

SUB-COMMITTEE ON HUMAN ELEMENT,
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REPORT TO THE MARITIME SAFETY COMMITTEE

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1 GENERAL

1.1 The Sub-Committee on Human Element, Training and Watchkeeping (HTW) held its second session from 2 to 6 February 2015 under the Chairmanship of Mr. Bradley Groves (Australia), who was unanimously elected as Chairman for 2015 at HTW 1. The Vice-Chairman, Ms. Mayte Medina (United States), was also unanimously elected as Vice-Chairman for 2015 at HTW 1.

1.2 The session was attended by delegations and observers from Member Governments and Associate Members of IMO; by observers from intergovernmental organizations; and by non-governmental organizations in consultative status, as listed in document HTW 2/INF.1.

Secretary-General's opening address

1.3 The Secretary-General welcomed participants and delivered his opening address, the full text of which can be downloaded from the IMO website at the following link: <http://www.imo.org/MediaCentre/SecretaryGeneral/SecretaryGeneralsSpeechesToMeetings/Pages/Default.aspx>.

Chairman's remarks

1.4 In responding, the Chairman thanked the Secretary-General for his words of guidance and encouragement and assured the Secretary-General that his advice and requests would be given every consideration in the deliberations of the Sub-Committee and its working groups.

Adoption of the agenda and related matters

1.5 The Sub-Committee adopted the agenda in document HTW 2/1 (Secretariat) and agreed to be guided in its work, in general, by the annotations to the provisional agenda contained in document HTW 2/1/1 (Secretariat) and by the arrangements in document HTW 2/1/2 (Secretariat). The agenda, as adopted, with the list of documents considered under each agenda item, is set out in document HTW 2/INF.7.

2 DECISIONS OF OTHER IMO BODIES

2.1 The Sub-Committee noted the decisions and comments pertaining to its work by MEPC 66, MSC 93, NCSR 1 and III 1, as reported in document HTW 2/2 (Secretariat), and by MSC 94, as reported in documents HTW 2/2/1 and HTW 2/2/1/Corr.1 (Secretariat), and took them into account in its deliberations under the relevant agenda items.

3 VALIDATED MODEL TRAINING COURSES

Report on the model course programme

3.1 The Sub-Committee noted the updated information provided by the Secretariat (HTW 2/3) on the status of production of model courses and the progress made with their translation into French and Spanish, and urged French- and Spanish-speaking countries to identify suitably qualified personnel who could assist the Organization to translate model courses.

3.2 The Sub-Committee also noted that:

- .1 of the 72 model courses listed in the aforementioned document, 47 were developed more than five years ago;
- .2 it was important to ensure that information and guidance in model courses provided to training providers was accurate;
- .3 model courses should assist training providers in developing training programmes for seafarers to meet the requirements of the 2010 Manila Amendments;
- .4 model courses should accurately reflect the minimum standards in the STCW Convention and Code;
- .5 currently, there was no formal process for reviewing and validating course content on a regular basis;
- .6 a formal process of review and validation of course content should be set out at least on a five-yearly cycle; and
- .7 it was crucial to have in place robust criteria and a standardized and transparent process for the development, revision and validating of model courses.

3.3 In light of the foregoing, the Sub-Committee agreed that the above factors should be considered when discussing the draft *Revised guidelines for model course development, updating and validation processes* under agenda item 5.

3.4 The delegation of Australia informed the Sub-Committee that the review and updating of model course 1.21 on Personal Safety and Social Responsibility had not been completed as yet, and that it expected to submit the revised model course to HTW 3 for validation.

Validation of model courses

Revised model courses on Advanced Training for Chemical Tanker Cargo Operations, Advanced Training for Oil Tanker Cargo Operations and Advanced Training for Liquefied Gas Tanker Cargo Operations

3.5 The Sub-Committee gave preliminary consideration to the draft revised model courses related to training in Advanced Training for Chemical Tanker Cargo Operations, Advanced Training for Oil Tanker Cargo Operations and Advanced Training for Liquefied Gas Tanker Cargo Operations (documents HTW 2/3/1, HTW 2/3/2 and HTW 2/3/3, respectively).

3.6 In this context, the Sub-Committee noted that the model courses on Advanced Training for Oil Tanker Cargo Operations and Advanced Training for Liquefied Tanker Cargo Operations had been referred by HTW 1 to a correspondence group coordinated by the United States for finalization with a view to validation by HTW 2.

3.7 In the ensuing discussion, the following views were expressed:

- .1 the principles for revision and updating of model courses agreed at STW 43 had not strictly been adhered to in revising model course 1.03 on Advanced Training for Chemical Tanker Cargo Operations;
- .2 there was reference to the dangers of working during electrical storms in revised model courses 1.02 and 1.05 but no such reference was included in the draft revised model course 1.03;
- .3 course developers should bear in mind that IMO model courses were meant to be for global use and not restricted for any particular national requirement; and
- .4 the drafting group, when considering draft revised model course 1.03 on Advanced Training for Chemical Tanker Cargo Operations, should take into account the principles for revision and updating of model courses, as set out in document STW 43/WP.7.

3.8 After some discussion, the Sub-Committee referred documents HTW 2/3/1, HTW 2/3/2 and HTW 2/3/3 for detailed consideration to Drafting Group 1 to be established on validation of model courses for finalization of the model courses, taking into account the urgent need for the model courses in order to assist STCW Parties to implement the 2010 Manila Amendments to the STCW Convention and Code. It requested the drafting group to compare the scope of the provisions in the STCW Code related to Advanced Training for Chemical Tanker Cargo Operations, Advanced Training for Oil Tanker Cargo Operations and Advanced Training for Liquefied Gas Tanker Cargo Operations with the contents of the draft model courses as presented, with a view to their validation by the Sub-Committee.

Revised model courses on Maritime English and Engine-Room Simulators

3.9 The Sub-Committee gave preliminary consideration to the draft revised model course related to training in Maritime English (document HTW 2/3/4), which had been revised/updated consequent to the adoption of the 2010 Manila Amendments to the STCW Convention and Code.

3.10 In the ensuing discussion, the following views were expressed:

- .1 the draft revised model course did not accurately reflect the knowledge, understanding and proficiency required for maritime English as set out in the STCW Code;
- .2 definitions for "communicative approach" and "maritime English for ratings forming part of an engineering watch" would need to be included;
- .3 the qualifications of maritime English instructors should also take into account the experience of seafarers who have served on board in the deck, engine-room and radio departments;
- .4 number of teaching hours indicated for general maritime English was high and unreasonable;

- .5 the model course was meant to teach maritime English and not English;
and
- .6 the course content for ratings was too advanced and should be aligned with
the requirements of the STCW Code.

3.11 After some discussion and taking into account the urgent need for the model courses to assist STCW Parties to implement the 2010 Manila Amendments to the STCW Convention and Code, the Sub-Committee referred document HTW 2/3/4 on the draft revised model course related to training in Maritime English to Drafting Group 2 to be established for finalization of the model course, with a view to validation by the Sub-Committee.

3.12 The Sub-Committee gave preliminary consideration to the draft revised model course related to training in Engine-room simulator (document HTW 2/3/5), which had been revised/updated consequent to the adoption of the 2010 Manila Amendments to the STCW Convention and Code.

3.13 In the ensuing discussion, the views were expressed that, as presented, the draft revised model course:

- .1 was not structured as an Engine-room simulator training course;
- .2 caused concern as it reflected that the training related to the standards in
tables III/1 and III/2 should be conducted using simulators;
- .3 was not in the format of an IMO model course; and
- .4 should be reviewed by the course developers and further revised.

3.14 After some discussion, the Sub-Committee referred document HTW 2/3/5 on the draft revised model course related to Engine-room simulator to Drafting Group 2 to be established for preliminary consideration and to provide guidance to the course developers, with a view to finalizing the revised draft for validation by HTW 3.

Development of a new model course on Special training requirements for seafarers on ships using gases or other low-flashpoint fuels

3.15 The Sub-Committee considered document HTW 2/3/8 (Norway), which proposed the development of a new model course on Special training requirements for seafarers on ships using gases or other low-flashpoint fuels and offered to develop this model course.

3.16 In the ensuing discussion, the following views were expressed:

- .1 it was helpful to develop a model course on Special training requirements
for seafarers on ships using gases or other low-flashpoint fuels;
- .2 as the Sub-Committee had approved, in principle, the amendment to
chapter V of the STCW Convention and Code related to Special training
requirements for seafarers on ships using gases or other low-flashpoint
fuels, development of the model course could commence now;
- .3 the model course should reflect the proposed requirements in chapter V of
the STCW Code;

- .4 the model course should be developed based on the draft revised guidelines for model course development, updating and validation processes expected to be completed at this session under agenda item 5 ; and
- .5 interested delegations could coordinate with Norway for the development of this model course.

3.17 After some discussion, the Sub-Committee accepted, with appreciation, the offer by Norway to develop a model course on Special training requirements for seafarers on ships using gases or other low-flashpoint fuels, and invited Norway to submit the draft model course for consideration by the Sub-Committee at its next session. In this context, the Sub-Committee urged interested delegations to coordinate with Norway for the development of this model course.

Revision of the model course on Radar Navigation at Operational Level

3.18 The Sub-Committee considered document HTW 2/3/7 (China), which provided information on its analysis of the deviation of IMO model course 1.07 on Radar Navigation at Operational Level from the current performance standards for radar equipment set out in IMO resolution MSC.192(79), and the need to revise this model course. Accordingly, China proposed the revision of the model course on Radar Navigation at Operational Level as early as possible.

3.19 In the ensuing discussion, the following views were expressed:

- .1 there was a clear need for model course 1.07 on Radar Navigation at Operational Level to be revised;
- .2 salient aspects in model course 1.08 on Radar Navigation at the Management Level would also require to be revised accordingly;
- .3 the revision should not extend beyond model course 1.07; and
- .4 the model course should be aligned with the requirements of the STCW Convention and Code, the SOLAS Convention and resolution MSC.192(79) and take account of new and updated operational standards.

3.20 After some discussion, the Sub-Committee accepted with appreciation the offer by China to revise the model course on Radar Navigation at Operational Level and invited China to submit the draft revised model course for consideration by the Sub-Committee. In this context, the Sub-Committee urged interested delegations to coordinate with China for the revision and updating of this model course.

Amendments to the ECDIS and IBS/INS model training courses

3.21 The Sub-Committee considered document HTW 2/3/9 (Italy), which analysed the contents of model course 1.27 on ECDIS and model course 1.32 on IBS/INS and their link with other IMO model courses, taking into account the "Human Element Analysis Process" and the safety of navigation, and proposed amendments to the model courses related to ECDIS and IBS/INS.

3.22 In the ensuing discussion, the following views were expressed:

- .1 ECDIS training should be integrated with other training and be conducted at the most appropriate time during a training programme;
- .2 concerns expressed by Italy related to the design and performance standards for ECDIS rather than to training requirements in the model courses;
- .3 the complexity of ECDIS must be given due consideration;
- .4 the proposed amendment of performance standards was beyond the scope of a model course;
- .5 the ECDIS model course had been revised recently, in 2012, pursuant to the 2010 Manila Amendments;
- .6 the "S mode" had not been finalized and was still under development; and
- .7 the IBS/INS model course required revision, however, not at this stage, but it could be placed on the priority list being updated by the Sub-Committee.

3.23 After some discussion, the Sub-Committee invited Italy to submit detailed proposed amendments for consideration by the Sub-Committee at the next session.

International Course on Operations in Antarctic Waters

3.24 The Sub-Committee considered document HTW 2/3/6/Rev.1 (Chile), providing information on Chile's International Course on Operations in Antarctic Waters (CIOAA), which the Maritime Authority of Chile had developed for deck officers and was a requirement for officers in charge of Chilean ships navigating in Antarctic waters; the document was presented for consideration by the Sub-Committee as a draft model course to be developed by the Organization for all ships operating in Antarctic waters.

3.25 In the ensuing discussion, the following views were expressed:

- .1 the course complied with section B-V/g of the STCW Code and supplements the provisions set out in the *Guidelines for ships operating in polar waters*;
- .2 it was premature to develop such a model course as amendments to chapter V of the STCW Convention pertaining to training requirements for master, officers and crew operating in polar waters had not been finalized;
- .3 the model course, as and when developed, should be aligned to the training requirements as set out in the STCW Convention and Code and should not be restricted to one region;
- .4 a model course was not a mandatory instrument but reflects the requirements of the mandatory STCW Code;
- .5 it was not possible to validate a model course that did not reflect requirements of the STCW Convention and a precedent should not be set by developing a model course to meet the transitional provisions; and

- .6 a timeline for the development of a model course should be developed after the amendments to chapter V were approved.

3.26 In this context, the delegation of Argentina expressed its interest in collaborating with Chile for the development of the model course based on the amendments to chapter V on training requirements for master, officers and crew operating in the polar region.

3.27 The delegation of Canada informed the Sub-Committee that it intended to develop a model course on training requirements for master, officers and crew operating in the polar region.

3.28 After some discussion, the Sub-Committee agreed that it was premature to develop a model course on training requirements for master, officers and crew operating in the polar region before the amendments to chapter V of the STCW Convention had been prepared.

3.29 The Sub-Committee invited Chile along with Argentina, Canada and other interested Member States to develop a draft model course after the aforesaid amendments to chapter V had been finalized by the Sub-Committee.

Review and updating of model courses on Assessment, Examination and Certification of Seafarers and Training Course for Instructors

3.30 The Sub-Committee noted with appreciation the offer by the International Maritime Lecturers Association and the International Association of Maritime Universities to jointly review and update model course 3.12 on Assessment, Examination and Certification of Seafarers and model course 6.09 "Training Course for Instructors", and invited them to submit the draft revised model courses for consideration by the Sub-Committee.

Establishment of drafting groups

3.31 The Sub-Committee established Drafting Group 1, under the chairmanship of Capt. George Edenfield (United States), and instructed it, taking into account decisions and comments in plenary and the urgent need for the model courses to assist STCW Parties to implement the 2010 Manila Amendments to the STCW Convention and Code, to consider documents HTW 2/3/1, HTW 2/3/2 and HTW 2/3/3 and:

- .1 compare the scope of the provisions in the STCW Code related to training in Advanced Training for Chemical Tanker Cargo Operations, Advanced Training for Oil Tanker Cargo Operations and Advanced Training for Liquefied Gas Tanker Cargo Operations and the contents of the aforementioned draft model courses as presented, with a view to validation of the model courses by the Sub-Committee; and
- .2 submit its report on Thursday, 5 February 2015.

3.32 The Sub-Committee established Drafting Group 2, under the chairmanship of Capt. Kersee Deboo (India), and instructed it, taking into account decisions and comments in plenary and bearing in mind the urgent need for the model courses to assist STCW Parties to implement the 2010 Manila Amendments to the STCW Convention and Code, to consider documents HTW 2/3/4 and HTW 2/3/5 and:

- .1 compare the scope of the provisions in the STCW Code related to Maritime English and the contents of the draft model course, as presented, with a view to validation by the Sub-Committee;

- .2 give preliminary consideration to the model course related to Engine-room simulator and provide guidance to the course developers with a view to finalizing the revised draft for validation by HTW 3; and
- .3 submit its report on Thursday, 5 February 2015.

Reports of the drafting groups

3.33 On receipt of the reports of Drafting Group 1 (document HTW 2/WP.6) and Drafting Group 2 (document HTW 2/WP.7), the Sub-Committee approved them in general and took action as summarized in the following paragraphs.

Advanced Training for Chemical Tanker Cargo Operations

3.34 The Sub-Committee noted that due to significant inconsistencies in alignment with the STCW Code, the group was unable to finalize the review of the model course on Advanced Training for Chemical Tanker Cargo Operations, in particular, the Instructors Manual (Part D) and Assessment and Evaluation (Part E). Bearing in mind the urgent need for this model course, the Sub-Committee agreed that this work should be continued intersessionally and established a correspondence group under the coordination of the United States*.

3.35 Accordingly, the Sub-Committee instructed the Secretariat to forward the model course referred to in paragraph 3.34 above to the correspondence group for finalization of parts D and E and to submit the model course to HTW 3 for validation.

Engine-room simulator

3.36 In light of a number of observations related to the draft revised model course on Engine-room simulator, as presented, the Sub-Committee approved a guidance note for the course developers, as set out in annex 2 of document HTW 2/WP.6, with a view to assist the course developers to further revise the model course on Engine-room simulator and to submit it to HTW 3 for validation.

3.37 The Sub-Committee validated the model courses, as amended, on:

- .1 Advanced Training for Oil Tanker Cargo Operations;
- .2 Advanced Training for Liquefied Gas Tanker Cargo Operations; and
- .3 Maritime English,

and instructed the Secretariat to finalize and publish them, as soon as possible.

3.38 The Sub-Committee recalled that validation of model courses by the Sub-Committee in this context meant that it found no grounds to object to their contents. In doing so, the Sub-Committee did not approve the documents and they could therefore not be regarded as official interpretations of the Convention.

* **Coordinator:**
Capt. George Edenfield
United States Merchant Marine Academy
Kings Point, NY 11024, United States
Tel: + 1516-726-5874;
Email: EdenfieldG@USMMA.EDU

4 REPORTS ON UNLAWFUL PRACTICES ASSOCIATED WITH CERTIFICATES OF COMPETENCY

Reports on fraudulent certificates as reported to the Secretariat

4.1 The Sub-Committee noted the information provided by the Secretariat (document HTW 2/4), detailing fraudulent certificates found on board ships during inspections or reportedly being used, as reported to the Secretariat for the years 2013 and 2014, and urged Member Governments to report details of fraudulent certificates detected, using the revised reporting format, as set out in document STW 38/17, annex 1, for this purpose.

4.2 The Sub-Committee recalled that HTW 1 and STW 44 had reiterated the invitation at STW 43 to Member Governments and international organizations to submit proposals on a strategy to address the problems associated with fraudulent certificates of competency to the next session.

4.3 In this context, the Sub-Committee, noting the large number of fraudulent certificates reported by Parties, urged Member Governments and international organizations to submit proposals, as requested by STW 43 and reiterated by STW 44 and HTW 1, for consideration at the next session.

4.4 The Sub-Committee urged Member Governments to provide the Secretariat with updated information to facilitate verification of certificates, and to respond in a timely manner to requests for verification of certificates.

4.5 The delegation of Australia informed the Sub-Committee that, in 2012, it had introduced plastic, credit card-sized certificates for basic safety training and, based on its success, had introduced similar certificates for ratings, able seafarers and GMDSS radio operators in 2014. It further informed the Sub-Committee that updated information on the implementation of these measures would be provided to HTW 3.

Certification verification facility

4.6 The Sub-Committee noted the oral information provided by the Secretariat that the certification verification facility through the IMO website had been used 13,297 times during the year 2014.

5 REVISED GUIDELINES FOR MODEL COURSE DEVELOPMENT, UPDATING AND VALIDATION PROCESSES

5.1 The Sub-Committee recalled that:

- .1 MSC 91 had included in the post-biennial agenda of the Committee an output on "Revision of the guidance for model course development, updating and validation processes", with two sessions needed to complete the item, assigning the STW (now HTW) Sub-Committee as the coordinating organ; and
- .2 HTW 1 had noted the progress relating to the preparation of the *Revised guidelines for model course development, updating and validation processes*, and had invited Member Governments and international organizations to submit comments and proposals to HTW 2.

5.2 The United States (document HTW 2/5) provided draft revised guidelines that incorporated the improvements suggested by the working group at HTW 1, which included the draft instructions to the course developers, the review group and the drafting group.

5.3 In the ensuing discussion, the following views were expressed:

- .1 there was general agreement that a formalized process was needed for model course revision, development and validation processes;
- .2 it was necessary to define a time frame for each stage to ensure that a model course could be published by the Organization without undue delay;
- .3 a five-yearly review cycle was too ambitious and model courses should be reviewed on a need-based approach;
- .4 resolution 15 of the 2010 Manila Amendments recommended that significant and extensive amendments to the STCW Convention and Code should, as far as possible, be developed and adopted every five years;
- .5 model courses needed to be reviewed to ensure that the guidance provided was accurate and up to date;
- .6 the definition of validation needed to be clarified in the revised guidelines;
- .7 there was concern regarding the random nature of the proposed review group and that instead the review group should be selected on a rotational basis; and
- .8 the resources available within the Secretariat for the proposed initial review should be given careful consideration and strengthened if necessary.

5.4 After an in-depth discussion, the Sub-Committee referred the document to Working Group 1 for detailed consideration and instructed it to prepare draft *Revised guidelines for model course development, updating and validation processes*, taking into account the comments and views expressed, in particular those discussed under agenda item 3, for consideration by the Sub-Committee, with a view to approval by the Committee.

Establishment of Working Group 1

5.5 The Sub-Committee established Working Group 1 under the chairmanship of Ms. Marina Angsell (Sweden) and instructed it, taking into account decisions and comments in the plenary, to:

- .1 consider document HTW 2/5 and prepare draft *Revised guidelines for model course development, updating and validation processes*, for consideration by the Sub-Committee, with a view to approval by the Committee;
- .2 review the list of IMO model courses in document HTW 1/WP.3, annex 3 and identify those model courses that require revision/updating as a priority;
- .3 advise the Sub-Committee on a process for a regular review of outdated model courses;
- .4 submit its report on Thursday, 5 February 2015.

Report of Working Group 1

5.6 On receipt of the report of Working Group 1 (document HTW 2/WP.3), the Sub-Committee approved it in general and took action as summarized in the following paragraphs.

Guidelines for the development, review and validation of model courses

5.7 The Sub-Committee agreed to include the text related to the meaning of "validated" as a footnote in paragraph 1.1 of the new *Guidelines for the development, review and validation of model courses*.

5.8 The Sub-Committee endorsed the draft MSC-MEPC circular on *Guidelines for the development, review and validation of model courses*, as set out in annex 1, and invited the Committees to approve it.

Review of IMO model courses and identification of those model courses that require revision/updating as a priority

5.9 The Sub-Committee noted the revised list of model courses and priorities, as set out in annex 5 of document HTW 2/WP.3.

5.10 The Sub-Committee instructed the Secretariat to conduct a preliminary review of model courses that were five years or older with a view to:

- .1 identify which Sub-Committee should be responsible for reviewing and updating each model course;
- .2 assess the anticipated workload and resources required of the Secretariat's Maritime Training and Human Element Section to review the older courses, which were the responsibility of the HTW Sub-Committee; and
- .3 submit the outcome of the review to HTW 3 for consideration.

6 GUIDANCE FOR THE IMPLEMENTATION OF THE 2010 MANILA AMENDMENTS

6.1 The Sub-Committee recalled that:

- .1 MSC 89 had agreed to include, in the 2012-2013 biennial agenda of the STW Sub-Committee and in the provisional agenda for STW 43, a planned output on "Development of guidance for the implementation of the 2010 Manila Amendments", with a target completion year of 2014; and
- .2 MSC 93, taking into account the need for further guidance on implementation of the 2010 Manila Amendments, had agreed to extend the target completion date of the output on "Development of guidance for the implementation of the 2010 Manila Amendments" until the end of the transitional arrangements, i.e. 2017.

Medical examination requirements, including colour vision testing

6.2 IMHA (HTW 2/6) provided information on the outcome of the experts' workshop held in Kobe, Japan, from 20 to 21 January 2014 to review the currently available options for colour vision testing and to recommend valid alternatives to those currently listed.

6.3 In the ensuing discussion, the following views were expressed:

- .1 some issues related to current testing procedures and the use of obsolete equipment;
- .2 caution should be exercised, as an academically driven approach may not necessarily lead to practical solutions;
- .3 no specific issues had been raised which could be resolved by the Sub-Committee;
- .4 some countries were working towards harmonization of medical certification;
- .5 there was a possible inconsistency between the requirements of the Convention and its applicability to existing seafarers; and
- .6 medical standards for existing seafarers had been addressed in section A-I/9 of the STCW Code and these include eyesight standards and testing procedures.

6.4 Furthermore, the IFSMA observer made a statement, as set out in annex 9. In this context, the Sub-Committee clarified that the issues related to existing seafarers were adequately addressed in section A-I/9 of the STCW Code. The Sub-Committee further clarified that the 2010 amendments, in particular paragraph 1 of section A-I/9, authorized the differentiation between those persons seeking to start a career at sea and those seafarers already serving at sea, for the purpose of establishing national medical standards leading to the issuing of medical certificates.

6.5 In this context, the delegation of Norway expressed its willingness to work closely with IMHA to find a resolution to the issues raised.

6.6 After some discussion, the Sub-Committee invited interested Member States and international organizations to collaborate with IMHA to submit future proposals for consideration by the Sub-Committee.

STCW-related information to be communicated through GISIS to reduce administrative burdens

6.7 China (document HTW 2/6/1) provided information on its analysis of various reporting and information communication obligations of Parties under article IV, VIII, IX of the STCW Convention and section A-1/7 of the STCW Code, from the perspectives of transparency and legal implications, and suggested that a future practical application of a GISIS module could reduce the administrative burden related to the implementation of the STCW Convention.

