and have application to all tanks irrespective of their location or initial filling level.

It is also apparent that any damage calculations made in respect of intermediate stages of
damage must be undertaken using a methodology which logically and consistently enables this transition to be accounted for.

The following text suggests such a methodology:

“In considering the transition between the initial filling of a tank subject to damage and its final filling at equilibrium, its contents during intermediate stages of damage should be determined in accordance with the following rules:

1. For each damaged compartment, the value of the mass of the final filling at equilibrium less the mass of the initial filling in the intact condition should be determined.

2. The total mass of the content of each damaged compartment at each of five intermediate stages of flooding and at final equilibrium should be determined by sequentially adding one sixth of this value to the mass of the initial filling for each stage.

3. Where the initial filling of a damaged compartment is not zero, the proportion of the initial mass remaining at each of the five intermediate stages of flooding should be determined by reducing the initial mass by one sixth at each stage. The remaining proportion of the initial filling assumed to remain in the final stage shall be zero.

4. The residual mass at each intermediate stage (determined by subtracting the remaining initial mass from the total mass at each stage) should be assumed to comprise sea water.

5. The total volume and effective SG to be applied to each damaged compartment during each intermediate stage should then be determined from the proportions of initial content and seawater, as shown in the examples below.

<table>
<thead>
<tr>
<th>Initial filling</th>
<th>Final filling at equilibrium</th>
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<tbody>
<tr>
<td>540 tonnes at SG=1.800</td>
<td>240 tonnes at SG 1.025</td>
</tr>
<tr>
<td>Stage</td>
<td>Assumed total mass in compartment</td>
</tr>
<tr>
<td>-------</td>
<td>----------------------------------</td>
</tr>
<tr>
<td>0</td>
<td>540</td>
</tr>
<tr>
<td>1</td>
<td>490</td>
</tr>
<tr>
<td>2</td>
<td>440</td>
</tr>
<tr>
<td>3</td>
<td>390</td>
</tr>
<tr>
<td>4</td>
<td>340</td>
</tr>
<tr>
<td>5</td>
<td>290</td>
</tr>
<tr>
<td>6</td>
<td>240</td>
</tr>
</tbody>
</table>

Initial filling = 150 tonnes at SG=0.600
Final filling at equilibrium = 300 tonnes at SG 1.025

<table>
<thead>
<tr>
<th>Stage</th>
<th>Assumed total mass in compartment</th>
<th>Assumed mass at original SG</th>
<th>Assumed Mass of sea water</th>
<th>Total volume assumed in compartment</th>
<th>Effective SG assumed in compartment</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>150</td>
<td>150</td>
<td>0</td>
<td>250.0</td>
<td>0.600</td>
</tr>
<tr>
<td>1</td>
<td>175</td>
<td>125</td>
<td>50</td>
<td>257.1</td>
<td>0.681</td>
</tr>
<tr>
<td>2</td>
<td>200</td>
<td>100</td>
<td>100</td>
<td>264.2</td>
<td>0.757</td>
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<tr>
<td>3</td>
<td>225</td>
<td>75</td>
<td>150</td>
<td>271.3</td>
<td>0.829</td>
</tr>
<tr>
<td>4</td>
<td>250</td>
<td>50</td>
<td>200</td>
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<tr>
<td>5</td>
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<td>6</td>
<td>300</td>
<td>0</td>
<td>300</td>
<td>292.7</td>
<td>1.025</td>
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</tbody>
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### IACS Rec. 110 - proposed revisions by GL

#### 1. Expression “Oil TANKER”

The expression “Oil Tanker” as defined in the 2008 code on intact stability (MSC. 267(85)) includes the ship types “combination carrier” and “oil-chemical tanker”:

> Oil tanker means a ship constructed or adapted primarily to carry oil in bulk in its cargo spaces and includes combination carriers and any chemical tanker as defined in Annex II of the MARPOL Convention when it is carrying a cargo or part cargo of oil in bulk.

As it was explicitly agreed by the Project Team dealing with Rec. 110 not to address combination carriers, there are several possibilities to solve this problem:

a) Adding a footnote to the title of Rec. 110: “Guideline for Scope of Damage Stability Verification on new oil tankers, chemical tankers and gas carriers” *)

*) excluding combination carriers

b) Indicating clearly in paragraph 1 “Application” that the Recommendation should not be applied to combination carriers.

c) Renaming “oil tankers” to “crude oil tankers”.

d) Implementing the vessel type “combination carrier” to IACS Rec. 110. This would extend the present scope into the direction of bulk carriers (carriage of deck load (UILL65) with SOLAS damage stability requirements).

Option a) was agreed by PT.

#### 2. Tropical Freeboard

The following draught requirements for damage stability of tankers can be found in the various regulations:

a) ICLL Reg. 27 (11) requires “its summer load line”.

Damage Stability Calculation up to the draught at tropical Freeboard should not be taken into account at this stage. Instead, the PM is requested to consult with the GL PT Member as to whether clarification on the extent of the term “all anticipated conditions of loading” as contained in IGC & IBC Codes can be sought from...
b) MARPOL (Reg. 28) requires “any operating draught”.

c) IBC+IGC Code 2.2+2.4 require “all anticipated conditions of loading and variations in draught and trim”.

To show the requirement for damage stability verification up to a draught corresponding to tropical freeboard, if assigned, a paragraph like the following could be added to Rec. 110 paragraph 3.2 “Scope of stability verification”:

“If tropical freeboard is assigned to an oil tanker, chemical tanker or gas carrier the verification of intact and damage stability should cover a draught range up to a draught corresponding to the tropical freeboard.

Damage stability requirements according to ICLL Reg. 27 shall remain unaffected; these should be verified up to the summer load line.”

### 3. ICLL damage stability calculation

A procedure for correct application of the ICLL damage stability calculations could be displayed in paragraph 6 of IACS Rec. 110 in the following way:

“In case of application of ICLL damage stability requirements to a new oil tanker, chemical tanker or gas carrier a damage stability calculation according regulation 27 should be performed considering the following:

a) Find worst possible VCG with trimmed/untrimmed loading condition acc. ICLL Reg. 27.

b) Create untrimmed initial loading condition with the (above) worst possible VCG considering all compartments empty and perform the damage stability analysis.

c) ICLL Reg. 27 damage stability criteria should not be applied to service loading conditions and need not to be checked by stability computers.”

---

**Paris MOU CIC on Tanker Damage Stability**

PT agreed that the questionnaire is a good basis for development of the Guidelines on application to existing...
ships. The special training program for PSCOs referred in the Press Release should also be considered.
Recommendation No.111 “PASSENGER SHIPS – Guidelines for preparation of Hull Structural Surveys”

Part A. Revision History

<table>
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<th>Version no.</th>
<th>Approval date</th>
<th>Implementation date when applicable</th>
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<tr>
<td>NEW (Feb 2010)</td>
<td>8 February 2010</td>
<td>N/A</td>
</tr>
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</table>

- NEW (Feb 2010)

  .1 Origin for Change:

  ☑ Request by non-IACS entity (Marine Accident Investigation Branch (MAIB))

  .2 Main Reason for Change:

  This IACS Recommendation has been developed as a response to recommendations from the UK Marine Accident Investigation Branch – MAIB given in their Report No. 5/2008 “Report on the investigation of the heavy weather damage to the passenger cruise ship Pacific Star”.

  .3 History of Decisions Made:

  The recommendation has been established according to the Work specification given in Form A Rev.2.
  In addition the draft document was amended by the Survey Panel at the September 2009 meeting.

  During the development two external reviews have been carried out by Cruise Lines International Association - CLIA with the following comments received.

  05 August 2009:
  The CLIA Technical Committee did not have any areas of concern to add to the listing in your letter and offered no technical advice on the inspection or repair of these areas. We will of course be interested in reviewing any draft guidelines which IACS may prepare. I would hope that our members and/or the Cruise Ship Safety Forum (of which LR, DNV, RINA and GL are members) would be able to provide input to such a draft.

  23 November 2009:
  We have reviewed the document and discussed it with our Technical Committee. Overall, we find this to be very good guidance and have only a couple of small points as indicated below.
• First, may we suggest that the cover, if it must have a cruise ship sketch on the cover, have a ship that is not identifiable by brand. Using a sketch clearly showing the Carnival Cruise Line unique funnel is, in our view, not appropriate as it appears to single out and vilify a specific brand. Irrespective of the operator on whose ship incident the guideline is based, a general guideline such as this should not identify these specifics.

• May we also suggest to change the wording “each ship” in section 3.2 to “each class of ship” taking into consideration that the design of each ship in the same class is likely be the same.

• Finally, current section 3.2 (access and inspection planning): “It is recommended that an accessibility document is developed for each ship containing the relevant information for accessing the structures indicated in 3.3 to 3.10 below.”

• Also, some of the items that are to be included in the accessibility document refer to specific safety issues and access procedures without providing further details. This is somewhat ambiguous. CLIA would like to recommend that we include a reference in the accessibility document to the applicable safety procedures as noted in the operator’s Safety Management System and remove any ambiguous wording.

.4 Other Resolutions Changes

None

.5 Any dissenting views

None

.6 Dates:

Original Proposal: 17 December 2009, made by Survey Panel PT on Task 58
Panel Approval: 27 January 2010
GPG Approval: 8 February 2010 (Ref. 8558dIGm)
Part B. Technical Background

List of Technical Background (TB) documents for Rec.111:

Annex 1. **TB for Original Resolution (Feb 2010)**

See separate TB document in Annex 1.
**Technical Background for Rec. 111 NEW, Feb 2010**

1. **Scope and objectives**

1) Develop an IACS Recommendation dealing with guidelines regarding the preparation for hull surveys on passenger ships particularly addressing the following items:
   - Accessibility to all parts of the ship’s structure;
   - Provision of information to the surveyors concerning the normal working level of the liquid contained in a tank, and any previous problems associated with the space to be surveyed.

2) Each Member Society to use the IACS Recommendation developed as per 1) above to issue instructions to their surveyors, as deemed appropriate.

2. **Engineering background for technical basis and rationale**

N.A.

3. **Source/derivation of the proposed IACS Resolution**

All members of the IACS Survey panel were asked to provide their experiences to serve as a basis for development of the Recommendation. CLIA was also invited to give such input, but no input was received.

The Recommendation was established by the Project Team based on the aggregated input from the members and the experience of the societies participating in the project team. During the process the Recommendation was reviewed by the IACS Survey Panel and CLIA, and comments were incorporated in the document.

4. **Summary of Changes intended for the revised Resolution:**

N.A.

5. **Points of discussions or possible discussions**

N.A.

6. **Attachments if any**

N.A.

(* Survey Panel Task No. 58)
Recommendation No.113 “Expert Parties Engaged in Visual and/or Sampling Checks for Preparation of Inventory of Hazardous Materials”

Part A. Revision History

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<td>02 October 2012</td>
<td>-</td>
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<td>NEW (Aug 2010)</td>
<td>26 August 2010</td>
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- **Rev.1 (Oct 2012)**

  **.1 Origin for Change:**

  ☑ Suggestion by IACS member

  **.2 Main Reason for Change:**

  To update Recommendation 113 with IMO Resolution MEPC.197 (62) adopted on 15 July 2011.

  **.3 List of non-IACS Member classification societies contributing through the TC Forum and/or participating in IACS Working Group:**

  None

  **.4 History of Decisions Made:**

  A Panel member proposed to amend the Rec.113 because Rec. 113 was produced in 2010 with the reference of IMO Resolution MEPC.179(59)- Guidelines for the Development of the Inventory of Hazardous Materials. This document was further replaced by Resolution MEPC.197 (62) .Survey Panel discussed and agreed to amend the text of Rec. 113 accordingly.

  **.5 Other Resolutions Changes**

  None

  **.6 Dates:**

  Original Proposal: 06 April 2012, made by Survey Panel
  GPG Approval: 02 October 2012 (Ref: 12161_IGb)
NEW (Aug 2010)

1 Origin for Change:

☑ Based on IMO Regulation (Hong Kong International Convention for the Safe and Environmentally Sound Recycling of Ships, 2009 & Res. MEPC 179(59))

2 Main Reason for Change:

Entry in to force of the Hong Kong Convention in future.

3 List of non-IACS Member classification societies contributing through the TC Forum and/or participating in IACS Working Group:

None

4 History of Decisions Made:

A panel member proposed an amendment to UR Z17 for Expert parties engaged in visual and/or sampling checks and testing for testing hazardous materials for the new Ship Recycling Convention. The Survey Panel decided instead to develop a new recommendation for Expert parties engaged in visual and/or sampling checks for preparation of Inventory of Hazardous Materials.

5 Other Resolutions Changes

None

6 Dates:

Original Proposal: 05 February 2010, made by Survey Panel
GPG Approval: 26 August 2010 (Ref: 9662_IgG)
Part B. Technical Background

List of Technical Background (TB) documents for Rec.113:


See separate TB document in Annex 1.

Note: There is no separate Technical Background (TB) document available for Rev.1 (Oct 2012).
Technical Background for Rec.113 New, Aug 2010

1. Scope and objectives

To develop a new IACS Recommendation for ‘Expert parties engaged in visual and/or sampling checks for preparation of Inventory of Hazardous Materials’.

The Hong Kong International Convention for the Safe and Environmentally Sound Recycling of Ships, 2009 was adopted on 19th May 2009.

A major requirement of the convention is that ships should have onboard an Inventory of Hazardous Materials (Regulation 5.1) and that this shall be verified by the administration or by any person or organisation authorised by the Administration. For existing ships, Regulation 5.2 requires that a plan shall be prepared describing the ‘visual and/or sampling check’ by which the Inventory of Hazardous Materials is developed.

The IMO Res. MEPC 179(59) provides recommendations for developing the Inventory of Hazardous Materials to assist compliance with regulation 5 of the Hong Kong Convention.

The objective was to develop draft guidelines intended for shipowners, when drawing upon expert assistance for the onboard visual and/or sampling check, including the use of services from laboratories carrying out testing of samples, which reflects the Hong Kong International Convention for the Safe and Environmentally Sound Recycling of Ships, 2009.

2. Engineering background for technical basis and rationale

It was foreseen that whilst IACS member societies would verify the inventory and attend onboard for that purpose, they would not sample onboard for hazardous materials, organise the testing of hazardous materials, or prepare the inventory, which would remain under Owner’s responsibility.

However, shipowners in general are not experts enough to undertake such work and so would be expected to employ experts to do this work. Both owners and IACS member societies will need confidence that the subcontractor is competent to do this work. It was concluded that Survey Panel should not engage at this stage to mandatory minimum requirements going beyond what is required by the "Ship Recycling Convention" and its associated Guidelines but develop a draft IACS Recommendation for 'Expert parties engaged in visual and/or sampling checks for hazardous materials.'

3. Source/derivation of the proposed IACS Resolution

- The Hong Kong International Convention for the Safe and Environmentally Sound Recycling of Ships, 2009 (SR/CONF 45)
- IMO Res. MEPC.179(59)

4. Summary of Changes intended for the revised Resolution:

New recommendation developed.

