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SUB-COMMITTEE ON NAVIGATION, COMMUNICATIONS AND SEARCH AND RESCUE
2nd session
Agenda item 23

NCSR 2/23
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REPORT TO THE MARITIME SAFETY COMMITTEE

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LIST OF ANNEXES

1 GENERAL

1.1 The Sub-Committee on Navigation, Communications and Search and Rescue (NCSR) held its second session from 9 to 13 March 2015 under the chairmanship of Mr. C. Salgado (Chile). The Vice-Chairman, Mr. R. Lakeman (Netherlands), was also present.

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

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/Secretary-GeneralsSpeechesToMeetings

Chairman's remarks

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

Statements made

1.5 The delegation of Malta, supported by Italy, made a statement relating to search and rescue of migrants travelling by sea, as set out in annex 12.

Adoption of the agenda and related matters

1.6 The Sub-Committee adopted the agenda (NCSR 2/1) and agreed to be guided in its work, in general, by the annotations contained in document NCSR 2/1/1 (Secretariat) and the arrangements in document NCSR 2/1/2 (Secretariat). The agenda, as adopted, together with the list of documents considered under each agenda item, is set out in document NCSR 2/INF.14.

2 DECISIONS OF OTHER IMO BODIES

2.1 The Sub-Committee noted the decisions and comments pertaining to its work made by III 1, FAL 39 and MSC 94, as reported in document NCSR 2/2, and took them into account in its deliberations when dealing with the relevant agenda items.

3 ROUTEING MEASURES AND MANDATORY SHIP REPORTING SYSTEMS

3.1 The Sub-Committee recalled that NAV 51 had agreed that a preliminary assessment of ships' routeing proposals would be made by the Chairman in consultation with the Secretariat and the Chairman of the Ships' Routeing Working Group and disseminated as a working paper. In this context, the Sub-Committee noted document NCSR 2/WP.3, outlining a preliminary assessment of the ships' routeing proposals.

Routeing measures other than traffic separation schemes (TSSs)

Establishment of new two-way routes in the south-west Coral Sea

3.2 The Sub-Committee, noting that the proposal submitted by Australia (NCSR 2/3/3) relating to the establishment of two-way routes in the south-west Coral Sea did not require any decision by the Sub-Committee in principle, referred it to the Navigation Working Group for detailed consideration and advice.

Establishment of a new area to be avoided in the south-west Coral Sea

3.3 The Sub-Committee, noting that the proposal submitted by Australia (NCSR 2/3/4) relating to the establishment of an area to be avoided in the south-west Coral Sea did not require any decision by the Sub-Committee in principle, referred it to the Navigation Working Group for detailed consideration and advice.

Establishment of five new areas to be avoided in the region of the Aleutian Islands

3.4 The Sub-Committee, noting that the proposal submitted by the United States (NCSR 2/3/5) relating to the establishment of five areas to be avoided in the region of the Aleutian Islands did not require any decision by the Sub-Committee in principle, referred it to the Navigation Working Group for detailed consideration and advice.

Model document templates for ships' routeing and reporting system proposals

3.5 The Sub-Committee recalled that, at its last session, it had considered all 12 proposals submitted by eight different Member Governments on ships' routeing, and a lack of consistency in the set-up of proposals in accordance with the requirements set out in MSC/Circ.1060 and addendum had been identified. In this context, the need for the development of standard formats for proposals, depending on the nature of the system, had been recognized. Accordingly, the Sub-Committee had instructed the Secretariat to make available some models/templates for consideration which might be used by Governments to submit proposals to the Sub-Committee..

3.6 The Sub-Committee considered two model document templates presented by the Secretariat (documents NCSR 2/3 and NCSR 2/3/1) for ships' routeing and ship reporting system proposals, respectively. Having noted the views of some delegations recommending the consideration of the use of AIS for reporting purposes before proposals for new ship reporting systems are submitted, agreed to refer the above models/templates to the Navigation Working Group for detailed consideration and advice.

Review of adopted mandatory ship reporting systems

3.7 The Chairman recalled the procedure followed for previous sessions of the NAV and NCSR Sub-Committees, when the Chairman had subsequently taken the initiative to bring to the attention of Member Governments the need to carry out an evaluation of adopted mandatory ship reporting systems and appealed to Member Governments to undertake this exercise.

3.8 Accordingly, the Chairman suggested that Member Governments should review the various ship reporting systems adopted by the Organization, at an early date, to ensure that they were all up to date.

Guidance on amendments to existing IMO-adopted ships' routeing systems

3.9 The Chairman drew the Sub-Committee's attention to paragraph 3.17 of the *General Provisions on Ships' Routeing* (resolution A.572(14)), as amended, which stated: "A routeing system, when adopted by IMO, shall not be amended or suspended before consultation with and agreement by IMO unless local conditions or the urgency of the case require that earlier action be taken." The intention of this requirement was to ensure consistency and predictability in routeing measures and the charting of such measures, particularly with regard to Traffic Separation Schemes (TSSs).

3.10 Accordingly, the Chairman urged Member Governments to abide by this requirement and inform the Organization of any planned changes to an IMO-adopted routeing measure so that the formal procedures for amendments were followed in line with the *General Provisions on Ships' Routeing*.

Establishment of the Navigation Working Group

3.11 The Sub-Committee established the Navigation Working Group under the chairmanship of Mr. R. Lakeman (Netherlands) and instructed it, taking into account decisions, comments and proposals made in plenary, to consider:

.1 documents NCSR 2/3/3, NCSR 2/3/4 and NCSR 2/3/5 and prepare ships' routeing measures, as appropriate, for consideration and approval by the Sub-Committee with a view to adoption by the Committee; and

.2 the model templates (documents NCSR 2/3 and NCSR 2/3/1) and advise the Sub-Committee, as appropriate,

and submit its report on Thursday, 12 March 2015.

Report of the Navigation Working Group

3.12 On receipt of the report of the Navigation Working Group (NCSR 2/WP.4), the Sub-Committee took action as summarized in the ensuing paragraphs.

Routeing measures other than traffic separation schemes (TSSs)

3.13 The Sub-Committee approved the establishment of the following new routeing measures other than traffic separation schemes, as set out in annex 1, which the Committee was invited to adopt:

.1 two-way routes in the south-west Coral Sea;

.2 an area to be avoided in the south-west Coral Sea; and

.3 five areas to be avoided in the region of the Aleutian Islands.

Date of implementation

3.14 The Sub-Committee agreed to recommend to the Committee that the new routeing measures detailed in paragraph 3.13 above be implemented six months after adoption by the Committee.

Model document templates for ships' routeing and ship reporting system proposals

3.15 The Sub-Committee endorsed the finalized model document templates for ships' routeing and ship reporting system proposals (NCSR 2/WP.4, paragraph 4.1, and annexes 4 and 5).

3.16 The Sub-Committee instructed the Secretariat to include the reference (eg, hyperlink and URL) to the finalized two templates in the Sub-Committee's Annotation to the provisional agenda (NCSR X/1/1) in future.

3.17 The Sub-Committee noted the working group's view that certain developments had evolved since the *Guidance Note on the Preparation of Proposals on Ships' Routeing Systems and Ship Reporting Systems for submission to the Sub-Committee on Safety of Navigation* had been published in 2003 (MSC.1/Circ.1060 and addendum), such as the utilization of the AIS information for maritime situational awareness purposes. Some elements of the Guidance Note were therefore considered out of date and might need to be revised.

3.18 Accordingly, the Sub-Committee invited Member Governments to submit proposals for an unplanned output for consideration by the Committee to revise the Guidance Note (MSC.1/Circ.1060 and addendum).

4 RECOGNITION OF GALILEO AS A COMPONENT OF THE WWRNS

4.1 The Sub-Committee recalled that MSC 93 had agreed to include, in the 2014-2015 biennial status report of the NCSR Sub-Committee and provisional agenda for NCSR 2, an unplanned output on "Recognition of Galileo as a component of the World-Wide Radionavigation System", with a target completion year of 2016 (MSC 93/22, paragraph 20.9).

4.2 The Sub-Committee recalled further that the performance standards for shipborne Galileo receiver equipment had been adopted by MSC 82 in 2006 by means of resolution MSC.233(82), and that NAV 59 had noted the status and plans provided by the European Commission (NAV 59/INF.7).

4.3 In considering the information provided by Austria et al. (NCSR 2/4) on the status and performance of the Galileo Global Navigation Satellite System, the Sub-Committee invited the European Commission to provide assurance that there would be no future mandatory requirement to carry shipborne Galileo receiver equipment for ships sailing in European waters.

4.4 Furthermore, the Sub-Committee noted that the co-sponsors intended to submit further information and evaluation materials to the next session of the Sub-Committee.

5 UPDATES TO THE LRIT SYSTEM

5.1 The Sub-Committee noted the outcome of MSC 94 (MSC 94/21, paragraphs 9.8 to 9.14) on LRIT-related matters.

Developments in relation to the operation of the LRIT system since NCSR 1

5.2 The Sub-Committee noted the information provided by the Secretariat (documents NCSR 2/5 and NCSR 2/INF.2) related to communication of information and the operation of the LRIT Data Distribution Plan (DDP) server and the Information Distribution Facility (IDF) since NCSR 1, the relevant outcomes of the meetings of the LRIT Operational governance body, modifications to the web interface of the DDP, the renewal of Public-Key Infrastructure (PKI) certificates and the implementation of new cryptographic key strengths.

5.3 The Sub-Committee also noted information provided by the European Commission observer related to the operation, performance and maintenance of the LRIT International Data Exchange (IDE) during 2014.

5.4 The Sub-Committee further noted the information provided by Ghana (NCSR 2/INF.8) related to the establishment of Ghana's National Vessel Traffic Management Information System (VTMIS), including integration of LRIT, GMDSS, AIS, CCTV and hydrological sensor services.

Audits of LRIT Data Centres

5.5 The Sub-Committee noted the information provided by IMSO (NCSR 2/5/1) related to the audit of LRIT Data Centres (DCs) conducted by the LRIT coordinator between 28 March 2013 and 2 January 2015, along with the summary audit reports which were available in the LRIT Data Distribution Plan (DDP) module of the Global Integrated Shipping Information System (GISIS). In this context, the Sub-Committee noted, in particular, that:

.1 the audit of the Venezuela National Data Centre (NDC) could not be conducted, once again and for the fourth consecutive year since its integration in 2010, as the operators of the DC did not cooperate with the LRIT Coordinator to enable the review and audit;

.2 the Ecuador NDC was removed from the 2014 audit calendar given that it was no longer part of the LRIT system; and

.3 the suspended 2013 audit of the Morocco NDC had resumed after settlement of outstanding financial obligations with IMSO.

5.6 The Sub-Committee also noted the information provided by IMSO (NCSR 2/5/3) on the performance of the LRIT system and once again urged governments responsible for the operation of DCs to ensure compliance with the provisions of the *Revised performance standards and functional requirements for the long-range identification and tracking (LRIT) of ships* (resolution MSC.263(84), as amended), in particular paragraphs 7.5, 7.5.1 and 7.5.2 related to audit requirements.

5.7 The Sub-Committee further noted the information provided by IMSO (NCSR 2/INF.13) related to the scale of charges to be levied by the LRIT Coordinator during 2015.

Proposals and recommendations related to the functioning and operation of the LRIT system

5.8 The Sub-Committee recalled that NCSR 1 had agreed, in principle, to a number of modifications to the LRIT system and invited IMSO to develop, in consultation with DC operators, the necessary draft amendments to the Technical specifications for consideration by NCSR 2 or at a future session (NCSR 1/28, paragraphs 8.18 and 8.21).

5.9 In light of the foregoing, the Sub-Committee considered the proposals by IMSO (NCSR 2/5/2) relating to amendments to the *Revised performance standards and functional requirements for the long-range identification and tracking (LRIT) of ships* (resolution MSC.263(84), as amended) and the LRIT Technical documentation, parts I and II (MSC.1/Circ.1259/Rev.6 and MSC.1/Circ.1294/Rev.4, respectively), with a view to improving the efficiency and effectiveness of the LRIT system.

5.10 The Sub-Committee recalled that, during the adoption of the Agenda, the delegation of Denmark expressed the view that the draft amendments proposed could have financial implications for DCs and for the IDE and that the amendments should first be approved by the Committee before implementing any changes.

5.11 With regard to the ship type classification proposed in paragraph 10 of document NCSR 2/5/2, the delegation of Australia, whilst supporting the proposal, recommended harmonizing the categories with other existing systems. In this respect, it was noted that the proposed amendments to the XML schemas had been developed with the capability to accommodate new ship type categories or sub-categories in the future, if required.

5.12 Having reviewed the above proposals, the Sub-Committee agreed, in principle, with the draft amendments related to:

.1 the use of coastal State standing orders to request LRIT information based on flag and type of ship;

.2 complementing Receipt Messages with Receipt Code 5 (ship not responding);

.3 the use of the existing SAR SURPIC request message for coastal State requests;

.4 processing custom coastal areas and coastal State standing orders; and

.5 consequential amendments to the XML schemas.

Distribution of SAR area polygons through the DDP server

5.13 The Sub-Committee noted that the information related to SAR services was contained in the Radiocommunications and Search and Rescue (COMSAR) module of GISIS and that, in particular, no specific standard format had been agreed for the definition of geographical limits of Search and Rescue Regions (SRRs). This was preventing the use or dissemination of the limits of SSRs through, for example, the LRIT system, in an automated manner.

5.14 The Sub-Committee also noted that the LRIT system provided a standard format for the definition of internal waters, territorial seas and other polygons, which could be used for the definition of SRRs. This standard format was based on the World Geodetic System (WGS) 84 datum and was expressed using the Geography Markup Language (GML).

5.15 Based on the Secretariat's advice, the Sub-Committee noted that if a new standard format were to be agreed for the definition of SRRs, Member Governments would be required to resubmit the information through the COMSAR module of GISIS. The automatic conversion into a new format would not be possible owing to the diversity of formats of the existing information and the absence of information related to the base coordinate reference system.

5.16 Following a brief discussion, the Sub-Committee agreed to invite the Committee to instruct the Secretariat to amend the COMSAR module of GISIS to allow submission of geographical limits of SRRs using the standard format defined for the LRIT system and to invite Member Governments to resubmit the information in the appropriate format once changes were implemented.

Use of the LRIT system infrastructure for the transmission of safety, security and environmental-related information between DCs

5.17 The Sub-Committee recalled that NCSR 1 had noted the information provided by IMSO (NCSR 1/8/4) related to the technical capability and real potential of expanding the existing LRIT shore-based infrastructure in order to facilitate the exchange of additional ship-related information between Administrations, with the view to enhancing maritime security, safety of navigation and the protection of the marine environment (NCSR 1/28, paragraph 8.25).

5.18 The Sub-Committee considered information provided by the Marshall Islands and the United States (NCSR 2/5/4) and which related to the exploratory use of the LRIT system infrastructure for the transmission of safety, security and environmental-related information between DCs and the further development and testbed demonstration using the existing LRIT developmental environment.

5.19 Some delegations were of the view that the LRIT system could provide a secure platform for the exchange of information between DCs and that its use should be further tested and explored. Other delegations were of the opinion that this was a policy issue that would require the Committee's approval and that the related technical development and the financial impact on DCs and the IDE should first be assessed before embarking on further developments.

5.20 The Sub-Committee noted the views expressed by the European Commission observer that one of the possibilities for the Committee could be to authorize the LRIT Operational governance body to consider requests for the use of the developmental environment of the LRIT system and authorize its use on behalf of the Committee, taking into account, in particular, any possible technical and financial impact on the IDE, the DDP server and DCs, and/or the developmental testing or functioning of other system components.

5.21 The Sub-Committee also noted the views expressed by the delegation of Panama that any decision that could have a financial impact on the LRIT system as a whole should first be considered by the Committee.

5.22 After some discussion, the Sub-Committee, having noted the information provided in document NCSR 2/5/4 and the views expressed by delegations, invited interested Member Governments to submit appropriate proposals to the Committee for its consideration.

Establishment of the Drafting Group on LRIT

5.23 The Sub-Committee established the Drafting Group on LRIT under the chairmanship of Mr. Pier Giovanni Taranti (Brazil) and instructed it, taking into account decisions, comments and proposals made in plenary, to review the draft amendments contained in document NCSR 2/5/3 and to:

.1 prepare a draft MSC resolution containing the draft amendments to resolution MSC.263(84) on *Revised performance standards and functional requirements for the long-range identification and tracking (LRIT) of ships*; and

.2 finalize the draft amendments to MSC.1/Circ.1259/Rev.6 and MSC.1/Circ.1294/Rev.4 on LRIT Technical documentation, parts I and II, respectively;

with a view to finalization and subsequent approval/adoption by MSC 95,

and submit its report on Thursday, 12 March 2015.

Report of the Drafting Group on LRIT

5.24 On receipt of the report of the Drafting Group on LRIT (NCSR 2/WP.7), the Sub-Committee took action as summarized in the ensuing paragraphs.

5.25 The Sub-Committee approved the draft MSC resolution on *Amendments to the Revised performance standards and functional requirements for the long-range identification and tracking (LRIT) of ships* (resolution MSC.263(84), as amended), as set out in annex 2, and invited the Committee to adopt it.

5.26 The Sub-Committee endorsed draft amendments to the LRIT Technical documentation, parts I and II (MSC.1/Circ.1259/Rev.6 and MSC.1/Circ.1294/Rev.4, respectively), as set out in annex 3, and invited the Committee to approve them.

5.27 In doing so, the Sub-Committee invited the Committee to authorize the Secretariat to issue MSC.1/Circ.1259/Rev.7 and MSC.1/Circ.1294/Rev.5 after making any editorial corrections that may be identified.

Second modification phase of the LRIT system

5.28 Furthermore, the Sub-Committee, recognizing that some of the aforementioned amendments would require retesting some of the LRIT system components, agreed to invite the Committee to authorize the LRIT Operational governance body to prepare the necessary detailed procedures for the second modification testing phase of the LRIT system and to coordinate the testing of all DCs, the IDE and the DDP server.

5.29 Additionally, the Sub-Committee also agreed that the amendments to the LRIT Technical documentation prepared by COMSAR 16 and approved by MSC 90 (MSC 90/28, paragraph 6.16 and COMSAR 16/17, annex 16, section 2) should also be included as part of the second modification phase of the LRIT system.

6 E-NAVIGATION STRATEGY IMPLEMENTATION PLAN

6.1 The Sub-Committee noted the outcome of MSC 94 related to e-navigation (MSC 94/21, paragraphs 9.15, 9.16, 18.16 and 18.17).

Harmonization of Guidelines related to Human-Centred Design (HCD), Usability Testing, Evaluation and Assessment (UTEA) and Software Quality Assurance (SQA)

6.2 The Sub-Committee recalled that NCSR 1 had established a Correspondence Group on Harmonization of Guidelines related to e-navigation under the coordination of Australia in order to consolidate into a single and harmonized guideline the draft *Guidelines on Human Centred Design (HCD) for e-navigation systems*, the draft *Guidelines on Usability Testing, Evaluation and Assessment (UTEA) for e-navigation systems*, and the draft *Guidelines on Software Quality Assurance (SQA) in e-navigation*.

6.3 The Sub-Committee considered the report of the correspondence group (NCSR 2/6) containing the draft text of the single and harmonized *Guideline on Software Quality Assurance and Human-Centred Design for e-navigation*.

6.4 A number of delegations supported the proposed draft Guideline, in general, with the view to finalization at this session, and recommended retaining the word "e-navigation" as part of the title of the draft guideline and throughout the document. Other delegations were of the view that some elements of the draft guideline were not sufficiently clear and needed further consideration by the NCSR or the HTW Sub-Committee.

6.5 After some consideration, the Sub-Committee agreed to refer the draft guideline to the Navigation Working Group for finalization and advice relating to the need to forward the draft guideline to the HTW Sub-Committee for consideration of human element aspects.

Other issues

6.6 The Sub-Committee noted with appreciation the information contained in the following documents submitted by the Republic of Korea:

.1 NCSR 2/INF.9, providing the results of a study on enhancing maritime logistics efficiency utilizing maritime VHF digital communication technology and facilitation method;

.2 NCSR 2/INF.10, providing the results of a study on ship operator centred collision prevention and alarm system; and

.3 NCSR 2/INF.11, outlining the requirements of S-Mode development based on the opinions of masters and deck officers.

Instructions to the Navigation Working Group

6.7 The Sub-Committee instructed the Navigation Working Group, taking into account decisions, comments and proposals made in plenary, to consider document NCSR 2/6 and, based on the text provided in the annex to this document, finalize the draft MSC circular on *Guideline on Software Quality Assurance and Human-Centred Design for e-navigation*, for consideration by the Sub-Committee and subsequent approval by the Committee.

Report of the Navigation Working Group

6.8 On receipt of the report of the Navigation Working Group (NCSR 2/WP.4), the Sub-Committee took action as summarized in the ensuing paragraphs.

6.9 The Sub-Committee endorsed a draft MSC circular on *Guideline on Software Quality Assurance and Human-Centred Design for e-navigation*, as set out in annex 4, and invited the Committee to approve it.

6.10 In doing so, the Sub-Committee agreed with the group's view that the guideline did not cover any issues related to the human element or training, which are required to be considered by the HTW Sub-Committee. In this context, the Sub-Committee noted the view of the delegation of Norway that any design process had an effect on the human element and that the guideline should be sent to the HTW Sub-Committee for review.

6.11 Taking into account that the work related to the development of the e-navigation Strategic Implementation Plan had been completed, the Sub-Committee agreed to invite the Committee to delete the planned output on "E-navigation Strategy Implementation Plan (5.2.6.1)" from its biennial agenda under agenda item 20.

7 PERFORMANCE STANDARDS FOR MULTI-SYSTEM SHIPBORNE NAVIGATION SYSTEMS

7.1 The Sub-Committee recalled that NCSR 1, having noted that some interested parties were willing to work together to produce a joint proposal for consideration at the next session of the Sub-Committee, had invited Member Governments and interested organizations to consider the matter in detail and submit comments and proposals to this session (NCSR 1/28, section 10).

7.2 The Sub-Committee had for its consideration the following documents:

.1 NCSR 2/7 (Australia et al.), providing the updated draft performance standards for shipborne receiver equipment capable of using a combination of radionavigation systems, taking into account views expressed at NCSR 1; and

.2 NCSR 2/7/2 (Germany), commenting on document NCSR 2/7 and expressing the view on the need for the careful evaluation of the advanced draft performance standards.

7.3 There was general support for both proposals that further consideration should be given to the use of radionavigation systems without world-wide coverage, such as terrestrial and regional systems, as an option.

7.4 After some discussion, the Sub-Committee referred the documents to the Communications Working Group for detailed consideration.

Draft guidelines for reliable Positioning, Navigation, and Timing data processing

7.5 The Sub-Committee recalled that NCSR 1 had agreed that further consideration should be given to the proposal by Germany related to the development of a concept for an open, harmonized and extendable onboard Positioning, Navigation and Timing (PNT) system.

7.6 The Sub-Committee considered the proposed draft guidelines by Germany (NCSR 2/7/1) for reliable PNT data processing, based on multi-system/multi-sensor-based techniques as envisaged by, for example, multi-system radionavigation receivers. Within the proposed guidelines, an onboard PNT unit facilitated reliability, integrity and resilience for the improved provision of PNT data to onboard applications. Germany considered the proposed guidelines as an indispensable, complementary step towards improved reliability, resilience and integrity of bridge equipment and navigational information. Consequently, these guidelines were considered as a key element for the development of a multi-system radionavigation receivers.

7.7 A number of delegations supported Germany's proposal, whilst others were of the view that more detailed development was required and that the proposed draft guidelines included issues that were not addressed as part of the draft performance standards proposed in document NCSR 2/7.

7.8 After some discussion, the Sub-Committee referred the document to the Communications Working Group for detailed consideration and advice.

Establishment of the Communications Working Group

7.9 The Sub-Committee established the Communications Working Group under the chairmanship of Mr. Alexander Schwarz (Germany) and instructed it, taking into account decisions, comments and proposals made in plenary, to consider:

.1 documents NCSR 2/7 and NCSR 2/7/2, and finalize the draft performance standards for multi-system shipborne navigation receivers for consideration by the Sub-Committee; and

.2 document NCSR 2/7/1 containing the proposed draft guidelines for reliable PNT data processing, and advise the Sub-Committee, as appropriate,

and to submit its report on Thursday, 12 March 2015.

Report of the Communications Working Group

7.10 On receipt of the report of the Communications Working Group (NCSR 2/WP.5), the Sub-Committee took action as summarized in the ensuing paragraphs.

7.11 The Sub-Committee approved the draft MSC resolution on *Performance standards for multi-system shipborne radionavigation receivers*, as set out in annex 5, and invited the Committee to adopt it. Taking into account that these performance standards would be complemented by guidelines (see paragraph 7.13 below), the Sub-Committee agreed that multi-system shipborne radionavigation receivers installed on or after 31 December 2017 should conform to these performance standards.

7.12 The delegation of Japan, supported by France, commenting on paragraph 3.4 of document NCSR 2/WP.5 and noting that there was currently no terrestrial radionavigation system which was available world-wide, expressed the view that the inclusion of at least one terrestrial radionavigation system as a mandatory requirement was a fundamental and very important issue, not only for manufacturers but also for Member Governments, especially those of coastal States, and for the Organization.

7.13 The Sub-Committee, recognizing the need to develop associated guidelines for the provision of PNT data and integrity information, invited the Committee to amend the title of output 5.2.4.9 from "Performance standards for multi-system shipborne navigation systems" to "Guidelines associated with multi-system shipborne radionavigation receivers dealing with the harmonized provision of PNT data and integrity information", with 2017 as the target completion year.

8 ANALYSIS OF DEVELOPMENTS IN MARITIME RADIOCOMMUNICATION SYSTEMS AND TECHNOLOGY

8.1 The Sub-Committee recalled that COMSAR 7 had agreed that no submissions concerning performance standards for any radiocommunication equipment should be accepted and/or considered under this agenda item (COMSAR 7/23, paragraphs 11.5 and 11.6).

Recognition of Iridium mobile satellite system as a GMDSS service provider

8.2 The Sub-Committee noted that, in considering the outcome of NCSR 1, MSC 94 had:

.1 agreed that IMSO should undertake the technical and operational assessment of the Iridium mobile satellite system;

.2 agreed that IMSO should provide a technical and operational assessment report for consideration by the NCSR Sub-Committee;

.3 agreed that the scope of the evaluation was to assess compliance with the criteria set out in resolution A.1001(25), taking into account the guidance laid down in MSC.1/Circ.1414;

.4 noted that IMSO would convene a Group of Experts and, in order to enhance transparency of the process, would make information available to Member States with regard to the selected experts who would carry out the technical and operational assessment; and

.5 instructed the Secretariat to oversee the work of IMSO during the evaluation process (MSC 94/21, paragraph 9.20).

Evaluation of the Iridium mobile satellite system

8.3 The Sub-Committee noted the information provided by IMSO and, in particular, that:

.1 IMSO, in close cooperation with Iridium, had started to prepare for the evaluation process in the most cost-effective manner, keeping the United States as sponsoring Government and IMO in its oversight role duly informed;

.2 IMSO had established a Group of Experts to perform the technical and operational evaluation;

.3 the selected Group of Experts would be able to deal with all five different elements identified in document MSC 94/9/2 in relation with Earth Stations, Space Segment, Mobile Terminals, Terrestrial Networks, GMDSS and Search and Rescue communications; and

.4 a report on the outcome of the technical and operational evaluation would be drafted by the Group of Experts and presented by the IMSO Director-General for consideration by NCSR 3.

The full text of the information provided by IMSO is set out in annex 12.

8.4 The delegation of Vanuatu, while noting with appreciation the work carried out by the IMSO Secretariat with regard to the technical and operational evaluation of the Iridium mobile satellite system, did question the nomination of the Group of Experts which, in its view, had not been made in full compliance with the Independent Group of Experts' Terms of Reference, Verification and Evaluation Procedures agreed by the IMSO Advisory Committee.

8.5 The response of IMSO to the questions raised by Vanuatu is set out in annex 12.

8.6 Following the discussion, the Sub-Committee agreed with the summing up of the Chairman that these issues were related to the internal working practices of IMSO and outside the remit of the Sub-Committee.

Concerns regarding a number of issues related to the recognition of the Iridium mobile satalite system as a GMDSS service provider

8.7 France and Spain (NCSR 2/8) expressed concerns regarding a number of issues related to the application to recognize and use the Iridium mobile satellite system in the GMDSS, and these concerns were not directly related to the assessment of compliance with the criteria set out in resolution A.1001(25).

8.8 In this regard, the delegation of the United States responded to the issues raised, as set out in annex 12. Furthermore, the Sub-Committee recalled that related matters had been discussed when dealing with agenda item 9 on the Review of the GMDSS (see paragraphs 9.6 to 9.8 below), and that the Communications Working Group had been instructed to take these matters into account when considering the issue of additional satellite systems in the GMDSS.

8.9 During the ensuing discussions, the following views were expressed:

.1 the terrestrial systems would provide suitable interoperability and the national Administrations would be responsible for reliable communication connections within their Rescue Coordination Centres (RCCs);

.2 terrestrial systems were not part of the oversight by IMSO;

.3 the interoperability regarding ship-to-ship communications between users of different satellite systems would also need to be addressed;

.4 RCCs should not need to install an Iridium terminal to communicate with ships fitted with Iridium equipment, but communications could be established using the normal telephone network;

.5 the recognition of Iridium should not lead to any additional costs and administrative burden for Member Governments, nor should it lead to the need to broadcast MSI messages on different systems in parallel;

.6 general matters concerning the introduction of new satellite providers in the GMDSS should be considered by the ongoing review of the GMDSS; and

.7 the evaluation of Iridium should be conducted on the basis of the criteria laid down in resolution A.1001(25) and, at this stage, no new criteria should be added during the process of evaluating Iridium.

8.10 Following an in-depth discussion, the Sub-Committee, noting the above-mentioned views, agreed to await the evaluation report from the Group of Experts established by IMSO to verify that Iridium had justified the criteria set out in resolution A.1001(25), taking into account the guidance set out in MSC.1/Circ.1414.

NAVDAT-based maritime safety-related information broadcasting test

8.11 The Sub-Committee noted with appreciation the information provided by China (NCSR 2/INF.4) on a NAVDAT-based maritime safety-related information broadcasting test.

Extension of the target completion year for this item

8.12 Recognizing that it was very important to consider developments in maritime radiocommunication systems and technology and that further proposals might be submitted, the Sub-Committee agreed to invite the Committee to extend the target completion year for this output to 2017 when discussing its biennial agenda under agenda item 20.

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

Outcome of the wenty-first session of the ICAO/IMO Joint Working Group

9.1 The Sub-Committee noted that the ICAO/IMO Joint Working Group on Harmonization of Aeronautical and Maritime Search and Rescue had considered issues related to the review and modernization of the GMDSS (NCSR 2/15, section 7.1) and that the Secretariat had informed the meeting of the Joint IMO/ITU Experts Group on Maritime Radiocommunication Matters, held in October last year, about the outcome of discussions at the meeting of the ICAO/IMO Joint Working Group.

Report of the tenth meeting of the Joint IMO/ITU Experts Group

9.2 The Sub-Committee considered document NCSR 2/13 (Secretariat), providing the report of the tenth meeting of the Joint IMO/ITU Experts Group on Maritime Radiocommunication Matters, which took place from 6 to 10 October 2014 under the chairmanship of Mr. K. Fisher (United Kingdom). It was noted, in particular, that the comments and recommendations of the Experts Group were forwarded to the Correspondence Group on the Review of the GMDSS.

9.3 Having noted that MSC 94 had approved the intersessional meeting of the Joint IMO/ITU Experts Group to be held in 2015 (MSC 94/21, paragraph 18.35), and the Council's endorsement (C 113/D, paragraph 8.2), the Sub-Committee endorsed the holding of the eleventh meeting of the Experts Group, from 5 to 9 October 2015, at IMO Headquarters in London, and instructed the Communications Working Group to prepare the draft terms of reference for that meeting.

Report of the Correspondence Group on the Review of the GMDSS

9.4 The Sub-Committee considered the report of the Correspondence Group on the Review of the GMDSS, submitted by the United States (NCSR 2/9/Rev.1) and containing an outline of the Detailed Review of the GMDSS.

9.5 Following a brief discussion, the Sub-Committee referred the relevant part of the report of the IMO/ITU Experts Group and the report of the Correspondence Group to the Communications Working Group for detailed consideration and to advise the Sub-Committee, as appropriate.

Additional satellite systems in the GMDSS

9.6 France and Spain (NCSR 2/9/2) expressed the view that the use of additional mobile satellite communication systems posed several operational problems and that this matter should be examined closely in terms of interoperability and operating costs. Furthermore, the integration of different future mobile satellite systems should also be considered, in particular, the repercussions for the operational requirements as well as for the search and rescue infrastructure.

9.7 The Sub-Committee recalled that related matters had been discussed when dealing with agenda item 8 on Analysis of developments in maritime radiocommunication systems and technology (see paragraphs 8.7 to 8.10 above).

9.8 During the ensuing discussion, views were expressed by some delegations that there was a need to address all technical, operational and financial issues related to the introduction of new satellite providers in the GMDSS and that matters specifically related to the evaluation of Iridium should be distinguished from the overall review of the GMDSS.

9.9 Following the discussion, the Sub-Committee referred document NCSR 2/9/2 to the Communications Working Group for detailed consideration when considering the issue of additional satellite systems in the GMDSS.

HF DSC and NBDP in sea area A3

9.10 Australia (NCSR 2/9/1) presented its experience with High Frequency (HF) Digital Selective Calling (DSC) since 1 July 2002, and invited the Sub-Committee to examine the current status of Narrow-Band Direct Printing (NBDP) in the GMDSS for sea area A3, as currently defined under the existing SOLAS regulation IV/10.2.1.3

9.11 Following a brief discussion, the Sub-Committee referred document NCSR 2/9/1 to the Communications Working Group for detailed consideration and to advise the Sub-Committee, as appropriate.

Coordination of the work on the review and modernization of the GMDSS with the work on the implementation of the e-navigation Strategy Implementation Plan

9.12 The Sub-Committee noted with appreciation the information provided by the Republic of Korea (NCSR 2/INF.7) on a study analyzing the results of a survey conducted among seafarers and relating to the need for coordinating the work on the review and modernization of the GMDSS with the work on the implementation of the e-navigation Strategy Implementation Plan.

Instructions for the Communications Working Group

9.13 The Sub-Committee instructed the Communications Working Group, taking into account decisions, comments and proposals made in plenary, to:

.1 review the report of the Correspondence Group on the Review of the GMDSS (NCSR 2/9/Rev.1), taking into account the report of the tenth meeting of the Joint IMO/ITU Experts Group (NCSR 2/13) and document NCSR 2/9/2 relating to the issue of recognition of additional satellite systems in the GMDSS, and advise the Sub-Committee, as appropriate;

.2 consider the proposal for the cessation of NBDP carriage requirements for vessels sailing in sea area A3, and its removal from SOLAS regulation IV/10.2.1.3 (NCSR 2/9/1), and advise the Sub-Committee, as appropriate;

.3 prepare draft terms of reference for the correspondence group for the intersessional work to be done between NCSR 2 and NCSR 3, as well as for the purpose of reporting to the eleventh meeting of the Joint IMO/ITU Experts Group; and

.4 prepare draft terms of reference for the eleventh meeting of the Joint IMO/ITU Experts Group, scheduled to take place from 5 to 9 October 2015,

and submit its report on Thursday, 12 March 2015.

Report of the Communications Working Group

9.14 On receipt of the report of the Communications Working Group (NCSR 2/WP.5), the Sub-Committee took action as summarized in the ensuing paragraphs.

Report of the correspondence group and related documents

9.15 The Sub-Committee noted the views of the correspondence group related to the first outline of the Detailed Review of the GMDSS (NCSR 2/WP.5, paragraphs 4.1 to 4.19). In doing so, the Sub-Committee invited:

.1 SOLAS Contracting Governments to present updated information on shore-based MF/HF DSC stations, as contained in the GMDSS Master Plan, to the next (i.e. eleventh) meeting of the Joint IMO/ITU Experts Group; and

.2 Member States and international organizations to send SAR experts to the next meeting of the Joint IMO/ITU Experts Group, and, vice versa, to send radiocommunication experts to the next (i.e. twenty-second) meeting of the ICAO/IMO Joint Working Group.

9.16 Having noted the contributions of SAR experts to the work of the Communications Working Group at this session, the Sub-Committee recognized the value of the simultaneous presence of navigation, communication and SAR experts, as appropriate, at NCSR meetings.

Proposal for the cessation of NBDP carriage requirements for sea area A3 vessels

9.17 The Sub-Committee invited SOLAS Contracting Governments to present information and statistics on the use of NBDP in distress communications for vessels sailing in sea area A3 to the next meeting of the Joint IMO/ITU Experts Group.

Re-establishment of the Correspondence Group on the Review of the GMDSS

9.18 The Sub-Committee re-established the Correspondence Group on the Review of the GMDSS, under the coordination of the United States*, with the following terms of reference:

"Taking into account the revised Plan of Work for the GMDSS Review and Modernization project (NCSR 1/28, annex 11), documents NCSR 2/9/Rev.1 and NCSR 2/WP.5, paragraphs 4.1 to 4.17 containing the report of the Communications Working Group at NCSR 2, and the outcome of discussions at the twenty-second meeting of the ICAO/IMO Joint Working Group on Search and Rescue (14 to 18 September 2015), as appropriate, the Correspondence Group on the Review of the GMDSS should:

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.1 develop proposals on issues identified at NCSR 2, including:

.1 consideration of the costs associated with the approval of additional GMDSS service providers; and

.2 development of reliable and correct data regarding shore-based infrastructure for the MF/HF communications system;

.2 develop the document containing the draft outcome of the Detailed Review of the GMDSS, also taking into account the outcome of NCSR 1 and of the tenth meeting of the Joint IMO/ITU Experts Group which took place in 2014;

.3 submit an interim report to the Joint IMO/ITU Experts Group's eleventh meeting (5 to 9 October 2015) for its consideration; and

.4 taking into account the outcome of discussions in the Joint IMO/ITU Experts Group, submit a report, including the document containing the (revised) draft outcome of the Detailed Review, to NCSR 3 by 11 December 2015."

9.19 In this context, the Sub-Committee authorized the correspondence group, as an exceptional case, to submit its report for NCSR 3 by 11 December 2015 (i.e. two weeks beyond the deadline for bulky documents), and invited the Committee to endorse the action taken.

Terms of reference for the eleventh meeting of the Joint IMO/ITU Experts Group

9.20 The Sub-Committee approved the terms of reference for the eleventh meeting of the Joint IMO/ITU Experts Group, to be held at IMO headquarters in London from 5 to 9 October 2015 (NCSR 2/WP.5, annex 3).

10 FURTHER DEVELOPMENT OF THE GMDSS MASTER PLAN ON SHORE-BASED FACILITIES

10.1 The Sub-Committee noted the information provided by the Secretariat on amendments to the GMDSS Master Plan, as disseminated through GMDSS/Circ.17 on 11 March 2015, and encouraged Administrations to check their national data, contained in GMDSS/Circ.17, for accuracy and to provide the Secretariat with any necessary amendments, as soon as possible.

10.2 The Sub-Committee further noted that the Secretariat was planning to issue GMDSS.1/Circ.18 in September 2015, providing Member Governments time enough after this session of the Sub-Committee to comment on the information contained in GMDSS.1/Circ.17.

Promulgation of Maritime Safety Information (MSI) – IMO NAVTEX Coordinating Panel

10.3 The Sub-Committee noted with appreciation the report of the Chairman of the IMO NAVTEX Coordinating Panel (NCSR 2/10) providing a summary of the current operational issues associated with the NAVTEX service world-wide and which are being addressed by the Panel, and the Panel's actions/activities since NCSR 1.

Future consideration of the GMDSS Master Plan

10.4 Noting that the information related to the GMDSS Master Plan, which needed to be updated on a regular basis, was very important, the Sub-Committee agreed that there was no need for a separate output and to consider this matter in future when discussing the output "Guidelines on MSI provisions" (see also paragraph 11.3 below).

11 GUIDELINES ON MSI (MARITIME SAFETY INFORMATION) PROVISIONS

Outcome of the sixth session of the IHO World-Wide Navigational Warnings Service Sub-Committee (WWNWS Sub-Committee)

11.1 The Sub-Committee noted with appreciation the information provided by IHO (NCSR 2/11) on the matters discussed and decisions taken at the sixth session of the IHO WWNWS Sub-Committee which was held from 18 to 22 August 2014.

11.2 In this context, with regard to the results of the year-long WWNWS customer survey questionnaire and, in particular, the finding that the comments and problems submitted by users were system and equipment related, reflecting a lack of understanding on the part of users, the Sub-Committee expressed the view that if this was to be discussed by various bodies within the Organization, a proposal for a new unplanned output would have to be submitted to the Committee for approval.

Merging of outputs relating to the GMDSS Master Plan and Maritime Safety Information (MSI)

11.3 Recalling that under agenda item 10 it had agreed that the consideration of issues related to the "Further development of the GMDSS Master Plan on shore-based facilities" could in future take place under the output "Guidelines on MSI provisions" (see paragraph 10.4 above), the Sub-Committee agreed to invite the Committee to merge the two outputs and rename he merged output "Updating of the GMDSS Master Plan and guidelines on MSI", when discussing its biennial agenda under agenda item 20.

12 RESPONSE TO MATTERS RELATED TO THE RADIOCOMMUNICATION ITU-R STUDY GROUP

12.1 The Sub-Committee noted that, since NCSR 1, ITU-R Working Party 5B (WP 5B) had held one meeting, in November 2014, and that in relation to this meeting a number of Radiocommunication ITU-R Study Group matters were of relevance to the Sub-Committee including, among others, the following:

.1 editorial amendments to Recommendation ITU-R M.1371-4 on Automatic Identification System (AIS);

.2 regulations for novel applications using AIS technology;

.3 ongoing consideration of amendments to Recommendation ITU-R M.493-13 on Digital Selective Calling (DSC); and

.4 ongoing work on new, and revision of existing recommendations and reports on a variety of topics.

Regulations for novel applications using AIS technology

12.2 The Sub-Committee referred a liaison statement received from WP 5B (NCSR 2/12) regarding the expanded usage of AIS devices and, in particular, novel applications using AIS technology to the Communications Working Group for consideration and preparation of a liaison statement back to WP 5B, as appropriate.

Revision of Recommendation ITU-R M.493-13

12.3 The Sub-Committee referred a liaison statement received from WP 5B (NCSR 2/12/1) regarding the revision of Recommendation ITU-R M.493-13 on DSC system for use in the Maritime Mobile Service to the Communications Working Group for consideration and preparation of a liaison statement back to WP 5B, as appropriate.

12.4 In this context, the Sub-Committee noted that COMSAR 9, COMSAR 10, COMSAR 12, COMSAR 13, COMSAR 14, COMSAR 16 and NCSR 1 all had sent liaison statements on this matter to WP 5B and that these should be taken into account when finalizing the liaison statement referred to in paragraph 12.3.

12.5 Further in this context, the Sub-Committee noted the concerns expressed by the United Kingdom about the proposed inclusion of Class M for man overboard devices.

Instructions for the Communications Working Group

12.6 The Sub-Committee instructed the Communications Working Group, taking into account decisions, comments and proposals made in plenary, to consider:

.1 document NCSR 2/12 regarding expanded usage of AIS devices, and prepare a liaison statement on this matter back to WP 5B, as appropriate; and

.2 document NCSR 2/12/1 regarding the revision of Recommendation ITU-R M.493-13 on DSC, taking into account liaison statements sent by the COMSAR and NCSR Sub-Committees in previous years, and prepare a liaison statement on this matter back to WP 5B, as appropriate,

and to submit its report on Thursday, 12 March 2015.

Report of the Communications Working Group

12.7 On receipt of the report of the Communications Working Group (NCSR 2/WP.5), the Sub-Committee took action as summarized in the ensuing paragraphs.

12.8 The Sub-Committee approved the draft liaison statement to WP 5B on the "revision of Recommendation ITU-R M.493-13", as set out in annex 6, and instructed the Secretariat to convey it to ITU, as well as inviting the Committee to endorse this action.

12.9 The Sub-Committee noted that the group, due to lack of time, did not consider the liaison statement on uncontrolled novel applications using AIS technology (NCSR 2/12), and instructed the Joint IMO/ITU Experts Group to consider it and advice the Sub-Committee, as appropriate.

13 RESPONSE TO MATTERS RELATED TO THE ITU WORLD RADIOCOMMUNICATION CONFERENCE

ITU's Conference Preparatory Meeting for WRC-15

13.1 The Sub-Committee noted that:

.1 MSC 94 had approved the draft IMO position on relevant ITU World Radiocommunication Conference 2015 (WRC-15) agenda items concerning matters relating to maritime services (NCSR 1/28, annex 14), and instructed the Secretariat to convey it to ITU's Conference Preparatory Meeting (CPM) (MSC 94/21, paragraph 9.30); and

.2 ITU-R had finalized and delivered the draft CPM report, for consideration by the CPM, scheduled to take place from 23 March to 2 April 2015.

Draft IMO position on relevant WRC-15 agenda items

13.2 The Sub-Committee considered the draft IMO position on relevant WRC-15 agenda items annexed to the report of the tenth meeting of the Joint IMO/ITU Experts Group (NCSR 2/13, appendix 3 of the annex), and noted the discussions as reflected in paragraphs 82 to 116 of the annex to document NCSR 2/13.

13.3 In considering the draft IMO position on relevant WRC-15 agenda items, the Sub-Committee discussed agenda item 10 on potential maritime-related agenda items for the next World Radiocommunication Conference, scheduled to be held in 2019 (WRC-19). In the ensuing discussion, the following views were expressed:

.1 IMO should support the inclusion of an agenda item for WRC-19 on the review of the GMDSS, which should also include the consideration of regulatory provisions related to the inclusion of additional satellite providers in the GMDSS;

.2 IMO would not be in a position to provide information to ITU-R, at least not at the start of the study cycle between WRC-15 and WRC-19, since no final decisions would have been taken regarding the review of the GMDSS and the introduction of additional satellite providers into the GMDSS;

.3 if protection of the frequency band 406–406.1 MHz, in use by Cospas-Sarsat, would not be adequately addressed under agenda item 9.1, issue 9.1.1, IMO should support proposals for the inclusion of an agenda item at WRC-19 to consider measures to protect the systems operating in the mobile satellite service in the band 406-406.1 MHz; and

.4 it was very important for IMO to ask for an agenda item promoting the safety of navigation.

13.4 After some discussion, the Sub-Committee agreed that the draft IMO position regarding agenda item 10 of WRC-15 should be further considered by the Communications Working Group.

Instructions for the Communications Working Group

13.5 The Sub-Committee instructed the Communications Working Group, taking into account decisions, comments and proposals made in plenary, to consider the background to and the sections of the draft IMO positionthat are concerned with agenda item 10 of WRC-15, as set out in document NCSR 2/13, appendix 3 of the annex, and advise the Sub-Committee, as appropriate.

Report of the Communications Working Group

13.6 On receipt of the report of the Communications Working Group (NCSR 2/WP.5), the Sub-Committee took action as summarized in the ensuing paragraphs.

13.7 The Sub-Committee noted the discussions of the group on two proposals pertaining to agenda item 10 of WRC-15 concerning future WRC agenda items (NCSR 2/WP.5, paragraphs 6.1 to 6.3).

13.8 Some delegations were of the view that a number of issues, such as those emanating from the review of the GMDSS, the inclusion of new satellite providers in the GMDSS, the introduction of the MEOSAR system, or issues related to the development of e-navigation or the Polar Code, could still be considered for inclusion in the agenda of WRC-19.

13.9 After some discussion, the Sub-Committee:

.1 endorsed the draft IMO position on relevant WRC-15 agenda items concerning matters relating to maritime services, as set out in annex 7, for approval by MSC 95 and consequential submission to WRC-15, scheduled to take place from 2 to 27 November 2015;

.2 instructed the Joint IMO/ITU Experts Group, taking into account submissions to WRC-15, to consider issues related to agenda item 10 of WRC-15 at its next meeting, scheduled to take place from 5 to 9 October 2015; and

.3 invited the Committee to authorize the Joint IMO/ITU Experts Group to submit any additional information relevant to the IMO position on WRC-15 directly to ITU, for consideration by the Conference.

13.10 The Sub-Committee further agreed to invite the Committee to instruct the Secretariat, when proposals were submitted for consideration by the Conference and which had not been foreseen when developing the IMO position, to consult with IMO Member States present at WRC-15 and to take appropriate action on new issues not included in the IMO position in order to protect IMO's interest. This was very important because of the Organization's concern with promoting the safety of navigation.

14 ANALYSIS OF INFORMATION ON DEVELOPMENTS IN INMARSAT AND COSPAS-SARSAT

Cospas-Sarsat services

Outcome of the ICAO/IMO Joint Working Group

14.1 The Sub-Committee noted the information provided in the report of the ICAO/IMO Joint Working Group (JWG) on Harmonization of Aeronautical and Maritime Search and Rescue in relation to Cospas-Sarsat matters (NCSR 2/15) and:

.1 requested Cospas-Sarsat to provide information for RCCs on the operational and technical implications of the introduction of the MEOSAR system; and

.2 referred consideration of the required period of time for storage of Cospas-Sarsat data for potential future access by accident investigators to the SAR Working Group, for advice**.**

Status of the Cospas-Sarsat Programme

14.2 The Sub-Committee noted with appreciation a status report on the Cospas-Sarsat Programme (NCSR 2/14/2), including system operations, significant developments, space and ground segments, beacons, false alerts and results of MCC-SPOC communication tests.

14.3 The delegation of Argentina made a statement in relation to the status report, as set out in annex 12.

Proposed modification to resolution A.810(19)

14.4 The Sub-Committee considered the liaison statement from Cospas-Sarsat (NCSR 2/14) with regard to homing on the frequency 121.5 MHz, proposing modification to resolution A.810(19).

14.5 In this context, the Sub-Committee noted that:

.1 the JWG had already considered this liaison statement (NCSR 2/15, annex, paragraphs 7.2.6 to 7.2.10) and had agreed that keeping the same level of performance of the 121.5 MHz final homing capability was the area of concern. The JWG had invited Cospas-Sarsat, interested Member Governments and international organizations to submit information to NCSR 2 for its review providing tested and documented evidence that this proposal had no detrimental effect on 121.5 MHz homing capability, as demonstrated through appropriate testing, and to document evidence and provide it for review by the Sub-Committee;

.2 no additional information had been submitted for consideration at this session of the Sub-Committee and, in any case, the revision of resolution A.810(19) would require submission of a proposal for a new unplanned output to the Committee, which should be considered and approved by the Committee before embarking on any work related to the proposed revision; and

.3 a proposal for a new unplanned output to update resolution A.810(19) and chapter IV of the SOLAS Convention in order to include the deployment of the Cospas-Sarsat MEOSAR system and the issuance of a second generation 406 MHz distress beacon had been submitted for consideration by MSC 95 (MSC 95/19/5).

14.6 The Sub-Committee recognized that any changes to the scope of the proposal referred to in paragraph 14.5.3 above to include the revision of resolution A.810(19), as indicated in document NCSR 2/14, would require the Committee's approval.

14.7 After some discussion, the Sub-Committee agreed with the JWG that keeping the same level of performance of the 121.5 MHz final homing capability was the area of concern and that evidence was needed that the proposed modification of the current IMO requirement for a continuous 121.5 MHz homing signal had no detrimental effect on 121.5 MHz homing capability. It was further agreed that this should be demonstrated through appropriate testing, which should be documented and provided for review to the Sub-Committee when it considers the revision of resolution A.810(19) at a future session, and that some Cospas-Sarsat participant States had offered to undertake this work.

MEOSAR developments

14.8 The Sub-Committee considered a summary provided by the United States (NCSR 2/14/3) of issues relevant to IMO which were discussed at a recent Cospas-Sarsat Council meeting, an update on the status of the Cospas-Sarsat MEOSAR system and second generation distress beacons, and the relationship with IMO documents.

14.9 In this context, the Sub-Committee noted that the Cospas-Sarsat Council had invited national administrations to review the documents on the development of the next generation 406 MHz distress beacons in order to promote early identification and ensure that potential concerns are addressed at an early stage. Accordingly, the Sub-Committee encouraged maritime sdministrations and, in particular, SAR experts to work closely together with their national representatives at Cospas-Sarsat meetings in order to give appropriate attention to SAR needs when setting the requirements for Cospas-Sarsat.

14.10 The Sub-Committee further noted information provided by Argentina on MEOSAR developments in that country.

14.11 The Sub-Committee also noted that the United States had submitted a proposal for a new unplanned output for consideration by MSC 95 pertaining to the review and updating of relevant IMO documents (MSC 95/19/5).

Inmarsat

14.12 The Sub-Committee noted with appreciation the information submitted by IMSO (NCSR 2/14/1) providing analysis and assessment of the performance by Inmarsat Global Ltd of the Company's obligations for the provision of maritime services within the GMDSS, as overseen by IMSO. The information covered the period from 1 November 2013 to 31 October 2014. The Sub-Committee agreed that, during this period, Inmarsat had continued to provide fully operational maritime mobile satellite distress and safety communication services for the GMDSS and fulfilled the Company's public service obligation as stated in the Public Services Agreement (PSA).

Establishment of the SAR Working Group

14.13 The Sub-Committee established the SAR Working Group under the chairmanship of Mr. Nigel Clifford (New Zealand) and instructed it, taking into account decisions, comments and proposals made in plenary, to consider paragraph 2.16 of document NCSR 2/15 pertaining to the required period of time for storage of Cospas-Sarsat data for potential future access by accident investigators, and advise the Sub-Committee, as appropriate.

Report of the SAR Working Group

14.14 On receipt of the report of the SAR Working Group (NCSR 2/WP.6), the Sub-Committee instructed the JWG to further consider in detail the issue regarding the required period of time for storage of Cospas-Sarsat data for potential future access by accident investigators.

15 GUIDELINES ON HARMONIZED AERONAUTICAL AND MARITIME SEARCH AND RESCUE PROCEDURES, INCLUDING SAR TRAINING MATTERS

Report of the twenty-first session of the ICAO/IMO Joint Working Group on Harmonization of Aeronautical and Maritime Search and Rescue

15.1 The Sub-Committee noted that, as agreed by COMSAR 17 and authorized by MSC 92, and confirmed by NCSR 1 and MSC 94, the twenty-first session of the ICAO/IMO Joint Working Group (JWG) on Harmonization of Aeronautical and Maritime Search and Rescue was held at IMO Headquarters, from 15 to 19 September 2014, under the chairmanship of Mr. D. Edwards (United States).

15.2 The Sub-Committee briefly considered the relevant part of document NCSR 2/15 (Secretariat) providing the report of the JWG's twenty-first session. In considering the action requested in paragraph 2.12, the Sub-Committee recalled that the matter of mandatory audits pertaining to SAR-related matters had been discussed at NCSR 1 and that there was no support to make changes to IMO's new, mandatory Member State audit scheme as this was not within the purview of the Sub-Committee. Although it was recognized that SAR-related matters had to be harmonized, the Sub-Committee agreed that the SAR Working Group and the JWG should not give further consideration to the harmonization of the ICAO and IMO audit schemes.

15.3 After some discussion, the Sub-Committee referred paragraphs 2.1 to 2.5, 2.9 to 2.11, and 2.18 to 2.21 of the report of the JWG to the SAR Working Group for detailed consideration and advice**.**

15.4 The Sub-Committee noted that ICAO's Co-Secretary of the JWG, Mr. Francois Robert, had recently retired from ICAO and thanked him for the work done for the SAR community in general, and, in particular, for his contribution to the JWGroup.

Draft revision of SAR.7/Circ.11 – List of IMO documents and publications which should be held by a Maritime Rescue Co-ordination Centre (MRCC)

15.5 The Sub-Committee referred document NCSR 2/15/1 (Secretariat), containing the proposed update of SAR.7/Circ.11 on the List of IMO documents and publications which should be held by a Maritime Rescue Co-ordination Centre (MRCC), to the SAR Working Group, instructing it to prepare the draft revised SAR.7 circular.

Use of a 3- or 4-Digit Maritime Emergency Telephone Number

15.6 The Islamic Republic of Iran (NCSR 2/15/2) proposed the use of a 3- or 4-digit telephone number for contacting MRCCs or sub-centres in cases of maritime emergency. Following a brief discussion, the Sub-Committee referred the proposal to the SAR Working Group for detailed consideration and advice.

Report on the sixteenth Combined Antarctic Naval Patrol 2013-2014

15.7 The Sub-Committee noted with appreciation the information provided by Argentina and Chile (NCSR 2/INF.12) on activities of the sixteenth Combined Antarctic Naval Patrol carried out by the submitting States with the aim of enhancing maritime safety and environmental protection on the Antarctic continent.

Instructions for the SAR Working Group

15.8 The Sub-Committee instructed the SAR Working Group, taking into account decisions, comments and proposals made in plenary, to consider:

.1 paragraphs 2.1 to 2.5, 2.9 to 2.11, and 2.18 to 2.21 of document NCSR 2/15, and advise the Sub-Committee, as appropriate;

.2 the proposed update of the List of IMO documents and publications which should be held by a MRCC (NCSR 2/15/1), and prepare the draft revised SAR.7 circular; and

.3 the proposal to use a 3- or 4-digit telephone number to contact MRCCs and sub-centres (NCSR 2/15/2), and advise the Sub-Committee, as appropriate,

and submit its report on Thursday, 12 March 2015.

Report of the SAR Working Group

15.9 On receipt of the report of the SAR Working Group (NCSR 2/WP.6), the Sub-Committee took action as summarized in the ensuing paragraphs.

15.10 The Sub-Committee approved SAR.7/Circ.12, revising SAR.7/Circ.11 and containing an updated list of documents and publications which should be held by a Maritime or Joint Rescue Coordination Centre, and instructed the Secretariat to circulate it, and invited the Committee to endorse the action taken.

15.11 The delegation of the Bahamas shared the concerns expressed by IMRF (NCSR 2/WP.6, paragraph 8) related to the issue of the coexistence of superseded circulars and expressed the view that this was a significant problem across the whole IMO website which should be considered at Committee or Council level.

15.12 The Sub-Committee noted:

.1 that the JWG had agreed that the deadline for submissions should be increased to four weeks prior to a meeting, in order to provide enough time for the review of input documents;

.2 that the JWG had discussed the cooperation and coordination between civil and military organizations in the field of SAR;

.3 that the JWG was considering ways to collect information on SAR cases and the development of an instrument to collect and consider this information; and

.4 the list of pending and new action items for the JWG (NCSR 2/WP.6, annex 2).

15.13 The Sub-Committee also noted that MSC 94 had approved the intersessional meeting of the JWG to be held in 2015 (MSC 94/21, paragraph 18.35), and that the Council had endorsed it (C 113/D, paragraph 8.2). In this context, the Sub-Committee endorsed the holding of the twenty-second session of the JWG, to take place in Trenton, Ontario, Canada, from 14 to 18 September 2015, and approved the provisional agenda for JWG 22 (NCSR 2/WP.6, annex 3).

15.14 The Sub-Committee instructed the JWG to undertake a review of the list of codes, recommendations, guidelines and other non-mandatory instruments related to SAR, based on the list approved by COMSAR 13 (COMSAR 13/13/1, as amended by COMSAR 13/WP.3, paragraphs 6.1 to 6.3).

15.15 The Sub-Committee encouraged:

.1 Member States to submit information with regard to Electronic Visual Distress Signalling Devices (EVDSD) to the JWG;

.2 SAR experts to contribute to the IMRF's ongoing MRO project, and, in particular, to submit information on lessons learned and SAR good practice to the online reference library project;

.3 Member States to consider implementing 3- or 4-digit telephone numbers to contact MRCCs and sub-centres on a national or regional basis; and

.4 Member States to improve the distribution and communication of SAR information, taking into account the information available on the United States Coast Guard website www.uscg.mil/nsarc.

15.16 The Sub-Committee requested the Secretariat to consider locating the latest version of all SAR-related documents in one section during the restructuring process of the IMO website.

Extension of the target completion year for this item

15.17 Recognizing that it was very important to further consider matters related to the harmonization of aeronautical and maritime search and rescue, the Sub-Committee agreed to invite the Committee to extend the target completion year for this output to 2017 when discussing its biennial agenda under agenda item 20.

16 FURTHER DEVELOPMENT OF THE GLOBAL SAR PLAN FOR THE PROVISION OF MARITIME SAR SERVICES

16.1 The Sub-Committee noted the information provided by the Secretariat on the status of the Global SAR Plan as available in IMO's Global Integrated Shipping Information System (GISIS).

16.2 The Sub-Committee further noted that the Global SAR Plan had been updated by several Member Governments during the period between NCSR 1 and this session of the Sub-Committee. It was further noted that the status of the availability of SAR services changed day by day and, therefore, entering updated information directly into GISIS was of utmost importance. Having available updated information would enable RCCs to act promptly without losing precious time when dealing with a distress situation.

16.3 In light of the foregoing, the Sub-Committee encouraged Member Governments to check the available information in GISIS on a regular basis and update the information immediately when changes had been notified to them.

Extension of the target completion year for this item

16.4 Recognizing that it was very important to consider the further development of the Global SAR Plan and that proposals might be submitted, the Sub-Committee agreed to invite the Committee to extend the target completion year for this output to 2017 when discussing its biennial agenda under agenda item 20.

17 PROCEDURES FOR ROUTEING DISTRESS INFORMATION IN THE GMDSS

17.1 Noting that no documents had been submitted on this item for several years, the Sub-Committee agreed to invite the Committee to delete this planned output when discussing its biennial agenda under agenda item 20.