6.8 In the ensuing discussion, the following views were expressed:

- .1 recognition should be given to the working languages of the Organization when providing information through GISIS and that it should not be necessary to provide an English translation;

- .2 the Country Maritime Profile had been developed by the Technical Cooperation Committee and not all Member States were interested in completing it; and
- .3 there should be no need to translate all domestic legislation into English.

6.9 After some discussion, the Sub-Committee referred the document to Working Group 2 to be established for detailed consideration and to advise the Sub-Committee, as appropriate.

Other issues

6.10 The Sub-Committee noted with appreciation the information provided by Japan (document HTW 2/INF.5) on "Introduction of leadership training on training ship in Japan".

Report of Working Group 2

6.11 On receipt of the report of Working Group 2 (document HTW 2/WP.4), the Sub-Committee approved it in general and took action as summarized in the following paragraphs.

STCW-related information to be communicated through GISIS to reduce administrative burdens

6.12 The Sub-Committee endorsed the group's recommendation:

- .1 on the language preference for documents submitted to the STCW GISIS module, as well as the recommendation for the three categories proposed in document HTW 2/6/1 (China) and the related table in the annex to the document for the development of a specific STCW GISIS module; and
- .2 to develop functional requirements, technical specifications and appropriate access rights for the GISIS module to progress its development.

6.13 The Sub-Committee noted that the group, due to time constraints and given the early stage in the development of a new GISIS module, could not finalize the guidance as instructed, and invited Member States and international organizations to submit comments and proposals to HTW 3 for consideration.

7 FOLLOW-UP ACTION TO THE STCW-F CONFERENCE RESOLUTIONS 6 AND 7

7.1 The Sub-Committee noted that no documents had been submitted for consideration at this session.

7.2 The Sub-Committee, noting that there had been no submissions under this agenda item for two sessions, agreed, in accordance with the *Guidelines on the organization and method of work of the Maritime Safety Committee and the Marine Environment Protection Committee and their subsidiary bodies*, to invite the Committee to delete this output from the biennial agenda when considering agenda item 16.

8 ROLE OF THE HUMAN ELEMENT

Outcome of MEPC 66

8.1 The Sub-Committee noted that MEPC 66 had noted that there were no documents submitted on the role of the human element to that session of the Committee. However, aware that the agenda of the HTW Sub-Committee contained items of relevance to the work of the Committee, MEPC 66 agreed to keep the item on its agenda to consider any human element-related issues and the outcome of the HTW Sub-Committee on the matter, as appropriate.

Outcome of MSC 94

Guidelines for port State control officers on the ISM Code

8.2 The Sub-Committee noted that MSC 94 (documents HTW 2/2/1 and HTW 2/2/1/Corr.1), having been advised that MEPC 67 agreed that the draft *Guidelines for port State control officers on the ISM Code*, as prepared by Ill 1 (Ill 1/18, annex 4), should be referred to the HTW Sub-Committee for comments, taking into account the views expressed by IACS on further definitions needed, prior to their approval, agreed that the draft *Guidelines for port State control officers on the ISM Code* should be referred to HTW 2 for consideration under its agenda item on the "Role of the human element", prior to their approval by MEPC 68 and MSC 95.

8.3 The IACS observer, proposing amendments to the draft *Guidelines for port State control officers on the ISM Code*, stated that the draft text could be improved to avoid those instances when, in the past, deficiencies had been raised by port State control officers on the basis that a systemic failure had been established, without proper justification or an investigation having been undertaken to identify exactly what had failed and how.

8.4 In this regard, the IACS observer:

- .1 proposed the insertion, in section 5, of appropriate definitions to distinguish between the terms "failures" and "serious failures";
- .2 urged the Sub-Committee to consider the inclusion of a new paragraph 6.3.2 on the application of professional judgement by port State control officers to assess if there is evidence that deficiencies are already being dealt with adequately by the Company, i.e.: "In applying professional judgement, the PSCO should assess if there is evidence that deficiencies are already being dealt with adequately by the Company, including the personnel working on board, so that such deficiencies do not indicate a failure of the implementation of the ISM Code."; and
- .3 urged the recognition of sections 9 and 10.2 of the ISM Code, which anticipate that non-conformities, accidents and hazardous situations are reported to, and addressed by, the Company.

8.5 In the ensuing discussion, the following views were expressed:

- .1 the aforementioned IACS proposals should be given detailed consideration and included in the draft guidelines;

- .2 the guidelines needed to provide a clear distinction between "failures" and "serious failures";
- .3 restricting the judgement of port State control officers to assess implementation of the ISM Code was unhelpful and could undermine the ISM system; and
- .4 it was not appropriate for port State control officers to be conducting ISM Code-type audits during PSC inspections and determine if companies had carried out corrective action.

8.6 After an in-depth discussion, the Sub-Committee referred the draft *Guidelines for port State control officers on the ISM Code*, prepared by III 1, as set out in document III 1/18, annex 4, to Working Group 3 to be established on Human Element Issues for consideration, taking into account the views expressed, in particular those by IACS, and to provide comments, as appropriate.

Revision of the Guidelines on fatigue mitigation and management

8.7 The Sub-Committee noted that MSC 94 had considered document MSC 94/18/7 (Australia et al.), proposing to review MSC/Circ.1014 on *Guidelines on fatigue mitigation and management*, and had included in the post-biennial agenda of the Committee a new output on "Revision of the Guidelines on fatigue", assigning the HTW Sub-Committee as the coordinating organ. The Sub-Committee further noted that MSC 94 had instructed HTW 2 to give preliminary consideration to the new output under its existing agenda item on "Role of the human element" and to place it on the agenda for HTW 3.

Proposed approach for the revision of the *Guidelines on fatigue mitigation and management*

8.8 Australia et al. (document HTW 2/8) provided information on a proposed approach for the revision and updating of the *Guidelines on fatigue mitigation and management* (as contained in the annex to MSC/Circ.1014) for preliminary consideration by the Sub-Committee.

8.9 The United Kingdom (document HTW 2/8/2) provided comments on the approach proposed in document HTW 2/8 to the revision and updating of MSC/Circ.1014.

8.10 In the ensuing discussion, the following views were expressed:

- .1 the current guidelines were outdated and needed to be revised;
- .2 since fatigue was still a major contributing factor in accidents, it should be addressed in a holistic manner;
- .3 international instruments such as the STCW Convention, the ISM Code and the Maritime Labour Convention, 2006, had been amended and adapted to mitigate fatigue;
- .4 manning levels and fatigue were linked and the issue of manning of ships needed to be addressed; however, the issue of manning of ships was outside the scope of this output;
- .5 consideration of causes and measures for the mitigation of fatigue should extend beyond the company and the ship;

- .6 specific guidance in the current guidelines was limited to the shipowner, the master, the crew members, pilots, naval architects and training providers;
- .7 specific guidance addressing the role of external parties, including authorities, in mitigating fatigue on board ships should be included in the revised guidelines; and
- .8 all stakeholders should be engaged in developing practical solutions to mitigate and manage fatigue.

8.11 After an in-depth discussion, the Sub-Committee referred documents HTW 2/8 and HTW 2/8/2 to Working Group 3 on Human Element Issues to be established for preliminary consideration and to advise the Sub-Committee on the way forward.

Human element and training issues regarding the implication of e-navigation

8.12 Italy (HTW 2/8/1), taking into account the outcome of MEPC 66 (MEPC 66/21, paragraph 16.4), referred in particular to the extensive discussion in the e-navigation Correspondence Group on the Implication of specific elements including the human element, the five factors directly related to safety (FSA) and the seven factors related to risk and cost-benefits (RCO) that had been identified. Italy suggested that the information provided should be taken into account during the training of personnel in the maritime sector.

8.13 In the ensuing discussion, the following views were expressed:

- .1 aspects of the information provided by Italy could have been better considered under agenda item 5 on *Revised guidelines for model course development, updating and validation processes*; and
- .2 it was too premature to consider addressing e-navigation related issues raised by Italy as the Committee had not yet decided on the way forward for the implementation of e-navigation.

8.14 After some discussion, the Sub-Committee invited Italy and other interested delegations and international organizations to submit relevant proposals for consideration by the Committee in the future.

Other issues

8.15 The Sub-Committee noted with appreciation the information contained in document HTW 2/INF.2 (IAMU) relating to the outcome of the IAMU Forum on Maritime Education and Training (MET) in Higher Education, held in Tokyo in February 2014.

8.16 The Sub-Committee noted with appreciation the information contained in document HTW 2/INF.3 (IMarEST) relating to the introduction of a controlled language in operating and maintenance manuals as a way of reducing human error.

8.17 The Sub-Committee noted with appreciation the information contained in document HTW 2/INF.6 (WMU) concerning the planned activities and outcomes from the CyClaDes Project related to the human element in shipping.

8.18 The Sub-Committee noted with appreciation the information contained in document HTW 2/INF.7 (NI and ITF) relating to seafarer fatigue and the need to address fatigue in the context of hours of work, hours of rest and minimum safe manning.

Establishment of Working Group 3

8.19 The Sub-Committee established Working Group 3, under the chairmanship of Capt. Moises De Gracia (Panama), and instructed it, taking into account decisions and comments in plenary, to:

- .1 consider documents HTW 2/2/1, HTW 2/2/1/Corr.1 and III1/18, annex 4 and review the draft MSC-MEPC.4 circular on *Guidelines for port State control officers on the ISM Code*, taking into account the views expressed by IACS, and provide comments, as appropriate, with a view to subsequent approval by the Committees;
- .2 consider documents HTW 2/8 (Australia et al.) and HTW 2/8/2 (United Kingdom) with regard to the review and updating of MSC/Circ.1014 on *Guidelines on fatigue mitigation and management* and advise the Sub-Committee, as appropriate; and
- .3 submit its report on Thursday, 5 February 2015.

Report of Working Group 3

8.20 On receipt of the report of Working Group 3 (document HTW 2/WP.5), the Sub-Committee approved it in general and took action as summarized in the following paragraphs.

Guidelines for port State control officers on the ISM Code

8.21 The Sub-Committee endorsed the draft MSC-MEPC.4 Circular on *Guidelines for port State control officers on the ISM Code*, as set out in annex 1 of document HTW 2/WP.5, and invited the Committees to forward the draft *Guidelines for port State control officers on the ISM Code* to the III Sub-Committee for review and finalization, with a view to approval by the Committees.

Guidelines on fatigue mitigation and management

8.22 The Sub-Committee noted the comments of the group with regard to the review and updating of MSC/Circ.1014 on *Guidelines on fatigue mitigation and management* and, in particular, that:

- .1 the delegation of Australia had offered to submit a proposal to HTW 3, in collaboration with interested Member Governments and international organizations; and
- .2 revision of the guidelines should be completed within the next two sessions of the Sub-Committee (i.e. HTW 3 and HTW 4).

9 MANDATORY CODE FOR SHIPS OPERATING IN POLAR WATERS

9.1 The Sub-Committee recalled that:

- .1 MSC 94 had adopted the Introduction and parts I-A and I-B of the International Code for Ships Operating in Polar Waters (Polar Code); and

- .2 HTW 1 (document HTW 1/21, paragraph 11.16) had noted the progress made in the preparation of draft amendments to the STCW Convention and part A of the STCW Code relating to training requirements for officers and crew on board ships operating in polar waters (document HTW 1/WP.4/Rev.1, annex 1), and had invited Member Governments and international organizations to submit comments and proposals to HTW 2.

Training requirements for officers and crew on board ships operating in polar waters

9.2 The United States (document HTW 2/9) proposed, based on the preliminary training requirements developed at HTW 1 (document HTW 1/WP.4/Rev.1, annex 1), revised training requirements for officers and crew on board ships operating in polar waters for inclusion in the STCW Convention and Code.

9.3 In the ensuing discussion, the following views were expressed:

- .1 duplication of training requirements in chapter II, the ISM Code and the Polar Water Operational Manual should be avoided;
- .2 the proposed sea service requirements were restricted to polar waters;
- .3 sea service should not be restricted to polar waters for seafarers to obtain required qualifying sea service;
- .4 flexibility should be provided in obtaining the required sea service to ensure that there was no shortage of qualified seafarers for service in polar waters;
- .5 experience of navigators in ice covered waters should be considered for qualifying sea service as there were not many ships available on which qualifying sea service could be obtained, if qualifying sea service were to be restricted to sea service in polar waters;
- .6 it was not appropriate to have separate model courses for Arctic and Antarctic waters; and
- .7 documentary evidence of sea service should be considered rather than certification of proficiency as this could lead to administrative burdens.

9.4 After an in-depth discussion, the Sub-Committee referred the document to Working Group 1 to develop draft amendments to the STCW Convention and Code relating to training requirements for officers and crew on board ships operating in polar waters.

Transitional arrangements for training and qualification requirements for seafarers on board ships operating in polar waters

9.5 China (document HTW 2/9/1) proposed amendments to the draft amendments to the STCW Code relating to the Polar Code pertaining to transitional arrangements, from the date of entry into force of the Polar Code, for training and qualification requirements for seafarers on board ships operating in polar waters.

9.6 In the ensuing discussion, the following views were expressed:

- .1 interim guidance valid only for a short period of time could not be supported;

- .2 the burden of implementing requirements of the Convention were heavy and Administrations should not be additionally burdened with the task of implementing interim provisions;
- .3 transitional requirements were provided in section B-V/g and, therefore, additional transitional provisions were not required;
- .4 there was no need to issue a circular providing guidance on transitional provisions; and
- .5 sea service for transitional arrangements needed further discussion.

9.7 After some discussion, the Sub-Committee referred the document to Working Group 1 for detailed consideration and to develop draft amendments to the STCW Code relating to transitional arrangements for officers and crew on board ships operating in polar waters.

Instructions to Working Group 1

9.8 The Sub-Committee instructed Working Group 1, taking into account decisions and comments in plenary, to:

- .1 consider documents HTW 2/9 (United States) and HTW 2/9/1 (China) and develop draft amendments to chapter V of the STCW Convention and Code, including transitional arrangements relating to training requirements for officers and crew on board ships operating in polar waters; and
- .2 submit its report on Thursday, 5 February 2015.

Report of Working Group 1

9.9 Having considered the report of Working Group 1 (document HTW 2/WP.3), the Sub-Committee approved it in general and took action as summarized in the following paragraph.

Training requirements for officers and crew on board ships operating in polar waters

9.10 The Sub-Committee endorsed the draft amendments to the STCW Convention, as set out in annex 2, and to parts A and B of the STCW Code, as set out in annexes 3 and 4 respectively relating to revised training requirements for masters and deck officers on board ships operating in polar waters, and invited the Committee to approve them, with a view to adoption at MSC 96.

9.11 In this context, the delegations of the Russian Federation and CLIA, supported by ICS and BIMCO, made a statement, as set out in annex 9.

9.12 Furthermore, the Sub-Committee noted the group's view that similar amendments to STCW regulation I/11, section A-I/11 and table B-I/11 relating to revalidation of certificates for masters, officers and ratings serving on board ships subject to the IGF Code were required. To this end, the Sub-Committee agreed to invite the Committee to decide if these could be included at the adoption stage and, if not, to advise the Sub-Committee on the way forward.

10 REVIEW OF STCW PASSENGER SHIP-SPECIFIC SAFETY TRAINING

10.1 The Sub-Committee recalled that:

- .1 MSC 91 had included an output on "Passenger ship training" in the post-biennial agenda of the Committee, with two sessions needed to complete the item, and had instructed STW 44 to include this item in the provisional agenda of STW 45 (renamed HTW 1);
- .2 HTW 1 had established a correspondence group coordinated by the United States and instructed it, taking into account documents HTW 1/13 and Corr.1 (United States) and HTW 1/13/1 (ITF), as well as views expressed in plenary, to prepare draft amendments to chapter V of the STCW Convention and Code, providing revised training requirements for passenger ship-specific safety training, and to submit its report to HTW 2; and
- .3 MSC 93 had agreed to include in the biennial status report of the SDC Sub-Committee and in the provisional agenda of SDC 2 a new unplanned output on "Amendments to SOLAS chapter II-1 and associated guidelines on damage control drills for passenger ships", with a target completion year of 2016, in association with the HTW Sub-Committee, as and when requested by the SDC Sub-Committee.

10.2 The Sub-Committee noted that MSC 93, having considered the report of the Working Group on Passenger Ship Safety, had instructed HTW 2 to include the item "Enhanced damage stability training" under the existing planned output 5.2.2.2 on the review of STCW passenger ship-specific safety training (document MSC 93/22, paragraph 6.26.4).

Revised training requirements relating to passenger ship-specific safety training

10.3 The United States (document HTW 2/10/1) provided information on the outcome of the work of the Correspondence Group on Development of revised training requirements relating to passenger ship-specific safety training.

10.4 CLIA et al. (document HTW 2/10/2) provided comments on the outcome of the work of the Correspondence Group on the Review and revision of passenger ship-specific training within the STCW Convention and Code set out in document HTW 2/10/1.

10.5 In this regard, the delegation of the United States advised the Sub-Committee that the following issues should be agreed in principle by the Sub-Committee, prior to finalizing the proposed revised training requirements relating to passenger ship-specific safety training:

- .1 existing training requirements should not be downgraded;
- .2 the levels of training should be agreed;
- .3 duplication of existing training requirements should be avoided;
- .4 proof of completion of training;
- .5 the structure of the proposed training;
- .6 requirements for course approval; and
- .7 training to be undertaken prior to being assigned shipboard duties.

10.6 In the ensuing discussion, the following views were expressed:

- .1 passenger ship familiarization training should not be a stand-alone course but should be included by companies as part of a mandatory familiarization package, under regulation VI/1, and should apply to all passengers;
- .2 some delegations preferred a two-tiered Basic and Advanced Passenger ship safety training; however, the majority preferred a three-tiered approach;
- .3 basic training of onboard, ship-specific training for masters, officers, ratings and other personnel designated to assist passengers in emergency situations should be undertaken in advance of the assignment of such tasks on board and they should be included in the muster list;
- .4 advanced training should consist of shore-based approved training for masters, officers and personnel who have management, command and control functions in emergency situations on board passenger ships;
- .5 there was a need for clarity on what constituted instructions as opposed to training and the applicability of training requirements, particularly for persons engaged/employed on board who may have limited or no assigned role or tasks in the event of an emergency;
- .6 assessment of the assigned ship-board emergency duties and the competence required should be undertaken to ascertain the level of training;
- .7 duplication of existing basic training and other specific training should be avoided;
- .8 documentary evidence was sufficient to demonstrate competence and proof of training should be retained on board;
- .9 there should be flexibility for providing training before being assigned shipboard duties; and
- .10 the focus of training should be on the tasks that a seafarer undertakes on board.

10.7 In light of the foregoing, the Sub-Committee agreed that:

- .1 there should be no downgrading of existing training requirements;
- .2 a three-tiered training approach should be adopted;
- .3 there should be no duplication of existing training requirements, and consistency of standards should be ensured;
- .4 documentary evidence was sufficient as proof of training;
- .5 no tables of competences were required for tier one, while tiers two and three should include tables of competence;
- .6 the working group could discuss in detail on the need for approval of the top and middle tier courses; and
- .7 training should be undertaken prior to duties being assigned on board.

10.8 After an in-depth discussion, the Sub-Committee referred the above documents to Working Group 2 on Training Matters to be established for detailed consideration and to prepare draft amendments to the STCW Convention and Code relating to revised training requirements for passenger ships, for consideration by the Sub-Committee, with a view to approval by the Committee.

Enhanced damage stability training

10.9 CLIA (document HTW 2/10/3) recalled the output from the Cruise Ship Safety Forum related to enhanced damage stability training programme, and provided comments which could serve as a basis for discussion on enhanced damage stability training during the Sub-Committee's review of STCW passenger ship-specific safety training.

10.10 In the ensuing discussion, the following views were expressed:

- .1 there was concern regarding the applicability of training to deck/all officers at management level and it was felt that the scope of application should be clarified;
- .2 there could be some duplications with chapter II training requirements;
- .3 more clarity was required with regard to the expected outcome; and
- .4 it was premature to consider the proposal at this stage.

10.11 After some discussion, the Sub-Committee agreed that it was premature to undertake a detailed consideration of the issues raised by CLIA to develop training requirements for enhanced damage stability training prior to the outcome of SDC 2 related to the output on "Amendments to SOLAS chapter II-1 and associated guidelines on damage control drills for passenger ships".

Instruction to Working Group 2

10.12 The Sub-Committee instructed Working Group 2, taking into account comments and decisions in plenary, to:

- .1 consider documents HTW 2/10/1 (United States) and HTW 2/10/2 (ICS, CLIA and INTERFERRY) and prepare draft amendments to the STCW Convention and Code providing revised training requirements for passenger ships, for consideration by the Sub-Committee, with a view to approval by the Committee; and
- .2 submit its report on Thursday, 5 February 2015.

Report of Working Group 2

10.13 Having considered the report of Working Group 2 (document HTW 2/WP.4), the Sub-Committee approved it in general and took action as summarized in the following paragraphs.

Revised training requirements relating to passenger ship-specific safety training

10.14 The Sub-Committee noted the group's discussion on the consistent application of the terms "officers", "ratings" and "other personnel".

10.15 The Sub-Committee endorsed, in principle, the draft amendments to regulation V/2 and section A-V/2 of the STCW Code and invited interested Member States and international organizations to submit comments and proposals, based on the text set out in document HTW 2/WP.4, annex 1, to HTW 3 for consideration.

10.16 In light of the foregoing, the Sub-Committee agreed to invite the Committee to extend the target completion year for the output "Review of the STCW passenger ship-specific safety training" to 2016.

11 TRAINING IN HOT-WORK PROCEDURES ON CRUDE OIL TANKERS

11.1 The Sub-Committee recalled that:

- .1 MSC 91 had included, in the post-biennial agenda of the Committee, an output on "Training in hot-work procedures on crude oil tankers", with one session needed to complete the item, assigning the STW Sub-Committee as the coordinating organ, in association with the FP (now renamed as SSE) Sub-Committee, as and when requested by the STW (renamed HTW) Sub-Committee; and
- .2 a number of issues in Risk Control Option 8 related to hot-work procedures had been addressed in section A-V/1 under the 2010 Manila Amendments to the STCW Convention and Code, and, noting that no documents had been submitted for consideration at HTW 1, the Sub-Committee had deferred further consideration to HTW 2.

11.2 The Sub-Committee, noting that training related to hot-work procedures had been addressed in section A-V/1 under the 2010 Manila Amendments to the STCW Convention and Code, and that no documents had been submitted for consideration by the Sub-Committee for two sessions, agreed to invite the Committee to delete this output from the biennial agenda when discussing agenda item 16.

12 FIRST OUTLINE OF THE DETAILED REVIEW OF THE GLOBAL MARITIME DISTRESS AND SAFETY SYSTEM (GMDSS)

12.1 The Sub-Committee recalled that MSC 90 had included in the 2012-2013 biennial agenda of the COMSAR, NAV and STW Sub-Committees and in the provisional agendas for COMSAR 17 and STW 44 an unplanned output on "Review and modernization of the Global Maritime Distress and Safety System (GMDSS)", with a target completion year of 2017, assigning the COMSAR Sub-Committee as the coordinating organ, in association with the NAV and STW Sub-Committees.

12.2 The Sub-Committee, noting that no documents had been submitted for consideration or referred to the Sub-Committee by NCSR 1 for review, deferred further consideration to HTW 3, pending further input/referral from NCSR 2.

13 E-NAVIGATION STRATEGY IMPLEMENTATION PLAN

13.1 The Sub-Committee recalled that HTW 1 had agreed that it was premature to consider any training requirements, pending the finalization of the e-navigation Strategy Implementation Plan (SIP) (document HTW 1/21, paragraphs 20.9 to 20.13).

13.2 The Sub-Committee noted that MSC 94 had approved the SIP, as set out in document NCSR 1/28, annex 7.

13.3 The Sub-Committee, bearing in mind that MSC 94 had approved the SIP, agreed to invite the Committee to delete this output, when discussing agenda item 16.

14 GUIDELINES FOR SHIPOWNERS AND SEAFARERS FOR IMPLEMENTATION OF RELEVANT IMO INSTRUMENTS IN RELATION TO THE CARRIAGE OF DANGEROUS GOODS IN PACKAGED FORM BY SEA

14.1 The Sub-Committee recalled that:

- .1 MSC 92 had included in the 2014-2015 biennial agenda of the HTW Sub-Committee and in the provisional agenda for HTW 1 an output on "Development of guidelines for shipowners and seafarers for proper implementation of relevant IMO instruments in relation to the carriage of dangerous goods in packaged form by sea", with a target completion year of 2015, in association with the CCC Sub-Committee, as and when requested by the HTW Sub-Committee (document MSC 92/26, paragraph 23.9); and
- .2 HTW 1 had agreed that it was premature to forward the draft *Guidelines for the implementation of IMO instruments in relation to the carriage of dangerous goods in packaged form by sea* to the CCC Sub-Committee, and consequently had invited the co-sponsors of the proposal and other interested Member Governments and international organizations to submit a revised draft for consideration by the Sub-Committee at this session.