5. Points of discussions or possible discussions

None

1 Survey Panel Task 66
6. Attachments if any

None
Recommendation No.114 “Recommendation for the design, construction, operation and survey of emergency shut down valves and safe cargo sampling connections on liquefied gas carriers”

Part A. Revision History

<table>
<thead>
<tr>
<th>Version no.</th>
<th>Approval date</th>
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<tbody>
<tr>
<td>New (June 2010)</td>
<td>30 June 2010</td>
<td>-</td>
</tr>
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</table>

- New (June 2010)

1 Origin of Change:

☐ Request by non-IACS entity (UK Marine Accident Investigation Branch (MAIB))

2 Main Reason for Change:

Following a major leak of liquid propane which occurred alongside a Marine Terminal in the UK after an accident occurred when sampling the cargo, the MAIB investigated and made some Recommendations (MAIB Report No. 10/2007).

3 List of non-IACS Member classification societies contributing through the TC Forum and/or participating in IACS Working Group:

None.

4 History of Decisions Made:

Following the recommendations from MAIB, the IACS GPG tasked the Machinery Panel to review the case and develop requirements if felt necessary. The Machinery Panel developed a new Recommendation which was reviewed by the Survey Panel.

5 Other Resolutions Changes:

None.

6 Dates:

Original Proposal: *February 2008, made by Machinery Panel*
Panel submission to GPG: *19 May 2010 (Ref. 7588_PMa)*
GPG Approval: *30 June 2010 (Ref. 7588_IGe)*
Part B. Technical Background

List of Technical Background (TB) documents for Rec.114:

Annex 1.  **TB for Original Resolution (June 2010)**

See separate TB document in Annex 1.
Technical Background for Rec.114, New June 2010

1. Scope and objectives

On 17 October 2006, a major leak of liquid propane occurred alongside at the Fawley Marine Terminal in the UK after an accident occurred when sampling the cargo. The MAIB completed a full investigation and provided some recommendations. The IACS GPG tasked the Machinery Panel to evaluate the recommendations and to take appropriate action.

The MAIB recommendations were:

1) A proposal to IACS on the development of unified requirements (URs) on sampling arrangements for liquefied gas carriers. The standards should, as a minimum, address the relevant shortfalls identified in this investigation, especially with regard to the provision of two valve separation from the cargo system and the avoidance of screw couplings.

2) A proposal to IACS regarding the operation and design of ESD valves which:
   • Stipulates a requirement for ESD valves to be tested and inspected during class surveys to verify effective closure.
   • Ensures that the IGC Code requirement for local manual closure means the ESD valve can be positively closed by hand.
   • Requires arrangements for the indication of the status of ESD valves to accurately mimic whether the valve is open or closed.

2. Engineering background for technical basis and rationale

The accident happened while cargo sampling operations were being carried out by a cargo surveyor using a sampling cylinder connecting to the sampling point. The sampling point was a drain plug fitted on the bottom of a globe valve in series with an Emergency Shut Down (ESD) valve which was located on the cargo pump discharge line of No.2 cargo tank.

When the cargo surveyor turned the sampling connector, the sampling valve assembly fitted on the bottom of the globe valve came off in his hand, and cargo began to leak. He tried to refit the sampling valve assembly, but failed. Although the ESD valve which was in series with the globe valve was activated, it did not completely shut and therefore failed to stop the flow of gas. After several attempts to stop the leak over a 29-hour period, the leak was eventually stopped with the resultant loss of 66 tonnes of gas to the atmosphere. Examination of all ESD valves on board was carried out, the failed ESD valve was found to have internal damage which prevented its operation whilst all the others were found to be in working order.

3. Source/derivation of the proposed IACS Resolution(s)

The IGC code Regulation 5.6 specifies the requirements for cargo system valve arrangements and Regulation 9.1 the requirement for gas sampling points. The recommendations provided by the MAIB report are to provide more clarity to the requirements stipulated.

4. Summary of Changes intended for the revised Resolution(s):

N/A

5. Points of discussions or possible discussions

It should be noted that the sampling method used was not an approved one in that the sample point in this case was a globe valve drain connection and that no other vessel had suffered the same fate. However, recognising that the IGC code allows for threaded connections for the sampling connection for pipes with a diameter of 25mm or less, the possibility exists for this connector becoming unintentionally detached with the potential to leak gas and/or injure personnel.

The additional recommendations proposed by the MAIB were intending to further enhance the reliability of the ESD operation due to the lessons learnt. Since there have not been widespread reports of ESD valve failures, the Panel concluded that a Unified Requirement would be excessive since it would force the changing of all ESD valves currently in use.

The Machinery Panel concluded that an IACS Recommendation would be appropriate and sufficient.

6. Attachments if any

N/A
Recommendation No.116 “Performance Standard for Protective Coatings for Cargo Oil Tanks of Crude Oil Tankers - 5 years field exposure test in accordance with MSC.288 (87)”

Part A. Revision History

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</table>

- **Rev.1 (Feb 2013)**

  **.1 Origin for Change:**
  - Suggestion by IACS members

  **.2 Main Reason for Change:**
  To harmonise the recommendation with the requirements in MSC.288 (87).

  **.3 List of non-IACS Member classification societies contributing through the TC Forum and/or participating in IACS Working Group:**
  None

  **.4 History of Decisions Made:**
  Statutory panel developed a new UI 259 for PSPC-COT – IMO resolution MSC.288(87). It was suggested that Rec 116 also needs to be revised to harmonise it with IMO resolution MSC.288(87).

  **.5 Other Resolutions Changes**
  New UI SC259

  **.6 Dates:**
  Original Proposal: 12 January 2013 by Statutory panel
  GPG Approval: 14 February 2013 (Ref: 9638fIGi)

- **NEW (Feb 2011)**

  **.1 Origin for Change:**
  - Based on IMO Regulation (MSC.288 (87))
.2 Main Reason for Change:

Imminent need for paint industry to produce approved by 5 year filed exposure test prior to the statutory entry into force of the resolution (1 January 2012), while requirements will be mandatory on 1 January 2013.

.3 List of non-IACS Member classification societies contributing through the TC Forum and/or participating in IACS Working Group:

None

.4 History of Decisions Made:

Procedures for the approval of coating system is provided as “Method B” in PR 34 and UI SC 223.

Pending the formal conclusion of the relevant Unified Interpretation, this part has been developed as a Recommendation to provide an interim solution.

.5 Other Resolutions Changes

Under development

.6 Dates:

Original Proposal: 30 September 2010 by EG Coating
GPG Approval: 16 February 2011 (Ref: 9638dIGc)
**Part B. Technical Background**

List of Technical Background (TB) documents for Rec.116:

Annex 1. **TB for Original Resolution (Feb 2011)**

See separate TB document in Annex 1.

Note: There is no separate Technical Background (TB) document available for Rev.1 (Feb 2013).
Technical Background for Rec.116 New, Feb 2011

1. Scope and objectives

To provide a clear test method for the “5 year field exposure test”.

2. Engineering background for technical basis and rationale

Some owner/paint manufacturer have already started field exposure test. In order to provide a procedure for the test, using the established test procedure given as “Method B” in the PR 34 and UI SC 234, as a basis of the work, taking into account the unique elements given in MSC.288 (87) for cargo oil tanks of crude oil tankers, a new recommendation has been prepared.

3. Source/derivation of the proposed IACS Resolution

IACS PR 34 and UI SC 234, as well as IMO MSC.288 (87).

4. Summary of Changes intended for the revised Resolution:

New recommendation developed to meet the requirements of MSC.288 (87).

5. Points of discussions or possible discussions

1. With regard to the test reporting format, the Group noted that Recommendation 87 is no longer available to the public, as well as the fact that the reporting format given in Annex to Recommendation requires modification for the use of field exposure test as per MSC.288 (87), the Group inserted a phrase “in accordance with the principles in section 4 of MSC.1/Circ. 1330” at this stage as an interim solution.
2. Paragraph 2.3 was developed, taking into account the footnotes inserted for the alternative coating system given in MSC.288 (87).

6. Attachments if any

None
Recommendation No.117 “Exchange of Statutory Documentation upon Transfer of Class”

Part A. Revision History

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<th>Version no.</th>
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<td>NEW (Mar 2011)</td>
<td>09 March 2011</td>
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- NEW (March 2011)

.1 Origin for Change:

☑ Suggestion by an IACS member

.2 Main Reason for Change:

To convert the contents of Internal Information No.5 into an IACS Recommendation as it was decided to delete Internal Information No.5.

.3 List of non-IACS Member classification societies contributing through the TC Forum and/or participating in IACS Working Group:

None

.4 History of Decisions Made:

GPG decided to delete the category 'Internal Information' and review the contents of Internal Information documents for appropriate relocation (GPG 67 FUA 8). A member proposed to convert the contents of Internal Information No.5 into an IACS Recommendation. PermSec prepared the draft of new Recommendation and circulated it for GPG's review and final approval. Rec. 117 was approved by GPG after discussions with some amendments.

.5 Other Resolutions Changes

PR 1, PR 8, II 5, II 12.

.6 Dates:

Original Proposal: 15 October 2010 by an IACS member
GPG Approval: 09 March 2011 (Ref: 10115_IGf)
Part B. Technical Background

List of Technical Background (TB) documents for Rec.117:

There is no separate technical background document available for Rec 117 (New, March 2011)

Part A. Revision History

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<td>NEW (Feb 2011)</td>
<td>25 February 2011</td>
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- Rev.1 (Jan 2012)

  .1 Origin for Change:
  ✓ Suggestion by IACS members

  .2 Main Reason for Change:

  Recommendation No.118 was amended in light of comments received from ISF.

  .3 List of non-IACS Member classification societies contributing through the TC Forum and/or participating in IACS Working Group:

  None

  .4 History of Decisions Made:

  A meeting between IACS and ISF was held in April 2011 at which Rec. 118, which had been published in Feb. 2011, was introduced. After the meeting, IACS received a letter from ISF in July 2011 with comments and suggestions on Rec. 118. At GPG’s instruction, IACS sent a reply to ISF responding to ISF’s concerns in Sept. 2011 and advised that IACS would uptake to improve the wording in Rec.118.

  .5 Other Resolutions Changes

  None

  .6 Dates:

  Original Proposal: 5 December 2011, made by EG/ILO
  GPG Approval: 20 January 2012 (Ref. 11125_IGj)

- NEW (Feb 2011)

  .1 Origin for Change:
  ✓ Suggestion by IACS PermSec, in consultation with EG/ILO
.2 Main Reason for Change:

EG/ILO requested that IACS position on the handling of complaints is to be codified and published as a Recommendation for use in the upcoming discussions with flag Administrations and stakeholders.

.3 List of non-IACS Member classification societies contributing through the TC Forum and/or participating in IACS Working Group:

None

.4 History of Decisions Made:

In its 2nd meeting in November 2010, EG/ILO developed a position paper “Handling of Complaints by Recognized Organizations” and submitted it for GPG approval. Following GPG approval of the paper on 20 January 2011, EG/ILO unanimously agreed to develop a recommendation based on the approved IACS position on this. IACS PermSec, in consultation with EG/ILO, prepared the draft of a new recommendation No. 118 and submitted for GPG approval. GPG approved the recommendation with some editorial corrections on 25 February 2011.

.5 Other Resolutions Changes

None

.6 Dates:

Original Proposal: 14 February 2011, made by IACS PermSec/EG/ILO
GPG Approval: 25 February 2011 (Ref: 9671cIGg)
Part B. Technical Background

List of Technical Background (TB) documents for Rec.118:

Annex 1. **TB for Original Resolution (Feb 2011)**

See separate TB document in Annex 1.


Technical Background for Rec.118 New, Feb 2011

1. Scope and objectives

A Recognized Organization (RO) may in some circumstances be specifically authorized by the flag State to carry out an inspection following a particular seafarer complaint. Also, when a vessel is inspected under the Maritime Labour Convention (MLC), 2006 by a RO on behalf of the flag State, a seafarer or seafarer representative may contact the RO to register a seafarer complaint. The complaint may be in verbal or written form. This recommendation describes the measures a RO should take subsequent to receiving a complaint from a seafarer.

2. Engineering background for technical basis and rationale

The rationale of this recommendation is that ROs should concern themselves only with matters of regulatory compliance that can be substantiated by objective evidence. This includes verifying the existence and satisfactory operation of Onboard Complaints Procedures in accordance with the flag State’s national requirements implementing the MLC. ROs should not discuss or attempt to resolve allegations of harassment, victimization and other complex matters or personal disputes. These should be passed to the flag State for resolution, but only when the complainant has put them in writing.

3. Source/derivation of the proposed IACS Resolution


4. Summary of Changes intended for the revised Resolution:

New recommendation developed.

5. Points of discussions or possible discussions

None

6. Attachments if any

None
1. Scope and objectives

Amend IACS Rec. 118 to:

- Clarify the wording that a written complaint provided by the seafarer should be attached to the copy of the report submitted to the flag State.

2. Engineering background for technical basis and rationale

None

3. Source/derivation of the proposed IACS Resolution


4. Summary of Changes intended for the revised Resolution:

A written complaint provided by a seafarer will not be included in/with the inspection report provided to the Master or Shipowner. The written complaint will only be attached to the report to the flag State in order to maintain complainant confidentiality.

5. Points of discussions or possible discussions

None

6. Attachments if any

None
Recommendation No.119 “Uniform application of SOLAS Reg. II-1/3-9 in association with MSC.1/Circ.1331”

Part A. Revision History

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<td>12 May 2011</td>
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- **Rev.1 (Apr 2013)**

  .1 Origin for Change:
  ✔️ Suggestion by IACS Statutory Panel

  .2 Main Reason for Change:

  MSC.1/Circ.1331 requires, in paragraphs 3.6.3 (Initial Installation Test), that every new accommodation ladder should be subjected to a static load test of the specified maximum working load upon initial installation. Unlike the periodical, renewal and annual surveys addressed in paragraph 5, paragraphs 3.6.3 does not mention that the accommodation ladder is to have no permanent deformation or damage for satisfactory completion of the initial survey. IACS considers that this is because there should be no failed structural components for new approved accommodation ladders. Accordingly, REC.119 is revised to remove the criteria for permanent deflection to be recorded during the initial survey. However, the maximum working load should still be applied after installation to confirm that the accommodation ladder including the winch and the connection to the deck is adequate.

  Also, REC.119 is editorially revised by replacing "suspending" with "holding" in the phrase in the 1st row of the matrix so as to be consistent with the same phrase occurring in the 3rd row of the matrix and with the use of “holding” in ISO 7364.

  .3 List of non-IACS Member classification societies contributing through the TC Forum and/or participating in IACS Working Group:

  None

  .4 History of Decisions Made:

  The revision of the recommendation and the justification (given above in section “Main reasons of change”) were unanimously agreed by all Statutory Panel Members.

  GPG approved the revision to the recommendation.

  PermSec updated the History File using the agreed justification.
.5 Other Resolutions Changes

None

.6 Dates:

Original Proposal: 06 March 2013 by Statutory Panel
GPG Approval: 22 April 2013 (Ref: 13068_IGb)

- **New (May 2011)**

.1 Origin for Change:

☑ Suggestion by IACS Statutory Panel

.2 Main Reason for Change:

New IACS Recommendation developed by IACS Statutory Panel under the long-standing Task 4 - Interpretation of IMO instruments.

.3 List of non-IACS Member classification societies contributing through the TC Forum and/or participating in IACS Working Group:

None

.4 History of Decisions Made:

The draft recommendation was unanimously agreed by all Panel Members. HF&TB documents were not developed as based on the instructions of IACS Procedures, Vol.1, IACS Recommendation should not be treated as IACS Resolution.