18 AMENDMENTS TO THE IAMSAR MANUAL

18.1 The Sub-Committee considered the relevant part of document NCSR 2/15 (Secretariat), providing the report of the twenty-first session of the ICAO/IMO Joint Working Group (JWG) on Harmonization of Aeronautical and Maritime Search and Rescue relating to the proposed amendments to the IAMSAR Manual. After some discussion, it referred appendixes D, E and F of the document to the SAR Working Group for detailed consideration and advice.

18.2 The Sub-Committee further considered comments by Greece (NCSR 2/15/3) on document NCSR 2/15 and, in particular, on the proposed amendments to the SAR Agreement Template in IAMSAR Manual Volume I, appendix I, and identifying some provisions that might lead to misinterpretation. Accordingly, additionalamendments were proposed.

18.3 After some discussion, the Sub-Committee referred document NCSR 2/15/3 to the SAR Working Group, instructing the Group to take it into account when considering the relevant proposed amendments to the IAMSAR Manual.

Instructions for the SAR Working Group

18.4 The Sub-Committee instructed the SAR Working Group, taking into account decisions, comments and proposals made in plenary, to consider the draft proposed amendments to the IAMSAR Manual, as provided in document NCSR 2/15, appendixes D, E and F, taking into account document NCSR 2/15/3, for approval by MSC 95 and consequential inclusion in the 2016 edition of the IAMSAR Manual, and to submit its report on Thursday, 12 March 2015.

Report of the SAR Working Group

18.5 On receipt of the report of the SAR Working Group (NCSR 2/WP.6), the Sub-Committee took action as summarized in the ensuing paragraphs.

18.6 The Sub-Committee endorsed the draft MSC circular on amendments to the IAMSAR Manual, as set out in annex 8, and requested the Committee to approve it, taking into account ICAO's concurrence with the inclusion of the proposed amendments to the IAMSAR Manual, for inclusion in the 2016 edition of the Manual.

18.7 The Sub-Committee requested the Secretariat to make the IAMSAR Manual, Volume III, Action Cards available for separate purchase and to make arrangements for the electronic version of the Action Cards to be printed.

18.8 The Sub-Committee noted the information provided by the JWG regarding proposed amendments to a future edition of the IAMSAR Manual (NCSR 2/15, annex, section 3.2 and appendix G).

19 UNIFIED INTERPRETATION OF PROVISIONS OF IMO SAFETY, SECURITY, AND ENVIRONMENT-RELATED CONVENTIONS

19.1 The Sub-Committee recalled that MSC 78 had included the consideration of IACS Unified Interpretations (UIs) as a continuous item in the Sub-Committee's biennial agenda, so that IACS could submit any newly developed or updated unified interpretations for consideration by the Sub-Committee, with a view to developing appropriate IMO interpretations, if deemed necessary.

19.2 The Sub-Committee, noting that no documents had been submitted on this item to this session, agreed to defer further consideration of the item to NCSR 3.

20 BIENNIAL AGENDA AND PROVISIONAL AGENDA FOR NCSR 3

Biennial status report

20.1 Taking into account the progress made at this session (NCSR 2/WP.2, annex 1), the Sub-Committee prepared the biennial status report, as set out in annex 9, for consideration by MSC 95.

Proposed agenda for the 2016-2017 biennium and provisional agenda for NCSR 3

20.2 Taking into account the progress made at the session (NCSR 2/WP.2, annexes 2 and 3) and the relevant decisions of MSC 94, the Sub-Committee prepared its proposed agenda for the 2016-2017 biennium and the proposed provisional agenda for NCSR 3, as set out in annexes 10 and 11, respectively, for consideration by MSC 95.

Arrangements for the next session

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

.1 SAR matters;

.2 Routeing measures and mandatory ship reporting systems;

.3 Recognition of Galileo as a component of the WWRNS;

.4 Updates to the LRIT system;

.5 Recognition of the Iridium mobile satellite system as a GMDSS service provider;

.6 Amendment(s) to performance standards, as necessary, to allow for interconnection of NAVTEX and Inmarsat SafetyNET receivers and their display on Integrated Navigation Display Systems;

.7 Review of the GMDSS;

.8 Revision of the SafetyNET and NAVTEX Manuals;

.9 Matters related to the Radiocommunication ITU-R Study Groups; and

.10 Matters related to ITU World Radiocommunication Conferences.

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

20.4 The Sub-Committee also established a Correspondence Group on the Review of the GMDSS.

Date of the next session

20.5 The Sub-Committee noted that the third session of the Sub-Committee had been tentatively scheduled to take place from 29 February to 4 March 2016.

21 ELECTION OF CHAIRMAN AND VICE-CHAIRMAN FOR 2016

21.1 In accordance with the Rules of Procedure of the Maritime Safety Committee, the Sub-Committee unanimously elected Mr. R. Lakeman (Netherlands) as Chairman and Mr. N. Clifford (New Zealand) as Vice-Chairman for 2016.

Expression of appreciation

21.2 The Sub-Committee expressed its sincere thanks and appreciation to Capt. Carlos Salgado of Chile for his excellent service to the COMSAR Sub-Committee over many years and, in particular, during the last two years when he served this Sub-Committee as its Chairman.

22 ANY OTHER BUSINESS

Protection of cable ships and repair operations for international submarine cables

22.1 The Sub-Committee recalled that, at its first meeting, the United States (NCSR 1/27) had proposed a Safety of Navigation circular based upon the issues presented in document NAV 59/INF.5. Although there was general support for the proposed circular within the Sub-Committee, certain views were expressed that it should not be based on the Cable Convention, which was not under the purview of IMO. Additionally, other views were expressed that the proposed safety distance might not be practicable in narrow waterways or channels (NCSR 1/28, paragraphs 27.3 to 27.6).

22.2 The Sub-Committee considered a proposal submitted by the United States (NCSR 2/22/3) containing an update of the proposed Safety of Navigation circular that had been presented at NCSR 1, taking into account the views expressed at NCSR 1 as well as the Sub-Committee's recommendations.

22.3 The Sub-Committee noted a number of concerns expressed by some delegations related to, inter alia, references to the United Nations Convention on the Law of the Sea, 1982 (UNCLOS), ships navigating within territorial waters or restricted waters, recommendations to maintain specific distances, the possible mandatory application of the circular by Member Governments and the need for an output to further develop such a circular or, instead, a Unified Interpretation regarding rule 18 of the COLREGs.

22.4 The delegation of the United States clarified that the aim of the proposal had been to provide advice to masters on recommended safety distances for vessels navigating near cable ships and repair buoys during repair operations. Having noted the above concerns, it agreed to withdraw the proposal.

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

22.5 The Sub-Committee noted that:

.1 MSC 93 had approved *Interim guidelines on drafting of amendments to the 1974 SOLAS Convention and related mandatory instruments*; and

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

Publication of ISO/PAS19697, titled "Ships and marine technology – Navigation and ship operations – Electronic inclinometers"

22.6 The Sub-Committee recalled that NCSR 1 had noted the information provided by ISO on the development of Publication ISO/PAS19697, titled "Ships and marine technology – Navigation and ship operations – Electronic inclinometers" (NCSR 1/28, paragraph 27.9).

22.7 The Sub-Committee noted with appreciation the information provided by ISO (NCSR 2/22/1) that publication ISO/PAS 19697 had been published on 15 December 2014 and that the Sub-Committee was invited to use or refer to the new standard, as appropriate.

Report on monitoring of ECDIS issues by the IHO

22.8 The Sub-Committee recalled that NCSR 1 had agreed that progress in resolving the outstanding issues with ECDIS operating anomalies, as well as other matters related to the implementation of ECDIS, could be reported to the Sub-Committee under "Any other business" (NCSR 1/28, paragraph 4.5).

22.9 The Sub-Committee noted with appreciation the information provided by IHO (NCSR 2/22/2), reporting on the outcome of IHO's continued monitoring of ECDIS issues related to the implementation of the carriage requirements in SOLAS regulations V/19.2.10 and V/19.2.11. In this context, the Sub-Committee also noted that steady progress was being made with resolving the known issues with ECDIS operating anomalies, with the active involvement of all key stakeholders, and that no major new issue had been identified since NAV 58.

22.10 The Sub-Committee noted with concern that the IHO Secretariat had recently been informed that some port authorities might require the carriage of paper charts in addition to the adequate set of ENCs, even though the ship was using ECDIS in accordance with the carriage requirements set out in SOLAS regulation V/19.2.1.4.

22.11 The delegation of the Cook Islands informed the Sub-Committeeof the following:

.1 it had had the honour of hosting a successful meeting of the South-West Pacific Hydrographic Commission (SWPHC), a regional hydrographic organization belonging to the IHO, in Rarotonga from 25 to 27 February 2015;

.2 it was of the view that care should be taken to ensure that a quality assurance mechanism was included to guarantee that crowd-sourced bathymetry data was at least as accurate as data available from conventional hydrographic surveys. Nevertheless, the potential value of using crowd-sourced data to allocate scarce hydrographic survey resources to remote areas, such as the Cook Islands, most in need of survey, was recognized; and

.3 it wished to assure the Sub-Committee that the Cook Islands would endeavour to continue to participate in and contribute constructively to the work of the Sub-Committee.

22.12 In this context, a number of delegations supported the view expressed by the Cook Islands related to crowd-sourced data.

Progress on standards development by the IEC

22.13 The Sub-Committee noted with appreciation the information provided by IEC (NCSR 2/22/4) on the preparation of relevant standards to support the performance standards of the Organization and, in particular, the measures toward enhancing maritime cyber security and the handling of GMDSS alerts in the Bridge Alert Management System.

Results of a survey on Differential GPS (DGPS) service

22.14 The Sub-Committee noted with appreciation the information provided by Australia (NCSR 2/INF.3) on the results of a survey on Differential GPS (DGPS) service, conducted by the Australian Maritime Safety Authority in 2013 and 2014.

AMVER and LRIT use in Search and Rescue

22.15 The Sub-Committee noted with appreciation the information provided by the United States (NCSR 2/INF.5) on AMVER and LRIT use in Search and Rescue.

Report on the activities of the AMVER programme

22.16 The Sub-Committee noted with appreciation the report provided by the United States (NCSR 2/INF.6) on the activities of the AMVER programme, particularly on AMVER performance metrics and the programme's annual report for 2013.

Launch of missiles without giving navigational warnings

22.17 The Sub-Committee noted the statement made by the United States, supported by the Republic of Korea and further statements of support by Japan, France, the Marshall Islands and Australia, as set out in annex 12. The Sub-Committee further noted the response by the Democratic People's Republic of Korea, as also set out in annex 12.

22.18 In this context, the Sub-Committee urged Member Governments to provide adequate advance notice with regard to all operations that might affect the safety of navigation, in compliance with resolution A.706(17), as amended.

Expressions of appreciation

22.19 The Sub-Committee expressed appreciation to the following delegates and observers, who had recently relinquished their duties, had retired or had been transferred to other duties or were about to, for their invaluable contribution to its work, and wished all of them a long and happy retirement or, as the case may be, every success in their new duties:

- Mr. Esteban Pacha Vincente of IMSO (on the ending of his term as Director-General of IMSO);
- Mrs. Anja Nachtegaal of the Netherlands (on retirement); and
- Mr. Junji Takita of CIRM (on retirement).

23 ACTION REQUESTED OF THE COMMITTEE

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

.1 adopt, in accordance with resolution A.858(20), the proposed establishment of:

.1 two-way routes in the south-west Coral Sea (paragraph 3.13.1 and annex 1);

.2 an area to be avoided in the south-west Coral Sea (paragraph 3.13.2 and annex 1); and

.3 five areas to be avoided in the region of the Aleutian Islands (paragraph 3.13.3 and annex 1);

.2 agree that the new routeing measures detailed in paragraph 3.13 be implemented six months after adoption, i.e. on 1 January 2016 at 0000 hours UTC (paragraph 3.14);

.3 instruct the Secretariat to amend the COMSAR module of GISIS to allow submission of geographical limits of Search and Rescue Regions, using the standard format defined for the LRIT system, and to invite Member Governments to resubmit the information in the appropriate format once changes are implemented (paragraph 5.18);

.4 adopt the draft MSC resolution on Amendments to the Revised performance standards and functional requirements for the long-range identification and tracking (LRIT) of ships (resolution MSC.263(84), as amended) (paragraph 5.25 and annex 2);

.5 approve the draft amendments to the LRIT Technical documentation, parts I and II (MSC.1/Circ.1259/Rev.6 and MSC.1/Circ.1294/Rev.4, respectively), and authorize the Secretariat to issue revised versions of the above circulars and to make any editorial corrections that may be identified (paragraphs 5.26 and 5.27 and annex 3);

.6 authorize the LRIT Operational governance body to prepare the necessary detailed procedures for the second modification testing phase of the LRIT system and to coordinate the testing of all DCs, the IDE and the DDP server (paragraph 5.28);

.7 approve the draft MSC circular on Guideline on Software Quality Assurance and Human-Centred Design for e-navigation (paragraph 6.9 and annex 4);

.8 adopt the draft MSC resolution on Performance standards for multi-system shipborne radionavigation receivers (paragraph 7.11 and annex 5);

.9 endorse the action taken by the Sub-Committee, as an exceptional case, in authorizing the Correspondence Group on the Review of the GMDSS to submit its report to NCSR 3 two weeks beyond the deadline for bulky documents, i.e. by 11 December 2015 (paragraph 9.19);

.10 endorse the action taken by the Sub-Committee in instructing the Secretariat to convey the liaison statement on the revision of Recommendation ITU-R M.493-13 to ITU-R Working Party 5B (paragraph 12.8 and annex 6);

.11 approve the draft IMO position on relevant ITU World Radiocommunication Conference (WRC-15) agenda items concerning matters relating to maritime services, and instruct the Secretariat to convey it to WRC-15 scheduled to take place from 2 to 27 November 2015 (paragraph 13.9.1 and annex 7);

.12 authorize the Joint IMO/ITU Experts Group to submit any additional information on the IMO position on relevant WRC-15 agenda items directly to ITU for consideration by the Conference (paragraph 13.9.3);

.13 instruct the Secretariat to consult with IMO Member States present at WRC-15 on new issues not included in the IMO position as developed and approved by the Committee, and to take action, as appropriate, to protect IMO's interest (paragraph 13.10);

.14 endorse the action taken by the Sub-Committee in instructing the Secretariat to circulate SAR.7/Circ.12 on the List of IMO documents and publications which should be held by a Maritime or Joint Rescue Coordination Centre (paragraph 15.10);

.15 approve the draft MSC circular on amendments to the IAMSAR Manual, taking into account ICAO's concurrence with the inclusion of the proposed amendments to the Manual, for inclusion in the 2016 edition of the Manual (paragraph 18.6 and annex 8); and

.16 approve the report in general.

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ANNEX 1

DRAFT ROUTEING MEASURES OTHER THAN TRAFFIC SEPARATION SCHEMES

ESTABLISHMENT OF TWO-WAY ROUTES IN THE SOUTH-WEST CORAL SEA

(Reference charts: AUS614, Feb 1994 (Edition 2 – 2010); AUS615, Sept 1994 (Edition 1 - 2001); AUS4620 (INT 620), Nov 1996 (Edition 6 – 2011); AUS4621 (INT621), Oct 2002 (Edition 4 – 2011).

Note: These charts are based on World Geodetic System 1984 datum (WGS 84).)

Description of the two-way routes

Diamond Passage

The Western limit is bounded by lines joining the following coordinates:

(1) 16° 58'.25 S 151° 15'.56 E
(6) 17° 32'.32 S 151° 10'.56 E
(5) 17° 55'.00 S 151° 02'.41 E

The Eastern limit is bounded by lines joining the following coordinates:

(2) 16° 58'.95 S 151° 20'.72 E
(3) 17° 33'.50 S 151° 15'.68 E
(4) 17° 56'.64 S 151° 07'.37 E

Holmes Reef

The Western limit is bounded by lines joining the following coordinates:

(1) 15° 57'.78 S 147° 51'.50 E
(6) 16° 23'.37 S 147° 28'.48 E
(5) 16° 44'.76 S 147° 23'.76 E

The Eastern limit is bounded by lines joining the following coordinates:

(2) 16° 01'.08 S 147° 55'.42 E
(3) 16° 25'.69 S 147° 33'.29 E
(4) 16° 45'.81 S 147° 28'.86 E.

ESTABLISHMENT OF AN AREA TO BE AVOIDED IN THE SOUTH-WEST CORAL SEA

(Reference charts: AUS614, Feb 1994 (Edition 2 – 2010); AUS615, Sept 1994 (Edition 1 – 2001); AUS617 Part 1&2, May 1996 (Edition 1 – 2001); AUS4620 (INT 620), Nov 1996 (Edition 6 – 2011); AUS4621 (INT621), Oct 2002 (Edition 4 – 2011).

Note: These charts are based on World Geodetic System 1984 datum (WGS 84).)

Description of area to be avoided

An area to be avoided is established bounded by a line connecting the following geographical positions:

(1)	15° 42'.48 S	149° 06'.07 E	(11)	17° 59'.43 S	150° 38'.35 E
(2)	15° 31'.87 S	149° 40'.07 E	(12)	18° 15'.94 S	149° 37'.97 E
(3)	15° 36'.90 S	149° 50'.43 E	(13)	18° 01'.91 S	148° 23'.34 E
(4)	16° 01'.16 S	150° 09'.79 E	(14)	17° 55'.49 S	148° 16'.26 E
(5)	16° 23'.25 S	150° 24'.56 E	(15)	17° 32'.90 S	148° 05'.14 E
(6)	16° 40'.91 S	150° 52'.21 E	(16)	17° 22'.27 S	147° 41'.63 E
(7)	17° 28'.26 S	151° 08'.01 E	(17)	16° 45'.01 S	147° 30'.47 E
(8)	17° 30'.71 S	151° 08'.01 E	(18)	16° 18'.56 S	147° 40'.61 E
(9)	17° 32'.59 S	151° 07'.45 E	(19)	16° 15'.00 S	147° 43'.82 E
(10)	17° 46'.83 S	150° 57'.56 E.			

AREAS TO BE AVOIDED "IN THE REGION OF THE ALEUTIAN ISLAND ARCHIPELAGO"

(Reference charts: United States 16011, 2012 edition; United States 16012, 2005 edition.

Note: These charts are based on North American 1983 Datum (NAD 83) which is equivalent to World Geodetic System 1984 Datum (WGS 84).)

Description of the areas to be avoided

In order to reduce the risk of a marine casualty and resulting pollution and damage to the environment "In the Region of the Aleutian Island Archipelago", all ships 400 gross tonnage and upwards solely in transit should avoid the areas to be avoided bounded by lines connecting the following geographical positions:

East area to be avoided

An area to be avoided is established and bounded by a line connecting the following geographical positions:

(1)	54° 07'.94 N	162° 19'.48 W	(7)	56° 19'.83 N	161° 04'.29 W
(2)	54° 22'.14 N	164° 59'.57 W	(8)	56° 04'.91 N	160° 29'.04 W
(3)	54° 43'.51 N	165° 09'.77 W	(9)	55° 40'.94 N	159° 32'.43 W
(4)	54° 59'.45 N	165° 14'.74 W	(10)	55° 22'.58 N	158° 49'.19 W
(5)	55° 43'.20 N	163° 38'.05 W	(11)	54° 41'.38 N	158° 31'.66 W
(6)	56° 08'.30 N	162° 22'.14 W	(12)	54° 21'.99 N	159° 11'.54 W

thence back to point (1).

Unalaska area to be avoided

An area to be avoided is established and bounded by a line connecting the following geographical positions:

(13)	51° 41'.19 N	170° 52'.93 W	(19)	54° 21'.96 N	165° 43'.77 W
(14)	51° 53'.22 N	171° 32'.60 W	(20)	54° 11'.15 N	163° 41'.63 W
(15)	52° 41'.95 N	171° 50'.08 W	(21)	53° 40'.84 N	163° 41'.67 W
(16)	53° 17'.64 N	171° 50'.31 W	(22)	53° 24'.39 N	164° 07'.37 W
(17)	54° 09'.49 N	169° 23'.53 W	(23)	52° 46'.62 N	165° 56'.33 W
(18)	54° 17'.62 N	168° 11'.32 W	(24)	51° 57'.40 N	168° 57'.60 W

thence back to point (13).

Atka area to be avoided

An area to be avoided is established and bounded by a line connecting the following geographical positions:

(25)	50° 38'.55 N	180° 00'.00 W	(30)	52° 41'.07 N	171° 56.15'W
(26)	51° 11'.83 N	179° 50'.46 W	(31)	51° 37'.86 N	171° 34.53'W
(27)	52° 39'.35 N	178° 39'.78 W	(32)	51° 15'.27 N	172° 36.40'W
(28)	53° 13'.18 N	173° 49'.18 W	(33)	50° 21'.63 N	179° 24.20'W
(29)	53° 02'.71 N	172° 51'.16 W			

thence back to point (25).

Amchitka area to be avoided

An area to be avoided is established and bounded by a line connecting the following geographical positions:

(34)	51° 51'.50 N	174° 47'.54 E	(39)	52° 36'.31 N	179° 22.09'W
(35)	52° 15'.54 N	174° 53'.24 E	(40)	51° 32'.27 N	179° 41.19'W
(36)	52° 46'.63 N	176° 15'.15 E	(41)	50° 33'.65 N	179° 33.12'E
(37)	52° 57'.86 N	177° 37'.91 E	(42)	50° 44'.11 N	178° 10.33'E
(38)	52° 48'.39 N	180° 00'.00 W	(43)	51° 21'.00 N	175° 59.57'E

thence back to point (34).

West area to be avoided

An area to be avoided is established and bounded by a line connecting the following geographical positions:

(44)	53° 40'.90 N	171° 50'.53 E	(50)	52° 08'.23 N	174° 21'.75 E
(45)	53° 49'.20 N	172° 29'.47 E	(51)	51° 40'.59 N	172° 45'.27 E
(46)	53° 47'.85 N	173° 25'.48 E	(52)	52° 20'.90 N	171° 29'.34 E
(47)	53° 24'.41 N	174° 54'.79 E	(53)	52° 40'.53 N	171° 10'.34 E
(48)	53° 07'.49 N'	175° 18'.74 E	(54)	53° 00'.92 N	171° 06'.20 E
(49)	52° 19'.54 N	174° 51'.62 E	(55)	53° 23'.69 N	171° 19'.71 E

thence back to point (44).

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ANNEX 2

DRAFT RESOLUTION MSC […](95)
(Adopted on […])

AMENDMENTS TO THE REVISED PERFORMANCE STANDARDS AND FUNCTIONAL REQUIREMENTS FOR THE LONG-RANGE IDENTIFICATION AND TRACKING (LRIT) OF SHIPS (RESOLUTION MSC.263(84), 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 resolution A.886(21) on *Procedure for the adoption of, and amendments to, performance standards and technical specifications*, by which the Assembly resolved that the function of adopting performance standards and technical specifications, as well as amendments thereto shall be performed by the Maritime Safety Committee,

BEARING IN MIND the provisions of regulation V/19-1 of the International Convention for the Safety of Life at Sea, 1974 (the Convention), relating to the long-range identification and tracking of ships, and the *Revised performance standards and functional requirements for the long-range identification and tracking of ships* (Revised performance standards), adopted by resolution MSC.263(84), as amended by resolution MSC.330(90),

HAVING CONSIDERED, at its [ninety-fifth] session, a number of modifications to the Long-Range Identification and Tracking of ships (LRIT) system with a view to improving the efficiency, effectiveness and use of the system,

1. ADOPTS amendments to the *Revised performance standards and functional requirements for the long-range identification and tracking (LRIT) of ships* (resolution MSC.263(84), as amended), the text of which is set out in the annex to the present resolution;

2. INVITES Contracting Governments to the Convention to bring the above amendments to the attention of all parties concerned.

ANNEX

AMENDMENTS TO THE REVISED PERFORMANCE STANDARDS AND FUNCTIONAL REQUIREMENTS FOR THE LONG-RANGE IDENTIFICATION AND TRACKING OF SHIPS (RESOLUTION MSC.263(84), AS AMENDED)

1 Table 2 (Data to be added by an Application Service Provider and at the LRIT Data Centre) is amended as follows:

"**Table 2**

DATA TO BE ADDED BY AN APPLICATION SERVICE PROVIDER AND AT THE LRIT DATA CENTRE

Parameters	**Comments**
Ship Identity[(1)]	The IMO ship identification number[(1)] and MMSI for the ship.
Name of ship	Name of the ship which has transmitted the LRIT information in the English language using latin-1 alphabet and UTF-8 encoding.
Type of ship[(2)]	Type of the ship which has transmitted the LRIT information using a pre-defined code.
Time Stamp 2	The date and time[(~~2~~3)] the transmission of LRIT information is received by the ASP (if used).
Time Stamp 3	The date and time[(~~2~~3)] the received LRIT information is forwarded from the ASP (if used) to the appropriate LRIT Data Centre.
LRIT Data Centre Identifier	The identity of the LRIT Data Centre to be clearly indicated by a Unique Identifier.
Time Stamp 4	The date and time[(~~2~~3)] the LRIT information is received by the LRIT Data Centre.
Time Stamp 5	The date and time[(~~2~~3)] the transmission of LRIT information is forwarded from the LRIT Data Centre to an LRIT Data User.

Notes: (1) See regulation XI-1/3 and resolution A.600(15) on *IMO ship identification number scheme*.
(2) Types of ships to be used in LRIT messages are outlined in LRIT Technical documentation, part I (MSC.1/Circ.1259, as revised).
(~~2~~3) All times should be indicated as Universal Coordinated Time (UTC)."

2 Paragraph 15.2 is amended as follows:

"15.2 Each Administration should provide to the selected LRIT Data Centre the following information for each of the ships entitled to fly its flag which is required to transmit LRIT information:

.1 name of ship;

.2 IMO Ship identification number;

.3 call sign;~~ and~~

.4 Maritime Mobile Service Identity~~.~~; and

.5 Type of ship."

***

ANNEX 3

DRAFT AMENDMENTS TO THE LRIT TECHNICAL DOCUMENTATION, PARTS I AND II (MSC.1/CIRC.1259/REV.5 AND MSC.1/CIRC.1294/REV.3) (English only)

MSC.1/Circ.1259/Rev.5, annex

1 In paragraph 1.2.3.1, the following new definitions are added after subparagraph .19:

".20 *Passenger ship* means a ship as defined in regulation I/2(f).

.21 *Cargo ship* means a ship as defined in regulation I/2(g).

.22 *Tanker* means a ship as defined in regulation I/2(h)."

2 The following new paragraph is added after paragraph 1.2.3.2 and the existing paragraph 1.2.3.3 is renumbered as 1.2.3.4:

"1.2.3.3 The term 'Ship Type' means type of the ship transmitting the LRIT information. The following main categories of ship-types are defined exclusively to be used for the purposes of the LRIT system:

.1 Passenger ship[4];

.2 Cargo ship[5, 6];

.3 Tanker;

.4 Mobile offshore drilling unit; and

.5 Other ship[7].

[4] Including High-speed Passenger Craft.
[5] Excluding Tanker.
[6] Including High-speed Craft.
[7] Ships which are not defined in other categories should be categorized as 'other ship'"

3 Paragraph 1.2.4.1.21 is amended as follows:

".21 ~~SAR~~ SURPIC ~~Search and Rescue~~ Surface Picture"

MSC.1/Circ.1259/Rev.5, annex, annex 1

4 In table 1 (Summary of LRIT messages), the row with entry "SAR SURPIC request" under column "Name" is amended as follows:

6	~~SAR~~ SURPIC request	Coastal or SAR request for position of ships in a specific area, broadcast via the IDE to all DCs	DC1	IDE	Yes[3]
			IDE	DCx	

Note:
"[3] Excludes Coastal SURPIC messages in which a DataUserProvider is specified."

5 In table 1 (Summary of LRIT messages), the following new rows are added at the end of the table:

16	Geographical area update	Request to perform technical validation of polygons	DC	IDE	No
		Submit, update or delete custom coastal geographical areas		DDP server	
17	Coastal State Standing order update	Update Coastal State Standing order	DC	DDP server	No

6 Paragraph 3.3.2.3 is amended as follows:

"3.3.2.3 SAR messages (Message types 3, 5, 6 (Access Type 6 only), and 7 where *ReceiptCode* = 1 (no ship in SAR SURPIC area)) should always be routed regardless of the DDP version used~~, should always be routed~~. The IDE should also consider as SAR messages (and pass without DDP version checking) message types 1 and 2 with *ResponseType* = 4 even though these are not proper message parameter combinations."

7 In the table after paragraph 3.3.3.3, the following new row is added at the end of the table:

Message Type 16 – Geographical area update	Received	The IDE should journal the message.

8 Paragraph 3.3.4.1.3 is amended as follows:

".3 routeing the LRIT message to the appropriate DC or to all DCs in the case of broadcast messages (i.e. ~~SAR~~ SURPIC request message);"

9 The following new section is added after paragraph 3.3.8.1:

"**3.3.9 Message handling for Geographical area update (Messages 16)**

3.3.9.1 The IDE should process the Geographical area update message by:

.1 Identifying the polygon(s) for technical validation by looking at the GML file parameter and performing the validation based on the constraints set out in the Technical specifications for the DDP;

.2 Building a receipt message with the receipt code of:

- 7, if the action type parameter is not 0 or if one or more polygons do not pass technical validation for any reason; and

- 10, if all polygons pass technical validation; and

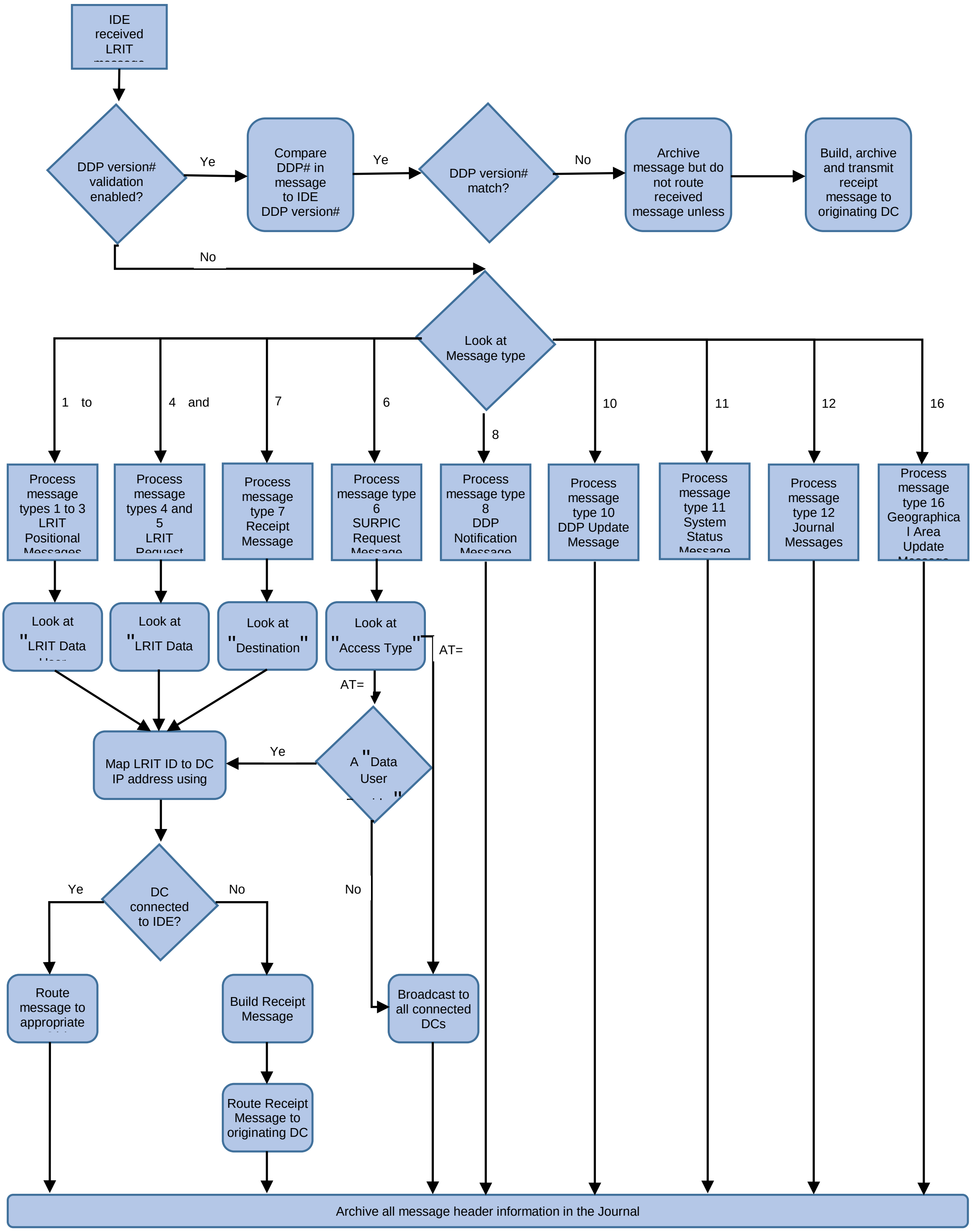
.3 Archiving all messages in the Journal(s)."

10 Figure 2 is amended as follows:

"Figure 2
IDE message handling and processing for received LRIT messages

MSC.1/Circ.1259/Rev.5, annex, annex 3

Note:
Figure 2 should be read in conjunction with the relevant paragraphs of the Technical specifications for communications within the LRIT system."



11 In table 1 (Summary of LRIT messages), the rows with the entries "3", "6" and "7" under column "Type" are amended as follows:

3	SAR position report	Position report containing LRIT information provided to a SAR service as a result of a SAR position request or a ~~SAR~~ SURPIC request with Access Type 6.

6	~~SAR~~ SURPIC request	Request by a Contracting Government or a SAR service for the provision of the most recent position reports already in a DC's database, within a specific geographical area.

7	Receipt	Acknowledges receipt of a message that was successfully processed or that cannot be processed for some reason

12 In table 1 (Summary of LRIT messages), the following two new rows are added at the end of the table:

16	Geographical Area Update	Requests technical validation of polygons from the IDE, and submits, updates or deletes custom coastal geographical areas in the DDP
17	Coastal State Standing Order Update	Updates Coastal State Standing order in the DDP

13 After paragraph 2.2.2.19, the following new paragraph is added, and the existing paragraphs 2.2.2.20 to 2.2.2.23 are renumbered as paragraphs 2.2.2.21 to 2.2.2.24, respectively:

"2.2.2.20 The *ShipType* parameter is the type of the ship transmitting the LRIT information. Ship types to be used in the LRIT system are defined in paragraph 1.2.3.3 to the annex of this circular."

14 In table 2 (Summary of LRIT position report messages (Messages 1, 2 and 3)), the following new row is added after the row with the entry "ShipName" under column "Parameter":

	ShipType	Ship type	Type of the ship transmitting the LRIT information: 0100 – Passenger ship[2] 0200 – Cargo ship[3] 0300 – Tanker 0400 – Mobile offshore drilling unit 9900 – Other ship[4]	D, C	nnnn

Notes:

2 Including High-speed Passenger Craft.
3 Excluding Tanker, but including High-speed Craft.
4 Ships which are not defined in other categories should be categorized as "other ship".

15 Section 2.2.4 is amended as follows:

"2.2.4 ~~SAR~~ SURPIC request message (Message 6)

2.2.4.1 Table 4 outlines the parameters associated with the ~~SAR~~ SURPIC request message.

2.2.4.2 NDCs and R/CDCs should format the ~~SAR~~ SURPIC message as specified in table 4 before transmitting it to the IDE. The LRIT Data User to NDC or R/CDC communication path may transmit ~~SAR~~ SURPIC messages amongst themselves in any format that they choose.

2.2.4.3 The LRIT Data User to IDC to IDE communication path should transmit ~~SAR~~ SURPIC messages in a processed format as specified in table 4.

2.2.4.4 This message requests the most recent LRIT information from the databases within the DCs. It is intended to provide LRIT Data Users (including SAR services) with the ability to obtain a picture of the ships in a given geographical area ~~where search and rescue operations are to be conducted~~. For non-SAR purposes, the requesting LRIT Data User may also customise its request by identifying the name of a specific Contracting Government and the type of ships it wishes to track."

2.2.4.5 The *MessageType* parameter indicates the type of the message. The LRIT components such as the DCs should use this parameter to distinguish between the various types of messages listed in table 1.

2.2.4.6 The *MessageId* parameter is a unique identification number that LRIT components should use to identify individual messages within the LRIT system. The *MessageId* is generated by linking the LRIT ID of the LRIT Data User, the date and time, and a 5 digit unique sequence number together. The unique sequence number should be generated by the LRIT Data User and the date and time should be the year, month, day, h, min and second when the parameter was generated. An example of a *MessageId* is 2999200701302155234444 where the LRIT ID of the LRIT Data User = 2999, year = 2007, month = 01, day = 30, h = 21, min = 55, second = 23, and unique sequence number = 44444.

2.2.4.7 The *AccessType* parameter indicates the requesting LRIT Data User's entitlement to receive the LRIT information. The LRIT Data User might be requesting the LRIT information as a coastal State or SAR service.

2.2.4.8 The *DataUserProvider* parameter is the LRIT ID of the LRIT Data User the information is requested from. This parameter is used to identify the destination of the request message. The IDE should look at this parameter during processing of the request message and use it to correctly route the message to the appropriate DC. If this parameter is unspecified, the message will be broadcast to all DCs."

2.2.4.~~7~~9 The ~~*SAR*~~*CircularArea* parameter defines the circular geographical area within which the LRIT Data User ~~SAR service~~ wishes to check for ships. The position of the centre of the circular area should be indicated by the latitude and longitude on the basis of the WGS 84 datum in degrees and minutes with North/South (latitude) and East/West (longitude). The radius of the circular area should be indicated in nautical miles. This parameter is only valid if the parameter is populated and indicates that the LRIT Data User ~~SAR service~~ wishes to perform a search based on a circular area. The radius of the circular search area should not exceed 999 nautical miles. If a processing DC encounters a radius of a circular search that is greater than 999 nautical miles then the processing DC should send a receipt message with receipt code 7 to the requestor.

2.2.4.~~8~~10 The ~~*SAR*~~*RectangularArea* parameter defines the rectangular geographical area within which the LRIT Data User ~~SAR service~~ wishes to check for ships. The rectangular area should be indicated by the latitude and longitude on the basis of the WGS 84 datum of the southwest corner of the rectangular area in degrees and minutes with North/South (latitude) and East/West (longitude), and the north and east offsets are expressed as: degrees.minutes.North and East from the Southwest corner. This parameter is only valid if the parameter is populated and indicates that the LRIT Data User ~~SAR service~~ wishes to perform a search based on a rectangular area. No side of the rectangular search area should exceed 2000 nautical miles. If a processing DC encounters a side of the rectangular area that is greater than 2000 nautical miles then the processing DC should send a receipt message with receipt code 7 to the requestor.

2.2.4.~~8~~10.1 If the latitude of the Southwest corner of the rectangular area is 90 degrees North or South, or if adding the North offset to the latitude of the Southwest corner results in a latitude of 90 degrees North or South, then the processing DC may, in the course of processing the request, modify the 90 degree latitude by a maximum of one minute to ensure proper geospatial processing (i.e. In the maximum allowable modification, the latitude should be set to 89 degrees 59 minutes).

2.2.4.~~8~~10.2 If adding the North offset to the latitude of the Southwest corner of the rectangular area results in a latitude of greater than 90 degrees North, then the processing DC should send a Receipt message with a receipt code of 7 to the requestor. In other words, the rectangular search area should not cross the North Pole. In situations where a LRIT Data User ~~SAR service~~ needs to submit a SURPIC that crosses either the North Pole or the South Pole, a circular area should be used."

2.2.4.11 The *ShipType* parameter is the type of the ship to be tracked. Ship types to be used in the LRIT system are defined in annex of the Technical Documentation (Part I). If this parameter is unspecified, it will default to all ship types.

2.2.4.~~9~~12 The *NumberOfPositions* parameter defines how many of the most recent position reports received by a DC during the past 24 h from ships within the requested geographical area are being requested by the LRIT Data User ~~SAR service~~. The number of positions must be from 1 to 4. Once a DC has received a ~~SAR~~ SURPIC request message, it should check all position reports it has received during the past 24 h from every ship registered to that DC. If the timestamp associated with these position reports are within the past 24 h and the position reports are within the geographical area established by the ~~SAR~~ SURPIC message, then the DC should send the last N position reports associated with the ship that are within the past 24-h window and in the geographical area. Thus all the position reports that are sent to the requesting DC should have timestamps that are within the past 24-h window as well as location coordinates that are within the geographical area.

2.2.4.1~~0~~3 The *DataUserRequestor* parameter is the LRIT Data User originating the request message. The *DataUserRequestor* parameter should be populated with an LRIT ID that is associated with a valid SAR service for SAR related messages.

2.2.4.1~~1~~4 The *TimeStamp* parameter is the date and time associated with the generation of the message.

2.2.4.1~~2~~5 The *DDPVersionNum* parameter is the version number of the DDP that is being used by the DC sending the message to the IDE for broadcast to all DCs.

2.2.4.1~~3~~6 The *test* parameter indicates whether the message is a test message intended for testing purposes only or if it is a regular message.

2.2.4.1~~4~~7 The *schemaVersion* parameter represents the release number associated with the set of XML schema files that define the LRIT messages. This parameter is informative only and no processing action is required by the receiving LRIT component."

16 The name of table 4 is amended as follows:

"Summary of ~~SAR~~ SURPIC request
(Message 6)"

17 In table 4 (Summary of SAR SURPIC request (Messages 6)):

.1 the word "SAR" under the column "Description" for MessageType parameter is deleted;

.2 the words "SARCircularArea" and "SARRectangularArea" under the column "Parameter" are replaced with "CircularArea" and "RectangularArea";

.3 the words "SAR service" under the column "Description" for NumberOfPositions parameter is replaced by "LRIT Data User"; and

.4 the following two new rows are added after the row with the entry "MessageId" under column "Parameter":

	AccessType	1, 6	This parameter should be set based upon the Data User Requestor's entitlement to receive LRIT information: 1 – Coastal 6 – SAR	B, C, D	n
	DataUserProvider	LRIT ID	LRIT ID of the Contracting Government the LRIT information is requested from. If unspecified, the message is broadcast to all DCs. This parameter is only valid for *AccessType* "1".	B, C, D	nnnn

18 In table 4 (Summary of SAR SURPIC request (Messages 6)), the following new row is added after the row with the entry "SARRectangularArea" under column "Parameter":

	ShipTypes	Ship type	Types of the ships to be tracked. If unspecified, it defaults to all ship types. Parameter is only valid for *AccessType* "1".	D, C	List of nnnn

19 Paragraph 2.2.5.2 is amended as follows:

"2.2.5.2 The Receipt message should be sent to the requestor in order to acknowledge the receipt of a message, or to indicate successful processing, or to inform that the request cannot be processed for some reason. When an LRIT component receives a message it should process the message and either send the requested information or send a Receipt message with the appropriate Receipt code ~~informing the originating LRIT component why the message could not be processed~~."

20 In paragraph 2.2.5.6, subparagraphs .2, .6, .9 and .10 are amended and four new subparagraphs are added after subparagraph 10 as follows:

".2 *ReceiptCode* 1 – *No ship in SAR SURPIC area* should be generated in response to a ~~SAR~~ SURPIC request message (with Access type = 6) if a DC that is processing a SAR SURPIC request message determines that there are no ships within the geographical area specified in the ~~SAR~~ SURPIC request message;"

…

.6 *ReceiptCode 5* – *Ship not responding* should be generated by a DC if a ship that transmits to that DC is not responding. All DCs should be detecting if ships associated with that DC are transmitting LRIT information at the preset time intervals. If a LRIT Data User requests LRIT information from a ship that is not responding, then the DC to which the ship transmits should generate a Receipt message with text ~~content stating how long the ship has not been responding~~ containing TimeStamp1 of the most recent LRIT information received from the ship;

…

.9 *ReceiptCode* 8 – *Could not load DDP* should be generated when a DC or the IDE is unable to process the received DDP. The message should be sent to the DDP server; ~~and~~

.10 *ReceiptCode* 9 – *Incorrect DDP version, message discarded* should be generated by the IDE when the *DDPVersionNum* parameter contained within the message does not match the *DDPVersionNum* being used by the IDE. The IDE should discard the message and build a Receipt message with the *ReferenceId* populated with the *MessageId* of the discarded message~~.~~;

.11 *ReceiptCode* 10 – *Polygon passed technical validation* should be generated by the IDE in response to a Message Type 16 with Action Type = 0 in the case where all the polygons are in accordance with the specifications;

.12 *ReceiptCode* 11 – *Geographical areas successfully updated* should be generated by the DDP server in response to a Message Type 16 with Action Type = 1 or 2 in the case where the polygons are successfully processed;

.13 *ReceiptCode* 12 – *Coastal State Standing Order successfully updated* should be generated by the DDP server in response to a Message Type 17 in the case where the Coastal State Standing Order is successfully processed; and

.14 *ReceiptCode* 13 – *Not entitled or no ships in the coastal SURPIC area* should be generated by a DC in response to a SURPIC request message (with Access Type = 1) when the requesting LRIT Data User is not entitled to receive the LRIT information it has requested, or when there are no ships within the SURPIC area specified."

21 In the table following paragraph 2.2.5.7 (table without title), the row with entry "6" under column "Type" is amended and two new rows are added at the end of the table as follows:

6	~~SAR~~ SURPIC request	LRIT Data User requestor

16	Geographical Area Update	LRIT Data User requestor
17	Coastal State Standing Order Update	LRIT Data User requestor

22 In table 5 (Summary of Receipt message (Message 7)), the row with the entry "ReceiptCode" under column "Parameter" is amended as follows:

	ReceiptCode	0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13	0 - Not entitled to data 1 - No ships in SAR SURPIC area 2 - IDE not available 3 - DC not available 4 - CSP not available 5 - Ship not responding 6 - Ship not available 7 - System fault 8 - Could not load DDP 9 - Incorrect DDP version, message discarded 10 - Polygon passed technical validation 11 - Geographical areas successfully updated 12 - Coastal State Standing Order successfully updated 13 - Not entitled or no ships in the coastal SURPIC area	B, C, D, E, F	nn

23 After paragraph 2.2.13.1, two new sections, including subparagraphs and tables, are added as follows:

"2.2.14 Geographical area update message (Message 16)

2.2.14.1 Table 11 outlines the parameters associated with the Geographical area update message.

2.2.14.2 The Geographical area update message should be sent by the LRIT Data User to the IDE or DDP server.

2.2.14.3 This message is used for:

.1 the technical validation of polygons by the IDE; or

.2 uploading or deleting custom coastal areas in the DDP by the LRIT Data User.

2.2.14.4 The *MessageType* parameter indicates the type of the message. LRIT components, such as the DCs, should use this parameter to distinguish between the various types of messages listed in table 1.

2.2.14.5 The *MessageId* parameter is a unique identification number that LRIT components should use to identify individual messages within the LRIT system. The MessageId is generated by linking the LRIT ID of the LRIT Data User, the date and time, and a 5 digit unique sequence number together. The unique sequence number should be generated by the LRIT Data User and the date and time should be the year, month, day, h, min and second when the parameter was generated. An example of a MessageId is 2999200701302155234444 where the LRIT ID of the LRIT Data User = 2999, year = 2007, month = 01, day = 30, h = 21, min = 55, second = 23, and unique sequence number = 44444.

2.2.14.6 The *ActionType* parameter indicates the type of action the LRIT Data User is requesting. If the value is 0, the request is sent to the IDE for the technical validation of the polygon. If the value is 1, the request is sent to the DDP server to upload the polygon(s) to the DDP. If the value is 2, the request is sent to the DDP server to delete the polygon(s) from the DDP.

2.2.14.7 The *GML file* parameter is a file attachement containing the polygon(s) created by the LRIT Data User.

2.2.14.8 The *GeographicalAreaId(s)* is a list of one or more CustomCoastalArea identifiers that uniquely identifies the polygon(s) that the LRIT Data User wants to delete.

2.2.14.9 The *DataUserRequestor* parameter is the LRIT ID of the LRIT Data User originating the request message.

2.2.14.10 The *TimeStamp* parameter is the date and time associated with the generation of the message.

2.2.14.11 The *DDPVersionNum* parameter is the version number of the DDP that is being used by the DC sending the message at the time the message is sent.

2.2.14.12 The *test parameter* indicates whether the message is a test message intended for testing purposes only or if it is a regular message.

2.2.14.13 The *schemaVersion* parameter represents the release number associated with the set of XML schema files that define the LRIT messages. This parameter is informative only and no processing action is required by the receiving LRIT component.

Table 11
Summary of Geographical area update message
(Message 16)

Parameter provided by	Parameter	Value	Description	LRIT system communication segments (see figure 1)	Processed format (see paragraph 2.2.1.3)
LRIT Data User	MessageType	16	Message type number: 16 – Geographical Area Update	D (when ActionType value is set to 0) E (when ActionType value is set to 1 or 2)	nn
	MessageId	Unique number	Unique message number generated by using: the LRIT Component ID of the data provider (Data User ID), date and time and unique sequence number		nnnnYYYYMMDDHHmmssnnnnn
	ActionType	0, 1, 2,	Action to be performed with the polygon(s): 0 – Technical validation of polygon(s) 1 – Upload polygon(s) 2 – Delete polygon(s)		n
	GML file[1]	Attachement	GML content with the polygon(s) to be submitted or validated		Described in section 4 of the Technical Specifications for the LRIT Data Distribution Plan
	Geographical AreaId(s)[2]	List of one or more Geographical area identifiers	List of Unique identifier of the geographical area(s) related with the requested action.		List of CustomCoastalArea IDs as defined in table I-1 of the Technical specifications for the DDP
	DataUserRequestor	LRIT ID	LRIT ID of the LRIT Data User originating the message		nnnn
DC	TimeStamp	Date and time	Date and time when an LRIT Data User transmits the message to its DC		xs:dateTime

Parameter provided by	Parameter	Value	Description	LRIT system communication segments (see figure 1)	Processed format (see paragraph 2.2.1.3)
	DDPVersionNum	Unique number	DDP version number of the DDP used by the DC		n1...nn:n1...nn
	Test	0, 1	Setting indicates if the message is a test message or a regular message 0 - Regular message 1 - Test message		n
	schemaVersion	Decimal number	The release number of the XML schema associated with all the LRIT messages.		n1...nn.n1...nn

Notes:

1 The GML file must only be specified when the ActionType is 0 or 1.

2 The GeographicalAreaId(s) must only be specified when the ActionType is 2

2.2.15 Coastal State standing order update message (Message 17)

2.2.15.1 Table 12 outlines the parameters associated with the coastal State standing order update message.

2.2.15.2 The coastal State standing order update message should be sent by the LRIT Data User to the DDP server.

2.2.15.3 This message is used to update the coastal State standing order of the Contracting Government.

2.2.15.4 The *MessageType* parameter indicates the type of the message. LRIT components such as the DCs should use this parameter to distinguish between the various types of messages listed in table 1.

2.2.15.5 The *MessageId* parameter is a unique identification number that LRIT components should use to identify individual messages within the LRIT system. The MessageId is generated by linking the LRIT ID of the LRIT Data User, the date and time, and a 5 digit unique sequence number together. The unique sequence number should be generated by the LRIT Data User and the date and time should be the year, month, day, h, min and second when the parameter was generated. An example of a MessageId is 299920070130215523444444 where the LRIT ID of the LRIT Data User = 2999, year = 2007, month = 01, day = 30, h = 21, min = 55, second = 23, and unique sequence number = 44444.

2.2.15.6 The *CoastalStateStandingOrder* parameter indicates the Geographical area IDs of the polygons, including any flag and ship-type filters associated with each Geographical area. The XML content for this parameter is defined by the CoastalStateStandingOrderType type defined in the XML Schemas for the LRIT system (Types.xsd). If this parameter is not specified, the Coastal State Standing Order will be deleted.

2.2.15.7 The *DataUserRequestor* parameter is the LRIT ID of the LRIT Data User originating the message.

2.2.15.8 The *TimeStamp* parameter is the date and time associated with the generation of the message.

2.2.15.9 The *DDPVersionNum* parameter is the version number of the DDP that is being used by the DC sending the message at the time the message is sent.

2.2.15.10 The *test parameter* indicates whether the message is a test message intended for testing purposes only or if it is a regular message.

2.2.15.11 The *schemaVersion* parameter represents the release number associated with the set of XML schema files that define the LRIT messages. This parameter is informative only and no processing action is required by the receiving LRIT component.

Table 12
Summary of coastal State standing order update message
(Message 17)

Parameter provided by	Parameter	Value	Description	LRIT system communication segments (see figure 1)	Processed format (see paragraph 2.2.1.3)
LRIT Data User	MessageType	17	Message type number: 17 – coastal State standing order update	E	nn
	MessageId	Unique number	Unique message number generated by using: the LRIT Component ID of the data provider (Data User ID), date and time and unique sequence number		nnnnYYYYMMDDHHmmssnnnnn
	CoastalStateStandingOrder	Text	Geographical area IDs of the polygons, including any associated flag and ship-type filters		XML in accordance with the coastalStateStandingOrderType defined in the XML Schemas for the LRIT system (Types.xsd)
	DataUserRequestor	LRIT ID	LRIT ID of the LRIT Data User originating the message		nnnn
DC	TimeStamp	Date and time	Date and time when an LRIT Data User transmits the message to its DC		xs:dateTime
	DDPVersionNum	Unique number	DDP version number of the DDP used by the DC		n1...nn:n1...nn
	Test	0, 1	Setting indicates if the message is a test message or a regular message 0 - Regular message 1 - Test message		n
	schemaVersion	Decimal number	The release number of the XML schema associated with all the LRIT messages.		n1...nn.n1...nn

24 The existing tables 11 to 15 are renumbered as tables 13 to 17, respectively, and references made to the existing tables 11 to 15 in paragraphs 2.2.1.3, 2.2.1.6, 2.2.2.19, 2.3.4.5, 2.3.5.1, 2.3.5.2, 2.3.9.1, 2.3.9.2 and 3.1.1.2 are updated accordingly.

25 Paragraph 2.3.4.1 is amended as follows:

"2.3.4.1 All DCs should use the coastal State standing order information contained within the DDP to determine when to start and stop tracking of a ship in the absence of any specific LRIT request message. For each polygon included in the coastal State standing order, the Contracting Government should be able to filter LRIT information based on the flag and type of ships it wishes to track. The providing DC establishes entitlement of an LRIT Data User to receive position reports by performing the following tasks:

.1 check all coastal State standing orders polygons contained in the DDP to determine if the ship is located within the geographical areas established by the polygon;

.2 verify that the ship is not located within the internal waters of another Contracting Government (including non-metropolitan territories or special administrative regions listed in the DDP under the providing Contracting Government) by checking all of the internal waters polygons contained within the DDP; ~~and~~

.3 verify that the ship is not located in the territorial sea of the Contracting Government (including non-metropolitan territories or special administrative regions listed in the DDP under the requesting Contracting Government) whose flag the ship is entitled to fly by checking the territorial seas polygon in the DDP; and~~.~~

.4 verify separately for each polygon in the coastal State standing orders contained in the DDP that the flag and type of the ship is not filtered by the associated Contracting Government."

26 The following new paragraph and figure are added after existing paragraph 2.3.4.1, and subsequent paragraphs and figures are renumbered accordingly (including references made to the existing figures 3 to 8 in paragraphs 2.3.6.7, 2.3.6.8, 3.1.1.1, 3.3.2.1 and 6.1.1.1):

"2.3.4.2 Where two or more polygons with different filtering settings overlap within a standing order, the providing DC should make sure that duplicate LRIT information is not provided to the requestor, and that only the LRIT information from ships that are filtered out (by flag and ship type parameters) in *both* of the polygons are not provided to the requestor. Example: Polygons 1 and 2 are overlapping in the coastal State standing order of Contracting Government A. LRIT information from passenger ships, tankers and all ships flying the flag of Contracting Government Z were filtered out in Polygon 1. LRIT information from tankers were filterd out in Polygon 2. In this example:

.1 the DC providing LRIT information for Contracting Government Z would:

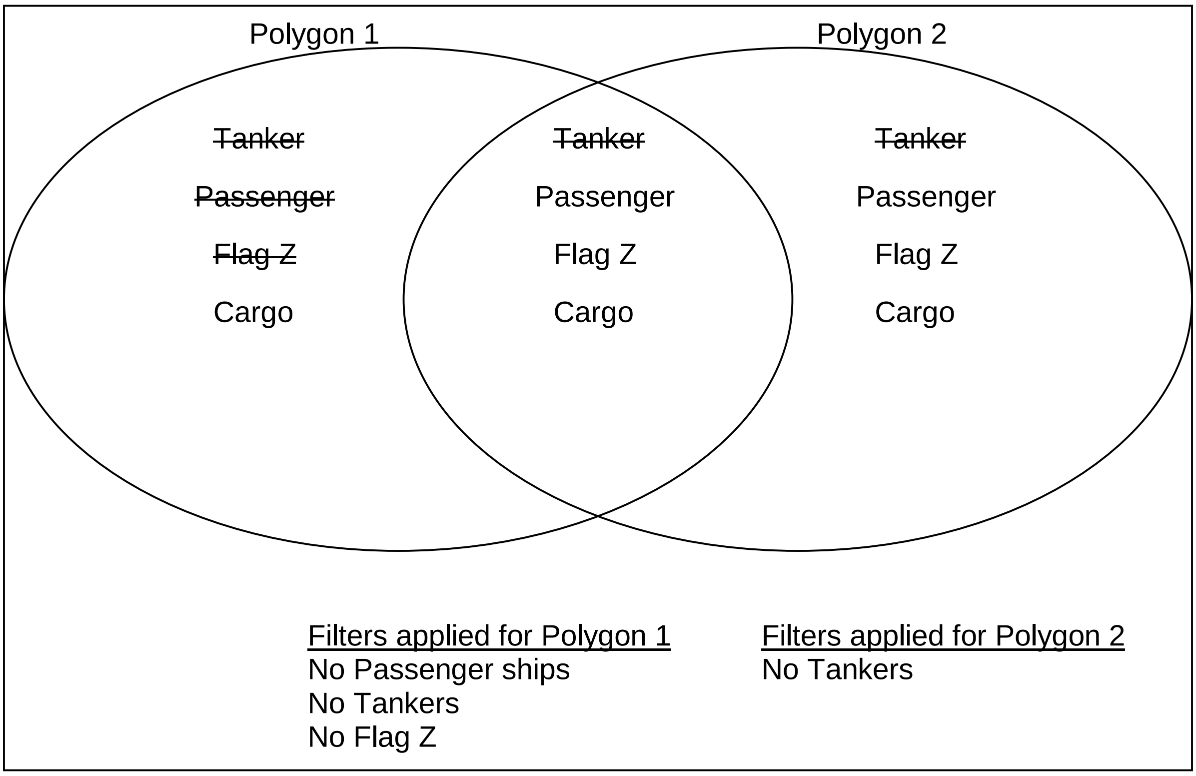
- not provide LRIT information for any ships in Polygon 1;
- provide LRIT information for all vessels, except tankers, in Polygon 2; and
- provide LRIT information for all vessels, except tankers, inside the overlapping area.

.2 the DCs providing LRIT information for other Contracting Governments would:

- provide LRIT information for all vessels, except passenger ships and tankers in Polygon 1;
- provide LRIT information for all vessels, except tankers, in Polygon 2; and
- provide LRIT information for all vessels, except tankers, inside the overlapping area but not send duplicate LRIT information.

Figure 3

Example of a DC processing a coastal State standing order containing two polygons with different filtering settings



27 Paragraphs 2.3.5 and 2.3.5.1 are amended as follows:

"**2.3.5 General processing of position request (Message type 4), SAR position request (Message type 5) and ~~SAR~~ SURPIC message (Message type 6)**

2.3.5.1 DCs should respond to position request messages (Message type 4), SAR position request messages (Message type 5) and ~~SAR~~ SURPIC messages (Message type 6) with valid LRIT position report messages (Message types 1, 2 and 3) as listed in table 11."

28 The existing table 11 is replaced with the following:

"**Table 11**
Operational scenarios that terminate, suspend or modify a request message

				Position Request Message MT 4			*SAR Position Request Message MT 5*			*SURPIC Request MT 6*		*Coastal State Standing Order*
				Access Type			*Access Type*			*Access Type*		
				1 Coastal	*3-5 Port*	*6 SAR*	*1 Coastal*	*3-5 Port*	*6 SAR*	*1 Coastal*	*6 SAR*	
LRIT Position Report Message	**MT 1**	Response Type	1 Coastal	**VALID**[1]	Not valid	Not valid	Not valid	Not valid	Not valid	**VALID**	Not valid	**VALID**
			3 Port	Not valid	**VALID**[2]	Not valid	Not valid	Not valid	Not valid	Not valid	Not valid	Not valid
			4 SAR	Not valid	Not valid	Not valid	Not valid	Not valid	Not valid	Not valid	Not valid	Not valid
	MT 2		1 Coastal	**VALID**[3]	Not valid	Not valid	Not valid	Not valid	Not valid	Not valid	Not valid	Not valid
			3 Port	Not valid	**VALID**[4]	Not valid	Not valid	Not valid	Not valid	Not valid	Not valid	Not valid
			4 SAR	Not valid	Not valid	Not valid	Not valid	Not valid	Not valid	Not valid	Not valid	Not valid
	MT 3		1 Coastal	Not valid	Not valid	Not valid	Not valid	Not valid	Not valid	Not valid	Not valid	Not valid
			3 Port	Not valid	Not valid	Not valid	Not valid	Not valid	Not valid	Not valid	Not valid	Not valid
			4 SAR	Not valid	Not valid	Not valid	Not valid	Not valid	**VALID**[5]	Not valid	**VALID**	Not valid

29 Paragraphs 2.3.5.4 and 2.3.5.5 are amended and a new paragraph 2.3.5.6 is added, as follows:

"2.3.5.4 The *~~SAR~~CircularArea* and *~~SAR~~RectangularArea* parameters should not be populated in the same ~~SAR~~ SURPIC request message. If both parameters are populated, then the providing DC should ignore the contents of the *~~SAR~~RectangularArea* parameter and use the contents of the *~~SAR~~CircularArea* parameter in responding to the ~~SAR~~ SURPIC request message.