14.2 Australia et al. (document HTW 2/14) proposed revised draft *Guidelines for the implementation of IMO instruments in relation to the carriage of dangerous goods in packaged form by sea*, aimed at those organizations responsible for the provision of suitable training to personnel involved with the transport of dangerous goods in packaged form by sea, to ensure that the requirements of existing IMO instruments are met.

14.3 In the ensuing discussion, the following views were expressed:

- .1 the revised guidelines would:
 - .1 enhance the implementation of requirements for handling dangerous goods especially by personnel ashore; and
 - .2 clarify the existing IMO requirements;
- .2 the references related to the STCW Convention and the ISM Code needed to be reviewed; and
- .3 the revised draft *Guidelines for the implementation of IMO instruments in relation to the carriage of dangerous goods in packaged form by sea*, developed by the Sub-Committee, should be forwarded to CCC 2 for comments, prior to approval by the Committee.

14.4 After some discussion, the Sub-Committee referred the document to Working Group 3 to be established for detailed consideration and with a view to developing draft *Guidelines for the implementation of IMO instruments in relation to the carriage of dangerous goods in packaged form by sea*, for consideration by the Sub-Committee.

Instruction to Working Group 3

14.5 The Sub-Committee instructed Working Group 3, taking into account comments and decisions in plenary to:

- .1 consider document HTW 2/14 and develop draft *Guidelines for the implementation of IMO instruments in relation to the carriage of dangerous goods in packaged form by sea*, for consideration by the Sub-Committee, and for comments by CCC 2, with a view to subsequent approval by the Committee; and
- .2 submit its report on Thursday, 5 February 2015.

Report of Working Group 3

14.6 On receipt of the report of Working Group 3 (document HTW 2/WP.5), the Sub-Committee approved it in general and took action as summarized in the following paragraph.

14.7 The Sub-Committee endorsed the draft MSC Circular on *Guidelines on consolidated IMO provisions for the safe carriage of dangerous goods in packaged form by sea*, as set out in annex 2 of document HTW 2/WP.5, and invited the Committee to forward the draft guidelines to the CCC Sub-Committee for review and finalization, with a view to subsequent approval by the Committee.

15 NON-MANDATORY INSTRUMENT ON REGULATIONS FOR NON-CONVENTION SHIPS

15.1 The Sub-Committee recalled that MSC 92 had:

- .1 included in the 2014-2015 biennial agenda of the HTW Sub-Committee and in the provisional agenda for HTW 2 an output related to the development of the Non-mandatory instrument on regulations for non-convention ships, with the III Sub-Committee as the coordinating Sub-Committee, with a target completion year of 2015; and
- .2 instructed the III Sub-Committee to report to the Committee prior to involving other Sub-Committees.

15.2 The Sub-Committee, noting the Committee's instruction referred to in paragraph 15.1.2 above, deferred further consideration, pending further instruction from the Committee, and agreed to invite the Committee to move this output to the post-biennial agenda when discussing agenda item 16.

16 BIENNIAL AGENDA AND PROVISIONAL AGENDA FOR HTW 3

Biennial status report

16.1 The Sub-Committee recalled that MSC 94 had approved the Sub-Committee's revised biennial agenda for 2014-2015 and the provisional agenda for HTW 2, as set out in annexes 25 and 26 to document MSC 94/21.

16.2 Taking into account the progress made at this session, the Sub-Committee prepared the biennial status report (document HTW 2/WP.2, annex 1), as set out in annex 5, for consideration by MSC 95.

Proposed biennial agenda for the 2016-2017 biennium and provisional agenda for HTW 3

16.3 Taking into account the progress made at the session and the relevant decisions of MSC 94, the Sub-Committee prepared its proposed biennial agenda for 2016-2017 (HTW 2/WP.2, annex 2) and the proposed provisional agenda for HTW 3 (HTW 2/WP.2, annex 3), as set out in annexes 6 and 7, respectively, for consideration by MSC 95.

Arrangements for the next session

16.4 The Sub-Committee agreed to establish at its next session working/drafting groups on subjects to be selected from the following:

- .1 validated model training courses (agenda item 3);
- .2 guidance for the implementation of the 2010 Manila Amendments (agenda item 6);
- .3 revision of the guidelines on fatigue (agenda item 8);
- .4 review of STCW passenger ship-specific safety training (agenda item 9);
- .5 amendments to SOLAS chapter II-1 and associated guidelines on damage control drills for passenger ships (agenda item 10);
- .6 first outline of the detailed review of the Global Maritime Distress and Safety System (GMDSS) (agenda item 11);
- .7 revision of requirements for escape route signs and equipment location markings in SOLAS and related instruments (agenda item 12); and
- .8 amendments to the IGF Code and development of guidelines for low-flashpoint fuels (agenda item 13),

whereby the Chairman, taking into account the submissions received on the respective subjects, would advise the Sub-Committee well in advance of HTW 3 on the final selection of such groups.

Date of the next session

16.5 The Sub-Committee noted that the third session of the Sub-Committee had been tentatively scheduled to take place from 1 to 5 February 2016.

17 ELECTION OF CHAIRMAN AND VICE-CHAIRMAN FOR 2016

17.1 In accordance with the Rules of Procedure of the Maritime Safety Committee, the Sub-Committee unanimously re-elected Mr. Brad Groves (Australia) as Chairman and Ms. Mayte Medina (United States) as Vice-Chairman for the year 2016.

18 ANY OTHER BUSINESS

Consolidation of ECDIS-related IMO circulars

18.1 The Sub-Committee noted that NCSR 1 had endorsed the draft MSC circular on ECDIS – *Guidance for good practice*, as set out in annex 1 to NCSR 1/WP.8, and forwarded it to the Sub-Committee for review, in particular the provisions related to ECDIS training and the use of simulators, for subsequent approval by the Committee.

18.2 In the ensuing discussion, the Sub-Committee was of the view that some references to the STCW Convention and Code needed to be reviewed for accuracy and consistency.

18.3 After a brief discussion, the Sub-Committee referred the aforementioned circular to Working Group 2 for review and finalization, for the consideration of the Sub-Committee and subsequent approval by MSC 95.

Establishment of Working Group 2

18.4 The Sub-Committee established Working Group 2 under the chairmanship of Ms. Maryanne Adams (Marshall Islands) and instructed it, taking into account comments and decisions in plenary, to:

- .1 consider document HTW 2/6/1 (China) and develop guidance for the development of a specific GISIS module to comply with the reporting and information communication obligations of Parties under the STCW Convention, 1978, as amended;
- .2 consider documents HTW 2/10/1 (United States) and HTW 2/10/2 (ICS, CLIA and INTERFERRY) and prepare draft amendments to the STCW Convention and Code providing revised training requirements for passenger ships, for consideration by the Sub-Committee, with a view to approval by the Committee;
- .3 consider documents HTW 2/18/2 (Secretariat) and NCSR 1/WP.8, annex 1 (Secretariat) and review the draft MSC circular on ECDIS – *Guidance for good practice*, in particular, the provisions related to ECDIS training and the use of simulators, for consideration by the Sub-Committee, with a view to subsequent approval by the Committee; and
- .4 submit its report on Thursday, 5 February 2015.

Report of Working Group 2

18.5 Having considered the report of Working Group 2 (document HTW 2/WP.4), the Sub-Committee approved it in general and took action as summarized in the following paragraphs.

Consolidation of ECDIS-related IMO circulars

18.6 The Sub-Committee endorsed the draft MSC circular on *ECDIS – Guidance for good practice*, as set out in annex 8, and invited the Committee to approve it.

Guidelines for port State control officers on certification of seafarers' rest hours based on the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW), 1978, as amended, and manning requirements from the flag State

18.7 The Sub-Committee noted that III 1 had agreed the draft MSC circular on *Guidelines for port State control officers on certification of seafarers' rest hours based on the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW), 1978, as amended, and manning requirements from the flag State* (III 1/18, annex 5), and had referred it to the HTW Sub-Committee for review, in general, and, in particular, paragraphs 6.2.24, 6.2.26, 6.4.2.2, 7.2.7, 7.3.2.4 and 7.3.2.14 containing some text within square brackets, for subsequent approval by the Committee (documents HTW 2/18/3 and HTW 2/2/1/Corr.1). In this context, the Secretariat clarified that there was an editorial error in the title of the aforementioned draft MSC circular and that the correct title was "*Guidelines for port State control officers on certification of seafarers, rest hours based on the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW), 1978, as amended, and manning requirements from the flag State*".

18.8 In the ensuing discussion, the following views were expressed:

- .1 there was no provision for equivalent competency in the STCW Convention;
- .2 there were many concerns related to inconsistencies in the content and the references to the STCW Convention in the draft guidelines;
- .3 the intent of the draft circular was unclear;
- .4 the draft circular needed thorough review prior to finalization; and
- .5 consideration should be deferred to HTW 3, pending further review by the III Sub-Committee.

18.9 After some discussion, the Sub-Committee referred the aforementioned draft MSC circular (document III 1/18, annex 5) to Working Group 3 on Human Element Issues for review, in general, and, in particular, paragraphs 6.2.24, 6.2.26, 6.4.2.2, 7.2.7, 7.3.2.4 and 7.3.2.14 containing some text within square brackets, with a view to possible approval by the Committee.

Instructions to Working Group 3

18.10 The Sub-Committee instructed Working Group 3, taking into account decisions and comments in plenary, to:

- .1 consider documents HTW 2/18/3 (Secretariat) and III 1/18, annex 5 and review the draft MSC circular on *Guidelines for port State control officers on certification of seafarers, rest hours based on the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW), 1978, as amended, and manning requirements from the flag State*, in particular paragraphs 6.2.24, 6.2.26, 6.4.2.2, 7.2.7, 7.3.2.4 and 7.3.2.14, with a view to approval by the Committee; and
- .2 submit its report on Thursday, 5 February 2015.

Report of Working Group 3

18.11 Having considered the report of Working Group 3 (document HTW 2/WP.5), the Sub-Committee approved it in general, and took action as summarized in the following paragraphs:

18.12 The Sub-Committee noted the comments of the group relating to the draft MSC circular on *Guidelines for port State control officers on certification of seafarers, rest hours based on the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW), 1978, as amended, and manning requirements from the flag State* (HTW 2/WP.5, paragraphs 20 to 23) and:

- .1 invited the Committee to forward the above comments to the III Sub-Committee noting, in particular, that further work would be carried out at HTW 3;
- .2 invited Member Governments and international organizations to submit relevant comments and proposals to HTW 3 for further consideration; and
- .3 noted that the delegation of the United States had offered to prepare a document for submission to HTW 3, in collaboration with interested Member Governments and international organizations.

18.13 The Sub-Committee also invited the Committee to request the III Sub-Committee, with regard to future revisions/development of port State control guidelines, to invite early inputs from relevant technical sub-committees in the development of related guidelines.

Guidance on drafting of amendments to the 1974 SOLAS Convention and related mandatory instruments

18.14 The Sub-Committee noted that:

- .1 MSC 93 had approved *Interim guidance on drafting of amendments to the 1974 SOLAS Convention and related mandatory instruments*; and
- .2 MSC 94 had approved MSC.1/Circ.1500 on *Guidance on drafting of amendments to the 1974 SOLAS Convention and related mandatory instruments*, and had instructed its subsidiary bodies to start using the guidance with immediate effect.

18.15 The delegation of the United States observed that with respect to the guidance on footnotes in MSC.1/Circ.1500, this should also apply to the STCW Convention, and that the status of footnotes in the STCW Convention must be clarified.

18.16 The delegation of Norway observed that a common understanding of the status of footnotes was required.

18.17 In this context, the Sub-Committee instructed the Secretariat to undertake an analysis of footnotes in the STCW Convention and submit a report to HTW 3.

Dispensations issued under Article VIII of the STCW Convention

18.18 The Sub-Committee noted information provided by the Secretariat (document HTW 2/18 and addendum) on the submissions made by the Parties in accordance with article VIII of the STCW Convention on dispensations granted by them in the years 2013 and 2014. The Sub-Committee also requested Member Governments to submit the information related to dispensations issued in the appropriate format, as set out in the annex to document HTW 2/18.

18.19 In this context, the delegation of Spain, observing the large number of dispensations that had been issued to chief engineers, reminded the Sub-Committee that article VIII (l) of the STCW Convention did not provide for dispensations to masters and chief engineers, except in circumstances of force majeure and then only for the shortest possible period.

Any other issues

Information on simulators available for use in maritime training

18.20 The Sub-Committee noted that MSC 81 had approved MSC.1/Circ.1209 requesting Member Governments to provide information on simulators available for use in maritime training. The Secretariat had received information from several Member Governments and added it to the GISIS database; this information can be viewed by the public on a "read-only" basis. The Secretariat requested those Member Governments who had not provided information to do so, at an early date, to enable the Secretariat to update the information on the GISIS database.

Reports of independent evaluation pursuant to regulation I/8 of the STCW Convention and section A-I/8 of the STCW Code

18.21 The Sub-Committee reminded Member Governments of the requirement for the submission of the reports of independent evaluation pursuant to regulation I/8 of the STCW Convention and section A-I/8 of the STCW Code, which requires a periodical independent evaluation of a Party's quality standards system to be conducted at intervals of not more than five years and for the report of this evaluation to be communicated to the Secretary-General. In this context, the Sub-Committee urged STCW Parties to refer to MSC.1/Circ.1164/Rev.13, with a view to ensuring that reports of independent evaluation pursuant to regulation I/8 of the STCW Convention and section A-I/8 of the STCW Code are submitted to the Secretary-General in a timely manner.

19 ACTION REQUESTED OF THE COMMITTEES

19.1 The Maritime Safety Committee, at its ninety-fifth session, is invited to:

- .1 approve the draft MSC-MEPC circular on *Guidelines for the development, review and validation of model courses* subject to concurrent approval by MEPC 68 (paragraph 5.8 and annex 1);
- .2 forward the draft *Guidelines for port State control officers on the ISM Code* to the III Sub-Committee for review and finalization with a view to approval by the Committees (paragraph 8.21);

- .3 approve the draft amendments to the STCW Convention, part A and B of the STCW Code, together with the associated draft MSC resolutions and STCW Circular related to revised training requirements for masters and deck officers on board ships operating in polar waters (paragraph 9.10 and annexes 2, 3 and 4);
- .4 bearing in mind the need to include provisions relating to revalidation of certificates of masters, officers and ratings serving on board ships subject to the IGF Code, to decide if these could be included at the adoption stage and, if not, to advise the Sub-Committee on the way forward (paragraph 9.12);
- .5 extend the target completion year for the output "Review of the STCW passenger ship-specific safety training" to 2016 (paragraph 10.16);
- .6 forward the draft MSC Circular on *Guidelines on consolidated IMO provisions for the safe carriage of dangerous goods in packaged form by sea* to the CCC Sub-Committee for review and finalization, with a view to subsequent approval by the Committee (paragraph 14.7);
- .7 approve the biennial status report of the Sub-Committee for the 2014-2015 biennium (paragraph 16.2 and annex 5);
- .8 approve the biennial agenda of the Sub-Committee for the 2016-2017 biennium (paragraph 16.3 and annex 6);
- .9 approve the provisional agenda for HTW 3 (paragraph 16.3 and annex 7);
- .10 approve the draft MSC circular on *ECDIS – Guidance for good practice* (paragraph 18.6 and annex 8);
- .11 forward the comments of the Sub-Committee relating to the draft *Guidelines for port State control officers on certification of seafarers, rest hours* based on the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW), 1978, as amended, and manning requirements from the flag State to the III Sub-Committee, in particular that further work will be carried out at HTW 3 (paragraph 18.12);
- .12 request the III Sub-Committee, with regard to future revisions/development of port State control guidelines, to invite early inputs from relevant technical Sub-Committees in the development of related guidelines (paragraph 18.13); and
- .13 approve the report in general.

19.2 The Marine Environment Protection Committee, at its sixty-eighth session, is invited to:

- .1 approve the draft MSC-MEPC circular on *Guidelines for the development, review and validation of model courses*, subject to concurrent approval by MSC 95 (paragraph 5.8 and annex 1); and
- .2 forward the draft *Guidelines for port State control officers on the ISM Code*, to the III Sub-Committee, subject to concurrent approval by MSC 95, for review and finalization with a view to approval by the Committees (paragraph 8.21).

ANNEX 1

DRAFT MSC-MEPC CIRCULAR

MSC-MEPC.2/Circ.[]
[] June 2015

**REVISED GUIDELINES FOR THE DEVELOPMENT, REVIEW AND VALIDATION
OF MODEL COURSES**

1 The Maritime Safety Committee, at its [ninety-fifth session (3 to 12 of June 2015)], and the Marine Environment Protection Committee, at its [sixty-eighth session (11 to 15 May 2015)], approved the *Guidelines for the development, review and validation of model courses* developed by the Sub-Committee on Human Element, Training and Watchkeeping (HTW) at its second session (2 to 6 February 2015), as set out in the annex.

2 These revised guidelines supersede the guidelines developed by STW 17 and approved by MSC 50.

3 Member Governments, international organizations and non-governmental organizations with consultative status are invited to disseminate the revised guidelines, as appropriate.

ANNEX

REVISED GUIDELINES FOR THE DEVELOPMENT, REVIEW AND VALIDATION OF MODEL COURSES

1 INTRODUCTION

1.1 The model courses play a very significant part in the implementation of IMO instruments. The intent of a model course is to provide a validated¹ "framework" for the use of course providers who develop education and training programs and courses which are consistent with the requirements of the IMO Instruments. Therefore, it is important that the model courses follow the standards set out in the IMO instruments. These guidelines are intended to ensure that model courses meet the general intent mentioned above, and more importantly, support the requirements and standards of the IMO instruments.

1.2 These guidelines are intended to update and standardize the process by which model courses are developed, reviewed and validated. The validation process will ensure that any model course is consistent with the relevant IMO Instrument.

1.3 These guidelines should be reviewed whenever the relevant IMO instruments are amended to ensure they are still valid and continue to support the standards established in the IMO instruments.

1.4 Administrations approve courses for education and training using mandatory IMO instruments as the minimum standard.

1.5 The inclusion of a timetable in a model course is general in nature and thus does not take into account variations in existing knowledge and skills of candidates entering this course. It is provided in a model course only as an indication of what may be required.

2 ROLES, COMPOSITION AND FUNCTIONS

2.1 Annex 1 of the guidelines provides a flow chart of the process for developing model courses. The composition and function of each group involved in the process is as follows:

- .1 A designated representative of the Secretariat will serve as a contact person for Model Course Development.
- .2 Course developer – Is the subject matter expert, education and training institution, non-governmental organization or Administration that has requested and/or been awarded the task of developing a new model course or revision of an existing model course.
- .3 Review Group – Its function is to review the content of the model course against the specific instructions/terms of reference provided to the course developer and resolve as many elements found within a model course prior to submission to the Committee/Sub-Committee meeting. The review group should include "all" stakeholders, including IMO member States, international organizations, representatives from the maritime industry, maritime training

¹ [Validation in this context means that the Committee/Sub-Committee has found no grounds to object to the model course's contents, but has not granted its approval to the document as it does not consider any model course to be an official interpretation of IMO Instruments].

and education establishments, seafarer representatives and other relevant professional organizations. This is not envisaged as a standing group as the members could change depending upon the course that is under consideration. The work of this group can be accomplished through correspondence.

- .4 The validation organ – Its function is to complete the validation process which is intended to ensure that model courses meet the requirements of the IMO instruments and are developed so that the IMO organ will find no grounds to object to the contents.

3 PRIORITIZATION AND REVIEW OF MODEL COURSES FOR DEVELOPMENT OR UPDATING

3.1 Within every five-year period the Secretariat should review each model course for its consistency with the relevant IMO Instrument, other relevant codes and its relevance to current practices and emerging technology. This review should coincide with the amendments to any other relevant conventions and codes. The results of this review should place the reviewed model course into one of the prioritization categories described in paragraph 3.2, and report to the Committee/Sub-Committee.

3.2 In order to maximize the efficient use of resources, the development of new model courses and the amending of existing model courses, should be prioritized in the following order:

- .1 New model courses to be developed as a result of new or amended IMO instruments;
- .2 Existing model courses that require significant changes, either individual or cumulative, due to amendments to IMO Instruments and/or significant industry/technological changes when reviewed under paragraph 3.1;
- .3 Existing model courses that require minor changes due to amendments to IMO and/or minor industry/technological changes when reviewed under paragraph 3.1;
- .4 Model courses requiring no changes when reviewed under paragraph 3.1 or were published less than five years before the date of the prioritization.

3.3 A model course that requires updating should follow the process identified in section 6.

4 PROCEDURE FOR DEVELOPING MODEL COURSES

4.1 The step-by-step process of development of model courses is as follows:

- .1 The model courses to be developed will be based upon the periodical assessment carried out by the Committee/Sub-Committee.
- .2 When it is decided to develop a model course, the Committee/Sub-Committee should select the course developer with the assistance of the IMO Secretariat and develop the course developer specific instructions/terms of reference (see annex 2). In relation to the STCW Convention and Code, consideration should be given to ensure that the same course developer is

selected when addressing competencies that include career progressions (for example deck operational and management level). Course developers must be provided with the model course development guidance for course developers (see annex 3), and the time frame for completion of the model course.

- .3 The course developer prepares an initial draft to be forwarded to the designated representative of the IMO Secretariat. The IMO Secretariat may conduct a review of the first draft of the course for adequacy and consistency with instructions, and suggests changes, where appropriate.
- .4 The course developer will then prepare a final draft with revisions from the IMO Secretariat. The IMO Secretariat receives the second draft and forwards the draft model course to the review group.

4.2 The terms of reference to the course developers should include standard instructions, a model course template and specific instructions that address:

- .1 the development time frame or submission date of the draft model course;
- .2 awareness that the course they develop could be used globally;
- .3 the course must be adaptable to varying resources and candidates from many backgrounds;
- .4 encouragement to the developer to invite the participation of interested parties;
- .5 other model courses that will use the developing model course as a prerequisite;
- .6 other model courses that will be the prerequisite for the developing model course;
- .7 other model courses that share common competencies or KUPs;
- .8 other conventions and codes with relevance to the subject matter to be presented; and
- .9 development of model courses based on the STCW Convention and Code should support competency-based outcomes.

5 PROCEDURE FOR THE REVIEW AND VALIDATION OF MODEL COURSES

5.1 The Committee/Sub-Committee should establish a review group for each model course that is expected to be validated.

5.2 The IMO Secretariat should provide the model course review group instructions and checklist (see annex 4) for the review of the model course under consideration, the instructions to the course developer and the time frame for the review.

5.3 The review group should select one member to coordinate the activities of the group, who should inform the designated representative of the Secretariat.

5.4 Upon receiving the draft model course from the course developer, the Secretariat will forward the document to the review group via the coordinator.

5.5 Each review group member will provide his/her proposed comments and/or amendments and supporting remarks within an agreed timeline as found in the Model Course Review Group Instructions and Checklist (annex 4). The course developer should participate in the proceedings of the review group in order to address comments, questions and changes from the member of the review group. Proposed amendments agreed to by the course developers and review group will be incorporated in a revised draft model course.

5.6 The review group prepares a report to the Committee/Sub-Committee about the suitability of model course, and any disagreements between the course developer and review group. The revised draft model course will be processed by the IMO Secretariat. Documents will be submitted observing the rules governing submission of documents.

5.7 The Committee/Sub-Committee will give preliminary consideration to the draft model courses and all comments made thereon, if any. Following this, the Committee/Sub-Committee will either refer the entire draft model course to the course developer for revision in detail or validate the model course.