GPG approved the recommendation with some editorial changes suggested by members.

PermSec developed a History File, to record the revision history.

.5 Other Resolutions Changes

None

.6 Dates:

Original Proposal: 20 April 2011 by Statutory Panel
GPG Approval: 12 May 2011 (Ref: 11070_IGb)
Part B. Technical Background

List of Technical Background (TB) documents for Rec.119:

No Technical Background documents were developed for Rec.119 (New, May 2011) and Rev.1 (April 2013).
Recommendation No.120
“Survey of electrical equipment installed in hazardous areas on tankers”

Part A. Revision History

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- **New (June 2015)**

  .1 Origin for Change:
  - Based on IMO Regulation *(Changes to SOLAS, IBC & IGC)*

  .2 Main Reason for Change:

  Changes to SOLAS, IBC and IGC which now reference the IEC Standard 60092-502: Electrical Installation in ships – Tankers – Special Features as the governing standard for electrical installations on Tankers. However, it was decided that a common approach to survey procedures of Ex installations should be provided as well as identifying surveyor training requirements.

  .3 List of non-IACS Member Classification Societies contributing through the TC Forum and/or participating in IACS Working Group:

  None

  .4 History of Decisions Made:

  The form A was approved 14 September 2006

  .5 Other Resolutions Changes

  None

  .6 Dates:

    Original Proposal: 13 October 2005       Made by: Machinery Panel
    Panel Approval: 14 May 2015
    GPG Approval: 04 June 2015 (Ref: 5029bIGm)
Part B. Technical Background

List of Technical Background (TB) documents:

Annex 1. **TB for New (June 2015)**

See separate TB document in Annex 1.
**Technical Background (TB) document for Rec 120 (New, June 2015)**

**1. Scope and objectives**

In December 2004 IMO’s Maritime Safety Committee (MSC79) adopted amendments to the regulation of electrical installations on tankers. The substance of the amendments is that the revised regulations refer to IEC 60092-502:1999 as the governing standard for electrical installations on tankers. SOLAS December 2004 Amendments II-1/45, Paragraphs 10, 11 & 12 have been revised.

IBC code (International Code for the Construction and Equipment of ships carrying Dangerous Chemicals in Bulk) and IGC code (International Code for the Construction and Equipment of ships carrying Liquefied Gases in Bulk) have been updated, referring to IEC 60092-502 as the governing standard.

Applicable to: Oil carriers, Chemicals carriers and Gas carriers with keel laying date > 1. January 2007

The tasks were to develop a UR “Z” for survey procedures for Ex installations as well as identify surveyor training requirements in a separate document.

**2. Engineering background for technical basis and rationale**

A project team was formed consisting of two experienced electrical engineers and a member of the survey panel to bring experience of the surveying of Tankers and the application of IBC and IGC codes.

**3. Source/derivation of the proposed IACS Resolution(s)**

- SOLAS, IBC & IGC
- IEC 60092-502 and IEC 60079-17
- A.948(23), A789(19) & PR7 were used as a reference for surveyor training requirements

**4. Summary of Changes intended for the revised Resolution(s)**

N/A

**5. Points of discussions or possible discussions**

5.1. Points of discussion for “survey requirements”:

1) Grounding of IS circuits have been discussed. Ref. IEC 60079-17 Ch. 5.3.
2) Termination of “spare cables”. IEC 60079-14 Ch. 9.1.12 says multi core cables only. We have interpreted this as all spare cable in hazardous area.
3) Ref. Item 1. “Ambient temperature range for the equipment1)” with its note was subject to discussion.
4) We had discussion regarding IEC60079-17 Table 1 item A11. quote “The flange gap dimensions are within maximum values permitted” We concluded this is not possible to check during survey, thus this is not included.
5) PT recommendation for the form of created documents. We suggest for the document “surveyor training needs” it will be a Recommendation. The document
“Survey of electrical equipment installed in hazardous area on tankers” take the form as UR Z.

6) Requirement to maintenance history has been deleted.

7) The draft UR Z[xx] as prepared by the Project Team was considered by the Machinery Panel by correspondence and during the 6th Panel meeting, Sept. 2007. Comments received from were discussed and the following modifications to the PT draft agreed at the 6th Panel meeting:

   a. Add under 6.2: “Be of a type designed to prevent spark and arcs and “hot spots” during its normal operation.”
   b. Modify under 5.2.3: “Ex-d. There is no significant corrosion and damage to the flame path 1).”
      1) Visual inspection only. If any damage or corrosion is detected inspection of the flame path is required.
   c. Renumber and rearrange paragraphs to enhance readability
      4.12: Remove requirement for measuring number of air changes as this may be difficult to implement.

8) UR Z [xx] was agreed unanimously by Panel members. It was agreed to forward the draft text to the Survey Panel for review. The survey panel provided some minor text amendments and asked for the UR to be rearranged as follows:

   1 – Scope
   2 – Enclosures
   3 – Surveys on New buildings
      Documentation for surveys
      Survey of installation
   4 – Survey on existing ships

The survey panel did not like the use of statements such as “Detailed Survey” and proposed that the following should be used “survey by means of opening enclosures by appropriate tools and checking connections/conditions/function”

Also, the machinery panel were asked to consider whether text indicating what to look at i.e. typical problems such as cracks etc are usually not included within IACS URs. Such text is usually providing guidelines to the surveyor and is usually listed in IACS recommendations.

It also directed that the qualifications of the survey section be removed as this is not a mandatory requirement and is under the control of the individual classification societies and therefore the remit of the surveyors training should be included within a recommendation.

The survey panel only recommended one minor amendment to the Rec. xx on surveyor training needs in that specifying a relevant training course and practical training should be completed is very subjective and therefore should be removed.

9) The 12th Panel meeting recorded as follows:
   The Chair recalled the history of the subject task. It was proposed to improve the layout of the current draft and one member volunteered to submit it to the Panel for comments. There were some editorial changes proposed which were included in
the draft and comments made during the meeting comments received by correspondence.

10) One member re-wrote the document in the new format with the changes proposed and submitted for comment.

11) Principal comments were given by 2011-04-15 as follows:

- Item 1.2 (Manufacturer's declaration), Column "Acceptance criteria", part "Note"
  One member suggests to indicate examples of simple apparatus (thermocouples, photocells, junction boxes and etc.) for better understanding, as stated in IEC 60092-502 (item 6.5.2.b).

- Item 3.4 (Cables)
  Information that "Intrinsically safe cable and non-intrinsically safe cable are not laid in the same cable bunch or pipe" should be added in (please see item 3.2.8 of Consolidated Comments Version).

- Item 1.2 -Manufacture Simple apparatus
  Add the following Note to "How" for Item 2:
  
  **Note:**
  In cases where the required mark for "Test institute and certificate number" has not been marked on Ex equipment, evidence of class approval may be accepted instead.

- Item 2.7 - Equipment condition
  One member is of the opinion that the marking of an "R" after major repairs have been completed is only required by EN standards. Therefore, it is recommended to revise "Acceptance Criteria" for Item 2.7. Major repairs like change of motor bearings, etc. shall be done by qualified personnel and marked with the symbol R if required and shall be recorded.

- Item 3.5 - Gas tight cable penetrations
  It is proposed to clarify the inspection methods for sealing of gas tight cable penetration by examples. (e.g. "NB : Air test" and "SIO : Visual examination")

- Item 7 - Space protected by over-pressure
  Action upon loss of pressure can be automatic or manual disconnections and audible and visual alarms depending on type of Ex protection used. Alarms are to be given at a manned station.

- 6. Surveys on ships in Operation
  An insulation resistance measurement is required every year in current draft UR. One member would like to clarify whether the confirmation of an insulation resistance meter installed in a 440V or 100V switchboard is acceptable instead of such a measurement. Furthermore, it is believed that because a gas free condition is needed to measure the insulation resistance in oil tankers, it is impractical to perform such a measurement each year for such ships.

- 7. Periodical Survey
  It is not appropriate that the UR specifies the wording "Not all classification societies do accept them". Therefore, such wording should be removed from the last paragraph of "Periodical Surveys".

- Item no.6
  Add Ventilation failure has to be alarmed and Electric motors driving fans should be placed outside the airflow for such ventilation onboard chemical and gas tankers.

12) New comments by deadline 2011-05-12:
• Concerning Earthing and Bonding (item 4), a MAXIMUM value for bonding resistance should be established the maximum allowable resistance value for earthing and bonding should be very low, and I propose 1 milliOhm (1 mOhm).  

  ☑ Conclusion: 1 MΩ is according to E9.

• Concerning Insulation Resistance (Item 4.2), a MINIMUM value for Insulation resistance should be established (as it was in the original document), and I agree with 1 MegaOhm (1MOhm)  

  ☑ Conclusion: Agreed

• Further, we do not agree to include in the UR Z... the sentence added at item 6." Electric motors driving fans should be placed outside the air flow for such ventilation onboard chemical and gas tankers." because we consider it not technically correct and not aligned with current IEC standards; in case this sentence is introduced, one member will consider raising a reservation; one member opinion is that also IGC and IBC should be amended in this respect.  

  ☑ Conclusion: Propose to delete it as IACS is minimum requirements and those who require the fans to be outside of the ventilation duct have to add this in their own implementation.

• 4.2 Insulation resistance of all electrical equipment should be minimum 1 MOhm. The insulation resistance is to be measured between operational conductive alive materials (conductors, contacts etc.) and operational conductive not alive materials (metal housings and cabinets) or ship’s hull. This resistance is a value of the quality of the insulating materials, which should be as high as possible!  

  ☑ Conclusion: Agreed

• In 2.9 add the word “proper” to read “A proper barrier is to be provided”  

  ☑ Conclusion: Propose the text: “A barrier/isolator is provided”  

  Reason: Both barriers and the isolators are interfaces between the sensor or the actuator in the Ex-i area and the controller.

• In 3.4 replace “Intrinsically safe cable and non-intrinsically safe cable are not laid in the same cable bunch or pipe unless there is intermediate layer of insulating material or earthed metal partition and intrinsically safe circuits or non-intrinsically safe circuits have metal sheaths or screens” with “IS- and non-IS cables may be pulled in the same bundle or duct provided: There is intermediate layer of insulating material or earthed metal partition between the cables, and IS- or non-IS circuits have metal sheaths or screens.  

  ☑ Reply: Disagree, there is no difference in content of the text, but existing text is editorially improved.

5.2. Comments returned from GPG:

1. With regard to the draft UR Z[xx]

  1.1 We appreciate the efforts to propose a uniform implementation statement for the draft UR, since none was included; however, the statement proposed (“This UR is to be uniformly implemented by IACS Societies from [1 July 2012][1 January 2013].”) may not be sufficient since, as the HF&TB indicates, the requirements in SOLAS, IBC Code
and IGC Code are applicable to oil carriers, chemical carriers and gas carriers with a keel laying date > 1 January 2007.


1.1.1 It appears that new building (NB) would be ships contracted for construction on/after [1 January 2013] and ships in operation (SIO) would be ships with a keel laying date on/after 1 January 2007. Is this what the Machinery Panel intends?


1.2. The intent of the second paragraph of the scope ("Compliance with the international standard IEC 60079-17 Explosive atmospheres – Electrical installations inspection and maintenance arrangements that comply with this UR may be accepted by the classification society.") is not clear. It is understood that the intent is that equipment in compliance with IEC 60079-17 may be accepted as complying with the draft UR. If this is what the Machinery Panel intends, the sentence should be reworded accordingly.

Machinery Panel: Agree, text deleted.

1.3. For ships in operation (SIO), the surveys for which these items are to be checked should be indicated (i.e., special/renewal, intermediate, annual).

Machinery Panel: Draft UR updated accordingly.

1.3.1 We note that item 4 refers to "annual surveys" and to "major surveys." We presume that "major surveys" means intermediate and special surveys and request that this be clarified.

Machinery Panel: The wording is identical to the wording used in UR E9, but as this is not in line with the correct terminology, the proposal is amended.

2. With regard to the draft REC No.xx, editorial changes are proposed in the attached file.

Machinery Panel: Noted and corrected.

3. We need clarification for the following Note which is laid down in the Scope of URz:

Note: The society may require design assessment as part of the verification of some of the survey items

It seems that the Note has not been discussed in MP. What design assessment in above Note to be done?

Machinery Panel: Text is found unclear and agreed to be deleted.

4. Item 1.2

In column "How", the third bullet should be split in two and separated by an "or" rather than an "and", hence a new fourth bullet should read "or having enclosure of at least IP55 and acceptable surface temperature"

Machinery Panel: Agreed and document updated.

5. Item 3.4, column "Acceptance criteria":

5.1 The reference to an "intermediate layer of insulating material" should be removed. The safety objective of this criterion is to avoid electrical inductance between cables which can be achieved by providing an earthed metal partition, as also stated in this item, but nor through an unspecified layer of insulating material.
5.2 The reference to "intrinsically safe circuits or non-intrinsically safe circuits have metal sheaths or screens" should be removed. Metal sheathing or screens alone are not considered sufficient (see also IEC 60092-352 para. 3.15n).

5.3. Circulation March 2012:
1) Added Ex-d and Ex-e to item 2.1.
2) Changed the note under scope to be specific on application.

5.4. Circulation June 2012:
1) Proposed to change the note 1 regarding temperature ratings for the equipment has been agreed.
2) A note new under 2.1 has been agreed.
3) A proposal to delete item 2.5 has not been agreed.