2.3.5.5 DCs have the option of processing the *DataUserRequestor* parameter of the ~~SAR~~ SURPIC message (with an AccessType = 6) in order to determine if the requestor is a SAR service entitled to receive the information requested. If a DC chooses to check the validity of a requestor then it should check the LRIT ID contained in the *DataUserRequestor* parameter against the SAR service LRIT IDs in the DDP. If a DC chooses to reject a ~~SAR~~ SURPIC message (with an AccessType = 6) based upon the LRIT ID in the *DataUserRequestor* parameter than the DC should send a receipt message with receipt code 0 (not entitled to data) to the requestor.

2.3.5.6 SURPIC request message**s** with Access Type 1 (coastal) should be processed in accordance with the entitlements which apply to Message Type 4 with Access Type 1. A requesting DC, when sending a SURPIC request message with Access Type 1, has the option of specifying the LRIT ID of the Contracting Government in the *DataUserProvider* field of the message. If *DataUserProvider* parameter is unspecified, then the IDE broadcast the request message to all DCs."

30 Paragraph 2.3.10.2.2 is amended as follows and the XML text (LritMessageLog.xsd) is deleted:

"2.3.10.2 The properties of the Journal file should feature the following:

.1 binary attachment to the Journal message (Message 12); and

.2 data compressed ZIP file containing XML files according ~~with the following schema:~~ to the format defined in the XML schemas (LritMessageLog.xsd)."

31 Paragraph 6.1.1.1 is amended as follows:

"6.1.1.1 Various message flows are illustrated in figures ~~6, 7 and 8.~~ 7, 8, 9, 10, 11, 12 and 13."

32 Existing figure 8 (Message flow example – SAR SURPIC request (Message 6 with Access Type 6), Receipt (Message 7) and SAR position report (Message 3)) is amended and four new figures are added as follows:

"Figure ~~8~~9
Message flow example
~~SAR~~ SURPIC request (Message 6 with Access Type 6),
Receipt (Message 7) and SAR position report (Message 3)

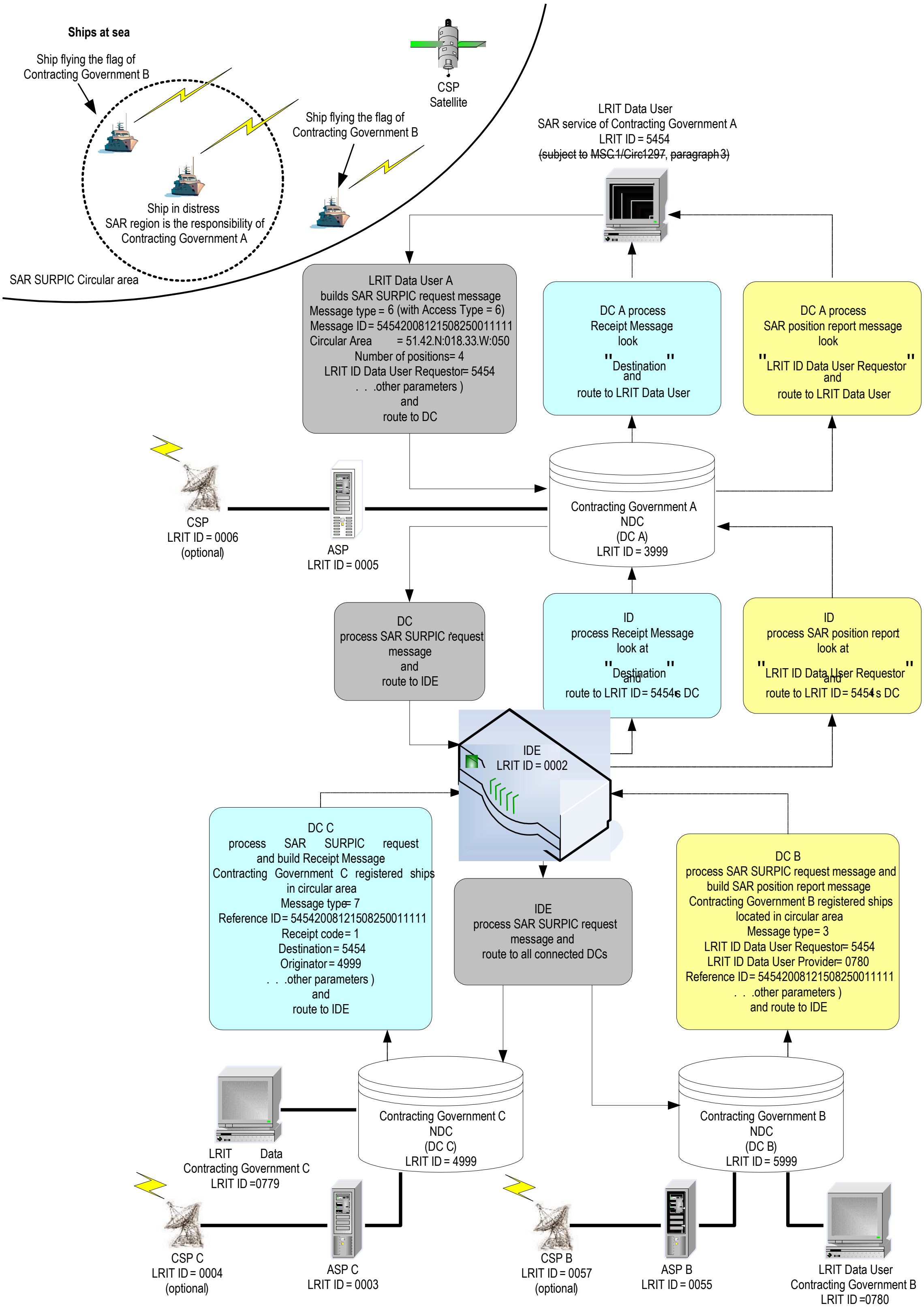


Figure 10
Message flow example for requesting technical validation of polygon(s) (Message 16 with Action Type 0) and Receipt message (Message 7)

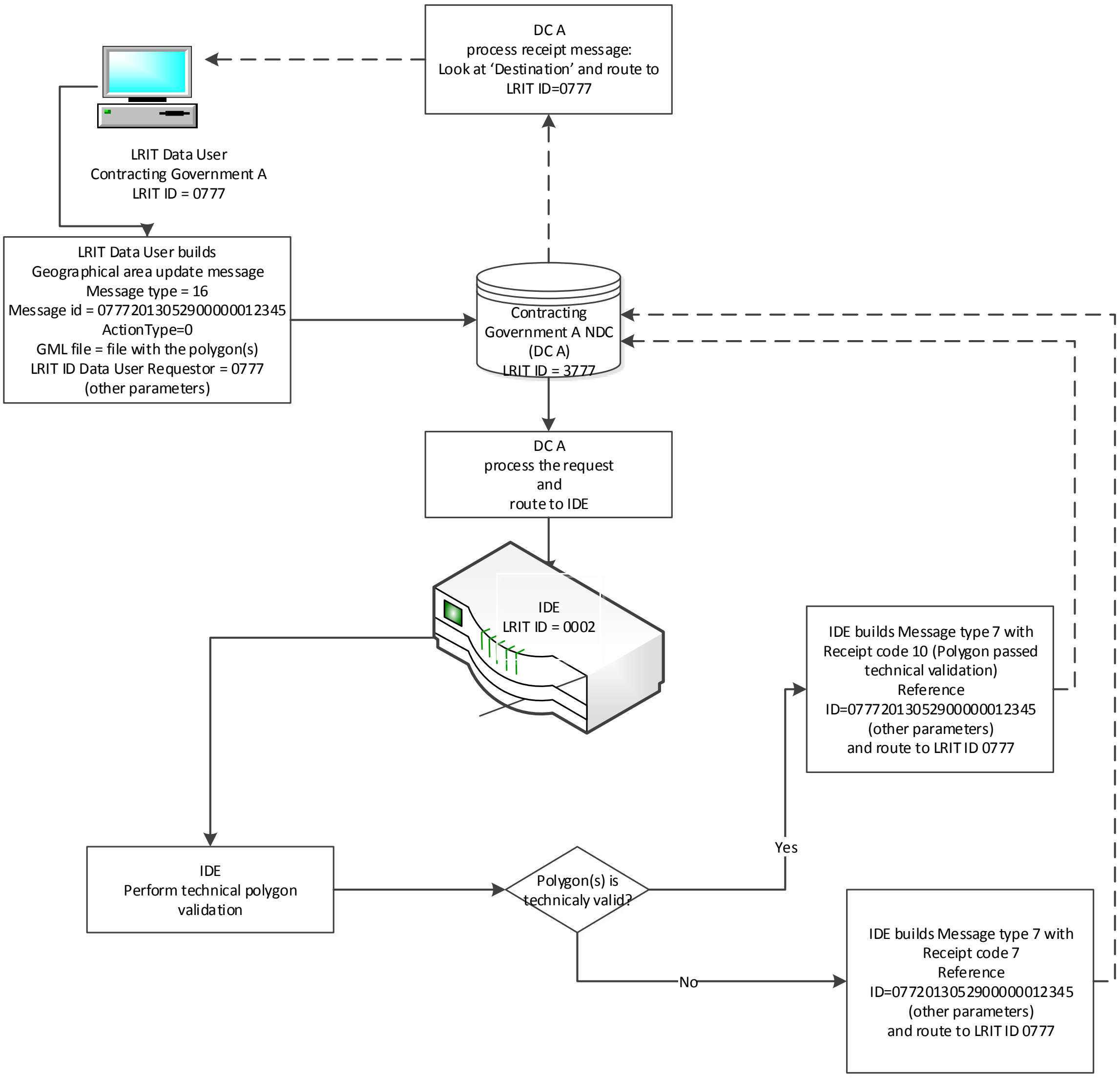


Figure 11
Message flow example for uploading polygon(s)
(Message 16 with Action Type 1) and Receipt message (Message 7)

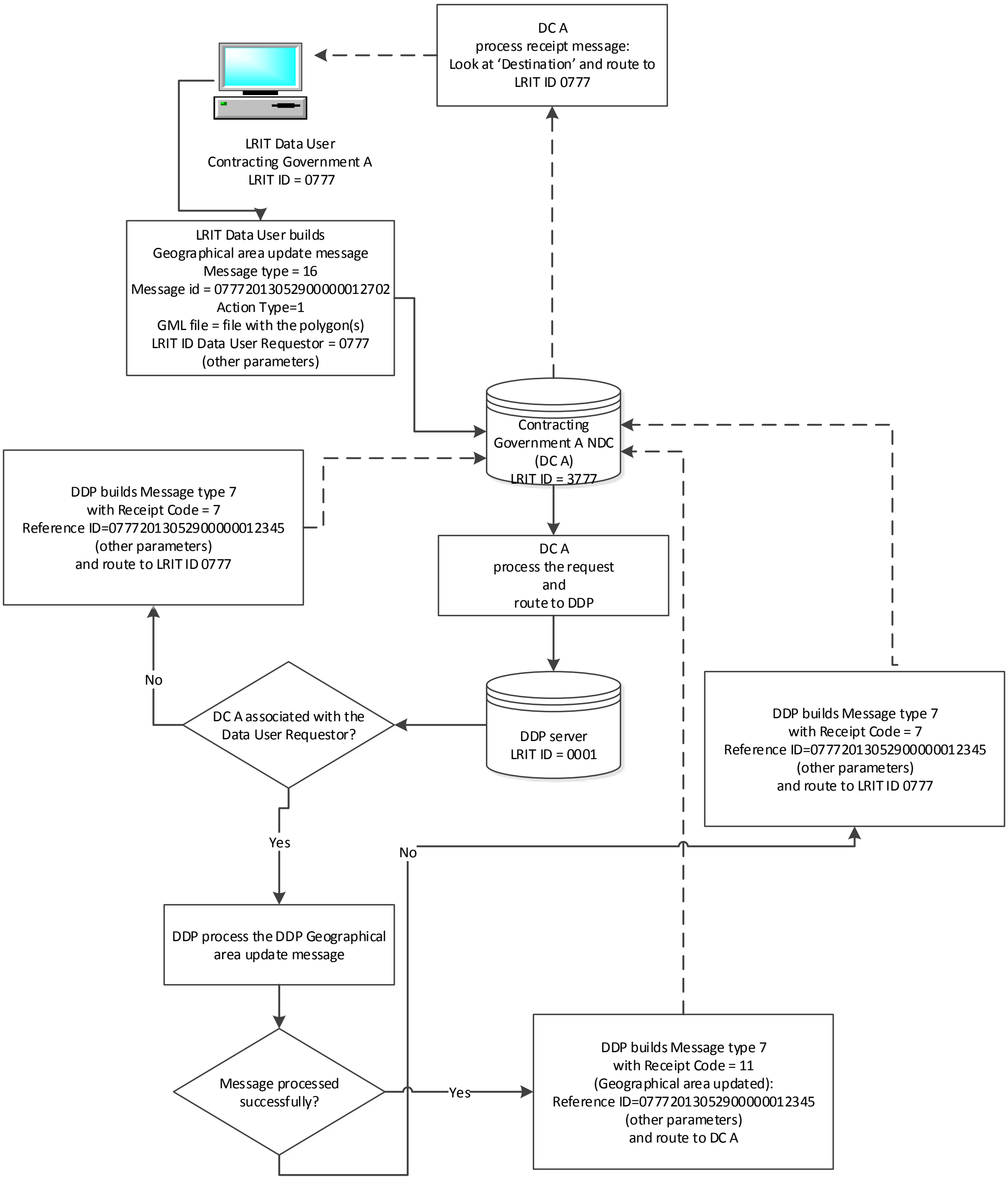


Figure 12
Message flow example for deleting polygon(s)
(Message 16 with Action Type 2) and Receipt message (Message 7)

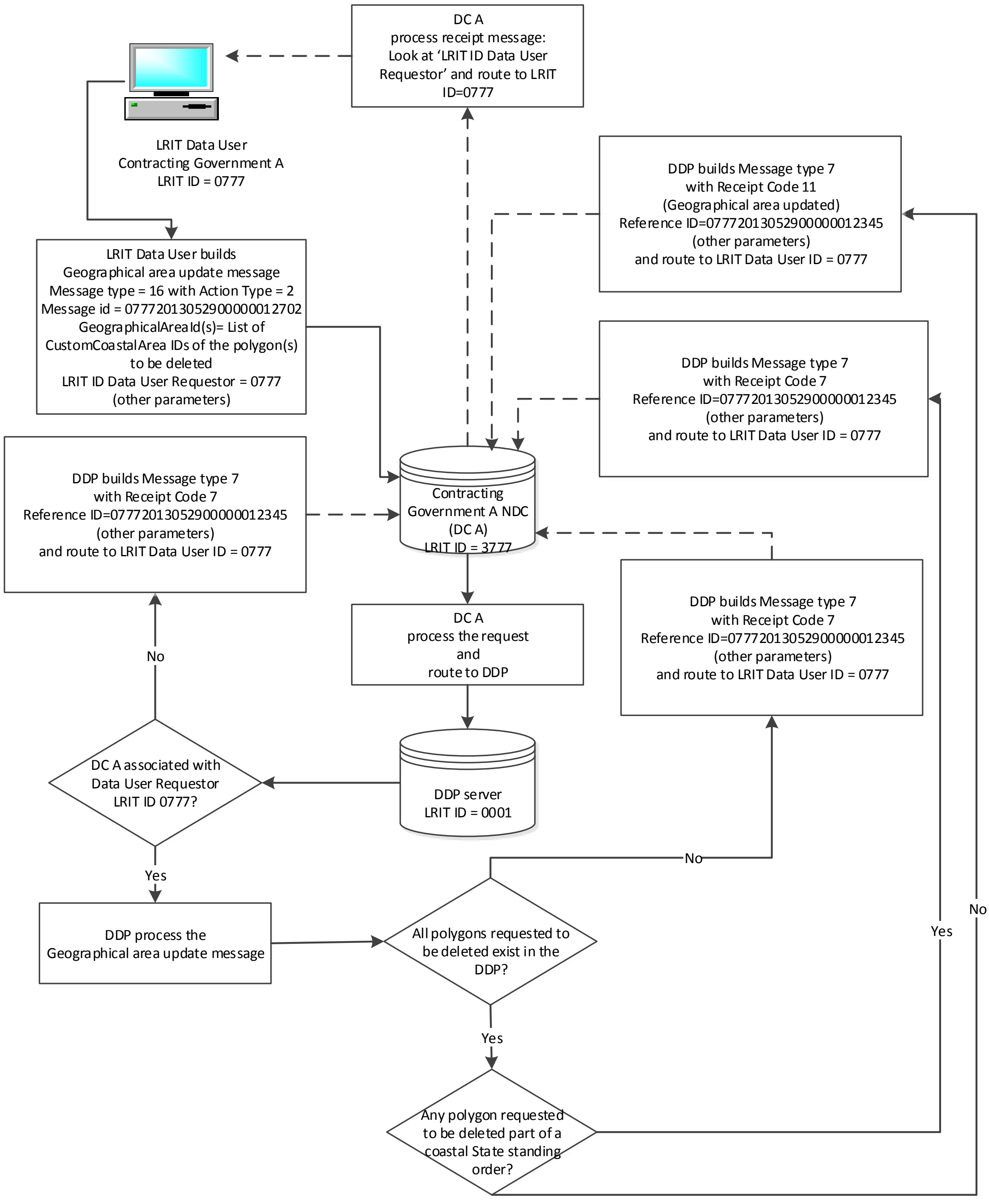
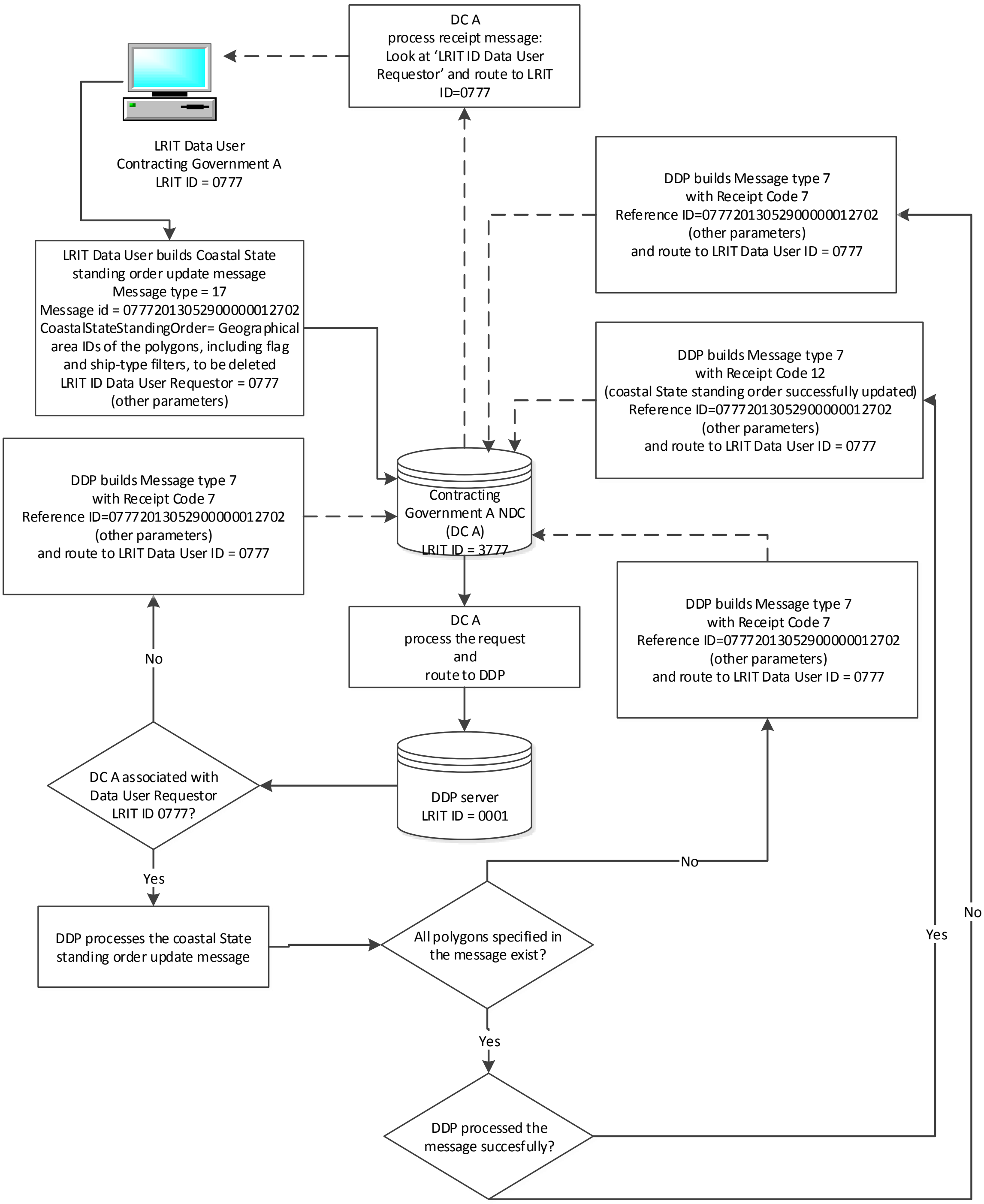


Figure 13
Message flow example for updating coastal State standing order (Message 17) and Receipt message (Message 7)



MSC.1/Circ.1259/Rev.6, annex, annex 4

33 Subparagraph .3 of paragraph 2.4 is amended as follows:

".3 Coastal State standing orders, including filtering by flag and ship type, where the geographical areas to be monitored have already been implemented by DCs. (Note that geographical areas, including custom coastal State areas, are *regular* DDP information, and generally take 24 h[6] after publishing to be implemented by recipient components);"

34 Paragraph 4.1 is amended as follows:

"4.1 DDP information on geographical areas may be uploaded by each Contracting Government to the DDP server, as polygons representing: (1) the water landward of baselines (referred to as *InternalWaters*); (2) the territorial sea (referred to as *TerritorialSea*); (3) 1,000 nautical miles area (referred to as *SeawardAreaOf1000NM*); and (4) other custom definitions of geographical areas within the 1,000 nautical miles area (referred to as *CustomCoastalAreas*), which may be used for the purposes of the coastal State standing order. The geographical areas can be uploaded by using the web interface of the DDP server, or via the DC serving the Contracting Government using *Message Type 16.*"

35 In paragraph 6.7, two new subparagraphs are added after subparagraph .5 as follows:

".6 *Geographical Area Update* (received only) – GeographicalAreaUpdate messages may be sent by the LRIT Data User at any time in order to upload or delete custom coastal areas of the Contracting Government.

.7 *Coastal State standing order update* (received only) – CoastalStateStandingOrderUpdate messages may be sent by the LRIT Data User at any time in order to update the Coastal State Standing order of the Contracting Government."

MSC.1/Circ.1259/Rev.6, annex, annex 6

36 The chapeau of the annex is amended as follows:

Annex 6

XML SCHEMAS

LRIT XML Resources ReadMe file
================================
Release Version: ~~**1.3**~~ **2.0**
Release Date: ~~07 December 2010~~ 22 October 2014
================================

37 Sections with headings "XSDs" and "WSDLs" are amended as follows:

"XSDs

File	File Version	Date
CoastalStateStandingOrderUpdateRequest.xsd	2.0	22 Oct 2014
DDP.xsd	~~1.2~~ 2.0	~~24 Oct 2008~~ 22 Oct 2014
DDPNotification.xsd	~~1.0~~ 2.0	~~22 Aug 2008~~ 22 Oct 2014
DDPRequest.xsd	~~1.1~~ 2.0	~~24 Oct 2008~~ 22 Oct 2014
DDPUpdate.xsd	~~1.1~~ 2.0	~~24 Sept 2008~~ 22 Oct 2014
GeographicalAreaUpdateRequest.xsd	2.0	22 Oct 2014
JournalReport.xsd	~~1.0~~ 2.0	~~22 Aug 2008~~ 22 Oct 2014
~~PricingFile.xsd~~	~~1.0~~	~~22 Aug 2008~~
~~PricingNotification.xsd~~	~~1.0~~	~~22 Aug 2008~~
~~PricingRequest.xsd~~	~~1.1~~	~~24 Oct 2008~~
~~PricingUpdate.xsd~~	~~1.1~~	~~24 Oct 2008~~
LritMessageLog.xsd	2.0	22 Oct 2014
Receipt.xsd	~~1.0~~ 2.0	~~22 Aug 2008~~ 22 Oct 2014
~~SARSURPICRequest.xsd~~	~~1.1~~	~~24 Oct 2008~~
ShipPositionReport.xsd	~~1.1~~ 2.0	~~24 Sept 2008~~ 22 Oct 2014
ShipPositionRequest.xsd	~~1.0~~ 2.0	~~22 Aug 2008~~ 22 Oct 2014
SURPICRequest.xsd	2.0	22 Oct 2014
SystemStatus.xsd	~~1.0~~ 2.0	~~22 Aug 2008~~ 22 Oct 2014
Types.xsd	~~1.2~~ 2.0	~~07 Dec 2010~~ 22 Oct 2014

WSDLs

File	File Version	Date
DC.wsdl	~~1.0~~ 2.0	~~22 Aug 2008~~ 22 Oct 2014
DDP.wsdl	~~1.0~~ 2.0	~~22 Aug 2008~~ 22 Oct 2014
IDE-DC.wsdl	~~1.0~~ 2.0	~~22 Aug 2008~~ 22 Oct 2014
IDE-DDP.wsdl	~~1.0~~ 2.0	~~22 Aug 2008~~ 22 Oct 2014"

38 The second paragraph under "Note" after the section with the heading "WSDLs" is amended as follows:

"Each file in this set has its own **File Version** number to track changes to that file, independently of the **Release Version** and other files within the set. This number is not used in any LRIT SOAP message."

39 The following text is added under "Changelog" after the log for "07 Dec 2010 – **Release Version 1.3**":

"22 Oct 2014 - **Release Version 2.0**
================================
* Added CoastalStateStandingOrderUpdate.xsd

* Updated DC.wsdl:
  - Renamed SARSURPIC to SURPIC
  - Deleted import of DDPRequest namespace (not used and should not have been in this WSDL)
  - Deleted all references to obsolete pricing-related functionality

* Updated DDP.wsdl:
    - Added namespace and binding for GeographicalAreaUpdate request
    - Added namespace and binding for CoastalStateStandingOrderUpdate request

* Updated DDP.xsd:
    - Using new definition of coastalStateStandingOrderType (defined in Types.xsd)
    - Updated schema version to 2.0
* Updated DDPNotification.xsd:
    - Updated schema version to 2.0

* Updated DDPRequest.xsd:
    - Updated schema version to 2.0

* Updated DDPUpdate.xsd:
    - Updated schema version to 2.0

* Added GeographicalAreaUpdate.xsd

* Updated IDE-DC.wsdl:
    - Changed SARSURPIC to SURPIC
    - Added namespace and binding for GeographicalAreaUpdate request
    - Deleted all references to obsolete pricing-related functionality

* Updated JournalReport.xsd:
    - Schema version set to 2.0

* Updated LritMessageLog.xsd (and included this file in the archive for the first time):
    - Changed SARSURPIC to SURPIC
    - Deleted all references to obsolete pricing-related functionality
    - Updated schema version to 2.0

* Deleted PricingFile.xsd

* Deleted PricingNotification.xsd

* Deleted PricingRequest.xsd

* Deleted PricingUpdate.xsd

* Updated Receipt.xsd:
    - Added new ReceiptCodes relating to geographical area update and coastal state standing order update
    - Updated schema version to 2.0

* Deleted SARSURPICRequest.xsd (succeeded by SURPICRequest.xsd)

* Updated ShipPositionReport.xsd:
    - Added ShipType as an element of LRIT information to be sent
    - Updated schema version to 2.0

* Updated ShipPositionRequest.xsd:
    - Schema version set to 2.0

* Added SURPICRequest.xsd (supercedes SARSURPICRequest.xsd)

* Updated SystemStatus.xsd:
  - Updated schema version to 2.0
* Updated Types.xsd:
  - Refactored common types relating to geographical area update and coastal state standing order update messages
  - Removed pricing-related type declarations: pricingVersionNumType; percentageValueType (this was not referenced in any XSD or WSDL); priceValueType; currencyType
  - Updated schema version to 2.0"

40 The entire text in the rest of the annex after "XSD files" (XML schemas) is replaced with the following text:

"XSD files

CoastalStateStandingOrderUpdate.xsd file


```
<!--
	File:			CoastalStateStandingOrderUpdate.xsd
	File Version:	2.0
	Date:			22 Oct 2014
-->
<xs:schema
	version="2.0"
	targetNamespace="http://gisis.imo.org/XML/LRIT/coastalStateStandingOrderUpdate/2014"
	xmlns="http://gisis.imo.org/XML/LRIT/coastalStateStandingOrderUpdate/2014"
	xmlns:xs="http://www.w3.org/2001/XMLSchema"
	xmlns:lrit="http://gisis.imo.org/XML/LRIT/types/2008"
	xmlns:xmime="http://www.w3.org/2005/05/xmlmime"
	elementFormDefault="qualified">

	<xs:import namespace="http://gisis.imo.org/XML/LRIT/types/2008"
schemaLocation="Types.xsd"/>

	<xs:simpleType name="messageTypeType">
		<xs:restriction base="xs:integer">
			<xs:enumeration value="17"/>
		</xs:restriction>
	</xs:simpleType>
	<xs:element name="CoastalStateStandingOrderUpdate">
		<xs:complexType>
			<xs:sequence>
				<xs:element name="MessageType"
type="messageTypeType"/>
				<xs:element name="MessageId" type="lrit:msgIDType"/>
				<xs:element name="CoastalStateStandingOrder"
type="lrit:coastalStateStandingOrderType"/>
				<xs:element name="DataUserRequestor"
type="lrit:lritIDType"/>
				<xs:element name="TimeStamp" type="xs:dateTime"/>
				<xs:element name="DDPVersionNum"
type="lrit:ddpVersionNumType"/>
			</xs:sequence>
			<xs:attribute name="test" type="lrit:testType" use="optional"
default="0"/>
			<xs:attribute name="schemaVersion" type="xs:decimal" use="required"/>
		</xs:complexType>
```

```
		</xs:element>
</xs:schema>
```

DDP.xsd file file

```
<!--
		File:			DDP.xsd
		File Version:	2.0
		Date:			22 Oct 2014
-->
<xs:schema
		version="2.0"
		targetNamespace="http://gisis.imo.org/XML/LRIT/ddp/2008"
		xmlns="http://gisis.imo.org/XML/LRIT/ddp/2008"
		xmlns:xs="http://www.w3.org/2001/XMLSchema"
		xmlns:lrit="http://gisis.imo.org/XML/LRIT/types/2008"
		elementFormDefault="qualified">

		<xs:import namespace="http://gisis.imo.org/XML/LRIT/types/2008"
schemaLocation="Types.xsd"/>

		<!-- Simple datatypes -->
		<xs:simpleType name="iso3166-1Alpha3CodeType">
			<xs:restriction base="xs:string">
				<xs:pattern value="[A-Z]{3}"/>
			</xs:restriction>
		</xs:simpleType>
		<xs:simpleType name="mmsiType">
			<xs:restriction base="xs:string">
				<xs:pattern value="[0-9]{9}"/>
			</xs:restriction>
		</xs:simpleType>
		<xs:simpleType name="contactIDType">
			<xs:restriction base="xs:string">
				<xs:pattern value="CPN1[0-9]{3}_[0-9]+"/>
				<xs:pattern value="CPDCINF1[0-9]{3}_[0-9]+"/>
				<xs:pattern value="CPASPINF1[0-9]{3}_[0-9]+"/>
				<xs:pattern value="CPSAR2[0-9]{3}_[0-9]+"/>
				<xs:pattern value="CPDC3[0-9]{3}_[0-9]+"/>
				<xs:pattern value="CPASP4[0-9]{3}_[0-9]+"/>
				<xs:pattern value="CPDDP0001_[0-9]+"/>
				<xs:pattern value="CPIDE0002_[0-9]+"/>
				<xs:pattern value="CPLC0003_[0-9]+"/>
			</xs:restriction>
		</xs:simpleType>
		<xs:simpleType name="dcInfoIDType">
			<xs:restriction base="xs:string">
				<xs:pattern value="DCINF1[0-9]{3}"/>
			</xs:restriction>
		</xs:simpleType>
		<xs:simpleType name="aspInfoIDType">
			<xs:restriction base="xs:string">
				<xs:pattern value="ASPINF1[0-9]{3}_[0-9]+"/>
			</xs:restriction>
		</xs:simpleType>
		<xs:simpleType name="exclusionIDType">
			<xs:restriction base="xs:string">
```

```
                        <xs:pattern value="EXCL1[0-9]{3}_[0-9]+"/>
                </xs:restriction>
        </xs:simpleType>
        <xs:simpleType name="sarFacilityTypeType">
                <xs:restriction base="xs:string">
                        <xs:enumeration value="RB"/>
                        <xs:enumeration value="RV"/>
                        <xs:enumeration value="SRG"/>
                        <xs:enumeration value="MRG"/>
                        <xs:enumeration value="LRG"/>
                        <xs:enumeration value="VLR"/>
                        <xs:enumeration value="ELR"/>
                        <xs:enumeration value="HEL-L"/>
                        <xs:enumeration value="HEL-M"/>
                        <xs:enumeration value="HEL-H"/>
                        <xs:enumeration value="GSU"/>
                        <xs:enumeration value="MAU"/>
                        <xs:enumeration value="UIU"/>
                        <xs:enumeration value="DUIU"/>
                        <xs:enumeration value="FFU"/>
                        <xs:enumeration value="IRU"/>
                </xs:restriction>
        </xs:simpleType>
        <xs:simpleType name="sarFacilityTypeListType">
                <xs:list itemType="sarFacilityTypeType"/>
        </xs:simpleType>
        <!-- Complex datatypes -->
        <xs:complexType name="contactPointType">
                <xs:sequence>
                        <xs:element name="Type">
                                <xs:simpleType>
                                        <xs:restriction base="xs:string">
                                                <xs:enumeration value="Primary"/>
                                                <xs:enumeration value="Alternate"/>
                                                <xs:enumeration value="Operational"/>
                                        </xs:restriction>
                                </xs:simpleType>
                        </xs:element>
                        <xs:element name="Title" type="xs:string" minOccurs="0"/>
                        <xs:element name="FirstName" type="xs:string" minOccurs="0"/>
                        <xs:element name="LastName" type="xs:string" minOccurs="0"/>
                        <xs:element name="Department" type="xs:string" minOccurs="0"/>
                        <xs:element name="Position" type="xs:string" minOccurs="0"/>
                        <xs:element name="AddressLine1" type="xs:string" minOccurs="0"/>
                        <xs:element name="AddressLine2" type="xs:string" minOccurs="0"/>
                        <xs:element name="AddressLine3" type="xs:string" minOccurs="0"/>
                        <xs:element name="AddressCity" type="xs:string" minOccurs="0"/>
                        <xs:element name="AddressPostcode" type="xs:string" minOccurs="0"/>
                        <xs:element name="AddressState" type="xs:string" minOccurs="0"/>
                        <xs:element name="AddressCountry" type="xs:string" minOccurs="0"/>
                        <xs:element name="Telephone" type="xs:string" minOccurs="0"
maxOccurs="unbounded"/>
                        <xs:element name="Fax" type="xs:string" minOccurs="0"
maxOccurs="unbounded"/>
```

```
						<xs:element name="Email" type="xs:string" minOccurs="0"
maxOccurs="unbounded"/>
						<xs:element name="Website" type="xs:anyURI" minOccurs="0"
maxOccurs="unbounded"/>
				</xs:sequence>
				<xs:attribute name="contactID" type="contactIDType" use="required"/>
		</xs:complexType>
		<xs:complexType name="dataCentreType">
				<xs:sequence>
						<xs:element name="Type">
								<xs:simpleType>
										<xs:restriction base="xs:string">
												<xs:enumeration value="International"/>
												<xs:enumeration value="National"/>
												<xs:enumeration value="Regional"/>
												<xs:enumeration value="Cooperative"/>
										</xs:restriction>
								</xs:simpleType>
						</xs:element>
						<xs:element name="Name" type="xs:string"/>
						<xs:element name="IDEInterfaceWebServiceLocation"
type="xs:anyURI"/>
						<xs:element name="DDPInterfaceWebServiceLocation"
type="xs:anyURI"/>
						<xs:element name="ContactPoint" type="contactPointType"
minOccurs="0" maxOccurs="unbounded"/>
						<xs:element name="AdditionalInformation" type="xs:string"
minOccurs="0"/>
				</xs:sequence>
				<xs:attribute name="lritID" type="lrit:dataCentreLRITIDType"/>
		</xs:complexType>
		<xs:complexType name="aspType">
				<xs:sequence>
						<xs:element name="Name" type="xs:string"/>
				</xs:sequence>
				<xs:attribute name="lritID" type="lrit:aspLRITIDType"/>
		</xs:complexType>
		<xs:complexType name="dataCentreInfoType">
				<xs:sequence>
						<xs:element name="DataCentreID" type="lrit:dataCentreLRITIDType"/>
						<xs:element name="ContactPoint" type="contactPointType"
minOccurs="0" maxOccurs="unbounded"/>
				</xs:sequence>
				<xs:attribute name="dcInfoID" type="dcInfoIDType" use="required"/>
		</xs:complexType>
		<xs:complexType name="sarServiceType">
				<xs:sequence>
						<xs:element name="Name" type="xs:string"/>
						<xs:element name="MMSI" type="mmsiType" minOccurs="0"/>
						<xs:element name="CallSign" type="xs:string" minOccurs="0"/>
						<xs:element name="VHFVoiceCallSign" type="xs:string"
minOccurs="0"/>
						<xs:element name="Telephone" type="xs:string" minOccurs="0"
maxOccurs="unbounded"/>
```

```
						<xs:element name="Fax" type="xs:string" minOccurs="0"
maxOccurs="unbounded"/>
						<xs:element name="Email" type="xs:string" minOccurs="0"
maxOccurs="unbounded"/>
						<xs:element name="Telex" type="xs:string" minOccurs="0"
maxOccurs="unbounded"/>
						<xs:element name="OtherLandlineComms" type="xs:string"
minOccurs="0"/>
						<xs:element name="AvailableFacilities" type="sarFacilityTypeListType"
minOccurs="0"/>
						<xs:element name="ContactPoint" type="contactPointType"
minOccurs="0" maxOccurs="unbounded"/>
				</xs:sequence>
				<xs:attribute name="lritID" type="lrit:sarServiceLRITIDType" use="required"/>
		</xs:complexType>
		<xs:complexType name="aspInfoType">
				<xs:sequence>
						<xs:element name="ASPID" type="lrit:aspLRITIDType"/>
						<xs:element name="Conditions" type="xs:string" minOccurs="0"/>
						<xs:element name="ContactPoint" type="contactPointType"
minOccurs="0" maxOccurs="unbounded"/>
				</xs:sequence>
				<xs:attribute name="aspInfoID" type="aspInfoIDType" use="required"/>
		</xs:complexType>
		<xs:complexType name="placeType">
				<xs:sequence>
						<xs:element name="Name" type="xs:string"/>
						<xs:element name="Position" type="lrit:posType"/>
				</xs:sequence>
				<xs:attribute name="placeCode" type="lrit:placeCodeType" use="required"/>
		</xs:complexType>
		<xs:complexType name="portFacilityType">
				<xs:sequence>
						<xs:element name="Name" type="xs:string"/>
						<xs:element name="Position" type="lrit:posType"/>
				</xs:sequence>
				<xs:attribute name="imoPortFacilityNumber"
type="lrit:imoPortFacilityNumberType" use="required"/>
		</xs:complexType>
		<xs:complexType name="portType">
				<xs:sequence>
						<xs:element name="Name" type="xs:string"/>
						<xs:element name="Position" type="lrit:posType"/>
				</xs:sequence>
				<xs:attribute name="locode" type="lrit:locodeType" use="required"/>
		</xs:complexType>
		<xs:complexType name="exclusionType">
				<xs:sequence>
						<xs:element name="ExcludedContractingGovernmentID"
type="lrit:contractingGovernmentLRITIDType"/>
						<xs:element name="From" type="xs:dateTime" minOccurs="0"/>
						<xs:element name="Until" type="xs:dateTime" minOccurs="0"/>
						<xs:element name="Reason" type="xs:string" minOccurs="0"/>
				</xs:sequence>
```

```
                <xs:attribute name="contractingGovernmentID"
type="lrit:contractingGovernmentLRITIDType" use="required"/>
                <xs:attribute name="exclusionID" type="exclusionIDType" use="required"/>
        </xs:complexType>
        <xs:complexType name="ddpServerType">
                <xs:sequence>
                        <xs:element name="Name" type="xs:string"/>
                        <xs:element name="WebServiceLocation" type="xs:anyURI"/>
                        <xs:element name="ContactPoint" type="contactPointType"
maxOccurs="unbounded"/>
                        <xs:element name="AdditionalInformation" type="xs:string"
minOccurs="0"/>
                </xs:sequence>
                <xs:attribute name="lritID" type="lrit:ddpServerLRITIDType"/>
        </xs:complexType>
        <xs:complexType name="ideType">
                <xs:sequence>
                        <xs:element name="Name" type="xs:string"/>
                        <xs:element name="DCInterfaceWebServiceLocation"
type="xs:anyURI"/>
                        <xs:element name="DDPInterfaceWebServiceLocation"
type="xs:anyURI"/>
                        <xs:element name="ContactPoint" type="contactPointType"
maxOccurs="unbounded"/>
                        <xs:element name="AdditionalInformation" type="xs:string"
minOccurs="0"/>
                </xs:sequence>
                <xs:attribute name="lritID" type="lrit:ideLRITIDType"/>
        </xs:complexType>
        <xs:complexType name="lritCoordinatorType">
                <xs:sequence>
                        <xs:element name="Name" type="xs:string"/>
                        <xs:element name="ContactPoint" type="contactPointType"
maxOccurs="unbounded"/>
                        <xs:element name="AdditionalInformation" type="xs:string"
minOccurs="0"/>
                </xs:sequence>
                <xs:attribute name="lritID" type="lrit:lritCoordinatorLRITIDType"/>
        </xs:complexType>
        <!-- Incremental datatypes -->
        <xs:complexType name="regularIncrementableType">
                <xs:choice>
                        <xs:element name="ContractingGovernment"
type="contractingGovernmentType"/>
                        <xs:element name="Territory" type="territoryType"/>
                        <xs:element name="ContactPoint" type="contactPointType"/>
                        <xs:element name="ASPInfo" type="aspInfoType"/>
                        <xs:element name="SARService" type="sarServiceType"/>
                        <xs:element name="Port" type="portType"/>
                        <xs:element name="PortFacility" type="portFacilityType"/>
                        <xs:element name="Place" type="placeType"/>
                        <xs:element name="Polygon" type="lrit:polygonType"/>
                        <xs:element name="DataCentreInfo" type="dataCentreInfoType"/>
                        <xs:element name="ASP" type="aspType"/>
                        <xs:element name="LRITCoordinator" type="lritCoordinatorType"/>
```

```
			</xs:choice>
			<xs:attribute name="xPath" type="xs:string" use="required"/>
		</xs:complexType>
		<xs:complexType name="immediateIncrementableType">
			<xs:choice>
				<xs:element name="StandingOrder" type="lrit:coastalStateStandingOrderType"/>
				<xs:element name="Exclusion" type="exclusionType"/>
				<xs:element name="DataCentre" type="dataCentreType"/>
				<xs:element name="DDPServer" type="ddpServerType"/>
				<xs:element name="IDE" type="ideType"/>
			</xs:choice>
			<xs:attribute name="xPath" type="xs:string" use="required"/>
		</xs:complexType>
		<!-- Root-element datatypes -->
		<xs:complexType name="contractingGovernmentType">
			<xs:sequence>
				<xs:element name="Name">
					<xs:complexType>
						<xs:simpleContent>
							<xs:extension base="xs:string">
								<xs:attribute name="isoCode" type="iso3166-1Alpha3CodeType"/>
							</xs:extension>
						</xs:simpleContent>
					</xs:complexType>
				</xs:element>
				<xs:element name="NationalPointsOfContact">
					<xs:complexType>
						<xs:sequence>
							<xs:element name="ContactPoint" type="contactPointType" minOccurs="0" maxOccurs="unbounded"/>
						</xs:sequence>
					</xs:complexType>
				</xs:element>
				<xs:element name="DataCentreInfo" type="dataCentreInfoType"/>
				<xs:element name="ASPInfo" type="aspInfoType" minOccurs="0" maxOccurs="unbounded"/>
				<xs:element name="SARServices">
					<xs:complexType>
						<xs:sequence>
							<xs:element name="SARService" type="sarServiceType" minOccurs="0" maxOccurs="unbounded"/>
						</xs:sequence>
					</xs:complexType>
				</xs:element>
				<xs:element name="Ports">
					<xs:complexType>
						<xs:sequence>
							<xs:element name="Port" type="portType" minOccurs="0" maxOccurs="unbounded"/>
						</xs:sequence>
					</xs:complexType>
				</xs:element>
				<xs:element name="PortFacilities">
					<xs:complexType>
						<xs:sequence>
```

```
                                    <xs:element name="PortFacility"
type="portFacilityType" minOccurs="0" maxOccurs="unbounded"/>
                              </xs:sequence>
                        </xs:complexType>
                  </xs:element>
                  <xs:element name="Places">
                        <xs:complexType>
                              <xs:sequence>
                                    <xs:element name="Place"
type="placeType" minOccurs="0" maxOccurs="unbounded"/>
                              </xs:sequence>
                        </xs:complexType>
                  </xs:element>
                  <xs:element name="InternalWaters">
                        <xs:complexType>
                              <xs:sequence>
                                    <xs:element name="Polygon"
type="lrit:polygonType" minOccurs="0" maxOccurs="unbounded"/>
                              </xs:sequence>
                        </xs:complexType>
                  </xs:element>
                  <xs:element name="TerritorialSea">
                        <xs:complexType>
                              <xs:sequence>
                                    <xs:element name="Polygon"
type="lrit:polygonType" minOccurs="0" maxOccurs="unbounded"/>
                              </xs:sequence>
                        </xs:complexType>
                  </xs:element>
                  <xs:element name="SeawardAreaOf1000NM">
                        <xs:complexType>
                              <xs:sequence>
                                    <xs:element name="Polygon"
type="lrit:polygonType" minOccurs="0" maxOccurs="unbounded"/>
                              </xs:sequence>
                        </xs:complexType>
                  </xs:element>
                  <xs:element name="CustomCoastalAreas">
                        <xs:complexType>
                              <xs:sequence>
                                    <xs:element name="Polygon"
type="lrit:polygonType" minOccurs="0" maxOccurs="unbounded"/>
                              </xs:sequence>
                        </xs:complexType>
                  </xs:element>
            </xs:sequence>
            <xs:attribute name="lritID" type="lrit:contractingGovernmentLRITIDType"
use="required"/>
      </xs:complexType>
      <xs:complexType name="territoryType">
            <xs:complexContent>
                  <xs:extension base="contractingGovernmentType">
                        <xs:attribute name="contractingGovernmentID"
type="lrit:contractingGovernmentLRITIDType" use="required"/>
                  </xs:extension>
            </xs:complexContent>
      </xs:complexType>
```

```
			<!-- Root elements -->
			<xs:element name="DataDistributionPlan">
				<xs:complexType>
					<xs:sequence>
						<xs:element name="ContractingGovernment"
type="contractingGovernmentType" minOccurs="0" maxOccurs="unbounded"/>
						<xs:element name="Territory" type="territoryType"
minOccurs="0" maxOccurs="unbounded"/>
						<xs:element name="CoastalStateStandingOrders">
							<xs:complexType>
								<xs:sequence>
									<xs:element
name="StandingOrder" type="lrit:coastalStateStandingOrderType" minOccurs="0"
maxOccurs="unbounded"/>
								</xs:sequence>
							</xs:complexType>
						</xs:element>
						<xs:element name="Exclusions">
							<xs:complexType>
								<xs:sequence>
									<xs:element name="Exclusion"
type="exclusionType" minOccurs="0" maxOccurs="unbounded"/>
								</xs:sequence>
							</xs:complexType>
						</xs:element>
						<xs:element name="DataCentres">
							<xs:complexType>
								<xs:sequence>
									<xs:element name="DataCentre"
type="dataCentreType" minOccurs="0" maxOccurs="unbounded"/>
								</xs:sequence>
							</xs:complexType>
						</xs:element>
						<xs:element name="ASPs">
							<xs:complexType>
								<xs:sequence>
									<xs:element name="ASP"
type="aspType" minOccurs="0" maxOccurs="unbounded"/>
								</xs:sequence>
							</xs:complexType>
						</xs:element>
						<xs:element name="DDPServer" type="ddpServerType"/>
						<xs:element name="IDE" type="ideType"/>
						<xs:element name="LRITCoordinator"
type="lritCoordinatorType"/>
					</xs:sequence>
					<xs:attribute name="versionNum" type="lrit:ddpVersionNumType"
use="required"/>
					<xs:attribute name="regularVersionPublishedAt" type="xs:dateTime"
use="required"/>
					<xs:attribute name="regularVersionImplementationAt"
type="xs:dateTime" use="required"/>
					<xs:attribute name="immediateVersionPublishedAt" type="xs:dateTime"
use="required"/>
					<xs:attribute name="immediateVersionImplementationAt"
type="xs:dateTime" use="required"/>
```

```
                        <xs:attribute name="schemaVersion" type="xs:decimal" use="required"/>
                    </xs:complexType>
                </xs:element>
                <xs:element name="DataDistributionPlan-IncrementalUpdate">
                    <xs:complexType>
                        <xs:sequence>
                            <xs:element name="Regular" minOccurs="0"
maxOccurs="unbounded">
                                <xs:complexType>
                                    <xs:choice minOccurs="0"
maxOccurs="unbounded">
                                        <xs:element name="Delete"
type="regularIncrementableType"/>
                                        <xs:element name="Insert"
type="regularIncrementableType"/>
                                        <xs:element name="Update"
type="regularIncrementableType"/>
                                    </xs:choice>
                                    <xs:attribute
name="baseRegularVersionNum" type="xs:int" use="required"/>
                                    <xs:attribute
name="targetRegularVersionNum" type="xs:int" use="required"/>
                                    <xs:attribute name="targetPublishedAt"
type="xs:dateTime" use="required"/>
                                    <xs:attribute
name="targetImplementationAt" type="xs:dateTime" use="required"/>
                                </xs:complexType>
                            </xs:element>
                            <xs:element name="Immediate" minOccurs="0"
maxOccurs="unbounded">
                                <xs:complexType>
                                    <xs:choice minOccurs="0"
maxOccurs="unbounded">
                                        <xs:element name="Delete"
type="immediateIncrementableType"/>
                                        <xs:element name="Insert"
type="immediateIncrementableType"/>
                                        <xs:element name="Update"
type="immediateIncrementableType"/>
                                    </xs:choice>
                                    <xs:attribute
name="baseImmediateVersionNum" type="xs:int" use="required"/>
                                    <xs:attribute
name="targetImmediateVersionNum" type="xs:int" use="required"/>
                                    <xs:attribute name="targetPublishedAt"
type="xs:dateTime" use="required"/>
                                    <xs:attribute
name="targetImplementationAt" type="xs:dateTime" use="required"/>
                                </xs:complexType>
                            </xs:element>
                        </xs:sequence>
                        <xs:attribute name="baseRegularVersionNum"
type="lrit:ddpIncrementalVersionNumType"/>
                        <xs:attribute name="targetRegularVersionNum"
type="lrit:ddpIncrementalVersionNumType"/>
```

```
                <xs:attribute name="baseImmediateVersionNum"
type="lrit:ddpIncrementalVersionNumType"/>
                <xs:attribute name="targetImmediateVersionNum"
type="lrit:ddpIncrementalVersionNumType"/>
                <xs:attribute name="schemaVersion" type="xs:decimal" use="required"/>
            </xs:complexType>
        </xs:element>
</xs:schema>
```

DDPNotification.xsd file

```
<!--
        File:           DDPNotification.xsd
        File Version:   2.0
        Date:           22 Oct 2014
-->
<xs:schema
        version="2.0"
        targetNamespace="http://gisis.imo.org/XML/LRIT/ddpNotification/2008"
        xmlns="http://gisis.imo.org/XML/LRIT/ddpNotification/2008"
        xmlns:xs="http://www.w3.org/2001/XMLSchema"
        xmlns:lrit="http://gisis.imo.org/XML/LRIT/types/2008"
        elementFormDefault="qualified">

        <xs:import namespace="http://gisis.imo.org/XML/LRIT/types/2008"
schemaLocation="Types.xsd"/>

        <xs:simpleType name="messageTypeType">
            <xs:restriction base="xs:integer">
                <xs:enumeration value="8"/>
            </xs:restriction>
        </xs:simpleType>

        <xs:element name="DDPNotification" type="DDPNotificationType"/>
        <xs:complexType name="DDPNotificationType">
            <xs:sequence>
                <xs:element name="MessageType" type="messageTypeType"/>
                <xs:element name="MessageId" type="lrit:msgIDType"/>
                <xs:element name="UpdateType">
                    <xs:simpleType>
                        <xs:restriction base="xs:integer">
                            <xs:enumeration value="0"/>
                            <xs:enumeration value="1"/>
                        </xs:restriction>
                    </xs:simpleType>
                </xs:element>
                <xs:element name="Message" type="lrit:messageType"/>
                <xs:element name="TimeStamp" type="xs:dateTime"/>
                <xs:element name="NewVersionNum"
type="lrit:ddpIncrementalVersionNumType"/>
            </xs:sequence>
            <xs:attribute name="test" type="lrit:testType" use="optional" default="0"/>
            <xs:attribute name="schemaVersion" type="xs:decimal" use="required"/>
        </xs:complexType>
</xs:schema>
```

DDPRequest.xsd file

```
<!--
	File:			DDPRequest.xsd
	File Version:		2.0
	Date:			22 Oct 2014
-->
<xs:schema
	version="2.0"
	targetNamespace="http://gisis.imo.org/XML/LRIT/ddpRequest/2008"
	xmlns="http://gisis.imo.org/XML/LRIT/ddpRequest/2008"
	xmlns:xs="http://www.w3.org/2001/XMLSchema"
	xmlns:lrit="http://gisis.imo.org/XML/LRIT/types/2008"
	elementFormDefault="qualified">

	<xs:import namespace="http://gisis.imo.org/XML/LRIT/types/2008"
schemaLocation="Types.xsd"/>

	<xs:simpleType name="messageTypeType">
		<xs:restriction base="xs:integer">
			<xs:enumeration value="9"/>
		</xs:restriction>
	</xs:simpleType>

	<xs:element name="DDPRequest" type="DDPRequestType"/>
	<xs:complexType name="DDPRequestType">
		<xs:sequence>
			<xs:element name="MessageType" type="messageTypeType"/>
			<xs:element name="MessageId" type="lrit:msgIDType"/>
			<xs:element name="ReferenceId" type="lrit:refIDType"/>
			<xs:element name="UpdateType">
				<xs:simpleType>
					<xs:restriction base="xs:integer">
						<xs:enumeration value="0"/>
						<xs:enumeration value="1"/>
						<xs:enumeration value="2"/>
						<xs:enumeration value="3"/>
						<xs:enumeration value="4"/>
					</xs:restriction>
				</xs:simpleType>
			</xs:element>
			<xs:element name="ArchivedDDPVersionNum"
type="lrit:ddpVersionNumType" minOccurs="0"/>
			<xs:element name="ArchivedDDPTimeStamp" type="xs:dateTime"
minOccurs="0"/>
			<xs:element name="Originator" type="lrit:lritIDType"/>
			<xs:element name="TimeStamp" type="xs:dateTime"/>
			<xs:element name="DDPVersionNum" type="lrit:ddpVersionNumType"/>
		</xs:sequence>
		<xs:attribute name="test" type="lrit:testType" use="optional" default="0"/>
		<xs:attribute name="schemaVersion" type="xs:decimal" use="required"/>
	</xs:complexType>
</xs:schema>
```

DDPUpdate.xsd file

```
<!--
```

```xml
		File:			DDPUpdate.xsd
		File Version:	2.0
		Date:			22 Oct 2014
-->
<xs:schema
	version="2.0"
	targetNamespace="http://gisis.imo.org/XML/LRIT/ddpUpdate/2008"
	xmlns="http://gisis.imo.org/XML/LRIT/ddpUpdate/2008"
	xmlns:xs="http://www.w3.org/2001/XMLSchema"
	xmlns:lrit="http://gisis.imo.org/XML/LRIT/types/2008"
	xmlns:xmime="http://www.w3.org/2005/05/xmlmime"
	elementFormDefault="qualified">

	<xs:import namespace="http://gisis.imo.org/XML/LRIT/types/2008"
schemaLocation="Types.xsd"/>

	<xs:simpleType name="messageTypeType">
		<xs:restriction base="xs:integer">
			<xs:enumeration value="10"/>
		</xs:restriction>
	</xs:simpleType>

	<xs:element name="DDPUpdate" type="DDPUpdateType"/>
	<xs:complexType name="DDPUpdateType">
		<xs:sequence>
			<xs:element name="MessageType" type="messageTypeType"/>
			<xs:element name="MessageId" type="lrit:msgIDType"/>
			<xs:element name="ReferenceId" type="lrit:msgIDType"/>
			<xs:element name="UpdateType">
				<xs:simpleType>
					<xs:restriction base="xs:integer">
						<xs:enumeration value="0"/>
						<xs:enumeration value="1"/>
						<xs:enumeration value="2"/>
						<xs:enumeration value="3"/>
						<xs:enumeration value="4"/>
					</xs:restriction>
				</xs:simpleType>
			</xs:element>
			<xs:element name="Message" type="lrit:messageType"/>
			<xs:element name="TimeStamp" type="xs:dateTime"/>
			<xs:element name="DDPFileVersionNum"
type="lrit:ddpVersionNumOrIncrementalVersionType"/>
			<xs:element name="DDPFile" type="xs:base64Binary"
xmime:expectedContentTypes="application/zip"/>
		</xs:sequence>
		<xs:attribute name="test" type="lrit:testType" use="optional" default="0"/>
		<xs:attribute name="schemaVersion" type="xs:decimal" use="required"/>
	</xs:complexType>
</xs:schema>
```

GeographicalAreaUpdateRequest.xsd file

```
<!--
	File:			GeographicalAreaUpdate.xsd
	File Version:	2.0
	Date:			22 Oct 2014
-->
<xs:schema
	version="2.0"
	targetNamespace="http://gisis.imo.org/XML/LRIT/geographicalAreaUpdate/2014"
	xmlns="http://gisis.imo.org/XML/LRIT/geographicalAreaUpdate/2014"
	xmlns:xs="http://www.w3.org/2001/XMLSchema"
	xmlns:lrit="http://gisis.imo.org/XML/LRIT/types/2008"
	xmlns:xmime="http://www.w3.org/2005/05/xmlmime"
	elementFormDefault="qualified">

	<xs:import namespace="http://gisis.imo.org/XML/LRIT/types/2008"
schemaLocation="Types.xsd"/>

	<xs:simpleType name="messageTypeType">
		<xs:restriction base="xs:integer">
			<xs:enumeration value="16"/>
		</xs:restriction>
	</xs:simpleType>

	<xs:element name="GeographicalAreaUpdate">
		<xs:complexType>
			<xs:sequence>
				<xs:element name="MessageType"
type="messageTypeType"/>
				<xs:element name="MessageId" type="lrit:msgIDType"/>
				<xs:element name="ActionType">
					<xs:simpleType>
						<xs:restriction base="xs:integer">
							<xs:enumeration value="0"/>
							<xs:enumeration value="1"/>
							<xs:enumeration value="2"/>
						</xs:restriction>
					</xs:simpleType>
				</xs:element>
				<xs:element name="GMLFile" minOccurs="0"
type="xs:base64Binary" xmime:expectedContentTypes="application/zip"/>
				<xs:element name="AreaIDs">
					<xs:simpleType>
						<xs:list itemType="lrit:areaIDType"/>
					</xs:simpleType>
				</xs:element>
				<xs:element name="DataUserRequestor"
type="lrit:lritIDType"/>
				<xs:element name="TimeStamp" type="xs:dateTime"/>
				<xs:element name="DDPVersionNum"
type="lrit:ddpVersionNumType"/>
			</xs:sequence>
			<xs:attribute name="test" type="lrit:testType" use="optional"
default="0"/>
			<xs:attribute name="schemaVersion" type="xs:decimal" use="required"/>
```

```
                </xs:complexType>
        </xs:element>
</xs:schema>
```