5.8 The Secretariat performs final editorial review of the model courses validated by the Committee/Sub-Committee.

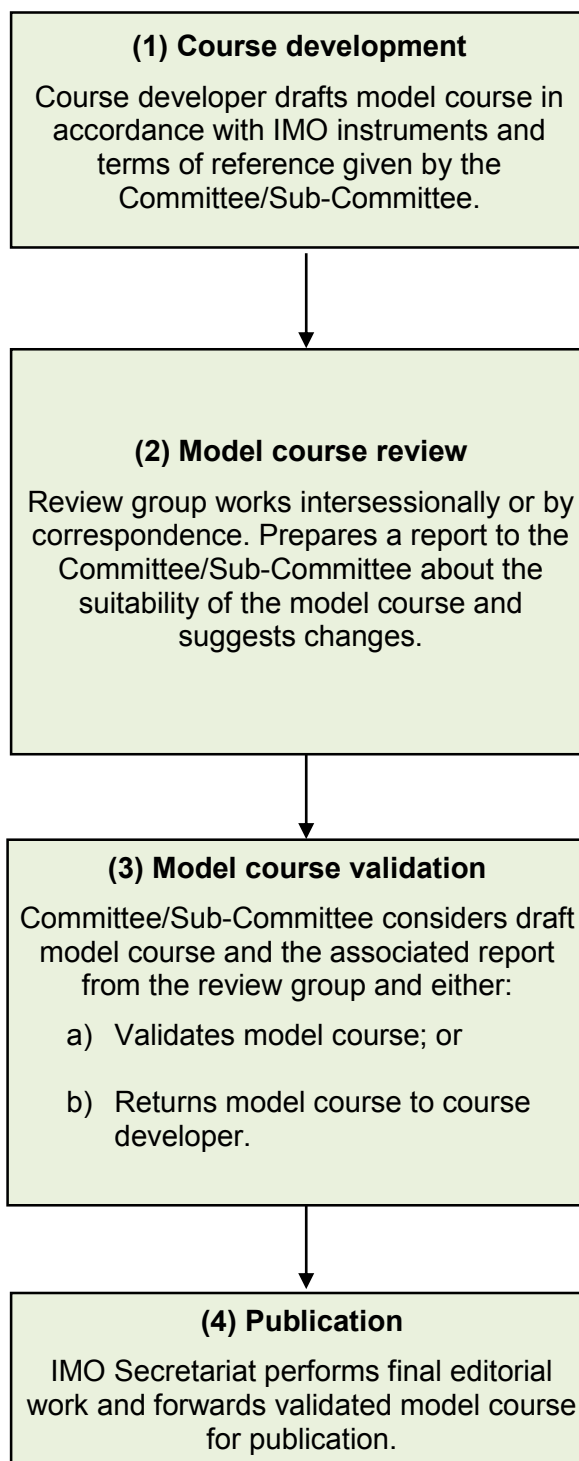
6 PROCEDURE FOR UPDATING MODEL COURSES

6.1 Decision to update model courses should follow the following process:

- .1 The model course requires no update to remain consistent with the relevant conventions, codes, industry practices or emerging technology.
- .2 The model course requires only minor updates to remain consistent with the relevant conventions, codes, industry practices or emerging technology. Depending on the number of updates, the model course can be forwarded directly to an appropriate review group, or a drafting/validating group. This group will be tasked to review changes by the Secretariat or to make changes as needed to update the model course. The model course is then revalidated as a new model course by the Committee/Sub-Committee or returned to the relevant review group for added changes. When a review group is used, the revalidation should follow the process outlined under section 5 above.
- .3 The model course requires substantial changes to remain consistent with or to address new changes to the relevant conventions, codes, industry practices or emerging technology. The model course will be considered as being a new model course for the purpose of its revision and be developed in accordance with section 4 above.

Annex 1

PROCESS FOR DEVELOPING MODEL COURSES



Annex 2

Course developer specific instructions/Terms of reference

<p>Course developer specific instructions/Terms of reference <u>(Name of Model Course)</u></p>	
<p>1) The overall goal of this model course is to develop the skills of the attending mariner so that they can <u>[state or list the relevant functions]</u> in accordance with the <u>[insert IMO Instrument]</u>. They are intended for a global audience and must be adaptable to a wide variety of candidates and teaching resources.</p>	
<p>2) This model course will be validated at <u>[insert Committee/Sub-Committee and session]</u>. The model course should be submitted to <u>[Secretariat Representative]</u> no later than <u>[insert date]</u> so that it can complete the review process.</p>	
<p>3) The following nations, organizations and subject matter experts (SME) have indicated their availability to work with you on this project. Their contact information is listed below. You are also encouraged to use other resources as may also be available to you.</p>	
Nation, Organization, SME	Contact Information
<p>4) This model course has some common and equal education and training requirements as are found in the listed model courses. The education and training requirements must use similar vernacular and be based upon the same information. However, alterations to reflect individual shipboard departmental requirements are expected.</p>	
Model Course	Education and training Requirement

5) This model course has some common, but lower level education and training requirements than that found in the listed model courses. These education and training requirements must use simpler taxonomy or topics to reflect their prerequisite nature.

Model Course	Education and training Requirement

6) This model course has some common, but higher-level education and training requirements than that found in the listed model courses. The education and training requirements must use a more advanced taxonomy or topics to reflect the advanced nature of the material presented.

Model Course	Education and training Requirement

7) This model course is to be included within these other model courses.

Model Course	Education and training Requirement

8) This model course is to include these other model courses.	
Model Course	Education and training Requirement
9) This model course is to include education and training requirements from other IMO Instruments.	
Convention and Codes	Education and training Requirement
<p>These Specific Instructions are to provide the course developer with guidelines to use during the development of a model course. They are as inclusive as possible. However, the course developer may, at their discretion and in consultation and agreement of the IMO Secretariat, adapt these instructions to meet the intent and goals of the Committee/Sub-Committee.</p>	

Annex 3

Model Course Development Guidance for course developers

1 Purpose of the model course

The purpose of an IMO model course is to assist organizations that focus on maritime training with the development and introduction of new training courses. This also includes the updating and improvement of existing courses so that the quality and effectiveness of the mariner training may be consistent internationally.

2 Developing the model course

2.1 Model courses should be developed with the following key concepts as guidelines.

- 2.1.1 There is an expectation that the candidate, having completed a course or programme of study based upon a model course, will have developed the competence necessary to perform their duties in a manner that provides for the safety of life, property, security at sea and the protection of the marine environment.
- 2.1.2 It is not the intention of the model course programme to present instructors with a rigid "teaching package" which they are expected to "follow blindly". Nor is it the intention to substitute audio-visual or "programmed" material for the instructor's presence. As in all training endeavours, the knowledge, skills and dedication of the instructors are the key components in the transfer of knowledge and skills to those being trained through IMO model course material.
- 2.1.3 The model course is intended for a varied, international set of end-users and excessive detail should be avoided. The educational systems and the cultural backgrounds of trainees in maritime subjects vary considerably throughout the world. For this reason, the model course material should be designed to identify the basic entry requirements and trainee target group for each course in universally applicable terms, and to specify clearly the technical content and levels of knowledge and skill necessary to meet the intent of the applicable IMO Instruments.
- 2.1.4 The model course should reflect the level of competence the candidate is studying to achieve by focusing on the training requirements found within the relevant IMO Instrument. The Model Course Developer (Developer) should avoid the repetition of material found in any prerequisite, supporting or supplemental model courses. The Developer should also avoid the insertion of material that is not included in the IMO Instrument's training requirements. In the event these become necessary, the model course should be notated, using the notations found in section 4 of this document as examples.

2.2 Before beginning the development of a model course, the Developer should review the relevant IMO Instruments, any current version of the model course to be developed, any model courses that will interact with the model course to be developed and perform a job survey of the occupation the model course represents.

2.3 The focus of the model course should be about the general, learning outcome-based content that must be taught and assessed and not the details that should be found within the lesson plans which must be developed by the instructor and approved by each administration. The instructor and the administration that develop any comprehensive courses or programmes based upon a model course should address the needs of their candidates, the local teaching environment and the administrations rules for certification.

2.4 In cases where there are apparent duplications of competencies or KUPs within a standard, the Developer must not duplicate the education and training, but differentiate the course goals and objectives to reflect either the increased level of complexity or the different technical aspect that a student must be presented with.

3 Model Course Structure

3.1 The following general structure should be adhered to.

3.1.1 Introduction

The introduction provides the model course user with a cursory description of the model course and the initial information to be considered by the user. This should also be used to introduce the information that will be presented in more detail later in the course.

3.1.2 Part A – Course Framework

Part A is a general description of the model course and the conditions that are needed for its implementation. It should specify the taxonomy used in the model course, the class infrastructure necessary to maximize candidate learning outcomes. The suggested infrastructure could include facilities, training aids, candidate to teacher ratios and other relevant training issues. Other IMO Instruments that affect the material in the course should be included. A notation that the model course user should adjust the suggested hours to meet the needs of the candidate should be incorporated (see 4.1.4).

3.1.3 Part B – General Outline

Part B is a general description of what material should be presented and its order of presentation. It should identify and correlate the functions, competencies and KUPs. When and where the standard addresses multiple functions, the general course outline should be divided into modules, according to function, and then subdivided into competencies. These competencies are further subdivided into KUPs. The numbering developed within this part should be used consistently throughout the model course.

3.1.4 Part C – Detailed Outline

Part C correlates the knowledge, understanding and proficiencies with the specific expertise that the candidate must acquire. Each specific expertise is presented as a topic or sub-topic. This is done so that the Developer, the instructor developing the working course and other model course users can focus on outcome-based learning. This is to be presented in an outline format and numbered to be consistent with part B. The outline format was chosen so that the model course user can trace the lineage of each task from sub-topic to function.

3.1.5 Part D – Instructor Manual

Part D provides the most detailed communication from the Developer to the model course user. It should include the topics and sub-topics that are listed in part C. It is here that the Developer discusses specifics about each topic and sub-topic. These specifics include, but are not limited to subject matter details, recommended presentation and assessment techniques. Potential problems, solutions, as well as suggestions on the use of different levels of technology and teaching techniques may be presented. It is numbered and subdivided in the same manner as part B above. If the Developer notes that a large amount of information necessary for the model course users is not available, the Developer should consider including a separate compendium that includes that information.

3.1.6 Part E – Evaluation and Assessment

Part E provides the model course user with information to consider concerning effective, objective evaluation and assessment. The concentration is upon developing techniques that minimize subjective testing. These suggestions are not inclusive and the Developer should present relevant and effective assessment strategies that can be effectively used by the model course user. Model courses based on the STCW Convention and Code should take into account the criteria for evaluating competence included in column four of the tables in the STCW Code.

3.1.7 Appendix I – Implementation of IMO Courses

Appendix I should be provided with the model course so that the end-user has additional information that can be used in the final course development and approval process.

3.1.8 Appendix II – Instructor Feedback on Model Course

To keep the training programme up to date, it is essential that the model course users provide feedback. This information will help improve better training in safety at sea and the protection of the marine environment. This appendix is provided with the model course and requests answers to specific questions regarding the model course and its implementation. It also provides contact information so that the responding model course user can submit answers to these questions and make additional comments.

4 Notations

4.1 In the event that the Developer finds that material not listed within the Convention or Code needs to be inserted, the Developer should properly highlight that information. The following are some notations that have been used within model courses that have been recently validated.

4.1.1 Notation for Review of material covered within prerequisite model course or experience

* Note that trainees must be familiar with this material. This knowledge is considered as being of such fundamental content for those taking this course that there is merit in reviewing the prerequisite content quickly before covering the additional elements required at the intended level. The learning time has been reduced for many elements on the basis that trainees will be reviewing rather than learning much of this content at this level. It may be necessary for some trainees to refresh their knowledge of such techniques before undertaking the more advanced techniques presented in this model course.

4.1.2 Notation for the required use of simulators, workshop or other education and training that must be done within a controlled setting due to its inherent hazards

* Some IMO Instruments requires trainees to be able to demonstrate practical competence in performing the tasks stated under this competence. This competence may be developed and demonstrated in service, in which case the practical elements of actual ship handling may not be included in the training course. The required performances indicated with an asterisk are therefore applicable only where the competence is to be developed and assessed as part of a training course.

4.1.3 Notation for possible need to added education and training at a prerequisite level

* This content builds on the elements of a prerequisite model course and is intended to ensure that the student can perform the task at the prerequisite level. Additional learning time may be required for candidates who have not retained competence in the prerequisite level tasks.

4.1.4 Notation for possible inclusion of suggested education and training hours of instruction

* Care should be taken when indicating the total hours for the model course and each subject presented in a model course. The approval of a detailed timetable is best left to Administrations due to their understanding of the entering candidates' knowledge and skills, the class size and the resources available to each training provider.

Annex 4

Model Course Review Group Instructions and Checklist

These instructions outline how courses will be reviewed by the Committee/Sub-Committee through its establishment of a Model Course Review Group (RG). In order to provide guidance, a copy of the instructions to the course developer and the following evaluation questionnaire has been provided to guide and assist the RG in order to obtain useful and consistent feedback and to ensure that the proposed model course meets the stated course objectives.

Instructions for the Model Course Review Group (RG)

1 The overall goal of this model course is to develop the skills of the attending mariner so that they can [state or list the relevant functions] in accordance with the [insert IMO Instrument reference]. They are intended for a global audience and must be adaptable to a wide variety of candidates and teaching resources.

2 This model course will be validated at [insert Committee/Sub-Committee and session]. The edited model course should be submitted to [Secretariat Representative] no later than [insert date].

3 This Evaluation Questionnaire is presented in three parts: Part I – Course evaluation by theme; Part II – Course evaluation by module; and Part III – Other comments.

4 The purpose of this multi-dimensional evaluation is to review the course from a variety of parameters, taking into account the component pieces, as well as considering it as a whole. The evaluation, once complete, should highlight the strengths of the course, areas for improvement, and concrete direction on elements to be modified and/or added for its finalization.

5 As such, the RG is requested to be as precise as possible and, where applicable, provide specific suggestions on areas requiring revision. This could include providing suggestions as to where new or better information could be sourced, providing marked sections with specific wording changes, or other suggestions, as appropriate.

The Evaluation Questionnaire

6 Part I of the evaluation questionnaire focuses on the format, structure, content and cohesiveness of the course as a whole.

7 Part II of the evaluation questionnaire focuses on the evaluation of the course on a module by module basis. If members of the RG are submitting marked up text, this should be referenced in part II and included with the final submission, preferably in track changes.

- .1 *Excellent* means only minor editorial corrections required, if any
- .2 *Good* means some editorial corrections and/or subject matter corrections required
- .3 *Fair* means some serious editorial corrections and/or subject matter corrections required, but the text is salvageable
- .4 *Needs work* means the text needs heavy revision

- 8 Part III allows for general comments and observations not captured in parts I and II.
1. Once finalized the RG should submit their evaluations to the IMO Secretariat.

COURSE TITLE		
Part I – Course evaluation by theme		
1. Aims/Objectives		
a.	Are the course objectives stated clearly?	
b.	Are the module objectives clearly stated?	
c.	Are learning outcomes for each module clear and measurable?	
2. Structure		
a.	Is the recommended course programme presented in a logical order?	
b.	Is the estimated timing presented in the programme reasonable and is there a disclaimer present encouraging differentiated education to meet the candidates' needs?	
c.	Is the overall length of the course appropriate and are the materials provided consistent with this?	
d.	Does the course progress in a logical sequence and does it flow and transition well from module to module?	
e.	Does the course reference and/or incorporate other relevant model courses?	
f.	Are the recommended qualifications of the teaching staff clearly defined and internationally applicable?	
g.	Is the recommended student/teacher ratio clearly defined and internationally applicable?	
h.	Are the recommended qualifications of the assessors clearly defined and internationally applicable?	
i.	Is the recommended education and training environment clearly defined and internationally available?	
j.	Are the recommended admission qualifications appropriate?	
k.	Are the recommended assessment standards appropriate?	

I.	Are any administrative monitoring mechanisms provided that are consistent with the relevant codes and conventions?	
3. Content		
a.	Are the relevant codes and conventions clearly defined?	
b.	Are the mandatory requirements in the relevant codes and conventions clearly represented?	
c.	Do the course materials support the stated course objectives or are there discrepancies?	
d.	Are the course materials sufficiently straightforward?	
e.	Are the various topics adequately covered? Is more (or less) detail required? Are there any gaps?	
f.	Is the suggested bibliography clear and do they provide adequate information on the topic?	
g.	Are the suggested audio/visual materials engaging and interesting enough to retain the attention of participants at different levels?	
h.	Are there any gaps or discrepancies to be addressed?	
4. Pedagogy and Learning Measurement		
a.	Is there sufficient guidance provided to course developers in preparing for and organizing the model course?	
b.	Are mechanisms included to ensure participants are meeting the learning objectives (exercises, other forms of evaluation) and are these sufficient?	
c.	Is there a sufficient level of interaction allowed for to ensure that the education and training is a dynamic process?	
d.	Does the course evaluation adequately capture the necessary information to provide an effective evaluation of the course?	
e.	Is the taxonomy proposed in the course appropriate for the training outcome?	

5. Other					
a.					
b.					
c.					
d.					
Part II – Course evaluation by module					
	Excellent	Good	Fair	Needs Work	Comments
Module 1					
Module 2					
Module 3					
Module 4					
Module 5					
Part III – Other Comments					

ANNEX 2

DRAFT AMENDMENTS TO THE INTERNATIONAL CONVENTION ON STANDARDS OF TRAINING, CERTIFICATION AND WATCHKEEPING FOR SEAFARERS, 1978, AS AMENDED

RESOLUTION MSC.[](96) (adopted on [] May 2016)

AMENDMENTS TO THE INTERNATIONAL CONVENTION ON STANDARDS OF TRAINING, CERTIFICATION AND WATCHKEEPING FOR SEAFARERS (STCW), 1978, AS AMENDED

THE MARITIME SAFETY COMMITTEE,

RECALLING Article 28(b) of the Convention on the International Maritime Organization concerning the functions of the Committee,

RECALLING ALSO article XII of the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW), 1978 (hereinafter referred to as "the Convention"), concerning the procedures for amending the Convention,

RECALLING ALSO that the Committee, by resolution MSC.386(94), adopted, inter alia, the new chapter XIV of the International Convention for the Safety of Life at Sea (SOLAS), 1974, as amended.

RECALLING FURTHER that the Committee, by resolution MSC.385(94), adopted the *International Code for Ships Operating in Polar Waters (Polar Code)* which will take effect on 1 January 2017 upon entry into force of the new chapter XIV of the Convention.

NOTING that there will be a transitional period between the entry into force of the Polar Code and the amendments to the STWC Convention.

HAVING CONSIDERED, at its ninety-sixth session, amendments to the Convention proposed and circulated in accordance with article XII(1)(a)(i) of the Convention,

1 ADOPTS, in accordance with article XII(1)(a)(iv) of the Convention, amendments to the Convention, the text of which is set out in the annex to the present resolution;

2 DETERMINES ALSO, in accordance with article XII(1)(a)(vii)(2) of the Convention, that the amendments to the Convention shall be deemed to have been accepted on [1 July 2017], unless, prior to that date more than one third of Parties or Parties the combined merchant fleets of which constitute not less than 50% of the gross tonnage of the world's merchant shipping of ships of 100 gross register ~~tonnes~~ tons or more, have notified their objections to the amendments;

3 INVITES Parties to note that, in accordance with article XII(1)(a)(ix) of the Convention, the amendments to the annex of the Convention shall enter into force on [1 January 2018] upon their acceptance in accordance with paragraph 2 above;

4 URGES Parties to implement these amendments at an early stage.

5 REQUESTS the Secretary-General, ~~in conformity with~~ for the purposes of article XII(1)(a)(v) to transmit certified copies of the present resolution and the text of the amendments contained in the annex to all Parties to the Convention;

6 ALSO REQUESTS the Secretary-General to transmit copies of this resolution and its annex to Members of the Organization, which are not Parties to the Convention.

ANNEX

**DRAFT AMENDMENTS TO THE INTERNATIONAL CONVENTION ON STANDARDS
OF TRAINING, CERTIFICATION AND WATCHKEEPING FOR
SEAFARERS (STCW), 1978, AS AMENDED**

CHAPTER I

GENERAL PROVISIONS

In regulation I/1.1, after the existing subparagraph .36, the following new definition is inserted:

- .37 Polar Code means the International Code for Ships Operating in Polar Waters, as defined in SOLAS regulation XIV/1.1.

In regulation I/11, after the existing paragraph 3, the following new paragraph is inserted:

"3 bis Every master or officer shall, for continuing seagoing service on board ships operating in polar waters, meet the requirements of paragraph 1 of this regulation and be required, at intervals not exceeding five years, to establish continued professional competence for ships operating in polar waters in accordance with section A-1/11, paragraph 4 of the STCW Code."

CHAPTER V

**SPECIAL TRAINING REQUIREMENTS FOR PERSONNEL ON
CERTAIN TYPES OF SHIPS**

In chapter V, after the existing regulation V/2, the new regulation is inserted:

Regulation V/4

Mandatory minimum requirements for the training and qualifications of masters and deck officers on ships operating in polar waters.

1 Masters, chief mates and officers in charge of a navigational watch on ships operating in polar waters shall hold a certificate in basic training for ships operating in polar waters, as required by the Polar Code.

2 Every candidate for a certificate in basic training for ships operating in polar waters shall have completed an approved basic training for ships operating in polar waters and meet the standard of competence specified in section A-V/4, paragraph 1 of the STCW Code.

3 Masters and chief mates on ships operating in polar waters, shall hold a certificate in advanced training for ships operating in polar waters, as required by the Polar Code.

4 Every candidate for a certificate in advanced training for ships operating in polar waters shall:

- .1 meet the requirements for certification in basic training for ships in polar waters; and
- .2 have at least two (2) months of approved seagoing service in the deck department, at management level or while performing watchkeeping duties in an operational level, within polar waters or other equivalent approved seagoing service; and
- .3 have completed approved advanced training for ships operating in polar waters and meet the standard of competence specified in section A-V/4, paragraph 2 of the STCW Code.

5 Administrations shall ensure that a Certificate of Proficiency is issued to seafarers, who are qualified in accordance with paragraphs 2 or 4 as appropriate.

Transitional provisions

6 Until [entry into force date + 2 years], seafarers who commenced approved seagoing service in polar waters prior to [the date of entry into force of this section] shall be able to establish that they meet the requirements of paragraph 2 by:

- .1 having completed approved seagoing service on board a ship operating in polar waters or equivalent approved seagoing service, performing duties in the deck department at the operational or management level, for a period of at least three months in total during the preceding five years; or
- .2 having successfully completed a training course meeting the training guidance established by the organization for ships operating in polar waters.¹

7 Until [entry into force date + 2 years], seafarers who commenced approved seagoing service in polar waters prior to [the date of entry into force of this section] shall be able to establish that they meet the requirements of paragraph 4 by:

- .1 having completed approved seagoing service on board a ship operating in polar waters or equivalent approved seagoing service, performing duties in the deck department at management level, for a period of at least three months in total during the preceding five years; or
- .2 having successfully completed a training course meeting the training guidance established by the organization for ships operating in polar waters² and having completed approved seagoing service on board a ship operating in polar waters or equivalent approved seagoing service, performing duties in the deck department at the management level, for a period of at least two months in total during the preceding five years.

¹ Refer to Section B-V/g of the STCW Code.

² Refer to Section B-V/g of the STCW Code.

ANNEX 3

**DRAFT AMENDMENTS TO PART A OF THE SEAFARERS' TRAINING,
CERTIFICATION AND WATCHKEEPING (STCW) CODE**

**RESOLUTION MSC.[](96)
(adopted on [] May 2016)**

**AMENDMENTS TO THE SEAFARERS' TRAINING,
CERTIFICATION AND WATCHKEEPING (STCW) CODE**

THE MARITIME SAFETY COMMITTEE,

RECALLING Article 28(b) of the Convention on the International Maritime Organization concerning the functions of the Committee,

RECALLING ALSO article XII and regulation I/1.2.3 of the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW), 1978, hereinafter referred to as "the Convention", concerning the procedures for amending part A of the Seafarers' Training, Certification and Watchkeeping (STCW) Code,

HAVING CONSIDERED, at its ninety-sixth session, amendments to part A of the STCW Code, proposed and circulated in accordance with article XII(1)(a)(i) of the Convention,

1 ADOPTS, in accordance with article XII(1)(a)(iv) of the Convention, amendments to the STCW Code, the text of which is set out in the annex to the present resolution;

2 DETERMINES ALSO, in accordance with article XII(1)(a)(vii)(2) of the Convention, that the amendments to the STCW Code shall be deemed to have been accepted on [1 July 2017], unless, prior to that date more than one third of Parties or Parties the combined merchant fleets of which constitute not less than 50% of the gross tonnage of the world's merchant shipping of ships of 100 gross register tonnes or more, have notified their objections to the amendments;

3 INVITES Parties to note that, in accordance with article XII(1)(a)(ix) of the Convention, that the amendments to the annex of the Convention, shall enter into force on [1 January 2018] upon their acceptance in accordance with paragraph 2 above;

4 URGES Parties to implement these amendments at an early stage.

5 REQUESTS the Secretary-General, ~~in conformity with~~ for the purposes of article XII(1)(a)(v) to transmit certified copies of the present resolution and the text of the amendments contained in the annex to all Parties to the Convention;

6 ALSO REQUESTS the Secretary-General to transmit copies of this resolution and its annex to Members of the Organization, which are not Parties to the Convention.

ANNEX

**AMENDMENTS TO PART A OF THE SEAFARERS' TRAINING,
CERTIFICATION AND WATCHKEEPING (STCW) CODE**

CHAPTER I – GENERAL PROVISIONS

In section A-I/11, *Revalidation of Certificates*, a new paragraph 4 is added as follows:

"4. Continued professional competence for masters and officers on board ships operating in polar waters as required under regulation 1/11 shall be established by:

- .1 approved seagoing service, performing functions appropriate to the certificate held, for a period of at least two months in total during the preceding five years; or
- .2 having performed functions considered to be equivalent to the seagoing service required in paragraph 4.1; or
- .3 passing an approved test; or
- .4 successfully completing an approved training course or courses."