5.5. Circulation February 2015:
1) Survey Panel concluded that this IACS document should be an IACS Recommendation instead of UR.
2) Survey Panel was of the opinion that any IACS document (Recommendation) will not be necessary for training of Surveyors. Therefore, Panel did not agree with the draft new Rec. XX (Surveyor training needs for surveys of electrical installations in hazardous area) which was submitted to GPG by Machinery Panel (Ref. `5029b1Gi`). GPG was requested not to issue the Rec. XX (Surveyor training needs for surveys of electrical installations in hazardous area).
3) There were objections to delete Rec.35 as it concerned electrical installations in hazardous areas, whereas the "new" document regards only tankers. One member suggested revision for existing Rec.35. Based upon this it was concluded to issue this as a separate Rec. applying to tankers and keep Rec.35.
4) Members supported the opinion that considering the decision of publishing the document as recommendation and therefore having a non-mandatory nature, it should not contain any statement requiring its application or implementation by Members.
5) Members accepted changes in the draft based on following comments/observations on the draft REC. developed by the Survey Panel.
   a. The Scope implies it is applicable to all tanker surveys but the note limits this to existing ships with a keel laying date on or after 1 January 2007. It is not felt appropriate to have different survey requirements for pre-2007 and post-2007 installations.
   b. The document contains requirements for the equipment in hazardous areas but does not explain what will be done with equipment which has previously been installed and accepted but does not comply with these requirements.
   c. In 2.1, there is a requirement that all the information be marked on the equipment with the statement that 'if this information is not possible to read on
the equipment it will normally be considered as not suitable’, but the standard allows for small items of equipment and identifies what must as a minimum be marked. It would be better to state the equipment marking is to be in accordance with IEC 60079 or the relevant standard to which it is constructed.

d. It is not clear in 2.2.1 why the certificate is to be from a recognised or national organization. It is a member’s view that even the national organization issuing the certificate should be recognised. It should be ‘a recognized international or national organization’.

e. Also in 2.2.1, simple apparatus should be as defined in IEC 60079-11.

f. In 2.2.2, there is a reference to conformity with specified requirements but not clear who specifies these. These requirements should be identified as a specific standard/standards such as IEC 60079-15.

g. At the bottom of 2.2.2, it is not clear if the text about simple apparatus is part of the text or part of the note. It should also reference IEC 60079-11.

h. In 2.3, the modifications should be carried out in accordance with IEC 60079-19.

i. Also in 2.3, perhaps the requirement for drawings to be submitted should reference 3.1.

j. In 2.4 the requirement for the cable glands to be of the same protection type as the apparatus does not permit those cases where Ex e enclosures are permitted to use (and sometimes certified for use with) Ex d glands.

k. The note 1 in 3.1.1 indicates that if the ambient temperature is not stated it is to be understood as that in UR M40.2 but this is incorrect since if it is not stated it is 40 degrees Celsius. This note could lead to incorrectly installed equipment and a potentially unsafe situation.

l. The requirement for only permitting joints in IS cables in zone 0 is misleading as on most ships there will only be IS cables in zone 0. The only exception is Gas Ships, which have submerged pumps. Other cables are not permitted according to IEC 60092-502.

m. The requirement that ‘all applicable electrical equipment’ shall have insulation resistance measured could give rise to measurements being made on IS circuits resulting in damage to the apparatus. This should be warned in a note.

n. In 3.2.9, the term ‘grounding’ is used where elsewhere the term is ‘earthing’. The terminology should be consistent.

o. In 3.2.16 it states that corrosion damage is not acceptable but it is not clear what ‘corrosion damage’ is. Minor surface corrosion will not adversely affect the equipment so there should be a means of determining the limit of acceptability.

p. In 4.1, the ‘ex’ should be ‘Ex’ and the word ‘be’ should be inserted before the word ‘survey’. It is also recommended that there be a reference to IEC 60079-17, which covers inspection of Ex equipment.

q. In 4.2 there should be an ‘is’ inserted in the first sentence after ‘equipment’.
Recommendation No.121 “Uniform Application of MARPOL Annex I, Revised Regulation 12”

Part A. Revision History

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• NEW (Dec 2011)

.1 Origin for Change:

☑ Suggestion by IACS Statutory Panel

.2 Main Reason for Change:

New IACS Recommendation developed by IACS Statutory Panel under the long-standing Task 3 - Monitoring of IMO and other external bodies’ activities and initiatives.

.3 List of non-IACS Member classification societies contributing through the TC Forum and/or participating in IACS Working Group:

None

.4 History of Decisions Made:

The draft recommendation was prepared by Statutory Panel and approved by GPG along with UI MPC99 (Oil residue (sludge) tank discharge connections to the bilge system, oily bilge water holding tank(s), tank top or oily water separators (MARPOL 73/78 Annex I Regulation 12.2)) and draft cover paper for submission of the UI to MEPC 63.

PermSec developed a History File, to record the revision history.

.5 Other Resolutions Changes

None

.6 Dates:

Original Proposal: 14 December 2011 by Statutory Panel
GPG Approval: 21 December 2011 (Ref: 11198_IGb)
Part B. Technical Background

List of Technical Background (TB) documents for Rec.121:

No Technical Background documents were developed for Rec.121 (New, Dec 2011)
Recommendation No.122 “Integral Buoyancy Casings in Lifeboats and Rescue Boats”

Part A. Revision History

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<td>11 January 2012</td>
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- NEW (Jan 2012)

.1 Origin for Change:

☑ Suggestion by IACS member

.2 Main Reason for Change:

A case of rescue boat accident due to the water ingress in buoyancy chamber.

.3 List of non-IACS Member classification societies contributing through the TC Forum and/or participating in IACS Working Group:

None

.4 History of Decisions Made:

With reference of a particular case of rescue boat accident due to the water ingress in buoyancy chamber, a Survey Panel Member proposed to discuss this matter with a view to providing guidance on the assessment of integral buoyancy chambers of lifeboats and rescue boats.

Panel discussed this matter under PSU11017 and unanimously agreed with the draft IACS Recommendation, which should be followed by safety officer or the Service Company at the time of boat inspection.

GPG approved the recommendation submitted by the Survey Panel.

PermSec developed a History File, to record the revision history.

.5 Other Resolutions Changes

None

.6 Dates:

Panel Approval: 15 December 2011 by Survey Panel
GPG Approval: 11 January 2012 (Ref: 11199_IGb)
Part B. Technical Background

List of Technical Background (TB) documents for Rec.122:

*No Technical Background documents were developed for Rec.122 (New, Jan 2012)*
Recommendation No.123 “Recommendation based on IMO instruments - MSC.1/Circ.1370 “Guidelines for the design, construction and testing of fixed hydrocarbon gas detection systems” and Resolution MSC.292 (87) “Amendments to the FSS Code Chapter 16 Fixed Hydrocarbon Gas Detection Systems””

Part A. Revision History

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</table>

- NEW (May 2012)

.1 Origin for Change:

☑ Suggestion by IACS Statutory Panel

.2 Main Reason for Change:

Interpretations of MSC.1 Circ.1370 and MSC.292 (87) (Long standing Task 4 – Interpretation of IMO instruments)

.3 List of non-IACS Member classification societies contributing through the TC Forum and/or participating in IACS Working Group:

None

.4 History of Decisions Made:

Statutory Panel submitted, for GPG approval, a draft paper to FP 56 seeking clarification of the meaning of "adjacent" relative to a fixed hydrocarbon gas detection systems complying with the FSS Code.

Along with the above paper, Statutory Panel also submitted a draft IACS Recommendation, for GPG approval, on Interpretations of MSC.1 Circ.1370 and MSC.292 (87).

On GPG’s instruction, PermSec reviewed and amended the draft document with a view to modify its mandatory language in line with the one used in IACS Recommendations. The text in italics was also revised to make it in line with the texts from the IMO instruments.

GPG approved the recommendation with some editorial improvements.

PermSec also developed a History File, to record the revision history.
.5 Other Resolutions Changes

None

.6 Dates:

Panel Approval: 09 March 2012 by Statutory Panel
GPG Approval: 25 May 2012 (Ref: 12032bIGd)
Part B. Technical Background

List of Technical Background (TB) documents for Rec.123:

No Technical Background documents were developed for Rec.123 (New, May 2012)

Part A. Revision History

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</table>

- **NEW (May 2012)**

  .1 Origin for Change:
  
  ✅ Suggestion from IACS members

  .2 Main Reason for Change:

  IACS Expert Group (EG) ISM-ISPS drafted the recommendation in response to the increasing demand from shipping companies for advice and assistance in relation to the employment of armed guards and the installation of citadels in anticipation of attacks by pirates in the Indian Ocean and the Arabian Sea.

  The Group considered that it essential that auditors and others who receive such requests be provided with guidance that is clear and consistent with the role of RSOs acting on behalf of flag administrations.

  .3 List of non-IACS Member classification societies contributing through the TC Forum and/or participating in IACS Working Group:

  None

  .4 History of Decisions Made:

  In accordance with the remit to review and maintain ISM and ISPS related IACS resolutions, the members of the ISM/ISPS Expert Group identified the need for guidance in support of the ISPS verification process described in PR24. The Group drafted a recommendation on Guidance on the role of RSOs in relation to armed guards and citadels.

  GPG approved the recommendation with some modifications.

  PermSec developed a History File, to record the revision history.

  .5 Other Resolutions Changes

  None
.6 Dates:

Expert Group Approval: 14 March 2012 by EG/ISM-ISPS
GPG Approval: 18 May 2012 (Ref: 12042_IGe)
Part B. Technical Background

List of Technical Background (TB) documents for Rec.124:

No Technical Background documents were developed for Rec.124 (New, May 2012)
Recommendation No.126
“Record of approved GMDSS radio installation”

Part A. Revision History

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- **New (Nov 2015)**

  .1 Origin for Change:

  ☑ Suggestion by IACS member

  .2 Main Reason for Change:

  To recast the existing Other Technical Resolutions in the IACS Blue Book into Recommendations.

  .3 List of non-IACS Member Classification Societies contributing through the TC Forum and/or participating in IACS Working Group:

  None

  .4 History of Decisions Made:

  During the discussions on the publication of updated IACS Blue Books in March 2012, a member proposed to review and recast the existing Other Technical Resolutions in the Blue Books into Recommendations. This proposal was approved by GPG.

  PermSec prepared the draft Recommendations (Recs 126, 127 & 128) and also the History Files to record the revision history. Following GPG’s request dated 25 July 2012 wherein Statutory Panel (now Safety Panel) was tasked to establish a small PT to review the Recs. 126 and 128 and that the proposed outcome of the PT be forwarded to the Survey Panel for their final review before being submitted to GPG for approval.

  The Safety Panel concluded its final review of the Recs. 126 and 128 developed by the "one man" PT during the fourth Safety Panel Meeting taking into account the comments received from Survey Panel.

  .5 Other Resolutions Changes

  None

  .6 Dates:

  Original Proposal: March 2012 made by an IACS member (Ref: 12009_IGe)
  Panel Approval: 2 October 2015 (Ref: SP12004t)
  GPG Approval: 12 November 2015 (Ref: 12009_I Gn)
Part B. Technical Background

List of Technical Background (TB) documents for Rec.126:

Note: There is no Technical Background (TB) document available for New (Nov 2015).

**Part A. Revision History**

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- **NEW (June 2012)**

  .1 Origin for Change:
  
  ☑️ Suggestion by IACS member

  .2 Main Reason for Change:

  To recast the existing Other Technical Resolutions in the IACS Blue Book into Recommendations.

  .3 List of non-IACS Member classification societies contributing through the TC Forum and/or participating in IACS Working Group:

  None

  .4 History of Decisions Made:

  During the discussions on the publication of updated IACS Blue Books in March 2012, a member proposed to review and recast the existing Other Technical Resolutions in the Blue Books into Recommendation. This proposal was approved by GPG (Ref: 12009_IGe).

  PermSec prepared the draft recommendations (Recommendations 126, 127 & 128) and also the history files to record the revision history.

  .5 Other Resolutions Changes

  None

  .6 Dates:

  GPG Approval: 19 June 2012 (Ref: 12009_IGh)
Part B. Technical Background

List of Technical Background (TB) documents for Rec.127:

*No Technical Background documents were developed for Rec.127 (New, June 2012)*
Recommendation No.128
“Record of approved Ship Safety Equipment”

Part A. Revision History

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- **New (Nov 2015)**

.1 Origin for Change:

☑ Suggestion by IACS member

.2 Main Reason for Change:

To recast the existing Other Technical Resolutions in the IACS Blue Book into Recommendations.

.3 List of non-IACS Member Classification Societies contributing through the TC Forum and/or participating in IACS Working Group:

None

.4 History of Decisions Made:

During the discussions on the publication of updated IACS Blue Books in March 2012, a member proposed to review and recast the existing Other Technical Resolutions in the Blue Books into Recommendations. This proposal was approved by GPG.

PermSec prepared the draft Recommendations (Recs 126, 127 & 128) and also the History Files to record the revision history. Following GPG’s request dated 25 July 2012 wherein Statutory Panel (now Safety Panel) was tasked to establish a small PT to review the Recs. 126 and 128 and that the proposed outcome of the PT be forwarded to the Survey Panel for their final review before being submitted to GPG for approval.

The Safety Panel concluded its final review of the Recs. 126 and 128 developed by the "one man" PT during the fourth Safety Panel Meeting taking into account the comments received from Survey Panel.

.5 Other Resolutions Changes

None

.6 Dates:

Original Proposal: March 2012 made by an IACS member (Ref: 12009_IGe)
Panel Approval: 2 October 2015 (Ref: SP12004t)
GPG Approval: 12 November 2015 (Ref: 12009_I Gn)
Part B. Technical Background

List of Technical Background (TB) documents for Rec.128:

►▲►

Note: There is no Technical Background (TB) document available for New (Nov 2015).
Recommendation No. 129 “Guidance on DMLC Part II review, inspection and certification under the Maritime Labour Convention, 2006”

Part A. Revision History

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• New (March 2013)

.1 Origin for Change:

☑ Suggestion by EG/ILO

.2 Main Reason for Change:

Uniform implementation of review, inspection and certification service under Maritime Labour Convention, 2006 (MLC).

.3 List of non-IACS Member Classification Societies contributing through the TC Forum and/or participating in IACS Working Group:

None

.4 History of Decisions Made:

GPG approved the recommendation. Also it was decided to publish PR 36 (Transfer of MLC 2006 Certification) along with the recommendation.

.5 Other Resolutions Changes

None

.6 Dates:

Original Proposal: 18 January 2013 Made by: EG/ILO
GPG Approval: 05 March 2013 (Ref: 13029aIGc)
Part B. Technical Background

List of Technical Background (TB) documents:

Note: There is no separate Technical Background (TB) document for Rec 129 (New, March 2013).
Recommendation No. 130 “Procedures for verifying that materials are asbestos free”

**Part A. Revision History**

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<tr>
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<td>04 June 2013</td>
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- **New (June 2013)**

  **1 Origin:**
  
  ☑  Suggestion by an IACS member

  **2 Main Reason for Change:**
  
  Based on the proposal of an IACS GPG Member, GPG tasked Survey Panel to develop a procedure detailing the process which would verify that the shipyard has implemented its own procedures for purchasing and controlling the supply of asbestos free material.

  **3 List of non-IACS Member classification societies contributing through the TC Forum and/or participating in IACS Working Group:**
  
  None

  **4 History of Decisions Made:**
  
  The Task was triggered by GPG to consider ways forward how a surveyor could be satisfied that the yards have procedures and checks to confirm that supplied materials are asbestos free.

  Panel discussed and concluded that asbestos is a problem of supply chain, which only the shipyard together with its subcontractors/manufacturers can control (and, in the case of ships in service, only the Owner and its suppliers) and therefore yard should have full control and procedure for purchasing asbestos free material. It is the opinion of Panel that shipyard should have their own procedure and it is RO’s responsibility only to monitor the procedure.

  A new IACS Recommendation has been developed as guidelines for new building yards, owner, manufacture of equipment and components for having a procedure of purchasing and controlling asbestos free material.

  **5 Other Resolutions Changes:**
  
  None
6 Dates:

Panel Approval: 7 March 2013 by Survey Panel (Ref: PSU12001)
GPG Approval: 04 June 2013 (Ref: 11073 _IGu)
Part B. Technical Background

Note: No separate Technical Background (TB) document is available for Rec.130 (New June 2013).
Recommendation No. 131 “Uniform application of SOLAS Ch.II-2 Reg. 4.5.7.3.2.1 for accepting a constant operative inerting systems (COIS) as an alternative to fixed hydrocarbon gas detection equipment in double hull and double-bottom spaces on oil tankers”

Part A. Revision History

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- **New (July 2013)**

  **.1 Origin:**

  ☑ Suggestion by IACS Statutory Panel & Machinery Panel

  **.2 Main Reason for Change:**

  The Recommendation has been developed by the Statutory Panel and consequently agreed by the Machinery Panel to achieve a uniform understanding of the term "constant operative inerting systems" introduced with new SOLAS regulation II-2/4.5.7.3.2 and ensure a consistency in its implementation by IACS Societies.