JournalReport.xsd file

```
<!--
        File:           JournalReport.xsd
        File Version:   2.0
        Date:           22 Oct 2014
-->
<xs:schema
        version="2.0"
        targetNamespace="http://gisis.imo.org/XML/LRIT/journalReport/2008"
        xmlns="http://gisis.imo.org/XML/LRIT/journalReport/2008"
        xmlns:xs="http://www.w3.org/2001/XMLSchema"
        xmlns:lrit="http://gisis.imo.org/XML/LRIT/types/2008"
        xmlns:xmime="http://www.w3.org/2005/05/xmlmime"
        elementFormDefault="qualified">

        <xs:import namespace="http://gisis.imo.org/XML/LRIT/types/2008"
schemaLocation="Types.xsd"/>

        <xs:simpleType name="messageTypeType">
                <xs:restriction base="xs:integer">
                        <xs:enumeration value="12"/>
                </xs:restriction>
        </xs:simpleType>

        <xs:element name="JournalReport" type="JournalReportType"/>
        <xs:complexType name="JournalReportType">
                <xs:sequence>
                        <xs:element name="MessageType" type="messageTypeType"/>
                        <xs:element name="MessageId" type="lrit:msgIDType"/>
                        <xs:element name="Message" type="lrit:messageType"/>
                        <xs:element name="TimeStamp" type="xs:dateTime"/>
                        <xs:element name="Originator" type="lrit:lritIDType"/>
                        <xs:element name="JournalFile" type="xs:base64Binary"
xmime:expectedContentTypes="application/zip"/>
                        <xs:element name="DDPVersionNum" type="lrit:ddpVersionNumType"/>
                </xs:sequence>
                <xs:attribute name="test" type="lrit:testType" use="optional" default="0"/>
                <xs:attribute name="schemaVersion" type="xs:decimal" use="required"/>
        </xs:complexType>
</xs:schema>
```

LritMessageLog.xsd file

```
<!--
        File:           LritMessageLog.xsd
        File Version:   2.0
        Date:           22 Oct 2014
-->
<xs:schema
        version="2.0"
        targetNamespace="http://gisis.imo.org/XML/LRIT/2008"
        xmlns="http://gisis.imo.org/XML/LRIT/2008"
```

```xml
        xmlns:xs="http://www.w3.org/2001/XMLSchema"
        xmlns:posrep="http://gisis.imo.org/XML/LRIT/positionReport/2008"
        xmlns:posreq="http://gisis.imo.org/XML/LRIT/positionRequest/2008"
        xmlns:surpic="http://gisis.imo.org/XML/LRIT/surpicRequest/2014"
        xmlns:receipt="http://gisis.imo.org/XML/LRIT/receipt/2008"
        xmlns:systemStatus="http://gisis.imo.org/XML/LRIT/systemStatus/2008"
        xmlns:journalReport="http://gisis.imo.org/XML/LRIT/journalReport/2008"
        xmlns:ddpNotification="http://gisis.imo.org/XML/LRIT/ddpNotification/2008"
        xmlns:ddpRequest="http://gisis.imo.org/XML/LRIT/ddpRequest/2008"
        xmlns:ddpUpdate="http://gisis.imo.org/XML/LRIT/ddpUpdate/2008"
        xmlns:xmime="http://www.w3.org/2005/05/xmlmime"
        elementFormDefault="qualified">

        <xs:import namespace="http://gisis.imo.org/XML/LRIT/journalReport/2008"
schemaLocation="JournalReport.xsd"/>
        <xs:import namespace="http://gisis.imo.org/XML/LRIT/positionReport/2008"
schemaLocation="ShipPositionReport.xsd"/>
        <xs:import namespace="http://gisis.imo.org/XML/LRIT/positionRequest/2008"
schemaLocation="ShipPositionRequest.xsd"/>
        <xs:import namespace="http://gisis.imo.org/XML/LRIT/surpicRequest/2014"
schemaLocation="SURPICRequest.xsd"/>
        <xs:import namespace="http://gisis.imo.org/XML/LRIT/receipt/2008"
schemaLocation="Receipt.xsd"/>
        <xs:import namespace="http://gisis.imo.org/XML/LRIT/systemStatus/2008"
schemaLocation="SystemStatus.xsd"/>
        <xs:import namespace="http://gisis.imo.org/XML/LRIT/ddpNotification/2008"
schemaLocation="DDPNotification.xsd"/>
        <xs:import namespace="http://gisis.imo.org/XML/LRIT/ddpRequest/2008"
schemaLocation="DDPRequest.xsd"/>
        <xs:import namespace="http://gisis.imo.org/XML/LRIT/ddpUpdate/2008"
schemaLocation="DDPUpdate.xsd"/>

        <xs:complexType name="PositionReportLogType">
                <xs:sequence>
                        <xs:element ref="posrep:ShipPositionReport"/>
                </xs:sequence>
                <xs:attribute name="positionSent" type="xs:boolean" use="required"/>
        </xs:complexType>

        <xs:complexType name="LritMessageType">
                <xs:sequence>
                        <xs:element name="ReceivedTimestamp" type="xs:dateTime"
minOccurs="0"/>
                        <xs:element name="SentTimestamp" type="xs:dateTime"
minOccurs="0"/>
                        <xs:choice minOccurs="1" maxOccurs="1">
                                <xs:element name="PositionReport"
type="PositionReportLogType"/>
                                <xs:element ref="posreq:ShipPositionRequest"/>
                                <xs:element ref="surpic:SURPICRequest" />
                                <xs:element ref="receipt:Receipt" />
                                <xs:element ref="systemStatus:SystemStatus" />
                                <xs:element ref="journalReport:JournalReport" />
                                <xs:element ref="ddpUpdate:DDPUpdate" />
                                <xs:element ref="ddpRequest:DDPRequest" />
```

```
                                        <xs:element ref="ddpNotification:DDPNotification" />
                              </xs:choice>
                    </xs:sequence>
          </xs:complexType>

          <xs:complexType name="MessageLogType">
                    <xs:sequence>
                              <xs:element name="LritMessage" type="LritMessageType"
maxOccurs="unbounded" />
                    </xs:sequence>
          </xs:complexType>

          <xs:element name="LritMessageLog" type="MessageLogType" />

</xs:schema>
```

Receipt.xsd file

```
<!--
          File:                   Receipt.xsd
          File Version:           2.0
          Date:                   22 Oct 2014
-->
<xs:schema
          version="2.0"
          targetNamespace="http://gisis.imo.org/XML/LRIT/receipt/2008"
          xmlns="http://gisis.imo.org/XML/LRIT/receipt/2008"
          xmlns:xs="http://www.w3.org/2001/XMLSchema"
          xmlns:lrit="http://gisis.imo.org/XML/LRIT/types/2008"
          elementFormDefault="qualified">

          <xs:import namespace="http://gisis.imo.org/XML/LRIT/types/2008"
schemaLocation="Types.xsd"/>

          <xs:simpleType name="messageTypeType">
                    <xs:restriction base="xs:integer">
                              <xs:enumeration value="7"/>
                    </xs:restriction>
          </xs:simpleType>

          <xs:simpleType name="receiptCodeType">
                    <xs:restriction base="xs:integer">
                              <xs:enumeration value="0"/>
                              <xs:enumeration value="1"/>
                              <xs:enumeration value="2"/>
                              <xs:enumeration value="3"/>
                              <xs:enumeration value="4"/>
                              <xs:enumeration value="5"/>
                              <xs:enumeration value="6"/>
                              <xs:enumeration value="7"/>
                              <xs:enumeration value="8"/>
                              <xs:enumeration value="9"/>
                              <xs:enumeration value="10"/>
                              <xs:enumeration value="11"/>
                              <xs:enumeration value="12"/>
                              <xs:enumeration value="13"/>
```

```xml
			</xs:restriction>
		</xs:simpleType>

		<xs:element name="Receipt">
			<xs:complexType>
				<xs:sequence>
					<xs:element name="MessageType"
type="messageTypeType"/>
					<xs:element name="MessageId" type="lrit:msgIDType"/>
					<xs:element name="ReferenceId" type="lrit:refIDType"/>
					<xs:element name="ReceiptCode" type="receiptCodeType"/>
					<xs:element name="Destination" type="lrit:lritIDType"/>
					<xs:element name="Originator" type="lrit:lritIDType"/>
					<xs:element name="Message" type="lrit:messageType"/>
					<xs:element name="TimeStamp" type="xs:dateTime"/>
					<xs:element name="DDPVersionNum"
type="lrit:ddpVersionNumType"/>
				</xs:sequence>
				<xs:attribute name="test" type="lrit:testType" use="optional"
default="0"/>
				<xs:attribute name="schemaVersion" type="xs:decimal" use="required"/>
			</xs:complexType>
		</xs:element>
</xs:schema>
```

ShipPositionReport.xsd file

```xml
<!--
		File:			ShipPositionReport.xsd
		File Version:	2.0
		Date:			22 Oct 2014
-->
<xs:schema
		version="2.0"
		targetNamespace="http://gisis.imo.org/XML/LRIT/positionReport/2008"
		xmlns="http://gisis.imo.org/XML/LRIT/positionReport/2008"
		xmlns:xs="http://www.w3.org/2001/XMLSchema"
		xmlns:lrit="http://gisis.imo.org/XML/LRIT/types/2008"
		elementFormDefault="qualified">

		<xs:import namespace="http://gisis.imo.org/XML/LRIT/types/2008"
schemaLocation="Types.xsd"/>

		<xs:simpleType name="messageTypeType">
			<xs:restriction base="xs:integer">
				<xs:enumeration value="1"/>
				<xs:enumeration value="2"/>
				<xs:enumeration value="3"/>
			</xs:restriction>
		</xs:simpleType>

		<xs:element name="ShipPositionReport" type="ShipPositionReportType"/>
		<xs:complexType name="ShipPositionReportType">
			<xs:sequence>
				<xs:element name="Latitude" type="lrit:latitudeType"/>
				<xs:element name="Longitude" type="lrit:longitudeType"/>
```

```
                              <xs:element name="TimeStamp1" type="xs:dateTime"/>
                              <xs:element name="ShipborneEquipmentId" type="xs:string"/>
                              <xs:element name="ASPId" type="lrit:aspLRITIDType"/>
                              <xs:element name="CSPId" type="lrit:cspLRITIDType" minOccurs="0"/>
                              <xs:element name="MessageType" type="messageTypeType"/>
                              <xs:element name="MessageId" type="lrit:msgIDType"/>
                              <xs:element name="ReferenceId" type="lrit:refIDType"/>
                              <xs:element name="IMONum" type="lrit:imoNumType"/>
                              <xs:element name="MMSINum" type="lrit:mmsiNumType"
minOccurs="0"/>
                              <xs:element name="TimeStamp2" type="xs:dateTime"/>
                              <xs:element name="TimeStamp3" type="xs:dateTime"/>
                              <xs:element name="DCId" type="lrit:dataCentreLRITIDType"/>
                              <xs:element name="TimeStamp4" type="xs:dateTime"/>
                              <xs:element name="TimeStamp5" type="xs:dateTime"/>
                              <xs:element name="ResponseType" type="lrit:responseTypeType"/>
                              <xs:element name="DataUserRequestor" type="lrit:lritIDType"/>
                              <xs:element name="ShipName" type="lrit:shipNameType"
minOccurs="0"/>
                              <xs:element name="ShipType" type="lrit:shipTypeType"/>
                              <xs:element name="DataUserProvider" type="lrit:lritIDType"/>
                              <xs:element name="DDPVersionNum" type="lrit:ddpVersionNumType"/>
                    </xs:sequence>
                    <xs:attribute name="test" type="lrit:testType" use="optional" default="0"/>
                    <xs:attribute name="schemaVersion" type="xs:decimal" use="required"/>
          </xs:complexType>
</xs:schema>
```

ShipPositionRequest.xsd file

```
<!--
          File:               ShipPositionRequest.xsd
          File Version:       2.0
          Date:               22 Oct 2014
-->
<xs:schema
          version="2.0"
          targetNamespace="http://gisis.imo.org/XML/LRIT/positionRequest/2008"
          xmlns="http://gisis.imo.org/XML/LRIT/positionRequest/2008"
          xmlns:xs="http://www.w3.org/2001/XMLSchema"
          xmlns:lrit="http://gisis.imo.org/XML/LRIT/types/2008"
          elementFormDefault="qualified">

          <xs:import namespace="http://gisis.imo.org/XML/LRIT/types/2008"
schemaLocation="Types.xsd"/>

          <xs:simpleType name="messageTypeType">
                    <xs:restriction base="xs:integer">
                              <xs:enumeration value="4"/>
                              <xs:enumeration value="5"/>
                    </xs:restriction>
          </xs:simpleType>
          <xs:simpleType name="accessTypeType">
                    <xs:restriction base="xs:integer">
                              <xs:enumeration value="0"/>
                              <xs:enumeration value="1"/>
```

```
                    <xs:enumeration value="2"/>
                    <xs:enumeration value="3"/>
                    <xs:enumeration value="5"/>
                    <xs:enumeration value="6"/>
               </xs:restriction>
          </xs:simpleType>
          <xs:simpleType name="requestTypeType">
               <xs:restriction base="xs:integer">
                    <xs:enumeration value="0"/>
                    <xs:enumeration value="1"/>
                    <xs:enumeration value="2"/>
                    <xs:enumeration value="3"/>
                    <xs:enumeration value="4"/>
                    <xs:enumeration value="5"/>
                    <xs:enumeration value="6"/>
                    <xs:enumeration value="7"/>
                    <xs:enumeration value="8"/>
                    <xs:enumeration value="9"/>
                    <xs:enumeration value="10"/>
                    <xs:enumeration value="11"/>
               </xs:restriction>
          </xs:simpleType>

          <xs:complexType name="requestDurationType">
               <xs:attribute name="startTime" type="xs:dateTime" use="optional"/>
               <xs:attribute name="stopTime" type="xs:dateTime" use="optional"/>
          </xs:complexType>

          <xs:simpleType name="distanceType">
               <xs:restriction base="xs:integer">
                    <xs:minInclusive value="0"/>
                    <xs:maxInclusive value="9999"/>
               </xs:restriction>
          </xs:simpleType>

          <xs:element name="ShipPositionRequest" type="ShipPositionRequestType"/>

          <xs:complexType name="ShipPositionRequestType">
               <xs:sequence>
                    <xs:element name="MessageType" type="messageTypeType"/>
                    <xs:element name="MessageId" type="lrit:msgIDType"/>
                    <xs:element name="IMONum" type="lrit:imoNumType"/>
                    <xs:element name="DataUserProvider" type="lrit:lritIDType"/>
                    <xs:element name="AccessType" type="accessTypeType"/>
                    <xs:choice minOccurs="0">
                         <xs:element name="Port" type="lrit:locodeType"/>
                         <xs:element name="PortFacility"
type="lrit:imoPortFacilityNumberType"/>
                         <xs:element name="Place" type="lrit:placeCodeType"/>
                    </xs:choice>
                    <xs:element name="Distance" type="distanceType"/>
                    <xs:element name="RequestType" type="requestTypeType"/>
                    <xs:element name="RequestDuration" type="requestDurationType"
minOccurs="0"/>
                    <xs:element name="DataUserRequestor" type="lrit:lritIDType"/>
```

```xml
					<xs:element name="TimeStamp" type="xs:dateTime"/>
					<xs:element name="DDPVersionNum" type="lrit:ddpVersionNumType"/>
				</xs:sequence>
				<xs:attribute name="test" type="lrit:testType" use="optional" default="0"/>
				<xs:attribute name="schemaVersion" type="xs:decimal" use="required"/>
		</xs:complexType>
</xs:schema>
```

SURPICRequest.xsd file

```xml
<!--
		File:			SURPICRequest.xsd
		File Version:	2.0
		Date:			22 Oct 2014
-->
<xs:schema
		version="2.0"
		targetNamespace="http://gisis.imo.org/XML/LRIT/surpicRequest/2014"
		xmlns="http://gisis.imo.org/XML/LRIT/surpicRequest/2014"
		xmlns:xs="http://www.w3.org/2001/XMLSchema"
		xmlns:lrit="http://gisis.imo.org/XML/LRIT/types/2008"
		elementFormDefault="qualified">

		<xs:import namespace="http://gisis.imo.org/XML/LRIT/types/2008"
schemaLocation="Types.xsd"/>

		<xs:simpleType name="messageTypeType">
				<xs:restriction base="xs:integer">
					<xs:enumeration value="6"/>
				</xs:restriction>
		</xs:simpleType>

		<xs:simpleType name="accessTypeType">
				<xs:restriction base="xs:integer">
					<xs:enumeration value="1"/>
					<xs:enumeration value="6"/>
				</xs:restriction>
		</xs:simpleType>

		<xs:simpleType name="circularAreaType">
				<xs:restriction base="xs:string">
					<xs:pattern value="()|((([0-8][0-9]\.[0-5][0-
9]\.[nNsS])|(90\.00\.[nNsS])):(([0-1][0-7][0-9]\.[0-5][0-9]\.[eEwW])|([0][8-9][0-9]\.[0-5][0-
9]\.[eEwW])|(180\.00\.[eEwW])):([0-9]{3}))"/>
				</xs:restriction>
		</xs:simpleType>

		<xs:simpleType name="rectangularAreaType">
				<xs:restriction base="xs:string">
					<xs:pattern value="()|((([0-8][0-9]\.[0-5][0-9]\.[nNsS])|(90\.00\.[nNsS])):(([0-
1][0-7][0-9]\.[0-5][0-9]\.[eEwW])|([0][8-9][0-9]\.[0-5][0-9]\.[eEwW])|(180\.00\.[eEwW])):(([0-8][0-9]\.[0-
5][0-9]\.[nN])|(90\.00\.[nN])):(([0-1][0-7][0-9]\.[0-5][0-9]\.[eE])|([0][8-9][0-9]\.[0-5][0-
9]\.[eE])|(180\.00\.[eE]))"/>
				</xs:restriction>
		</xs:simpleType>

		<xs:simpleType name="numberOfPositionsType">
```

```
				<xs:restriction base="xs:integer">
					<xs:minInclusive value="1"/>
					<xs:maxInclusive value="4"/>
				</xs:restriction>
			</xs:simpleType>

			<xs:element name="SURPICRequest">
				<xs:complexType>
					<xs:sequence>
						<xs:element name="MessageType" type="messageTypeType"/>
						<xs:element name="MessageId" type="lrit:msgIDType"/>
						<xs:element name="AccessType" type="accessTypeType"/>
						<xs:element name="DataUserProvider" type="lrit:lritIDType" minOccurs="0"/>
						<xs:choice>
							<xs:element name="CircularArea" type="circularAreaType"/>
							<xs:element name="RectangularArea" type="rectangularAreaType"/>
						</xs:choice>
						<xs:element name="ShipTypes" minOccurs="0">
							<xs:simpleType>
								<xs:list itemType="lrit:shipTypeType"/>
							</xs:simpleType>
						</xs:element>
						<xs:element name="NumberOfPositions" type="numberOfPositionsType"/>
						<xs:element name="DataUserRequestor" type="lrit:lritIDType"/>
						<xs:element name="TimeStamp" type="xs:dateTime"/>
						<xs:element name="DDPVersionNum" type="lrit:ddpVersionNumType"/>
					</xs:sequence>
					<xs:attribute name="test" type="lrit:testType" use="optional" default="0"/>
					<xs:attribute name="schemaVersion" type="xs:decimal" use="required"/>
				</xs:complexType>
			</xs:element>
</xs:schema>
```

SystemStatus.xsd file

```
<!--
	File:			SystemStatus.xsd
	File Version:	2.0
	Date:			22 Oct 2014
-->
<xs:schema
	version="2.0"
	targetNamespace="http://gisis.imo.org/XML/LRIT/systemStatus/2008"
	xmlns="http://gisis.imo.org/XML/LRIT/systemStatus/2008"
	xmlns:xs="http://www.w3.org/2001/XMLSchema"
	xmlns:lrit="http://gisis.imo.org/XML/LRIT/types/2008"
	elementFormDefault="qualified">
```

```
	<xs:import namespace="http://gisis.imo.org/XML/LRIT/types/2008"
schemaLocation="Types.xsd"/>

	<xs:simpleType name="messageTypeType">
		<xs:restriction base="xs:integer">
			<xs:enumeration value="11"/>
		</xs:restriction>
	</xs:simpleType>
	<xs:simpleType name="systemStatusIndicatorType">
		<xs:restriction base="xs:integer">
			<xs:enumeration value="0"/>
			<xs:enumeration value="1"/>
		</xs:restriction>
	</xs:simpleType>

	<xs:element name="SystemStatus" type="SystemStatusType"/>
	<xs:complexType name="SystemStatusType">
		<xs:sequence>
			<xs:element name="MessageType" type="messageTypeType"/>
			<xs:element name="MessageId" type="lrit:msgIDType"/>
			<xs:element name="TimeStamp" type="xs:dateTime"/>
			<xs:element name="DDPVersionNum" type="lrit:ddpVersionNumType"/>
			<xs:element name="SystemStatus" type="systemStatusIndicatorType"/>
			<xs:element name="Message" type="lrit:messageType"/>
			<xs:element name="Originator" type="lrit:lritIDType"/>
		</xs:sequence>
		<xs:attribute name="test" type="lrit:testType" use="optional" default="0"/>
		<xs:attribute name="schemaVersion" type="xs:decimal" use="required"/>
	</xs:complexType>
</xs:schema>
```

Types.xsd file

```
<!--
	File:			Types.xsd
	File Version:	2.0
	Date:			22 Oct 2014
-->
<xs:schema
	version="2.0"
	targetNamespace="http://gisis.imo.org/XML/LRIT/types/2008"
	xmlns="http://gisis.imo.org/XML/LRIT/types/2008"
	xmlns:xs="http://www.w3.org/2001/XMLSchema"
	elementFormDefault="qualified">

	<xs:simpleType name="lritIDType">
		<xs:restriction base="xs:string">
			<xs:pattern value="[0-4][0-9]{3}"/>
		</xs:restriction>
	</xs:simpleType>

	<xs:simpleType name="contractingGovernmentLRITIDType">
		<xs:restriction base="lritIDType">
			<xs:pattern value="[1][0-9]{3}"/>
		</xs:restriction>
	</xs:simpleType>

	<xs:simpleType name="sarServiceLRITIDType">
		<xs:restriction base="lritIDType">
			<xs:pattern value="[2][0-9]{3}"/>
		</xs:restriction>
	</xs:simpleType>

	<xs:simpleType name="dataCentreLRITIDType">
		<xs:restriction base="lritIDType">
			<xs:pattern value="[3][0-9]{3}"/>
		</xs:restriction>
	</xs:simpleType>

	<xs:simpleType name="aspLRITIDType">
		<xs:restriction base="lritIDType">
			<xs:pattern value="[4][0-9]{3}"/>
		</xs:restriction>
	</xs:simpleType>

	<xs:simpleType name="cspLRITIDType">
		<xs:restriction base="lritIDType">
			<xs:pattern value="[4][0-9]{3}"/>
		</xs:restriction>
	</xs:simpleType>

	<xs:simpleType name="ddpServerLRITIDType">
		<xs:restriction base="lritIDType">
			<xs:enumeration value="0001"/>
		</xs:restriction>
	</xs:simpleType>

	<xs:simpleType name="ideLRITIDType">
```

```
                <xs:restriction base="lritIDType">
                        <xs:enumeration value="0002"/>
                </xs:restriction>
        </xs:simpleType>

        <xs:simpleType name="lritCoordinatorLRITIDType">
                <xs:restriction base="lritIDType">
                        <xs:enumeration value="0003"/>
                </xs:restriction>
        </xs:simpleType>

        <xs:simpleType name="msgIDType">
                <xs:restriction base="xs:string">
                        <xs:pattern value="([0-9]{4})(20[0-2][0-9])(0[1-9]|1[0-2])(0[1-9]|[1-2][0-
9]|3[0-1])([0-1][0-9]|2[0-3])([0-5][0-9])([0-5][0-9])([0-9]{5})"/>
                </xs:restriction>
        </xs:simpleType>

        <xs:simpleType name="refIDType">
                <xs:restriction base="xs:string">
                        <xs:pattern value="()|(([0-9]{4})(20[0-2][0-9])(0[1-9]|1[0-2])(0[1-9]|[1-2][0-
9]|3[0-1])([0-1][0-9]|2[0-3])([0-5][0-9])([0-5][0-9])([0-9]{5}))"/>
                </xs:restriction>
        </xs:simpleType>

        <xs:simpleType name="imoNumType">
                <xs:restriction base="xs:string">
                        <xs:pattern value="[0-9]{7}"/>
                </xs:restriction>
        </xs:simpleType>

        <xs:simpleType name="shipNameType">
                <xs:restriction base="xs:string">
                        <xs:minLength value="0"/>
                        <xs:maxLength value="50"/>
                </xs:restriction>
        </xs:simpleType>

        <xs:simpleType name="mmsiNumType">
                <xs:restriction base="xs:string">
                        <xs:pattern value="[0-9]{9}"/>
                </xs:restriction>
        </xs:simpleType>

        <xs:simpleType name="testType">
                <xs:restriction base="xs:integer">
                        <xs:enumeration value="0"/>
                        <xs:enumeration value="1"/>
                </xs:restriction>
        </xs:simpleType>

        <xs:simpleType name="responseTypeType">
                <xs:restriction base="xs:integer">
                        <xs:enumeration value="1"/>
                        <xs:enumeration value="2"/>
                        <xs:enumeration value="3"/>
```

```
                <xs:enumeration value="4"/>
            </xs:restriction>
        </xs:simpleType>

        <xs:simpleType name="longitudeType">
            <xs:restriction base="xs:string">
                <xs:length value="11"/>
                <xs:pattern value="([0-1][0-7][0-9]\.[0-5][0-9]\.[0-9][0-9]\.[eEwW])|([0][8-
9][0-9]\.[0-5][0-9]\.[0-9][0-9]\.[eEwW])|(180\.00\.00\.[eEwW])"/>
            </xs:restriction>
        </xs:simpleType>

        <xs:simpleType name="latitudeType">
            <xs:restriction base="xs:string">
                <xs:length value="10"/>
                <xs:pattern value="([0-8][0-9]\.[0-5][0-9]\.[0-9][0-
9]\.[nNsS])|(90\.00\.00\.[nNsS])"/>
            </xs:restriction>
        </xs:simpleType>

        <xs:simpleType name="messageType">
            <xs:restriction base="xs:string">
                <xs:maxLength value="256"/>
            </xs:restriction>
        </xs:simpleType>

        <xs:simpleType name="ddpVersionNumType">
            <xs:restriction base="xs:string">
                <xs:pattern value="[0-9]+:[0-9]+"/>
            </xs:restriction>
        </xs:simpleType>

        <xs:simpleType name="ddpIncrementalVersionNumType">
            <xs:restriction base="xs:string">
                <xs:pattern value="[0-9]+"/>
            </xs:restriction>
        </xs:simpleType>

        <xs:simpleType name="ddpVersionNumOrIncrementalVersionType">
            <xs:restriction base="xs:string">
                <xs:pattern value="[0-9]+(:[0-9]+)?"/>
            </xs:restriction>
        </xs:simpleType>

        <xs:simpleType name="locodeType">
            <xs:restriction base="xs:string">
                <xs:pattern value="[A-Z]{2}([A-Z0-9]){3}"/>
            </xs:restriction>
        </xs:simpleType>

        <xs:simpleType name="imoPortFacilityNumberType">
            <xs:restriction base="xs:string">
                <xs:pattern value="[A-Z]{2}([A-Z0-9]){3}-[0-9]{4}"/>
            </xs:restriction>
        </xs:simpleType>
```

```
        <xs:simpleType name="placeCodeType">
                <xs:restriction base="xs:string">
                        <xs:pattern value="[A-Z]{3}([0-9]){3}"/>
                </xs:restriction>
        </xs:simpleType>

        <xs:complexType name="polygonType">
                <xs:sequence>
                        <xs:element name="Caption" type="xs:string" minOccurs="0"
form="qualified"/>
                        <xs:element name="PosList" type="polygonPosListType"
form="qualified"/>
                </xs:sequence>
                <xs:attribute name="areaID" type="areaIDType" use="required"/>
        </xs:complexType>

        <xs:simpleType name="posType">
                <xs:restriction base="xs:string">
                        <xs:pattern value="\s*-?[0-9]{1,3}\.[0-9]{2}\s+-?[0-9]{1,2}\.[0-9]{2}\s*"/>
                </xs:restriction>
        </xs:simpleType>

        <xs:simpleType name="polygonPosListType">
                <xs:restriction base="xs:string">
                        <xs:pattern value="\s*(\s*-?[0-9]{1,3}\.[0-9]{2}\s+-?[0-9]{1,2}\.[0-
9]{2}\s*)(\s+-?[0-9]{1,3}\.[0-9]{2}\s+-?[0-9]{1,2}\.[0-9]{2}\s*){2,}"/>
                </xs:restriction>
        </xs:simpleType>

        <xs:simpleType name="shipTypeType">
                <xs:restriction base="xs:string">
                        <xs:pattern value="[0-9]{2}[0-9]{2}"/>
                </xs:restriction>
        </xs:simpleType>

        <xs:simpleType name="areaIDType">
                <xs:restriction base="xs:string">
                        <xs:pattern value="GA(IW|TS|OT|CA)1[0-9]{3}_[0-9]+"/>
                </xs:restriction>
        </xs:simpleType>

        <xs:complexType name="coastalStateStandingOrderType">
                <xs:sequence>
                        <xs:element name="Polygon">
                                <xs:complexType>
                                        <xs:sequence>
                                                <xs:element name="FilterFlag"
minOccurs="0">
                                                        <xs:simpleType>
                                                                <xs:list
itemType="contractingGovernmentLRITIDType" />
                                                        </xs:simpleType>
                                                </xs:element>
                                                <xs:element name="FilterShipType"
minOccurs="0">
                                                        <xs:simpleType>
```

```
                                                            <xs:list
itemType="shipTypeType" />
                                                        </xs:simpleType>
                                                    </xs:element>
                                                </xs:sequence>
                                                <xs:attribute name="areaID" type="areaIDType" />
                                            </xs:complexType>
                                        </xs:element>
                                    </xs:sequence>
                                    <xs:attribute name="contractingGovernmentID"
type="contractingGovernmentLRITIDType" />
                        </xs:complexType>
</xs:schema>
```

WSDL files

DC.wsdl file

```
<!--
	File:		DC.wsdl
	File Version:	2.0
	Date:		22 Oct 2014
-->
<wsdl:definitions
	name="dc"
	targetNamespace="http://gisis.imo.org/XML/LRIT/2008"
	xmlns:wsdl="http://schemas.xmlsoap.org/wsdl/"
	xmlns:tns="http://gisis.imo.org/XML/LRIT/2008"
	xmlns:posrep="http://gisis.imo.org/XML/LRIT/positionReport/2008"
	xmlns:posreq="http://gisis.imo.org/XML/LRIT/positionRequest/2008"
	xmlns:surpic="http://gisis.imo.org/XML/LRIT/surpicRequest/2014"
	xmlns:receipt="http://gisis.imo.org/XML/LRIT/receipt/2008"
	xmlns:ddpNotification="http://gisis.imo.org/XML/LRIT/ddpNotification/2008"
	xmlns:ddpUpdate="http://gisis.imo.org/XML/LRIT/ddpUpdate/2008"
	xmlns:systemStatus="http://gisis.imo.org/XML/LRIT/systemStatus/2008"
	xmlns:xs="http://www.w3.org/2001/XMLSchema"
	xmlns:soap12="http://schemas.xmlsoap.org/wsdl/soap12/">

	<wsdl:types>
		<xs:schema elementFormDefault="qualified"
targetNamespace="http://gisis.imo.org/XML/LRIT/2008">
			<xs:import
namespace="http://gisis.imo.org/XML/LRIT/positionReport/2008"
schemaLocation="ShipPositionReport.xsd"/>
			<xs:import
namespace="http://gisis.imo.org/XML/LRIT/positionRequest/2008"
schemaLocation="ShipPositionRequest.xsd"/>
			<xs:import
namespace="http://gisis.imo.org/XML/LRIT/surpicRequest/2014"
schemaLocation="SURPICRequest.xsd"/>
			<xs:import namespace="http://gisis.imo.org/XML/LRIT/receipt/2008"
schemaLocation="Receipt.xsd"/>
			<xs:import
namespace="http://gisis.imo.org/XML/LRIT/ddpNotification/2008"
schemaLocation="DDPNotification.xsd"/>
			<xs:import namespace="http://gisis.imo.org/XML/LRIT/ddpUpdate/2008"
schemaLocation="DDPUpdate.xsd"/>
			<xs:import
namespace="http://gisis.imo.org/XML/LRIT/systemStatus/2008"
schemaLocation="SystemStatus.xsd"/>

			<xs:simpleType name="responseType">
				<xs:restriction base="xs:string">
					<xs:enumeration value="Success"/>
				</xs:restriction>
			</xs:simpleType>
			<xs:element name="Response">
				<xs:complexType>
					<xs:sequence>
						<xs:element name="response"
type="tns:responseType"/>
```

```xml
                        </xs:sequence>
                    </xs:complexType>
                </xs:element>
            </xs:schema>
    </wsdl:types>

    <wsdl:message name="ShipPositionReportRequest">
            <wsdl:part name="params" element="posrep:ShipPositionReport"/>
    </wsdl:message>
    <wsdl:message name="ShipPositionReportResponse">
            <wsdl:part name="params" element="tns:Response"/>
    </wsdl:message>

    <wsdl:message name="ShipPositionRequestRequest">
            <wsdl:part name="params" element="posreq:ShipPositionRequest"/>
    </wsdl:message>
    <wsdl:message name="ShipPositionRequestResponse">
            <wsdl:part name="params" element="tns:Response"/>
    </wsdl:message>

    <wsdl:message name="SURPICRequestRequest">
            <wsdl:part name="params" element="surpic:SURPICRequest"/>
    </wsdl:message>
    <wsdl:message name="SURPICRequestResponse">
            <wsdl:part name="params" element="tns:Response"/>
    </wsdl:message>

    <wsdl:message name="ReceiptRequest">
            <wsdl:part name="params" element="receipt:Receipt"/>
    </wsdl:message>
    <wsdl:message name="ReceiptResponse">
            <wsdl:part name="params" element="tns:Response"/>
    </wsdl:message>

    <wsdl:message name="DDPNotificationRequest">
            <wsdl:part name="params" element="ddpNotification:DDPNotification"/>
    </wsdl:message>
    <wsdl:message name="DDPNotificationResponse">
            <wsdl:part name="params" element="tns:Response"/>
    </wsdl:message>

    <wsdl:message name="DDPUpdateRequest">
            <wsdl:part name="params" element="ddpUpdate:DDPUpdate"/>
    </wsdl:message>
    <wsdl:message name="DDPUpdateResponse">
            <wsdl:part name="params" element="tns:Response"/>
    </wsdl:message>

    <wsdl:message name="SystemStatusRequest">
            <wsdl:part name="params" element="systemStatus:SystemStatus"/>
    </wsdl:message>
    <wsdl:message name="SystemStatusResponse">
            <wsdl:part name="params" element="tns:Response"/>
    </wsdl:message>

    <wsdl:portType name="dcPortType">
```

```
			<wsdl:operation name="ShipPositionReport">
				<wsdl:input message="tns:ShipPositionReportRequest"/>
				<wsdl:output message="tns:ShipPositionReportResponse"/>
			</wsdl:operation>
			<wsdl:operation name="ShipPositionRequest">
				<wsdl:input message="tns:ShipPositionRequestRequest"/>
				<wsdl:output message="tns:ShipPositionRequestResponse"/>
			</wsdl:operation>
			<wsdl:operation name="SURPICRequest">
				<wsdl:input message="tns:SURPICRequestRequest"/>
				<wsdl:output message="tns:SURPICRequestResponse"/>
			</wsdl:operation>
			<wsdl:operation name="Receipt">
				<wsdl:input message="tns:ReceiptRequest"/>
				<wsdl:output message="tns:ReceiptResponse"/>
			</wsdl:operation>
			<wsdl:operation name="DDPNotification">
				<wsdl:input message="tns:DDPNotificationRequest"/>
				<wsdl:output message="tns:DDPNotificationResponse"/>
			</wsdl:operation>
			<wsdl:operation name="DDPUpdate">
				<wsdl:input message="tns:DDPUpdateRequest"/>
				<wsdl:output message="tns:DDPUpdateResponse"/>
			</wsdl:operation>
			<wsdl:operation name="SystemStatus">
				<wsdl:input message="tns:SystemStatusRequest"/>
				<wsdl:output message="tns:SystemStatusResponse"/>
			</wsdl:operation>
		</wsdl:portType>

		<wsdl:binding name="dcServiceBinding" type="tns:dcPortType">
			<soap12:binding style="document"
transport="http://schemas.xmlsoap.org/soap/http"/>
			<wsdl:operation name="ShipPositionReport">
				<soap12:operation soapAction=""/>
				<wsdl:input>
					<soap12:body use="literal"/>
				</wsdl:input>
				<wsdl:output>
					<soap12:body use="literal"/>
				</wsdl:output>
			</wsdl:operation>
			<wsdl:operation name="ShipPositionRequest">
				<soap12:operation soapAction=""/>
				<wsdl:input>
					<soap12:body use="literal"/>
				</wsdl:input>
				<wsdl:output>
					<soap12:body use="literal"/>
				</wsdl:output>
			</wsdl:operation>
			<wsdl:operation name="SURPICRequest">
				<soap12:operation soapAction=""/>
				<wsdl:input>
					<soap12:body use="literal"/>
				</wsdl:input>
```

```
					<wsdl:output>
						<soap12:body use="literal"/>
					</wsdl:output>
				</wsdl:operation>
				<wsdl:operation name="Receipt">
					<soap12:operation soapAction=""/>
					<wsdl:input>
						<soap12:body use="literal"/>
					</wsdl:input>
					<wsdl:output>
						<soap12:body use="literal"/>
					</wsdl:output>
				</wsdl:operation>
				<wsdl:operation name="DDPNotification">
					<soap12:operation soapAction=""/>
					<wsdl:input>
						<soap12:body use="literal"/>
					</wsdl:input>
					<wsdl:output>
						<soap12:body use="literal"/>
					</wsdl:output>
				</wsdl:operation>
				<wsdl:operation name="DDPUpdate">
					<soap12:operation soapAction=""/>
					<wsdl:input>
						<soap12:body use="literal"/>
					</wsdl:input>
					<wsdl:output>
						<soap12:body use="literal"/>
					</wsdl:output>
				</wsdl:operation>
				<wsdl:operation name="SystemStatus">
					<soap12:operation soapAction=""/>
					<wsdl:input>
						<soap12:body use="literal"/>
					</wsdl:input>
					<wsdl:output>
						<soap12:body use="literal"/>
					</wsdl:output>
				</wsdl:operation>
		</wsdl:binding>

		<wsdl:service name="dcService">
				<wsdl:port name="dcPort" binding="tns:dcServiceBinding">
					<soap12:address location="http://localhost:8080/dc"/>
				</wsdl:port>
		</wsdl:service>

</wsdl:definitions>
```


DDP.wsdl file


```
<!--
		File:			DDP.wsdl
		File Version:	2.0
		Date:			22 Oct 2014
-->
<wsdl:definitions
```

```
	name="ddp"
	targetNamespace="http://gisis.imo.org/XML/LRIT/2008"
	xmlns:wsdl="http://schemas.xmlsoap.org/wsdl/"
	xmlns:tns="http://gisis.imo.org/XML/LRIT/2008"
	xmlns:ddpRequest="http://gisis.imo.org/XML/LRIT/ddpRequest/2008"
	xmlns:receipt="http://gisis.imo.org/XML/LRIT/receipt/2008"
	xmlns:systemStatus="http://gisis.imo.org/XML/LRIT/systemStatus/2008"
	xmlns:geographicalAreaUpdate="http://gisis.imo.org/XML/LRIT/geographicalAreaUpdate/20
14"
	xmlns:coastalStateStandingOrderUpdate="http://gisis.imo.org/XML/LRIT/coastalStateStandi
ngOrderUpdate/2014"
	xmlns:xs="http://www.w3.org/2001/XMLSchema"
	xmlns:soap12="http://schemas.xmlsoap.org/wsdl/soap12/">

	<wsdl:types>
		<xs:schema elementFormDefault="qualified"
targetNamespace="http://gisis.imo.org/XML/LRIT/2008">
			<xs:import namespace="http://gisis.imo.org/XML/LRIT/ddpRequest/2008"
schemaLocation="DDPRequest.xsd"/>
			<xs:import namespace="http://gisis.imo.org/XML/LRIT/receipt/2008"
schemaLocation="Receipt.xsd"/>
			<xs:import
namespace="http://gisis.imo.org/XML/LRIT/systemStatus/2008"
schemaLocation="SystemStatus.xsd"/>
			<xs:import
namespace="http://gisis.imo.org/XML/LRIT/geographicalAreaUpdate/2014"
schemaLocation="GeographicalAreaUpdate.xsd"/>
			<xs:import
namespace="http://gisis.imo.org/XML/LRIT/coastalStateStandingOrderUpdate/2014"
schemaLocation="CoastalStateStandingOrderUpdate.xsd"/>

			<xs:simpleType name="responseType">
				<xs:restriction base="xs:string">
					<xs:enumeration value="Success"/>
				</xs:restriction>
			</xs:simpleType>
			<xs:element name="Response">
				<xs:complexType>
					<xs:sequence>
						<xs:element name="response"
type="tns:responseType"/>
					</xs:sequence>
				</xs:complexType>
			</xs:element>
		</xs:schema>
	</wsdl:types>

	<wsdl:message name="DDPRequestRequest">
		<wsdl:part name="params" element="ddpRequest:DDPRequest"/>
	</wsdl:message>
	<wsdl:message name="DDPRequestResponse">
		<wsdl:part name="params" element="tns:Response"/>
	</wsdl:message>

	<wsdl:message name="ReceiptRequest">
		<wsdl:part name="params" element="receipt:Receipt"/>
```

```
	</wsdl:message>
	<wsdl:message name="ReceiptResponse">
		<wsdl:part name="params" element="tns:Response"/>
	</wsdl:message>

	<wsdl:message name="SystemStatusRequest">
		<wsdl:part name="params" element="systemStatus:SystemStatus"/>
	</wsdl:message>
	<wsdl:message name="SystemStatusResponse">
		<wsdl:part name="params" element="tns:Response"/>
	</wsdl:message>

	<wsdl:message name="GeographicalAreaUpdateRequest">
		<wsdl:part name="params"
element="geographicalAreaUpdate:GeographicalAreaUpdate"/>
	</wsdl:message>
	<wsdl:message name="GeographicalAreaUpdateResponse">
		<wsdl:part name="params" element="tns:Response"/>
	</wsdl:message>

	<wsdl:message name="CoastalStateStandingOrderUpdateRequest">
		<wsdl:part name="params"
element="coastalStateStandingOrderUpdate:CoastalStateStandingOrderUpdate"/>
	</wsdl:message>
	<wsdl:message name="CoastalStateStandingOrderUpdateResponse">
		<wsdl:part name="params" element="tns:Response"/>
	</wsdl:message>

	<wsdl:portType name="ddpPortType">

		<wsdl:operation name="DDPRequest">
			<wsdl:input message="tns:DDPRequestRequest"/>
			<wsdl:output message="tns:DDPRequestResponse"/>
		</wsdl:operation>

		<wsdl:operation name="Receipt">
			<wsdl:input message="tns:ReceiptRequest"/>
			<wsdl:output message="tns:ReceiptResponse"/>
		</wsdl:operation>

		<wsdl:operation name="SystemStatus">
			<wsdl:input message="tns:SystemStatusRequest"/>
			<wsdl:output message="tns:SystemStatusResponse"/>
		</wsdl:operation>

		<wsdl:operation name="GeographicalAreaUpdate">
			<wsdl:input message="tns:GeographicalAreaUpdateRequest"/>
			<wsdl:output message="tns:GeographicalAreaUpdateResponse"/>
		</wsdl:operation>

		<wsdl:operation name="CoastalStateStandingOrderUpdate">
			<wsdl:input message="tns:CoastalStateStandingOrderUpdateRequest"/>
			<wsdl:output
message="tns:CoastalStateStandingOrderUpdateResponse"/>
		</wsdl:operation>
```

```
	</wsdl:portType>

	<wsdl:binding name="ddpServiceBinding" type="tns:ddpPortType">
		<soap12:binding style="document"
transport="http://schemas.xmlsoap.org/soap/http"/>

		<wsdl:operation name="DDPRequest">
			<soap12:operation soapAction=""/>
			<wsdl:input>
				<soap12:body use="literal"/>
			</wsdl:input>
			<wsdl:output>
				<soap12:body use="literal"/>
			</wsdl:output>
		</wsdl:operation>

		<wsdl:operation name="Receipt">
			<soap12:operation soapAction=""/>
			<wsdl:input>
				<soap12:body use="literal"/>
			</wsdl:input>
			<wsdl:output>
				<soap12:body use="literal"/>
			</wsdl:output>
		</wsdl:operation>

		<wsdl:operation name="SystemStatus">
			<soap12:operation soapAction=""/>
			<wsdl:input>
				<soap12:body use="literal"/>
			</wsdl:input>
			<wsdl:output>
				<soap12:body use="literal"/>
			</wsdl:output>
		</wsdl:operation>

		<wsdl:operation name="GeographicalAreaUpdate">
			<soap12:operation soapAction=""/>
			<wsdl:input>
				<soap12:body use="literal"/>
			</wsdl:input>
			<wsdl:output>
				<soap12:body use="literal"/>
			</wsdl:output>
		</wsdl:operation>

		<wsdl:operation name="CoastalStateStandingOrderUpdate">
			<soap12:operation soapAction=""/>
			<wsdl:input>
				<soap12:body use="literal"/>
			</wsdl:input>
			<wsdl:output>
				<soap12:body use="literal"/>
			</wsdl:output>
		</wsdl:operation>
	</wsdl:binding>
```

```
		<wsdl:service name="ddpService">
			<wsdl:port name="ddpPort" binding="tns:ddpServiceBinding">
				<soap12:address location="http://localhost:8080/ddp"/>
			</wsdl:port>
		</wsdl:service>

</wsdl:definitions>
```

IDE-DC.wsdl file

```
<!--
	File:			IDE-DC.wsdl
	File Version:	2.0
	Date:			22 Oct 2014
-->
<wsdl:definitions
	name="ide"
	targetNamespace="http://gisis.imo.org/XML/LRIT/2008"
	xmlns:wsdl="http://schemas.xmlsoap.org/wsdl/"
	xmlns:tns="http://gisis.imo.org/XML/LRIT/2008"
	xmlns:posrep="http://gisis.imo.org/XML/LRIT/positionReport/2008"
	xmlns:posreq="http://gisis.imo.org/XML/LRIT/positionRequest/2008"
	xmlns:surpic="http://gisis.imo.org/XML/LRIT/surpicRequest/2014"
	xmlns:receipt="http://gisis.imo.org/XML/LRIT/receipt/2008"
	xmlns:systemStatus="http://gisis.imo.org/XML/LRIT/systemStatus/2008"
	xmlns:journalReport="http://gisis.imo.org/XML/LRIT/journalReport/2008"
	xmlns:geographicalAreaUpdate="http://gisis.imo.org/XML/LRIT/geographicalAreaUpdate/20
14"
	xmlns:xs="http://www.w3.org/2001/XMLSchema"
	xmlns:soap12="http://schemas.xmlsoap.org/wsdl/soap12/">

	<wsdl:types>
		<xs:schema elementFormDefault="qualified"
targetNamespace="http://gisis.imo.org/XML/LRIT/2008">
			<xs:import
namespace="http://gisis.imo.org/XML/LRIT/positionReport/2008"
schemaLocation="ShipPositionReport.xsd"/>
			<xs:import
namespace="http://gisis.imo.org/XML/LRIT/positionRequest/2008"
schemaLocation="ShipPositionRequest.xsd"/>
			<xs:import
namespace="http://gisis.imo.org/XML/LRIT/surpicRequest/2014"
schemaLocation="SURPICRequest.xsd"/>
			<xs:import namespace="http://gisis.imo.org/XML/LRIT/receipt/2008"
schemaLocation="Receipt.xsd"/>
			<xs:import
namespace="http://gisis.imo.org/XML/LRIT/systemStatus/2008"
schemaLocation="SystemStatus.xsd"/>
			<xs:import
namespace="http://gisis.imo.org/XML/LRIT/journalReport/2008"
schemaLocation="JournalReport.xsd"/>
			<xs:import
namespace="http://gisis.imo.org/XML/LRIT/geographicalAreaUpdate/2014"
schemaLocation="GeographicalAreaUpdate.xsd"/>

			<xs:simpleType name="responseType">
```

```
                <xs:restriction base="xs:string">
                    <xs:enumeration value="Success"/>
                </xs:restriction>
            </xs:simpleType>
            <xs:element name="Response">
                <xs:complexType>
                    <xs:sequence>
                        <xs:element name="response"
type="tns:responseType"/>
                    </xs:sequence>
                </xs:complexType>
            </xs:element>
        </xs:schema>
    </wsdl:types>

    <wsdl:message name="ShipPositionReportRequest">
        <wsdl:part name="params" element="posrep:ShipPositionReport"/>
    </wsdl:message>
    <wsdl:message name="ShipPositionReportResponse">
        <wsdl:part name="params" element="tns:Response"/>
    </wsdl:message>

    <wsdl:message name="ShipPositionRequestRequest">
        <wsdl:part name="params" element="posreq:ShipPositionRequest"/>
    </wsdl:message>
    <wsdl:message name="ShipPositionRequestResponse">
        <wsdl:part name="params" element="tns:Response"/>
    </wsdl:message>

    <wsdl:message name="SURPICRequestRequest">
        <wsdl:part name="params" element="surpic:SURPICRequest"/>
    </wsdl:message>
    <wsdl:message name="SURPICRequestResponse">
        <wsdl:part name="params" element="tns:Response"/>
    </wsdl:message>

    <wsdl:message name="ReceiptRequest">
        <wsdl:part name="params" element="receipt:Receipt"/>
    </wsdl:message>
    <wsdl:message name="ReceiptResponse">
        <wsdl:part name="params" element="tns:Response"/>
    </wsdl:message>

    <wsdl:message name="DDPUpdateResponse">
        <wsdl:part name="params" element="tns:Response"/>
    </wsdl:message>

    <wsdl:message name="SystemStatusRequest">
        <wsdl:part name="params" element="systemStatus:SystemStatus"/>
    </wsdl:message>
    <wsdl:message name="SystemStatusResponse">
        <wsdl:part name="params" element="tns:Response"/>
    </wsdl:message>

    <wsdl:message name="JournalReportRequest">
        <wsdl:part name="params" element="journalReport:JournalReport"/>
    </wsdl:message>
```

```
        <wsdl:message name="JournalReportResponse">
                <wsdl:part name="params" element="tns:Response"/>
        </wsdl:message>

        <wsdl:message name="GeographicalAreaUpdateRequest">
                <wsdl:part name="params"
element="geographicalAreaUpdate:GeographicalAreaUpdate"/>
        </wsdl:message>
        <wsdl:message name="GeographicalAreaUpdateResponse">
                <wsdl:part name="params" element="tns:Response"/>
        </wsdl:message>

        <wsdl:portType name="idePortType">
                <wsdl:operation name="ShipPositionReport">
                        <wsdl:input message="tns:ShipPositionReportRequest"/>
                        <wsdl:output message="tns:ShipPositionReportResponse"/>
                </wsdl:operation>
                <wsdl:operation name="ShipPositionRequest">
                        <wsdl:input message="tns:ShipPositionRequestRequest"/>
                        <wsdl:output message="tns:ShipPositionRequestResponse"/>
                </wsdl:operation>
                <wsdl:operation name="SURPICRequest">
                        <wsdl:input message="tns:SURPICRequestRequest"/>
                        <wsdl:output message="tns:SURPICRequestResponse"/>
                </wsdl:operation>
                <wsdl:operation name="Receipt">
                        <wsdl:input message="tns:ReceiptRequest"/>
                        <wsdl:output message="tns:ReceiptResponse"/>
                </wsdl:operation>
                <wsdl:operation name="SystemStatus">
                        <wsdl:input message="tns:SystemStatusRequest"/>
                        <wsdl:output message="tns:SystemStatusResponse"/>
                </wsdl:operation>
                <wsdl:operation name="JournalReport">
                        <wsdl:input message="tns:JournalReportRequest"/>
                        <wsdl:output message="tns:JournalReportResponse"/>
                </wsdl:operation>
                <wsdl:operation name="GeographicalAreaUpdate">
                        <wsdl:input message="tns:GeographicalAreaUpdateRequest"/>
                        <wsdl:output message="tns:GeographicalAreaUpdateResponse"/>
                </wsdl:operation>
        </wsdl:portType>

        <wsdl:binding name="ideServiceBinding" type="tns:idePortType">
                <soap12:binding style="document"
transport="http://schemas.xmlsoap.org/soap/http"/>
                <wsdl:operation name="ShipPositionReport">
                        <soap12:operation soapAction=""/>
                        <wsdl:input>
                                <soap12:body use="literal"/>
                        </wsdl:input>
                        <wsdl:output>
                                <soap12:body use="literal"/>
                        </wsdl:output>
                </wsdl:operation>
                <wsdl:operation name="ShipPositionRequest">
```

```
            <soap12:operation soapAction=""/>
            <wsdl:input>
                <soap12:body use="literal"/>
            </wsdl:input>
            <wsdl:output>
                <soap12:body use="literal"/>
            </wsdl:output>
        </wsdl:operation>
        <wsdl:operation name="SURPICRequest">
            <soap12:operation soapAction=""/>
            <wsdl:input>
                <soap12:body use="literal"/>
            </wsdl:input>
            <wsdl:output>
                <soap12:body use="literal"/>
            </wsdl:output>
        </wsdl:operation>
        <wsdl:operation name="Receipt">
            <soap12:operation soapAction=""/>
            <wsdl:input>
                <soap12:body use="literal"/>
            </wsdl:input>
            <wsdl:output>
                <soap12:body use="literal"/>
            </wsdl:output>
        </wsdl:operation>
        <wsdl:operation name="SystemStatus">
            <soap12:operation soapAction=""/>
            <wsdl:input>
                <soap12:body use="literal"/>
            </wsdl:input>
            <wsdl:output>
                <soap12:body use="literal"/>
            </wsdl:output>
        </wsdl:operation>
        <wsdl:operation name="JournalReport">
            <soap12:operation soapAction=""/>
            <wsdl:input>
                <soap12:body use="literal"/>
            </wsdl:input>
            <wsdl:output>
                <soap12:body use="literal"/>
            </wsdl:output>
        </wsdl:operation>
        <wsdl:operation name="GeographicalAreaUpdate">
            <soap12:operation soapAction=""/>
            <wsdl:input>
                <soap12:body use="literal"/>
            </wsdl:input>
            <wsdl:output>
                <soap12:body use="literal"/>
            </wsdl:output>
        </wsdl:operation>
    </wsdl:binding>

    <wsdl:service name="ideService">
        <wsdl:port name="idePort" binding="tns:ideServiceBinding">
```

```
                        <soap12:address location="http://localhost:8080/ide"/>
                </wsdl:port>
        </wsdl:service>

</wsdl:definitions>
```

IDE-DDP.wsdl file

```
<!--
        File:                   IDE-DDP.wsdl
        File Version:           2.0
        Date:                   22 Oct 2014
-->
<wsdl:definitions
        name="ide"
        targetNamespace="http://gisis.imo.org/XML/LRIT/2008"
        xmlns:wsdl="http://schemas.xmlsoap.org/wsdl/"
        xmlns:tns="http://gisis.imo.org/XML/LRIT/2008"
        xmlns:receipt="http://gisis.imo.org/XML/LRIT/receipt/2008"
        xmlns:ddpNotification="http://gisis.imo.org/XML/LRIT/ddpNotification/2008"
        xmlns:ddpUpdate="http://gisis.imo.org/XML/LRIT/ddpUpdate/2008"
        xmlns:systemStatus="http://gisis.imo.org/XML/LRIT/systemStatus/2008"
        xmlns:xs="http://www.w3.org/2001/XMLSchema"
        xmlns:soap12="http://schemas.xmlsoap.org/wsdl/soap12/">

        <wsdl:types>
                <xs:schema elementFormDefault="qualified"
targetNamespace="http://gisis.imo.org/XML/LRIT/2008">
                        <xs:import
namespace="http://gisis.imo.org/XML/LRIT/ddpNotification/2008"
schemaLocation="DDPNotification.xsd"/>
                        <xs:import namespace="http://gisis.imo.org/XML/LRIT/ddpUpdate/2008"
schemaLocation="DDPUpdate.xsd"/>
                        <xs:import
namespace="http://gisis.imo.org/XML/LRIT/systemStatus/2008"
schemaLocation="SystemStatus.xsd"/>
                        <xs:import namespace="http://gisis.imo.org/XML/LRIT/receipt/2008"
schemaLocation="Receipt.xsd"/>

                        <xs:simpleType name="responseType">
                                <xs:restriction base="xs:string">
                                        <xs:enumeration value="Success"/>
                                </xs:restriction>
                        </xs:simpleType>
                        <xs:element name="Response">
                                <xs:complexType>
                                        <xs:sequence>
                                                <xs:element name="response"
type="tns:responseType"/>
                                        </xs:sequence>
                                </xs:complexType>
                        </xs:element>
                </xs:schema>
        </wsdl:types>

        <wsdl:message name="ReceiptRequest">
                <wsdl:part name="params" element="receipt:Receipt"/>
```

```
	</wsdl:message>
	<wsdl:message name="ReceiptResponse">
		<wsdl:part name="params" element="tns:Response"/>
	</wsdl:message>

	<wsdl:message name="DDPNotificationRequest">
		<wsdl:part name="params" element="ddpNotification:DDPNotification"/>
	</wsdl:message>
	<wsdl:message name="DDPNotificationResponse">
		<wsdl:part name="params" element="tns:Response"/>
	</wsdl:message>

	<wsdl:message name="DDPUpdateRequest">
		<wsdl:part name="params" element="ddpUpdate:DDPUpdate"/>
	</wsdl:message>
	<wsdl:message name="DDPUpdateResponse">
		<wsdl:part name="params" element="tns:Response"/>
	</wsdl:message>

	<wsdl:message name="SystemStatusRequest">
		<wsdl:part name="params" element="systemStatus:SystemStatus"/>
	</wsdl:message>
	<wsdl:message name="SystemStatusResponse">
		<wsdl:part name="params" element="tns:Response"/>
	</wsdl:message>

	<wsdl:portType name="ideDDPPortType">
		<wsdl:operation name="Receipt">
			<wsdl:input message="tns:ReceiptRequest"/>
			<wsdl:output message="tns:ReceiptResponse"/>
		</wsdl:operation>
		<wsdl:operation name="DDPNotification">
			<wsdl:input message="tns:DDPNotificationRequest"/>
			<wsdl:output message="tns:DDPNotificationResponse"/>
		</wsdl:operation>
		<wsdl:operation name="DDPUpdate">
			<wsdl:input message="tns:DDPUpdateRequest"/>
			<wsdl:output message="tns:DDPUpdateResponse"/>
		</wsdl:operation>
		<wsdl:operation name="SystemStatus">
			<wsdl:input message="tns:SystemStatusRequest"/>
			<wsdl:output message="tns:SystemStatusResponse"/>
		</wsdl:operation>
	</wsdl:portType>

	<wsdl:binding name="ideDDPServiceBinding" type="tns:ideDDPPortType">
		<soap12:binding style="document"
transport="http://schemas.xmlsoap.org/soap/http"/>
		<wsdl:operation name="Receipt">
			<soap12:operation soapAction=""/>
			<wsdl:input>
				<soap12:body use="literal"/>
			</wsdl:input>
			<wsdl:output>
				<soap12:body use="literal"/>
			</wsdl:output>
```

```
			</wsdl:operation>
			<wsdl:operation name="DDPNotification">
				<soap12:operation soapAction=""/>
				<wsdl:input>
					<soap12:body use="literal"/>
				</wsdl:input>
				<wsdl:output>
					<soap12:body use="literal"/>
				</wsdl:output>
			</wsdl:operation>
			<wsdl:operation name="DDPUpdate">
				<soap12:operation soapAction=""/>
				<wsdl:input>
					<soap12:body use="literal"/>
				</wsdl:input>
				<wsdl:output>
					<soap12:body use="literal"/>
				</wsdl:output>
			</wsdl:operation>
			<wsdl:operation name="SystemStatus">
				<soap12:operation soapAction=""/>
				<wsdl:input>
					<soap12:body use="literal"/>
				</wsdl:input>
				<wsdl:output>
					<soap12:body use="literal"/>
				</wsdl:output>
			</wsdl:operation>
		</wsdl:binding>

		<wsdl:service name="ideDDPService">
			<wsdl:port name="ideDDPPort" binding="tns:ideDDPServiceBinding">
				<soap12:address location="http://localhost:8080/ideDDP"/>
			</wsdl:port>
		</wsdl:service>

</wsdl:definitions>"
```

MSC.1/Circ.1294/Rev.4, annex, annex 1, annex

41 In table 1 (Summary of LRIT messages), the row with entry "6" under column "Type" is amended and two new rows are added at the end of the table as follows:

6	~~SAR~~ SURPIC request	Coastal or SAR request for position of ships in a specific area, broadcast via the IDE to all DCs	DC1	IDE	Yes[3]

<table>
<tr><td rowspan="2">16</td><td rowspan="2">Geographical area update</td><td>Request to perform technical validation of polygons</td><td rowspan="2">DC</td><td>IDE</td><td rowspan="2">No</td></tr>
<tr><td>Submit, update or delete custom coastal geographical areas</td><td>DDP server</td></tr>
<tr><td>17</td><td>Coastal State Standing order update</td><td>Update Coastal State Standing order</td><td>DC</td><td>DDP server</td><td>No</td></tr>
</table>

Note:

(3) Excludes Coastal SURPIC messages in which a DataUserProvider is specified."