**CHAPTER V – SPECIAL TRAINING REQUIREMENTS FOR PERSONNEL
ON CERTAIN TYPES OF SHIPS**

A new section A-V/4 is added after the existing section A-V/2 as follows:

"Section A-V/4

Mandatory minimum requirements for the training and qualifications of masters and deck officers on ships operating in polar waters

Standard of competence

1 Every candidate for certification in basic training for ships operating in polar waters shall be required to:

- .1 demonstrate the competence to undertake the tasks, duties and responsibilities listed in column 1 of table A-V/4-1; and
- .2 provide evidence of having achieved:
 - .1 the minimum knowledge, understanding and proficiency listed in column 2 of table A-V/4-1, and
 - .2 the required standard of competence in accordance with the methods for demonstrating competence and the criteria for evaluating competence tabulated in column 3 and 4 of table A-V/4-1.

2 Every candidate for certification in advanced training for ships operating in polar waters shall be required to:

- .1 demonstrate the competence to undertake the tasks, duties and responsibilities listed in column 1 of table A-V/4-2; and
- .2 provide evidence of having achieved:
 - .1 the minimum knowledge, understanding and proficiency listed in column 2 of table A-V/4-2, and
 - .2 the required standard of competence in accordance with the methods for demonstrating competence and the criteria for evaluating competence tabulated in column 3 and 4 of table A-V/4-2.

Table A-V/4-1

**Specification of minimum standard of competence in basic training
for ships operating in polar waters**

Column 1 Competence	Column 2 Knowledge, understanding and proficiency	Column 3 Methods for demonstrating competence	Column 4 Criteria for evaluating competence
<p>Contribute to safe operation of vessels operating in polar waters</p>	<p><i>Basic knowledge of ice characteristics and areas where different type of ice can be expected in the area of operation:</i></p> <ol style="list-style-type: none"> 1. Ice physics, terms, formation, growth, aging and stage of melt; 2. Ice types and concentrations; 3. Ice pressure and distribution; 4. Friction from snow covered ice. 5. Implications of spray-icing; danger of icing up, precautions to avoid icing up and options during icing up; 6. Ice regimes in different regions. Significant differences between the Arctic and the Antarctic, first year and multiyear ice, sea ice and land ice; 7. Use of ice imagery to recognize consequences of rapid change in ice and weather conditions; 8. Knowledge of ice sky and water blink; 9. Knowledge of differential movement of icebergs and pack ice; 10. Knowledge of tides and currents in ice; 11. Knowledge of effect of wind and current on ice. 	<p>Examination and assessment of evidence obtained from one or more of the following:</p> <ol style="list-style-type: none"> 1. approved in-service experience 2. approved training ship experience 3. approved simulator training, where appropriate 4. approved training 	<p>Identification of ice properties and their characteristics of relevance for safe vessel operation.</p> <p>Information obtained from ice information and publications is interpreted correctly and properly applied.</p> <p>Use of visible and infrared satellite images. Use of egg charts. Coordination of meteorological and oceanographic data with ice data.</p> <p>Measurements and observations of weather and ice conditions are accurate and appropriate for safe passage planning.</p>

Column 1 Competence	Column 2 Knowledge, understanding and proficiency	Column 3 Methods for demonstrating competence	Column 4 Criteria for evaluating competence
	<p><i>Basic knowledge of vessel performance in ice and low air temperature:</i></p> <ol style="list-style-type: none"> 1. Vessel characteristics; 2. Vessel types, hull designs; 3. Engineering requirements for operating in ice; 4. Ice strengthening requirements; 5. Limitations of ice-classes; 6. Winterization and preparedness of vessel, including deck and engine; 7. Low-temperature system performance; 8. Equipment and machinery limitation in ice condition and low air temperature; 9. Monitoring of ice pressure on hull; 10. Sea suction, water intake, superstructure insulation and special systems. 	<p>Examination and assessment of evidence obtained from one or more of the following:</p> <ol style="list-style-type: none"> 1. approved in-service experience 2. approved training ship experience 3. approved simulator training, where appropriate 4. approved training 	<p>Identification of vessel characteristics and limitations under different ice conditions and cold environmental impact.</p> <p>Procedures are made for risk assessment before entering ice.</p> <p>Awareness of fresh water ballast freezing in ballast tanks.</p> <p>Actions are carried out in accordance with accepted principles and procedures to prepare the vessel and the crew for operations in ice and low air temperature.</p> <p>Communications are clear, concise and effective at all times in a seamanlike manner.</p>
	<p><i>Basic knowledge and ability to operate and manoeuvre a ship in ice:</i></p> <ol style="list-style-type: none"> 1. Safe speed in the presence of ice and icebergs; 2. Ballast tank monitoring; 3. Cargo operations in the polar waters; 4. Awareness of engine loads and cooling problems; 5. Safety procedures during ice transit. 	<p>Examination and assessment of evidence obtained from one or more of the following:</p> <ol style="list-style-type: none"> 1. approved in-service experience 2. approved training ship experience 3. approved simulator training, where appropriate 4. approved training 	<p>Use Polar Code and Polar Water Operations Manual to correctly determine the recommended procedures to load/offload cargo/passengers in low temperatures, monitor ballast water for icing, monitor engine temperatures, anchor watch concerns in ice, and transit near ice.</p> <p>Interpretation and</p>

Column 1 Competence	Column 2 Knowledge, understanding and proficiency	Column 3 Methods for demonstrating competence	Column 4 Criteria for evaluating competence
			<p>analysis of information from radar is in accordance with sharp lookout and with special caution regarding identification of dangerous ice features.</p> <p>Information obtained from navigational charts, including electronic charts, and publications is relevant, assessed, interpreted correctly and properly applied.</p> <p>The primary method of position fixing is frequent and the most appropriate for the prevailing conditions and routing through ice.</p> <p>Performance checks and tests of navigation and communication systems comply with recommendations for high latitude and low air temperature operation.</p>
<p>Monitor and ensure compliance with legislative requirements</p>	<p><i>Basic knowledge of regulatory considerations:</i></p> <ol style="list-style-type: none"> 1. Antarctic Treaty and the Polar Code; 2. Accident reports concerning vessels in polar waters; 3. IMO standards for operation in remote areas; 	<p>Examination and assessment of evidence obtained from one or more of the following:</p> <ol style="list-style-type: none"> 1. approved in-service experience 2. approved training ship experience 3. approved simulator training, where appropriate 4. approved training 	<p>Locate and apply relevant portion of the Polar Water Operational Manual</p> <p>Communication is in accordance with local/regional and international standard procedures.</p> <p>Legislative requirements related to relevant regulations, codes and practices are identified.</p>

Column 1 Competence	Column 2 Knowledge, understanding and proficiency	Column 3 Methods for demonstrating competence	Column 4 Criteria for evaluating competence
Apply safe working practices, respond to emergencies	<p><i>Basic knowledge of crew preparation, working conditions and safety:</i></p> <ol style="list-style-type: none"> 1. Recognize limitations of search and rescue readiness and responsibility, including radio area A4 and its SAR communication facility limitation; 2. Awareness of contingency planning; 3. How to establish and implement safe working procedures for crew specific to polar environments such as low temps, ice covered surfaces , personal protective equipment, use of buddy system, and working time limitations; 4. Recognize dangers when crews are exposed to low temperatures; 5. Human factors including cold fatigue, medical-first aid aspects, crew welfare; 6. Survival requirements including the use of personal survival equipment and group survival equipment; 7. Awareness of the most common hull and equipment damages and how to avoid these; 8. Superstructure-deck icing, including effect on stability and trim; 9. Prevention and removal of ice including the factors of accretion; 10. Recognize fatigue problems due to noise and vibrations; 	<p>Examination and assessment of evidence obtained from one or more of the following:</p> <ol style="list-style-type: none"> 1. approved in-service experience 2. approved training ship experience 3. approved simulator training, where appropriate 4. approved training 	<p>Identification and initial actions on becoming aware of hazardous situations for vessel and individual crew members.</p> <p>Actions are carried out in accordance with Polar Water Operational Manual, accepted principles and procedures to ensure safety of operations and avoid pollution to the marine environment.</p> <p>Safe working practices are observed and appropriate safety and protective equipment is correctly used at all times.</p> <p>Response actions are in accordance with established plans and are appropriate to the situation and nature of the emergency.</p> <p>Correctly identifies and applies legislative requirements related to relevant regulations, codes and practices.</p> <p>Appropriate safety and protective equipment is correctly used</p> <p>Defects and damages are detected and properly reported</p>

Column 1	Column 2	Column 3	Column 4
Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
	11. Identify need for extra resources, such as bunker, food and extra clothing.		
Ensure compliance with pollution-prevention requirements and prevent environmental hazards	<p><i>Basic knowledge of environmental factors and regulations:</i></p> <ol style="list-style-type: none"> 1. Identify particular sensitive sea areas regarding discharge; 2. Identify areas where shipping is prohibited or should be avoided; 3. Special areas in MARPOL; 4. Recognize limitations oil-spill equipment; 5. Plan for coping with increased volumes of garbage, bilge water, sewage, etc.; 6. Lack of infrastructure. 7. Oil spill and pollution in ice, including consequences; 	<p>Examination and assessment of evidence obtained from one or more of the following:</p> <ol style="list-style-type: none"> 1. approved in-service experience 2. approved training ship experience 3. approved simulator training, where appropriate 4. approved training 	<p>Legislative requirements related to relevant regulations, codes and practices are identified.</p> <p>Correctly identify/select the limitations on vessel discharges contained in the Polar Code.</p> <p>Correctly applies Polar Water Operations Manual/ Waste Management Plan to determine limitations on vessel discharges and plans for storing waste</p> <p>Identify references that detail areas to be avoided, such as wild life refuge, ecological heritage parks, migratory pathways, etc. (MARPOL, Antarctic Treaty, etc.)</p> <p>Identify factors that must be considered to manage waste stream during Polar voyages</p>

Table A-V/4-2

**Specification of minimum standard of competence in advanced training
for ships operating in polar waters**

Column 1	Column 2	Column 3	Column 4
Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
<p>Plan and conduct a voyage in polar waters</p>	<p><i>Knowledge of voyage planning and reporting:</i></p> <ol style="list-style-type: none"> 1. Information sources; 2. Reporting regimes in polar waters; 3. Development of safe routing and passage planning to avoid ice where possible; 4. Ability to recognize the limitations of hydrographic information and charts in polar regions and whether the information is suitable for safe navigation; 5. Passage planning deviation and modification for dynamic ice conditions; <p><i>Knowledge of equipment limitations:</i></p> <ol style="list-style-type: none"> 1. Understand and identify hazards associated with limited terrestrial navigational aids in polar regions; 2. Understand and recognize high latitude errors on compasses; 3. Understand and identify limitations in discrimination of radar targets and ice-features in ice-clutter; 	<p>Examination and assessment of evidence obtained from one or more of the following:</p> <ol style="list-style-type: none"> 1. approved in-service experience 2. approved training ship experience. 3. approved simulator training, where appropriate. 4. approved training. 	<p>The equipment, charts and nautical publications required for the voyage are enumerated and appropriate to the safe conduct of the voyage.</p> <p>The reasons for the planned route are supported by facts obtained from relevant sources and publications, statistical data and limitations of communication and navigational systems.</p> <p>Voyage plan correctly identified relevant polar regulatory regimes and need for ice-pilotage or/and icebreaker assistance.</p> <p>All potential navigational hazards are accurately identified.</p> <p>Positions, courses, distances and time calculations are correct within accepted accuracy standards for navigational equipment.</p>

Column 1 Competence	Column 2 Knowledge, understanding and proficiency	Column 3 Methods for demonstrating competence	Column 4 Criteria for evaluating competence
	<ol style="list-style-type: none"> 4. Understand and recognize limitations of electronic positioning systems at high latitude; 5. Understand and recognize limitations in nautical charts and pilot descriptions; 6. Understand and recognize limitations in communication systems. 		
<p>Manage the safe operation of vessels operating in polar waters</p>	<p><i>Knowledge and ability to operate and manoeuvre a ship in ice:</i></p> <ol style="list-style-type: none"> 1. Preparation and risk assessment before approaching ice, including presence of icebergs, and taking into account wind, darkness, swell, fog and pressure ice; 2. Conduct communications with an icebreaker and other vessels in the area and with Rescue Coordination Centres 3. Understand and describe the conditions for the safe entry and exit to and from ice or open water, such as leads or cracks, avoiding icebergs and dangerous ice conditions and maintaining safe distance to icebergs 4. Understand and describe ice ramming procedures – including double and single ramming passage; 	<p>Examination and assessment of evidence obtained from one or more of the following:</p> <ol style="list-style-type: none"> 1. approved in-service experience 2. approved training ship experience. 3. approved simulator training, where appropriate. 4. approved training. 	<p>All decisions concerning navigating in ice are based on a proper assessment of the ship's manoeuvring and engine characteristics and the forces to be expected while navigating within a polar waters.</p> <p>Demonstrate communications skills, request ice routing, plot and commence voyage through ice.</p> <p>All potential ice hazards are correctly identified.</p> <p>All decisions concerning berthing anchoring, cargo and ballast operations are based on a proper assessment of the ships manoeuvring and engine characteristics and the forces to be</p>

Column 1 Competence	Column 2 Knowledge, understanding and proficiency	Column 3 Methods for demonstrating competence	Column 4 Criteria for evaluating competence
	<ol style="list-style-type: none"> 5. Recognize and determine the need for bridge watch team augmentation based upon environmental conditions, vessel equipment and vessel ice class; 6. Recognize the presentations of the various ice conditions as they appear on radar. 7. Understand icebreaker convoy terminology, and communications, and take icebreaker direction and move in convoy; 8. Understand methods to avoid besetment and to free beset vessel, and consequences of besetment; 9. Understand towing and rescue in ice, including risks associated with operation; 10. Handling ship in various ice concentration and coverage, including risks associated with navigation in ice, and turning-backing; avoidance; etc.; 11. Use of different type of propulsion and rudder systems, including limitations to avoid damage when operating in ice; 12. Use of heeling and trim-systems-; hazards in connection with 		<p>expected and in accordance with the Polar Code guidelines and applicable international agreements.</p> <p>Safely demonstrate progression of a vessel through ice, manoeuvring vessel through moderate ice concentration (range of 1/10 to 5/10).</p> <p>Safely demonstrate progression of a vessel through ice, manoeuvring vessel through dense ice concentration (range of 6/10 to 10/10).</p> <p>Operations are planned and carried out in accordance with established rules and procedures to ensure safety of operation and avoid pollution of the marine environment.</p> <p>Safety of navigation is maintained through sailing strategy and adjustment of ship's speed and heading through different types of ice.</p> <p>Actions are understood to permit use of anchoring system</p>

Column 1 Competence	Column 2 Knowledge, understanding and proficiency	Column 3 Methods for demonstrating competence	Column 4 Criteria for evaluating competence
	<p>ballast and trim in relation with ice;</p> <p>13. Docking and undocking in ice covered waters, including hazards associated with operation and the various techniques to safely and undock in ice covered waters;</p> <p>14. Anchoring in ice, including the dangers to anchoring system – ice accretion to hawse pipe and ground tackle;</p> <p>15. Recognize conditions which impact polar visibility and may give indication of local ice and water conditions, including sea smoke, blink and refraction.</p>		<p>in cold temperatures</p> <p>Actions are carried out in accordance with accepted principles and procedures to prepare for icebreaker towing, including notch towing.</p>
<p>Maintain safety of the ship's crew and passengers and the operational condition of life-saving, firefighting and other safety systems</p>	<p><i>Knowledge of safety:</i></p> <ol style="list-style-type: none"> 1. Understand the procedures and techniques for abandoning the ship and survival on the ice and in ice-covered waters; 2. Recognize limitations on fire-fighting systems and life-saving appliances due to low air temperatures, 3. Understand unique concerns in conducting emergency drills in ice and low temperatures; 	<p>Examination and assessment of evidence obtained from one or more of the following:</p> <ol style="list-style-type: none"> 1. approved in-service experience 2. approved training ship experience. 3. approved simulator training, where appropriate. 4. approved training. 	<p>Response measures are in accordance with established plans and procedures, and are appropriate to the situation and nature of the emergency.</p>

Column 1 Competence	Column 2 Knowledge, understanding and proficiency	Column 3 Methods for demonstrating competence	Column 4 Criteria for evaluating competence
	4. Understand unique concerns in conducting emergency response in ice and low air and water temperatures.		

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ANNEX 4

DRAFT STCW.6 CIRCULAR

STCW.6/Circ.[...]

**DRAFT AMENDMENTS TO PART B OF THE SEAFARERS' TRAINING,
CERTIFICATION AND WATCHKEEPING (STCW) CODE**

- 1 The Maritime Safety Committee, at its [ninety-sixth session ([11 to 20 May 2016])], adopted the following amendments to part B of the STCW Code.
- 2 In section B-I, the table B-I/2 is replaced as follows:

Table B-I/2

List of certificates or documentary evidence required under the STCW Convention

The list below identifies all certificates or documentary evidence described in the Convention which authorize the holder to serve in certain functions on board ships. The certificates are subject to the requirements of regulation I/2 regarding language and their availability in original form.

Regulations	Type of certificate and brief description	Endorsement attesting recognition of a certificate¹	Registration required²	Revalidation of certificate³
II/1, II/2, II/3, III/1, III/2, III/3, III/6, IV/2, VII/2	Certificate of Competency – For masters, officers and GMDSS radio operators	Yes	Yes	Yes
II/4, III/4, VII/2	Certificate of Proficiency – For ratings duly certified to be a part of a navigational or engine-room watch	No	Yes	No
II/5, III/5, III/7, VII/2	Certificate of Proficiency – For ratings duly certified as able seafarer deck, able seafarer engine or electro-technical rating	No	Yes	No
V/1-1, V/1-2	Certificate of Proficiency or endorsement to a Certificate of Competency – For masters and officers on oil, chemical or liquefied gas tankers	Yes	Yes	Yes
V/1-1, V/1-2	Certificate of Proficiency – For ratings on oil, chemical or liquefied gas tankers	No	Yes	No
V/2	Documentary evidence – Training for masters, officers, ratings and other personnel serving on passenger ships	No	No	No ⁴
V/4	Certificate of Proficiency – for masters and officers on ships operating in polar waters	No	Yes	Yes
VI/1	Certificate of Proficiency ⁵ – Basic training	No	Yes	Yes ⁶
VI/2	Certificate of Proficiency ⁵ – Survival craft, rescue boats and fast rescue boats	No	Yes	Yes ⁶
VI/3	Certificate of Proficiency ⁵ – Advanced firefighting	No	Yes	Yes ⁶

Regulations	Type of certificate and brief description	Endorsement attesting recognition of a certificate ¹	Registration required ²	Revalidation of certificate ³
VI/4	Certificate of Proficiency ⁵ – Medical first aid and medical care	No	Yes	No
VI/5	Certificate of Proficiency – Ship security officer	No	Yes	No
VI/6	Certificate of Proficiency ⁷ – Security awareness training or security training for seafarers with designated security duties	No	Yes	No

Notes:

¹ *Endorsement attesting recognition of a certificate* means endorsement in accordance with regulation I/2, paragraph 7.

² *Registration required* means as part of register or registers in accordance with regulation I/2, paragraph 14.

³ *Revalidation of a certificate* means establishing continued professional competence in accordance with regulation I/11 or maintaining the required standards of competence in accordance with sections A-VI/1 to A-VI/3, as applicable.

⁴ As required by regulation V/2, paragraph 3 seafarers who have completed training in "crowd management", "crisis management and human behaviour" or "passenger safety, cargo safety and hull integrity" shall at intervals not exceed five years, undertake appropriate refresher training or to provide evidence of having achieved the required standards of competence within the previous five years.

⁵ The certificates of competency issued in accordance with regulations II/1, II/2, II/3, III/1, III/2, III/3, III/6 and VII/2 include the proficiency requirements in "basic training", "survival craft and rescue boats other than fast rescue boats", "advanced fire fighting" and "medical first aid"; therefore, holders of mentioned certificates of competency are not required to carry Certificates of Proficiency in respect of those competences of chapter VI.

⁶ In accordance with sections A-VI/1, A-VI/2 and A-VI/3, seafarers shall provide evidence of having maintained the required standards of competence every five years.

⁷ Where security awareness training or training in designated security duties is not included in the qualification for the certificate to be issued.

ANNEX 5
BIENNIAL STATUS REPORT

SUB-COMMITTEE ON HUMAN ELEMENT, TRAINING AND WATCHKEEPING (HTW)								
Planned output number	Description	Target completion year	Parent organ(s)	Coordinating organ(s)	Associated organ(s)	Status of output for Year 1	Status of output for Year 2	References
2.0.1.1	Provisions to ensure the integrity and uniform implementation of the 1969 TM Convention	2014	MSC	SDC	HTW	Completed		MSC 89/25, paragraph 22.34
5.1.1.6 (UO)	Amendments to SOLAS chapter II-1 and associated guidelines on damage control drills for passenger ships	2015	MSC	SDC	HTW	N/A	No work requested by SDC	MSC 93/22, paragraph 20.5
<p>Notes: MSC 93, following consideration of the recommendations of the Working Group on Passenger Ship Safety (MSC 93/22, paragraphs 6.27.5 and 20.15), included in the provisional agenda of SDC 2 a new unplanned output on "Amendments to SOLAS chapter II-1 and associated guidelines on damage control drills for passenger ships", with a target completion year of 2016, in association with the HTW Sub-Committee as and when requested by the SDC Sub-Committee.</p>								
5.1.2.3 (UO)	Revision of requirements for escape route signs and equipment location markings in SOLAS and related instruments (2016)	2015	MSC	SSE	HTW	N/A	No work requested by SDC	MSC 94/21, paragraph 18.24
<p>Notes: MSC 94 included in the 2014-2015 biennial agenda of the SSE Sub-Committee and in the provisional agenda for SSE 2, a new unplanned output on "Revision of requirements for escape route signs and equipment location markings in SOLAS and related instruments", with a target completion date of 2016, assigning the SSE Sub-Committee as the coordinating organ, in association with the HTW Sub-Committee as and when requested by the SSE Sub-Committee.</p>								

SUB-COMMITTEE ON HUMAN ELEMENT, TRAINING AND WATCHKEEPING (HTW)								
Planned output number	Description	Target completion year	Parent organ(s)	Coordinating organ(s)	Associated organ(s)	Status of output for Year 1	Status of output for Year 2	References
5.2.1.2	Amendments to the IGF Code and development of guidelines for low-flashpoint fuels (2016)	2014	MSC	CCC	HTW	Completed	N/A	MSC 94/21, paragraphs 18.5 and 18.6; HTW 1/21, section 17
Notes: MSC 94 approved the extension of target completion year to 2016 and changed the description of the output to "Amendments to the IGF Code and development of guidelines for low-flashpoint fuels" following the expected adoption of the IGF Code by MSC 95, to more accurately reflect the next phase of work. MSC 94 approved draft amendments related to the IGF Code, to the STCW Convention and the associated draft MSC resolutions and the STCW Circular, prepared by HTW 1 with a view to adoption at MSC 95.								
5.2.1.3	Review of general cargo ship safety	2014	MSC		SDC / NCSR / III / HTW	Completed	N/A	MSC 90/28, paragraph 25.10 STW 44/19, section 15
5.2.1.15	Mandatory Code for ships operating in polar waters	2015	MSC / MEPC	SDC	HTW / PPR / SSE / NCSR	Completed	Completed	MSC 94/21, Paragraphs 3.61 and 3.64 HTW 2/19, section 9
Notes: The Sub-Committee prepared consequential amendments to the STCW Convention and Code relating to training requirements for officers and crew on board ships operating in polar waters for approval of the Committee.								
5.2.1.16	Non mandatory instrument on regulations for non-convention ships	2015	MSC	III	PPR / SDC / SSE / NCSR / HTW	In progress	No work requested by SDC	MSC 92/26, section 12 HTW 2/19 Section 15

SUB-COMMITTEE ON HUMAN ELEMENT, TRAINING AND WATCHKEEPING (HTW)								
Planned output number	Description	Target completion year	Parent organ(s)	Coordinating organ(s)	Associated organ(s)	Status of output for Year 1	Status of output for Year 2	References
Notes: Noting the Committee's instruction to the III Sub-Committee to report to the Committee prior to involving other Sub-Committees, it is proposed that until further instructions of the Committee, to move this output to the post-biennial agenda.								
5.2.1.20	Follow-up action to the STCW-F Conference resolutions 6 and 7	2015	MSC		HTW		Completed	HTW 2/19, section 7
Notes: No documents submitted for two sessions, hence the Committee has been invited to delete this output from the biennial agenda.								
5.2.1.23	Guidelines for wing-in-ground craft	2015	MSC	SDC	SSE / NCSR / HTW	Postponed	No work requested by SDC	MSC 88/26, paragraph 23.30 HTW 1/21, section 7
Notes: Noting that the work from the Sub-Committee's perspective on this output has been deferred, pending completion of trials by the Republic of Korea move this output to the Post-biennial Agenda.								
5.2.1.32 (UO)	Review MODU Code, LSA Code and MSC.1/Circ.1206/Rev.1	2015	MSC	SSE	HTW	N/A	No work requested by SSE	MSC 93/22, paragraph 20.3
Notes: MSC 93 included in the provisional agenda of SSE 2 an unplanned output on "Review MODU Code, LSA Code and MSC.1/Circ.1206/Rev.1", with a target completion date of 2016, in association with the HTW Sub-Committee as and when requested by the SSE Sub-Committee.								
5.2.2.1	Guidance for the implementation of the 2010 Manila Amendments	2014 (2017)	MSC		HTW	In progress	In progress	MSC 93/22, paragraph 11.4 HTW 2/19, section 6
Notes: MSC 93, taking into account the need for further guidance on implementation of the 2010 Manila Amendments, extended the target completion date of the output on "Development of guidance for the implementation of the 2010 Manila Amendments", until the end of the transitional arrangements, i.e. 2017.								