  **.3 List of non-IACS Member classification societies contributing through the TC Forum and/or participating in IACS Working Group:**

  None

  **.4 History of Decisions Made:**

  The recommendation was developed by the Statutory Panel, in cooperation with the Machinery Panel, under the long-standing Task 4 - Interpretation of IMO instruments and agreed by all Members of IACS Machinery and Statutory Panels.

  **.5 Other Resolutions Changes:**

  None

  **.6 Dates:**

  Panel Approval: 18 June 2013 by Statutory Panel & Machinery Panel (Ref: PM129006 & SP11010y)

  GPG Approval: 23 July 2013 (Ref: 13153_IGc)
Part B. Technical Background

Note: No separate Technical Background (TB) document is available for Rec.131 (New July 2013).
Recommendation No. 132 “Human Element Recommendations for structural design of lighting, ventilation, vibration, noise, access and egress arrangements”

Part A. Revision History

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- **New (Dec 2013)**

  .1 **Origin:**

  ☑ Suggestion by IACS EG/GBS

  .2 **Main Reason for Change:**

  The Recommendation has been developed by EG/GBS in view of IMO GBS audits.

  .3 **List of non-IACS Member classification societies contributing through the TC Forum and/or participating in IACS Working Group:**

  None

  .4 **History of Decisions Made:**

  The recommendation was developed by EG/GBS. Contents of the Rec. 132 are related to SOLAS regulation II-1/3-6, UI SC191 and statutory requirements specified in MLC 2006. GPG approved the recommendation and requested EG/GBS to continue working on it with a view of preparing for IMO GBS audit.

  .5 **Other Resolutions Changes:**

  None

  .6 **Dates:**

  EG Approval: 15 November 2013 by EG/GBS

  GPG Approval: 05 December 2013 (Ref: 13248_IGb)
Part B. Technical Background

Note: No separate Technical Background (TB) document is available for Rec.132 (New Dec 2013).
Recommendation No.133
“Guidelines for Pilot Schemes of Extended Interval between Surveys in Dry-Dock - Extended Dry-docking (EDD) Scheme”

Part A. Revision History

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- **New (Nov 2013)**

1 Origin for Develop:

☑ Suggestion by IACS GPG

2 Main Reasons for Develop:

1. To consider the technical feasibility and practicality of carrying out an extended dry-docking (EDD) programme.

2. To develop an IACS Recommendation on Extended Dry Docking (EDD) to ensure and demonstrate that there is a common technical understanding amongst IACS Members on how such an EDD scheme will operate.

3 List of non-IACS Member classification societies contributing through the TC Forum and/or participating in IACS Working Group:

None.

4 History of Decisions Made:

Survey Panel initiated this discussion due to the declaration of one IACS Member that it would maintain reservation on IACS UR Z7.1 by adapting a new concept of dry docking survey scheme for allowing selected ships fulfilling the criteria to carry out 2 consecutive bottom surveys afloat.

At first round of discussion under PSU10016, Panel noted that the concept of extending dry docking is not a new concept but a simple extension of a survey interval based upon improved technologies. Panel discussed different aspects regarding carry out 2 consecutive bottom surveys afloat and reported to GPG for further instruction.

Panel involved in second round of discussion, based on GPG’s specific instructions, under PSU11016 with a view to develop common understanding among IACS Members. At first stage Panel concentrated on technical feasibility and practicality of carrying out an extended dry-docking (EDD) programme such as types of vessels which could enter in EDD scheme, specific survey requirements, how to conduct surveys for some specific items, availability of coating regimes etc.
Based on the outcome and agreement on various technical issues, Panel further developed an IACS guideline for EDD as pilot scheme. This IACS document recommends the acceptance procedure to a scheme which extends the interval between surveys in dry-dock. Ships eligible for the Extended Dry-Docking (EDD) scheme should meet the provisions and conditions described in this document.

.5 Other Resolutions Changes

None.

.6 Dates:

Original Proposal: 26 March 2010 by Survey Panel Chairman
Survey Panel Approval: 5 September 2013 during 18th Survey Panel Meeting
GPG Approval: 20 November 2013 (Ref: 10040aIGd)
Part B. Technical Background

Note: No Technical Background (TB) document has been prepared for Recommendation No.133 (New, Nov 2013).
**Recommendation No.134**  
“Boat Transfers Safe Practice”

**Part A. Revision History**

<table>
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- **New (Mar 2014)**

1 **Origin for Develop:**

- Suggestion by IACS GPG

2 **Main Reasons for Develop:**

This recommendation is intended to provide Societies with reference information to be used in developing Boat Transfer procedures or technical instructions for their Surveyors, according to a common reference standard of good practice.

3 **List of non-IACS Member classification societies contributing through the TC Forum and/or participating in IACS Working Group:**

None.

4 **History of Decisions Made:**

EG/SoS developed the recommendation as requested by GPG using a draft Procedure Requirement (PR) originally developed based on EG members’ expertise and members’ internal procedures and requirements for Boat Transfers.

5 **Other Resolutions Changes**

None.

6 **Dates:**

Original Proposal: 7 October 2013 by IACS GPG  
EG Approval: 20 January 2014 by EG/SoS  
GPG Approval: 05 March 2014 (Ref: 13055_IGq)
Part B. Technical Background

Note: No Technical Background (TB) document has been prepared for Recommendation No.134 (New, Mar 2014).
Recommendation No.135  
“Rooms for emergency fire pumps in cargo ships”

Part A. Revision History

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- **New (June 2014)**

1 Origin for Develop:

☑ Suggestion by an IACS Member

2 Main Reasons for Develop:

To downgrade UR M62 (Rooms for emergency fire pumps in cargo ships) to a new IACS Recommendation.

3 List of non-IACS Member classification societies contributing through the TC Forum and/or participating in IACS Working Group:

None.

4 History of Decisions Made:

A member proposed to either withdraw UR M62 or downgrade it to a Recommendation because this UR fails to meet attributes No. 5 "Technical Integrity" and 11 "Clarity" of a UR specified in IACS Procedures Vol. 1, C5.2.1 since the word "adequate" used for the rooms for emergency fire pumps in cargo ships, is vague and impossible to be uniformly apply by IACS Members (i.e. what one Society may consider to be adequate space may not be the same as that which other Societies consider to be adequate). After deliberations GPG agreed to withdraw UR M62 and develop a new IACS Recommendation containing the text of UR M62.

5 Other Resolutions Changes

None.

6 Dates:

Original Proposal: 21 June 2013 by an IACS member
GPG Approval: 10 June 2014 (Ref: 13075_IGl)
Part B. Technical Background

Note: No Technical Background (TB) document has been prepared for Recommendation No.135 (New, June 2014).
Recommendation No.136
“Guidelines for Working at Height”

Part A. Revision History

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- **New (June 2014)**

1 **Origin for Develop:**

☑ Suggestion by EG/SoS

2 **Main Reasons for Develop:**

A new Recommendation on “Working at Height” (WAH) was developed by EG/SOS, as Task No. 5 (WI2), to establish procedures designed to promote the safety of personnel when conducting WAH activities.

3 **List of non-IACS Member classification societies contributing through the TC Forum and/or participating in IACS Working Group:**

None.

4 **History of Decisions Made:**

Document was drafted with input from all EG members and reviewed and accepted by all EG members.

5 **Other Resolutions Changes**

None.

6 **Dates:**

- Original Proposal: May 2014 by EG/SoS
- EG/SoS Approval: 31 May 2014
- GPG Approval: 30 June 2014 (Ref: 14091_IGb)
Part B. Technical Background

Annex 1. **TB for New (June 2014)**

See separate TB document in Annex 1.
Technical Background (TB) document for IACS Recommendation 136
(New, June 2014)

1 Scope and objectives

It is recommended that IACS Societies consider the information contained in this document when establishing procedures designed to promote the safety of their personnel when conducting Working at Height (WAH) activities. The recommended practices contained herein apply specifically to survey activities carried out on existing vessels, during new construction, at repair yards and in vendors’ fabrication shops and facilities. Individual Societies’ procedures should also take into account relevant occupational safety and health regulatory requirements applicable at locations where such work is conducted.

2 Engineering background for technical basis and rationale

IACS Societies’ survey staffs are frequently required to work at heights when carrying out their duties. Such work can be hazardous if appropriate safety procedures are not fully implemented. IACS has not, until now, provided members with specific guidance regarding WAH. This Recommendation is intended to provide such guidance.

3 Source/derivation of the proposed IACS Resolution

- EG member expertise
- EG member internal procedures and requirements for WAH
- See also referenced documents in the Guidelines

4 Summary of Changes intended for the revised Resolution

This is the original draft resolution. No changes are intended at this point.

5 Points of discussions or possible discussions

- The responsibility to develop appropriate guidance was assigned to a small working group. A draft was developed which was submitted to all EG members in late 2013.
- The document was then subject to various reviews and comments by EG members.
- The Recommendations are based upon recognized standards and members’ own practical experience.
- All EG members that attended the annual group meeting of 25 to 27 February 2014 participated in the review of the document that was brought into completion as a final draft.
- Final clean up and formatting was reassigned to the subgroup.
- The final draft was submitted again to all EG members and, following further adjustments, it was accepted by the group on 30 May 2014.

6 Attachments if any

None
Recommendation No.137
“Recommendation for protection of socket outlets for road freight units”

Part A. Revision History

<table>
<thead>
<tr>
<th>Version no.</th>
<th>Approval date</th>
<th>Implementation date when applicable</th>
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</thead>
<tbody>
<tr>
<td>New (Oct 2014)</td>
<td>02 October 2014</td>
<td>-</td>
</tr>
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</table>

- **New (October 2014)**

1 Origin for Develop:

☑ Suggestion by MAIB through Machinery Panel

2 Main Reasons for Develop:

As a result of a fire on the main vehicle deck of a ro-ro passenger vessel (MAIB Safety Bulletin 3/2010 refers), IACS was asked by the UK Marine Accident Investigation Branch to address the issue of electrical fault protection systems installed in electrical power circuits supplying road freight units stored on vehicle deck, special category and ro-ro spaces. Upon further consideration, IACS agreed that a Recommendation would be the most suitable instrument to address this issue.

3 List of non-IACS Member classification societies contributing through the TC Forum and/or participating in IACS Working Group:

None.

4 History of Decisions Made:

Machinery Panel agreed to develop an IACS Recommendation to ensure that power supply cables and fittings provided for refrigerated trailer units are in good condition and that electrical protection devices activate at an appropriate level. Form A was developed for task No: PM11924. Recommendation developed by Machinery Panel was approved by GPG.

5 Other Resolutions Changes

None.

6 Dates:

Original Proposal: 14 February 2013
Panel Approval: 01 September 2014 (By Machinery Panel)
GPG Approval: 02 October 2014 (Ref: 13050_Igc)
Part B. Technical Background

Note: There is no Technical Background (TB) document developed for Rec 137 (New, Oct 2014).
Recommendation No. 138
“Recommendation for the FMEA process for diesel engine control systems”

Part A. Revision History

<table>
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<th>Implementation date when applicable</th>
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</thead>
<tbody>
<tr>
<td>New (Dec 2014)</td>
<td>11 December 2014</td>
<td>-</td>
</tr>
</tbody>
</table>

- **New (Dec 2014)**

.1 Origin for original version:

☑ Suggestion by IACS member

.2 Main Reason for proposal:

Based on CIMAC WG 15 (through WG 2) request from 2012-08-20 towards IACS Machinery Panel to provide guidance for a uniform approach for the FMEA as required in IACS UR M44.

.3 List of non-IACS Member Classification Societies contributing through the TC Forum and/or participating in IACS Working Group:

None

.4 History of Decisions Made:

A first draft of the document was agreed unanimously at the 19th Machinery Panel meeting (February 2014) and subsequently circulated to CIMAC for comments. Comments from CIMAC WG 2 and WG 15 were received on 2014-06-16, reviewed by the Panel, and incorporated in the Recommendation as appropriate.

.5 Other Resolutions Changes

Refer UR M44.

.6 Dates:

Original Proposal: 22 July 2014, Made by: Machinery Panel
Panel Approval: 10 November 2014 (Ref: PM12918_IMl)
GPG Approval: 11 December 2014 (Ref: 13000_1Gc)
Part B. Technical Background

List of Technical Background (TB) documents:

Annex 1. TB for New (Dec 2014)

See separate TB document in Annex 1.
Technical Background (TB) document for Rec. 138 (New Dec 2014)

1. Scope and objectives

To provide guidance on the FMEA process and documentation as required in UR M44.

2. Engineering background for technical basis and rationale

IACS UR M44 defines the documents required for the approval of diesel engines. For engine control systems, the following item and respective footnote is listed in Table 1 of UR M44:

<table>
<thead>
<tr>
<th></th>
<th>FMEA (for engine control system)</th>
</tr>
</thead>
<tbody>
<tr>
<td>25</td>
<td></td>
</tr>
</tbody>
</table>

Where engines rely on hydraulic, pneumatic or electronic control of fuel injection and/or valves, a failure mode and effects analysis (FMEA) is to be submitted to demonstrate that single failure of the control system will not result in the operation of the engine being degraded beyond acceptable performance criteria for the engine. The FMEA reports required will not be explicitly approved by the classification society.

FMEA is a widely used tool to support the design process of complex and innovative designs. While there are a range of standards and accepted industry practices available, experience shows that FMEA submitted to class as required by UR M44 for engine control systems vary significantly in scope, process and documentation.

The Recommendation was developed in response to a request from CIMAC for guidance on a uniform approach towards this particular FMEA application. It draws on existing standards, experience gained since the introduction of the FMEA requirement in UR M44 and current industry practice. The focus lies on the process and documentation requirements. More general aspects of the FMEA method are readily available in the literature and not covered by this Recommendation.

3. Source/derivation of the proposed IACS Resolution

The provisions of this Recommendation are based on:
- Recognized standards such as HSC-Code Annex 3 and Annex 4 and IMCA M 166
- Experience gained in the application of the FMEA requirement since its introduction
- Current industry practice
- CIMAC WG 15 document ‘Information towards IACS Machinery Panel: Input to FMEA requirements as defined in UR M44’ dated 20 August 2012

4. Summary of Changes intended for the revised Resolution:

N/A

5. Points of discussions or possible discussions

The Recommendation was agreed unanimously at the 19th Machinery Panel meeting (February 2014) and subsequently submitted to CIMAC for comment. Comments
received from CIMAC were reviewed by the Panel, incorporated as appropriate and the Panel position on individual items returned to CIMAC (see attachments).

6. Attachments if any

Attachments 1:
CIMAC WG 15 ‘Information towards IACS Machinery Panel: Input to FMEA requirements as defined in UR M44’ dated 20 August 2012

Attachment 2:
Comments received from CIMAC WG 15 with Machinery Panel positions

Attachment 3:
Comments received from CIMAC WG 2 with Machinery Panel positions
Information towards IACS Machinery Panel

R.Boom/chairman/WG15 20.08.2012

Subject: Input to FMEA requirements as defined in UR M44

Background

The IACS Machinery Panel has requested CIMAC to deliver input to the FMEA requirements, which are described in UR M44. A recurring theme from the engine industry has been the variation in documentation requirements from the different classification societies. A more unified requirement would be of the benefit of the classification societies and industry.