42 The following entries are added to the list of appendices:

"Appendix 2B LRIT Data Centre test procedures and test cases

Tables 2-B.1 to 2-B.2 – Test procedures and test cases for the second modification testing"

"Appendix 3B International LRIT Data Exchange test procedures and test cases

Tables 3-B.1 and 3-B.2 – Test procedures and test cases for the second modification testing"

"Appendix 4A LRIT Data Distribution server test procedures and test cases

Tables 4-A.1 and 4-A.2 – Test procedures and test cases for the second modification testing"

43 In Test procedure DC-3.0 and Test cases DC-3.1 and DC-3.2, the words "SAR SURPIC" are replaced with the word "SURPIC".

44 In Test cases DC-3.1 and DC-3.2, column "Case", the words "Access Type 6 and" are inserted between the words "with" and "all".

45 In Test procedure DC-15.0, column "Test procedure", the words "and no filtering is applied to polygons" are inserted between the words "valid" and "unless".

46 In Test procedure IDE-3.0, column "Test procedure", the words "SAR SURPIC" are replaced with the word "SURPIC" and the words "a SAR Service (Message Type 6 with Access Type 6) associated with" are inserted between the words "request from" and "DC 1".

47 In Test cases IDE-3.1 to IDE-3.10, column "Case", the words "SAR SURPIC" are replaced with the word "SURPIC" and the words "with Access Type 6" are inserted after the words "Message Type 6".

48 In Test cases IDE-3.2 and IDE-3.4 and IDE-3.10, column "Expect results", the word "to" is inserted between the words "request" and "all DCs".

49 The following new appendixes are inserted:

Appendix 2-B

LRIT DATA CENTRE TEST PROCEDURES AND CASES

Test Procedures and cases for the second Modification testing

Test cases DC-3.1 to DC-3.3 and the following test procedures and test cases are required to be conducted by all DCs during the second modification testing phase.

Table 2-B.1

Test procedure DC-18.0

Test	REF	Test procedure	Pass/Fail
DC-18.0	PS: 7.4 TS3: 2.2.4 TS3:2.3.5	DC1 receives a SURPIC Request (Message Type 6) sent by another DC (C). Communication paths specified in parentheses for each test case. All parameters associated with each message should be valid unless specified otherwise in a given test case.	

Test cases DC-18.1 to DC-18.7

Test	REF	Case	Expect results	Test type	Environment	Required before entering	Required during	Certification	Pass/Fail
DC-18.1	PS: 7.4 TS3: 2.2.4 TS3:2.3.5	DC1 receives a SURPIC Request Message with Access Type 1, a specified area inside the Coastal entitlement, no filtering specified and the number of positions requested to 2. (C)	DC1 sends the 2 most recent position reports within the past 24 h for all ships that are located within the specified geographical area and compliant with the Coastal entitlement. (D)	F	Test Production	Yes N/A	Yes No	External N/A	

Test	REF	Case	Expect results	Test type	Environment	Required before entering	Required during	Certification	Pass/Fail
DC-18.2	PS: 7.4 TS3: 2.2.4 TS3:2.3.5	DC1 receives a SURPIC Request Message with Access Type 1, no filtering specified and a specified area outside the Coastal entitlement. (C)	Sent a Receipt Message (Message Type 7) with Receipt code 13 to the requestor. (D)	F	Test Production	Yes N/A	Yes No	External N/A	
DC-18.3	PS: 7.4 TS3: 2.2.4 TS3:2.3.5	DC1 receives a SURPIC Request Message with Access Type 1 and an area inside the Coastal entitlement and there are no positions inside the area. (C)	Sent a Receipt Message (Message Type 7) with Receipt code 13 to the requestor. (D)	F	Test Production	Yes N/A	Yes No	External N/A	
DC-18.4	PS: 7.4 TS3: 2.2.4 TS3:2.3.5	DC1 receives a SURPIC Request Message with Access Type 1 and an area part inside and part outside the Coastal entitlement and there are no positions inside the area that is within the Coastal entitlement. (C)	Sent a Receipt Message (Message Type 7) with Receipt code 13 to the requestor. (D)	F	Test Production	Yes N/A	Yes No	External N/A	

Test	REF	Case	Expect results	Test type	Environment	Required before entering	Required during	Certification	Pass/Fail
DC-18.5	PS: 7.4 TS3: 2.2.4 TS3:2.3.5	DC1 receives a SURPIC Request Message with access type 1, filtering by ShipType=A and Flag=Z, an area inside the Coastal entitlement (DC1 is associated with Flag X). Inside the area there are ship positions of ShipType=A and ShipType=B of Flag=Z and Flag=X. (C)	DC1 sends only the ship position of the ShipType=B and Flag=X these postions must be within the past 24 h and all ships should be located within the specified geographical area and compliant with the Coastal entitlement (D).	F	Test Production	Yes N/A	Yes No	External N/A	
DC-18.6	PS: 7.4 TS3: 2.2.4 TS3:2.3.5	DC1 sends a SURPIC Request Message with Access Type 1, Data User Provider=M and filtering by ShipType=A and ShipType=B to DC2 for an area inside the Coastal entitlement. (D)	Verify that the DC can send a SURPIC request message with valid parameters to the IDE.	F	Test Production	Yes N/A	Yes No	External N/A	
DC-18.7	PS: 7.4 TS3: 2.2.4 TS3:2.3.5	DC1 sends a SURPIC Request Message with Access Type 1, filtering by ShipType=A to all DCs for an area inside the Coastal entitlement. (D)	Verify that the DC can send a SURPIC request message with valid parameters to the IDE.	F	Test Production	Yes N/A	Yes No	External N/A	

Table 2-B.2

Test procedure DC-19.0

Test	REF	Test procedure	Pass/Fail
DC-19.0	PS: 7.1.7 TS3:2.2.2 TS3:2.3.4	DC1 sends a ship Position Report (Message Type 1) to DC2 through the IDE in response to standing orders from a Contracting Government associated with DC2. All parameters associated with each message should be valid and no filtering is applied to polygons unless specified otherwise in a given test case.	

Test cases DC-19.1 to DC19.4

DC-19.1	PS: 7.1.7 TS3:2.2.2 TS3:2.3.4	DC1 receives a position report from their ASP that is within a polygon listed under the custom Coastal standing order of a Contracting Government associated with DC2 and polygon of the DC2 is filtering DC1 flag. The ship position is neither within the internal waters of another Contracting Government nor the territorial sea of the Contracting Government associated with DC1.	DC1 does not send any position reports to DC2.	F	Test Production	Yes N/A	Yes No	External N/A	

DC-19.2	PS: 7.1.7 TS3:2.2.2 TS3:2.3.4	DC1 receives a position report associated to a shipType A from their ASP. This position is within a polygon listed under the custom Coastal standing order of a Contracting Government associated with DC2 and this polygon is filtering ShipType A. The ship position is neither within the internal waters of another Contracting Government nor the territorial sea of the Contracting Government associated with DC1.	DC1 does not send any position reports to DC2.	F	Test Production	Yes N/A	Yes No	External N/A	
DC-19.3	PS: 7.1.7 TS3:2.2.2 TS3:2.3.4	DC1 receives a position report associated to a shipType A from their ASP. This position is within polygons listed under the custom Coastal standing orders of two Contracting Governments associated with DC2 and DC3. The DC2 polygon is filtering ShipType A. The ship position is neither within the internal waters of another Contracting Government nor the territorial sea of the Contracting Government associated with DC1.	DC1 does not send any position reports to DC2 and sends the appropriate position report to DC3. (D)	F	Test Production	Yes N/A	Yes No	External N/A	

DC-19.4	PS: 7.1.7 TS3:2.2.2 TS3:2.3.4	DC1 receives a position report associated to a shipType A from their ASP. This position is inside the overlapping area of two polygons listed under the custom Coastal standing order of Contracting Government associated with DC2. The first DC2 polygon is filtering ShipType A and the second DC2 polygon is filtering ShipType B. The ship position is neither within the internal waters of another Contracting Government nor the territorial sea of the Contracting Government associated with DC1.	DC1 sends the appropriate position report to DC2. No duplicate reports are sent by DC1. (D)	F	Test Production	Yes N/A	Yes No	External N/A	

Appendix 3-B

INTERNATIONAL LRIT DATA EXCHANGE TEST PROCEDURES AND CASES

Test Procedures and cases for the second Modification testing

Test cases IDE-3.1 to IDE-3.10 and the following test procedure and test cases are required to be conducted by the IDE during the second modification testing phase.

Table 3-B.1

Test procedures IDE-12.0

Test	REF	Test procedure	Pass/Fail
IDE-12.0	PS: 10.3.1 to PS: 10.3.4 PS: 10.3.7 to PS: 10.3.11 PS: 12.1 TS1: 2.1.1 TS1: 3.2.1 TS3: 2.1.2 TS3: 2.2.4 TS3: 2.3.1 TS3: 2.3.5	IDE receives a SURPIC request (Message Type 6 with access type 1) from DC1. Communication paths specified in parentheses for each test case. All parameters associated with each message should be valid unless specified otherwise in a given test case.	

Test cases IDE-12.1 to IDE-12.3

Test	REF	Case	Expect results	Test type	Environment	Required before entering	Required during	Certification	Pass/Fail
IDE-12.1	PS: 10.3.1 to PS: 10.3.4 PS: 10.3.7 to PS: 10.3.11 PS: 12.1 TS1: 2.1.1 TS1: 3.2.1 TS3: 2.1.2 TS3: 2.2.4 TS3: 2.3.1 TS3: 2.3.5	Valid SURPIC Request (Message Type 6 with Access Type 1) and specifies a Data User Provider associated with DC2. (D)	Message stored in Journal, IDE routes position request to DC2 (F)	F	Test Production	No N/A	Yes No	External N/A	
IDE-12.2	PS: 10.3.1 to PS: 10.3.4 PS: 10.3.7 to PS: 10.3.11 PS: 12.1 TS1: 2.1.1 TS1: 3.2.1 TS3: 2.1.2 TS3: 2.2.4 TS3: 2.3.1 TS3: 2.3.5	Valid SURPIC Request (Message Type 6 with Access Type 1) and the Data User Provider is unspeficied. (D)	Message stored in Journal, IDE routes position request to all DCs. (G)	F	Test Production	No N/A	Yes No	External N/A	

Test	REF	Case	Expect results	Test type	Environment	Required before entering	Required during	Certification	Pass/Fail
IDE-12.3	PS: 10.3.1 to PS: 10.3.4 PS: 10.3.7 to PS: 10.3.11 PS: 12.1 TS1: 2.1.1 TS1: 3.2.1 TS3: 2.1.2 TS3: 2.2.4 TS3: 2.3.1 TS3: 2.3.5	Message validation with invalid Message parameter. (D)	A SOAP Fault or Receipt Message with Receipt code 7 is sent with message text indicating the reason for rejection. (C)	C	Test Production	No N/A	Yes No	External N/A	

Table 3-B.2

Test procedure IDE-13.0

Test	REF	Test procedure	Pass/Fail
IDE-13.0	PS: 10.3.1 to PS: 10.3.4 PS: 10.3.7 to PS: 10.3.11 PS: 12.1 TS1: 2.1.1 TS1: 3.2.1 TS3: 2.1.2 TS3: 2.2.14 TS3: 2.3.1 TS3: 2.3.5	IDE receives a Geographical Area Update (Message Type 16) sent by a DC. Communication paths specified in parentheses for each test case. All parameters associated with each message should be valid unless specified otherwise in a given test case.	

Test cases IDE-13.1 to IDE -13.3

Test	REF	Case	Expect results	Test type	Environment	Required before entering	Required during	Certification	Pass/Fail
IDE-13.1	PS: 10.3.1 to PS: 10.3.4 PS: 10.3.7 to PS: 10.3.11 PS: 12.1 TS1: 2.1.1 TS1: 3.2.1 TS3: 2.1.2 TS3: 2.2.14 TS3: 2.3.1 TS3: 2.3.5	IDE receives Geographical Area Update from DC1 with Action type 0 (technical validation of polygon(s)) with valid polygon. (D)	Receipt Message with Receipt code 10 is sent to the DC1 after the polygon(s) passed technical validation. (C).	F	Test Production	No N/A	Yes N/A	Internal N/A	
IDE-13.2	PS: 10.3.1 to PS: 10.3.4 PS: 10.3.7 to PS: 10.3.11 PS: 12.1 TS1: 2.1.1 TS1: 3.2.1 TS3: 2.1.2 TS3: 2.2.14 TS3: 2.3.1 TS3: 2.3.5	IDE receives Geographical Area Update from DC1 with Action type 0 (technical validation of polygon(s)) with an invalid polygon. (D)	Receipt Message with Receipt code 7 is sent with message text indicating the reason for rejection. (C)	F	Test Production	No N/A	Yes N/A	Internal N/A	

Test	REF	Case	Expect results	Test type	Environment	Required before entering	Required during	Certification	Pass/Fail
IDE-13.3	PS: 10.3.1 to PS: 10.3.4 PS: 10.3.7 to PS: 10.3.11 PS: 12.1 TS1: 2.1.1 TS1: 3.2.1 TS3: 2.1.2 TS3: 2.2.14 TS3: 2.3.1 TS3: 2.3.5	Message validation with invalid Message parameter. (D)	A SOAP Fault or Receipt Message with Receipt code 7 is sent with message text indicating the reason for rejection. (C)	C	Test Production	No N/A	Yes N/A	Internal N/A	

Appendix 4-A

LRIT Data Distribution Plan server test procedures and cases

Test Procedures and cases for the second Modification testing

Table 4-A.1

Test procedures DDP-6.0

Test	REF	Test procedure	Pass/Fail
DDP-6.0	PS: 11.3 TS3: 2.2.5 TS3: 2.2.14 TS4: 6.6 TS4: 6.7	DDP server receives a Geographical Area Update (Message Type 16) sent by a DC. Communication paths specified in parentheses for each test case. All parameters associated with each message should be valid unless specified otherwise in a given test case.	

Test cases DDP-6.1 to DDP-6.6

Test	REF	Case	Expect results	Test type	Environment	Required before entering	Required during	Certification	Pass/Fail
DDP-6.1	PS: 11.3 TS3: 2.2.5 TS3: 2.2.14 TS4: 6.6 TS4: 6.7	DDP server receives Geographical Area Update from DC1 with Action Type 1 (upload polygon(s)). (L)	Receipt Message with Receipt code 11 is sent to DC1, the DDP server generates a regular DDP version and sends a DDP notification message (message type 8) to IDE. (K, A).	F	Test Production	No N/A	Yes N/A	Internal N/A	

Test	REF	Case	Expect results	Test type	Environment	Required before entering	Required during	Certification	Pass/Fail
DDP-6.2	PS: 11.3 TS3: 2.2.5 TS3: 2.2.14 TS4: 6.6 TS4: 6.7	DDP server receives Geographical Area Update from DC1 with Action Type 1 (upload polygon(s)) and with a polygon with wrong format. (L)	Receipt Message with Receipt code 7 is sent with message text indicating the reason for rejection. (K)	F	Test Production	No N/A	Yes N/A	Internal N/A	
DDP-6.3	PS: 11.3 TS3: 2.2.5 TS3: 2.2.14 TS4: 6.6 TS4: 6.7	DDP server receives Geographical Area Update from DC1 with Action Type 1 (upload polygon (s)) to modify an existing custom coastal area polygon with an active standing order. (L)	Receipt Message with Receipt code 11 is sent to DC1, and the DDP server includes the updated polygons in the next regular DDP version	F	Test Production	No N/A	Yes N/A	Internal N/A	
DDP-6.4	PS: 11.3 TS3: 2.2.5 TS3: 2.2.14 TS4: 6.6 TS4: 6.7	DDP server receives Geographical Area Update from DC1 with Action Type 2 (delete polygon(s)) and Geographical AreaId(s) with list of two custom coastal area identifiers that are not part of an active coastal State standing order. (L)	Receipt Message with Receipt code 11 is sent to the DC1, the DDP server generates a regular DDP version and sends a DDP notification message (message type 8) to IDE. (K, A).	F	Test Production	No N/A	Yes N/A	Internal N/A	
DDP-6.5	PS: 11.3 TS3: 2.2.5 TS3: 2.2.14 TS4: 6.6 TS4: 6.7	DDP server receives Geographical Area Update from DC1 with Action Type 2 (delete polygon(s)) to delete a custom coastal area polygon with an active standing order. (L)	Receipt Message with Receipt code 7 is sent with message text indicating the reason for rejection. (K)	F	Test Production	No N/A	Yes N/A	Internal N/A	

Test	REF	Case	Expect results	Test type	Environment	Required before entering	Required during	Certification	Pass/Fail
DDP-6.6	PS: 11.3 TS3: 2.2.5 TS3: 2.2.14 TS4: 6.6 TS4: 6.7	Message validation with invalid Message parameter. (L)	A SOAP Fault or Receipt Message with Receipt code 7 is sent with message text indicating the reason for rejection. (K)	C	Test Production	No N/A	Yes N/A	Internal N/A	

Table 4-A.2

Test procedure DDP-7.0

Test	REF	Test procedure	Pass/Fail
DDP-7.0	PS: 11.3 TS3: 2.2.5 TS3: 2.2.14 TS4: 6.6 TS4: 6.7	DDP server receives a Coastal State Standing Order Update (Message Type 17) sent by a DC. Communication paths specified in parentheses for each test case. All parameters associated with each message should be valid unless specified otherwise in a given test case.	

Test cases DDP-7.1 to DDP-7.2

Test	REF	Case	Expect results	Test type	Environment	Required before entering	Required during	Certification	Pass/Fail
DDP-7.1	PS: 11.3 TS3: 2.2.5 TS3: 2.2.14 TS4: 6.6 TS4: 6.7	DDP server receives a Coastal State Standing Order Update from DC1 to modify the current standing order. (L)	Receipt Message with Receipt code 12 is sent to DC, the DDP server generates an immediate DDP version and sends a DDP notification message (message type 8) to IDE. (K, A)	F	Test Production	No N/A	Yes N/A	Internal N/A	
DDP-7.2	PS: 11.3 TS3: 2.2.5 TS3: 2.2.14 TS4: 6.6 TS4: 6.7	Message validation with invalid Message parameter. (L)	A SOAP Fault or Receipt Message with Receipt code 7 is sent with message text indicating the reason for rejection. (K)	C	Test Production	No N/A	Yes N/A	Internal N/A	

Test	REF	Case	Expect results	Test type	Environment	Required before entering	Required during	Certification	Pass/Fail
DDP-7.3	PS: 11.3 TS3: 2.2.5 TS3: 2.2.14 TS4: 6.6 TS4: 6.7	DDP receives a request for activation of a coastal State standing order containing at least one geographical area that has not yet been implemented in the DDP. (L)	Receipt Message with Receipt code 7 is sent to DC, indicating that at least one polygon has not yet been implemented.	F	Test Production	No N/A	Yes N/A	Internal N/A	

ANNEX 4

DRAFT MSC CIRCULAR

GUIDELINE ON SOFTWARE QUALITY ASSURANCE AND HUMAN-CENTRED DESIGN FOR E-NAVIGATION

1 The Sub-Committee on Navigation, Communications and Search and Rescue (NCSR), [at its second session (9 to 13 March 2015)], agreed on the *Guideline on Software Quality Assurance and Human-Centred Design for e-navigation*.

2 The Maritime Safety Committee, [at its ninety-fifth session (3 to 12 June 2015)], having considered the proposal by NCSR 2, approved the *Guideline on Software Quality Assurance and Human-Centred Design for e-navigation*.

3 The guideline is intended to ensure that software trustworthiness and user needs are met through the application of Software Quality Assurance (SQA) and Human-Centred Design (HCD) in the development of e-navigation systems.

4 The guideline is also intended to support the principles identified in SOLAS regulation V/15 (Principles relating to bridge design, design and arrangement of navigational systems and equipment, and bridge procedures).

5 Member Governments are invited to bring the *Guideline on Software Quality Assurance and Human-Centred Design for e-navigation* to the attention of all parties concerned.

GUIDELINE ON SOFTWARE QUALITY ASSURANCE AND HUMAN CENTRED-DESIGN FOR E-NAVIGATION

1 Introduction

1.1 Navigation systems increasingly provide a variety of information and services for enhancing navigation safety and efficiency. These systems require the connection and integration of onboard navigational systems as well as shore-side support systems and involve the collection, integration, exchange, presentation and analysis of marine data and information.

1.2 The merits of navigation systems can be found not only in their range of functions but also underpinned by their trustworthy software and overall usability. This guideline is intended to complement and support the principal requirements as specified under SOLAS regulation V/15.

1.3 Achieving trustworthy software and usability in the development of complex systems requires a disciplined and structured approach. This guideline encourages such an approach in the development and management of e-navigation systems, with particular focus on Software Quality Assurance (SQA) and Human-Centred Design (HCD) that includes Usability Testing (UT). Systems so designed, developed and managed throughout their life cycle deliver improved user performance, being stable and resilient, and, most importantly, support users in low and high workload environments, such as during challenging navigation and environmental conditions when users are most vulnerable to making mistakes and when error management and recovery is essential. Other important benefits include limiting the amount of operator familiarization training that is needed and the time and resources required for system maintenance and support.

1.4 SQA focuses on defining and testing software quality and how that helps meet user requirements to ensure that high quality, robust, testable and stable software is used in e-navigation systems. E-navigation software quality needs to be evaluated to ensure relevant quality characteristics meet the requirements of the system.

1.5 The basic premise of HCD is that systems are designed to suit the characteristics of intended users and the tasks they perform, rather than requiring users to adapt to a system. UT is a key component of HCD and uses methods that rely on including users to test the ability of systems to support user needs. UT helps to identify potential problems and solutions during design and development stages by using an iterative approach to testing where the design evolves through rounds of prototyping, testing, analysing, refining and testing again.

1.6 The combination of SQA and HCD (including UT) provides opportunities to guide system design and development to improve data quality and information analysis, and to generally meet user needs and enhance safety.

1.7 This guideline is not intended to be the sole source of guidance for SQA and HCD and associated activities. Rather, it is intended to provide a general understanding of SQA and HCD for the effective design and development of e-navigation systems. It draws extensively on existing relevant international standards. Appendix 1 provides a list of recommended international standards used to support this guideline.

1.8 For any ISO/IEC standards referred to in this guideline, the current edition (including any amendments) applies, taking into account implementation periods, as applicable.

2 Scope

2.1 The scope of this guideline is to provide an overarching document to ensure that e-navigation quality design attributes are included in the development of e-navigation systems. Figure 1 provides an overview of the quality design attributes that should be considered and includes "product and data quality", "meet user needs", "security" and "functional safety". This guideline mainly addresses software quality, which incorporates "product and data quality" and "meet user needs". Consideration of all the design attributes will help ensure that software and human-based risks are addressed. Figure 1 also provides information on relevant standards that developers and designers of e-navigation systems should consider in ensuring all quality attributes are addressed ensuring overall system quality.

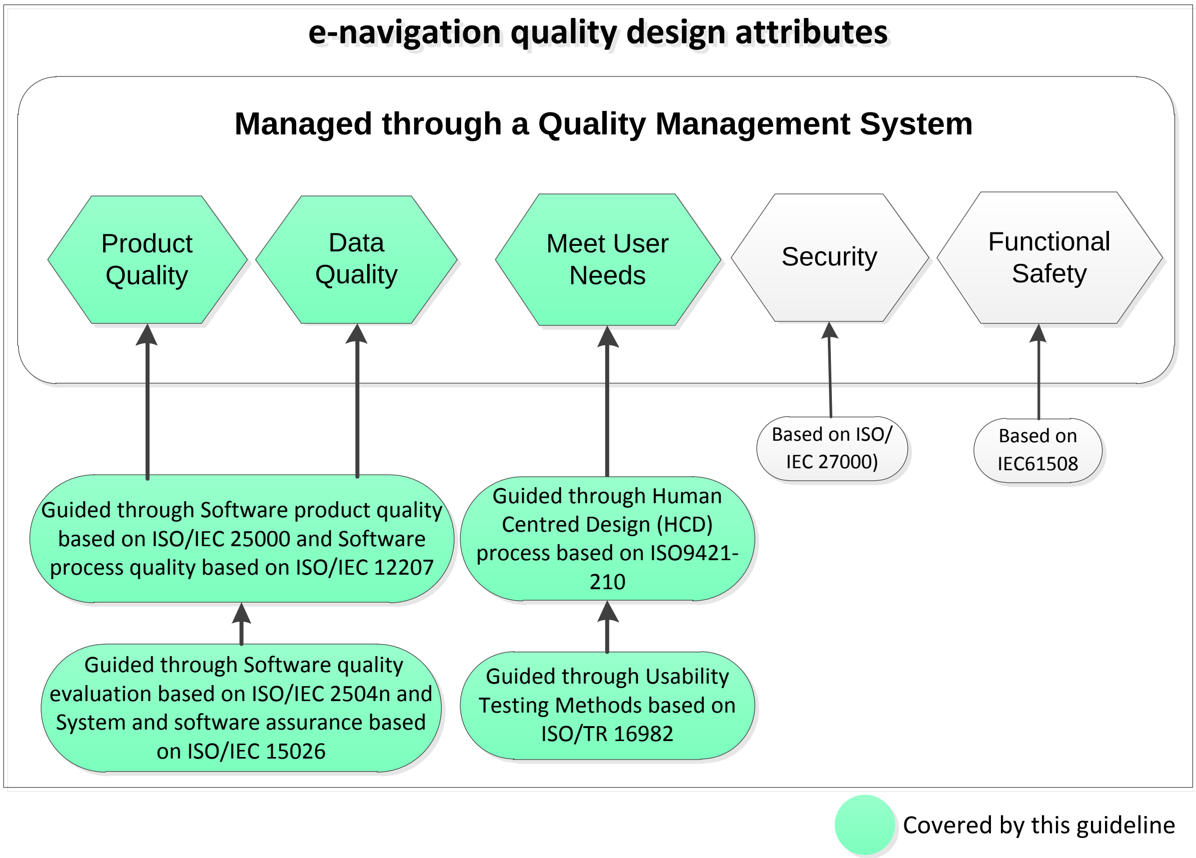


Figure 1: Concepts and standards for e-navigation quality design attributes

2.2 This guideline is intended to be used by all stakeholders involved in the design and development of e-navigation systems, with its primary users being those who develop and test e-navigation systems. Stakeholders include equipment designers and manufacturers, system integrators, maritime authorities and regulators, shipbuilders, shipowners, ship operators, Vessel Traffic Service authorities and Rescue Coordination Centres, and other relevant international organizations such as the International Association of Marine Aids to Navigation and Lighthouse Authorities (IALA) and the International Hydrographic Organization (IHO).

2.3 Table 1 provides a summary of stakeholder involvement in the application of this guideline at each stage of the e-navigation system's life cycle.

Table 1: Stakeholder involvement

Life cycle Stage	**Stakeholder**
Analysis Operational System Feedback	Manufacturers/system designers, users, shipowners, ship operators, regulatory authority
Stage 1: Concept development	Manufacturers/system designers, users
Stage 2: Planning and Analysis	Manufacturers/system designers, users
Stage 3: Design	Manufacturers/system designers, users
Stage 4: Integration and Testing	Manufacturers/system designers, users, approval authority (regulator), shipowners, ship operators
Stage 5: Operational	Users, shipowners, ship operators and manufacturers/system designers
Disposal	Shipowners, ship operators and manufacturers/system designers

2.4 The provisions in this guideline are goal-based and are not intended to specify or discourage the use of any particular quality assurance, management process, or testing method. Hence, detailed and prescriptive design requirements, which specify design solutions, are not covered.

2.5 It is recommended that users of this guideline be generally familiar with contemporary quality management processes, software quality assurance and human factors.

2.6 This guideline does not address training requirements.

3 Definitions

3.1 **Data quality:** The degree to which quality characteristics of data have the intrinsic potential to satisfy stated and implied needs.

3.2 **Data Quality Assurance (DQA)**: A set of processes, that ensures that shore and shipboard based data used by e-navigation systems meets and complies with required quality specifications.

3.3 **Effectiveness:** Measure of accuracy and completeness with which users achieve specified goals.

3.4 **Efficiency:** Resources expended in relation to the accuracy and completeness with which users achieve goals.

3.5 **E-navigation:** The harmonized collection, integration, exchange, presentation and analysis of marine information on board and ashore by electronic means to enhance berth-to-berth navigation and related services for safety and security at sea and protection of the marine environment.

3.6 **Human factors:** The scientific discipline concerned with the application of validated scientific research about people, their abilities, characteristics and limitations to the design of systems they use, environments in which they function and interact, and jobs they perform to optimize human well-being and overall system performance.

3.7 **Human-Centred Design (HCD):** An approach to system design and development that aims to make interactive systems more usable by focussing on the use of the system; applying human factors, ergonomics and usability knowledge and techniques.

Note 1: The term "human-centred design" is used rather than "user-centred design" in order to emphasize that this process also addresses impacts on a number of stakeholders, not just those typically considered as users. However, in practice, these terms are often used synonymously.

Note 2: Usable systems can provide a number of benefits including improved productivity, reduction in training needs, enhanced user well-being, avoidance of stress, increased accessibility, and reduced risk of harm.

3.8 **Product quality:** The degree to which a product or system meets functional suitability, performance efficiency, compatibility, usability, reliability, security, maintainability and portability as defined by ISO/IEC 25010 or relevant standards. The overall product quality is a result of quality of hardware, software and data.

3.9 **Satisfaction:** Freedom from discomfort along with positive attitudes towards the use of the system.

3.10 **Socio-technical system**: A system that includes interaction between people, technology (i.e. equipment and systems) and their physical and organizational environments.

3.11 **Software quality:** The degree to which a software product (system, component or process) meets specified requirements with the aim of also meeting stakeholder expectations.

3.12 **Software Quality Assurance (SQA)**: A set of processes that ensures software meets and complies with required quality specifications. Designated SQA processes align with a system design life cycle.

3.13 **Software quality evaluation:** A systematic examination of the extent to which a software product is capable of satisfying stated and implied needs.

3.14 **Software quality in use:** Capability of a software product to enable specific users to achieve specific goals with effectiveness, productivity, safety and satisfaction in specific contexts of use.

3.15 **Stakeholder:** An individual or organization having a right, share, claim or interest in a system.

3.16 **System:** Combination of interacting elements organized to achieve one or more stated purposes. A system can consist of products (tools used to achieve a specific task), equipment, services and/or people.

3.17 **System life cycle (Life cycle):** The stages containing the processes activities and tasks spanning the life of the system and/or product from the definition of its requirements to the termination of its use; life cycle covers its conception, design, operation, maintenance, support and disposal.

3.18 **Usability:** The extent to which systems can be used by users to achieve specified goals with effectiveness, efficiency and satisfaction, in a specified context of use.

3.19 **Usability Testing (UT):** Evaluation methods and techniques used to support Human-Centred Design (HCD) and used for the purpose of increasing the usability of a system.

3.20 **User:** Anyone interacting with the system, including its operators and maintainers.

4 Quality management systems

4.1 It is recommended that SQA, HCD and associated activities are performed using a quality management system such as ISO/IEC 90003 or relevant standards to ensure that quality requirements are embedded in the development life cycle process in order to achieve software quality, meet user needs and enhance safety of e-navigation systems.

4.2 This guideline can be applied to the design of systems with varying levels of complexity, regardless of whether a new system is being developed or an existing system is being modified.

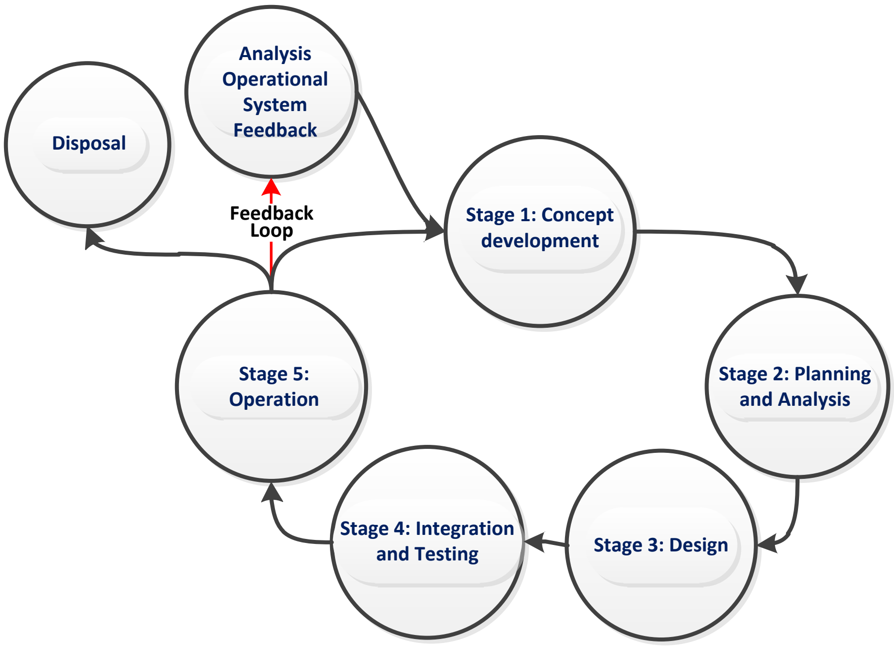


Figure 2: Generic life cycle

4.3 Figure 2 shows a typical generic life cycle[1] with the stages recommended as a minimum for the application of this guideline to the development of e-navigation systems:

.1 Analysis of operational system feedback;

.2 Stage 1: Concept development;

.3 Stage 2: Planning and analysis;

.4 Stage 3: Design;

.5 Stage 4: Integration and testing;

.6 Stage 5: Operation; and

.7 Disposal.

[1] The system life cycle management approach in IEC61174 (for ECDIS) can be referred to as an example.

4.4 The aim of SQA, HCD and associated UT activities is to ensure that for each stakeholder, user and task requirements are considered in the development process. This takes into account interactions between people, technology and the physical and organizational environments within which they work. Outcomes can be maximized if SQA, HCD and associated activities are applied by teams with relevant multidisciplinary skills and experiences.

4.5 SQA and HCD are performance- and risk-based processes. Hazards are identified, associated risks assessed and, if necessary, risk reduction and control measures are implemented to ensure an acceptable level of quality, usability and safety. Because they are performance-based processes, validation is based on how the outcomes are achieved.

5 Software quality assurance (SQA)

5.1 Key to ensuring software quality in e-navigation is to address the quality attributes that need to be considered in the development and design of e-navigation systems as highlighted in figure 1.

5.2 Software in support of e-navigation can be a product on its own, or part of a larger system and includes data and information. A key function of e-navigation software is to harmonize, integrate, exchange, present and analyze maritime data and information to meet user needs.

5.3 Functional Safety: The performance of systems related to e-navigation software should be assured in terms of required functions and level of integrity. The reliability and availability of safety-related functions should be specified based on stakeholder requirements and traceable through documentation. Functional safety requirements should be defined, implemented and managed throughout the life cycle. The required level of functional safety can vary depending on the designed functionality and intended use, and should be determined by an appropriate risk-based process. Guidance for ensuring functional safety is provided in IEC 61508 or relevant standards.

5.4 Security: It is important to consider and properly address security to prevent cyber-attacks, hacking or other illegal intrusions. Any e-navigation implementation should provide a secure digital environment, in particular: addressing avoidance, prevention and detection of any cyber security threats, locally, regionally and internationally. Guidance on software and cyber security is provided in ISO/IEC 27000 or relevant standards.

5.5 Software Quality Models for e-navigation: This section introduces three types of quality models for e-navigation software systems that are defined by the ISO/IEC 25000 series:

.1 Product quality;

.2 Data quality; and

.3 Quality-in-use.

5.6 The Product quality model categories are: functional suitability, performance efficiency, compatibility, usability[1], reliability, security, maintainability and portability.

[1] It should be noted that ISO 25010 uses "usability" to describe the attributes that confer quality-in-use. The usage of usability in this guideline is different but very close to quality-in-use.

5.7 Software quality is also dependant on the quality of input data, which should conform to relevant international standards. As shown in figure 1, data quality is one of the key attributes of e-navigation systems. Data quality requirements and data quality characteristics should be based on ISO/IEC 25012 and related standards (i.e. International Hydrographic Organization (IHO) standards for nautical information including Electronic Navigational Charts (ENC)). These standards propose a general data quality model to support organizations to acquire, manipulate and use data with the necessary quality characteristics. It is recommended that Data Quality Assurance (DQA) is performed using a quality management system such as ISO/IEC 90003 or relevant standards.

5.8 A systematic approach to ensure data quality is recommended and can include:

.1 defining and evaluating data quality requirements in data production, acquisition and integration processes;

.2 identifying data quality criteria, also useful for re-engineering, assessment and improvement of data; and

.3 evaluating the compliance of data with legislation and other relevant requirements.

5.9 Producers of input data should have life cycle management practices in place to handle possible data format changes during the life cycle. These life cycle management practices should include timely announcements to software producers and end users about such changes. As part of DQA, producers of input data should test all data in service for conformance with relevant international standards.

5.10 The quality-in-use of a system characterizes the impact that the product (system or software product) has on stakeholders, measuring effectiveness, efficiency, freedom from risk and satisfaction in specific contexts of use. It is determined by the quality of the software, hardware and operating environment and by the characteristics of the users, tasks and social environment. All these factors contribute to the quality-in-use of the system. Examples of quality-in-use measures are given in ISO/IEC 25024.

5.11 Appendix 2 provides details of recommended sub-activities to be undertaken during the software life cycle to ensure the development of better quality software.

5.12 Software quality evaluation: The required software quality depends on the intended use or objectives of the system of which the software is a part. Software products need to be evaluated during design, implementation and integration to determine whether the relevant quality characteristics are met.

5.13 Software quality evaluation processes are defined in relevant international standards, such as ISO/IEC 25040 which contains the following activities:

.1 define the purpose and scope of the evaluation and identify software quality requirements;

.2 specify and develop the quality measures and establish decision criteria;

.3 develop the evaluation plan;

.4 carry out the evaluation applying quality measures and the decision criteria; and

.5 review the evaluation results and prepare an evaluation report and provide feedback.

5.14 For each activity, applicable measurement tools, constraints, inputs and outputs are identified. Outputs of previous activities can be used as inputs to subsequent stages. The first activity may include output from previous evaluations as an input.

5.15 When an evaluation is performed concurrently with software product development, associated activities can be performed as part of software life cycle processes (ISO/IEC 12207 or relevant standards) and/or system life cycle processes (ISO/IEC 15288 or relevant standards).

5.16 Figure 3 outlines the main activities that should be undertaken in the software life cycle, as below:

.1 Pre-activity: Preliminary hazard analysis;

.2 Activity 1: Definition of stakeholders and system requirements;

.3 Activity 2: Analysis of system requirements;

.4 Activity 3: Software architecture design and implementation;

.5 Activity 4: Software testing, installation and acceptance;

.6 Activity 5: Software operation and maintenance; and

.7 Activity 6: System disposal.

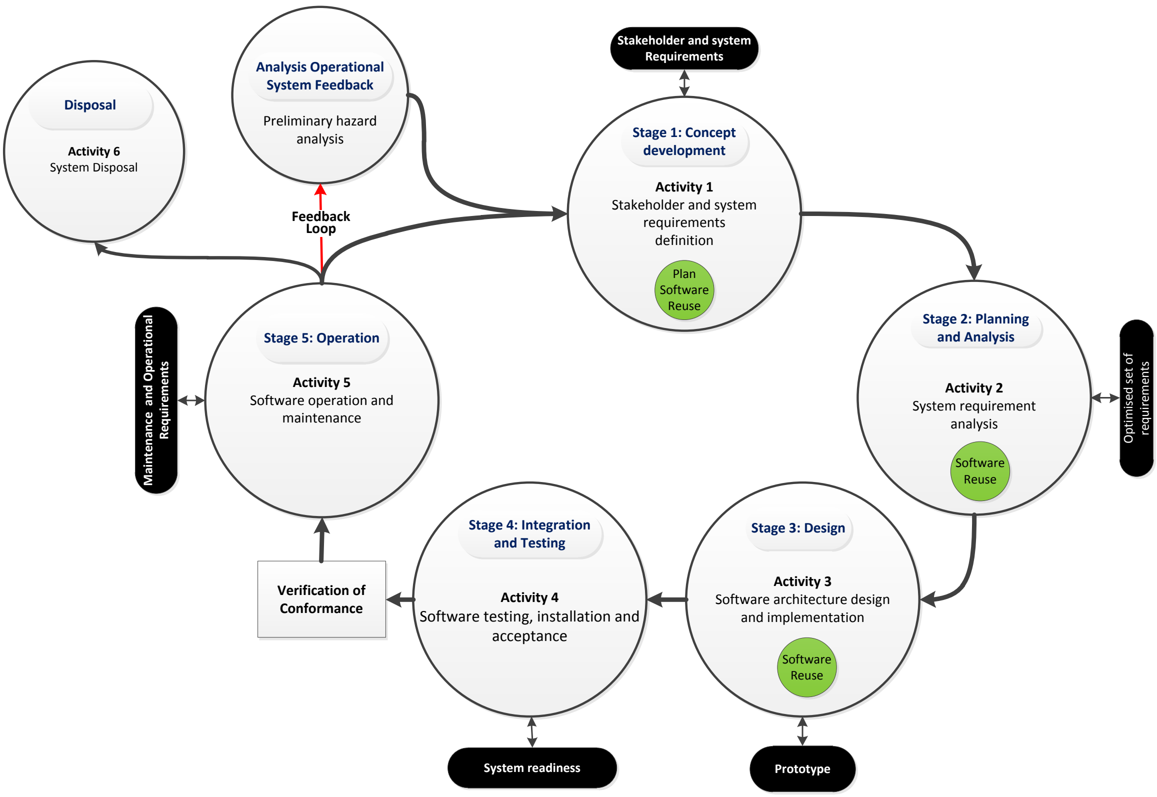


Figure 3: Overview of Software Quality Assurance activities

Activity 1: Definition of stakeholders and system requirements

5.17 This activity involves specifying the required characteristics and identifying the context of use of the system being developed. During this activity validation and conformance requirements of the system will also be identified.

Activity 2: Analysis of system requirements

5.18 This activity involves defining a set of functional and non-functional system requirements with various configurations developed in order to ensure an optimized solution. This activity results in a prioritized, approved and updated set of system requirements including SQA requirements which are consistent and traceable.

Activity 3: Software architecture design and implementation

5.19 This activity involves defining and structuring the elements of the system, ensuring it meets defined software quality requirements. The verification between the system requirements and the system architecture should also be carried out during this stage. A strategy for software integration based on the priorities of the system requirements needs to be developed with criteria to verify compliance.

5.20 An important aspect to be considered during the early stages of software design is software reuse. This needs to be considered during stages 1 to 3 of the software life cycle. Software reuse is the use of existing software assets in some form within a software development process. Software assets include products from prior developments such as components, test suites, designs and documentation. Software assets may be modified as needed to meet new system requirements.

Activity 4: Software testing, installation and acceptance

5.21 This activity ensures that the integrated software is compliant with the system requirements. Appropriate methods and standards for testing software should be developed to ensure the reliability and validity of the software qualification test and, as much as possible, conformance to expected results. Software qualification testing should take place in its intended operational environment. As previously mentioned, appropriate test data sets provided by relevant international organizations such as IALA and IHO should be used to ensure conformance to shore-based data. An important pre-condition is to ensure that the use of shore- and ship-based data has been subject to a DQA process. This activity also involves evaluating and testing the integrated system using pre-defined criteria, with evidence produced that demonstrates quality assurance.

5.22 Verification of conformance: It is recommended that certificates of conformance to existing software and data quality should meet relevant standards to ensure the verification of software systems.

5.23 It is recommended that the verification process for e-navigation SQA be carried out by reviewing the related documents on the e-navigation software system or data, by inspecting the implementation of the e-navigation software system and testing the software functions. It is recommended that the testing environment covers berth-to-berth operation, ship-to-ship communication, ship-to-shore communication as well as shore-to-shore communication.

Activity 5: Software operation and maintenance

5.24 This activity involves the identification and evaluation of conditions for correct operation of the software in its intended environment. An operation and maintenance strategy needs to be developed in consultation between the software developers and users. This will ensure that any software and system modifications, upgrades, changes to the existing system interface and updating of system and software documentation are appropriately managed and do not compromise product requirements or safety.

Activity 6: System disposal

5.25 A system disposal strategy should be developed to facilitate knowledge retention and analysis of long-term impacts. A hardware disposal strategy should also be developed to promote the use of non-hazardous materials during manufacturing.

5.26 Note that some of the software quality activities described in this section will also overlap with the HCD process activities described in Section 6.

6 Human-Centred Design (HCD)

6.1 HCD helps to ensure that human factors-related knowledge and techniques in system design and development processes are addressed, thus ensuring that user needs and safety are met. The primary goals of usability and safety through efficiency, effectiveness, risk reduction and satisfaction should always be maintained.

6.2 Key elements of HCD are the involvement of multi-disciplinary teams including users and an iterative approach to design. HCD is driven by knowledge about use, derived from evaluation and testing with users, the results of which drive a formal feedback loop in each of the design stages to ensure usability and safety. E-navigation systems should aim to ensure that navigational and associated tasks are effectively supported, with usability being the measure that is tested to ensure that this is achieved.

6.3 Figure 4 outlines the activities that should be undertaken in each of the life cycle stages, illustrating the interdependence of each activity. The following HCD activities are carried out to inform development throughout the life cycle:

.1 Pre-activity: Conduct Early Human Element Analysis (EHEA);

.2 Activity 1: Understand and specify the context of use;

.3 Activity 2: Identify the user requirements;

.4 Activity 3: Produce and/or develop design solutions to meet user requirements;

.5 Activity 4: Evaluate the design against usability criteria; and

.6 Activity 5: Maintain operational usability.

6.4 Fundamental to HCD is the collection of user feedback through UT. UT is an effective means to discover and resolve potential usability and design issues early as well as throughout the life cycle of a system by using an iterative testing approach to ensure a safe, satisfactory, effective and efficient system. Evaluation through usability testing is carried out iteratively at all stages in the life cycle and provides input for future versions of systems.

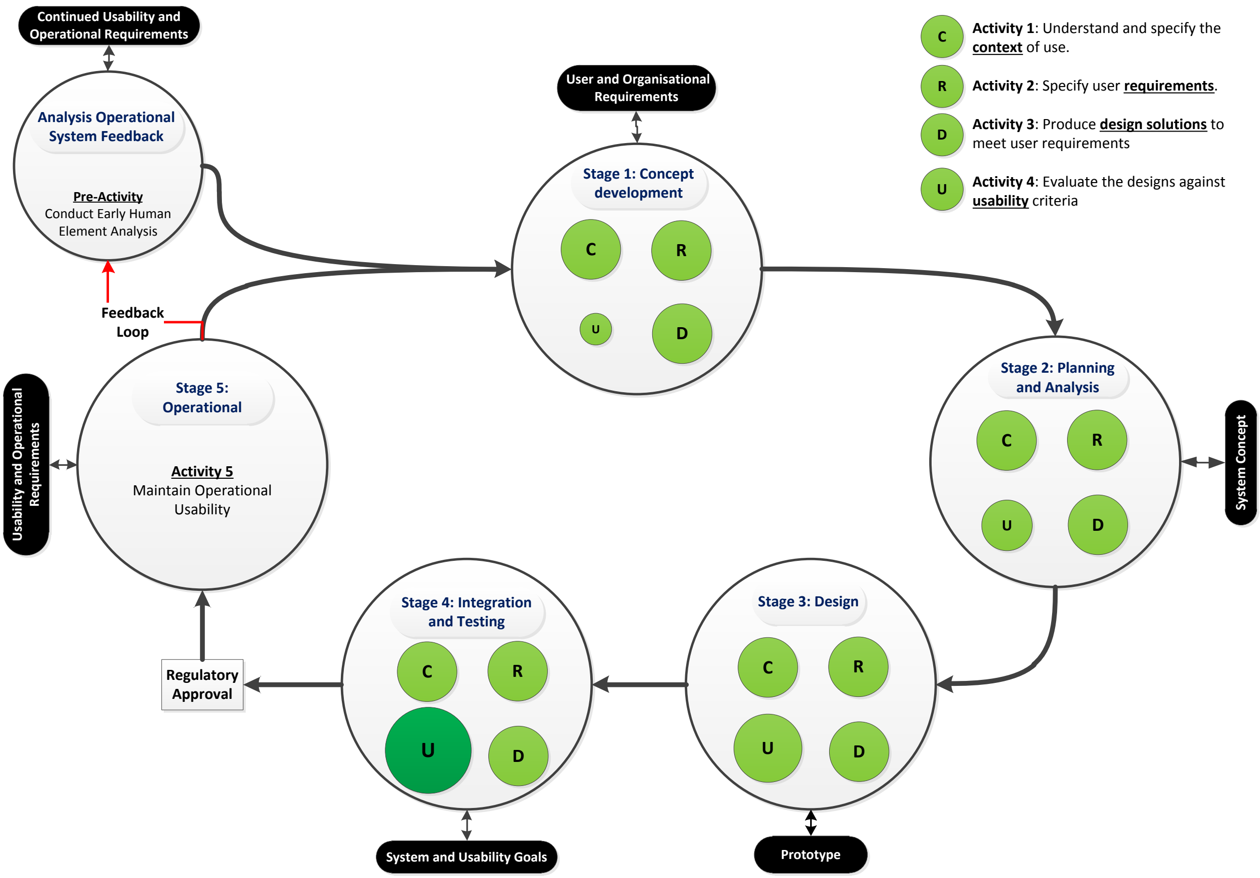


Figure 4: Overview of HCD for e-navigation systems

Pre-activity – Conduct an Early Human Element Analysis (EHEA)

6.5 The pre-activity involves establishing an understanding of usability issues. This may include conducting an Early Human Element Analysis (EHEA), which involves capturing lessons learned from operating similar systems, prioritization of human element issues, all documented in a risk register. Advantages of an EHEA include identifying emerging or innovative requirements and needs.

Activity 1: Understand and specify the context of use

6.6 Context of use consists of the users' characteristics (and their associated individual cognitive and physical factors), their goals and interactions with tasks, stakeholders, physical operating environments (i.e. the work environment where the e-navigation system is being used), and social and management environments (i.e. training, the company and its management policies and procedures). The context of use appropriately takes into account relevant aspects of socio-technical systems. As shown in figure 4, this is conducted during stages 1 to 4 of the design and development life cycle of a system with varying levels of intensity, as necessary.

6.7 Information gathered when establishing context of use can help frame scenarios which provide realistic examples of future use. Scenarios encourage designers to consider the characteristics of the intended users, their tasks and environment, and they enable usability issues to be explored at an early stage in the design process. They are best developed in conjunction with users. Scenarios also need to include common, routine tasks and rarely performed but critical tasks (e.g. those that need to be performed in an emergency).

6.8 When new systems are to be used in combination with existing systems, the context of use needs to include the overlapping elements and the interaction of the new system with the elements of the other systems.

Activity 2: Identify user requirements

6.9 The user requirements include user needs and task-related needs identified in the context of use of a system and task-related activity. This involves progressing user and contextual needs into an explicit statement of user requirements in relation to the intended context of use and the business objectives of the system.

6.10 Activity 2 involves some or all of the following:

.1 clarification of system goals;

.2 analysis of stakeholders' needs and expectations;

.3 analysis of user needs and expectations;

.4 resolution of conflicts between different user and task requirements;

.5 identification of safety issues (risks and hazards);

.6 analysis of training needs;

.7 analysis of system/equipment familiarization requirements;

.8 generation of operational concept and top-level system requirements;

.9 ensuring the quality of user requirement specifications; and

.10 further development and refinement of task-based scenarios and test cases.

Activity 3: Produce and/or develop design solutions to meet user requirements

6.11 Activity 3 involves applying the knowledge gained earlier about the intended context of use, including user roles, responsibilities, tasks and their outputs to design solutions.

Activity 3 may involve some or all of the following:

.1 development of prototypes and/or specific test beds;

.2 development of design solutions and altering them based on UT and other feedback;

.3 designing user-system interaction and user interface to meet context of use and usability requirements; and

.4 development of a maintenance/support regime.

Activity 4: Evaluate the design against usability criteria

6.12 Activity 4 is the basis on which UT is carried out as appropriate to the particular stage in the life cycle. The evaluation of the design against usability criteria should be conducted before a system is deployed operationally and should, as a minimum, employ test participants who are representative of user groups.

6.13 Planning the UT involves:

.1 selecting scenarios and test cases;

.2 identifying and recruiting testing participants;

.3 choosing methods, techniques and documentation for collecting and analysing data; and

.4 determining acceptance criteria.

6.14 Measurements of usability should include effectiveness, efficiency and satisfaction. Appropriate methods include expert evaluation (such as observation of scenario/task performance), questionnaires, interviews, walk-throughs, task-based user testing and observations. Typical measures for these are included in ISO/TR 16982:2002. Appendix 3 includes an example of a usability method referred to as the "usability rating method" applied to ECDIS.

Activity 5: Maintain operational usability

6.15 Activity 5 addresses HCD in a system's operation. Throughout a system's operational life users are trained and will use the system. They are therefore able to provide accurate feedback on use and usability. This feedback may lead to refinements to the system and subsequently improved performance in newer versions, and hence activity 5 is linked to the pre-activity through a feedback loop.

APPENDIX 1

International standards on SQA, HCD and associated activities

Topic	Relevant standard	Subject
Human-Centred Design	ISO 9241-210	Ergonomics of human-system interaction – Human-centred design for interactive systems.
	ISO 9241-110	Ergonomics of human-system interaction – Dialogue Principles.
	ISO TR 18529	Ergonomics of human-system interaction – Human-centred life cycle process definitions
Usability Testing	ISO/TR 16982	Ergonomics of human-system interaction – Usability methods for supporting human-centred design.
System and software Quality Requirements and Evaluation (SQuaRE)	ISO/IEC 25010	Systems and software quality models
	ISO/IEC 25012	Data quality models
	ISO/IEC CD 25024	Measurement of data quality (under development and replacing ISO/IEC TR 9126-4:2004)
	ISO/IEC 25040 ISO/IEC 25041 ISO/IEC 25042 ISO/IEC 25045	Quality Evaluation Division (Evaluation process, guides and modules)
	ISO/IEC 25060	Common Industry Format (CIF) for usability: General framework for usability-related Information
	ISO/IEC 25062	Common Industry Format (CIF) for usability test reports
System and Software Assurance	ISO/IEC 15026-1	Part 1: Concepts and vocabulary
	ISO/IEC 15026-2	Part 2: Assurance case
	ISO/IEC 15026-3	Part 3: System integrity levels
	ISO/IEC 15026-4	Part 4: Assurance in the life cycle
System and software life cycle processes	ISO/IEC 15288	System life cycle processes
	ISO/IEC 12207	Software life cycle processes
Ships and marine technology – Computer applications	ISO 17894	General principles for the development and use of programmable electronic systems in marine applications
Software Quality Management	ISO/IEC 90003	Guidelines for the application of ISO 9001to computer software

APPENDIX 2

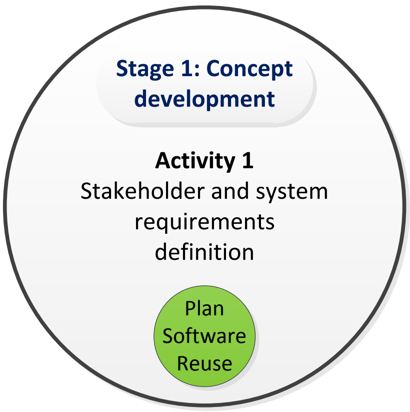
Recommended Software Quality Assurance activities and sub-activities

1 This appendix details actions and associated expected outcomes that can be used to assist with software development and Software Quality Assurance (SQA) activities.

2 Activities, and where appropriate sub-activities, can be specific or holistic in nature. The expected outcomes may result in documentation which should in general align with the requirements of the quality management system being used. This will in many cases result in evidence showing that the results of activities undertaken comply with top-level requirements for the e-navigation systems being developed.

3 Depending on the required characteristics of the software system, boundaries between activities may be flexibly arranged to help assist with effective SQA across the software life cycle.

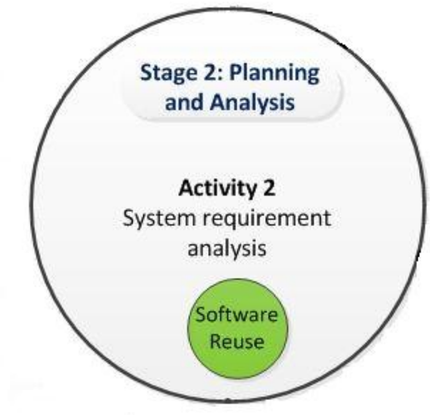
4 For Activity 1, it is recommended to define stakeholder requirements which can include the following actions and expected outcomes:



- Define stakeholder requirements
- Plan software reuse

Activity or sub-activity	Actions/Outcomes
Stakeholder requirements definition	✓ Elicit needs of stakeholders and identify the context of use; ✓ Develop specification of the required characteristics and context of use; ✓ Definition of the constraints on the system to be developed; ✓ Traceability of stakeholder requirements to stakeholders and their needs; ✓ The basis for defining the system requirements; ✓ The basis for validating the conformance of the services; and ✓ A basis for negotiating and agreeing to supply the system to be developed.

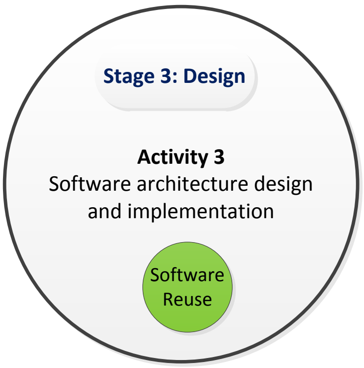
5 For Activity 2, it is recommended to conduct a system requirement analysis which can include the following actions and expected outcomes:



- System requirement analysis
- Software reuse

Activity or sub-activity	**Actions/Outcomes**
System requirement analysis	✓ A defined set of functional and non-functional requirements; ✓ Systems configuration for the optimized solution; ✓ Correctness and testability analysis of the system requirements; ✓ Impact analysis of the system requirements on the operating environment; ✓ Prioritized, approved and updated set of the requirements when needed; ✓ Consistency and traceability between the system requirements and the stakeholder's requirements baseline; and ✓ Impact analysis of changes to the baseline for cost, schedule and technology.

6 For Activity 3, it is recommended to conduct system architectural design and implementation which can include the following actions and expected outcomes:



- Software architecture design
- Implementation
- Software reuse

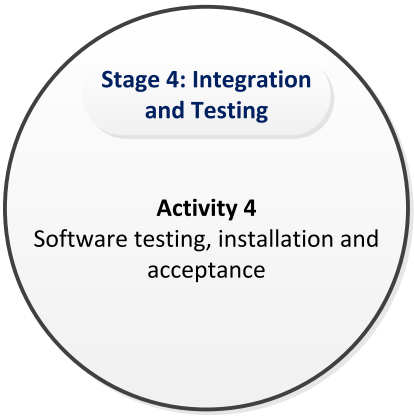
Activity or sub-activity	**Actions/Outcomes**
Software architectural design	✓ A software architecture design defining the elements of a system that meets the defined requirements; ✓ Functional and non-functional requirements of the system; ✓ Allocation of some of requirements to the elements of the system; ✓ Internal and external interfaces of each system element;

Activity or sub-activity	Actions/Outcomes
	✓ Verification between the system requirements and the software architecture; ✓ Traceability to the stakeholder's requirements base line; ✓ Maintaining the consistency and traceability between the system requirements and software architecture design; ✓ Base lining the relationships between the system requirements and the architecture design and informing all affected stakeholders; and ✓ Incorporating human factors principles and knowledge in system design.
Implementation	✓ A strategy for software integration based on the priorities of the system requirements; ✓ Criteria to verify compliance with the system requirements; ✓ Verification of system integration by using the defined criteria; ✓ A regression strategy for re-testing the system when changes are made; ✓ Establishment of consistency and traceability between the system design and the integrated system elements; ✓ An integrated system with compliance with the system design; and ✓ An integrated system with a complete set of usable deliverable system elements.

7 The software reuse activity falls within Activities 1, 2 and 3, which can include the following actions and expected outcomes:

Activity or sub-activity	Actions/Outcomes
Software reuse	✓ Establishing the policy, plan and processes for software reuse; ✓ Selecting representation forms for the domain models and the domain architectures; ✓ The boundaries of the domain and its relationships to other domains; ✓ A domain model that captures the essential common and different features, capabilities, concepts, and functions in the domain; ✓ A domain architecture describing the family of systems within the domain, including their commonalities and differences; ✓ Specification of assets belonging to the domain; ✓ Acquisition, development and maintenance of assets belonging to the domain throughout their life cycles; and ✓ Maintaining the domain models and architectures throughout their life cycles.

8 For Activity 4, it is recommended to conduct software integration, qualification and testing, installation and acceptance, which can include the following actions and expected outcomes:



- Software integration
- Software testing
- Software installation
- Software acceptance

Activity or sub-activity	**Actions/Outcomes**
Software integration	✓ Test coverage of system requirements; ✓ Appropriateness of test methods and standards used; ✓ Conformance to expected results; ✓ Feasibility of software qualification testing; and ✓ Feasibility of operation and maintenance.
Software qualification testing	✓ A criteria for evaluating compliance with system requirements; ✓ Testing the integrated system using the defined criteria; ✓ Recording the test results; and ✓ Assuring readiness of the system for delivery.
Software installation	✓ A software installation strategy; ✓ Criteria for software installation showing compliance with the software installation requirements; ✓ Installing the software in the target environment; and ✓ Assuring readiness of the software product for use in its intended environment.
Software acceptance support	✓ The completed software system; ✓ Acceptance tests and reviews by acquirer; ✓ Putting the completed software system into operation in the intended environment; ✓ Identification of problems detected during acceptance; and ✓ Notification of the identified problems to the responsible party.