SUB-COMMITTEE ON HUMAN ELEMENT, TRAINING AND WATCHKEEPING (HTW)								
Planned output number	Description	Target completion year	Parent organ(s)	Coordinating organ(s)	Associated organ(s)	Status of output for Year 1	Status of output for Year 2	References
5.2.2.2	Review of STCW passenger ship-specific safety training	2015	MSC		HTW	In progress	In progress	HTW 2/19, section 10
Notes: As the work is still ongoing, the Committee has been invited to extend the target completion date to 2016								
5.2.2.3	Validated model training courses	Continuous	MSC		HTW	Ongoing	Ongoing	HTW 2/19, section 3
5.2.2.4	Reports on unlawful practices associated with certificates of competency	Annual	MSC		HTW	Completed	Completed	HTW 2/19, section 4
5.2.2.6	Revised guidelines for model course development, updating and validation processes	2015	MSC		HTW	In progress	Completed	HTW 2/19, section 5
5.2.2.7	Training in hot-work procedures on crude oil tankers	2015	MSC	HTW	SSE	In progress	Completed	HTW 2/19, section 11
Notes: No documents submitted for two sessions, hence the Committee has been invited to delete this output from the biennial agenda.								
5.2.2.8	Guidance for personnel involved with tug-barge operations	2014	MSC	HTW	SDC	Completed	N/A	MSC 90/28, paragraph 25.42 HTW 1/21, paragraph 9.5

SUB-COMMITTEE ON HUMAN ELEMENT, TRAINING AND WATCHKEEPING (HTW)								
Planned output number	Description	Target completion year	Parent organ(s)	Coordinating organ(s)	Associated organ(s)	Status of output for Year 1	Status of output for Year 2	References
5.2.2.9	Guidelines for shipowners and seafarers for implementation of relevant IMO instruments in relation to the carriage of dangerous goods in packaged form by sea	2015	MSC		HTW	In progress	Completed	HTW 2/19, Section 14
Notes: As the work on this output from the Sub-Committee's perspective has been completed and forwarded to the CCC Sub-Committee, the Committee has been invited to delete this output.								
5.2.2.10	A globally consistent format for the certificate of training and education issued under the STCW Convention	2015	MSC		HTW	Completed	N/A	HTW 1/21, paragraph 16.4 HTW 1/21, Section 16
5.2.3.2	Measures to prevent loss of containers	2014	MSC	CCC	SDC / HTW	In progress	No work requested by SSE	MSC 94/21, paragraphs 3.51 and 3.52
Notes: DSC 18 completed work on this output. Amendments to SOLAS Chapter VI were approved by MSC 93 and adopted by MSC 94. This output is deleted.								
5.2.5.2	First outline of the detailed review of the Global Maritime Distress and Safety System (GMDSS)	2015	MSC	NCSR	HTW	In progress	In progress	MSC 90/28, paragraph 25.18 HTW 2/19, section 12
Notes: Taking into account that the Detailed Review is in a very early stage and cannot be finalized by NCSR 2, MSC 94 agreed to extend this planned output, for an additional year (to 2018) and approved the revised Plan of work.								

SUB-COMMITTEE ON HUMAN ELEMENT, TRAINING AND WATCHKEEPING (HTW)								
Planned output number	Description	Target completion year	Parent organ(s)	Coordinating organ(s)	Associated organ(s)	Status of output for Year 1	Status of output for Year 2	References
5.2.6.1	E-navigation strategy implementation plan	2015	MSC	NCSR	HTW	In progress	Completed	HTW 1/21, section 20
Notes: As MSC 94 approved the e-navigation Strategy Implementation Plan (SIP), the Committee has been invited to delete this output from the post-biennial agenda.								
12.1.2.1	Analysis of casualty and PSC data to identify trends and develop knowledge and risk-based recommendations	Annual	MSC / MEPC	III	HTW / PPR / CCC / SDC / SSE / NCSR	No work requested by coordinating organ through the parent organ	No work requested by coordinating organ through the parent organ	MSC 92/26, paragraph 22.29 HTW 1/21, paragraph 20.16

ANNEX 6

PROPOSED BIENNIAL AGENDA FOR THE 2016-2017 BIENNIUM

Planned output number	Description	Parent organ(s)	Coordinating organ(s)	Associated organ(s)	Target completion year
5.1.1.6 (UO)	Amendments to SOLAS chapter II-1 and associated guidelines on damage control drills for passenger ships	MSC	SDC	HTW	2016
5.1.2.3 (UO)	Revision of requirements for escape route signs and equipment location markings in SOLAS and related instruments (2016)	MSC	SSE	HTW	2016
5.2.1.2	Amendments to the IGF Code and development of guidelines for low-flashpoint fuels (2016)	MSC	CCC	HTW	2016
5.2.1.32 (UO)	Review MODU Code, LSA Code and MSC.1/Circ.1206/Rev.1	MSC	SSE	HTW	2016
5.2.2.1	Guidance for the implementation of the 2010 Manila Amendments (2017)	MSC		HTW	2017
5.2.2.2	Review of STCW passenger ship-specific safety training (2017)	MSC		HTW	2016
5.2.2.3	Validated model training courses	MSC		HTW	Continuous
5.2.2.4	Reports on unlawful practices associated with certificates of competency	MSC		HTW	Annual

Planned output number	Description	Parent organ(s)	Coordinating organ(s)	Associated organ(s)	Target completion year
5.2.5.2	First outline of the detailed review of the Global Maritime Distress and Safety System (GMDSS)	MSC	NCSR	HTW	2018
To be assigned	Revision of the guidelines on fatigue	MSC	HTW		2017

ITEMS ON THE COMMITTEE'S POST-BIENNIAL AGENDA THAT FALL UNDER THE PURVIEW OF THE SUB-COMMITTEE

MARITIME SAFETY COMMITTEE (MSC)								
ACCEPTED POST-BIENNIAL OUTPUTS				Parent organ(s)	Coordinating organ(s)	Associated organ(s)	Timescale (sessions)	Remarks
Number	Reference to Strategic Direction	Reference to High-level Actions	Description					
5.2.1.16	5.2	5.2.1	Non mandatory instrument on regulations for non-convention ships	MSC	III	PPR / SDC / SSE / NCSR / HTW	As decided by the Committee	MSC 92/26, section 12
Notes: Noting the Committee's instruction to the III Sub-Committee to report to the Committee prior to involving other Sub-Committees, until further instructions of the Committee, move this output to the post-biennial agenda.								
5.2.1.23	5.2	5.2.1	Guidelines for wing-in-ground craft	MSC	SDC	SSE / NCSR / HTW	2 sessions	MSC 88/26, paragraph 23.30 HTW 1/21, section 7
Notes: Noting that the work from the Sub-Committee's perspective on this output has been deferred, pending completion of trials by the Republic of Korea, move this output to the Post-biennial Agenda.								

ANNEX 7

DRAFT PROVISIONAL AGENDA FOR HTW 3

Provisional agenda for HTW 3

- Opening of the session
- 1 Adoption of the agenda
 - 2 Decisions of other IMO bodies
 - 3 Validated model training courses (5.2.2.3)
 - 4 Reports on unlawful practices associated with certificates of competency (5.2.2.4)
 - 5 Guidance for the implementation of the 2010 Manila Amendments (5.2.2.1)
 - 6 Role of the human element (n/a)
 - 7 Revision of the Guidelines on Fatigue (to be assigned)
 - 8 Review of STCW passenger ship-specific safety training (5.2.2.2)
 - 9 Amendments to SOLAS chapter II-1 and associated guidelines on damage control drills for passenger ships (5.1.1.6)
 - 10 First outline of the detailed review of the Global Maritime Distress and Safety System (GMDSS) (5.2.5.2)
 - 11 Revision of requirements for escape route signs and equipment location markings in SOLAS and related instruments (5.1.2.3)
 - 12 Amendments to the IGF Code and development of guidelines for low-flashpoint fuels (5.2.1.2)
 - 13 Review MODU Code, LSA Code and MSC.1/Circ.1206/Rev.1 (5.2.1.32)
 - 14 Biennial agenda and provisional agenda for HTW 4
 - 15 Election of Chairman and Vice-Chairman for 2017
 - 16 Any other business
 - 18 Report to the Maritime Safety Committee

ANNEX 8

DRAFT MSC CIRCULAR

ECDIS – GUIDANCE FOR GOOD PRACTICE

1 The Maritime Safety Committee, at its [ninety-fourth session (17 to 21 November 2014)], approved the annexed *ECDIS – Guidance for Good Practice*, drawing together relevant guidance from seven previous ECDIS circulars into a single, consolidated document.

2 The undeniable safety benefits of navigating with Electronic Chart Display and Information Systems (ECDIS) were recognized through Formal Safety Assessments submitted to the Organization and experience gained by the voluntary use of ECDIS for many years. ECDIS was mandated for carriage by High-Speed Craft (HSC) as early as 1 July 2008. Subsequently, the mandatory carriage of ECDIS for ships other than HSC (depending on the ship type, size and construction date, as required by SOLAS chapter V, regulation 19.2.10) commenced in a phased manner from 1 July 2012 onwards.

3 ECDIS is a complex, safety-relevant, software-based system with multiple options for display and integration. The ongoing safe and effective use of ECDIS involves many stakeholders including seafarers, equipment manufacturers, chart producers, hardware and software maintenance providers, shipowners and operators, and training providers. It is important that all these stakeholders have a clear and common understanding of their roles and responsibilities in relation to ECDIS.

4 ECDIS was accepted as meeting the chart carriage requirements of SOLAS regulation V/19 in 2002. Over the years, IMO Member States, hydrographic offices, equipment manufacturers and other organizations have contributed to the development of guidance on a variety of ECDIS-related matters. Over the years, IMO has issued a series of complementary circulars on ECDIS.

5 Whilst much useful IMO guidance on ECDIS was developed in this incremental manner, the information now needs to be consolidated where possible, to have ECDIS-related guidance within a single circular, which could be easily kept up to date without duplication or need for continual cross-referencing. Such consolidation of information will offer clear and unambiguous understanding of the carriage requirements and use of ECDIS.

6 The consolidated guidance termed "*ECDIS – Guidance for Good Practice*" is set out in the annex to this circular (referred to as "Guidance" hereafter). Ship operators, ~~masters and navigating officers~~ *masters and deck officers* on ECDIS-fitted ships are encouraged to use this guidance to improve their understanding and facilitate safe and effective use of ECDIS.

7 Members of the Organization and all Contracting Governments to the SOLAS Convention are invited to bring this circular to the attention of all entities concerned. In particular, port States are invited to make the guidance available to their port State control inspectors, and flag States to shipowners, masters, recognized organizations, flag State control inspectors and surveyors. An electronic copy of this circular can be downloaded from the Organization's website at: (<http://www.imo.org/OurWork/Circulars/Pages/Home.aspx>).

8 This circular revokes MSC.1/Circ.1391, SN.1/Circ.207/Rev.1, SN.1/Circ.266/Rev.1, SN.1/Circ.276, SN.1/Circ.312, STCW 7/Circ.10 and STCW 7/Circ.18.

ANNEX

ECDIS – GUIDANCE FOR GOOD PRACTICE



IMO

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INTRODUCTION

1 The undeniable safety benefits of navigating with Electronic Chart Display and Information Systems (ECDIS) were recognized through Formal Safety Assessments submitted to the Organization and experience gained by the voluntary use of ECDIS for many years. ECDIS was mandated for carriage by High-Speed Craft (HSC) as early as 1 July 2008. Subsequently, the mandatory carriage of ECDIS for ships other than HSC (depending on the ship type, size and construction date, as required by SOLAS chapter V, regulation 19.2.10) commenced in a phased manner from 1 July 2012 onwards.

2 ECDIS is a complex, safety-relevant, software-based system with multiple options for display and integration. The ongoing safe and effective use of ECDIS involves many stakeholders including seafarers, equipment manufacturers, chart producers, hardware and software maintenance providers, shipowners and operators, and training providers. It is important that all these stakeholders have a clear and common understanding of their roles and responsibilities in relation to ECDIS.

3 This *ECDIS – Guidance for Good Practice*, referred to as "Guidance" hereafter, draws together relevant guidance from seven previous ECDIS circulars into a single, consolidated document. It has been laid out in seven sections, namely:

- A. Chart carriage requirement of SOLAS
- B. Maintenance of ECDIS software
- C. Operating anomalies identified within ECDIS
- D. Differences between raster chart display system (RCDS) and ECDIS
- E. ECDIS training
- F. Transitioning from paper chart to ECDIS navigation
- G. Guidance on training and assessment in the operational use of ECDIS simulators

This guidance is intended to assist smooth implementation of ECDIS and its ongoing safe and effective use on board ships. Ship operators, ~~masters and navigating officers~~ *masters and deck officers* on ECDIS-fitted ships are encouraged to use this guidance to improve their understanding and facilitate safe and effective use of ECDIS.

4 Although this guidance replaces seven IMO ECDIS-related circulars, there remain several other IMO circulars that also address ECDIS matters to varying degree and reference should also be made to these circulars where necessary. A list containing the IMO ECDIS performance standards, the seven IMO ECDIS-related circulars that have been replaced and the other IMO circulars that relate to ECDIS is provided in the reference section.

A CHART CARRIAGE REQUIREMENT OF SOLAS

5 The mandatory carriage of ECDIS, as required by SOLAS regulation V/19.2.10, is subject to a staged entry into force between 1 July 2012 and 1 July 2018. As per SOLAS regulations V/18 and V/19, for a ship to use ECDIS to meet the chart carriage requirements of SOLAS, the ECDIS equipment must conform to the relevant IMO performance standards. ECDIS units on board are required to comply with one of two performance standards (either IMO resolutions A.817(19), as amended or MSC.232(82)), depending on the date of their installations. Essentially, where an ECDIS is being used to meet the chart carriage requirements of SOLAS, it must:

- i) be type-approved;

- ii) use up to date electronic nautical charts (ENC);
- iii) be maintained so as to be compatible with the latest applicable IHO standards; and
- iv) have adequate, independent back-up arrangements in place.

6 According to SOLAS regulation V/18, ECDIS units on board ships must be type-approved. Type approval is the certification process that ECDIS equipment must undergo before it can be considered as complying with IMO performance standards. The process is carried out by flag Administration accredited type-approval organizations or marine classification societies in accordance with the relevant test standards developed by, inter alia, the International Electrotechnical Commission (IEC) (e.g. IEC 61174).

7 In accordance with SOLAS regulation V/19.2.1.4, ships must carry all nautical charts necessary for the intended voyage. As defined by SOLAS regulation V/2.2, nautical charts are issued officially by or on the authority of a Government, authorized Hydrographic Office or other relevant government institutions. Ships required to fit ECDIS and ships choosing to use ECDIS to meet the chart carriage requirements of SOLAS should carry Electronic Navigational Charts (ENCs) or, where ENCs are not available at all or are not of an appropriate scale for the planning and display of the ship's voyage plan, Raster Navigational Charts (RNC) and/or any needed paper charts.

8 *The IHO provides an online chart catalogue that details the coverage of ENCs together with references to coastal State guidance on any requirements for paper charts (where this has been provided). The catalogue also provides links to IHO Member States' websites where additional information may be found. The IHO online chart catalogue can be accessed from the IHO website at: www.iho.int.*

9 As per SOLAS regulation V/27, all nautical charts necessary for the intended voyage shall be adequate and up to date. For ships using ECDIS to meet the chart carriage requirement of SOLAS, all ENCs and RNCs must be of the latest available edition and be kept up to date using both the electronic chart updates (e.g. ENC updates) and the latest available notices to mariners. Additionally, ECDIS software should be kept up to date such that it is capable of displaying up to date electronic charts correctly according to the latest version of the IHO's chart content and display standards.

10 Relevant appendices of IMO performance standards for ECDIS specify the requirements for *adequate independent back-up arrangements to ensure safe navigation in case of ECDIS failure. Such arrangements include: 1) facilities enabling a safe take-over of the ECDIS functions in order to ensure that an ECDIS failure does not result in a critical situation; 2) a means to provide for safe navigation for the remaining part of the voyage in case of ECDIS failure.*

B MAINTENANCE OF ECDIS SOFTWARE

11 *ECDIS in operation comprises hardware, software and data. It is important for the safety of navigation that the application software within the ECDIS works fully in accordance with the Performance Standards and is capable of displaying all the relevant digital information contained within the ENC.*

12 *ECDIS that is not updated for the latest version of IHO Standards may not meet the chart carriage requirements as set out in SOLAS regulation V/19.2.1.4).*

13 *For example, in January 2007, Supplement No.1 to the IHO ENC Product Specification was introduced in order to include, within the ENC, the then recently introduced IMO requirements for Particularly Sensitive Sea Areas (PSSA), Archipelagic Sea Lanes (ASL) and to cater for any future Safety of Navigation requirements.*

14 *Any ECDIS which is not upgraded to be compatible with the latest version of the IHO ENC Product Specification or the Presentation Library may be unable to correctly display the latest charted features. Additionally, the appropriate alarms and indications may not be activated even though the features have been included in the ENC. Similarly any ECDIS which is not updated to be fully compliant with the latest version of the IHO Data Protection Standard may fail to decrypt or to properly authenticate some ENCs, leading to failure to load or install. An up-to-date list of all the relevant IHO standards relating to ECDIS equipment can be accessed from the IHO website (www.iho.int).*

15 *The need for safe navigation requires that manufacturers should provide a mechanism to ensure software maintenance arrangements are adequate. This may be achieved through the provision of software version information using a website. Such information should include the IHO Standards which have been implemented*

16 *Administrations should inform shipowners and operators that proper ECDIS software maintenance is an important issue and that adequate measures need to be implemented by masters, shipowners and operators in accordance with the International Safety Management (ISM) Code .*

C OPERATING ANOMALIES IDENTIFIED WITHIN ECDIS

17 *A number of ECDIS operating anomalies have been identified. Due to the complex nature of ECDIS, and in particular because it involves a mix of hardware, software and data, it is possible that further anomalies may exist*

18 *These anomalies are particularly apparent in ECDIS units that have been built and type-approved to ECDIS Performance Standards (resolution A.817(19), as amended), (i.e. before 2009). However, ECDIS units type-approved to the revised ECDIS Performance Standards (resolution MSC.232(82), [as may be amended]) are still vulnerable to the limitations in Appendix 1, item 5(a)*

19 *An ECDIS anomaly is an unexpected or unintended behaviour of an ECDIS unit which may affect the use of the equipment or navigational decisions made by the user. Examples include, but are not limited to:*

- *failure to display a navigational feature correctly, such as:*
- *navigation areas recently recognized by IMO such as PSSA (Particularly Sensitive Sea Area) and ASL (Archipelagic Sea Lanes);*

- *lights with complex characteristics; and*
- *underwater features and isolated dangers;*
- *failure to detect objects by "route checking" in voyage planning mode;*
- *failure to alarm correctly; and*
- *failure to manage a number of alarms correctly).*

20 *The existence of such anomalies highlights the importance of maintaining ECDIS software to ensure that it is capable of displaying up to date electronic charts correctly according to the latest version of the IHO's chart content and display standards. It is recommended that appropriate checks are made with the equipment manufacturer. This is of particular importance where ECDIS is the only source of chart information available.*

21 *IHO has produced an ECDIS Data Presentation and Performance Check (DPPC) dataset that allows mariners to check some important aspects of the operation of their ECDIS. This dataset contains two fictitious ENC cells which navigating officers can load into their ECDIS units to assess operating performance and to determine whether there may be any display anomalies that either need to be remedied or otherwise managed in the way that the ECDIS is operated. If the check highlights a problem, the accompanying guidance notes with the check dataset offer suggested courses of action. The check dataset and accompanying instructions can be obtained from ENC service providers, or can be downloaded from the IHO website at: (www.iho.int).*

22 *A list of the known anomalies with advice, and information on whether or not the DPPC dataset checks for each anomaly is provided in appendix 1.*

23 *Given the widespread use and the implementation of the ECDIS carriage requirement, the Committee considered it important that any anomalies identified by mariners are reported to and investigated by the appropriate authorities to ensure their resolution.*

24 *In order to better understand the extent of the issue, Administrations are invited to collect, investigate and disseminate information about ECDIS anomalies. The Administrations or designated bodies are invited to:*

- .1 encourage vessels under their flag to report such anomalies, with sufficient detail on the ECDIS equipment and ENCs, to allow analysis;*
- .2 treat the identity of the reporter as confidential;*
- .3 agree to share information with other IMO Member Governments and international organizations on request; and*
- .4 issue alerts to mariners where such anomalies might affect safety of navigation.*

D DIFFERENCES BETWEEN RASTER CHART DISPLAY SYSTEM (RCDS) AND ECDIS

25 ECDIS may be operated in one of the *two modes*:

- .1 *the ECDIS mode when ENC's are used; and*
- .2 *the RCDS mode when ENC's are not available and RNC's are used instead.*

Although in recent years, ENC coverage has increased rapidly, there could be some areas for which suitably detailed ENC's may not have been issued.

26 *The RCDS mode does not have the full functionality of ECDIS and can only be used together with an appropriate portfolio of up-to-date paper charts.* Limitations of the RCDS mode is provided in appendix 2.

E ECDIS TRAINING

27 The information provided below aims to assist Member Governments, Parties to the STCW Convention, companies and seafarers in ensuring that training programmes in the use of ECDIS provided to *masters and deck officers* ~~masters and officers⁴ certificated under chapter II or VII~~ serving on ships fitted with ECDIS to meet the mandatory training requirements of the STCW Convention ~~takes into account~~:

- .1 under the provisions of the STCW Convention and Code, all officers in charge of a navigational watch on ships of 500 gross tonnage or more must have a thorough knowledge and ability to use nautical charts and nautical publications (Refer STCW Code table A-II/1);
- .2 masters and officers in charge of a navigational watch (both at management and operational level) serving on ships fitted with ECDIS, should as a minimum, undertake appropriate generic ECDIS training ~~(which may be based upon IMO model course⁵ 1.27)~~, meeting the competence requirements of the 2010 Manila Amendments to the STCW Convention and Code ~~(refer to section A-II/1 and A-II/2 of the STCW Code)~~;
- .3 the 2010 Manila Amendments to the STCW Convention and Code have reinforced ECDIS training requirement and introduced several additional specific competencies in the use of ECDIS for ~~masters and deck officers in charge of a navigational watch~~ both at management and operational level (Refer STCW Code Tables A-II/1 and A-II/2) serving on ECDIS-fitted ships. Training in accordance with the 2010 Manila Amendments became effective from 1 July 2013;
- .4 masters and officers certificated under chapter II of the STCW Convention serving on board ships fitted with ECDIS are to be familiarized (in accordance with STCW regulation I/14) with the ship's equipment including ECDIS;

⁴ Training and assessment in the use of ECDIS is not required for those who serve exclusively on ships not fitted with ECDIS. This limitation shall be reflected in the endorsements issued to the seafarer concerned (refer to tables A-II/1 and A-II/2 of the STCW Code).

⁵ IMO model course 1.27 on Operational Use of Electronic Chart Display and Information Systems (ECDIS) ~~may be of assistance in the preparation of the courses.~~

- .5 ~~ECDIS manufacturers are encouraged to provide resources, such as type-specific materials, which could be provided on a CD or DVD. These resources may form part of the ECDIS familiarization training in;~~
- .6 regulation I/14, paragraph 1.5 of the STCW Convention, as well as sections 6.3 and 6.5 of the International Safety Management (ISM) Code, requires companies to ensure seafarers are provided with familiarization training. A ship safety management system should include familiarization with the ECDIS equipment fitted, including its backup arrangements, sensors and related peripherals. ~~To assist Member Governments, Parties to the STCW Convention, companies and seafarers, a record of such familiarization should be provided.~~ ECDIS manufacturers are encouraged to provide training resources including type-specific materials. These resources may form part of the ECDIS familiarization training;
- .7 regulation I/14, paragraph 1.4 of the STCW Convention, requires companies to maintain evidence of the training and ensures that it is readily accessible. For Certificates of competency that have expiry dates beyond 1 January 2017, port State control authorities should accept the certificate issued as *prima facie* evidence that the seafarer has met the standard of competence required by the 2010 Amendments in accordance with the control provisions of article X and regulation I/4.
- .8 Companies should also maintain evidence of the familiarization training in compliance with regulation I/14, paragraph 1.5 of the STCW Convention.
- .9 Administrations should inform their port State control officers of the requirements for ECDIS training as detailed in paragraph 67 above. ~~A certificate of competency issued in accordance³ with the 2010 Manila Amendments would be prima facie evidence of generic ECDIS training; however, a record of the ship specific familiarization of the ECDIS should be provided; and~~
- .10 attention is also drawn to STCW.7/Circ.17 – Advice for port State control officers on transitional arrangements leading up to the full implementation of the requirements of the 2010 Manila Amendments to the STCW Convention and Code on 1 January 2017 and STCW.7/Circ.16 – Clarification of transitional provisions relating to the 2010 Manila Amendments to the STCW Convention and Code.