CIMAC WG15 members are active in the 2- and 4-stroke engine control and automation system and responsible for control system architecture, software and hardware design and final system integration. The failure mode effect analysis (FMEA) is a commonly used tool in control- and safety systems designs. The pragmatic experiences with the FMEA as a tool are valuable assets, which enables the CIMAC WG15 members to provide input to the IACS Machinery Panel.

M44

M44 defines the required documents for the approval of diesel engines. M44 requires under item #28 a schematic diagram of engine control and safety system on the engine. Item #28 is identified with an „A“ as being documentation to be approved by Classification Society. A footnote is made to item #28 stating the following:

6. and the system so far as supplied by the engine manufacturer. Where engines incorporate electronic control systems a failure mode and effects analysis (FMEA) is to be submitted to demonstrate that failure of an electronic control system will not result in the loss of essential services for the operation of the engine and that operation of the engine will not be lost or degraded beyond an acceptable performance criteria of the engine.

An additional note is made to the above footnote

The FMEA reports required by FOOTNOTE 6 will not be explicitly approved by the Classification Society

The M44 doesn’t define a format on how the requested FMEA information needs to be presented. This is left to the judgement of the submitting engine builder and individual classification society. A minimum documentation requirement definition is
considered to be useful to perform a proper assessment of the FMEA work and results.

Proposal

CIMAC WG15 proposes that there will be no format requirements be specified in M44. The objective of M44 should be that the requested information is used to verify an FMEA has been done as part of the design and validation of the engine control- and safety system. The submitted documentation needs to provide the classification society the proof that the FMEA has been used to identify and mitigate risks to an acceptable level.

The submitted FMEA documentation should contain therefore the following as an absolute minimum, but not limited to:

- General information:
  - Description of the engine application, primarily defining:
    - Single main engine propulsion
    - Multiple engines (D/E and D/M)
    - Auxiliary engine
    - Emergency engines
  - Specification: The specification from shipyard which identifies the control- and safety system definition and identifies the requirements

- The overall electronic control- and safety system boundaries to be subject for FMEA. The FMEA is considered to be applicable to the control- and safety system of the engine only:
  - Block diagram
  - I/O signal specification
  - Interface signal specification
  - Monitoring system - HMI
  - Network connection – CAN bus, Ethernet,...
  - Sensors
  - Actuators
  - Protection – ground fault for example
  - Hardwired safety circuits
  - Power supply arrangement

- Acceptance criteria for the electronic control- and safety system performance
  - List of acceptable "consequences"
  - List of NOT acceptable "consequences"
  - Application specific exemptions

- Design intent(s) and system operational modes for the electronic control system
  - Functional description
  - Description of manual operation,
  - Description of local/remote mode
  - List specific environmental issues, like EMC
- Consider E10 requirements for electronic modules/hardware
  - Describe redundancy if required
  - Power supply requirements
  - Alarms/warnings
  - Control & safety system – separation – independency

- All component groups included within the electronic control system boundary.
  The relevant system names, main units and their main intended functions shall be presented in a structured manner, supported with a descriptive narrative text.
  - Listing of components
  - Part list
  - Descriptive narrative text to support Block Diagram
  - Processor module, I/O modules make clear
  - Split system in "independent" processors – multiple CPU based systems
  - Describe how multiple CPU operate from a concept/system architecture perspective
  - Distributed control system architecture

- All assumptions related to systems interfaces and dependencies of external systems
  - Di-electrical isolation
  - Quality of power supply
  - Pneumatic / hydraulic systems – actuators
  - Cables and connectors
  - Type of contacts – dry contact/open collector type/...

- Single failure and common cause analysis at electronic control system levels
  - Single failure is different from common cause
    - Common cause: over/under voltage for example
    - Single failure: wire break for example
  - All excessive environmental conditions – use of type approved hardware
  - Cabling/termination examples

- A reference to a test program to support the conclusions shall be included or referred
  - Based on FMEA analysis – outcome of the FMEA when used as the tool
  - Test program will follow from specification

CIMAC WG15 has reviewed the recommended practice document from DNV (DNV-RP-D102). This document is considered a good reference document for the M44 requirements. The document provides good examples on the above listed documentation requirements.
Subject: Comments to the PM12918 draft IACS recommendation for FMEA requirements for UR M44

Dear Mr. Peter Baum-Müller,

Within the CIMAC WG15 we have discussed and evaluated the draft document from the IACS Machinery Panel, PM12918, on the FMEA requirements per UR M44. As a result the WG15 has identified several areas where additional clarification is required and comments on the draft text. In some cases an alternative text or suggestion is provided. In this document the WG15 comments are categorized by chapter and paragraph, as per draft PM12981 document.

The title of the document refers to Diesel engines only.

- Why is the document referring to Diesel engines only?

1.1
The reference does not seem to refer to the newest released version of UR M44. It would probably be as relevant to refer to UR E22, in which the design documentation to form the basis for the FMEA is already specified.

- Why are there “nested” references and duplications between UR M44 and UR E22?
- Are there any other cross-references taken into consideration?

1.2.3.
The reference to the standard IEC60812 implies a bottom up approach while the UR M44 tries to do a top down approach.

It’s therefore suggested to consider deleting paragraph 1.2.3. As it’s incomplete, not precise and inconsistent. In addition it referred as an example only.

1.3.3.
This paragraph is stating the obvious about the FMEA as a development tool.

- What is the purpose of having this paragraph?

Or specifically the sentence “Any failure mode which may cause an effect on the system beyond previously agreed acceptance criteria shall be mitigated by system or equipment redundancy”

Note: Equipment redundancy is not the only countermeasure against unacceptable risk.

1.3.4
It’s suggested to consider modifying the text as “The assumptions stated within the FMEA shall be confirmed within the development process”
1.4
It has been noted that the definition of safety given in the acronyms and definition overview is not the same as which is defined in the IEC 61508. It’s therefore suggested to consider to remove the reference to IEC61508 from the safety definition.

It has been noted that the functional safety is not used in the document. The suggestion is to remove it from the acronyms and definition overview.

It has been noted that the CCF is only explained as the acronym for common cause failure. It’s suggested to provide an additional explanation. For example: *Failures of different items, resulting from a single event, where these failures are not consequences of each other.*

It’s suggested to consider to modify the definition of FMEA by replacing *demonstrate that no single failure will cause an undesired event* with *identify the potential failure modes, their causes and effects on the performance of a system*.

2
The draft document describes the FMEA document to be a self contained and stand alone document. To the opinion of WG15 this should not be required. The FMEA is a part of the total package of documents that is required and defined in UR E22. Therefore it should be allowed to refer to existing documents.

It’s noted that in figure 1. there is step “10” defined, as input to the test program. This step is not part of the FMEA process itself. It’ suggested to delete this step from the document.

Figure 1. is specifically labeled as an example.

- Does this mean there could be a deviation from the example and follow a different process?

The 10 steps from the example are a collection of inputs, FMEA process and outputs. It’s suggested to consider to visualize in the diagram what is considered input, what is the FMEA process and what is the output.

2.1.
The generation of the system description, as specified in section 2.1, is not a part of the FMEA process. It is assumed that these descriptions are available before the FMEA process is started. This is considered an essential INPUT for the FMEA process itself and not part of the FMEA process.

2.1.3.
The sentence “Redundancy level and nature of the redundancies, separation independency” is not clear.

- What is exactly meant with these words? i.e. the word redundancies is typically used in other contexts.

2.1.4.
Evidence of hardware type approval is already required as part of the engine documentation. It seems irrelevant as input to an FMEA, especially if this is made as part of the design process, it can only be assumed that the components are appropriate for the purpose, - alternatively requirements to components are identified during the elaboration of the FMEA.

2.2.
It’s noted that 2.2 is an INPUT required for the FMEA process itself and not part of the FMEA process.

2.4.
Is it relevant to consider two levels, engine and engine application? If the first level is enough, inclusion of a second level will introduce an unnecessary overhead.
Part B, Annex 1

It’s suggested to consider to remove the text about the two levels.

2.5.
It’s suggested to include a manual inspection as a possible detection method.

2.10.
Is an OUTPUT of the FMEA process

Note: This is a requirement to the test specification, not to the FMEA. It is already specified in M50, sec. 3.3.5 and M51, sec. 1.5. This section could be moved to E22. If wished to be included here, it could be changed to a guiding note of: The FMEA should be an input to the development of test specifications in general and particularly for identification of relevant test to be done during Type Approval Test (TAT) and Factory Acceptance Test (FAT) respectively.

3
WG15 considers the FMEA process as a development tool. The FMEA process is an essential part of the complete development process. Already existing documents from the development process should not be duplicated into an FMEA report. I.e. the FMEA report should not be a self contained document in that respect. The requested information, as described as the FMEA report, is partly redundant. I.e. information is already available and considered essential input to the FMEA process.

Therefore it’s suggested to consider to delete the requirement that the FMEA report has to be a self contained and stand alone report. The FMEA report should be a part of the complete engine documentation per UR E22.

I hope the above comments and suggestions are of value to the IACS MP and I’m looking forward to their comments.

Yours sincerely,

Rick Boom
Chairman CIMAC WG15
### Attachment 3

**Template for comments and IACS MP observations**

<table>
<thead>
<tr>
<th>Comp. / NMA¹</th>
<th>Clause/ Subclause</th>
<th>Paragraph/ Figure/ Table</th>
<th>Type of comment²</th>
<th>Comments</th>
<th>Proposed change</th>
<th>Observations of IACS Machinery Panel</th>
</tr>
</thead>
<tbody>
<tr>
<td>MTU</td>
<td>M44 FMEA</td>
<td></td>
<td></td>
<td>&quot;diesen Entwurf zur FMEA Durchführung sehen wir als unkritisch. Es wird immer nur von „Empfehlung-recommendation“ und „sollte-should“ gesprochen.</td>
<td></td>
<td>IACS documents should refer to international standards.</td>
</tr>
<tr>
<td></td>
<td>1.2.3</td>
<td></td>
<td></td>
<td>Unter 1.2.3 werden Standards (IEC 60812, HSC-Code Annex 3 and Annex 4 and IMCA M 166) zur FMEA-Durchführung genannt. Die MTU hat sich an den VDA 4-2012 angelehnt. Es wäre hier sinnvoll, wenn dieser VDA-Standard auch aufgeführt wird.</td>
<td></td>
<td>The Recommendation suggests a more practical approach for the present application than a &quot;standard&quot; FMEA/FMECA, which is top-down. IACS documents should refer to international standards.</td>
</tr>
<tr>
<td>MDT</td>
<td>M44 FMEA</td>
<td></td>
<td></td>
<td>See comments by MDT below</td>
<td></td>
<td></td>
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<tr>
<td>Cummins</td>
<td>M44 FMEA</td>
<td>1.3.4</td>
<td></td>
<td>By the nature of FMEA, some of the failure modes will be at extremes of operating parameters (voltage, current, temperature, pressure, etc.) not likely to occur during normal situations. Requiring a test to be performed is not necessary, when engineering judgment, analysis, past experience and/or other inputs to the FMEA lead to a conclusion of failure. For example, what is gained by predicting a failure in the FMEA, and then conducting a test to confirm the FMEA is right (and damaging or destroying parts/assemblies/engines in the process)?</td>
<td>Since the FMEA is a rigorous and cross-functional exercise, and the final FMEA document can stand on it's own merits, I submit that a validation test is unnecessary. Section 1.3.4 should be removed.</td>
<td>Text modified to: Test programme of selected items. Test programme to be agreed with classification society.</td>
</tr>
</tbody>
</table>

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¹ Company or National Member Association (NMA - enter the ISO 3166 two-letter country code, e.g. CN for China)
² Type of comment:  **ge** = general  **te** = technical  **ed** = editorial

IACS documents commenting template/version 2014-04
# Recomendation for the FMEA process - Comments by MDT

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<th>ID</th>
<th>Page no.</th>
<th>Reference</th>
<th>Comment</th>
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<tr>
<td>5</td>
<td>1</td>
<td>1.1</td>
<td>The reference does not seem to refer to the newest released version of UR M44. It would probably be as relevant to refer to UR E22, in which the design documentation to form the basis for the FMEA is already specified.</td>
</tr>
<tr>
<td>6</td>
<td>3</td>
<td>2.1</td>
<td>Evidence of hardware type approval is already required as part of the engine documentation. It seems irrelevant as input to an FMEA, especially if this is made as part of the design process, it can only be assumed that the components are appropriate for the purpose, - alternatively requirements to components are identified during the elaboration of the FMEA.</td>
</tr>
<tr>
<td>7</td>
<td>4</td>
<td>2.1.4</td>
<td>This is a requirement to the test specification, not to the FMEA. It is already specified in M50, sec. 3.3.5 and M51, sec. 1.5. This section could be moved to E22. It wished to be included here, it could be changed to a guiding note of: The FMEA should be an input to the development of test specifications in general and particularly for identification of relevant test to be done during Type Approval Test (TAT) and Factory Acceptance Test (FAT) respectively.</td>
</tr>
<tr>
<td>8</td>
<td>6</td>
<td>2.10</td>
<td>The objective of the analysis should be the actual design, which means that the actual design documentation would be the most relevant to use, i.e. a list of referenced documentation of specific version should be appropriate (or even better) for the analysis. It will be an advantage to base the analysis on documentation which is elaborated and used also for other purposes, 1) to avoid analysis based on branched ‘dead’ documentation, which is not kept up to date during design process, 2) to promote the analysis to be an integrated process of the development, and 3) to limit the work of the analysis, which otherwise may suffer in resources and thereby in quality. I.e. the FMEA documentation should be an item in the engine control system documentation package, instead that the engine documentation are items in the FMEA package (ref. UR E22).</td>
</tr>
<tr>
<td>9</td>
<td>6</td>
<td>3.1</td>
<td>The objective of the analysis should be the actual design, which means that the actual design documentation would be the most relevant to use, i.e. a list of referenced documentation of specific version should be appropriate (or even better) for the analysis. It will be an advantage to base the analysis on documentation which is elaborated and used also for other purposes, 1) to avoid analysis based on branched ‘dead’ documentation, which is not kept up to date during design process, 2) to promote the analysis to be an integrated process of the development, and 3) to limit the work of the analysis, which otherwise may suffer in resources and thereby in quality. I.e. the FMEA documentation should be an item in the engine control system documentation package, instead that the engine documentation are items in the FMEA package (ref. UR E22).</td>
</tr>
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</table>

1 Company or National Member Association (NMA - enter the ISO 3166 two-letter country code, e.g. CN for China)
2 Type of comment:   
   ge = general   
   te = technical   
   ed = editorial

IACS documents commenting template/version 2014-04
### Template for comments and IACS MP observations

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<th>Company or National Member Association</th>
<th>Type of comment</th>
<th>Comment</th>
</tr>
</thead>
</table>
| 1  |      |                                         | ge             | "What is the difference between a FMECA and the approach described in this document? If a FMECA is required, it would be better to call it a FMECA."
| 2  |      |                                         | ed             | "Any failure mode which is not operating correctly should be identified and removed or reconfigured."
| 3  |      |                                         | ge             | "Remove 'by system or equipment redundancy'. (There are other means to mitigate an undesired effect than redundancy.)"
| 4  |      |                                         | ed             | "Include the term 'FMECA' - if required."
| 5  |      |                                         | ed             | "Define the term 'Common Cause Failure'. Proposal: 'Failures of different items, resulting from a single event, where these failures are not consequences of each other'."
| 6  |      |                                         | ge             | "Replace 'demonstrate that no single failure will cause an undesired event' with 'identify the potential failure modes, their causes and effects on the performance of a system'."
| 7  |      |                                         | ed             | "This definition should be complyed with throughout the document!"
| 8  |      |                                         | ge             | "Functional Sa [IEC 61508] should be defined in the 'References' section."
| 9  |      |                                         | ge             | "The FMEA report shall be included in the documentation."
| 10 |      |                                         | ed             | "This activity belongs to test planning - not FMEA."
| 11 |      |                                         | ed             | "Production of the system description, as specified in section 2.1, is not a part of the FMEA process. It is assumed that these descriptions are available before the FMEA process is started."
| 12 |      |                                         | ed             | "The interval: '1 event in 10 to 1 event in 1 engines per year in engine operation' is missing!"
| 13 |      |                                         | ed             | "Is it relevant to consider two levels, engine and engine application? If the first level is enough, inclusion of a second level will introduce an unnecessary overhead."
| 14 |      |                                         | ed             | "Remove section 2.10 and include the information in the test plan."
| 15 |      |                                         | ed             | "This should be provided through references to existing documentation."
| 16 |      |                                         | ed             | "As well as the reference to"

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IACS Machinery Panel: Answers to most comments by MDT are provided in CIMAC WG 15 document ‘Comments to the PM12918 draft IACS recommendation for FMEA requirements for UR M44’ dated 21.05.2014.