9 For Activity 5, it is recommended to conduct the software operation process and the software maintenance process which can include the following actions and expected outcomes:

- Software operation
- Software maintenance

Activity or sub-activity	Actions/Outcomes
Software operation	✓ An operation strategy; ✓ Identification and evaluation of conditions for correct operation of the software in its intended environment; ✓ Testing the software to determine the operation in its intended environment; ✓ Operating the software in its intended environment; and ✓ Assistance and consultation for the stakeholders of the software product in accordance with the agreement.
Software maintenance	✓ A maintenance strategy to manage modification and migration of products according to the release strategy; ✓ Identification of the impact of changes to the existing system on organization, operations or interfaces; ✓ Updating system and software documentation as needed; ✓ Modification of products without compromising requirements; ✓ Migration of product upgrades including data upgrade to the customer's environment; and ✓ Informing all affected parties of the system software modifications.

10 For Activity 6, it is recommended to conduct the system disposal process which can include the following actions and expectedoutcomes:

• System disposal

Activity or sub-activity	Actions/Outcomes
System disposal	✓ A software/hardware disposal strategy; ✓ Disposal constraints; ✓ Destruction of software/hardware elements as needed; ✓ Storage of software/hardware elements as needed; ✓ The software environment left in an agreed-upon state; ✓ Records allowing knowledge retention of disposal actions and any analysis of long-term impacts; ✓ Evidence showing that the results above comply with top-level requirements of the e-navigation systems to be developed; and ✓ Confirmation that disposal is not detrimental to health, safety, security and the environment.

APPENDIX 3

Example of Usability Testing

1 This appendix provides some information on Usability Testing (UT) and uses ECDIS as a closely aligned example relevant to future e-navigation systems. This UT example aligns with Stage 4 of the HCD process for evaluating the performance of essential tasks by competent users. The selection of test participants is important and has a bearing on the quality of test results.

2 If tasks require operations based on navigational experience or knowledge, then appropriate participants should be selected. Tasks that are generally performed by less experienced or knowledgeable personnel should be similarly tested.

3 The UT activity involves the following steps:

.1 Planning;

.2 Preparation;

.3 Undertaking and controlling tests;

.4 Evaluation of results; and

.5 Use of feedback.

4 Only the steps related to planning and evaluation of results are explained in this appendix since these steps are the most important.

5 A UT plan should be developed by defining scenarios and identifying the most important or critical tasks that users must perform. Users and the test environment should also be identified.

6 A goal-based approach should be used when setting the tasks with the aim of facilitating flexible yet practical assessment of the target system.

7 The following steps can be part of the goal-based approach:

.1 Definition of goals based on the context of use of the system, which may come from functions stipulated in internationally agreed performance standards;

.2 Specify functional requirements or the criteria to be satisfied in order to conform to the goals, taking into account the relevant performance standards and user requirements;

.3 Specify "usability" requirements that must be achieved during testing, based on the aspects of effectiveness, efficiency and satisfaction; and

.4 Prepare tests that will assist in verifying the extent to which the system conforms with the identified goals.

8 In the case of ECDIS goals could include "to plan and display the ship's route for the intended voyage and to plot and monitor positions throughout the voyage", based on SOLAS regulation V/19.2.1.4.

9 Similarly, functional requirements for ECDIS could be defined based on the IMO's ECDIS performance standard (resolution MSC.232(82)). The following example of ECDIS functional requirements relates to nautical data handling necessary for safe navigation, with the following sub-requirements:

.1 Chart data handling (example: change display orientation, mode, etc.);

.2 Own ship data handling (example: read position, speed, etc.); and

.3 Tracked target (TT) and radar data handling (example: show TT symbols overlaid on ECDIS chart screen, etc.).

10 In the case of ECDIS, "usability" can be evaluated in terms of user effectiveness and efficiency for each of the tasks and overall satisfaction of the system (for example through subjective evaluation). As highlighted in table 1, measures of effectiveness relate the selected user goals to the accuracy and completeness with which these goals can be achieved. In this example, the achievement rate is used as a measure of "effectiveness". The four levels and their criteria are listed in table 1. Usability outcomes can be based on the "dialogue principles", as identified under ISO 9421-110, using UT methods based on ISO/TR16982. It is important that methods for evaluating usability are selected when devising the UT plan.

11 Scenarios and test tasks can also be created to satisfy the functional requirements. The following are examples of tasks for a basic display handling scenario:

Task 1: Adjust display modes and scale to meet operator's needs

Task 2: Obtain information about a lighthouse

Task 3: Measure the bearing and distance to a landmark

Task 4: Overlay a tracked target symbol and obtain information about the target

12 Criteria should be set to establish the degree to which tasks are achieved and also to capture user feedback on satisfaction with the operation of the system. Table 1 provides simple examples of achievement criteria for each task. Quantitative performance criteria such as time taken to complete tasks can also be included.

13 For the evaluation of system performance the level of task achievement can be useful (e.g. the time required to complete tasks). Questionnaires can assist with overall subjective system evaluation.

Table 1: Examples of achievement criteria for measures of effectiveness

Achievement level		Criteria
Achieved	1	✓ Participants understood the information correctly and operated properly with confidence. ✓ In case participants made some mistakes but noticed the mistakes immediately and achieved the goal smoothly, this should be considered "achieved smoothly".
	2	✓ Participants completed the task properly by themselves, even with some hesitation or confusion. ✓ In case participants took time to find the first action or to recover from errors but completed the task, this should be considered "achieved not smoothly".
Not achieved	3	✓ Even if participants completed the task properly, it should be considered "not achieved with errors" if the participants could not understand the information correctly or if achievement took a large number of interactions.
	4	✓ Participants could not complete the task by themselves and needed suggestions from the moderator.

14 To satisfy quality management system requirements a UT report should be developed. ISO/IEC 25062 provides an example for a template that can be used for a UT report.

UT methods that can be applied at various stages in the life cycle (based on ISO/TR 16982)

Name of the method	**Direct involvement of users**	**Short description of method**	**Life cycle stage**
Observation of users	Y	Collection of information in a precise and systematic way about the behaviour and the performance of users, in the context of specific tasks during user activity.	4
Performance-related measurements	Y	Collection of quantifiable performance measurements in order to understand the impacts of usability issues.	4
Critical incident analysis	Y	Systematic collection of specific events (positive or negative).	1
Questionnaires	Y	Indirect evaluation methods which gather users' opinions about the user interface in predefined questionnaires.	1 and 2
Interviews	Y	Similar to questionnaires but with greater flexibility involving face-to-face interaction with the interviewee.	2
Thinking aloud	Y	Involves having users continuously verbalize their ideas, beliefs, expectations, doubts, discoveries, etc. during their use of the system being tested.	3 and 4
Collaborative design and evaluation	Y	Methods which allow different types of participants (users, product developers and human factors specialists, etc.) to collaborate in the evaluation or design of systems.	Any
Creativity methods	Y/N	Methods which involve the elicitation of new products and system features, usually extracted from group interactions. In the context of human-centred approaches, members of such groups are often users.	1 and 2

Name of the method	**Direct involvement of users**	**Short description of method**	**Life cycle stage**
Document-based methods	N	Examination of existing documents by the usability specialist to form a professional judgement of the system.	1 and 2
Model-based approaches	N	Use of abstract representations of the evaluated product to allow the prediction of users' performance.	2 and 3
Expert evaluation	N	Evaluation based on the knowledge, expertise and practical experience in ergonomics of the usability specialist.	Any
Automated evaluation	N	Algorithms focused on usability criteria or using ergonomic knowledge-based systems which diagnose the deficiencies of a product compared to pre-defined rules.	4
Simulation	N	Use of computer simulation modelling tools used for initial evaluations.	2 and 3

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ANNEX 5

DRAFT RESOLUTION MSC […](95)
(Adopted on […])

PERFORMANCE STANDARDS FOR MULTI-SYSTEM SHIPBORNE RADIONAVIGATION RECEIVERS

THE MARITIME SAFETY COMMITTEE,

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

RECALLING ALSO resolution A.886(21), by which the Assembly resolved that the functions of adopting performance standards for radio and navigational equipment, as well as amendments thereto, should be performed by the Maritime Safety Committee on behalf of the Organization,

RECOGNIZING the need for performance standards for multi-system shipborne radionavigation receiver equipment in order to ensure that ships are provided with resilient position-fixing equipment suitable for use with available radionavigation systems throughout their voyage,

TAKING INTO ACCOUNT present performance standards for shipborne radionavigation receivers as laid down in resolution MSC.112(73), resolution MSC.113(73), resolution MSC.114(73), resolution MSC.115(73), resolution MSC.233(82) and resolution MSC.379(93);

HAVING CONSIDERED the recommendation made by the Sub-Committee on Navigation, Communications and Search and Rescue at its second regular session,

1. ADOPTS the Recommendation on Performance Standards for multi-system shipborne radionavigation receivers, the text of which is set out in the annex to the present resolution;

2. RECOMMENDS Governments to ensure that multi-system shipborne radionavigation receivers installed on or after [31 December 2017], conform to performance standards not inferior to those specified in the annex to the present resolution.

ANNEX

PERFORMANCE STANDARDS FOR MULTI-SYSTEM SHIPBORNE RADIONAVIGATION RECEIVERS

1 INTRODUCTION

1.1 Global Navigation Satellite Systems (GNSS), some of which are currently recognized as components of the World-Wide Radio Navigation System (WWRNS) by the Organization, are space-based systems that provide World-wide Position, Velocity and Time (PVT) determination services. Each GNSS space segment is composed of up to 30 satellites per constellation, which may be deployed in several orbital planes and orbit types. The spacing of satellites in orbit is normally arranged such that a minimum of four satellites will be in view to users, World-wide. Each satellite transmits signals that can be processed by receiver equipment to establish a three-dimensional position with a Position Dilution Of Precision (PDOP) ≤ 6 or Horizontal Dilution Of Precision (HDOP) ≤ 4, to ensure that the position information can be reliably used for navigation purposes.

1.2 Terrestrial radionavigation systems use signals from ground-based transmitting stations to determine PVT information. Signals received from at least three stations should be processed by receiver equipment to establish a two-dimensional position.

1.3 Augmentation systems use ground-based or space-based transmitters to provide augmentation data to improve accuracy and integrity for specific service areas (such as navigation in harbour entrances, harbour approaches and coastal waters).

1.4 The introduction of multi-system shipborne navigation receiver performance standards will allow the combined use of current and future radionavigation as well as augmentation systems for the provision of position, velocity and time data within the maritime navigation system.

1.5 A multi-system receiver using navigation signals from two or more GNSS, with or without augmentation, provides improved position, velocity, and time data. An improved resistance to intentional and unintentional radio frequency interference is achieved when two or more independent or frequency diverse radionavigation systems are used. Such a combined approach also provides redundancy to mitigate the loss of a single system

1.6 Receiver equipment, capable of combining measurements from multiple GNSS and at least one terrestrial radionavigation system, with or without augmentation, to form a single resilient PVT solution, can be used for navigation purposes on ships of speeds not exceeding 70 knots. Such equipment should, in addition to the general provisions contained in resolution A.694(17)[2], comply with the minimum performance standards as stated in this document.

1.7 It is the intention of these performance standards to define the minimum requirements, without defining the approach taken.

1.8 The multi-system shipborne radionavigation receiver determines, as a minimum, the position, course over ground (COG), speed over ground (SOG) and timing either for navigation purposes or as input to other shipboard functions. This information should be available during static and dynamic operations.

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2 Refer to Publication IEC 60945.

1.9 The performance standards allow the application of different methods and techniques for the provision of PVT data and related integrity information. Where guidelines dealing with the harmonized provision of PNT data as well as integrity monitoring of PNT system in use and provided data products have been approved by the Organization, these should be applied.

2 RECEIVER EQUIPMENT (MODULE A)

2.1 The term "multi-system shipborne radionavigation receiver equipment" (hereafter referred to as "the equipment") as used in these performance standards includes all the components and units necessary for the system to properly perform its intended functions. The equipment should include the following minimum components and capabilities:

.1 antennas capable of receiving all radionavigation signals required to support the functionality of the receiver equipment;

.2 receiver(s) and processor(s) capable of processing the radionavigation signals required to support the functionality of the receiver equipment;

.3 means of accessing the computed PVT information (e.g. display of latitude, longitude, COG, SOG, time, sources; and the phase(s) of navigation currently supported[3]);

.4 interface for supplying data controlling/ configuring the receiver;

.5 display;

.6 raw data output, for the provision of additional information, such as range measurements and GNSS's navigation data;

.7 indication of the quality and reliability of the computed and distributed PVT data to the user; and

.8 indication of radionavigation system (or systems) currently used for the PVT information to the user.

2.2 The design of the antennas should be suitable for fitting at a position(s) on the ship which provides a satisfactory environment for the reception of all required radionavigation signals. Multi-path and electromagnetic compatibility (EMC) effects should be taken into consideration;

2.3 The equipment should be designed to mitigate interference from authorized out-of-band sources;

2.4 The equipment should be designed to provide a means of integrity monitoring for each PVT source employed (e.g. RAIM, CAIM)[4]; and

2.5 The equipment should be designed to provide a means of multi-source autonomous integrity monitoring[5].

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3 The requirements for the different phases of navigation are set out in resolutions A.915(22) and A.1046(27).

4 Resolution A.915(22).

5 Multi-source integrity monitoring is envisioned to be a cross-check between independent PVT sources.

3 OPERATIONAL AND FUNCTIONAL REQUIREMENTS (MODULE B)

The equipment should:

3.1 Operate using civil access navigation signals of at least two independent GNSS recognized by the Organization as part of WWRNS, provided in the radionavigation satellite service (space-to-Earth) frequency bands designated in article 5 of the Radio Regulations[6];

3.2 Provide PVT data with the necessary level of resilience and integrity, whether it is used directly as input to other equipment, or provided for use within Integrated Navigation Systems (INS);

3.3 Operate using terrestrial radionavigation system(s) signals provided in the protected frequency bands;

3.4 Have the facilities to process augmentation data, in accordance with the appropriate methods[7];

3.5 Provide the facility for the user to select or deselect radionavigation and augmentation signals;

3.6 Be capable of processing the above signals and combining to provide a single PVT solution, including:

.1 position information of the consistent common reference point[8] in latitude and longitude, referenced to an implementation of an International Terrestrial Reference Frame (ITRF)[9], with coordinates in degrees and minutes to a precision reflective of the accuracy of the position information, up to four (4) decimal places;

.2 COG of the consistent common reference point[7] in degrees to a precision reflective of the accuracy of the calculated course information, relative to true north, up to one decimal place;

.3 SOG of the consistent common reference point[7] in knots to a precision reflective of the accuracy of the calculated speed information, up to two decimal places; and

.4 time, referenced to UTC (BIPM[10]), to one tenth of one second;

3.7 Be capable of providing the PVT solution to the required accuracy[11] within 5 min where there is no valid satellite almanac data (cold start);

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6 "Radio Regulations" means the Radio regulations annexed to, or regarded as being annexed to, the most recent Convention of the International Telecommunication Union which is in force at any time.

7 e.g. Recommendation ITU-R M.823, RTCM 10410, or other relevant standards , already existing or still to be developed in particular for Satellite Based Augmentation System (SBAS) adoption.

8 A single consistent common reference point for all spatially related information. For consistency the recommended reference location should be the conning position, according to the Resolution MSC 252(83).

9 For example, the World Geodetic System 1984(WGS 84) used by GPS, Earth Parameters 1990 (from Russian "Parametry Zemli" 1990) (PZ-90) used by GLONASS, the Galileo Terrestrial Reference Frame (GTRF) or the China Geodetic Coordination System (CGCS2000) used by BDS.

10 Bureau International de Poids et Mesures.

11 Resolution A.1046(27).

3.8 Be capable of providing the PVT solution to the required accuracy within 1 min where there is valid satellite almanac data (warm start);

3.9 Be capable of providing the PVT solution within 2 min, when subjected to a power interruption or loss of signals of < 60 s;

3.10 Provide time in UTC;

3.11 Be capable of meeting the requirements for the phases of navigation outlined in resolution A.1046(27);

3.12 Be capable of generating a new PVT solution at least once every 0.5 s for High-Speed Craft (HSC) in compliance with speed requirements as in paragraph 1.6 above and at least once every 1 s for conventional vessels;

3.13 Be capable of assessing whether the performance of the PVT solution (e.g. accuracy and integrity) meets the requirements for each phase of navigation[12]. An *alert* should be provided when such assessment cannot be determined;

3.14 Provide a caution if after 2 s for HSC or 3 s for conventional vessels, equipment is unable to assess the current achieved performance (e.g. accuracy and integrity) with respect to each navigation phase;

3.15 Provide a warning, if after 5 s for HSC or 7 s for conventional vessels, new PVT data has not been calculated. Under such conditions the last known position and the time of last valid fix, with the explicit indication of the state so that no ambiguity can exist, should be output until normal operation is resumed.

3.16 If it is not possible to provide a new position update at the next scheduled update, output the last plausible position, SOG, COG, and the time of the last valid fix, with indication of this state so that no ambiguity can exist, until position update is resumed.

3.17 Provide an indication of augmentation status, including:

.1 the receipt of augmentation signals;

.2 the validity of the signals received;

.3 whether augmentation is applied to the position in the PVT solution; and

.4 the identification of the augmentation signal(s).

3.18 Provide the following information, in alphanumerical form, for the final PVT solution and for each individual source when requested, to a local display (or a separate interfaced display):

.1 position;

.2 COG and SOG;

.3 time;

.4 the PVT solution source(s);

[12] Resolution A.1046(27).

.5 the assessment of the navigation phase(s) for which performance requirements are supported;

.6 the identification of the augmentation signal(s) applied to the position solution; and

.7 any alert information.

4 INTERFACING AND INTEGRATION (MODULE C)

The equipment should:

4.1 Provide the following interfaces in accordance with the relevant international standards:[13]

.1 at least one interface from which the PVT solution should be available in the WGS 84 (i.e. including position information, COG, SOG, time, PVT source(s) (available and used), assessment of phase(s) of navigation for which performance requirements are met, and augmentation information) can be provided. Means may be provided for transforming the computed position based upon WGS 84 into data compatible with the datum of the navigational chart in use;

.2 at least one interface from which data from all available sources can be provided (e.g. to an Integrated Navigation System (INS) for enhanced assessment of PVT information which should be available in WGS 84);

.3 an interface for *alert* management (i.e. with the Bridge Alert Management (BAM); and

.4 facilities to accept the input of augmentation signals from at least one source.[14]

4.2 Be capable of operating satisfactorily under normal interference conditions, consistent with the requirements of resolution A.694(17)[15], and taking into account the typical electromagnetic and radio frequency spectrum environment on board and from outside a vessel.

4.3 Ensure that no permanent damage can result from an accidental short circuit or grounding of the antenna or any of its input or output connections or any of the inputs or outputs.

5 DOCUMENTATION (MODULE D)

Documentation for the equipment should be provided, preferably in an electronic format, and should include:

5.1 Operating manuals, which should contain an overall function description including:

.1 the multi-system concept and the benefits and limitations of using GNSS and terrestrial radionavigation systems and augmentation (i.e. as source(s) for the PVT solution);

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[13] Refer to Publication IEC 61162.

[14] Recommendation ITU-R M.823.

[15] Refer to resolution A.694(17) and IEC 60945.

.2 a statement on which GNSS and terrestrial radionavigation systems and augmentation(s) are supported (i.e. as sources for the PVT solution);

.3 a statement on which navigation phase(s) are supported and by which PVT source(s);

.4 user guidance for receiver adjustments necessary to achieve the navigation phase requirements;

.5 an explanation of the method used for the applied indicators and thresholds;

.6 an explanation of the fusion process and input selection for multiple systems; and

.7 a description of possible failures and their effects on the receiver equipment.

5.2 Installation manuals, which should contain:

.1 details of the components and the interconnections between them;

.2 details of interfaces and connections for data input/output, and interconnection diagrams;

.3 configuration options and commissioning instructions;

.4 power supply and earthing arrangements; and

.5 recommendations on the physical layout of equipment, including antenna mounting requirements and necessary space for installation and maintenance.

5.3 Familiarization material, which should explain all configurations, functions, limitations, controls, displays, alerts, indications and standard operator checks of the equipment;

5.4 a failure analysis,[16] at the functional level, which should verify that the equipment is designed using safe design principles and ensuring that the equipment includes "fail-to-safe" actions. The failure analysis should consider the impact of all failure modes (e.g. those caused by electrical, component, radiofrequency interference or jamming, etc.); and

5.5 information which should support maintenance of the equipment.

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[16] Publication IEC 60812.

ANNEX 6

LIAISON STATEMENT TO ITU-R WP 5B

REVISION OF RECOMMENDATION ITU-R M.493-13

Digital Selective-Calling System for use in the Maritime Mobile Service

1 IMO's Sub-Committee on Navigation, Communications and Search and Rescue (NCSR), at its second session from 9 to 13 March 2015, considered the liaison statement sent by ITU-R Working Party 5B (WP 5B) in November 2014 regarding the draft revision of Recommendation ITU-R M.493-13 (Annex 28 to Document 5B/761-E) and comments as follows.

2 The Sub-Committee noted that WP 5B had further considered amendments to a revision of Recommendation ITU-R M.493-13 and that it had taken into consideration comments previously received from IMO and also subsequent comments from ITU-R Members within recent years.

3 The Sub-Committee supports the development at WP 5B of the definition of equipment functionality in the form of a closed and prescriptive list.

4 The Sub-Committee recommends that equipment which uses DSC channels/frequencies should show full compliance with one of the defined classes equivalent to its intended application.

5 The Sub-Committee is of the view that it is necessary to take into account the compatibility with existing equipment.

6 The Sub-Committee requests that the operational procedures for DSC in Recommendation ITU-R M.541-9 are reviewed to ensure that new classes are appropriately covered and if necessary revise that Recommendation.

7 The Sub-Committee further noted that two new classes of equipment had been added, Class H (for handheld VHF DSC equipment with GNSS) and Class M (man overboard beacon with GNSS and a DSC receiver).

8 The Sub-Committee supports the addition of Class H.

9 Recognizing the potential benefit for safety of life at sea, the Sub-Committee supports the addition of Class M under the condition that an undue burden is not placed upon shipping and that the existing system is not harmed. The Sub-Committee, having noted Report ITU-R M.2285-0, is of the view that some further assessment would be beneficial in certain aspects. WP 5B should give particular consideration to measures to avoid false alerts, to the cancellation of distress alerts and to the operational impact in the further development of Recommendation ITU-R M.493-13.

10 The Sub-Committee noted WP 5B's view that a standardised Human Machine Interface would be beneficial for the usability of DSC based communication equipment and that it was considered timely to update Annexes 3 and 4. In this context, the Sub-Committee supports the update of these Annexes with a view to further standardize and simplify the Human Machine Interface in a future revision.

IMO's request to ITU-R WP 5B

11 IMO requests ITU-R WP 5B to take the above noted comments into consideration, as appropriate, and requests to be informed of the further discussion and developments in this regard.

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ANNEX 7

DRAFT IMO POSITION ON WRC-15 AGENDA ITEMS CONCERNING MATTERS RELATING TO MARITIME SERVICES

General

Over 90% of world trade is transported by sea. This totals some 7.5 billion tonnes (32,000 billion tonne miles), of which about 33% is oil, 27% is bulk (ore, coal, grain and phosphates), the remaining 40% being general cargo. Operating these merchant ships generates an estimated annual income of $380 billion in freight rates within the global economy, amounting to 5% of total world trade.

The industry employs over 1.2 million seafarers.

Agenda item 1.1

1.1 *To consider additional spectrum allocations to the mobile service on a primary basis and identification of additional frequency bands for International Mobile Telecommunications (IMT) and related regulatory provisions, to facilitate the development of terrestrial mobile broadband applications, in accordance with resolution* ***233 (WRC-12)****;*

Background

Consideration of the following frequency bands is of particular concern to the maritime community:

.1 406- 406.1 MHz in use for Cospas-Sarsat;

.2 1518-1559 MHz in use for satellite terminals on board SOLAS ships;

.3 1559-1610 MHz in use for RNSS;

.4 1626.5-1660.5 MHz in use for satellite terminals on board SOLAS ships;

.5 1668-1675 MHz in use as uplink paired with the downlink 1518-1525 MHz for satellite communications;

.6 2900-3100 MHz in use for Maritime radionavigation (S-band radar); and

.7 3400-4200 MHz partly in use for feeder links of Inmarsat.

The S-band radar is of particular importance for safety of navigation (safety of life service) and for use in adverse weather conditions, for instance heavy rain. Previous ITU-R studies on sharing with the band 2900 to 3100 MHz are no longer valid, because new generation equipment had not been taken into account.

IMO position

To exclude the frequency bands 406-406.1 MHz, 1518-1559 MHz, 1559-1610 MHz, 1626.5-1660.5 MHz, 1668-1675 MHz, 2900-3100 MHz and 3400-4200 MHz, or any other frequency bands that are used by maritime safety systems, as candidate bands under WRC-15, agenda item 1.1, due to the potential adverse impact to maritime safety and the efficient movement of international commerce.

If the band 2 700-2 900 MHz was decided to be a candidate band under WRC-15, agenda item 1.1., IMO requests ITU to address the impact on the band 2 900-3 100 MHz, including the consequential coexistence between different types of radars that may result from potential IMT use between 2 700-2 900 MHz.

To ensure that emissions from IMT operating in adjacent bands to the frequency bands mentioned above do not affect the operation of the existing maritime systems

Agenda item 1.8

1.8 *To review the provisions relating to earth stations located on board vessels (ESVs), based on studies conducted in accordance with resolution **909 (WRC-12)**;*

Background

Currently, around 12,000 vessels use VSATs for broadband communication. This service is limited to distances off shore of 125 kilometres for the frequency band 14-14.5 GHz and 300 kilometres for the frequency band 5925-6425 MHz in accordance with resolution 902 (WRC-03). The agenda item is to review the provisions related to ESVs. Ships have a particular need for broadband communications when entering and leaving ports. For example:

.1 for the synchronization of databases;

.2 to transmit port-entry and -exit documents electronically, as harmonized, among others, in IMO's Convention on Facilitation of International Maritime Traffic (FAL Convention) and in accordance with the maritime single window concept to enhance the efficiency of port operations; and

.3 for communication of the crew with their families.

IMO position

IMO requests that modifications to resolution 902 (WRC-2003) will permit ESVs to be operated by the mariner in an uncomplicated, straightforward manner and closer to the shore, in accordance with the outcome of studies to maintain compatibility with other services that may be affected.

Agenda item 1.12

1.12 *To consider an extension of the current worldwide allocation to the Earth exploration-satellite (active) service in the frequency band 9 300-9 900 MHz by up to 600 MHz within the frequency bands 8 700-9 300 MHz and/or 9 900-10 500 MHz, in accordance with resolution **651 (WRC-12)**;*

Background

Over one million marine radars operate in the frequency band 9 200-9 500 MHz. The GMDSS Radar Search and Rescue Transponders (Radar SART) operates also in this frequency band which is included in provision No. 31.2 of article 31 of the Radio Regulations and appendix 15 to the Radio Regulations, listing the frequencies for distress and safety communications for the GMDSS and protection against harmful interference. The maritime radionavigation service in the band 9 300-9 800 MHz is protected by RR provision No. 5.476A.

Previous ITU-R studies on sharing with the band 9 200 to 9 500 MHz are no longer valid, because new generation equipment had not been taken into account.

IMO position

Protection of the maritime radionavigation service, operating in the frequency band 9 200-9 500 MHz, is essential for "safety of navigation" and "safety of life" and in accordance with Nos.1.59 and 4.10 of the Radio Regulations. IMO requests that if the band 9 200-9 500 MHz is considered under agenda item 1.12, for Earth exploration satellite (active) service, due consideration is given to ensure that there is no potential of harmful impact on global shipping.

Agenda item 1.14

1.14 *To consider the feasibility of achieving a continuous reference time-scale, whether by the modification of coordinated universal time (UTC) or some other method, and take appropriate action, in accordance with resolution **653 (WRC-12)**;*

Background

Time as measured by the rotation of the earth is running slightly slower than time measured by atomic clocks (as used in GNSS) and the correction for this is to add "leap seconds" when the difference approaches one second. This has occurred 26 times over the past 40 years, the most recent being in June 2015. The corrected time is known as Coordinated Universal Time (UTC) and the arrangements for inserting the leap second are given in Recommendation ITU-R TF.460-6.

Work in the ITU-R has considered the future elimination of leap seconds resulting in UTC gradually diverging from earth rotation time without limit but no agreement has so far been reached. The advantage of eliminating the leap second is that it would remove the cost and disruption involved in adjusting equipment. The disadvantage would be that the definition of UTC would change which might have regulatory consequences.

IMO makes extensive use of UTC in its requirements and will continue to do so in future.

Some manufacturers have reported difficulties in updating equipment when having to take into account the leap seconds.

Celestial navigation is a requirement of the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers, 1978, as amended and is important to the maritime community, which requires time based on Earth rotation. Inertial navigation, which is currently used by naval ships and may be introduced on merchant ships, requires an accurate time reference.

IMO recognizes that there are advantages and disadvantages of the various methods to address this agenda item and recommends Administrations to consider the methods considering that the issue goes beyond maritime matters

IMO position

IMO requests that the importance of the maritime systems is acknowledged in deciding on this agenda item and attempt to minimize the impact on maritime services.

Agenda item 1.15

1.15 *To consider spectrum demands for onboard communication stations in the maritime mobile service in accordance with resolution **358 (WRC-12)**;*

Background

IMO Member Governments have identified the need for the consideration of improvement and expansion of onboard communication stations in the maritime mobile service in the UHF bands.

UHF onboard communications is much used on board ships, including on board emergencies, fire fighting, berthing, passenger control, etc. There are six frequencies based on 25 kHz channel spacing and an additional four frequencies based on 12.5 kHz channel spacing available, as listed in provision No.5.287 of the Radio Regulations, but these are not always available in all countries and are not sufficient in all cases. The technology is currently defined as analogue FM by Recommendation ITU-R M.1174-2, which is found to be very robust in operations in metal ships. A revision of this Recommendation, to introduce digital technologies could provide more voice channels in one frequency but the performance in the operational environment must be evaluated together with the compatibility with existing equipment based on analogue technology.

IMT is also permitted to use this frequency band under provision No.5.286AA of the Radio Regulations and may be a future source of interference.

IMO position

IMO supports measures which would make more efficient use of the frequency band available for onboard systems and would welcome an international solution for the identification of the channels in provision No.5.287 of the Radio Regulations.

Agenda item 1.16

1.16 *To consider regulatory provisions and spectrum allocations to enable possible new Automatic Identification System (AIS) technology applications and possible new applications to improve maritime radiocommunication in accordance with resolution **360 (WRC-12)**;*

Background

AIS is widely used and accepted for shipping but in some parts of the world the capacity of the channels is reaching its limit, due to the introduction of new applications. The continued introduction of new applications and increasing number of AIS devices, as for example, for fishing and leisure use, will require new channels which have been made available by WRC-12 for experimentation.

The need for digital information exchange (VDE) in the maritime domain, where the VHF Mobile band plays a key role in ship-to-ship communication and coastal ship-shore communication, continues to increase.

A 2008 study in the area of Tokyo bay (Tokyo wan) showed that 27.4% of AIS slots were used. In 2012 the loads of 38% were reached. This 10% increase within four years shows that in Japan the limiting factor of 50% as noted in IALA Recommendation A-124 appendix 18 "VDL Loading Management" could be reached quite soon.

IMO position

Modifications should not be required to existing AIS equipment on board existing vessels. New applications using AIS technology should be allowed to evolve, supported by communication primarily on the new frequencies identifed by WRC-12, while protecting the integrity of the original operational purpose of AIS on the existing AIS frequencies. This will also address the concerns expressed previously on congestion by moving various applications to alternative channels in the existing VHF mobile band.

IMO supports the VDES concept, without committing the Organization regarding future requirements on the use of the VHF frequency band.

<u>Agenda item 2</u>

2 *To examine the revised ITU-R Recommendations incorporated by reference in the Radio Regulations communicated by the Radiocommunication Assembly, in accordance with resolution* ***28 (Rev.WRC-03)****, and to decide whether or not to update the corresponding references in the Radio Regulations, in accordance with the principles contained in annex 1 to resolution* ***27 (Rev.WRC-12)****;*

Background

There are a number of Recommendations incorporated by reference in the Radio Regulations. IMO has reviewed all these Recommendations.

IMO position

IMO has studied the Recommendations of relevance and commented on each as given in annex 1. Incorporation by reference is of importance to IMO because of the close relationship between many of the ITU-R Recommendations related to GMDSS equipment and its operation, to IMO performance standards. IMO requests early indication of any changes proposed by ITU to the mechanism of incorporation by reference and to the list of incorporated Recommendations.

<u>Agenda item 4</u>

4 *In accordance with resolution* ***95 (Rev.WRC-07)****, to review the resolutions and recommendations of previous conferences with a view to their possible revision, replacement or abrogation;*

Background

There are a number of Resolutions and Recommendations in the Radio Regulations. IMO has reviewed all these Resolutions and Recommendations.

IMO position

IMO has studied the Resolutions and Recommendations of relevance and commented on each as given in annex 2.

<u>Agenda item 9</u>

9 *To consider and approve the Report of the Director of the Radiocommunication Bureau, in accordance with article 7 of the Convention:*

9.1 *on the activities of the Radiocommunication Sector since WRC-12;*

9.2 *on any difficulties or inconsistencies encountered in the application of the Radio Regulations; and*

9.3 *on action in response to resolution* ***80 (Rev.WRC-07)****;*

Agenda item 9.1, issue 9.1.1

Background

Under agenda item 9.1, issue 9.1.1 ITU-R is invited to study, in accordance with resolution 205 (Rev.WRC-12), the Protection of the systems operating in the mobile-satellite service in the band 406-406.1 MHz.

The Cospas-Sarsat satellite 406 MHz EPIRB is a mandatory distress alerting device on board SOLAS ships which is frequently carried as the second means of alerting. For ships not subject to the SOLAS Convention it is also often the primary means of distress alerting outside A1 sea area.

There is evidence that the required transmitted output power of the Cospas-Sarsat 406 MHz EPIRB (together with the other devices ELTs and PLBs) is greater than the system design minimum value, apparently, because of other emissions from outside and inside the frequency band.

Besides UWB and cable TV systems, there are developing plans for Power Line Transmission Systems, operating in a frequency band up to 470 MHz, which can have the potential of producing in-band interference to the Cospas-Sarsat system.

The proposed frequency bands for use for Public Protection and Disaster Relief (PPDR), under agenda item 1.3, include a band 380-470 MHz which also has the potential of producing in-band interference to the Cospas-Sarsat system.

There is also a possible development for IMT systems to operate in the band 410-430 MHz which may cause an increased amount of out of band emission to the band 406-406.1 MHz.

IMO position

It is essential to preserve the MSS frequency band 406-406.1 MHz free from any emissions that would degrade the operation of the 406 MHz satellite transponders and receivers, with the risk that satellite Emergency Position Indicating Radio Beacon (EPIRB) signals would go undetected.

Agenda item 9.1, issue 9.1.6

Background

Under agenda item 9.1, issue 9.1.6 ITU-R is invited to study, in accordance with resolution 957 (WRC-12), toward review of the definitions of fixed service, fixed station and mobile station.

Under this agenda item ITU-R is invited to conduct the necessary studies to review the definitions of fixed service, fixed station and mobile station contained in article 1 of the Radio Regulations for possible modification. Furthermore, ITU-R is invited to study the potential impact on regulatory procedures in the Radio Regulations (coordination, notification and recording) and the impact on current frequency assignments of other services resulting from possible changes to the definitions contained in article 1.

IMO position

Ensure that measures taken at WRC-15 under this agenda item do not have an adverse impact on the maritime services and maritime applications.

Agenda item 10

10 *To recommend to the Council items for inclusion in the agenda for the next WRC, and to give its views on the preliminary agenda for the subsequent conference and on possible agenda items for future conferences, in accordance with article 7 of the Convention.*

Background

Resolution **808 (WRC-12)** containing the Preliminary agenda for WRC-18 lists, as item 2.1 for inclusion in the agenda for WRC-18, to consider regulatory actions, including spectrum allocations, to support GMDSS modernization and implementation of e-navigation in accordance with resolution **359 (WRC-12)**.

Due to the complexity of the work related to the review of the GMDSS, IMO plans to complete the modernization plan for the GMDSS in 2018. The first stage on further work to be undertaken on the implementation of e-navigation is expected to take place in the period 2016 to 2019. Taking into account the above, it is not expected to be possible defining detailed regulatory actions in a time available before WRC-18.

Not directly related to the GMDSS modernization, IMO has received an application to introduce a new satellite service provider into the GMDSS. If a new satellite service provider is recognised for use in the GMDSS, consequential regulatory actions may need to be considered by the ITU.

At the time a new satellite service provider is recognised for use in the GMDSS, IMO supports inclusion of an agenda item to consider consequential regulatory actions in this regard in the agenda of a future conference.

Draft IMO position

TBD

Note: The Joint IMO/ITU Experts Group on Maritime Radiocommunication Matters has been instructed to consider issues related to agenda item 10 of WRC-15, taking into account proposals sent to WRC-15, at its meeting from 5 to 9 October 2015. The Experts Group has been authorised by the Maritime Safety Committee to send any additional information to the IMO position on WRC-15 directly to ITU for consideration by the Conference.

ANNEX 1

RECOMMENDATION ITU-R M.476-5

Direct-printing telegraph equipment in the maritime mobile service*
(Question ITU-R 5/8)

(1970-1974-1978-1982-1986-1995)

No longer needed by IMO. Probably no longer needed by the maritime community.

RECOMMENDATION ITU-R M.489-2

Technical characteristics of VHF radiotelephone equipment operating in the maritime mobile service in channels spaced by 25 kHz

(1974-1978-1995)

Needed by IMO to support the carriage requirements of SOLAS IV and needed by the maritime community in general. Will likely be needed into the foreseeable future.

RECOMMENDATION ITU-R M.492-6

Operational procedures for the use of direct-printing telegraph equipment in the maritime mobile service

(Question ITU-R 5/8)
(1974-1978-1982-1986-1990-1992-1995)

Currently needed by IMO to support the NBDP carriage requirement in SOLAS chapter IV, although the system is little used.

RECOMMENDATION ITU-R M.541-9

Operational procedures for the use of digital selective-calling equipment in the maritime mobile service

(Question ITU-R 9/8)
(1978-1982-1986-1990-1992-1994-1995-1996-1997)

Needed by IMO. Likely to be needed into the foreseeable future.

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* This Recommendation is retained in order to provide information concerning existing equipment, but will probably be deleted at a later date. New equipment should conform to Recommendation ITU-R M.625 which provides for the exchange of identification signals, for the use of 9-digit maritime mobile service identification signals and for compatibility with existing equipment built in accordance with this Recommendation.

Note by the Secretariat: The references made to the Radio Regulations (RR) in this Recommendation refer to the RR as revised by the World Radiocommunication Conference 1995. These elements of the RR will come into force on 1 June 1998. Where applicable, the equivalent references in the current RR are also provided in square brackets.

RECOMMENDATION ITU-R M.585-6

Assignment and use of identities in the maritime mobile service

(1982-1986-1990-2003-2007-2009-2012)

Required by the maritime community and useful to IMO.

RECOMMENDATION ITU-R M.625-3

Direct-printing telegraph equipment employing automatic identification in the maritime mobile service[**]

(Question ITU-R 5/8)

(1986-1990-1992-1995)

Currently needed by IMO to support the NBDP carriage requirement in SOLAS chapter IV, although the system is little used.

RECOMMENDATION ITU-R M.633-4

Transmission characteristics of a satellite emergency position-indicating radio beacon (satellite EPIRB) system operating through a satellite system in the 406 MHz band

(1986-1990-2000-2004-2010)

Used by IMO to support the Performance standards for EPIRBs.

RECOMMENDATION ITU-R M.690-1

Technical characteristics of emergency position-indicating radio beacons (EPIRBs) operating on the carrier frequencies of 121.5 MHz and 243 MHz

(Question ITU-R 31/8)

(1990-1995)

Required by IMO to define the homing signal characteristics for the satellite EPIRB required by SOLAS chapter IV. Likely to be used by the maritime community for some time to come for EPIRBs and man overboard devices.

** Newly developed equipment should conform to the present Recommendation which provides for compatibility with existing equipment built in accordance with Recommendation ITU-R M.476.

RECOMMENDATION ITU-R M.1084-4

Interim solutions for improved efficiency in the use of the band 156-174 MHz by stations in the maritime mobile service

(Question ITU-R 96/8)

(1994-1995-1997-1998-2001)

Used by IMO for the description of VHF channels.

RECOMMENDATION ITU-R M.1171

Radiotelephony procedures in the maritime mobile service

(1995)

Required by IMO and the maritime community as long as coast stations offer a public correspondence service. The number of such coast stations is however declining.

RECOMMENDATION ITU-R M.1172

Miscellaneous abbreviations and signals to be used for radiocommunications in the maritime mobile service

(1995)

No longer required by IMO which uses the Standard Marine Communication Phrases but required by the maritime community.

RECOMMENDATION ITU-R M.1173

Technical characteristics of single-sideband transmitters used in the maritime mobile service for radiotelephony in the bands between 1 606.5 kHz (1 605 kHz Region 2) and 4 000 kHz and between 4 000 kHz and 27 500 kHz

(1995)

Required by IMO and the maritime community and likely to be required into the foreseeable future.

RECOMMENDATION ITU-R M.1174-2

Technical characteristics of equipment used for onboard vessel communications in the bands between 450 and 470 MHz

(1995-1998)

Required by the maritime community and useful to IMO. This recommendation is related to agenda item 1.15 for which IMO has developed a position.

RECOMMENDATION ITU-R M.1638

Characteristics of and protection criteria for sharing studies for radiolocation, aeronautical radionavigation and meteorological radars operating in the frequency bands between 5 250 and 5 850 MHz

(2003)

Not required by IMO but may be required by the maritime community where radars in this band are used.

ANNEX 2

RESOLUTION 13 (Rev.WRC-97)

Formation of call signs and allocation of new international series

Retain.

RESOLUTION 18 (Rev.WRC-12)

Relating to the procedure for identifying and announcing the position of ships and aircraft of States not parties to an armed conflict

Retain.

RESOLUTION 205 (Rev.WRC-12)

Protection of the band 406-406.1 MHz allocated to the mobile-satellite service

Subject to Agenda item 9.1.1

RESOLUTION 207 (Rev.WRC-03)

Measures to address unauthorized use of and interference to frequencies in the bands allocated to the maritime mobile service and to the aeronautical mobile (R) service

Retain.

RESOLUTION 222 (Rev.WRC-12)

Use of the bands 1 525-1 559 MHz and 1 626.5-1 660.5 MHz by the mobile-satellite service, and procedures to ensure long-term spectrum access for the aeronautical mobile-satellite (R) service

Retain.

RESOLUTION 331 (Rev.WRC-12)

Operation of the Global Maritime Distress and Safety System

Retain.

RESOLUTION 339 (Rev.WRC-07)

Coordination of NAVTEX services

Retain.

RESOLUTION 343 (REV. WRC-12)

Maritime certification for personnel of ship stations and ship earth stations for which a radio installation is not compulsory

Retain to ensure common operations between Convention and non-Convention ships.

RESOLUTION 344 (Rev.WRC-12)

Management of the maritime mobile service identity numbering resource

Retain.

RESOLUTION 349 (Rev. WRC-12)

Operational procedures for cancelling false distress alerts in the Global Maritime Distress and Safety System

Retain.

RESOLUTION 352 (WRC-03)

Use of the carrier frequencies 12 290 kHz and 16 420 kHz for safety-related calling to and from rescue coordination centres

Retain.

RESOLUTION 354 (WRC-07)

Distress and safety radiotelephony procedures for 2 182 kHz

Retain.

RESOLUTION 356 (WRC-07)

ITU maritime service information registration

Retain.

RESOLUTION 358 (WRC-12)

Consideration of improvement and expansion of onboard communication stations in the maritime mobile service in the UHF bands

Subject of agenda item 1.15.

RESOLUTION 359 (WRC-12)

Consideration of regulatory provisions for modernization of the Global Maritime Distress and Safety System and studies related to e-navigation

Subject of agenda item 10.

RESOLUTION 360 (WRC-12)

Consideration of regulatory provisions and spectrum allocations for enhanced automatic identification system technology applications and for enhanced maritime radiocommunication

Subject of agenda item 1.16.

RESOLUTION 758 (WRC-12)

Allocation to the fixed-satellite service and the maritime-mobile satellite service in the 7/8 GHz range

Subject of agenda item 1.9.2.

RESOLUTION 909 (WRC-12)

Provisions relating to earth stations located on board vessels which operate in fixed-satellite service networks in the uplink bands 5 925-6 425 MHz and 14-14.5 GHz

Subject of agenda item 1.8.

RESOLUTION 612 (Rev. WRC-12)

Use of the radiolocation service between 3 and 50 MHz to support high-frequency oceanographic radar operations

Retain.

RECOMMENDATION 7 (Rev.WRC-97)

Adoption of standard forms for ship station and ship earth station licences and aircraft station and aircraft earth station licences

Retain.

RECOMMENDATION 37 (WRC-03)

Operational procedures for earth stations on board vessels (ESVs) use

Subject of agenda Item 1.8.

RECOMMENDATION 316 (Rev.MOB-87)

Use of ship earth stations within harbours and other waters under national jurisdiction

Retain.

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ANNEX 8

DRAFT MSC CIRCULAR

AMENDMENTS TO THE INTERNATIONAL AERONAUTICAL AND MARITIME SEARCH AND RESCUE (IAMSAR) MANUAL

1 The Maritime Safety Committee (MSC), at its [ninety-fifth session (3 to 12 June 2015)], having been informed that the International Civil Aviation Organization (ICAO) had approved the amendments to the IAMSAR Manual prepared by the ICAO/IMO Joint Working Group on Harmonization of Aeronautical and Maritime Search and Rescue, and that they had been endorsed by the Sub-Committee on Navigation, Communications and Search and Rescue (NCSR) at its second session, approved the annexed amendments in accordance with the procedure laid down in resolution A.894(21).

2 This circular revokes COMSAR/Circ.23 and COMSAR.1/Circ.57.

3 The Committee decided that the amendments should become applicable on [1 July 2016].

PROPOSED AMENDMENTS TO IAMSAR MANUAL VOLUME I

1 Contents

- Add on page iii the following text:

4.9 Social Media

On page iv, chapter 6, renumber existing sections 6.7 and 6.8 to 6.8 and 6.9

On page iv, chapter 6, insert new section 6.7 Multiple aircraft SAR operations

On page iv, amend the text related to appendix J as follows:

Sample ~~terms of reference for a~~ SAR coordinating committee agreement

2 Abbreviations and Acronyms

- Delete the following text on page vii

~~**AES**.......aeronautical earth station~~

~~**CES**.......coast earth station~~

~~**GES**.......ground earth station~~

3 Glossary

- Delete the following text on page xi

~~**Coast earth station (CES)** Maritime name for an Inmarsat shore-based station linking ship earth stations with terrestrial communications networks.~~

- Amend the Glossary as follows:

Cospas-Sarsat System A satellite system designed to detect and locate activated distress beacons transmitting ~~on~~ in the frequency band of 406.0-406.1 MHz.

Direction Finding (DF) ~~Homing on signals to pinpoint a position~~. Radiodetermination using the reception of radio waves for the purpose of determining the direction of a station or object.

Emergency Locator Transmitter(ELT)	~~Aeronautical distress beacon for alerting and transmitting homing signals~~. A generic term (related to aircraft) describing equipment which broadcast distinctive signals on designated frequencies and, depending on application, may be automatically activated by impact or be manually activated.

NAVAREA	~~One of 16 areas into which the world's oceans are divided by the International Maritime Organization for dissemination of navigation and meteorological warnings~~. A geographical sea area established for the purpose of coordinating the broadcast of navigational warnings. The term NAVAREA followed by a roman numeral may be used to identify a particular sea area. The delimitation of such areas is not related to and shall not prejudice the delimitation of any boundaries between States.
Personal locator beacon (PLB)	~~Personal radio distress beacon for alerting and transmitting homing signals.~~ A portable device, manually activated, which transmits a distress signal on 406 MHz, and may have an additional homing signal on a separate frequency.
Search and rescue point of contact (SPOC)	~~Rescue co-ordination centres and other established and recognized national points of contact which can accept responsibility to receive Cospas–Sarsat alert data to enable the rescue of persons in distress.~~ *A point of contact for SAR, designated by the national administration, that is responsible for receiving distress alert information and providing the information to appropriate SARauthorities*.
Rescue co-ordination centre (RCC)	Note: The term RCC will be used within this Manual to apply to either aeronautical, maritime or joint centres; ARCC, MRCC or JRCC will be used as the context warrants.

- Add the following:

Area of SAR action An area of defined dimensions that is established, notified or agreed for the purposes of protecting aircraft during SAR operations and within which SAR operations take place.

4 Chapter 2

- Amend page 2-7, paragraph 2.3.11(c), 9th line as follows:

... is responsible for planning the search and rescue operations and coordinating the transit of ~~SRUs~~ SAR facilities to and from the scene."

- Amend page 2-11, paragraph 2.6.1, 7th line as follows:

...plan the search and/or rescue if the OSC becomes aware of a distress situation directly..."

- Amend page 2-11, paragraphs 2.6.2 to 2.6.4 as follows:

2.6.2 Responsible authorities should find ways ~~for information,~~ of training and exercising the OSC and ACO functions, both for those who act ~~as ACOs~~ in these roles and for those who co-operate closely with them ~~ACOs~~.

On Scene Coordinator (OSC) and Aircraft Coordinator (ACO) joint training

2.6.3 The SAR management should provide OSC and ACO training between SRU crews from different organizations that might act as OSCs or ACOs. The ~~ACO~~ training should improve understanding of the OSC and ACO roles and increase confidence amongst the participating SRUs.

2.6.4 OSC and ACO training can consist of:

- lessons from real life SAR missions;
- legal documents;
- duties of co-operating organizations;
- performance characteristics of SRUs;
- typical cases and methods;
- SMC-OSC-ACO role-playing; and
- paper exercises."

- Insert new sub-section at the end of section 2.5 **SAR Facilities** called **Area of SAR action** as follows:

Area of SAR action

2.5.7 During SAR operations the SAR aircraft involved should be able to carry out their activities without interference from other air activity. Additionally, aeronautical organizations and aircraft not involved in a SAR operation, need to be made aware of it for their safety. The temporary establishment of appropriate areas surrounding SAR operations might improve safety and inform others of SAR activity.

2.5.8 An 'Area of SAR Action' is an area of defined dimensions used or agreed by appropriate authorities for the protection of aircraft during SAR operations. It should be assumed that within areas of SAR action special flying procedures relevant to SAR operations might take place. Areas of SAR action are described in further detail in Volume II Chapter 7.

2.5.9 SAR organizations should arrange that RCC have methods in place for implementing areas of SAR action to facilitate SAR operations.

- Insert new sub-section at the end of section 2.7 **Support Facilities** called **SAR Refuelling Facilities** as follows:

SAR Refuelling Facilities

2.7.6 In parts of a SRR without refuelling facilities, SAR organizations should arrange that RCC have alternative plans for refueling SRUs in place.

2.7.7 Existing facilities, such as airfields, land-based refuelling facilities close to coastlines, offshore drilling platforms and vessels that can refuel aircraft, could also be used. Where possible, it is recommended for SAR management to make preparatory agreements with operators of such facilities for use in SAR operations.

5 Chapter 3

- Amend page 3-2, paragraph 3.2.1, as follows:

3.2.1 All SAR specialists need ~~some~~ training, in particular~~,~~ the SCs, RCC chiefs, SMCs, RCC staff, ~~and~~ OSCs, ACOs and SRUs.

- Amend page 3-3, paragraph 3.2.11, as follows:

Add "Mass rescue operations" to the list of general categories.

6 Chapter 4

- Amend page 4-5, paragraph 4.4.8, last sentence as follows:

If there is any way to confirm the position reported in an alert, it would be prudent to do so, especially with initial ~~EPIRB and ELT~~ 406 MHz distress beacon alerts via Cospas-Sarsat which may provide an "A" position and a "B" position that indicates either one could be the ~~both a~~ true position and the other is an image position

- Amend page 4-6, paragraph 4.5.2, third bullet point as follows:

- Inmarsat land earth stations (LESs) ~~(also known as maritime coast earth stations (CESs) and aeronautical ground earth stations (GESs);~~

- Amend page 4-7, paragraph 4.5.11, first line as follows:

- ARCCs and MRCCs may install and use ~~Inmarsat GESs~~ LESs or ship earth...

- Amend page 4-9, paragraph 4.5.26, first bullet point as follows:

- Arrange for CRSs and ~~CESs~~LESs to relay ship messages…

- Add in new section at end of page 4-10 as follows:

4.9 Social media

4.9.1 Social media are not part of the international distress alerting system and is not monitored as a primary means of distress notification. However, the public uses social media to create online communities to share information, ideas, personal messages and other content. This can raise a public expectation that SAR authorities, especially for prolonged SAR incidences with news media interest, should either provide information to or accept information from social media sites. RCCs should have procedures in place for efficient management of social media.

7 Chapter 5

- Amend page 5-4, paragraph 5.2.14, last sentence as follows:

Appendix I contains ~~sample text and guidance for a national SAR plan~~ guidance and a sample SAR agreement.

- Amend page 5-9, add a new paragraph after paragraph 5.4.4 as follows:

5.4.5 In some circumstances there may be a need for immediate response to large numbers of persons in distress such that the capabilities normally available to the SAR authorities are inadequate. These are known as mass rescue operations: see chapter 6. SAR managers should plan for such operations by

  - agreeing to share SAR facilities regionally and/or internationally;
  - identifying additional SAR facilities locally, including shipping in the area; and
  - identifying ways of providing support to persons in distress until they can be rescued.

- Renumber existing paragraphs 5.4.5 through 5.4.16 to 5.4.6 through 5.4.17

- Amend page 5-10, table 5-2, middle column, 'Coordinate SAR services' row, 4th item as follows:

Plan ~~searches~~ search and rescue operations

- Amend page 6-4, paragraph 6.4.5, fourth line as follows:

Appendix J contains a ~~sample text and guidance for an~~ SCC agreement.

- Amend page 6-7, paragraph 6.5.5 first bullet point, third line as follows:

…(which are now more and more being fitted with ~~AESs linked to~~ satellite communication (satcom) equipment linked to LESs)...

- Renumber existing sections 6.7 and 6.8 to 6.8 and 6.9

- Add in new section on **Multiple SAR Operations** as follows:

6.7 Multiple aircraft SAR operations

6.7.1 A multiple aircraft SAR operation is one in which two or more aircraft are taking part.

Safety

6.7.2 SAR organizations should establish plans and procedures to ensure that multiple aircraft SAR operations can be performed efficiently while flight safety is maintained.

Notes:

1. Depending on the State's aviation regulatory framework, SAR organizations may need to work in conjunction and collaboration with the relevant State civil aviation regulatory, air navigation service providers and military aviation authorities to establish such plans and procedures.

2. Plans and procedures need to take into account possible operational and procedural differences that may exist between civil and military operations.

Common Procedures

6.7.3 Differences in the availability of airborne SRUs, capabilities and geography across different SRRs, cause regional differences in plans for multiple aircraft SAR operations. Significant differences may increase risks to safety during operations in which aircraft, SRUs or staff from different SAR organizations works together.

6.7.4 In order to promote safety, effectiveness and best practise, it is important that SAR organizations develop plans for multiple aircraft SAR operations based on common procedures and principles. Relevant procedures and principles are described in the IAMSAR Volume II Chapter 7 and Volume III Section 5.

6.7.5 It is recommended that SAR organizations share their experiences and recommendations for multiple aircraft SAR operations with each other, and their State civil and military aviation authorities, to improve procedures and plans.

8 Appendix E

- Amend text on page E-3 as follows:

…

- once an EPIRB is switched on~~, whether accidentally or~~ intentionally, the vessel should make every reasonable attempt to communicate with SAR authorities by other means to advise them of the situation ~~before turning the EPIRB off~~;

- if an EPIRB is accidently activated, it should be turned OFF as soon as practicable and the RCC should be notified that the alert is false. In cases where the beacon cannot be turned OFF, measures should be taken to prevent or inhibit the transmission of signal. Such actions may render the beacon inoperable for future use unless it is serviced by an appropriate service facility;

- after emergency use, if possible, retrieve and deactivate the EPIRB

9 Appendix I

- Amend text of second to last paragraph as follows:

The concept of "territory" is understood to include territorial land, territorial sea and the airspace above them ~~and seas~~.

- Insert new text at the bottom of page 1, as follows:

IMO and ICAO use the term "agreement" but many States view this as type of a legal instrument. Different terms may be used for the title of a legal instrument, such as "Agreement", "Memorandum of Understanding", "Arrangement" and other related terms. The type of instrument can be decided by the States involved as long as the document meets the intent of the international conventions to serve as the basis for cooperation and the provision of expeditious and effective SAR services.

In some cases, the term "Search and Rescue Point of Contact (SPOC)" can be used in lieu of Rescue Coordination Centre (RCC). The definition of SPOC includes the RCC and some national SAR authorities that may not have an internationally designated RCC.

This template serves as guidance for States to draft a SAR Agreement (which may take the form of an MOU or Arrangement or other) and the text to be included in this document is for the Parties to decide.

- Replace the current appendix I "SAR Agreement" as follows:

Bilateral or Regional SAR Agreement

Agreement
FOR COOPERATION BETWEEN
THE [name of national agency/State]
AND [name of national agency/State]

Note: ***The term agreement is used in order to be consistent with ICAO Annex 12 and the International Convention on Maritime Search and Rescue. State may elect to use a different term such and "Memorandum of Understanding", "Letter of understanding", "Arrangement" or others as appropriate.***

This template serves as guidance for States to draft a SAR Agreement (which may take the form of an MOU or SAR Arrangement or other instrument title) and the text to be included in this document is for the Parties involved to decide.

CONCERNING AERONAUTICAL [AND/OR] MARITIME SEARCH AND RESCUE

1. Introduction

1.1 The [name of national agency/State] and [name of national agency/State] (hereinafter referred to as the "Parties" in this Agreement, recognize the benefits enjoyed from previous close cooperation with regard to search and rescue SAR operations and training, and further recognize that additional benefits may be enjoyed from the cooperative arrangements detailed herein; and

1.2 The Parties have been recognized by their respective governments as having primary responsibility for coordinating and providing aeronautical and maritime SAR services in their respective aeronautical and maritime SAR regions.

1.3 The Parties recognize the great importance of cooperation in aeronautical and maritime SAR, and in the provision of expeditious and effective SAR services to save lives and reduce suffering and have assumed their respective responsibilities for SAR within the framework of the International Convention on Maritime Search and Rescue, 1979, the Convention on International Civil Aviation, 1944, and the International Aeronautical and Maritime Search and Rescue (IAMSAR) Manual.

1.4 The Parties have accordingly reached the following understanding.

2. Objectives and Scope

2.1 This agreement establishes a framework for cooperation among the Parties in carrying out activities related to SAR within the aeronautical and/or maritime environment and sets out their various responsibilities.

2.2 The Parties should ensure close coordination with their respective national aeronautical and maritime SAR authorities to help promote common and effective SAR services under this agreement.

3. Responsibilities

3.1 [name of national agency] and [name of national agency] are each responsible for the maintenance of safety of life and within their respective aeronautical and maritime SAR regions, under their respective Rescue Coordination Centre (RCC).

3.2 Each Party, on receiving information of an incident where any person is in distress within its SAR region, should take urgent measures to provide the most appropriate assistance regardless of the nationality or status of such a person, or the circumstances in which that incident occurred or is detected.

3.3 SAR operations should normally be carried out in accordance with the relevant SAR manuals and recommendations of International Civil Aviation Organization (ICAO) and the International Maritime Organization IMO, including the IAMSAR Manual (as amended from time to time), taking into account SAR procedures established by national legislation.

3.4 The Parties should make every effort to retrieve persons in distress, provide for their initial medical or other needs and deliver them to a place of safety; additionally, when it does not involve excessive risk or cost to the units involved in SAR operations, the Parties may attempt to rescue the craft or vessel on which the persons in danger are aboard.

3.5 To ensure that SAR operations are conducted in an efficient and coordinated manner, the Parties should consult and cooperate with each other as necessary and appropriate, lending mutual assistance as their capabilities allow.

3.6 Either Party may conduct SAR operations within the SAR region of the other Party under the coordination of that other Party's RCC.

3.7 Entry of the SAR units of one Party into or over the territory of the other Party for the purpose of conducting SAR operations should be expeditiously arranged to the best of each Party's ability and via the appropriate RCCs.

3.8 Solely for the purpose of searching for the site of an accident, rescuing survivors of such accidents, rendering emergency rescue assistance to persons, vessels, or aircraft in danger or distress and when the location is reasonably well known, permission to enter its territory shall be granted by a State to another State's search and rescue unit(s), provided that a request has been transmitted to the rescue coordination centre of the concerned State or to such other authority as has been designated by the State.

3.9 The RCC of the State requesting assistance or the use of suitable SAR facilities of another State ("the requesting RCC" and "the assisting State" respectively), shall provide all pertinent details on the scope of the assistance or facilities required. The requesting RCC should provide a full briefing, directly or indirectly, to the SAR Units that have been made available by the assisting State, on the scope of the mission before the SAR units enter the SRR of the requesting RCC. If it is necessary for the SAR Units of an assisting State to land at an airfield or to make use of the facilities of the requesting RCC in the course of performing an assigned SAR task, he RCC concerned should make all necessary arrangements to facilitate the taking of such measures or actions.