F TRANSITIONING FROM PAPER CHART TO ECDIS NAVIGATION

28 *As an initial step, shipowners and operators should undertake an assessment of the issues involved in changing from paper chart to ECDIS navigation. Ships' crews masters and deck officers should participate in any such assessment so as to capture any practical concerns or needs of those that would be required to use ECDIS. Such a process will help facilitate an early understanding of any issues to be addressed and will aid crews masters and deck officers prepare for change*

29 *Documenting the assessment of issues, combined with the development of ECDIS standard operating procedures, will help lead to the adoption of robust ECDIS navigation practices, simplification of crews masters and deck officers' training and facilitate smooth handovers between crews.*

30 *In addition, shipowners and operators should ensure that their ships' crews masters and deck officers are provided with a generic ECDIS training and an ECDIS familiarization programme so that the ships' crews masters and deck officers fully understand the use of ECDIS for passage planning and navigation.*

31 *In addition to national and international rules, regulations, IMO model course and performance standards, IHO has published an online publication "Facts about electronic charts and carriage requirements". It is a recommended source of information on ECDIS hardware, training and the technical aspects of electronic chart data. Copies are available free of charge from various sources including: www.iho.int.*

32 *Shipowners and operators should always refer to their national Administrations for the latest information on ECDIS carriage and use.*

G GUIDANCE ON TRAINING AND ASSESSMENT IN THE OPERATIONAL USE OF ECDIS SIMULATORS

~~33 When simulators are being used for training or assessment in the operational use of ECDIS the following principles should be taken into consideration in any such training or assessment:~~

- ~~.1 Training and assessment in the operational use of the ECDIS should:
 - incorporate the use of an ECDIS simulation equipment; and
 - conform to standards not inferior to those given in paragraphs .2 to .30 below.~~
- ~~.2 ECDIS simulation equipment should, in addition to meeting all applicable performance standards set out in section A-1/12 of the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW), 1978, as amended, be capable of simulating navigational equipment and bridge operational controls which meet all applicable performance standards adopted by the Organization, incorporate facilities to generate soundings and:
 - i) create a real-time operating environment, including navigation control and communications instruments and equipment appropriate to the navigation and watchkeeping tasks to be carried out and the maneuvering skills to be assessed; and
 - ii) realistically simulate 'own ship' characteristics in open water conditions, as well as the effects of weather, tidal stream, and currents.~~
- ~~.3 Demonstrations of, and practice in, ECDIS use should be undertaken where appropriate through the use of simulators. Training exercises should preferably be undertaken in real time, in order to increase trainees' awareness of the hazards of the improper use of ECDIS. Accelerated time scale may be used only for demonstrations.~~

33 When simulators are being used for training or assessment in the operational use of Electronic Chart Display and Information Systems (ECDIS), the following interim guidance should be taken into consideration in any such training or assessment.

34 Training and assessment in the operational use of the ECDIS should:

.1 incorporate the use of ECDIS simulation equipment; and

.2 conform to standards not inferior to those given in paragraphs 38 to 65 below.

35 ECDIS simulation equipment should, in addition to meeting all applicable performance standards set out in section A-I/12 of the STCW Code, as amended, be capable of simulating navigational equipment and bridge operational controls which meet all applicable performance standards adopted by the Organization, incorporate facilities to generate soundings and:

.1 create a real-time operating environment, including navigation control and communications instruments and equipment appropriate to the navigation and watchkeeping tasks to be carried out and the manoeuvring skills to be assessed; and

.2 realistically simulate "own ship" characteristics in open-water conditions, as well as the effects of weather, tidal stream and currents.

36 Demonstrations of, and practice in, ECDIS use should be undertaken, where appropriate, through the use of simulators. Training exercises should preferably be undertaken in real time, in order to increase trainees' awareness of the hazards of the improper use of ECDIS. Accelerated timescale may be used only for demonstrations.

34 37 Detailed guidance is provided in appendix 3.

APPENDIX 1

LIST OF ECDIS APPARENT OPERATING AND DISPLAY ANOMALIES
(NOT IN PRIORITY ORDER)

In the following list, items 1, 2, 3, 4, 5(b), 6, 7, and 11 are checked by the IHO DPPC dataset dated November 2011:

1 *Inability to correctly display symbols for IMO-approved features such as ASLs or PSSAs – ECDIS equipment that does not have the latest version of the IHO Presentation Library installed will, instead of displaying the correct symbol, either show question marks (?) or nothing at all. In some cases the ECDIS may fail to load an ENC that includes such data. An ECDIS retains its type approval certificate regardless of the version of the Presentation Library installed.*

Workaround – interrogate any "?" symbol displayed using the "pick report" or refer to paper charts and/or publications.

2 *Incorrect display of foul areas and obstructions in some ECDIS equipment – some ECDIS models do not show some underwater features in Standard display mode as expected (however they do activate appropriate alarms). These features are only displayed when the "All" or "Other" display mode is used. Also in some cases different symbols are used to depict these features.*

Workaround – use Mode "All" or "Other".

3 *On some occasions some stranded/dangerous wrecks and obstructions may not display in any mode; it is believed that this is limited to some ECDIS versions from a single manufacturer who has now produced a software amendment to resolve the problem.*

Workaround – use paper charts.

4 *An object that falls on a contour line may fail to display in "Standard" Mode in some ECDIS equipment.*

Workaround – use Mode "All" or "Other".

5 *Small (point) land areas, especially those depicted only on small scale (usage band 1 and 2) ENCs may not always be clearly displayed and do not always activate alarms in route planning or route monitoring modes in some ECDIS equipment:*

- (a) *it is possible for small land features to be obscured by other chart detail such as names or contour labels; and*
- (b) *some ECDIS equipment may not conduct route checks on small scale ENCs and may not therefore provide an appropriate warning. Where this is the case the land area may not be detected by the "look-ahead" function during route monitoring.*

Workaround – careful manual inspection of the largest scale ENC available.

Due to the limitations of ECDIS referred to in 5(a) above, mariners (even those using the most modern systems) should always undertake careful visual inspection of the entire planned route using the "Other/All" display mode to confirm that it, and any deviations from it, are clear of dangers.

6 *Incorrect display of the coloured arcs of light sectors – some ECDIS may not display the coloured arcs of complex lights as intended. This is especially prevalent where the sectors straddle 0/360deg (North).*

Workaround – use "pick report" function to check light sectors.

7 *Some early models of ECDIS are unable to display correctly time-variable data encoded in ENCs. For example features with Date Start and Date End attributes used for the implementation of new Traffic Routeing measures in ENCs may not be depicted correctly; the result being that both old and new instances are displayed simultaneously. Tests for this were not included in IEC61174 Ed1.*

Workaround – use "pick report" function to determine Start/End date/time.

8 *Tidal stream data not available in usable form – some early models of ECDIS only provide a comma-separated list of values which is difficult to interpret and use.*

Workaround – use Tidal Stream Atlases external to ECDIS.

9 *Display of anchorage, berth and channel names may not be easily visible to the mariner and the radius of a maximum swinging circle may not be shown.*

Workaround – use "All" or "Other" display mode and "pick report" function to obtain swinging circle information; VTS/Port Authority communications will be able to clarify any necessary names.

10 *Three hundred and sixty degree landfall lights not always prominent in comparison to shorter range sector lights.*

Workaround – mariners to be aware – use "pick report" to verify light characteristic.

11 *ENCs may include certain shoal soundings, especially reported depths, which have been encoded in such a way that they do not display in "Standard" Mode and might not activate an alarm even where the depth is less than the safety contour setting. Most Hydrographic Offices have reported to the IHO that they have updated the relevant ENCs to ensure that significant depths are displayed in Standard Mode.*

Workaround – operate in a display Mode where all soundings are shown.

12 *Areas of foul ground that have no known depth value may be depicted in some ECDIS as isolated dangers and shown in "Standard" mode; this can result in unnecessary screen clutter.*

Workaround – no workaround for clutter problem, mariners to be aware and use "pick report" function to determine if the feature is a danger.

13 *Where ECDIS includes an option to show isolated dangers in waters shoaler than the safety contour value the symbology used may vary between manufacturers.*

Workaround – mariners to be aware and to use "All" or "Other" Mode when operating in such areas.

14 *Screen clutter can be a problem when displaying smaller scale ENC's for areas where larger scale coverage is also loaded in ECDIS. This can be more apparent when the user zooms out. This is due to a combination of each manufacturer's ENC loading strategy and the individual ENC producer's encoding policy. Where HOs use SCAMIN (scale minimum) attributes on chart features then this problem is minimized. The intention of the IHO standard is that ECDIS should not display ENC data which has a compilation scale significantly different from the display scale in use. Improvements could be made, in future, by adopting a standardized ENC loading strategy based on a scale range defined within the ENC.*

Workaround – the situation can be improved through use of the standard display mode during voyage monitoring and appropriate (but not over) use of the zoom function. This technique has been included in the IMO 1-27 Model Course syllabus.

15 *In some ECDIS equipment the text for some notes in the ENC may be truncated or not displayed at all, and therefore is not available to the mariner.*

Workaround – no workaround available; mariners should advise ENC service providers where they observe this problem.

16 *Unnecessary alarms and indications – feedback from mariners shows that ECDIS can produce excessive and distracting alarms. This is due to a combination of the interpretation of the requirements of the ECDIS Performance Standards and the ENC encoding. Some control over the number of alarms and indications is available to the mariner in ECDIS built to the revised Performance Standards (resolution MSC.232(82)), but this is not always recognized.*

Workaround – the methods available to minimize alarms are included in the IMO 1-27 Model Course syllabus.

APPENDIX 2

DIFFERENCES BETWEEN RASTER CHART DISPLAY SYSTEM (RCDS) AND ECDIS

The mariners' attention is drawn to the following limitations of the RCDS mode:

- 1 Unlike ENC, where there are no displayed boundaries, RNCs are based on paper charts and as such have boundaries which are evident in ECDIS;*
- 2 RNCs will not trigger automatic alarms (e.g. anti-grounding). However alarms and indications can be generated with the manual addition, during passage planning, e.g. of clearing lines, ship safety contour lines, isolated danger markers and danger areas to mitigate these limitations;*
- 3 Horizontal datums and chart projections may differ between RNCs. Mariners should understand how a chart's horizontal datum relates to the datum of the position fixing system in use. In some instances, this may appear as a shift in position. This difference may be most noticeable at grid intersections;*
- 4 A number of RNCs cannot be referenced to either WGS-84 or PE 90 geodetic datums. Where this is the case, ECDIS should give a continuous indication;*
- 5 the display of RNCs features cannot be simplified by the removal of features to suit a particular navigational circumstance or task at hand. This could affect the superimposition of radar/ARPA;*
- 6 Without selecting different scale charts the look-ahead capability may be limited. This may lead to inconvenience when determining range and bearing or the identity of distant objects;*
- 7 Orientation of the RCDS display to other than chart-up, may affect the readability of chart text and symbols (e.g. course-up, route-up);*
- 8 It is not possible to interrogate RNC features to gain additional information about charted objects. Whether using ENC or RNC, in the planning process a navigator should consult all relevant publications (such as sailing directions, etc.);*
- 9 With RNC it is not possible to display a ship's safety contour or safety depth and highlight it on the display, unless these features are manually entered during route planning;*
- 10 Depending on the source of the RNC, different colours may be used to show similar chart information. There may also be differences in colours used during day and night time;*
- 11 An RNC is intended to be used at the scale of the equivalent paper chart. Excessive zooming in or zooming out can seriously degrade the displayed image. If the RNC is displayed at a larger scale than the equivalent paper chart, the ECDIS will provide an indication; and*
- 12 ECDIS provides an indication in the ENC which allows a determination of the quality of hydrographic the data. When using RNCs, mariners are invited to consult the source diagram or the zone of confidence diagram, if available.*

APPENDIX 3

GUIDANCE ON TRAINING AND ASSESSMENT IN THE OPERATIONAL USE OF ECDIS SIMULATORS

GENERAL

~~Goals of an ECDIS training programme~~

- ~~.1 — The ECDIS trainee should be able to:~~
- ~~i) — operate the ECDIS equipment, use the navigational functions of ECDIS, select and assess all relevant information and take proper action in the case of a malfunction;~~
 - ~~ii) — state the potential errors of displayed data and the usual errors of interpretation; and~~
 - ~~iii) — explain why ECDIS should not be relied upon as the sole reliable aid to navigation.~~

~~Theory and demonstration~~

- ~~.2 — As the safe use of ECDIS requires knowledge and understanding of the basic principles governing ECDIS data and their presentation rules as well as potential errors in displayed data and ECDIS-related limitations and potential dangers, a number of lectures covering the theoretical explanation should be provided. As far as possible, such lesson should be presented within a familiar context and make use of practical examples. They should be reinforced during simulator exercises.~~
- ~~.3 — For safe operation of ECDIS equipment and ECDIS-related information (use of the navigational functions of ECDIS, selection and assessment of all relevant information, becoming familiar with ECDIS man-machine interfacing), practical exercises and training on the ECDIS simulators should constitute the main content of the course.~~
- ~~.4 — For the definition of training objectives, a structure of activities should be defined. A detailed specification of learning objectives should be developed for each topic of this structure.~~

~~Simulator exercises~~

- ~~.5 — Exercises should be carried out on individual ECDIS simulators, or full-mission navigation simulators including ECDIS, to enable trainees to acquire the necessary practical skills. For real time navigation exercises, navigation simulators are recommended to cover the complex navigation situation. The exercises should provide training in the use of the various scales, navigational modes, and display modes which are available, so that the trainees will be able to adapt the use of the equipment to the particular situation concerned.~~

- ~~.6 — The choice of exercises and scenarios is governed by the simulator facilities available. If one or more ECDIS workstations and a full-mission simulator are available, the workstations may primarily be used for basic exercises in the use of ECDIS facilities and for passage planning exercises, whereas full-mission simulators may primarily be used for exercises related to passage monitoring functions in real time, as realistic as possible in connection with the total workload of a navigational watch. The degree of complexity of exercises should increase throughout the training programme until the trainee has mastered all aspects of the learning subject.~~
- ~~.7 — Exercises should produce the greatest impression of realism. To achieve this, the scenarios should be located in fictitious sea area. Situations, functions and actions for different learning objectives which occur in different sea areas can be integrated into one exercise and experienced in real time.~~
- ~~.8 — The main objective of simulator exercises is to ensure that a trainee understands his responsibilities in the operational use of ECDIS in all safety-relevant aspects and is thoroughly familiar with the used system and equipment.~~

~~Principal types of ECDIS systems and their display characteristics~~

- ~~.9 — The trainee should gain knowledge of the principal types of ECDIS in use; their various display characteristics, data structure and an understanding of:
 - ~~.1 — differences between vector and raster charts;~~
 - ~~.2 — differences between ECDIS and EGS;~~
 - ~~.3 — differences between ECDIS and RCDS;~~
 - ~~.4 — characteristics of ECDIS and their different solutions;~~
 - ~~.5 — characteristics of systems for special purposes (unusual situations/emergencies).~~~~

~~Risks of over-reliance on ECDIS~~

- ~~.10 — The training in ECDIS operational use should address:
 - ~~.1 — the limitations of ECDIS as a navigational tool;~~
 - ~~.2 — potential risk of improper functioning of the system;~~
 - ~~.3 — system limitations, including those of its sensors;~~
 - ~~.4 — hydrographic data inaccuracy; limitations of vector and raster electronic charts (ECDIS vs. RCDS and ENC vs. RNC); and~~
 - ~~.5 — potential risk of human errors.~~~~

~~Emphasis should be placed on the need to keep a proper look-out and to perform periodical checking, especially of the ship's position, by ECDIS-independent methods.~~

Detection of misrepresentation of information

- ~~.11 Knowledge of the limitations of the equipment and detection of misrepresentation of information is essential for the safe use of ECDIS. The following factors should be emphasized during training:~~
- ~~.1 performance standards of the equipment;~~
 - ~~.2 radar data representation on an electronic chart, elimination of discrepancy between the radar image and the electronic chart;~~
 - ~~.3 possible projection discrepancies between an electronic and paper charts;~~
 - ~~.4 possible scale discrepancies (overscaling and underscaling) in displaying an electronic chart and its original scale;~~
 - ~~.5 effects of using different reference systems for positioning;~~
 - ~~.6 effects of using different horizontal and vertical datums;~~
 - ~~.7 effects of the motion of the ship in a seaway;~~
 - ~~.8 ECDIS limitations in raster chart display mode;~~
 - ~~.9 potential errors in the display of:
 - ~~.1 the own ship's position;~~
 - ~~.2 radar data and ARPA information;~~
 - ~~.3 different geodetic co-ordinate systems; and~~~~
 - ~~.10 verification of the results of manual or automatic data correction:
 - ~~.1 comparison of chart data and radar picture; and~~
 - ~~.2 checking the own ship's position by using the other independent position fixing systems.~~~~
- ~~.12 False interpretation of the data and proper action taken to avoid errors of interpretation should be explained. The implications of the following should be emphasized:~~
- ~~.1 ignoring overscale of the display;~~
 - ~~.2 uncritical acceptance of the own ship's position;~~
 - ~~.3 confusion of display mode;~~
 - ~~.4 confusion of chart scale;~~
 - ~~.5 confusion of reference systems;~~
 - ~~.6 different modes of presentation;~~
 - ~~.7 different modes of vector stabilization;~~

- ~~.8 — differences between true north and gyro north (radar);~~
- ~~.9 — the same data reference system;~~
- ~~.10 — appropriate chart scale;~~
- ~~.11 — using the best suited sensor to the given situation and circumstances;~~
- ~~.12 — entering the correct values of safety data; and
 - ~~.1 — the own ship's safety contour;~~
 - ~~.2 — safety depth (safe water); and~~
 - ~~.3 — events; and~~~~
- ~~.13 — proper use of all available data.~~
- ~~.13 — Appreciation that RCDS is only a navigational aid and that, when operating in the RCDS mode, the ECDIS equipment should be used together with an appropriate portfolio of up-to-date paper charts.~~

Factors affecting system performance and accuracy

- ~~.14 — An elementary understanding should be attained of the principles of ECDIS, together with a full practical knowledge of:
 - ~~.1 — starting and setting up ECDIS; connecting data sensors: satellite and radionavigation system receivers, radar, gyrocompass, log, echo-sounder; accuracy and limitations of these sensors, including effect of measurements errors and ship's position accuracy, manoeuvring on the accuracy of course indicators performance, compass error on the accuracy of course indication, shallow water on the accuracy of log performance, log correction on the accuracy of speed calculation, disturbance (sea state) on the accuracy of an echo-sounder performance; and~~
 - ~~.2 — the current electronic chart display and information system performance standards adopted by the Organization.~~~~

PRACTICE

Setting up and maintaining display

- ~~.15 — Knowledge and skills should be attained in:
 - ~~.1 — the correct starting procedure to obtain the optimum display of ECDIS information;~~
 - ~~.2 — the selection of display presentation (standard display, display base, all other information displayed individually on demand);~~
 - ~~.3 — the correct adjustment of all variable radar/ARPA display controls for optimum display of data;~~~~

- ~~.4 — the selection of convenient configuration;~~
- ~~.5 — the selection, as appropriate, of required speed input to ECDIS;~~
- ~~.6 — the selection of the time scale of vectors; and~~
- ~~.7 — performance checks of position, radar/ARPA, compass, speed input sensors and ECDIS.~~

Operational use of electronic charts

- ~~.16 — Knowledge and skills should be attained in:~~
 - ~~.1 — the main characteristics of the display of ECDIS data and selecting proper information for navigational tasks;~~
 - ~~.2 — the automatic functions required for monitoring ship's safety such as display of position, heading/gyro course, speed, safety values and time;~~
 - ~~.3 — the manual functions (by cursor, electronic bearing line, range rings);~~
 - ~~.4 — selecting and modification of electronic chart content;~~
 - ~~.5 — scaling (including underscaling and overscaling);~~
 - ~~.6 — zooming;~~
 - ~~.7 — setting of the own ship's safety data;~~
 - ~~.8 — using a daytime or night-time display mode;~~
 - ~~.9 — reading all chart symbols and abbreviations;~~
 - ~~.10 — using different kinds of cursors and electronic bars for obtaining navigational data;~~
 - ~~.11 — viewing area in different directions and returning to the ship's position;~~
 - ~~.12 — finding necessary area using geographical co-ordinates;~~
 - ~~.13 — displaying indispensable data layers appropriate to navigational situation;~~
 - ~~.14 — selecting appropriate and unambiguous data (position, course, speed, etc.);~~
 - ~~.15 — entering the mariner's notes;~~
 - ~~.16 — using north-up orientation presentation and other kinds of orientation; and~~
 - ~~.17 — using true and relative motion modes.~~

Route planning

- ~~.17 Knowledge and skills should be attained in:~~
 - ~~.1 loading the ship's characteristics into ECDIS;~~
 - ~~.2 sea area selection for route planning:
 - ~~.1 reviewing required waters for the sea passage;~~
 - ~~.2 changing over of chart scale;~~~~
 - ~~.3 route planning on a display by means of ECDIS using the graphic editor taking into consideration rhumb-line and great circle sailing:
 - ~~.1 using ECDIS database for obtaining navigational, hydrometeorological and other data;~~
 - ~~.2 taking into consideration turning radius and wheel over points/lines when it is expressed on chart scale;~~
 - ~~.3 marking dangerous depths and areas and exhibiting guarding isolines;~~
 - ~~.4 marking waypoints with the crossing isolines and critical cross-track deviations, as well as by adding, replacing and erasing of waypoints;~~
 - ~~.5 taking into consideration safe speed;~~
 - ~~.6 checking pre-planned route for navigational safety;~~
 - ~~.7 generating alarms and warnings;~~~~
 - ~~.4 route planning with calculation in the table format including:
 - ~~.1 way-points selection;~~
 - ~~.2 recalling the way points list;~~
 - ~~.3 planning notes;~~
 - ~~.4 adjustment of a planned route;~~
 - ~~.5 checking pre-planned route for navigational safety;~~
 - ~~.6 alternative route planning;~~
 - ~~.7 saving planned routes, loading and unloading or deleting routes;~~
 - ~~.8 making a graphic copy of the monitor screen and printing a route;~~
 - ~~.9 editing and modification of the planned route;~~~~

- ~~.10 — safety values setting according to size and manoeuvring parameters of the vessel;~~
- ~~.11 — back-route planning; and~~
- ~~.12 — connecting several routes.~~

Route monitoring

- ~~.18 — Knowledge and skills should be attained in:
 - ~~.1 — using independent data to control ship's position or using alternative systems within ECDIS;~~
 - ~~.2 — using look-ahead function
 - ~~.1 — changing charts and their scales;~~
 - ~~.2 — reviewing navigational charts;~~
 - ~~.3 — vector time selecting;~~
 - ~~.4 — predicting the ship's position for some time interval;~~
 - ~~.5 — changing the pre-planned route (route modification);~~
 - ~~.6 — entering independent data for the calculation of wind drift and current allowance;~~
 - ~~.7 — reacting properly to the alarm;~~
 - ~~.8 — entering corrections for discrepancies of the geodesic datum;~~
 - ~~.9 — displaying time markers on a ship's route;~~
 - ~~.10 — entering ship's position manually; and~~
 - ~~.11 — measuring co-ordinates, course, bearings and distances on a chart.~~~~~~

Alarm handling

- ~~.19 — Knowledge and ability to interpret, react properly to all kinds of systems, such as navigational sensors, indicators, data and charts alarms and indicator warnings including switching the sound and visual alarm signalling system should be attained in case of:
 - ~~.1 — absence of next chart in ECDIS database;~~
 - ~~.2 — crossing a safety contour;~~
 - ~~.3 — exceeding cross-track limits;~~
 - ~~.4 — deviation from planned route;~~
 - ~~.5 — approaching a waypoint;~~~~

- ~~.6 — approaching a critical point;~~
- ~~.7 — discrepancy between calculated and actual time of arrival to a waypoint;~~
- ~~.8 — information on underscale or overscale;~~
- ~~.9 — approaching an isolated navigational danger or danger area;~~
- ~~.10 — crossing a specified area;~~
- ~~.11 — different geodetic datum;~~
- ~~.12 — approaching other ships;~~
- ~~.13 — watch termination;~~
- ~~.14 — switching timer;~~
- ~~.15 — system test failure;~~
- ~~.16 — malfunctioning of positioning system used in ECDIS;~~
- ~~.17 — failure of dead-reckoning; and~~
- ~~.18 — inability to fix vessel's position using navigational system.~~