ID 10: 1.2.2: FMEA may also include assessment of severity and probability, see e.g. HSC Code

---

1. **Company or National Member Association** (NMA - enter the ISO 3166 two-letter country code, e.g. CN for China)
2. **Type of comment:** ge = general, te = technical, ed = editorial

*IACS documents commenting template/version 2014-04*
Recommendation No. 139 “Guidelines on Approval of Hull Steels with Improved Fatigue Properties”

Part A. Revision History

<table>
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<tr>
<th>Version no.</th>
<th>Approval date</th>
<th>Implementation date when applicable</th>
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<tbody>
<tr>
<td>New (Feb 2015)</td>
<td>2 February 2015</td>
<td>-</td>
</tr>
</tbody>
</table>

- **New (Feb 2015)**

1 **Origin for Change:**

☐ Suggestion by IACS Members

2 **Main Reason for Change:**

None – new document.

3 **List of non-IACS Member classification societies contributing through the TC Forum and/or participating in IACS Working Group:**

None

4 **History of Decisions Made:**


5 **Other Resolutions Changes**

None

6 **Dates:**

EG/MW Approval: 12 January 2015
GPG Approval: 2 February 2015 (Ref: 12108 _IGj)
Part B. Technical Background

Annex 1. TB for Rec. 139 (New, Feb 2015)

See separate TB document in Annex 1.
Technical Background document for Rec. 139 (New, Feb 2015)

1. Scope and objectives

The Japanese steel industry has developed hull steels with improved fatigue properties to retard the initiation of and propagation of fatigue cracks (fatigue resistant steels). Application of fatigue resistant steels for various vessels such as bulk carriers, oil tankers, LPG/LNG tankers, PCC, etc. will have huge benefits to the marine construction industry especially in design hot spots known to have high risk fatigue cracking. IACS recognized that it is necessary to develop the recommendation (Rec.) on fatigue resistant steels covering following items;

- Material specification
- Manufacturing approval scheme
- Production testing requirement.

2. Engineering background for technical basis and rationale

Several issues were highlighted that IACS needed to address:

a) Fatigue resistant steels are hull structural steels. The mechanical properties and chemical composition of fatigue resistant steels shall conform to those of conventional hull structural steels.

b) The criteria S-N curves are specified as key material specification of the fatigue resistant steels considering that the fatigue crack growth rate can not be directly applied to the calculation of cumulative fatigue damage which is common practice of shipbuilding industry.

c) The criteria S-N curves are based on the fatigue test results of the fatigue resistant steels. Because the curves were drawn under all the test data, the degree of confidence of the said criteria S-N curves corresponds to 100%.

d) The negative inverse slope of the criteria S-N curves are set based on the analysis of fatigue test results of the fatigue resistant steels. The same negative inverse slope of conventional steels (Haibach’s modification) is applied to the fatigue resistant steels in the range of Nf > $10^7$ (Nf: number of cycles to failure) since no fatigue test results of the fatigue resistant steels are available in the same range.

e) The fatigue life of transverse non-load-carrying fillet welded joint and longitudinal fillet welded gusset of fatigue resistant steels is respectively set two (2) times longer than that of conventional steels at specific stress range corresponding to Nf of $2 \times 10^6$ cycles on the basic design S-N curve of UK HSE (DEn).

f) The following two (2) kinds of welded joints are specified for evaluation since these kinds of joints are typical component joints for fatigue evaluation:
1) Transverse non-load-carrying fillet welded joint
2) Longitudinal fillet welded gusset.

For production testing, the kind of welded joint for fatigue test is to be agreed between the steel manufacturer and the purchaser, unless otherwise specified by the Classification Society, since the shipyard needs the fatigue test results for the specific type of welded joint considering the intended structural members to which the fatigue resistant steels are applied.

g) Dimensions of fatigue test specimens are specified with reference to the recognized standard and the relevant fatigue test specimens of the fatigue resistant steels tested. Thickness of test specimen is specified as 22mm since the thickness is considered as standard thickness of the fatigue test specimens in UK HSE (DEn).

(h) On the occasion of manufacturing approval, fatigue tests of conventional steels are required in addition to fatigue tests of fatigue resistant steels. The purpose of fatigue tests for conventional steels as well as fatigue resistant steels is to confirm that the fatigue strength of welded joints of the fatigue resistant steels is not improved by the welding procedures including bead profiles.

i) For stress range of fatigue test, $70\text{N/mm}^2$ and $150\text{N/mm}^2$ are specified as representative stress ranges of the criteria S-N curves. On the occasion of manufacturing approval, three (3) additional stress ranges are required for the fatigue test in order to enhance the reliability of the fatigue test results. Stress condition of fatigue test for transverse non-load-carrying fillet welded joint is specified by the stress range and the maximum stress of the specified minimum yield strength of the test steel, whereas that of longitudinal fillet welded gusset is specified by the stress range and the stress ratio, considering that fatigue test specimens of transverse non-load-carrying fillet welded joint tend to have lesser welding residual stress compared with that of actual welded structures.

j) The specified criteria S-N curves are only intended to be used for the purpose of approval of fatigue resistant steels, and not intended to be used for design approval purpose to determine the fatigue life of structures which utilise these steels, since the S-N curves intended for design approval purpose should be established by each Classification Society based on the relevant expertise of the fatigue resistant steels for the design approval.

3. Source/derivation of the proposed IACS Resolution

None

4. Summary of Changes intended for the revised Resolution:

Not applicable
5. Points of discussions or possible discussions

None

6. Attachments if any

None
Recommendation No. 140 “Recommendation for safe precautions during Survey and Testing of Pressurized Systems”

Part A. Revision History

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<th>Version no.</th>
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<td>New (June 2015)</td>
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- **New (June 2015)**

1 **Origin for Change:**

☐ Suggestion by IACS Members

2 **Main Reason for Change:**

None – new document.

3 **List of non-IACS Member classification societies contributing through the TC Forum and/or participating in IACS Working Group:**

None

4 **History of Decisions Made:**

- Document was drafted with input from all EG/SOS members
- Document was reviewed and accepted by all EG/SOS members


5 **Other Resolutions Changes**

None

6 **Dates:**

Original Task Proposal to GPG: March 2013 by EG/SOS
EG/SOS Approval: 31 August 2014
GPG Approval: 1 June 2015 (Ref: 14174_IGI)
Part B. Technical Background

Technical Background (TB) documents for Rec.140:

Annex 1. TB for New (June 2015)

See separate TB document in Annex 1.
1. **Scope and objectives**

The proposed Recommendation provides guidance for IACS societies when establishing procedures for the witnessing of pressure tests by class society personnel. The Recommendation has been developed to promote the safety of class society personnel when conducting inspections of items and systems under pressure. It applies to survey activities carried out on existing vessels, at new construction, in repair yards and at vendors’ fabrication shops and facilities. Societies may recommend the measures outlined in the Guidelines as applicable and also should meet any relevant occupational safety and health legislative requirements in place at locations where work is conducted.

2. **Engineering background for technical basis and rationale**

The marine industry continues to have relevant incidents and even fatalities when personnel are dealing with Pressure Tests and Pressurized Items. IACS has, until now, not had any specific requirements placed on members regarding these activities; this Recommendation provides guidance for surveyors and industry. The recommendations in this document are being used by one or more of the member societies and have been found to be practical.

3. **Source/derivation of the proposed IACS Resolution**

- EG member expertise
- EG member internal procedures and requirements
- See also referenced documents in the Guidelines

4. **Summary of Changes intended for the revised Resolution:**

This is the original draft resolution. No changes are intended at this point.

5. **Points of discussions or possible discussions**

- The document was initially assigned to a small group who completed the draft during first half of 2014 and the Chairman submitted the initial draft to all EG members, by July of 2014.
- The document was subject to various reviews and comments until the end of August 2014. The Guidelines are based upon recognized standards and did not cause any relevant controversy during the process.
- All members have participated, by emails and telecom, in the review of the document that was brought into completion of a final draft.

6. **Attachments if any**

None
Recommendation No. 141 “Guidelines for the Assessment of Safety Aspects at Workplace”

Part A. Revision History

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- **New (July 2015)**

1. Origin for Change:

☐ Suggestion by IACS Member

2. Main Reason for Change:

Surveyors continue to face significant occupational safety and health hazards as they undertake their work on third party sites. This informative document is intended to increase awareness of health and safety hazards to class Surveyors and also the maritime industry.

3. List of non-IACS Member classification societies contributing through the TC Forum and/or participating in IACS Working Group:

None

4. History of Decisions Made:

- Document was drafted with input from all EG members
- Document was reviewed and accepted by all EG members
- Document was commented on by Survey Panel.
- EG SoS members reviewed comments of Survey Panel.
- Document was updated to Draft Rev 1 on 16th April 2015.
- Document title changed to “Guidelines for the Assessment of Safety Aspects at Workplace”

5. Other Resolutions Changes

None

6. Dates:

Original Task Proposal to GPG: March 2013 by EG/SOS
EG/SOS Approval: 31 December 2014
GPG Approval: 12 July 2015 (Ref: 14210_IGi)
Part B. Technical Background

Technical Background (TB) documents for Rec.141:

Annex 1. TB for New (July 2015)

See separate TB document in Annex 1.
Technical Background document for Rec. 141 (New, July 2015)

1. Scope and objectives

The proposed Recommendation provides guidance for IACS societies when establishing procedures for the “Guidelines for Shipyards Health & Safety Assessment”. The Recommendation has been developed to promote the safety of class society personnel when conducting inspections at the Shipyards. It applies to survey activities carried out at new construction yards and repair yards. Societies may recommend the measures outlined in the Guidelines as applicable and also should meet any relevant occupational safety and health legislative requirements in place at locations where work is conducted.

2. Engineering background for technical basis and rationale

The marine industry continues to have relevant incidents and even fatalities when personnel are working in Shipyards. Unfortunately, this may include CS’s surveyors. IACS has, until now, not had any specific requirements placed on members regarding these activities; this Recommendation provides guidance for surveyors and industry. The recommendations in this document are being used by one or more of the member societies and have been found to be practical.

3. Source/derivation of the proposed IACS Resolution

- EG member expertise
- EG member internal procedures and requirements
- See also referenced documents in the Guidelines

4. Summary of Changes intended for the revised Resolution:

This is the original draft resolution. No changes are intended at this point.

5. Points of discussions or possible discussions

- The document was initially assigned to a small group who completed the draft by October 2014 and the Chairman submitted the initial draft to all EG members, by beginning of November 2014.
- The document was subject to various reviews and comments until the end of December 2014. The Guidelines are based upon recognized standards and did not cause any relevant controversy during the process.
- All members have participated, by emails and telecom, in the review of the document that was brought into completion of a final draft.

6. Attachments if any

None
Recommendation No.142
“LNG Bunkering Guidelines”

Part A. Revision History

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- **New (June 2016)**

  **.1 Origin for Change:**
  ✔️ Suggestion by IACS member

  **.2 Main Reason for Change:**

  As a consequence of rapid technological and operational developments in using LNG as a fuel for cargo and passenger ships, IACS Council agreed, as a part of the IACS strategy plan, to develop LNG bunkering guidelines based on international/national standards as well as relevant and available Class documents, in order to enhance and promote the safety of ships undertaking LNG bunkering operations and to be made available to the industry.

  **.3 List of non-IACS Member Classification Societies contributing through the TC Forum and/or participating in IACS Working Group:**

  None

  **.4 History of Decisions Made:**

  The draft Recommendation was circulated to relevant industry partners in December 2015 for their review and comments. GPG re-activated the Project Team which developed Recommendation 142 with a task to review received proposals, suggestions and comments and incorporate them where seemed appropriate and necessary.

  **.5 Other Resolutions Changes**

  None

  **.6 Dates:**

  Original Proposal: May 2014 by SC/Strategy
  Panel Approval: 2 June 2016 (Ref: PM14915)
  GPG Approval: 22 June 2016 (Ref: 14102_IGr)
Part B. Technical Background

List of Technical Background (TB) documents for Rec.142:

Note: There is no Technical Background (TB) document available for New (June 2016).
Recommendation No. 143
“Recommended procedure for the determination of contents of metals and other contaminants in a closed fresh water system lubricated stern tube”

Part A. Revision History

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<td>New (Oct 2015)</td>
<td>9 Oct 2015</td>
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• **New (Oct 2015)**

.1 Origin for Develop:

☑ Other *(Suggestion by GPG)*

.2 Main Reasons for Develop:

Following the issue of the approved revision 3 of UR Z21 related to the propeller shaft surveys, GPG tasked the Survey Panel to draft a new recommendation dealing with the procedures for the “fresh water sample test” related to the lubricating media of the propulsion shafts lubricated by fresh water in closed loop.

.3 List of non-IACS Member classification societies contributing through the TC Forum and/or participating in IACS Working Group:

None

.4 History of Decisions Made:

Survey Panel started the discussion under the task 15005 by making reference to the IACS Recommendation 36, dealing with the procedure for the determination of contents of metals and other contaminants in stern tube lubricating oil, and concurred that the structure of the new recommendation should be based on this.

A first draft was prepared and examined with the cooperation of the Members who has the greater experience on these propulsion systems using fresh water in closed loop.

At the 21st Panel meeting the frame of the drafted guideline has been discussed by leaving aside the particular relevant to the elements to be verified during the test of the samples and their allowable content limits. The Panel tasked the Members having the experience on these systems to suggest, according to their backgrounds and feedbacks, the list of elements to be examined and the related allowable content limits in to the lubricant media.

Machinery Panel Members provided their comments that have been dealt with by the Survey Panel Members. The editorial comments have been analysed and applied as appropriate.
Finally Survey Panel agreed the final draft of the new recommendation during the 22\textsuperscript{nd} Survey Panel Meeting.