3.10 To facilitate the coordination referred to in this section, the Parties should, to the best of their ability, keep each other fully and promptly informed of all relevant SAR operations. The Parties should develop appropriate procedures in accordance with the IAMSAR Manual to provide for the most effective and efficient means of communication.

4. SAR Regions

4.1 The aeronautical and maritime SAR regions of [State] and [State] are separated geographically by a continuous line as follows:

[Provide the geographic coordinates of the lines of delimitation between both States' SAR regions only. Add additional States lines of delimitation for regional SAR Agreement.]

4.2 The establishment of SAR regions is intended only to provide an understanding concerning the regions within which a Party accepts primary responsibility for coordinating SAR operations.

4.3 The delimitation of SAR regions is not related to and does not prejudice or have any bearing on the delimitation of any boundary between States.

5. Rescue Coordination Centres (RCCs)

5.1 The primary operational points of contact under this Agreement are the internationally recognized aeronautical and maritime RCCs of the Parties.

5.1.1 [Identify national RCC]
5.1.2 [Identify national RCC]

5.2 The Parties, to the best of their ability, should provide to each other any information which might be useful in order to expedite and improve coordination.

5.3 Identification of the operational points of contact, as referred to in this Section, is not intended to preclude appropriate direct coordination between any SAR facility or organizational unit of the Parties, especially when time is of the essence in the saving of lives.

5.4 Transfer of SAR mission coordination responsibilities between the RCCs, if deemed necessary, should be conducted by consultation between RCCs.

6. Cooperation

6.1 The subordinate elements of the Parties may provide for further coordination and cooperation by the establishment of appropriate operational arrangements and procedures consistent with this Agreement.

6.2 In addition to information related to specific SAR cases, the Parties may exchange any other information that may serve to improve the effectiveness of SAR operations. This information may include, but not be limited to:

6.2.1 communication details;

6.2.2 information about SAR facilities;

6.2.3 descriptions of available airfields;

6.2.4 knowledge of fuelling and medical facilities; and

6.2.5 information useful for training SAR personnel.

6.3 The Parties will endeavour to promote mutual SAR cooperation by giving due consideration to collaboration including, but not limited to:

6.3.1 exchange visits between SAR personnel;

6.3.2 joint SAR exercises and training;

6.3.3 the use of ship reporting systems for SAR purposes;

6.3.4 sharing of information systems, SAR procedures, techniques, equipment, and facilities;

6.3.5 provision of services in support of SAR operations;

6.3.6 coordination of national positions on international SAR issues of mutual interest;

6.3.7 supporting and conducting joint research and development initiatives aimed at reducing search time, improving rescue effectiveness, and minimizing risk to SAR personnel; and

6.3.8 conducting regular communications checks and exercises, including the use of alternative means of communications that would be used to handle communication overloads during major SAR operations.

7. Finances

7.1 Unless otherwise agreed by the Parties, each Party is to fund its own expenses for activities pertinent to this Agreement.

7.2 The provisions of the Agreement are contingent upon the availability of SAR personnel, facilities and funding.

7.3 SAR services provided by the Parties to persons in danger or distress are to be without subsequent cost recovery from the person(s) assisted.

8. Application of this Agreement

8.1 Nothing in this Agreement is intended to affect in any way rights and duties based on international agreements or other arrangements between the Parties or their respective governments.

8.2 All activities conducted under this Agreement should be in conformity with national legislation of the Parties, as well as with the relevant international conventions in force.

8.3 No provision of this Agreement should be construed as an obstacle to prompt and effective action by any Party to relieve distress whenever and wherever found.

8.4 Any dispute regarding the interpretation or implementation of this Agreement is to be resolved by consultation between the Parties and is not to be referred to any international body, court or third party for settlement.

9. Modification

9.1 This Agreement may be modified in writing by the Parties.

10. Duration, Withdrawal and Discontinuation

10.1 Cooperation under this Agreement may commence from the date of signature and may continue indefinitely.

10.2 Either Party may withdraw from this Agreement at any time, upon giving not less than six (6) months' notice in writing to the other Party.

10.3 Cooperation under this Agreement may be discontinued mutually by the Parties in writing, or by any superseding arrangement.

10.4 The Parties should ensure that such discontinuation does not adversely impact any SAR operations or other cooperation in progress at the time that such discontinuation takes effect and should consult each other closely for this purpose.

Signed in duplicate at [City, State], this ____ day of _______, 2016.

For the [national agency]:

____
Signature of Authorized Signatory
Name: ___________________________
Designation:_______________________
Organization:______________________

Signed in duplicate at [City, State], this ____ day of _______, 2016.
For the [national agency]:

____
Signature of Authorized Signatory
Name: ___________________________
Designation:_______________________
Organization:______________________

10 Appendix J

- Replace text of appendix J as follows:

Sample [National] SAR [Co-ordinating] Committee agreement
[State name]
National Search and Rescue Committee
Interagency Agreement

1. PURPOSE

1.1 This Agreement provides for a national-level Committee to coordinate civil search and rescue (SAR) matters of interagency interest within [State name].

2. BACKGROUND

2.1 The National Search and Rescue Committee (NSARC) is established as a standing interagency group to oversee the National Search and Rescue Plan (NSP) and to act as a coordinating forum for national SAR matters. [Note: If the National Search and Rescue Plan (NSP) is created first, then the paragraph could read as: The [State] National Search and Rescue Plan (NSP) established a standing interagency group to oversee the NSP and to act as a coordinating forum for national SAR matters. This group is named the National Search and Rescue Committee (NSARC).]

3. SPONSORSHIP

3.1 The [name of national agency] is the sponsor of NSARC. The [name of national agency] shall:

3.2 Designate an executive-level person to Chair the Committee, who shall report to the Secretary of [Department or Ministry name] via the [name of national agency]; and

3.3 Appoint a Committee Secretary to ensure that the Committee operates according to policies and procedures contained in current directives.

4. MEMBERSHIP, OBSERVERS AND ADVISORS

4.1 The Member Agencies of the Committee are as follows:
....
....
....

[e.g.: Ministry/Department of Defence, Ministry/Department of Transportation; Ministry/Department of Commerce, National Police, Emergency Management Agency, Medical, etc.]

4.2 Each of these Member Agencies shall designate one representative by name or position to serve as its primary Committee Member, and another to serve as its Alternate Committee Member.

4.3 Each Committee Member may call upon officials in that agency to serve as Advisors and to participate in meetings of the Committee, or of subsidiary groups of the Committee.

4.4 Others may be invited with the approval of the Chair or the Committee to participate as government or non-government Observers on an ad hoc basis.

5. NATIONAL SEARCH AND RESCUE PLAN PARTICIPATION

5.1 Member Agencies of NSARC are, by virtue of their membership, also Participants to the National Search and Rescue Plan of [State name].

6. OBJECTIVES

6.1 The objectives of the Committee are to:

6.1.1 Recommend implementation strategies and actions that ensure that the [State] meets domestic needs and international commitments to provide effective civil SAR services;

6.1.2 Hold sole responsibility for the provisions of the NSP;

6.1.3 Serve as the primary coordinating forum within the national government for the conduct and support of civil SAR operations covered by the NSP, and for matters relating to national civil SAR policies and positions;

6.1.4 Administer the National Search and Rescue Supplement to the International Aeronautical and Maritime Search and Rescue Manual for interagency guidance on implementing the NSP;

6.1.5 Seek to ensure compatibility between the NSP and the National [Disaster] Response Plan (NRP) so that the NSP can be implemented independently or concurrently with the NRP during an incident of national significance;

6.1.6 Promote application of research and development, improved standards and procedures, new technologies, regulations, and education to improve the effectiveness and efficiency of distress alerting and other civil SAR services, and to reduce the associated risks;

6.1.7 Help coordinate the civil SAR efforts of the NSARC Member Agencies with other national and international government, private, and volunteer organizations;

6.1.8 Promote the effective use of all available resources to support civil SAR;

6.1.9 Foster appropriate use of SAR agreements and other arrangements and plans to improve cooperation and mutual support among the various national and international civil SAR communities;

6.1.10 Promote close cooperation among civilian and military authorities and organizations for provision of effective civil SAR services;

6.1.11 Promote analysis and initiatives to help citizens avoid or cope with distress situations; and

6.1.12 Consider, as appropriate, contingency plans for use of SAR resources in emergencies other than civil SAR.

7. PROCEDURES

7.1 The following procedures shall be followed in conducting the business of the Committee:

7.1.1 The Committee shall schedule regular meetings on at least a [quarterly] basis.

7.1.2 The Chair or any Member Agency via its respective Committee Member may call a special meeting when deemed necessary.

7.1.3 Meetings will be properly documented by the Secretary. Decisions will normally be made by consensus. Where consensus cannot be reached, decisions will be submitted to the Committee for majority vote at a regular or executive meeting of the Committee, or by an informal poll of the Committee Members by the Secretary with the results properly documented.

7.1.4 The Chair is authorized to represent directly the views, actions, recommendations and decisions of the Committee, or otherwise act on behalf of the Committee, by correspondence or other means, except that where such correspondence is directed to the [Secretary of Homeland Security] [Transportation], it shall be via the [name of national agency].

7.1.5 The normal procedure for addition of a national Agency as an NSARC Member Agency and NSP Participant shall be as follows:

i) Based on a unanimous vote of the Committee, the Chair will extend a written invitation to the prospective Member Agency, and the Agency will respond to the Chair in writing of the Agency's acceptance; and

ii) The Chair will then notify each Member Agency, via the Member Agency's Executive Secretary or an individual designated to receive such notification, of the acceptance. If no Member Agency objects within [60] days, the invited Agency will from that time become a NSARC Member Agency and a NSP Participant. Such notifications, designations, and objections must be in writing.

7.1.6 Alternatively, an additional national Agency may become a Member Agency and NSP Participant by mutual written agreement of all current Member Agencies and the prospective Member Agency.

7.1.7 Termination of an Agency's Committee Membership shall automatically terminate its status as an NSP Participant; such termination shall be accomplished by the Agency's written notification to the other Member Agencies at least six months in advance.

7.1.8 Policy issues or plans that require the attention or approval of the Signatories, e.g. adoption of the NSP, will be submitted by the Chair with recommendations for action. In such cases the views of all of the Committee Members shall be included.

7.1.9 Nothing in this Agreement shall be viewed to obligate the Member Agencies to comply with decisions of the Committee.

8. ENTRY INTO FORCE, AMENDMENT, RENEWAL AND TERMINATION

8.1 This Agreement shall enter into force on the date of the first Committee meeting following the completion of the signatures by the Secretaries (or equivalent level authority) of all of the Member Agencies.

8.2 Based on a unanimous vote of the Committee, any proposed amendment(s) to this Agreement or to the NSP must be adopted by one of the following means:

8.2.1 The Chair will notify each Member Agency, via the Member Agency's Executive Secretary or an individual designated to receive such notification, of the proposed amendment(s). If no Member Agency objects within [60] days, the amendment(s) will be considered adopted. Such notifications, designations, and objections must be in writing.

8.2.2 The amendment(s) shall be adopted by mutual written agreement of all Member Agencies.

8.3 This Agreement, as amended, shall be automatically renewed on 1 January [year] and every five years thereafter unless superseded by a new arrangement or terminated.

[Agency names and signers]

PROPOSED AMENDMENTS TO IAMSAR MANUAL VOLUME II

1 Contents

- Add or amend text starting on page iii:

2.18 ~~Inmarsat SafetyNET~~ Maritime safety information services

2.19 Broadcast services

Renumber existing 2-19 through 2-33 as 2-20 through 2-34

2-35 Additional device considerations

2-36 RCC actions to consider

2-37 Social media

- Renumber existing **Chapter 7** and **Chapter 8** as **Chapter 8** and **Chapter 9**

- Insert new Chapter 7:

Chapter 7 Multiple aircraft SAR operations

7.1 Overview

7.2 Area of SAR action

7.3 Aircraft coordinator

7.4 Communications

7.5 Search mission

7.6 Evacuation missions

7.7 Long range operations

7.8 Effects of the environment and weather

Appendix T Multiple aircraft SAR operations

2 Abbreviations and Acronyms

- Delete the following text on page vii

~~**AES**.......aeronautical earth station~~
~~**CES**.......coast earth station~~
~~**GES**.......ground earth station~~

- Add on page xiii the following text:

SLDMB……self-locating datum marker buoy

3 Glossary

- Delete the following text on page xi

~~**Coast earth station (CES)** Maritime name for an Inmarsat shore-based station linking ship earth stations with terrestrial communications networks.~~

- Amend the Glossary as follows:

Cospas-Sarsat System	A satellite system designed to detect and locate activated distress beacons transmitting ~~on~~ in the frequency band of 406.0-406.1 MHz.
Direction Finding (DF)	~~Homing on signals to pinpoint a position~~. Radiodetermination using the reception of radio waves for the purpose of determining the direction of a station or object.
Datum marker buoy (DMB)	Droppable floating beacon used to determine actual total water current, or to serve as a location reference. There are two types, the radio type and the self-locating datum marker buoy type.
Emergency Locator Transmitter (ELT)	~~Aeronautical distress beacon for alerting and transmitting homing signals.~~ A generic term (related to aircraft) describing equipment which broadcast distinctive signals on designated frequencies and, depending on application, may be automatically activated by impact or be manually activated.
Fetch	The distance the waves have been driven by a wind blowing ~~over which the wind blows~~ in a constant direction, without obstruction.
Maritime Safety Information Service	The internationally and nationally coordinated network of broadcasts containing information which is necessary for safe navigation.
Maritime Safety Information (MSI)	Navigational and meteorological warnings and forecasts and other urgent safety related messages broadcast to ships, as defined in regulation IV/2 of the 1974 SOLAS Convention.
Page **NAVAREA**	~~One of 16 areas into which the world's oceans are divided by the International Maritime Organization for dissemination of navigation and meteorological warnings~~. A geographical sea area established for the purpose of

	coordinating the broadcast of navigational warnings. The term NAVAREA followed by a roman numeral may be used to identify a particular sea area. The delimitation of such areas is not related to and shall not prejudice the delimitation of any boundaries between States.
Personal locator beacon (PLB)	~~Personal radio distress beacon for alerting and transmitting homing signals.~~ A portable device, manually activated, which transmits a distress signal on 406 MHz, and may have an additional homing signal on a separate frequency.
Search and rescue point of contact (SPOC)	~~Rescue co-ordination centres and other established and recognized national points of contact which can accept responsibility to receive Cospas–Sarsat alert data to enable the rescue of persons in distress.~~ A point of contact for SAR, designated by the national administration, that is responsible for receiving distress alert information and providing the information to the appropriate SAR authorities.
Self-locating datum marker buoy (SLDMB)	Droppable floating beacon, equipped with a global navigation satellite system (GNSS) sensor that transmits its location periodically, used to determine actual total water current, or to serve as a location reference.
Rescue co-ordination centre (RCC)	Note: The term RCC will be used within this Manual to apply to either aeronautical, maritime or joint centres; ARCC, MRCC or JRCC will be used as the context warrants.
Vessel Monitoring System (VMS)	~~A tracking system which provides for environmental and fisheries regulatory organizations to monitor position, time at a position, course and speed of commercial fishing vessels~~ Systems primarily used by environmental, fisheries and regulatory organizations, but also used by other organizations, to monitor the position, time of the position provided, course and speed of vessels

4 Chapter 1

- Amend page 1-2, paragraph 1.2.3(a), final sentence as follows:

The SMC plans the search and rescue operations and coordinates the transit of SAR facilities to and from the scene."

- Amend page 1-3, paragraph 1.2.4, 7th line as follows:

~~Conceivably, t~~ The OSC may have to assume SMC duties and actually plan the search and/or rescue if the OSC becomes aware of a distress situation directly..."

- Amend page 1-3, paragraph 1.2.4, bullets as follows:

  – assume operational coordination of all SAR facilities on scene;

  – receive the search and/or rescue action plan from the SMC;

  – modify the ~~search~~ action plan based on prevailing environmental conditions and keep~~ing~~ the SMC advised of any changes to the plan (~~do in consultation~~ discuss proposed modifications with the SMC when practicable);

  – provide relevant information to the other SAR facilities;

  – implement the ~~search~~ action plan;

  – monitor the performance of other units participating in the ~~search~~ operation; and

  ~~– co-ordinate safety of flight issues for SAR aircraft;~~

  ~~– develop and implement the rescue action plan (when needed); and~~

  – make consolidated reports (SITREPs) ~~back~~ to the SMC.

- Amend page 1-4, paragraph 1.3.2 as follows:

A list of potential SAR resources is contained in ~~the International Aeronautical and Maritime Search and Rescue~~ IAMSAR Manual ~~on~~ Volume I, *Organization and Management*."

- Amend page 1-8, paragraph 1.6.10 as follows:

  Add to the end of the paragraph: A rescue action plan is also required.

- Amend page 1-8, paragraph 1.6.11, 3rd line as follows:

...ensuring that the search and rescue plans ~~is~~are received, understood, and followed..."

- Amend page 1-13, paragraph 1.8.15 as follows:

  Add Mass rescue operations to the subject matter list.

5 Chapter 2

- Amend page 2-5, paragraph 2.5.13, 4th line as follows:

… maritime safety information (MSI). Some Inmarsat ~~coast earth stations (CESs)~~ LESs also offer EGC...

- Replace page 2-5, paragraph 2.6.7 with the following:

2.6.7 Cospas-Sarsat position information can be determined by several methods. The LEOSAR system uses a Doppler plot resulting from relative motion between the 406 MHz distress beacon signal source and the orbiting satellites. Alert messages provide two positions an equal distance on each side of the satellite track, and a confidence level (annotated as a percentage) to help in assessing which position is correct. Cospas-Sarsat is transitioning to a system (MEOSAR) which will calculate position based on time difference of arrival and frequency difference of arrival of the beacon signal at multiple satellites. This method will provide a single position. Some 406 MHz distress beacon messages may also include information derived from the Global Navigation Satellite System (GNSS). RCCs should consult the Cospas-Sarsat Handbook on Distress Alert Messages for Rescue Coordination Centres (RCCs), Search and Rescue Points of Contact (SPOCs) and IMO Ship Security Competent Authorities (C/S G.007, available on the Cospas-Sarsat website.) and other appropriate Cospas-Sarsat documentation for more information.

- Amend page 2-6, paragraph 2.6.9, first paragraph as follows:

2.6.9 In the original (LEOSAR) Cospas-Sarsat system, ~~S~~signals from 406 MHz distress beacons can be stored aboard a satellite and relayed to ground later if no LUT receiver is immediately within view of the satellite, enabling the system to operate in a global mode with fewer LUTs required. In the MEOSAR system which will augment the Cospas-Sarsat System, the signal from a 406 MHz distress beacon will be relayed through multiple satellites and received by an extensive network of LUTs providing near instantaneous notification and location of distress events.

- Amend page 2-6 paragraph 2.7.4, first line as follows:

2.7.4 Inmarsat type-approved ship earth stations (SESs) and aeronautical earth stations (AESs) transmit via the satellites to land earth stations (LESs)~~, also known as coast earth stations (CESs) for maritime functions and ground earth stations (GESs) for aeronautical functions~~.

- Replace section 2.10 **Mobile telephones – satellite and cellular** with the following:

2.10 Mobile telephones – satellite and cellular

2.10.1 Mobile (Cellular) telecommunications devices (such devices include basic mobile/cell phones; 'smart-phones'; 'Blackberry™' and similar devices; notebook; tablet and laptop computers using WiFi or telecommunications devices either as add-on or built in.) are in widespread use around the globe. Terrestrial mobile telecommunications devices can provide users with services such as telephone, text (Short Message Service – SMS), image (photo and video) capture and audio messaging – called Multimedia Message Services, email and data services (e.g. internet connection), and geographical position fixing and basic navigation capabilities (e.g. 'Satnav').

2.10.2 Mobile telecommunications devices can be used for reporting emergencies both at sea or on land. Cellular telecommunications are often easily available and familiar to users and can sometimes provide an effective signal over considerable distances on or near large bodies of water – depending on the location, height and power of the terrestrial aerial infrastructure.

2.10.3 A mobile/cell telephone can be a satellite or cellular telephone.

A satellite telephone communicates through satellites that can provide regional or global coverage.

A mobile phone (also known as a cellular phone, cell phone) is a phone that can make and receive telephone calls over a radio link. It does so by connecting to a cellular network provided by a mobile phone operator, allowing access to the public telephone network.

Many aspects of the guidance below regarding cellular telephones can also apply to the satellite telephone. Cellular telephones work well for point-to-point conversations within range of a supporting cellular network. Some cellular telephones can shift to satellite communications when they are moved outside terrestrial networks. However, these devices would have limitations in the maritime or remote environments, and therefore the advantages and use of dedicated marine and/or aviation communications and alerting systems should continue to be stressed by national administrations.

The following are some limitations which SAR authorities should make cellular telephone users in the aviation and maritime communities aware of, so that they see the advantages of using dedicated systems:

- use of a VHF radio in a distress situation for a MAYDAY call not only alerts SAR personnel, but other vessels, aircraft or stations within range, often enabling faster assistance from a variety of closer potential rescuers;

- the user must know or look up any needed telephone number if they want to use a cellular telephone for that purpose;

- radio signals can be used effectively to help locate survivors using either land or mobile DF equipment, but cellular telephones require close time-consuming coordination with service providers to identify the cell from which a call was placed (usually a 10-15 mile radius);

- VHF radios allow receipt of safety advisories, while cellular telephones do not;

- battery-powered cellular telephones are good for only a limited amount of talk time before batteries need to be changed or recharged;

- cellular telephone service providers can deny service to selected cellular telephones without advance notice (e.g. for late payment of fees);

- in disaster areas, cellular systems quickly become saturated with callers, making calls to others in the same area nearly impossible; and

- where installed, cellular phone coverage in the maritime environment can be limited, intermittent, or non-existent, based on several factors to include cellular tower accessibility and orientation in relationship to a cellular telephone call initiated from an offshore or coastal area.

2.10.4 The services available to mobile telecommunications devices are provided over terrestrial radio systems which are connected to computer servers which record the activity, cell site connection and general locality of the user. This formation provides data which is of use to Search and Rescue authorities who may need to identify the location of persons in actual or possible danger e.g. overdue vessel, aircraft or persons on land.

2.10.5 When receiving an alert via cellular telephone, SAR personnel should obtain the following information:

- caller's complete cellular telephone number;
- caller's cellular service provider;
- roam number if needed to recall the user;
- other means of available communications; and
- an alternative point of contact.

2.10.6 The caller might be advised to ensure the phone is left on to receive further communications, or agree on a communications schedule. The caller might also be advised that the cellular number may need to be broadcast if an assistance broadcast is made. (Caution should be used in actually broadcasting the number, since this would enable anyone for any reason to call and tie up communications.)

2.10.7 Survivors from distressed vessels, vehicles or crashed aircraft may be able to use mobile telecommunications devices to communicate in an emergency or call for assistance; or active devices may transmit occasional 'polling' emissions that could provide information as to the current location; or, the last activity of a device may provide a clue to calculate a last known position. Therefore, use of procedures to exploit location data from these devices to communicate with or determine the location of survivors can be important for effective SAR response, particularly when conventional means of communication or location information are not available or are inconsistent or inaccurate.

2.10.8 Cellular service providers may be able to provide some of the following help in finding the position of callers in an emergency:

- call trace to the receiving cell while the call is connected, and an estimate of maximum range from the tower;

- approximate position based on the assessment of signal strength or time difference of arrival to several tower sites or from the cell phone's GNSS-derived positioning obtained either through direct means, in which a call is placed by the cellular user or by dialling the cellular number of the individual in distress (if known), or through indirect means via the phone's standby connectivity to the cellular network (provided the phone is powered on), which can be of particular use in instances where an individual may not be able to place or answer a call;

- cell tower location(s) of the last series of calls placed by the caller (useful for proximity searches), its associated traffic data, if available; and

- notification when a call is made from the user's number (useful in overdue cases).

2.10.9 SAR authorities should make all appropriate arrangements (i.e. legal, logistic, etc.) with cellular service providers in their SRR to obtain the critical information in 2.10.8 in as quick a manner as possible and to establish regulations that require wireless providers to provide this information either through network-based or handset-based (e.g. built-in GNSS receiver) capabilities. Similar arrangements and protocols should also be made with emergency or public safety service agencies so that SAR-related emergencies may be directed to the appropriate SAR authority along with the caller's name, location, and other pertinent information when and where available.

2.10.10 RCCs should provide all possible assistance to other RCCs requesting information about users of mobile telecommunications devices that are or may be in distress. This may include requesting information from communications service providers in their country on behalf of RCCs in other SRRs.

2.10.11 National administrations should consider establishing free of charge, abbreviated telephone numbers to connect callers with emergency or public safety service agencies (e.g. "1-1-2", "9-1-1", "9-9-9") or direct cellular call connection numbers to SAR authorities (e.g. "1-6-1-6" in France and "1-5-3-0" in Italy) in order to provide emergency services and SAR authorities with an expedient means of notification from cell phone users in an emergency, and to publicize this information widely.

2.10.12 Search planning techniques can be used in situations where a mobile telecommunications device can only be located using the terrestrial radio signal information obtained from the aerial site the device was or is connected to. Where Global Navigation Satellite Systems (GNSS) information is available on the location of a mobile telecommunications device (i.e. the user has a GNSS enabled device with positioning service activated), the SMC may simply be able to send a rescue unit to the reported position or apply normal Datum Point search planning procedures and techniques to the GNSS position. However, information on the signal-derived location may also be a useful corroboration of any GNSS position.

Satellite Communications Services

2.10.13 Many mobile satellite communications services are not regulated for the provision of aeronautical or maritime distress alerting, nor are they suitable substitutes for approved means of distress communications. RCCs must still be capable of coordinating the response to incidents alerted via these services. There are numerous non-GMDSS international services (systems) used aboard aircraft and vessels for the provision of voice, fax, email, and data communications. Quite often these services automatically interface with public communications networks.

2.10.14 Most satellite service providers maintain a network operations centre that is staffed 24/7. RCCs should maintain contact information for these centres to assist in establishing follow-on communications and obtaining vital data in the event of an alert being transmitted via one of their services. If an alert is transmitted via one of these services, either directly to a RCC or relayed to a RCC via another source, the SMC should then action the alert to resolve the incident.

- Amend page 2-13, paragraph 2.19.2, 2nd line as follows:

...continue to be voluntarily used ~~into the next century~~...

- Delete paragraphs 2.17.4 to 2.17.7 related to NAVTEX and WWNWS.

- Replace section 2.18 **Inmarsat SafetyNET** with the following:

2.18 Maritime Safety Information Services

2.18.1 The World Wide Navigational Warning Service (WWNWS) is the internationally and nationally coordinated service for the promulgation of navigational warnings. Navigational warning means a message containing urgent information relevant to safe navigation, broadcast to ships in accordance with the provision of the International Convention for the Safety of Life at Sea (SOLAS), 1974, as amended.

2.18.2 The two principal methods used for broadcasting maritime safety information (MSI), which include navigational warnings and meteorological information, in accordance with the provision of SOLAS are NAVTEX and SafetyNET.

2.18.3 All NAVAREA, Sub-area and coastal warnings should be broadcast only in English in the international NAVTEX and SafetyNET services in accordance with IMO resolution A.706(17), as amended. In addition to the required broadcast in English, NAVAREA, Sub-area and coastal warnings may be broadcast in a national language using a national service.

- Insert new section 2.19 **Broadcast Services** before section **Radio Telegraph** as follows:

2.19 Broadcast Services

2.19.1 NAVTEX is used to promulgate navigation and meteorological warnings and other safety-related information to vessels and may be used by SAR services and for SAR purposes.

2.19.2 International SafetyNET is used to promulgate navigation and meteorological warnings and other safety-related information to vessels and may be used by SAR services and for SAR purposes.

2.19.3 Every RCC should make arrangements with an associated NAVAREA or National Coordinator to promulgate warnings on SAR-related information. Such information may include areas to be avoided or where search and rescue operations are being carried out.

2.19.4 The International SafetyNET Manual describes the structure and operation of the International SafetyNET service. This includes examples and coding which must be followed for preparing SafetyNET broadcasts, including SAR broadcasts.

2.19.5 It may be appropriate and advisable to promulgate distress alert relays over both NAVTEX and SafetyNET. All SOLAS ships and many fishing and other vessels sailing within NAVTEX coverage areas can be expected to carry 518 kHz NAVTEX receivers. Some may also carry equipment to receive SafetyNET broadcasts.

2.19.6 Normally, the most practical way to handle SAR broadcasts over SafetyNET is to send them to all vessels within a desired radius of a specified position.

2.19.7 The use of an all-ships broadcast to identify a vessel to divert for SAR operations should be considered as an initial action. It may require time to obtain responses from available vessels, and to select an appropriate one or more for the task, and can affect quite a few vessels. Although SafetyNET is a reliable, economical and important SAR tool, it must be used wisely. It is often prudent to supplement an all-ships broadcast with direct communications as a next step using vessels identified via LRIT, AMVER or another ship reporting system. Factors that may be considered when tasking vessels should include the location of vessels in relation to the incident area, relative ability of vessels to conduct a rescue and appreciation of the impact of diversions on the responding vessels.

- Renumber existing 2-19 through 2-33 as 2-20 through 2-34

- Add new section 2.35 **Additional device considerations** as follows:

2.35 Additional device considerations

2.35.1 These are additional devices that are seen in the maritime environment including those that are classified as a distress signal and/or locating device. These devices can include:

(a) Radar SART (Search and Rescue Transponders)

- Transmissions from these devices are classed as distress signals and visible to vessels and aircraft operating radar in the 9 GHz bandwidth

- Radar SARTs should activate an RCC's distress procedures and the appendix F - Distress Phase checklist

(b) Devices with AIS component

- Devices that have AIS locating capability include Man Overboard (MOB) devices, AIS SART and EPIRBS. These AIS devices are required to have an MMSI which is programmed by the manufacturer in a serialised manner. This MMSI is not connected with a vessel MMSI. Registration data may not be available but where it does exist it is strongly encouraged to be provided to RCCs..

- AIS SART (Search and Rescue Transmitters)

AIS-SARTs are part of the GMDSS and have been able to be used as an alternative to radar (X-band) SARTs. These are visible to AIS equipped vessels, and some shore stations (e.g. VTS) monitoring AIS. They are designated only as a locating signal and are intended to be used following transmission of distress alerting signals. However, as an AIS SART activation may be related to a vessel or person(s) that has activated a device to draw attention to their location because of an emergency situation that they could not make known by other means, it may need to be investigated.

(c) AIS MOB (Man Overboard Device)

- AIS Man Overboard (AIS MOB) devices are intended as personal locating devices for use by, for example, ship's crew members, offshore energy industry personnel, small boat users, divers, etc. These devices are small, portable and/or can be fitted to life jackets and personal flotation devices. AIS MOB devices transmit AIS locating signals in the same way as AIS SARTs.

- The sighting or reporting of an AIS MOB signal may indicate that a person or persons activated the device to draw attention to their location perhaps because of an emergency, for example, a man overboard from a vessel or offshore installation. The AIS MOB is primarily intended to enable the vessel, craft or installation from which a person has fallen, to locate them and for other nearby vessels to be able to assist if necessary.

- AIS MOB devices are used by small craft, for example, pleasure boats and small fishing vessels that may be operating single-handed or where crew numbers are small and so reports of AIS MOB sightings should be investigated.

(d) EPIRB – AIS

- EPIRB-AIS devices are 406 MHz distress alerting devices that contain an additional AIS transmitter developed using the same AIS-SART technology, where the AIS component is used as an aid in locating that EPIRB-AIS. EPIRB-AIS devices will be displayed in the same way as an AIS-SART.

- Add new section 2.36 **RCC Actions to consider** as follows:

2.36 RCC actions to consider

a) RCCs should consider initiating Uncertainty Phase actions if an AIS signal is observed or reported to a RCC. This decision should be considered in conjunction with other available intelligence including but limited to other indications of a situation requiring a search and rescue response, local experience and considerations.

b) Dependent on the decision to initiate a SAR phase the following additional action can be considered. If reported by a vessel:

- Details and position of reporting vessel
- Range and Bearing of radar SART transmissions or position of AIS SART
- Vessels ability to proceed to position and ETA

c) Other elements to consider:
- When was SART transmission observed?
- Are there any targets on radar or AIS in the direction of SART?
- Check own AIS display (if available) for vessels in vicinity that can assist
- If further search action is required conducting an electronic search for AIS SART/MOB devices, a sweep width should be calculated using IAMSAR Volume II, appendix N-10, Distance to Horizon formula:

$$\text{Horizon NM} = \sqrt{\text{Receiver height in feet}}$$

Horizon $\sqrt{}$ Receiver height in Metres

- Add new section 2.37 **Social media** as follows:

2.37 Social media

2.37.1 Social media are not part of the international distress alerting system and is not monitored as a primary means of distress notification. However, the public uses social media to create online communities to share information, ideas, personal messages and other content. This can raise a public expectation that SAR authorities, especially for prolonged SAR incidences with news media interest, should either provide information to or accept information from social media sites.

2.37.2 As a loosely-defined collaborative Internet network of hundreds or thousands of websites, there are no international protocols or policy to manage distress alerting via social media. The exchange of information on social media can occur real-time but often there is a lag time as participants enter and depart a website and commence and conclude their communication. Also, the large number of social media websites and associated time and personnel resource demands makes it impractical for SAR authorities and RCCs to monitor these websites.

2.37.3 The SMC should be aware of the possible uses and RCC workload impact of social media in supporting a search and rescue response. These can range from the ability of persons to report information to family or friends as well as requesting intelligence from the community in regard to persons that are subject of a search and rescue response. SMCs should also be aware that social media may result in uncoordinated contributions and have the potential to distract SMCs from operational response, preventing effective coordination. SMCs should be able to rely on other resources to manage the operation of social media. This may be part of a coordinated national policy but at a minimum should be addressed within a SAR Authority's media policy. Also, commercial industry, such as passenger ship and airline companies may be making use of social media and, therefore, SAR authorities should collaborate on the flow of information with others that may be involved in a search and rescue response.

2.37.4 Social media can be effectively utilized for disaster preparation, alerting and recovery, but this issue is different from distress alerting. For example, a designated disaster social media website can:

(a) Support a disaster response when the responding/organizing authorities develop a social media website through which all distress notifications are received (The challenge is notifying the public of the existence of this specific social media website, and how to navigate to the site).

(b) Provide relief to call centres during extended disasters which may receive large traffic volume.

(c) Provide additional information critical to those in distress as well as those who are reporting persons in distress.

(d) Provide a way for people to "leave messages" that may not reflect an urgent distress situation, but are still important and would allow SAR authorities to respond when able to the person posting the request.

(e) Provide updated disaster response information on one website.

(f) Provide information on what and to whom changes in situation(s) should be reported.

(g) Provide information on who to contact to receive more information.

Note: *Care and caution should be adhered to during the use of information and material obtained from social media during response to SAR incidents*

2.37.5 The SMC should make use of the capability of social media, as appropriate, but also should rely on other resources to manage the operation of social media. Also, commercial industry, such as passenger ship and airline companies may be making use of social media and, therefore, SAR authorities should collaborate on the flow of information with them.

6 Chapter 3

- Amend page 3-1, paragraph 3.1.2, 2nd line as follows:

during the first 24 hours...

- Amend page 3-6, paragraph 3.4.8, last sentence as follows:

This especially applies ~~to~~when an initial Cospas-Sarsat alert ~~where~~ provides an A and a B position, the A and the B positions can be in different SRRs.

- Amend page 3-7, paragraph 3.5.6 (h) as follows:

Add additional text at end of current sentence:

Try to obtain information about persons in distress who may be carrying mobile telecommunications devices. Attempt to communicate with them by mobile/cell telephone call, text or email and/or contact the mobile communications service provider and request information about the device(s) last known location and use.

Note: *Legislative restrictions may require that another agency have to undertake this task on behalf of the SAR services.*

- Amend page 3-8, paragraph 3.5.9 as follows:

Add new bullet point after first bullet item:

If normal radio or satellite communications are unavailable or not connecting, and terrestrial telecommunications are likely to be within range, attempt or make calls, texts or emails to any distressed person(s) known to be carrying a mobile telecommunications device.

- Amend page 3-12, paragraph 3.8.5 (c) as follows:

(c) The probability of the search object remaining close to the position of the distress incident decreases with time. Floating search objects drift, and survivors on land may be walking. If the search object is mobile, the size of the search area must increase with time. Delay may dramatically increase search area size, possibly beyond what the available search facilities can cover. For survivors adrift in rapid water currents, the best chance of locating them is soon after they have gone adrift, while the search area is still small. For areas of high drift rate or whenever there is potential for an extended search for objects which drift, early deployment of one or more datum marker buoys, particularly self-locating datum marker buoys (SLDMB), can assist in determining the area to search and for relocating drifting objects.

- Amend page 3-12, paragraph 3.8.6 as follows:

Environment-related factors may severely limit available rescue time. Survivor life expectancy varies with the use of lifejackets, immersion suits, the type of clothing worn, the clothing's wetness, survivor activity, initial body temperature, physical and psychological condition, thirst, exhaustion, hunger, and will to live. Individuals can exceed common life expectancies or tolerance times. (Regarding survival in cold water, the IMO provides more information in its *Pocket Guide to Cold Water Survival*.) The following are guidelines, not absolute factors, for search planning and suspension. Expert medical advice should also be sought if available.

(a) Exposure to the chilling effects of cold air, wind, or water can result in hypothermia, the abnormal lowering of internal body temperature. The rate of body heat loss increases as air and water temperatures decrease. Death from hypothermia occurs~~ over four times more often in water than on land~~ more quickly in water than in air at the same apparent temperature. If possible, advise survivors not to enter the water, or to get out of it, even partially, if they are able to do so.

(b) The warmest ocean water that can be expected at any time of year is 29°C (84°F). About one third of the earth's ocean surface has water temperatures above 19°C (66°F). The term "cold" can be applied to water as warm as 25°C (77°F): long periods of immersion in water as high as this temperature can result in a fall in deep body temperature. It follows that most of the planet is covered in "cold" water.

(c) Wind is a factor for exposed survivors, as body heat loss accelerates with increasing wind velocity. Figure N-13 in appendix N shows the effects of various wind speed and air temperature combinations, and indicates the equivalent temperature on dry skin in still air. This emphasizes the need to shelter survivors who would otherwise be exposed to severe cold.

(d) ~~The warmest ocean water that can be expected at any time of year is 29°C (84°F). About one third of the earth's ocean surface has water temperatures above 19°C (66°F).~~ Figure N-14 in appendix N shows the realistic upper limit of survival time for people wearing normal clothing in water at various ~~water~~ temperatures, where "normal" means the clothing likely to be worn in the open in the circumstances; warm clothing in higher latitudes, light clothing in the tropics. The graph is based on the analysis of known survival cases and laboratory experimentation~~, and shows a reasonable upper limit for search duration~~. But it does not apply directly to people in additional protective clothing, nor to people who may have managed to get themselves wholly or partly out of the water: both might survive for longer times than the graph indicates. SOLAS survival suits are meant to keep a person alive for 24 hours in extremely cold water, for example. Neither should the graph be taken to imply that people in the water wearing normal clothing will survive for the time shown. Particularly at lower temperatures, many people in the water in normal clothing will survive for significantly shorter periods than the maxima shown in figure N-14. ~~t~~The search planner must remember that this graph can only be indicative and that a number of uncertainty factors can improve or reduce survival time. It is a decision-making aid, not a decision-making tool.

(e) Guidelines based on analysis of accidents, together with laboratory-based experimental evidence, show a clear correlation between water temperature, body cooling and survival times. However, it is also apparent that, because of the ~~vast array of~~ many personal factors that can influence survival time in cold water, including cardiac problems and rapidly evoked responses ("cold shock") that result in early drowning, this time can vary from seconds to days.

Among the ~~F~~factors that slow the loss of body heat are:

- warmer water;
- calmer water;
- getting out of the water, or partial rather than full immersion
- good state of health;
- high body fat;
- heavy clothing;
- survival clothing;
- using a lifejacket or other flotation device (to minimize the need to exercise); and
- the use of protective behaviour.

Among the ~~F~~factors that make a person lose body heat faster are:

- ~~gender (females are more prone to hypothermia);~~
- colder water;
- rougher or faster-flowing water;
- full immersion;
- injury / poor state of health;
- use of alcohol, non-medical drugs and most medications (which deregulate temperature control);
- age (children and the elderly are more prone to hypothermia);
- low body fat;
- light clothing;
- exercising (such as situations where persons without lifejackets have to swim); and
- seasickness.

There are other factors, and not all can be known to the search planner. Those listed here indicate the uncertainty that must be allowed for when referring to the graph in figure N-14.

~~Thus in water at 5°C (41°F), the 50 per cent survival time for a normally clothed individual is estimated to be in the region of one hour, with a recommended search time of six hours. The corresponding times for 10°C (50°F) are two hours and twelve hours. While in water at 15°C~~

~~(59°F) the 50 per cent survival time is about six hours, with a recommended search time of 18 hours. Between 20°C (68°F) and 30°C (86°F)~~ It should also be noted that the graph in figure N-14 only extends to a maximum water temperature of 20°C (68°F). Above this temperature survival depends even more on individual circumstances and a "realistic upper limit of survival time" cannot be usefully determined. ~~s~~Search times exceeding 24 hours should be considered, and searching for several days should be considered for the highest water temperatures ~~at the upper end of this temperature scale~~.

~~As there are many factors to consider, this model cannot be used for all situations. SOLAS survival suits are meant to keep a person alive for 24 hours in extremely cold water; and a person may be able to keep himself out of the water by climbing onto wreckage, for example.~~ It should be kept in mind that factors working positively on survival times are often unknown to the SMC. Some of these factors include, but are not limited to, the following:

- Near-naked swimmers would be at the lower ranges of ~~these~~ survival times. But i~~I~~n calm water there may be an exceptional individual (someone who is very fat and fit) who will exceed expectations. If it is known that the victim is such an individual, consideration should, exceptionally, be given to extending the search time~~s from 3-6 to 10 times the predicted 50 per cent survival time~~.

- For inshore incidents, survival times may be less due to breaking water and adverse currents. However, consideration must be given to the possibility that the inshore survivor managed to get ashore. Consequently, the limiting effects of cold water cooling will no longer be the only consideration, and the search must be continued until the shore has been thoroughly searched.

- For offshore incidents, it is reasonable to expect that individuals may be better equipped to survive and have access to appropriate protective clothing and lifejackets~~ and possibly liferafts~~. Consequently, search times for them should be at the upper limits of those expected ~~(10 times predicted 50 per cent survival time),~~ unless obviously adverse conditions prevail – and should exceed them if it is possible that survivors may have been able to get out of the water.

- Survival time is shortened by physical activity (such as swimming) ~~and increased by wearing heavy clothing and, if wearing a lifejacket, adopting protective behaviour (such as huddling with other survivors or adopting a foetal position in the water)~~. Wearing a lifejacket or using some other flotation aid can increase survival time significantly. Lifejackets with a retaining system correctly attached (preventing body slippage) and a spray hood or splash guard (to protect the airway) are most likely to maximize survival. Survival time is also increased by wearing heavy clothing and/or adopting protective behaviour (such as huddling with other survivors, adopting a foetal position in the water, or getting partially or fully out of the water). Specialized insulated protective clothing (such as immersion suits or wet suits) is capable of increasing survival time from 2 to 10 times, depending on the type of clothing, whether there has been inadvertent water ingress, and sea conditions. ~~The SMC should bear in mind that w~~Water ingress into an immersion/survival suit of as little as half a litre ~~of water~~ can reduce its insulation value by 30 per cent, and ~~that~~ wave height of one metre can reduce it by additional 15 per cent.

Predicting survival times in immersion victims is not a precise science; there is no formula to determine exactly how long someone will survive, or how long a search should continue. The SMC must make some difficult decisions based on the best information available, including expert medical advice, and on a number of assumptions, and should extend the search time ~~beyond that~~ to the maximum at which ~~they~~ anyone can reasonably be expected ~~anyone~~ to survive in the prevailing circumstances.

(e) The presence of certain forms of_marine ~~animals~~ life may increase hazards and reduce expected survival time. The SMC should be aware of what marine life may be in the search area and where to acquire specialized medical help quickly.

(f) Heat stress and dehydration are dangers in hot climates, particularly desert areas. The most severe form of heat stress is heatstroke, when body temperature rises. If the body temperature rises above 42°C (107°F) for sustained periods, death usually occurs. Dehydration is a critical factor both in hot climates and survival at sea; a person without water will die in a few days. A combination of high temperatures and lack of water will quickly aggravate heat stress and dehydration. In high-humidity areas, the water needs of the body are about one half those in deserts at equal temperatures.

- Insert on page 3-14, text on Areas of SAR Action after paragraph 3.8.8 as follows:

3.8.9 *Areas of SAR Action*. During SAR operations the SAR aircraft involved should be able to carry out their activities without interference from other air activity. Additionally, aeronautical organizations and aircraft not involved in a SAR operation, need to be made aware of it for their safety. The temporary establishment of appropriate areas surrounding SAR operations might improve safety and inform others of SAR activity.

An "Area of SAR Action" is an area of defined dimensions used or agreed by appropriate authorities for the protection of aircraft during SAR operations. It should be assumed that within areas of SAR action special flying procedures relevant to SAR operations might take place. Areas of SAR action are described in further detail in Volume II Chapter 7.

SAR organizations should arrange that RCC have methods in place for implementing areas of SAR action to facilitate SAR operations.

- Renumber existing 3.8.9 through 3.8.12 as 3.8.10 through 3.8.13

7 Chapter 4

- Amend page 4-4, paragraph 4.3.4 (a) as follows:

…it is usually obtained from the distressed craft itself or from external position fixing equipment (such as two or more lines of bearing from independent direction finding stations or positions provided by satellites, e.g. Cospas-Sarsat or from information obtained about mobile telecommunications device location and/or activity.

- Amend page 4-6, paragraph 4.3.5 as follows:

…based upon the navigational capabilities of the reporting source or the position-fixing estimates used by the SMC e.g. EPIRB, Satcom, radio direction-finding fix, position reports, mobile telecommunications devices location data, etc. and the distance travelled since the last navigational fix.

- Amend page 4-7, paragraph 4.4.4 as follows:

The best way to obtain wind and TWC information is through direct observation. One way to get such observations is from ships passing through the area. Such vessels should be asked to report set and drift as well as wind and other weather observations. If they are available, the observed movements of drifting buoys designed to have zero leeway and move with the surface currents can be used to determine TWC. ~~Some States maintain inventories of datum marker buoys (DMBs) which may be deployed by SRUs and either relocated by means of a radio beacon or tracked by satellite to measure surface currents.~~ Datum marker buoys have been mainly designed for use in determining total water current in the search area and for relocating drifting objects. There are buoys which can also provide elements of leeway.
There are two primary sources for obtaining this type of information:

(a) SRUs, ships and aircraft, can deploy datum marker buoys (DMBs). There are two types of DMBs. The radio type DMB is located by radio direction finding from the SRU which must relocate the DMB for each current estimate (and send the DMB position and time back to the search planner). The self-locating DMB(SLDMB) uses GNSS technology to determine the buoy's position. It provides frequent, precise position information via satellite to a database for use by the search planner. This means that the SRU does not have to relocate the SLDMB or report its position. When using DMBs, search planners should use their best judgment to estimate the area into which to deploy DMBs. For example, multiple or high currents in the probable search area are best handled by deploying several DMBs so as to gain a better picture of the influence of the current. Time is also a consideration. An incident in which the last known position is known and the time lag to DMB deployment is minimal, only a single DMB may be necessary. However, if a large time lag exists, or the last known position is not available, or there is potential for an extended search, then multiple DMBs should be used.

(b) Many other satellite-tracked buoys are adrift in the world's oceans in conjunction with various oceanographic studies. Unfortunately, there is no centralized database for identifying the principal investigator for a study and no mechanism for obtaining near-real-time observations for search planning purposes. However, it may be worthwhile to contact nearby universities or Government agencies engaged in oceanographic studies and determine whether they have, or can obtain, more accurate TWC information than that already available to the search planner. *Caution: Many drifting buoys used in oceanographic studies are drogued to move with sub-surface currents. Those that move with the upper one or two metres of the ocean measure total water current while those that are designed to move with deeper currents tend to measure only sea current.* Advance planning and an exchange of visits between search planners and nearby oceanographers would help in establishing ways to obtain near-real-time sea current data suitable for use in search planning.

8 Chapter 6

- Amend page 6-6, paragraph 6.8.3(b) as follows:

Add at the end of the subparagraph:

(Regarding recovery techniques, the IMO provides more information in its *Pocket Guide to Recovery Techniques*.)

- Amend page 6-14, paragraph 6.15.1 as follows:

Add at the end of this paragraph:

It is therefore necessary to plan to enhance SAR capability in MROs. Three means of doing so are to:

– agree to share SAR facilities regionally and/or internationally;

– identify additional SAR facilities locally, including shipping in the area; and

– extend survival time by providing support to persons in distress until they can be rescued.

- On page 6-14, add a new paragraph, 6.15.X as follows:

MROs will bring together organizations, at sea and on land, who do not usually work together. It is vital that these organizations communicate effectively at all stages – before and after an MRO as well as during it. Effective communications begin long before any MRO, at the planning stage, and also include post-incident analysis to improve arrangements based on the experience gained.

- Amend page 6-14, paragraph 6.15.2 as follows:

Add to the end of this paragraph:

It is therefore important to share, and to study, lessons learned in actual MROs and during the planning, training and testing phases of MRO preparation.

- Amend page 6-15, paragraph 6.15.6 as follows:

Add to the end of this paragraph:

It is therefore essential for as many potential MRO responders as practicable to plan and train together.

- Amend page 6-15, paragraph 6.15.10, 2nd sentence as follows:

...unusual levels of co-operation ~~to achieve~~ at the planning stage.

- Amend page 6-16, add text at the end of paragraph 6.15.14 as follows:

On-scene responsibilities for the safety of passengers and crew remain with the person in charge of the craft in distress while that person is still in command. During the rescue/recovery operation responsibilities for the safety of passengers and crew are shared by the person in charge of the craft in distress and the pilot in command or master of the rescue unit.

The pilot in command or master of each rescue unit has responsibility for the safety of survivors while they are on board the rescue unit.

- Amend page 6-16, paragraph 6.15.25 as follows:

Ship companies should be encouraged to equip large passenger ships and possibly other types of vessels with helicopter landing areas~~,~~ or clearly marked hoist-winch areas~~, and onboard helicopters~~ to facilitate ~~more~~ direct transfers ~~of numerous persons~~."

- Amend page 6-16, paragraph 6.15.16 as follows:

Add at the end of the paragraph:

(Regarding recovery techniques, the IMO provides more information in its *Pocket Guide to Recovery Techniques*.)

- After page 6-17, add paragraph 6.15.XX as follows:

If this approach is intended, it is essential that it is pre-planned, with full involvement of all parties, including the RCC staff, to avoid confusion at the time of an incident. The plan may, for example, provide for the RCC to maintain coordination of the SAR response while the higher operations centre handles the wider issues.

- Amend page 6-18, paragraph 6.15.32, 4th bullet as follows:

begin quickly with a high level of effort and stand down as appropriate rather than begin too late or with too little effort"

- Amend page 6-19, paragraph 6.15.36, last bullet as follows:

…Distress frequencies may be used for the~~ir~~ initial response...

- Amend page 6-20, paragraph 6.15.48 by adding sentence at the end as follows:

Included in this are social media and awareness that industry, particularly airlines and passenger ship companies, may be making use of social media and, therefore, SAR authorities should collaborate on the flow of information with them.

6 Chapter 7

- Insert new chapter **Multiple Aircraft SAR Operations** as follows:

Multiple Aircraft SAR Operations – General Guidance

7.1 Overview

7.1.1 The information in this chapter provides guidance for the management and conduct of multiple aircraft SAR operations. Any of the described principles and procedures might have to be modified by SMCs, ACOs and SRUs, in order to deal with specific situations. Further information on multiple aircraft SAR operations is available in IAMSAR volume III, section 5.

7.1.2 Flight safety is a primary concern during any mission involving multiple SAR aircraft. SAR aircraft should be able to operate effectively and only the aircraft necessary for the mission should be involved.

Number of SAR aircraft required

7.1.3 In any SAR operation, SMCs should consider the capabilities and the number of aircraft required. Too few aircraft in an operation might prove fatal for persons in distress, while too many can be difficult to organize and increase the risk of collisions. Other factors that might affect the number of aircraft required include the number of casualties, the carrying capacity of participating aircraft, weather conditions on scene, the distance of persons in distress from rescue facilities, the number of evacuation points, the speed at which an evacuation can take place, the speed of participating aircraft, the availability of refuelling facilities, the duration of an operation, aircrew fatigue and other operational factors. Where more aircraft than needed are available some can be held in reserve.

Aircraft Capabilities

7.1.4 SMCs should consider how to match different aircraft capabilities to the circumstances and tasks required. For instance, fixed-wing aircraft might be excellent communications platforms and able to carry out searches and ACO duties, but are not capable of rescue hoist operations. SAR helicopters are flexible in their operations, but usually cannot fly as fast, as far, or as high as fixed-wing aircraft and generally need to refuel more often. Remotely Piloted Aircraft (RPA) might have useful reconnaissance and communications capabilities and be able to remain on scene for long periods of time, but some RPA also have a limited radius of operations. In general, for safety reasons, aircraft flown by aircrew and RPA should be kept well apart.

7.1.5 SAR plans for multiple aircraft operations should be designed to achieve the most effective blend of aircraft and surface unit capabilities for the situations that are anticipated. SAR plans should aim to achieve continuous and efficient use of aircraft on scene when needed, while minimizing the situations in which aircraft are airborne without a mission.

7.1.6 SMCs should consider the abilities of the crew and aircraft when planning and during operations, so that no tasks are beyond their abilities.

7.1.7 Under some conditions, SAR aircraft might not be able to operate in accordance with SAR plans. Alternative plans should be developed and agreed in advance by SMC and pilots in command participating in the SAR-operation. Alternative courses of action during the mission should be agreed by pilot in command and SMC.

Participation by other aircraft

7.1.8 In some situations, such as mass evacuations from offshore drilling platforms, large scale incidents over land areas etc., aircraft belonging to commercial companies or other organizations might be able to respond to incidents as part of existing emergency plans. During SAR operations, it is essential that the activities of these aircraft be coordinated with the overall SAR response in order to reduce the risk of collisions and to make the overall operation safe and effective. SAR authorities and SMCs should therefore make agreements with commercial companies and other organizations describing how SAR operations should be coordinated, when both SAR and other aircraft are involved. SAR authorities and SMCs should also be aware of the SAR requirements and capabilities of relevant companies and organizations in their SRRs.

Refuelling Facilities

7.1.9 Use could be made of strategically located aircraft refuelling facilities that exist within range of an incident. Examples of suitable facilities include airfields, helicopter operating facilities, offshore drilling platforms and vessels that can refuel aircraft.

Debriefing of SAR mission

7.1.10 Whenever a multiple aircraft SAR operation has taken place, a debrief should be held soon afterwards. The debrief should normally be conducted by the RCC in overall charge of coordinating the SAR operation. The debrief should include all the relevant units involved in the operation and record observations, lessons and recommendations to improve future SAR plans and operations.

7.2 Area of SAR action

7.2.1 During multiple aircraft SAR operations, SAR aircraft involved should be able to operate free from interference from other aircraft and operations.

Definition

7.2.2 The term "area of SAR action" is derived from ICAO procedures for air navigation services (PANS-ATM). An area of SAR action is an area of defined dimensions that is established, notified or agreed for the purposes of protecting aircraft during SAR operations and within which SAR operations take place. There should be arrangement in place for SMCs to establish an "area of SAR action".

Establishing Areas of SAR Action

7.2.3 The dimensions of the required area of SAR action depend on the circumstances and can be different over land compared to maritime operations. In general, the horizontal and vertical dimensions of an area of SAR action should be large enough to enable safe operations for SRUs, taking into account the need for airborne SRUs to safely manoeuvre throughout their mission profile. SAR plans might involve procedures in which different altitude levels are assigned to different aircraft. This is an important consideration whenever any combination of fixed wing aircraft, helicopters and RPA are operating in the same area. Factors to be taken into account when considering the dimensions of areas of SAR action include the following:

(a) The required extent of SAR activities, including searching.

(b) The need for multiple aircraft to manoeuvre safely.

(c) The need to protect SAR aircraft from other types of operations.

(d) The impact that SAR activities might have on other, neighbouring activities.

SAR Operations within Controlled Airspace

7.2.4 If multiple aircraft SAR operations take place within controlled airspace, then either the ATS should control SAR aircraft in accordance with normal ATS procedures or an agreed portion of airspace should be temporarily handed over for coordination by an ACO[17]. The ATS unit involved may also be in a position to carry out some of the duties of an ACO.

1 *This procedure might also involve the establishment of restricted or danger areas and the temporary suspension of controlled airspace*.

Entry to Areas of SAR Action

7.2.5 SAR aircraft intending to enter an area of SAR action should not enter the area until the ACO gives them permission and provides them with sufficient information to safely join the flow of SAR aircraft involved in the operation (see also paragraph 7.4.2). Aircraft should call the ACO as early as possible before entering the area, in order to allow time for information to be exchanged and in case they are required to remain clear. As a general guide, aircraft should aim to get in touch with an ACO when at least ten minutes' flying time from the edge of an area of SAR action and pass entry information using the format described in appendix T. In the event that an area of SAR action has been established but an ACO is not yet available, SAR aircraft should receive information that they require from the coordinating RCC.

Leaving Areas of SAR Action

7.2.6 Aircraft leaving areas of SAR action should contact the ACO before the area boundary and before changing to another frequency. Aircraft leaving should use the format described in appendix T.

Flights in Areas of SAR Action by Other Aircraft

7.2.7 Aircraft that are not involved in a SAR operation should normally not fly within areas of SAR action. However, if such aircraft need to enter an area of SAR action, they should do so only with the approval of a SMC, ACO or coordinating ATS unit and are subject to the rules of the area or the relevant class of airspace. If a SMC or coordinating ATS unit is giving approval, the ACO should first be consulted.

7.3 Aircraft coordinator

Purpose of an ACO

7.3.1 The purpose of an ACO is to contribute to flight safety and to perform an efficient SAR operation. The ACO should have a clear understanding of the aim of the SAR operation. ACOs should be prepared and able to coordinate SAR aircraft tasked by an SMC. Particular attention should be paid to aircraft that are likely to operate close to each other.

ACO Qualification and Training

7.3.2 ACOs fulfil a vital function during SAR operations and their duties can be complex and require specialist knowledge. Therefore, ACOs need to have experience of relevant operations and exercises and be specially prepared for their duties. In order to ensure the best standard of SAR operations and safety, people likely to be designated as ACOs should be specially trained to carry out this duty. Once trained, SAR authorities should ensure that exercises take place to train ACOs and to practice multiple aircraft operations. RCCs should be aware of trained ACOs in their SRRs and establish procedures for tasking them whenever they might be needed for a SAR mission.

Responsibility for Safety

7.3.3 Information from ACOs to aircraft on scene is advisory, but should nevertheless be followed as closely as practicable. If necessary to ensure flight safety, aircraft pilots-in-command should take whatever measures they assess are needed. If aircraft pilots-in-command deviate from advice passed by an ACO, then they should inform the ACO as soon as possible. The final decision concerning the safety of an aircraft, its crew and passengers rests with the pilots-in-command of the aircraft involved.

ACO Duties

7.3.4 Procedures, duties and tasks involving ACOs are described throughout this Section. A list of normal duties for an ACO, also contained in IAMSAR Volume III, can include the following tasks:

(a) Contributing to flight safety:

— maintain a safe flow of aircraft

— ensure use of a common altimeter setting for all aircraft involved

— advise the SMC of on-scene weather implications

— determine a direction for entering and leaving areas of SAR action

— determine all points necessary for maintaining a safe flow of aircraft within the area of SAR action

— filter radio messages to and from SAR aircraft

— ensure frequencies are used in accordance with SMC directives

— coordinate with adjacent air traffic services (ATS) units

(b) Prioritizing and allocating tasks:

— ensure SAR aircraft are aware of the SMC/OSC overall plan and their own tasks

— monitor and report search area coverage

— with appropriate SMC/OSC, identify emerging tasks and direct SAR aircraft to meet them.

(c) Coordinating aircraft operations:

— respond to changing factors on scene and supervise effectiveness of operations

— ensure the continuity of aircraft operations in coordination with SMC/OSC

(d) Informing SAR aircraft:

- Assign tasks to aircraft
- Distribute relevant flight
- safety information to aircraft (see subparagraph (a) above)
- Provide information about relevant air activity and dangers on scene
- Provide information about search areas (if applicable) evacuation points (if applicable) and refuelling facilities.
- Provide operational information about the ongoing SAR-mission
- Provide relevant weather information.

(e) Make periodic situation reports (SITREPs) of SAR aircraft operations to the SMC and the OSC, as appropriate.

(f) Work closely with the OSC:

- assist in the execution of SMC directives
- maintain communications
- advise on how the ACO can assist.

(g) Coordinate aircraft refuelling.

Designating an ACO

7.3.5 Whenever two or more aircraft are taking part in a SAR operation and are likely to operate close to each other, SAR authorities should consider designating a person, unit or organization as an ACO.

7.3.6 An ACO is designated by a SMC and should carry out missions under a SMC's direction

SMCs should consider designating an ACO as soon as they recognize that a SAR incident might need a response from two or more aircraft. ACOs should be notified of their mission as early as possible, in order to give them the maximum time to prepare for their tasks.