~~Manual correction of a ship's position and motion parameters~~

- ~~.20 — Knowledge and skills should be attained in manually correcting:~~
 - ~~.1 — the ship's position in dead-reckoning mode, when the satellite and radionavigation system receiver is switched off;~~
 - ~~.2 — the ship's position, when automatically obtained coordinates are inaccurate; and~~
 - ~~.3 — course and speed values.~~

~~Records in the ship's log~~

- ~~.21 — Knowledge and skills should be attained in:~~
 - ~~.1 — automatic voyage recording;~~
 - ~~.2 — reconstruction of past track taking into account;~~
 - ~~.3 — recording media;~~
 - ~~.4 — recording intervals;~~
 - ~~.5 — verification of database in use;~~
 - ~~.6 — viewing records in the electronic ship's log;~~
 - ~~.7 — instant recording in the electronic ship's log;~~
 - ~~.8 — changing ship's time;~~

- ~~.9 — entering the additional data;~~
- ~~.10 — printing the electronic ship's log content;~~
- ~~.11 — setting up the automatic record time intervals;~~
- ~~.12 — composition of voyage data and reporting; and~~
- ~~.13 — interphase with a voyage data recorder (VDR).~~

Chart updating

- ~~.22 — Knowledge and skills should be attained in:~~
 - ~~.1 — performing manual updating of electronic charts. Special attention should be paid to reference ellipsoid conformity and to conformity of measurements units used on a chart and in the correction text;~~
 - ~~.2 — performing semi-automatic updating of electronic charts using the data obtained on a diskette in the electronic chart format; and~~
 - ~~.3 — performing automatic updating of electronic charts, obtained via modern communication lines.~~

~~In the scenarios where non-updated data are employed to create a critical situation, trainees should be required to perform ad hoc updating of the chart.~~

Operational use of ECDIS where radar/ARPA connected

- ~~.23 — Knowledge and skills should be attained in:~~
 - ~~.1 — connecting ARPA to ECDIS;~~
 - ~~.2 — indicating target's speed vectors;~~
 - ~~.3 — indicating target's tracks;~~
 - ~~.4 — archiving target's tracks;~~
 - ~~.5 — viewing the table of the targets;~~
 - ~~.6 — simulating the manoeuvre;~~
 - ~~.7 — corrections of a ship's position using a reference point captured by ARPA; and~~
 - ~~.8 — corrections using the ARPA's cursor and electronic bar.~~

Operational use of ECDIS where AIS connected

- ~~.24 — Knowledge and skills should be attained in:~~
 - ~~.1 — interface with AIS; and~~
 - ~~.2 — interpretation of AIS data.~~

Operational warnings, their benefits and limitations

~~.25 — Trainees should gain an appreciation of the uses, benefits and limitations of ECDIS operational warnings and their correct setting, where applicable, to avoid spurious interference.~~

System operational tests

~~.26 — Knowledge and skills should be attained in:~~

~~.1 — methods of testing for malfunctions of ECDIS, including functional self-testing;~~

~~.2 — precautions to be taken after a malfunction occurs; and~~

~~.3 — adequate back-up arrangements (takeover and navigate using the back-up system).~~

Debriefing exercise

~~.27 — The instructor should analyse the results of all exercises completed by all trainees and print them out. The time spent on the debriefing should occupy between 10% and 15% of the total time used for simulator exercises.~~

Goals of an ECDIS training programme

1 The ECDIS trainee should be able to:

.1 operate the ECDIS equipment, use the navigational functions of ECDIS, select and assess all relevant information and take proper action in the case of a malfunction;

.2 state the potential errors of displayed data and the usual errors of interpretation; and

.3 explain why ECDIS should not be relied upon as the sole reliable aid to navigation.

Theory and demonstration

2 As the safe use of ECDIS requires knowledge and understanding of the basic principles governing ECDIS data and their presentation rules as well as potential errors in displayed data and ECDIS-related limitations and potential dangers, a number of lectures covering the theoretical explanation should be provided. As far as possible, such lessons should be presented within a familiar context and make use of practical examples. They should be reinforced during simulator exercises.

3 For safe operation of ECDIS equipment and ECDIS-related information (use of the navigational functions of ECDIS, selection and assessment of all relevant information, becoming familiar with ECDIS man-machine interfacing), practical exercises and training on the ECDIS simulators should constitute the main content of the course.

4 For the definition of training objectives, a structure of activities should be defined. A detailed specification of learning objectives should be developed for each topic of this structure.

Simulator exercises

5 Exercises should be carried out on individual ECDIS simulators, or full-mission navigation simulators including ECDIS, to enable trainees to acquire the necessary practical skills. For real-time navigation exercises, navigation simulators are recommended to cover the complex navigation situation. The exercises should provide training in the use of the various scales, navigational modes, and display modes which are available, so that the trainees will be able to adapt the use of the equipment to the particular situation concerned.

6 The choice of exercises and scenarios is governed by the simulator facilities available. If one or more ECDIS workstations and a full-mission simulator are available, the workstations may primarily be used for basic exercises in the use of ECDIS facilities and for passage-planning exercises, whereas full-mission simulators may primarily be used for exercises related to passage-monitoring functions in real time, as realistic as possible in connection with the total workload of a navigational watch. The degree of complexity of exercises should increase throughout the training programme until the trainee has mastered all aspects of the learning subject.

7 Exercises should produce the greatest impression of realism. To achieve this, the scenarios should be located in a fictitious sea area. Situations, functions and actions for different learning objectives which occur in different sea areas can be integrated into one exercise and experienced in real time.

8 The main objective of simulator exercises is to ensure that trainees understand their responsibilities in the operational use of ECDIS in all safety-relevant aspects and are thoroughly familiar with the system and equipment used.

Principal types of ECDIS systems and their display characteristics

9 The trainee should gain knowledge of the principal types of ECDIS in use; their various display characteristics, data structure and an understanding of:

- .1 differences between vector and raster charts;
- .2 differences between ECDIS and ECS;
- .3 differences between ECDIS and RCDS;
- .4 characteristics of ECDIS and their different solutions; and
- .5 characteristics of systems for special purposes (unusual situations/emergencies).

Risks of over-reliance on ECDIS

10 The training in ECDIS operational use should address:

- .1 the limitations of ECDIS as a navigational tool;
- .2 potential risk of improper functioning of the system;

- .3 system limitations, including those of its sensors;
- .4 hydrographic data inaccuracy; limitations of vector and raster electronic charts (ECDIS vs RCDS and ENC vs RNC); and
- .5 potential risk of human errors.

Emphasis should be placed on the need to keep a proper look-out and to perform periodical checking, especially of the ship's position, by ECDIS-independent methods.

Detection of misrepresentation of information

11 Knowledge of the limitations of the equipment and detection of misrepresentation of information is essential for the safe use of ECDIS. The following factors should be emphasized during training:

- .1 performance standards of the equipment;
- .2 radar data representation on an electronic chart, elimination of discrepancy between the radar image and the electronic chart;
- .3 possible projection discrepancies between an electronic and paper charts;
- .4 possible scale discrepancies (overscaling and underscaling) in displaying an electronic chart and its original scale;
- .5 effects of using different reference systems for positioning;
- .6 effects of using different horizontal and vertical datums;
- .7 effects of the motion of the ship in a seaway;
- .8 ECDIS limitations in raster chart display mode;
- .9 potential errors in the display of:
 - .9.1 the own ship's position;
 - .9.2 radar data and ARPA and AIS information;
 - .9.3 different geodetic coordinate systems; and
- .10 verification of the results of manual or automatic data correction:
 - .10.1 comparison of chart data and radar picture; and
 - .10.2 checking the own ship's position by using the other independent position-fixing systems.

12 False interpretation of the data and proper action taken to avoid errors of interpretation should be explained. The implications of the following should be emphasized:

- .1 ignoring overscaling of the display;
- .2 uncritical acceptance of the own ship's position;

- .3 confusion of display mode;
- .4 confusion of chart scale;
- .5 confusion of reference systems;
- .6 different modes of presentation;
- .7 different modes of vector stabilization;
- .8 differences between true north and gyro north (radar);
- .9 using the same data reference system;
- .10 using the appropriate chart scale;
- .11 using the best-suited sensor to the given situation and circumstances;
- .12 entering the correct values of safety data:
 - .12.1 the own ship's safety contour,
 - .12.2 safety depth (safe water), and
 - .12.3 events; and
- .13 proper use of all available data.

13 Appreciation that RCDS is only a navigational aid and that, when operating in the RCDS mode, the ECDIS equipment should be used together with an appropriate portfolio of up-to-date paper charts:

- .1 appreciation of the differences in operation of RCDS mode as described in SN.1/Circ.207/Rev.1 "Differences between RCDS and ECDIS"; and
- .2 ECDIS, in any mode, should be used in training with an appropriate portfolio of up-to-date charts.

Factors affecting system performance and accuracy

14 An elementary understanding should be attained of the principles of ECDIS, together with a full practical knowledge of:

- .1 starting and setting up ECDIS; connecting data sensors: satellite and radio navigation system receivers, radar, gyro-compass, log, echo-sounder; accuracy and limitations of these sensors, including effects of measurement errors and ship's position accuracy, manoeuvring on the accuracy of course indicator's performance, compass error on the accuracy of course indication, shallow water on the accuracy of log performance, log correction on the accuracy of speed calculation, disturbance (sea state) on the accuracy of an echo-sounder performance; and
- .2 the current performance standards for electronic chart display and information systems adopted by the Organization*.

(* See relevant/appropriate performance standards adopted by the Organization.)

Practice

Setting up and maintaining display

15 Knowledge and skills should be attained in:

- .1 the correct starting procedure to obtain the optimum display of ECDIS information;
- .2 the selection of display presentation (standard display, display base, all other information displayed individually on demand);
- .3 the correct adjustment of all variable radar/ARPA display controls for optimum display of data;
- .4 the selection of convenient configuration;
- .5 the selection, as appropriate, of required speed input to ECDIS;
- .6 the selection of the timescale of vectors; and
- .7 performance checks of position, radar/ARPA, compass, speed input sensors and ECDIS.

Operational use of electronic charts

16 Knowledge and skills should be attained in:

- .1 the main characteristics of the display of ECDIS data and selecting proper information for navigational tasks;
- .2 the automatic functions required for monitoring ship's safety, such as display of position, heading/gyro course, speed, safety values and time;
- .3 the manual functions (by the cursor, electronic bearing line, range rings);
- .4 selecting and modification of electronic chart content;
- .5 scaling (including underscaling and overscaling);
- .6 zooming;
- .7 setting of the own ship's safety data;
- .8 using a daytime or night-time display mode;
- .9 reading all chart symbols and abbreviations;
- .10 using different kinds of cursors and electronic bars for obtaining navigational data;
- .11 viewing an area in different directions and returning to the ship's position;
- .12 finding the necessary area, using geographical coordinates;

- .13 displaying indispensable data layers appropriate to a navigational situation;
- .14 selecting appropriate and unambiguous data (position, course, speed, etc.);
- .15 entering the mariner's notes;
- .16 using north-up orientation presentation and other kinds of orientation; and
- .17 using true- and relative-motion modes.

Route planning

17 Knowledge and skills should be attained in:

- .1 loading the ship's characteristics into ECDIS;
- .2 selection of a sea area for route planning:
 - .2.1 reviewing required waters for the sea passage, and
 - .2.2 changing over of chart scale;
- .3 verifying that proper and updated charts are available;
- .4 route planning on a display by means of ECDIS, using the graphic editor, taking into consideration rhumb line and great-circle sailing:
 - .4.1 using the ECDIS database for obtaining navigational, hydro-meteorological and other data;
 - .4.2 taking into consideration turning radius and wheel-over points/lines when they are expressed on chart scale;
 - .4.3 marking dangerous depths and areas and exhibiting guarding depth contours;
 - .4.4 marking waypoints with the crossing depth contours and critical cross-track deviations, as well as by adding, replacing and erasing of waypoints;
 - .4.5 taking into consideration safe speed;
 - .4.6 checking pre-planned route for navigational safety; and
 - .4.7 generating alarms and warnings;
- .5 route planning with calculation in the table format, including:
 - .5.1 waypoints selection;
 - .5.2 recalling the waypoints list;
 - .5.3 planning notes;

- .5.4 adjustment of a planned route;
- .5.5 checking a pre-planned route for navigational safety;
- .5.6 alternative route planning;
- .5.7 saving planned routes, loading and unloading or deleting routes;
- .5.8 making a graphic copy of the monitor screen and printing a route;
- .5.9 editing and modification of the planned route;
- .5.10 setting of safety values according to the size and manoeuvring parameters of the vessel;
- .5.11 back-route planning; and
- .5.12 connecting several routes.

Route monitoring

18 Knowledge and skills should be attained in:

- .1 using independent data to control ship's position or using alternative systems within ECDIS;
- .2 using the look-ahead function:
 - .2.1 changing charts and their scales;
 - .2.2 reviewing navigational charts;
 - .2.3 vector time selecting;
 - .2.4 predicting the ship's position for some time interval;
 - .2.5 changing the pre-planned route (route modification);
 - .2.6 entering independent data for the calculation of wind drift and current allowance;
 - .2.7 reacting properly to the alarm;
 - .2.8 entering corrections for discrepancies of the geodetic datum;
 - .2.9 displaying time markers on a ship's route;
 - .2.10 entering ship's position manually; and
 - .2.11 measuring coordinates, course, bearings and distances on a chart.

Alarm handling

19 Knowledge and ability to interpret and react properly to all kinds of systems, such as navigational sensors, indicators, data and charts alarms and indicator warnings, including, switching the sound and visual alarm signalling system, should be attained in case of:

- .1 absence of the next chart in the ECDIS database;
- .2 crossing a safety contour;
- .3 exceeding cross-track limits;
- .4 deviation from planned route;
- .5 approaching a waypoint;
- .6 approaching a critical point;
- .7 discrepancy between calculated and actual time of arrival to a waypoint;
- .8 information on under-scaling or over-scaling;
- .9 approaching an isolated navigational danger or danger area;
- .10 crossing a specified area;
- .11 selecting a different geodetic datum;
- .12 approaching other ships;
- .13 watch termination;
- .14 switching timer;
- .15 system test failure;
- .16 malfunctioning of the positioning system used in ECDIS;
- .17 failure of dead-reckoning; and
- .18 inability to fix vessel's position using the navigational system.

Manual correction of a ship's position and motion parameters

20 Knowledge and skills should be attained in manually correcting:

- .1 the ship's position in dead-reckoning mode, when the satellite and radio navigation system receiver is switched off;
- .2 the ship's position, when automatically obtained coordinates are inaccurate; and
- .3 course and speed values.

Records in the ship's log

- 21 Knowledge and skills should be attained in:
- .1 automatic voyage recording;
 - .2 reconstruction of past track, taking into account:
 - .2.1 recording media;
 - .2.2 recording intervals;
 - .2.3 verification of database in use;
 - .3 viewing records in the electronic ship's log;
 - .4 instant recording in the electronic ship's log;
 - .5 changing ship's time;
 - .6 entering the additional data;
 - .7 printing the content of the electronic ship's log;
 - .8 setting up the automatic record time intervals;
 - .9 composition of voyage data and reporting; and
 - .10 interface with a voyage data recorder (VDR).

Chart updating

- 22 Knowledge and skills should be attained in:
- .1 performing manual updating of electronic charts. Special attention should be paid to reference ellipsoid conformity and to conformity of the measurement units used on a chart and in the correction text;
 - .2 performing semi-automatic updating of electronic charts, using the data obtained on electronic media in the electronic chart format; and
 - .3 performing automatic updating of electronic charts, using update files obtained via electronic data communication lines.

In the scenarios where non-updated data are employed to create a critical situation, trainees should be required to perform ad hoc updating of the chart.

Operational use of ECDIS where radar/ARPA is connected

- 23 Knowledge and skills should be attained in:
- .1 connecting ARPA to ECDIS;
 - .2 indicating target's speed vectors;
 - .3 indicating target's tracks;

- .4 archiving target's tracks;
- .5 viewing the table of the targets;
- .6 checking alignment of radar overlay with charted geographic features;
- .7 simulating one or more manoeuvres;
- .8 corrections to own ship's position, using a reference point captured by ARPA; and
- .9 corrections using the ARPA's cursor and electronic bar.

See also section B-I/12, Guidance regarding the use of simulators (pertaining to radar and ARPA), especially paragraphs 17 to 19 and 36 to 38.

Operational use of ECDIS where AIS is connected

24 Knowledge and skills should be attained in:

- .1 interface with AIS;
- .2 interpretation of AIS data;
- .3 indicating target's speed vectors;
- .4 indicating target's tracks; and
- .5 archiving target's tracks.

Operational warnings, their benefits and limitations

25 Trainees should gain an appreciation of the uses, benefits and limitations of ECDIS operational warnings and their correct setting, where applicable, to avoid spurious interference.

System operational tests

26 Knowledge and skills should be attained in:

- .1 methods of testing for malfunctions of ECDIS, including functional self-testing;
- .2 precautions to be taken after a malfunction occurs; and
- .3 adequate back-up arrangements (take over and navigate using the back-up system).

Debriefing exercise

27 The instructor should analyse the results of all exercises completed by all trainees and print them out. The time spent on the debriefing should occupy between 10% and 15% of the total time used for simulator exercises.

REFERENCES

IMO PERFORMANCE STANDARDS FOR ECDIS

- 1 RESOLUTION A.817(19): PERFORMANCE STANDARDS FOR ELECTRONIC CHART DISPLAY AND INFORMATION SYSTEMS (ECDIS)
- 2 RESOLUTION MSC.64(67): RECOMMENDATIONS ON NEW AND AMENDED PERFORMANCE STANDARDS
- 3 RESOLUTION MSC.86(70): ADOPTION OF NEW AND AMENDED PERFORMANCE STANDARDS FOR NAVIGATIONAL EQUIPMENT
- 4 RESOLUTION MSC.232(82): ADOPTION OF THE REVISED PERFORMANCE STANDARDS FOR ELECTRONIC CHART DISPLAY AND INFORMATION SYSTEMS (ECDIS)

OTHER IMO CIRCULARS RELATED TO ECDIS

- 1 MSC.1/Circ.982: GUIDELINES ON ERGONOMIC CRITERIA FOR BRIDGE EQUIPMENT AND LAYOUT
- 2 MSC.1/Circ.1091: ISSUES TO BE CONSIDERED WHEN INTRODUCING NEW TECHNOLOGY ON BOARD SHIP
- 3 MSC.1/Circ.1221: VALIDITY OF TYPE APPROVAL CERTIFICATION FOR MARINE PRODUCTS
- 4 MSC.1/Circ.1389: GUIDANCE ON PROCEDURES FOR UPDATING SHIPBORNE NAVIGATION AND COMMUNICATION EQUIPMENT
- 5 SN.1/Circ.213: GUIDANCE ON CHART DATUMS AND THE ACCURACY OF POSITIONS ON CHARTS
- 6 SN.1/Circ.243/Rev.1 AMENDED GUIDELINES FOR THE PRESENTATION OF NAVIGATIONAL-RELATED SYMBOLS, TERMS AND ABBREVIATIONS
- 7 SN.1/Circ.255: ADDITIONAL GUIDANCE ON CHART DATUMS AND THE ACCURACY OF POSITIONS ON CHARTS
- 8 SN.1/Circ.265: GUIDELINES ON THE APPLICATION OF SOLAS REGULATION V/15 TO INS, IBS AND BRIDGE DESIGN
- 9 SN.1/Circ.288: GUIDELINES FOR BRIDGE EQUIPMENT AND SYSTEMS, THEIR ARRANGEMENT AND INTEGRATION (BES)

ANNEX 9

STATEMENTS BY DELEGATIONS

STATEMENT BY IFSMA – Medical examination requirements, including colour vision testing

Thank you Chair. IFSMA representing Shipmasters fully supports the paper submitted by IMHA. We have come a long way since colour vision tests were carried out on the River adjacent to this building over a century ago by a forerunner of one of our affiliated masters' organizations. The work proposed is essential not only to ensure safety but that no person is wrongly denied employment in the shipping industry.

In addition to colour visions, it has been brought to the attention of IFSMA, that there appears to be an inconsistency between the interpretation and the application of the general eyesight requirements applicable to deck officers, as of 31 December 2016.

Under the STCW Convention and STCW Codes, Parts A and B, the 2010 Manila Amendments would seem to remove the capacity of flag States and their medical practitioners to grant exemptions in respect of the eyesight standards to persons who previously held such exemptions in accordance with the STCW Convention in force prior to the Manila Amendments.

If understood correctly, it would not after 31 December 2016 appear possible for flag States to grant exemptions to any seafarers, or to extend any exemptions in respect of eyesight tests to seafarers who have previously been granted such exemptions.

This may be construed as unintentional, as it may result in perhaps a large number of senior masters and seafarers no longer being able to hold a certificate of competency and thus not able continue their career and their service at sea.

We request this last statement recorded in the Report from this Sub-Committee.

Thank you Mr. Chairman

STATEMENT BY THE RUSSIAN FEDERATION – Training requirements for officers and crew on board ships operating in polar waters

Thank you, Mr Chairman!

First of all, allow me to thank Mrs. Marina Angsell (Sweden) and IMO Secretariat in the person of Mr. Julian Abril for the fruitful work and efficient dealing with the tasks faced by the group in whose work this delegation took part.

Mr Chairman, in this intervention, we would like to note paragraph 4.4 of the working group report in particular and, in general, the part of the report dealing with amendments to the STCW Convention and Code relating to training for officers on board ships operating in polar waters (I would like to make a special stress here, in polar waters).

As you well know, Mr Chairman, the goal of chapter 12 of the Polar Code that will enter into force on 1 January 2017 as part of the SOLAS Convention is read as follows: to ensure that ships operating in polar waters are appropriately manned by adequately qualified, trained and experienced personnel.

Bearing in mind Article IX of the STCW Convention that provides for the Parties to be able to develop equivalents, it is our opinion that separate provisions on equivalents to be introduced into Convention Chapter V and STCW Code Chapter I will be totally superfluous.

Moreover, Mr Chairman, as you know, the concept of personnel training on specific types of ships provides for establishing sea service requirements for the specific types of ships only.

This can be seen in training requirements for crews of oil tankers, chemical carriers, gas carriers and also in the recently adopted training requirements for crews on board ships covered by the IGF Code. We think that adopting a sea service equivalent may result in weaker training requirements for masters and chief mates, that is those, Mr Chairman, who take up the main bulk of duties to ensure safe operation of the ship, especially in navigationally complicated regions such as polar waters. This would be against the ethos of STCW Convention Chapter V as such.

It is also our opinion that, in case equivalents are introduced, we may, in the sphere of practical experience, end up omitting some very important peculiar features: difficult weather conditions, peculiarities of day and night alteration likely to aggravate fatigue, navigation in old ice, escort movement and mandatory interaction with the icebreaker to name but a few.

We strongly believe that such practical experience can only be gained through sea-going practice in polar waters.

In conclusion, I would like to mention that the Russian Federation is at this moment prepared to implement the requirements for training of crew on board ships operating in polar waters on the national legislation level, with no transitional period, as of 1 January 2017, i.e. from the date of entry into force of the Polar Code.

1 January 2017 seems to be a suitable date bearing in mind growing ship traffic in polar waters, and we welcome the initiative of the Organization to urge Parties to implement the discussed amendments to the STCW Convention and Code at an early stage and to include this provision into relevant draft MSC resolutions.

We would like the above Statement to be included into the final report of the current HTW Sub-Committee session.

Thank you!

STATEMENT BY CLIA – Transitional arrangements for training and qualification requirements for seafarers on board ships operating in polar waters

CLIA has carefully analyzed the transitional provisions within the STCW Amendments and finds them to not be practicable for non-ice strengthened category C ships operating seasonally within Polar Waters. These ships do not spend enough time operating in these waters, or waters that may be considered equivalent for polar waters, for their officers to meet the proposed seagoing service requirement. The transitional requirements need to allow for equivalent approved seagoing service for officers to meet the experience levels necessary to ensure that enough masters, officers, and ice pilots are in supply for when these STCW amendments go into effect.

With regard to the requirements for regular seagoing service for the advanced level according to Regulation V/4, it will be very difficult to obtain the required seagoing time in order to meet the requirements given the fact that these ships only operate in Polar Waters for only a few days per year. Even if a master and chief mate have basic training and are operating with an ice pilot, they will still not accumulate the seagoing service time necessary without the equivalent approved seagoing service provision going in to effect.

Additionally, this delegation is of the view that the working group had been tasked by plenary to remove duplication. CLIA is of the view that duplications within the competency tables were not adequately considered by the working group and that a number of duplications in training mentioned in STCW and accompanying IMO model courses 7.01 and 7.03 still remain within the amendments.