.5 Other Resolutions Changes:

Not Applicable

.6 Dates:

Panel Approval: 15 September 2015 (Ref: PSU15005)
GPG Approval: 9 October 2015 (Ref: 12080_IGo)
Part B. Technical Background

List of Technical Background (TB) documents for Rec.143:

Annex 1. **TB for New (Oct 2015)**

See separate TB document in Annex 1.
Technical Background (TB) document for Rec.143 (New Oct 2015)

1. Scope and objectives
Develop a new Recommendation related to the procedure for the determination of contents of metals and other contaminants in a closed fresh water system lubricated stern tube.

2. Engineering background for technical basis and rationale
With the revision 3 of UR Z21 it has been introduced the surveys of propulsion systems using as a lubricant media the Fresh Water operating in a close loop system. Among other things the survey criteria expects that every six months the lubricant media is submitted to test in order to verify the possible contents of contaminants and to confirm the allowable limits of these. This is required for survey Method 2 and survey Method 3, and possible extension surveys.

3. Source/derivation of the proposed IACS Resolution
Survey Panel Members, in consultation with their own Society’s experts, backgrounds and feedbacks
Machinery Panel Members background and feedbacks

4. Summary of Changes intended for the revised Resolution
This is the original draft resolution. No changes are intended at this point.

5. Points of discussions or possible discussions
- The recommendation has been developed on the basis of the frame of IACS Recommendation 36 which deals with the procedure for the determination of contents of metals and other contaminants in stern tube lubricating oil
- The following parameters have been considered:
  - Metal contents
  - Corrosion inhibitors in fresh water
  - Salinity indicators
  - Contents of bearing and seal particles,
  - Data of records of fresh water make up in the systems
- The draft was subjected to an initial discussion and review by part of the Panel Members
- Subsequently Panel agreed to task the Members who have more experience on this matter to define the contaminants typical of these systems and set the allowable limits for these. In particular the following has been defined:
  - Metal that might contaminate the water: Iron, Chromium, Nickel, Copper, Silicon. Other metal such as Lead, Tin, Aluminum, Manganese have not
been considered since these are the material of white metal bearings used in conjunction to an oil lubricated system.

- Salinity indicators: Chloride contents and Sodium

For what concern the corrosion inhibitors no value has been set since it depends by the indication of the system Manufacturer. Anyway it has been set the minimum value of the fresh water PH (or alkalinity indicator) that should be not less than 11 in order to grant the shaft material passivation against the oxygen contained in the water.

It is worth to note that the following consideration on metals contents and PH has been provided by one expert Member in order to justify the choices:

- The metals chosen were those likely to be constituents of a propulsion shaft. Tin and Lead were not included since these are predominantly white metal bearing constituents which do not apply in case of synthetic bearings in closed loop water based systems.

Following discussion with our Materials specialists it was suggested that one difference between oil and water based systems might be a higher amount of adsorbance on a water based system – ie. The sample we get might be more misleading – greater margin for error.

Adsorption is the adhesion of atoms, ions, or molecules from a gas, liquid, or dissolved solid to a surface. This process creates a film of the adsorbate on the surface of the adsorbent. It is considered that there might be more particles adhering to the pipework and being taken out of the flow system in a water based system rather than an oil based system, and hence the figures based upon Rec 36 were strategically adjusted to attempt to take account of this phenomenon.

This explains the reduction in wear elements suspended in the system and also explain the minor reduction of the upper limits for salinity.

- At pH>10 corrosion of metals is minimal, hence it has been set the reference value at pH=11. The lower pH limit shall be maintained at 11 to ensure desired passivation of the metal surfaces. Passivation of steel in a medium with moderate to high level of dissolved oxygen would require a comparatively higher level of alkalinity.

6. Attachments if any

None.
Recommendation No.144
“Inspection of ship’s side valves”

Part A. Revision History

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- **New (Feb 2016)**

.1 Origin for Change:

☑ Suggestion by IACS member

.2 Main Reason for Change:

A Member drew the attention of the Panel to the contents of an accident investigation report No. 14/2015 issued by the ‘Marine Accident Investigation Branch’ (MAIB) of the UK Government. The report deals with the flooding of the engine room caused by the malfunctioning of the closing mechanism of a ship’s side valve.

.3 List of non-IACS Member Classification Societies contributing through the TC Forum and/or participating in IACS Working Group:

None

.4 History of Decisions Made:

The Survey Panel started the discussion under the task 15038 by making reference to the report of the incident and examined the IACS resolutions relating to the inspection of the ship’s side valves and their actuating mechanisms: UR Z3 and UR Z7. Members noted that both unified requirements do not deal with the matter in detail.

Members discussed by correspondence and during the 22nd meeting whether it was necessary to introduce a modification to UR Z7 to require the inspection of the ship’s side valves and their actuating mechanisms or to issue a dedicated new recommendation. Members agreed to address the matter in depth and separate from UR Z7.

As consequence of the discussion Members agreed to draft a new recommendation which details the minimum survey criteria for the ship’s side valves and their actuating mechanisms.

Finally Survey Panel agreed the final draft of the new recommendation during the 22nd Survey Panel Meeting.

No TB has been prepared.
.5 Other Resolutions Changes

None

.6 Dates:

Original Proposal: 17 August 2015 made by IACS Member
Panel Approval: 21 January 2016 (Ref: PSU15038)
GPG Approval: 10 February 2016 (Ref: 16019_IGb)
Part B. Technical Background

List of Technical Background (TB) documents for Rec.144:

Note: There is no Technical Background (TB) document available for New (Feb 2016).
**Recommendation No.145**

“Recommendation for the Operation of Shore-based Emergency Response Services”

**Part A. Revision History**

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<td>18 May 2016</td>
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**New (May 2016)**

**1 Origin for Change:**
- ☑ Request by non-IACS entity *(EU DG-MOVE)*
- ☑ Suggestion by IACS member

**2 Main Reason for Change:**

Following discussion at C72 as well as discussions with DG-MOVE, it was concluded that a document addressing the minimum support services for vessels in need of operational technical support (including vessels in need of a Port of Refuge) was desired. The primary intention of the expected technical support is to consider structural strength and stability (including down-flooding) and consideration of damage to the hull envelope as well as environmental aspects.

**3 List of non-IACS Member Classification Societies contributing through the TC Forum and/or participating in IACS Working Group:**

None

**4 History of Decisions Made:**

Each Hull Panel Member was requested to provide details of their respective Societies’ emergency response capabilities. These capabilities were reviewed in order to establish the minimum capabilities required to both comply with relevant national and international regulations and guidelines as well provide effective and rapid technical assistance to a ship in a casualty situation.

**5 Other Resolutions Changes**

None

**6 Dates:**

- Original Proposal: 03 February 2016 made by Hull Panel Chair
- Panel Approval: 12 April 2016 (Ref: PH16005)
- GPG Approval: 18 May 2016 (Ref: 14134_IGb)
Part B. Technical Background

List of Technical Background (TB) documents for Rec.145:

Annex 1. **TB for Original Resolution**

See separate TB document in Annex 1.
Technical Background (TB) document for Rec.145 (New May 2016)

1. Scope and objectives

Following discussion at C72 as well as discussions with DG-MOVE, it was concluded that a document addressing the minimum support services for vessels in need of operational technical support (including vessels in need of a Port of Refuge) was desired. The primary intention of the expected technical support is to consider structural strength and stability (including down-flooding) and consideration of damage to the hull envelope as well as environmental aspects.

2. Engineering background for technical basis and rationale

Each Hull Panel Member was requested to provide details of their respective Societies’ emergency response capabilities. These capabilities were reviewed in order to establish the minimum capabilities required to both comply with relevant national and international regulations and guidelines as well provide effective and rapid technical assistance to a ship in a casualty situation.

3. Source/derivation of the proposed IACS Resolution

The relevant national and international standards which were considered are as follows:

- MARPOL Annex I, Regulation 37 – Shipboard oil pollution emergency plan (SOPEP)

  *All oil tankers of 5,000 tons deadweight or more shall have prompt access to computerised, shore-based damage stability and residual structural strength calculation programs.*

- Shipboard marine pollution emergency plan for noxious liquid substances (SMPEP)

  *Stability and strength considerations: Great care in casualty response must be taken to consider stability and strength when taking actions to mitigate the spillage of oil or noxious liquid substance or to free the ship if aground. The Plan should provide the master with detailed guidance to ensure that these aspects are properly considered. Nothing in this section shall be construed as creating a requirement for damage stability plans or calculations beyond those required by relevant international conventions.*

  1. Internal transfers should be undertaken only with a full appreciation of the likely impact on the ship’s overall longitudinal strength and stability. When the damage sustained is extensive, the impact of internal transfers on stress and stability may be impossible for the ship to assess. Contact may have to be made with the owner or operator or other entity in order that information can be provided so that damage stability and damage longitudinal strength assessments may be made. These could be made within the head office technical departments. In other cases, classification societies or independent organizations may need to be contacted. The Plan should clearly indicate who
the master should contact in order to gain access to these facilities. Additionally, in the case of ships certified to carry NLSs, consideration as to the compatibility of all substances involved such as cargoes, bunkers, tanks, coatings, piping, etc., must also be considered before such an operation is undertaken.

- Oil Pollution Act (OPA 90), CFR 155.240 – Damage stability information for oil tankers and offshore barges
  
  (a) Owners or operators of oil tankers and offshore oil barges shall ensure that their vessels have prearranged prompt access to computerised, shore-based damage stability and residual strength calculation programmes.
  
  (b) Vessel baseline strength and stability characteristics must be pre-entered into such programmes and be consistent with the vessel’s existing configuration.
  
  (c) Access to shore-based programmes must be available 24 hours a day.
  
  (d) At a minimum, the programme must facilitate calculation of the following:
      - Residual hull girder strength based on reported extent of damage
      - Residual stability when the vessel’s compartments are breached
      - The most favourable off-loading, ballasting or cargo transfer sequences to improve residual stability, reduce hull girder stresses and reduce ground-force reaction.
      - The bending and shear stresses caused by pinnacle loads from grounding or stranding.

- ISM Code: Regulation 8, Emergency Preparedness
  
  8.1 The Company should identify potential emergency shipboard situations and establish procedures to respond to them.
  
  8.2 The Company should establish programmes for drills and exercises to prepare for emergency actions.
  
  8.3 The safety management system should provide for measures ensuring that the Company’s organisation can respond at any time to hazards, accidents and emergency situations involving its ships.

- SOLAS, Chapter II-1, Part B-1, Regulation 8-1 – System capabilities and operational information after a flooding casualty on passenger ships
  
  For the purpose of providing operational information to the Master for safe return to port after a flooding casualty, passenger ships constructed on or after 1 January 2014 shall have:
  
  1. onboard stability computer, or
  
  2. shore-based support,

  based on guidelines developed by the Organization

- MSC Circular 1400 – Guidelines on Operational Information for Masters of Passenger Ships for Safe Return to Port by Own Power or Under Tow
Owners or operators of passenger ships should ensure that their ships have prearranged, prompt access to computerized, shore-based damage stability and residual structural strength calculation programs. The output should be within the tolerances specified in the Guidelines for the approval of stability instruments (MSC.1/Circ.1229). Access to the shore-based calculation program should be available 24 hours a day. The computer model of the ship and its subdivision arrangements should be input at the commencement of the contract.

There should be a contract for the supply of shore-based support at all times during the validity of ship certification.

Shore-based support should be operational within one hour; whereby operational means the ability to input details of the conditions of the ship as instructed.

Shore-based support should be manned by adequately qualified persons with regard to stability and ship strength; no less than two qualified persons should be available to be on call at all times.

At least two independent computers capable of carrying out stability and global strength calculations should be available at all times.

4. Summary of Changes intended for the revised Resolution:
None

5. Points of discussions or possible discussions
None

6. Attachments if any
None
Recommendation No. 146
“Risk assessment as required by the IGF Code”

Part A. Revision History

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- **New (Aug 2016)**

.1 Origin for Change:

☑ Request by non-IACS entity (INTERTANKO)

.2 Main Reason for Change:

The IGF Code states that the techniques used as part of the risk assessment shall be "acceptable", "recognised" and "documented to the satisfaction of the Administration" (IGF Code Part A, 4.2.3). However, the Code makes no mention of: (1) 'what is acceptable'; (2) 'what level of recognition is required'; and (3) 'what documentation would be satisfactory'. By addressing these three items IACS would provide a common platform for the risk assessment. This would promote consistency in application, reporting and judgements made on the level of risk. This Recommendation is aimed to provide for consistency in the application of risk assessment techniques and criteria in respect of the IGF Code requirement for risk assessment.

.3 List of non-IACS Member Classification Societies contributing through the TC Forum and/or participating in IACS Working Group:

None.

.4 History of Decisions Made:

Form A and Form 1 were approved by 13120_IGd dated 31 October 2014. The ‘Recommendation’ was developed by the project team via correspondence and a workshop between January 2015 and April 2016 (workshop, 24-25 March 2015). The draft 'Recommendation' was submitted to Machinery Panel for review on 4 September 2015 and subsequent revisions incorporated, as directed by the Panel.

.5 Other Resolutions Changes

None.

.6 Dates:

Original Proposal: 12 July 2013  Made by GPG (INTERTANKO’s request)
Panel Approval: 9 May 2016 (Ref: PM13915)
GPG Approval: 10 August 2016 (Ref: 13120_IGk)
Part B. Technical Background

List of Technical Background (TB) documents for Rec. 146:


See separate TB document in Annex 1.
Technical Background (TB) document for Rec. 146 (New Aug 2016)

1. Scope and objectives

The IGF Code states that the techniques used as part of the risk assessment shall be “acceptable”, “recognised” and “documented to the satisfaction of the Administration” (IGF Code Part A, 4.2.3). However, the Code makes no mention of: (1) ‘what is acceptable’; (2) ‘what level of recognition is required’; and (3) ‘what documentation would be satisfactory’. By addressing these three items IACS would provide a common platform for the risk assessment which would promote consistency in application, reporting and judgements made on the level of risk.

The objective is to provide guidance to promote consistent application of risk assessment approaches in relation to the IGF Code requirements. The scope covers the use of low-flashpoint fuel; supply, storage, preparation and use.

2. Engineering background for technical basis and rationale

The recommended risk assessment approach is based on established practice modified to the specific application required by the IGF Code.

3. Source/derivation of the proposed IACS Resolution

Reference was made to:


4. Summary of Changes intended for the revised Resolution:

N/A

5. Points of discussions or possible discussions

a. Scope issue

There was a comment to re-evaluate the status, scope and objective of the document considering the decision made at MSC 95 to narrow down the scope of a risk assessment to a number of specific areas (5.10.5, 5.12.3, 6.4.1.1, 6.4.15.4.7.2, 8.3.1.1, 13.4.1, 13.7 and 15.8.1.10 and paragraphs 4.4 and 6.8 of the annex to the IGF Code). However, in spite of the exemptions for LNG (Part A-1), a risk assessment is a general requirement of the IGF Code for all low-flashpoint fuels (Part A, 4.2.1), and therefore Machinery Panel concurred to keep the original scope and objective of
the document to provide a framework to promote consistency in risk assessment to cover all potential low-flashpoint fuels.

b. Format issue
From discussions at and after MSC 95, it was revealed that there was still a degree of uncertainty and even different views among Flag Administrations as to the detailed scope and required depth of analysis. Against this background, it was not considered prudent for IACS to issue a UR this time. Instead, it was agreed to publish the document as a Recommendation this time and later to consider upgrading it to a UR with necessary amendments.

6. Attachments if any

N/A