7.3.7 There are many factors for SMCs to consider when designating an ACO, however, some significant considerations are as follows:

(a) Designating an ACO should be considered when two or more aircraft are involved in a SAR mission.

(b) An ACO should be equipped with appropriate forms of communication for the SAR mission, such as the appropriate radios for communicating with aircraft, with ATS units, with SAR authorities and with SRUs on the surface.

(c) An ACO should clearly understand the overall objective of the SAR operation and relevant SMC plans.

(d) ACOs should be provided with sufficient information to carry out their mission or have access to sufficient information.

(e) An ACO should know which authority to report to (normally a SMC) and which other units are involved in a mission.

(f) ACOs should be able to reach the required location in sufficient time for them to prepare for and carry out their duties.

(g) A person or SAR unit designated as an ACO should have received appropriate training beforehand.

(h) An ACO should be familiar with the types of aircraft involved and their flying operations.

(i) An ACO should be familiar with SAR operations involving multiple aircraft.

(j) ACOs should ideally be familiar with the environment, normal procedures, activities and air traffic systems in the areas of operation.

(k) The time that ACOs may be available to carry out their missions should be considered. If an ACO is on board an aircraft, then aircraft endurance might limit the amount of time for which that ACO can be available.

ACO Location

7.3.8 ACOs should ideally be as close to the scene of a SAR incident as practicable. However, the choice of location of an ACO is flexible, and they should operate in locations which best help them to carry out their duties, such as on a fixed-wing aircraft, a helicopter, a ship, a fixed structure such as an oil rig, an ATS unit, a coordinating RCC or another appropriate land unit.

ACO Workload

7.3.9 The workload of an ACO can be very high. SMCs should bear this factor in mind, when they are considering the total number of SRUs that might be required for a SAR operation.

Coordination with Adjacent Facilities

7.3.10 As much as possible, SMCs should aim to reduce an ACO's workload by coordinating SAR activities taking place within an area of SAR action, with relevant ATS units, airfields and other facilities. However, depending on the location and circumstances of an incident, ACOs should also be prepared to carry out these duties.

On-Scene Altimeter Setting

7.3.11 A common altimeter setting should be used by all aircraft within an area of SAR action. This altimeter setting might be determined when the first SAR aircraft equipped with a radio altimeter arrives on scene. Alternatively, the on scene altimeter setting can be determined by the ACO, in consultation with an ATS unit (when available) a SMC or an OSC (when appropriate). The ACO should pass the information to all aircraft in the area of SAR action.

Reporting On Scene Activity

7.3.12 The ACO should make regular reports of on scene activity to the SMC and aircraft involved in the SAR operation. When possible, these reports should be made when ACOs or aircraft are not busy with other operational tasks. The radio communications procedures described in paragraph 7.4.2 can be used for this purpose; however, other methods might also be appropriate. A general guide is for ACOs to make reports every thirty minutes during a SAR operation.

Information from SAR Aircraft to the ACO

7.3.13 In order to enhance situational awareness for ACOs and other SAR aircraft and to assist with safety and the continuity of operations, participating aircraft should report as follows:

(a) Entry report.

(b) Reaching assigned points.

(c) Leaving assigned points.

(d) Commencing operations (search, investigation during search, approach to the surface/ship, missed approach, hoist, landing etc.).

(e) Completing operations, including information regarding results.

(f) Leaving present altitude.

(g) Reaching new altitude.

(h) 30 minutes on scene endurance, expecting fuel at (location).

(i) 10 minutes to completing hoist operation.

(j) 10 minutes to completing search.

(k) Exit report.

Transfer of ACO tasks

7.3.15 During some SAR operations, particularly those lasting for long periods of time, it may be necessary to transfer the tasks from one ACO to another. This might be due to fatigue, factors affecting an ACO's location, such as the requirement for an ACO's aircraft to refuel, or for other reasons.

7.3.16 Before accepting the task the new ACO should understand the details of the SAR mission and the SMC's plans. The details required include the aim of the operation, the position of the missing object, number of persons in distress, other units involved, locations of participating aircraft, communications and any limitations to the operation. When possible, basic pre-flight information should be provided by a SMC in order to simplify the transfer to the new ACO. Examples of information that might be of use to ACOs on scene can be found in are in appendix T - 3

7.3.17 A new ACO will need enough time to obtain information, study it and then prepare to accept the task from the previous ACO. Every SAR mission may be different, but as a general guide, a handover of information should begin approximately thirty minutes before a new ACO formally takes over.

When to Conclude ACO Operations

7.3.18 A SMC is normally in charge of a SAR mission and determines which SRUs take part in it. However, in practice, an ACO is often in the best position to advise the SMC, when a SAR operation no longer requires an ACO. The decision to end ACO operations should normally be made by the SMC that designated the ACO, after consulting with relevant organizations and units.

Checklists and Guides

7.3.19 Units who are likely to be designated as ACOs or take part as airborne SRUs in the event of a multiple aircraft SAR operation, should always have ACO checklists or guides available whenever they are on duty. Guides and checklists suitable for ACOs are contained in appendix T.

Reference Information for Air Crew

7.3.20 SAR authorities should ensure that all air crew likely to become involved in multiple SAR operations are aware of the procedures. To help with this process, air crew should routinely operate and fly with reference information, including IAMSAR Vol III, in case they are required to take part in an operation at short notice. Additionally, a short reference list known as the "Pilot Information File" (PIF) contains information useful for all aircraft involved in multiple aircraft operations and is illustrated in appendix T - 6 and also in IAMSAR Volume III.

7.4 Communications

Radio Voice Communications

7.4.2 There should be agreed, common, on scene procedures for the following:

(a) On Scene Coordination Frequency. An agreed coordination frequency for radio voice communications should be used within an area of SAR action. This frequency should be one which all aircraft can access, together with the ACO. Information that should be passed between an ACO and SAR aircraft is listed in appendix T.

(b) Alternative Frequencies. Alternative frequencies should also be nominated by an ACO, if the agreed coordination frequency is likely to become too busy or unusable.

(c) Capabilities. Care should be taken to ensure that aircraft and surface units involved in an operation are capable of complying with the communications procedures.

(d) Communications with an OSC. Consideration should be given to enabling communications between an ACO and an OSC. However, it should not normally be necessary for SAR aircraft other than an ACO to communicate directly with the OSC.

(e) Radio Communications Failure Procedures. All SAR plans for multiple aircraft SAR operations should include procedures for use when radio communications fail. A failure of radio communications might affect aircraft, SRUs or persons in distress individually, or might involve a compromise of radio systems affecting several participants. The systems affected might include radio voice communications or radio systems designed to indicate the positions of aircraft, vessels or people, including transponders and other devices. In general, the following principles should apply to most situations in which radio communications fail:

- A backup means of radio voice communication should be determined and then nominated by an ACO, along with the normal communications plan.

- The backup radio voice communications might include alternative frequencies, alternative radio communications systems or both. In the event of a radio communications failure, with no alternative airborne communications available, aircraft should normally continue with their planned timings, events and flight path, still transmitting all position and altitude reports, until they are clear of the immediate on scene area.

- If an aircraft has not been given a plan when a radio communications failure occurs, then it should avoid the on scene area, departing by an appropriate route and heights.

- Once clear of the on scene area, aircraft should consider moving near or landing at a suitable facility in order to establish communications by alternative methods.

7.4.3 If radio voice communications cannot be restored, then alternative procedures could be considered such as increasing the distances between aircraft using time. If not already included in SAR plans, then all participating airborne SRUs might have to be assembled together in order for this procedure to be briefed and understood. In most cases, this would result in considerable delays to a SAR operation.

7.4.4 A diagram illustrating a basic example of communications during multiple aircraft SAR operations, involving an ACO is described in appendix T-2.

Long Range Radio Communications

7.4.5 Communications systems designed for long range SAR operations can be different from the types of communications used at shorter ranges. Types of radio equipment that relies on direct 'line of sight' between a transmitter and receiver may not be suitable for long range communications between SMCs and SRUs. Some long range communications methods include the following:

(a) High Frequency radio systems.

(b) Satellite communications systems.

(c) Position tracking systems, including those that enable two-way communications.

(d) The use of high flying aircraft to relay VHF radio communications to and from lower flying SAR aircraft.

(e) Relay of information to and from SAR aircraft through ATS units.

(f) Relay of information by ships at sea able to communicate with SAR aircraft on marine band VHF frequencies, whilst a shore based RCC uses satellite, MF or HF communications to communicate with the relaying ship(s).

(g) Relay of information by any surface units able to communicate with both SRUs and SMCs.

7.5 Search mission

Safety and Search Effectiveness

7.5.1 ACO and SAR aircraft should use procedures that ensure flight safety, without making the search ineffective. Aircraft should be given sufficient operational freedom to carry out their searches effectively, but should conform to safety procedures briefed by the ACO.

7.5.2 Methods used to safely keep aircraft apart will depend on the on scene conditions. Beginning with good weather conditions and progressing to poor conditions, methods for keeping aircraft apart can be as follows:

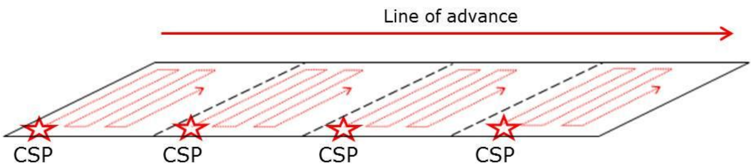
(a) Visual Methods.
(b) Flow Methods.
(c) Coordination Zones.
(d) No Fly Zones.

Visual Methods

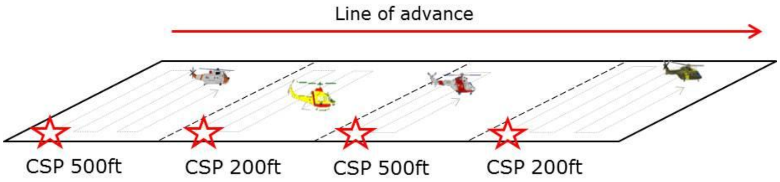
7.5.3 Visual methods involve the ACO allocating aircraft to search areas and aircraft avoiding each other visually. Visual methods may be the only measure necessary when weather conditions on scene are good. When using visual methods, the ACO can allow aircraft more freedom of action compared to other, more restrictive, methods. However, this freedom will not relieve aircraft or ACOs from other duties outlined earlier in this section, for example providing information on air activity or making aircraft reports.

Flow Methods

7.5.4 Flow methods can be used to keep SAR aircraft apart in slightly poorer conditions, by ensuring that they fly the same search patterns (commence search point /line of advance, etc.) but in adjacent search areas. The first aircraft on scene should be allocated the search area furthest away from the line of advance. This method enables aircraft to execute effective searches of areas with a minimum of radio communication. Aircraft can also be kept apart by using time. This method could be used if aircraft arrive on-scene at considerably different times, for example as a result of departing from different base locations.



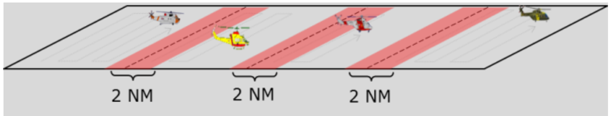
7.5.5 The ACO may order specific search altitudes for SRUs, to allow an extra margin of safety when aircraft operate in close proximity to each other. However, in this situation the ACO should be aware that any limit to the operational freedom of an aircraft, particularly in altitude, could reduce the effectiveness of the search. The ACO should also expect aircraft to deviate from their assigned altitude if they need to investigate objects on the surface. ACOs should ensure that all aircraft use the same reference for altitude.



Coordination Zones

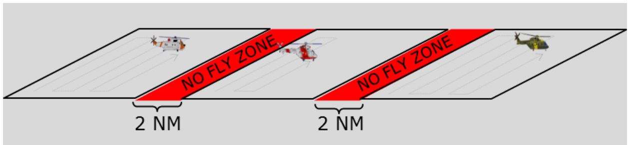
7.5.6 Coordination zones are border areas established by an ACO between adjacent search areas, which SAR aircraft can only enter under specific conditions. Coordination zones enable aircraft to have operational flexibility within their allocated search areas and ensure a level of safety between them.

7.5.7 The dimensions of a coordination zone depend on the on-scene conditions and the size of a search area. As a general guide a coordination zone might be 2 nautical miles across, but this size may be increased or decreased if needed. Before entering a coordination zone, aircraft sharing the zone should communicate with each in order to safely coordinate the entry. The ACO should ensure that the aircraft have a clear understanding of their mutual operating areas. The aircraft should call again when leaving the zone.



No Fly Zones

7.5.8 If on scene conditions are sufficiently difficult, no fly zones can be used in which flight is not permitted while searching is taking place in adjacent areas. The dimensions of no fly zones can be similar to coordination zones. Whenever no fly zones are used, the ACO should coordinate with the SMC and OSC to ensure that the zones are searched appropriately during the SAR mission.



7.6 Evacuation missions

Safety Flow Procedures

7.6.1 The main aim of on scene procedures for multiple aircraft operations should be safety. In general, there are two methods that can be used to ensure a safe flow of SAR aircraft, which are as follows:

(a) *Horizontal Spacing.* Horizontal spacing of aircraft should be the basic method used by SAR authorities and ACOs. It can be achieved by establishing specific routes to be flown by SAR aircraft to, from and within the area of SAR action.

(b) *Vertical Spacing.* For situations in which keeping aircraft apart horizontally will not ensure sufficient levels of safety, or if a cross-over of aircraft flight paths cannot be avoided then, when weather permits, vertical spacing should be considered. It may not always be necessary for SAR aircraft to fly at different altitudes, unless they are likely to fly close to each other or their flight paths cross over. If a significant possibility of collision exists, then different altitudes should be assigned for SAR aircraft.

(c) In general, altitudes for RPAs should be kept apart from altitudes allocated for other SAR aircraft.

7.6.2 Ideally, the most effective method to ensure a safe flow of aircraft is by using a combination of both horizontal and vertical spacing. The best way to achieve this is through planning by an ACO and a clear understanding of procedures by all of the units and authorities involved.

Aircraft Approach and Departure Flight Paths

7.6.3 Approach and departure flight paths are usually influenced by the prevailing wind direction; factors which might also have to be taken into account are:

(a) Fumes directly downwind from burning structures may be unsafe – the direction of approach for aircraft might have to be off-set from the wind direction.

(b) Geographic features or the design of the casualty location might compel aircraft to approach only from specific directions. Structures such as cranes, towers or vertical obstructions in line with the wind direction, might be dangerous.

(c) ACOs and SAR aircraft should be aware of all surface vessels, installations or other obstructions in the approach and departure sectors and plan to avoid them.

7.7 *Long range operations*

7.7.1 Long range is any distance that significantly limits or compromises the ability of SAR aircraft to operate on scene effectively and safely.

Long Range Procedures

7.7.2 When flying long distances, SAR aircraft should attempt to reduce fuel consumption while in transit, to provide for more additional time on scene. It might be necessary for SAR aircraft to fly as directly as possible to and from an incident, with the result that multiple aircraft SAR procedures have to be modified and rely on basic safety arrangements. These arrangements could include separate arrival times on scene and basic inbound and outbound height differences in order to keep aircraft safely apart. Additional considerations for long range SAR communications are described in paragraph 7.4.5

7.7.3 The risks to SRUs during long range SAR operations should be considered carefully before long range SAR operations take place, including the following:

(a) Overall urgency to save life.
(b) Range offshore.

(c) Nature of the mission.
(d) Performance characteristics and technical limitations of aircraft taking part in the mission.
(e) Communications.
(f) Availability and effectiveness of flight following equipment: satellite tracking; ATS radar picture, etc.
(g) Likelihood of locating the relevant person in distress, vessels or platforms.
(h) The risk to SRUs in the event of an accident.
(i) Current and forecast weather conditions en route and on scene.
(j) Sea state/ swell.
(k) The amount of darkness on scene (at night).
(l) Size, shape and characteristics of the casualty vessel, platform or location.
(m) Location of persons in distress on a vessel (e.g. should they be moved to a suitable position for rescue hoist operations).
(n) The proximity of refuelling facilities to the persons in distress.
(o) The availability of diversions or locations for temporary landing (e.g. offshore energy installations, etc.)
(p) Aircrew capabilities or skill levels.
(q) Aircrew fatigue.

Bringing a Casualty Vessel Within Range

7.7.4 If the casualty is on a moving vessel, SMCs should consider the possibility of directing it to move to a point within the effective range of SAR aircraft or other forms of assistance. Alternatively, it might be possible for SAR aircraft to refuel at locations that effectively bring a casualty within their maximum radius for SAR operations. It could also be effective for SMCs to use both of these options at the same time.

7.8 Effects of the environment and weather

7.8.1 Factors such as the type of environment and weather can significantly affect the conduct of multiple aircraft SAR operations. It is important that SAR authorities establish plans that contain procedures for all of the weather conditions likely to be encountered. As a general principle, it is usually better to plan for poor conditions and to then modify procedures if better conditions permit. As weather and environmental conditions become worse, the risks for both the persons in distress and rescuers increase and the speed at which SAR operations can take place becomes slower.

7.8.2 Some weather conditions might prevent certain types of SRU from operating, while other types of SRU can still continue. For example, conditions such as very poor visibility at sea might limit or prevent airborne SRUs operations, but might not prevent surface rescue craft from operating. Heavy seas might make ship to ship transfers of persons in distress unacceptably dangerous, while helicopter hoist operations can continue. Poor weather conditions at airfields, places of safety, along coastlines or along an intended route can affect SRUs and prevent them from departing for, or fulfilling their SAR missions.

7.8.3 In extreme situations the risks to SRUs and persons in distress of attempting a SAR operation might be sufficiently high that operations cannot take place at all, until conditions improve. There are many factors that can affect multiple aircraft SAR operations; several of the more common ones are outlined below.

(a) *Wind Direction – General.* Wind direction can have a strong influence on search patterns flown by aircraft and the directions of approach and departure by aircraft to persons in distress. Generally, approaches and departures by aircraft are flown into wind. Geographic features, characteristics of the casualty vessel or structure, might mean that approach and departure directions have to be modified. Additionally, if the location of persons in distress is on a burning structure, then smoke and fumes may be dangerous. Airborne SRUs should avoid flying directly downwind of the source. The wind direction might have a significant influence on a SAR operation and multiple aircraft SAR procedures should be designed with this principle in mind.

(b) *Strong Winds – Maritime Operations.* Strong winds can present significant difficulties for aircraft, whether operating on their own or together with other aircraft. During maritime operations, rescue attempts from surface vessels with large amounts of movement due to heavy seas can be extremely dangerous. Strong winds and high sea states can affect even the largest vessels, sufficiently to prevent helicopters from landing on helicopter decks. Strong winds can also make rescue hoist operations extremely difficult. Air turbulence downwind of large vertical structures such as offshore platforms, wind farms or the superstructures of large vessels can be dangerous for aircraft operations.

(c) *Strong Winds – Moisture and Atmosphere.* Strong winds can significantly affect transit times for aircraft and might limit the ranges at which they can operate. Moisture from the sea can be stirred up into the atmosphere at least 1000 ft above sea level. This moisture can decrease visibility and in very cold conditions can cause ice to build up on aircraft structures. Moisture that has a high salt content can also reduce aircraft engine performance enough to limit the amount of people and cargo that can be carried and make aircraft operations unsafe.

(d) *Strong Winds – Over Land Operations.* Strong winds over land can result in turbulence in the air that is dangerous for aircraft. Turbulence can be particularly severe in mountainous areas, near cliffs and for significant distances downwind of hills and mountains. In very strong winds, horizontal visibility is usually reduced; this is most noticeable both in and downwind of dry, dusty regions such as deserts. A similar, but usually more local affect can take place in snow-covered regions. Multiple aircraft SAR operations can be significantly affected by such events and may not be able to take place at all until conditions improve.

(e) *Low Cloud and Poor Visibility.* Low cloud can reduce visibility and restrict the amount of altitude in which SAR aircraft can manoeuvre. Low cloud and poor visibility also reduce the effectiveness of SAR operations or even prevent them altogether.

(f) *Adjusting SAR Plans.* Some SAR authorities have plans for multiple aircraft operations that enable them to operate in conditions of poor visibility, sometimes relying on ATS units and good levels of training. During maritime operations, some aircraft are themselves capable of finding and flying to vessels in conditions of very poor visibility. This procedure may only be possible if carried out by aircraft and aircrew capable of this type of flying. At the very least, poor visibility will significantly slow down the speed at which multiple aircraft operations can be conducted, compared with operations in good weather. In many situations, low cloud and poor visibility may prevent multiple aircraft SAR operations from taking place at all, until conditions improve.

(g) *Darkness.* During darkness distances are more difficult to visually assess than during daylight and aircraft often need to maintain greater horizontal and vertical spacing from each other.

Night Vision Devices

7.8.4 Night vision devices are often being worn by SAR aircrew, as they can compensate for the effects of darkness. When used appropriately, night vision devices significantly improve safety and effectiveness over land as well as in coastal and maritime operations.

7.8.5 Although using night vision devices can improve multiple aircraft SAR operations, these devices can be affected by the weather conditions at night in a similar way that visual flying can be affected by day. Night vision devices also need at least a small amount of light in order to work adequately.

7.8.6 The amount of darkness at night is affected by many factors, including the amount of moonlight, cloud and lighting made by human activity, such as structures and buildings. All authorities and units involved in SAR operations in which night vision devices are used should be aware of the effect that weather and light conditions can have on their performance. In very dark conditions, such as when there is no moon at all and significant cloud, night vision devices may be of little use during a SAR operation.

Effect of Artificial Lighting on Night Vision Devices

7.8.7 Night Vision systems can be adversely affected by powerful sources of artificial lighting, such as searchlights and pyrotechnic flares used by SRUs. These light sources should not be used without prior warning or agreement with SAR aircraft on scene.

- Renumber existing chapters 7 and 8 to chapters 8 and 9

Amend page B-11 as follows:

Suggested format for alert information from a commercial locating, tracking and emergency notification service provider to an RCC
(Format based upon Cospas-Sarsat standard format)

Field No.	**Field Name**	**Field Content**	**Field Format**
1	SEND Alert	SEND Distress Alert	Header
2	Reporting Centre	Call Center Identity	Agreed alphabetical abbreviation for Call Center (e.g. "GEOS")
3	Message Number	Unique Message Number	Call Center Abbreviation followed by unique message number assigned by call center (e.g. GEOS/12345)

Field No.	Field Name	Field Content	Field Format
4	Message Date	~~Year-Month-Day~~ Day Month Year in the Gregorian calendar	~~**YYYY-MM-DD**~~ **DD MMM YY** where ~~YYYY~~DD is the ~~year~~day, MMM is the month annotated with the first three letters of the month~~of the year between 01 (January) and 12 (December)~~, and ~~DD~~ YY is the last two numbers of the year ~~day of the month between 01 and 31~~
5	Message Transmit Time	Hours~~:~~Minutes~~:Seconds~~ in Coordinated Universal Time (UTC)	**hh~~:~~mm~~:ssZ~~UTC** where hh is the number of complete hours that have passed since midnight (00-24), mm is the number of complete minutes that have passed since the start of the hour (00-59), ~~ss is the number of complete seconds since the start of the minute (00-60) and Z indicates~~ the use of UTC time.
6	Local Time (optional)	Hour~~:~~Minutes~~:Seconds~~ in local time of where device is located	**hh~~:~~mm~~:ss~~(Local)** where hh is the number of complete hours that have passed since midnight (00-24), mm is the number of complete minutes that have passed since the start of the hour (00-59~~), ss is the number of complete seconds since the start of the minute (00-60)~~ and Local is replaced with EST, CST, MST, PST or other local time zone abbreviation. Abbreviation shall include Daylight saving time if applicable.
7	Message Type	New Alert or Update (if later include original Message No)	"New" or "Update" as appropriate plus for updates the original message number as per Field #3
8	Destination Responsible SAR Authority	Message Destination	Identity of the SAR Authority that the message is intended for in English
9	Message Source ID	Message Identifier	If alerting device message identifier is different to the message number in Field #3 then insert it here otherwise leave this field blank
10	Device ID	IMEI Number (the 15 digit International Mobile Equipment Identity (IMEI) number of the device)	**AA-BBBBBB-CCCCCC-D** where AA-BBBBBB are the Type Allocation Code (TAC) for the device, CCCCCC is the manufacturer assigned serial number of the device and D is the Luhn check digit

Field No.	Field Name	Field Content	Field Format
11	Device Manufacturer and Model Number	Identity of the device sending the distress alert	Device Manufacturer and Model Number (e.g. SPOT Satellite GPS Messenger)
12	Satellite System	Identity of the carrier of the distress alert	Identity of satellite system used (e.g. Globalstar, Inmarsat, Iridium)
13	Message	Complete Message	The complete text of the message as transmitted by the device
14	Latitude	Latitude in Degrees and Decimal Minutes in WGS84 format	**~~s~~DD~~°~~ MM~~.~~MMM~~'~~s** where ~~s indicates if the latitude is North "N" or South "S" of the equator~~, DD indicates the number of degrees and MM~~.~~MMM indicates the number of minutes and decimal parts of minutes of latitude (to an accuracy of approximately 2m (6ft)), and s indicates if the latitude is North "N" or South "S" of the equator
15	Longitude	Longitude in Degrees and Decimal Minutes in WGS84 format	**~~s~~DDD~~°~~ MM~~.~~MMMs~~'~~** where ~~s indicates if the longitude is East "E" or West "W" of the prime meridian~~, DDD indicates the number of degrees and MM~~.~~MMM indicates the number of minutes and decimal parts of minutes of longitude (to an accuracy of approximately 2 m (6ft)), and s indicates if the longitude is East "E" or West "W" of the prime meridian
16	Position Source and Accuracy	Location provided by GPS, Doppler etc and estimated accuracy of location	Location source (e.g. GPS, Glonass, Doppler) and estimated location accuracy in Meters (e.g. GPS: 10 m)
17	Optional Position Movement and Height	If available speed and course over ground (SOG and COG) and height above sea level	**SSS:CCC:HHHHH** where SSS is the speed over ground (SOG) in Knots (from 1 to 999), CCC is the track made good (Course over Ground (COG)) in degrees (from 1 to 360) relative to True North and HHHHH is the elevation above ground (Height from 1 to 99999) in Meters. If any field is not available leave blank
18	Device Database Source	Identity of Where Database Containing User Contact Details Held	Full address and phone numbers (including country, postal/zip code and international telephone dialling codes)

Field No.	Field Name	Field Content	Field Format
19	Registered Name	Name of SEND Owner	Full name of registered SEND owner
20	Registered Address	Owners Address	Full address of SEND owner including country and postal/zip code
21	Registered Phone Numbers	Owners Phone Numbers	Phone numbers including full dialling codes for all phones registered by the Owner including land line and mobile/ cell phone
22	Emergency Contact Details 1	Full Name, Address and Telephone Numbers for first emergency contact	Full name, address and phone numbers (including country, postal/zip code and international telephone dialling codes)
23	Emergency Contact Details 2	Full Name, Address and Telephone Numbers for second emergency contact	Full name, address and phone numbers (including country, postal/zip code and international telephone dialling codes)
24	Supporting Information	Medical, Vehicle, Trip Plan, Numbers in party, etc.	Free text field, in which to provide any additional data that may be of use to SAR
25	Call Center Contact Details	Full Address and Telephone Numbers for Call Center	Full address and phone numbers (including country, postal/zip code and international telephone dialling codes)
26	Call Center Operative	Name of the person handling the alert at the call center and their direct telephone number	Full name and phone number (including extension if applicable)
27	Remarks	Any additional information that the Call Center has on the situation	Free text field
28	End Message	End of Message	Message Ends

[FROM COMSAR 17]

- Amend page B-15 as follows:

Sample of alert from a commercial locating, tracking and emergency notification service provider to an RCC

Alert from a commercial locating, tracking and emergency notification service provider to an RCC

Reporting Centre	: GEOS
Message Number	: GEOS/12345
Message Date	: ~~2011-12-31~~ 31 DEC 11
Message Transmit Time	: ~~21:13:39Z~~ 2113 UTC
Local Time (optional)	: ~~15:13:39(EST)~~1513 (EST)
Message Type	: Update to GEOS/12344
SAR Authority	: Jackson County, OR. Sherriff's Department
Message Source ID	:

Device ID	: 49-015420-323751-8
Device Manufacture/Model #	: SPOT Satellite GPS Messenger
Satellite System	: Globalstar
Message	: "as sent by SEND device"
Latitude	: ~~N42º 06.935'~~42 06 935 N
Longitude	: ~~W122º 42.340'~~122 42 340 W
Position Source and Accuracy	: GPS:10m
Speed:Course:Height (optional)	: 010:034:00500
Device Database Source	: GEOS 1234 Sends Road Springfield, TX. 60092 USA +1 908 145 8389
Registered Name	: John Smith
Registered Address	: 3450 Twin Cedar Drive Ashland, OR 97563 USA
Registered Phone Number	: (541) 772 5899
Emergency Contact Details (1)	: Jane Smith 3450 Twin Cedar Drive Ashland, OR 97563 USA Home (541) 772 5899 Cell (541) 458 9273
Emergency Contact Details (2)	: Jack Smith 8800 Mountain View Drive Phoenix, OR 97543 USA Home (541) 544 5637 Cell (541) 634 9545

Supporting Information :"Free text field in which to provide any additional data that may be of use to SAR forces"

Call Center Contact Details	: GEOS 1234 Sends Road Springfield, TX. 60092 USA +1 908 145 8389
Call Center Operative	: Max Jones +1 908 145 8389 ext 342
Remarks	:"Any additional information on the situation"

****************************** END MESSAGE *************************

7 Appendix C

- Amend page C-1, insert new 6th bullet beneath the similar text concerning OSCs as follows:

test capabilities of potential ACOs and ability to transfer ACO duties;

- Amend page C-1, 8th bullet ("coordinate activities and achieve information

exchanges"), 1st sub-bullet as follows:

...RCC-OSC-ACO..."

- Add at page C-4, 3rd paragraph, at the end of 3rd bullet:

(A means of rescue is a requirement for ro-ro passenger ships, and ships on international voyages are required to have ship-specific plans and procedures for recovery of persons from the water.)

- Amend page C-4, 3rd paragraph, 9th bullet as follows:

provide on board helicopter landing or winching areas ~~and helicopters~~;

- Amend page C-4, 3rd paragraph, 10th bullet as follows:

prepare to assist survivors ~~once~~ until and after they have been delivered to a place of safety;"

- Amend page C-7, 'MRO communications in a maritime

incident', 1st paragraph as follows:

It needs to be established from the outset ~~which frequency could include relations to the media (refer to Contact with the media in section 2 of the IAMSAR Manual, volume III)~~

8 Appendix F

- Amend appendix F, bullet **19** as follows:

19 Have ATS unit alert *en-route* aircraft and consider establishing a temporary Area of SAR Action.

Amend page I-4, as follows:

Maritime Search and Rescue Recognition Code (MAREC Code)

General

1 The purpose of this Code is to facilitate the communication of essential descriptive information regarding merchant vessels and small crafts within and between maritime SAR ~~organizations~~ services.

2 The MAREC Code is in two parts:

- Part 1 — Merchant vessels

- Part 2 — Small crafts

3 All messages should be preceded by the prefix MAREC followed by a local serial number, assigned by the RCC.

4 The message should contain all the lettered identification groups as separate paragraphs. If the information is not known, the symbol UNK should be inserted or alternatively the symbol NA, where the lettered group is not applicable.

5 When sending Email, Fax, SMS or some other electronic messages, there is no guarantee that the recipient receives the message or that the message is being processed.

Part 1 – Merchant vessels

The message is composed of the following identification groups and will be transmitted in the following sequence:

MAREC – Local serial number

A.	Type of vessel – name – call sign or ship station identity
B.	Superstructure – location – colour
C.	Hull profile – colour
D.	Sequence of uprights
E.	Length
F.	Condition of loading
G.	Other characteristics

A. ***Type of vessel, name and call sign or ship station identity***

Merchant ships are classified as follows:

Voice	~~TLX~~***Electronic***
Passenger ship	PAX
Ferry	FERRY
Tanker	TANK
Bulk carrier	BULK
General cargo ship	GEN
Coaster	COAST
Fishing vessel	FISH
Containership	CONT
Specialized ship	SPEC

The name and call sign, or ship station identity, are added to the above classification.

For specialized vessels, the specific type of vessel should also be given, as appropriate, e.g. gas carrier, tug, or icebreaker.

Example:

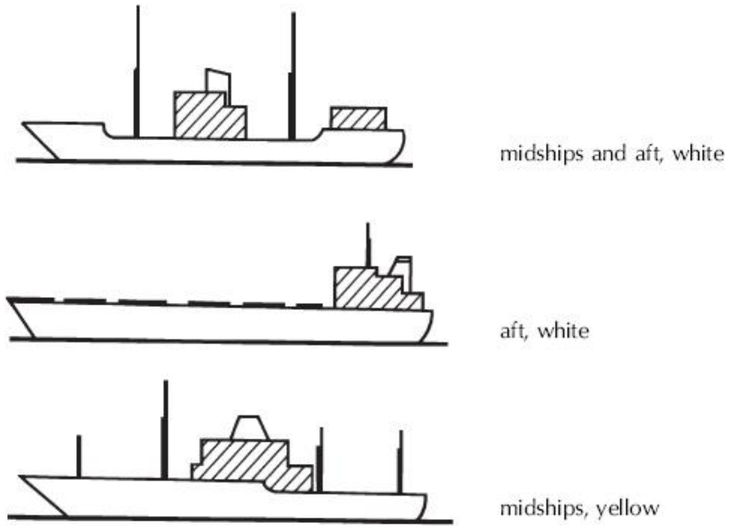
Voice: ALFA, SPECIALIZED SHIP GAS CARRIER, FLYING DRAGON, CHARLIE GOLF HOTELINDIA

~~TLX~~Electronic: A/SPEC/GAS CARRIER/FLYING DRAGON, CGHI

B. Superstructure: Location and colour

Superstructures are referred to as being located forward, midships or aft or a combination of these positions, and may be described as long or short.

Colour is given in plain language.



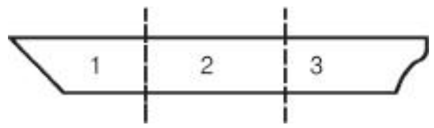
Example:

Voice: BRAVO, SUPERSTRUCTURE MIDSHIPS AND AFT, WHITE

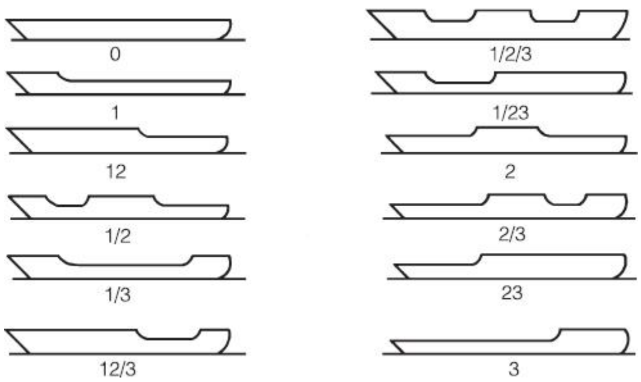
~~***TLX***~~***Electronic:***B/MIDSHIPS AND AFT/WHITE

C. *Hull profile and colour*

The hull profile is divided into three sections, numbered 1, 2 and 3 from stem to stern.



The existence or otherwise of raised sections (other than superstructures) above the main weather deck of the vessel should be reported numerically as follows:



The colour of the hull is given in plain language.

Example:

Voice: CHARLIE, PROFILE ONE TWO SLANT THREE, BLACK

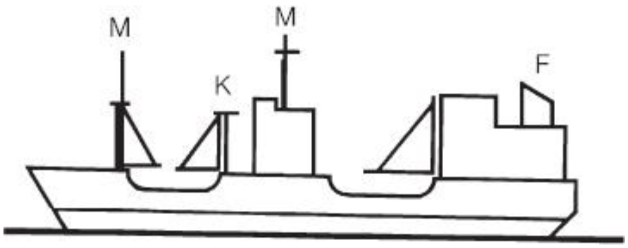
~~***TLX***~~***Electronic:*** C/12/3 BLACK

D. ***Uprights***

Uprights include everything, other than the profile and superstructures, which is prominent and can clearly be seen at a distance. The uprights are reported from stem to stern according to the list below:

Voice	***~~TLX~~Electronic***
Mast	M
Kingpost	K
Funnel	F
Crane	C
Gantry	G

Uprights located close to a superstructure such that they cannot be clearly seen from a distance should not be included. Double kingposts located athwartships (perpendicular to vessel's centreline) are reported as one kingpost.



Example:

Voice*:* DELTA, MAST, KINGPOST, MAST, FUNNEL

~~TLX~~Electronic: D/M K M F

E. ***Length***

Length is the length overall (LOA) given in metres.

Note: Length can be estimated by observing the vessel's lifeboats, which are normally about 10 metres long, in proportion to the ship's length.

Example:

Voice: ECHO, TWO ZERO METRES

~~TLX~~Electronic: E/LOA 20

F. ***Conditions of loading***

The conditions of loading are indicated as follows:

Voice	***~~TLX~~Electronic***
Light	LIGHT
In ballast	BALL
Partially loaded	PART
Fully loaded	LOAD

Example:

Voice: FOXTROT, PARTIALLY LOADED

~~TLX~~Electronic: F/PART

G. ***Other characteristics***

Other prominent characteristics should be given, e.g. stack insignia, conspicuous deck cargo or other distinguishing marks or colour variations, e.g. name in big letters on vessel's side or company insignia painted on side of hull. In the message, such specific characteristics should be given in full.

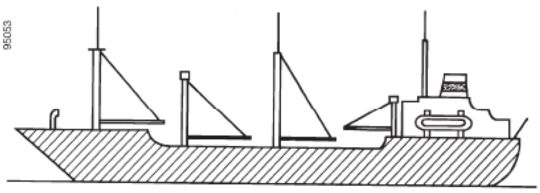
Example:

Voice: GOLF, RAILROAD CARS ON DECK

~~TLX~~Electronic: G/RAILROAD CARS ON DECK

Complete Example

The following illustrates a typical merchant vessel and how it would be described in a message according to this system.



Voice: MAREC, ~~15/76~~1/10 RCC ~~STOCKHOLM~~ SWEDEN RESCUE
ALFA, GENERAL CARGO SHIP, VIKING, ECHO SIERRA DELTA CHARLIE
BRAVO, SUPERSTRUCTURE AFT, WHITE
CHARLIE, PROFILE ONE SLANT THREE, BLACK
DELTA, MAST, KINGPOST, MAST, MAST, FUNNEL
ECHO, EIGHT FIVE METRES
FOXTROT, LIGHT
GOLF, NOT APPLICABLE

~~TLX~~Electronic: MAREC ~~15/76~~1/10 RCC ~~STOCKHOLM~~ SWEDEN RESCUE
A/GEN/VIKING/ESDC
B/AFT/WHITE
C/1/3/BLACK
D/M K M M F
E/LOA 85
F/LIGHT
G/NA

Part 2 – Small craft

The message is composed of the following identification groups and will be transmitted in the following sequence:

MAREC – Local serial number
A. Type of craft/number of hulls – name – call sign or ship station identity – use
B. Make – distinctive markings
C. Motor installation or rigging
D. Construction – material – colour
E. Stem – stern
F. Type of bottom
G. Length
H. Other characteristics
I. Number of persons on board

A. *Type of small craft/number of hulls, name, call sign or ship station identity and use*

Voice	***~~TLX~~Electronic***
Motor open	MOTO
Motor part cabin	MOTPC
Motor full cabin	MOTFC
Rowing	ROW
Sailing open	SAILO
Sailing part cabin	SAILPC
Sailing full cabin	SAILFC
Motor sail	MOTSAIL
Inflatable	INFLAT

Where the number of hulls is more than one, this should be indicated by adding the words or group as follows:

Two hulls – Catamaran CAT

Three hulls – Trimaran TRI

The craft's name, call sign or ship station identity and use should be added to words or groups above. Under *use* indicate the purpose for which the craft is being used, e.g. fishing, pilot boat, or offshore racer.

Example:

Voice: ALFA, MOTOR PART CABIN CATAMARAN, LUCKY LADY, NAVIS ONE THREE, PLEASURE

~~TLX~~Electronic: A/MOTPC/CAT/LUCKY LADY/NAVIS 13/PLEASURE

B. Make and distinctive markings

The make and distinctive markings should be given in plain language.

Example:

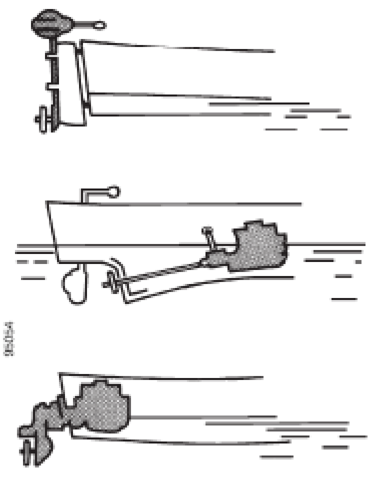
Voice: BRAVO, MAKE STORTRISS, SAIL MARKINGS TWO OVERLAPPING TRIANGLES WITH POINTS UP AND NUMBER SIERRA ONE THREE EIGHT

~~TLX~~Electronic: B/STORTRISS/SAILMARKINGS TWO OVERLAPPING TRIANGLES POINTS UP/S138

C. *Motor installation or sail rigging*

Motor installation

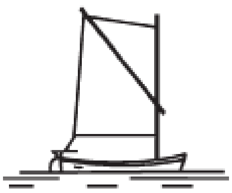
The motor installation is given according to the figures shown below.



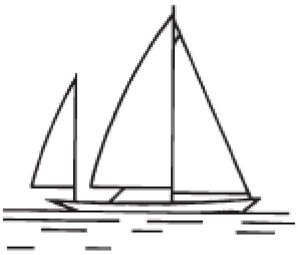
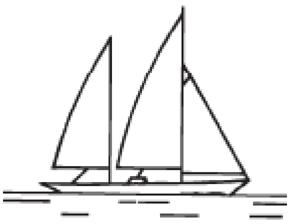
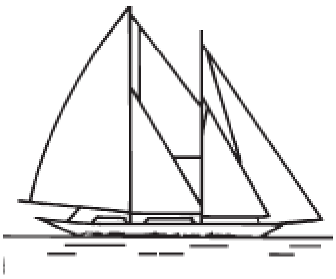
Voice	***~~TLX~~Electronic***
Outboard motor,	OUTB
if applicable, with	
the addition	
Double	OUTB 2
or Triple	OUTB 3
Inboard motor	INB
Aquamatic, if applicable, with the addition	AQUA
Double	AQUA 2

Rigging (sailing boats)

Type of rigging is described on sailing boats and motor sailers according to the figures below. (If there is more than one mast, this is indicated by the appropriate number.)



Voice	***~~TLX~~Electronic***
Jib rig	JIB
Sprit rig	SPRI
Gaff rig	GAFF

	Voice	***~~TLX~~Electronic***
	Lug sail	LUG
	Lateen rig	LAT
	Sloop rig	SLOOP
	Junk rig	JUNK
	Yawl	YAWL
	Ketch	KETCH
	Schooner	SCHON

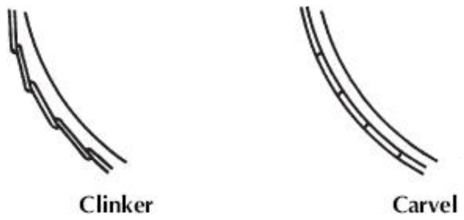
	Voice	***~~TLX~~Electronic***
Example 1:		
Voice:	CHARLIE, OUTBOARD MOTOR, DOUBLE	
~~TLX~~Electronic:	C/OUTB 2	
Example 2:		
Voice:	CHARLIE, SLOOP RIG	
~~TLX~~Electronic:	C/SLOOP	

D. ***Construction – material – colour***

Construction

Two different types of construction exist, viz. clinker-built and carvel-built or smooth-sided.

Note: Some glass fibre boats are moulded to resemble clinker-built and should be so described in this Code.



Material

The materials are wood, metal or glass-reinforced plastic (GRP). Construction, material and colour should be given in plain language.

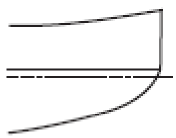
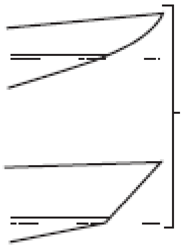
Example:

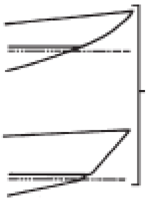
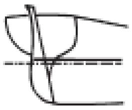
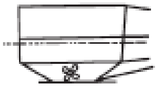
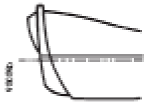
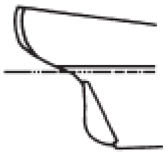
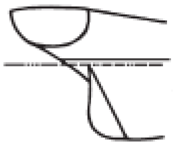
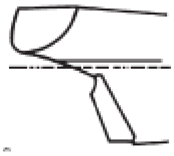
Voice: DELTA, CLINKER, GLASS FIBRE, WHITE

~~TLX~~Electronic: D/CLINKER/GRP/WHITE

E. ***Stem – stern***

Stem and stern are described according to the figures shown below.

	Voice	**~~TLX~~Electronic**
	Straight stem	STR
	Clipper stem	CLIP
	Falling stem	FALL

	Voice	~~TLX~~*Electronic*
		
	Flat stern	FLAT
	Square stern	SQUARE
	Sharp stern	SHARP
	Canoe stern	CAN
	Transom stern	TRANS
	Negative transom stern	NTRANS

Example:

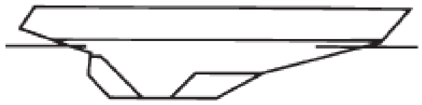
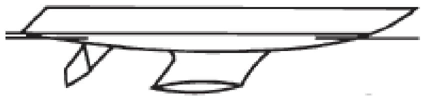
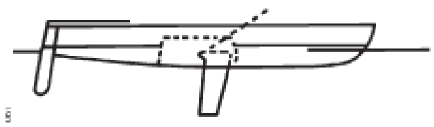
Voice: ECHO, FALLING STEM, CANOE STERN

~~TLX~~Electronic: E/FALL/CAN

F. ***Type of bottom***

Type of bottom is described according to the figures shown below.

	Voice	~~TLX~~*Electronic*
	V-bottom	VBOT
	Flat bottom	FLAT
	Round bottom	ROUND

	Ribbed bottom	RIB
	Keel	KEEL
	Fin-keel(where double fin-keel, add the word "double")	FIN
	Centre-board	CB

Example:

Voice: FOXTROT, RIBBED BOTTOM

~~TLX~~Electronic: F/RIB

G. *Length*

Length is the length overall (LOA) given in metres.

Example:

Voice: GOLF, TWO ZERO METRES

~~TLX~~Electronic: G/LOA 20

H. *Other characteristics*

Other characteristics should be included to describe certain details that might facilitate identification, e.g. flying bridge or spinnaker sail colouring.

Example:

Voice: HOTEL, RED SPINNAKER

~~TLX~~Electronic: H/RED SPINNAKER

I. *Number of persons on board*

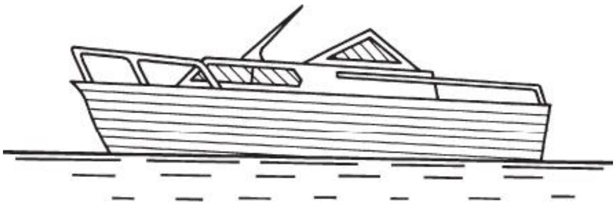
Example:

Voice: INDIA, THREE

~~TLX~~Electronic: 1/3

Complete Example

Motorboat



Voice:

MAREC ~~7/76~~3/10, RCC ~~STOCKHOLM~~ STAVANGER

ALFA, MOTORBOAT PART CABIN, GALANT, NAVIS ONE THREE, PLEASURE

BRAVO, MAKE SOLOE TWO FIVE

CHARLIE, INBOARD MOTOR

DELTA, CLINKER, GLASS FIBRE, WHITE

ECHO, FALLING STEM, SQUARE STERN

FOXTROT, V-BOTTOM

GOLF, SEVEN AND A HALF METRES

HOTEL, PULPIT FORWARD

INDIA, UNKNOWN

~~F~~Electronic:

MAREC ~~7/76~~ 3/10, RCC ~~STOCKHOLM~~ STAVANGER

A/MOTPC/GALANT/NAVIS 13/PLEASURE

B/SOLOE/25

C/INB

D/CLINKER/GRP/WHITE

E/FALL/SQUARE

F/VBOT

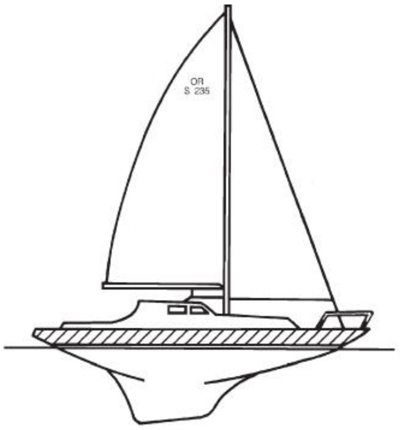
G/LOA 7.5

H/PULPIT FORWARD

I/UNK

Complete Example

Sailing boat



Voice:

MAREC ~~8/76~~ 4/10, RCC ~~GOTHENBURG~~ SWEDEN RESCUE

ALFA, SAILING PART CABIN, ARABESQUE, NAVIS ONE TWO, PLEASURE

BRAVO, MAKE VIVO TWO ZERO, SAIL MARKINGS LETTERS OSCAR ROMEO SIERRA TWO THREE FIVE

CHARLIE, SLOOP RIG

DELTA, CARVEL, WOOD, BLACK WITH WHITE CABIN

ECHO, FALLING STEM, NEGATIVE TRANSOM STERN

FOXTROT, KEEL

GOLF, EIGHT METRES

HOTEL, PULPIT FORWARD

INDIA, TWO

~~TLX~~Electronic:

A/SAILPC/ARABESQUE/NAVIS 12/PLEASURE

B/VIVO 20/OR S 235

C/SLOOP

D/CARVEL/WOOD/BLACK WITH WHITE CABIN

E/FALL/NTRANS

F/KEEL

G/LOA 8

H/PULPIT FORWARD

I/2

9 Appendix K

- Amend appendix K, K.2.4, 7th line, as follows:

…a line of bearing for the distressed position or mobile telecommunications device data which may help indicate present or past location or area… can be established which may eliminate some scenarios.

[FROM NCSR 1]

Appendix N

Amend Figure N-14 on page N-19, as follows:

Figure N-14† – *Realistic upper limit of survival time for people in the water* wearing normal clothing, from time of entry into the water. ~~(See Volume II, chapter 3 for details.)~~

[Footnote:] "† ~~Based on expert medical opinion and the latest scientific data.~~ Note that this graph does NOT show a 'recommended search time'. There are many factors to take into account in determining search time. See Volume II, chapter 3.8.6.

10 Appendix T

Insert Appendix T after Appendix S, as follows:

Appendix T

Checklist for multiple aircraft SAR operations

Checklist for Multiple Aircraft SAR Operations

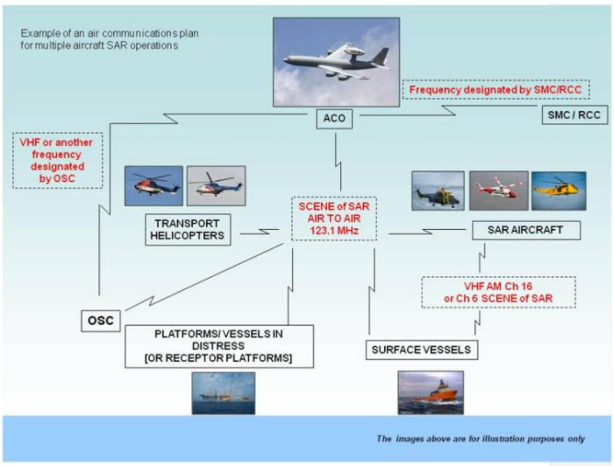
The Checklist below is for example purposes and for general guidance only. Each SAR operation is different therefore not all of the items below might be needed and additional ones might be required. Some items might also be carried out by different facilities and units from those indicated below.

SERIAL	TASK	ACO	SMC	ATS	SRU
1	Declare Emergency Phase		X		
2	Identify Requirement for ACO		X		X
3	Designate and Notify ACO	X	X		
4	Inform ATS units & Establish Area of SAR Action		X	X	
5	Identify Aircraft And Capabilities	X	X		
6	Develop and Promulgate Plan	X	X		X
7	Establish Co-operation with OSC	X	X		
8	Co-ordination with ATS	X	X	X	X
9	Manage Aircraft Activities	X	X	X	
10	Call ACO before Entering Area	X			X
11	Call ACO when leaving Area	X			X
12	Monitor and Update On Scene Plan	X	X		
13	Provide Regular Situation Reports	X	X		
14	Manage Fuel & Numbers of airborne SRUs	X	X	X	X
15	Stand Down or Relieve the ACO	X	X		
16	Cancel/ Terminate the SAR Operation	X	X	X	X
17	Cancel Area of SAR Action	X	X	X	X

Notes:

1. **'X'** signifies action required or the receipt of information
2. For the purposes of this checklist, **'SRU'** refers to aircraft involved in the SAR operation.

Example Radio Communications Plan



ACO Procedure Form-Mass Rescue Operations

GENERAL INFORMATION	
OPERATION	
EMERGENCY LOCATION	
IDENTIFICATION (VERSION)	
TIME ZONE	
ACO INFORMATION	
ACO FREQUENCY	
ACO TEL / EMAIL	
WAYPOINTS	
REFERENCE POINT	
EXIT POINT	
HOLDING POINT	
HOLDING POINT	
HOLDING POINT	
EVACUATION SITE	
EVACUATION SITE	
REFUELING/CREW SUPPORT	
ALTITUDES	
ENROUTE/ENTRY	
HOLDING POINT(S)	
EXIT POINT	
ENROUTE/LEAVING AREA	
NATURE OF DISTRESS AND/OR SEARCH OBJECTS	
SAFETY BRIEF	
"The Air Coordinator will only provide advisory information. You (the Aircraft Commander) are responsible for the safety of your own aircraft at all times. If you, because of safety reasons, are unable to comply with instructions given by ACO, you are to notify me (ACO) immediately."	

PICTURE OF ACO PROCEDURE	
MISSED APPROACH PROCEDURE	
OPERATIONAL INFORMATION	
COMM PLAN	**WEATHER ON SCENE + QNH**
ACO 123,100 **RCC/OSC CH** **SHIPS CH** **OTHER**	**WIND** **VIS** **CLDS** **TEMP** **QNH**

Briefings

The ACO should ensure that the following information is briefed to the SAR aircraft after check in and when appropriate

SAFETY BRIEF	*"The Air Coordinator will <u>only</u> provide advisory information. You are responsible for the safety of you own aircraft at all times. If you because of safety reasons are unable to comply with instructions given by the Air Coordinator, you are to notify me immediately"*
QNH/ALT.	Which reference is used for common altimeter setting?
ORGANISATION ON SCENE	Who is acting Aircraft Coordinator? Who is acting On Scene Coordinator? Who is acting SMC.?
OTHER SRUs	Other airborne SRUs on scene (call sign, position, task) Ships on scene (call sign, task)
FREQUENCY PLAN	What frequencies are the SRU expected to use and/or monitor? - co ordination with other SAR aircraft - coordination with OSC/ships - hoist frequency? - frequency for transit back after mission.
WEATHER ON SCENE	Flight conditions on scene.

SEARCH MISSION	
ROUTEPOINTS	Position of: - Entry point - Exit point
PATTERN	Search directions Track spacing
SEARCH OBJECTS	Primary search object Secondary search object
ADJACENT SRU	Which SRU are operating in close proximity.
SAFETY ON SCENE	Which safety methods have been implemented.

MASS. EVACUATION	
HOIST POSITION	Position of hoist
ROUTEPOINTS	Position/altitude of: - Reference point - Holding points - Exit point
EVACUATION SITE	Position of evacuation site/post mission landing site.

SAR Aircraft Entry and Exit Reports

Aircraft Entry Report

The Entry Report should be given to ACO/RCC before entering the area of SAR action (at least 20NM/10 minutes flight time to casualty).

1. Call sign
2. Nationality
3. Type (specify fixed-wing or helicopter and type)
4. Position
5. Altitude and altimeter setting
6. Estimated Time of Arrival
7. Endurance on scene
8. Remarks (specific equipment or limitations)
9. POB (crew, other personnel)

Example of Entry Report: *"Air Coordinator, Lifeguard 901; one Swedish S-76 rescue helicopter; position 25 NM south of Ronneby; 1500 ft. on QNH 1013; ETA holding point North 1015Z; Endurance on scene 2 hours; no limitations, 4 crew on board"*

Aircraft Exit Report

The Exit Report should be given to the ACO/RCC before leaving the area of SAR action.

1. CALLSIGN
2. Persons on Board (crew, other personnel, rescued)
3. Estimated Time of Arrival at destination
4. Requirements at destination (fuel, medical care, food etc.)
5. Estimated Time of Arrival back in operations area
6. Remarks (e.g. Hoist position, weather, etc.)

Example of Exit Report: *" Air Coordinator, Lifeguard 901; total POB 9, 4 crew and 5 rescued; ETA to EVAC 1230Z; Require fuel after landing; ETA back in area 1430Z; hoist position 5535.9N 01659E "*

Pilot Information File

"AIR COORDINATOR" 123.100 MHz

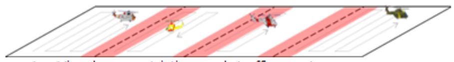
ENTRY REPORT / 20 NM before reaching area!

1. Callsign
2. Nationality
3. Type (FIXED/HELICOPTER AND TYPE)
4. Position
5. Altitude and altimeter setting
6. ETA (RELEVANT POINT OR SEARCH AREA)
7. Endurance on scene
8. Remarks (EQUIPMENT – LIMITATIONS)
9. POB (crew, other personnel)

REPORTING

- **Reaching** assigned points.
- **Leaving** assigned points.
- **Commencing** operations (search, investigation during search, approach to surface/ship, missed approach, hoist, landing etc).
- **Completing** operations, including information regarding results.
- Leaving present altitude.
- Reaching new altitude.
- 10 minutes to completing hoist operation or search.
- 30 minutes on scene endurance, expecting fuel at (location)
- Exit Report: POB, ETA and requirements at destination, ETA back in operations area and any remarks (hoist position and weather)

SEARCH MISSION



1. Visual – no restrictions, only traffic reports
2. Flow – spacing by flow: separation of ETA, CSP's
3. Coordination zones – example 1 NM on each side of border. Call neighbouring helo before entering coordination zone and when exiting 1NM
4. No fly zones – Do not enter buffer zone.

NOTE:
The ACO provides only ADVISORY information, aircraft commanders are responsible for the safety of own aircraft.
Notify ACO immediately if unable to comply with instructions received.

PROPOSED AMENDMENTS TO IAMSAR MANUAL VOLUME III

1 Contents

- Add new Section 5 on Multiple Aircraft SAR Operations as follows:

- Add new appendix H as follows:

Appendix H

2 Abbreviations and Acronyms

- Delete the following text on page vii and page viii

~~**CES**.......coast earth station~~

~~**GES**.......ground earth station~~

Add the following text:

RPA Remotely Piloted Aircraft

RPAS Remotely Piloted Aircraft System

SLDMB self-locating datum marker buoy

3 Glossary

- Delete the following text on page xiii

~~**Coast earth station (CES)** Maritime name for an Inmarsat shore-based station linking ship earth stations with terrestrial communications networks.~~

- Amend the Glossary as follows:

Cospas-Sarsat System	A satellite system designed to detect and locate activated distress beacons transmitting ~~on~~ in the frequency band of 406.0-406.1 MHz.
Direction Finding (DF)	~~Homing on signals to pinpoint a position~~. Radiodetermination using the reception of radio waves for the purpose of determining the direction of a station or object.
Datum marker buoy (DMB)	Droppable floating beacon used to determine actual total water current, or to serve as a location reference. There are two types, the radio type and the self locating datum marker buoy type.
Emergency	~~Aeronautical distress beacon for alerting and transmitting homing signals.~~ A generic term (related to aircraft) describing equipment which broadcast distinctive signals on designated frequencies and, depending on application, may be automatically activated by impact or be manually activated.
Fetch	The distance the waves have been driven by a wind blowing ~~over which the wind blows~~ in a constant direction, without obstruction.
Maritime Safety Information Service	The internationally and nationally coordinated network of broadcasts containing information which is necessary for safe navigation.
Maritime Safety Information (MSI)	Navigational and meteorological warnings and forecasts and other urgent safety related messages broadcast to ships, as defined in regulation IV/2 of the 1974 SOLAS Convention.
Page NAVAREA	~~One of 16 areas into which the world's oceans are divided by the International Maritime Organization for dissemination of navigation and meteorological warnings~~. A geographical sea area established for the purpose of coordinating the broadcast of navigational warnings. The term NAVAREA followed by a roman numeral may be used to identify a particular sea area. The delimitation of such areas is not related to and shall not prejudice the delimitation of any boundaries between States.

Personal locator beacon (PLB)	~~Personal radio distress beacon for alerting and transmitting homing signals.~~ A portable device, manually activated, which transmits a distress signal on 406 MHz, and may have an additional homing signal on a separate frequency.
Remotely Piloted Aircraft (RPA)	an unmanned aircraft which is piloted from a remote pilot station.
Remotely Piloted Aircraft System (RPAS)	a remotely piloted aircraft, its associated remote pilot station(s), the required command and control links and any other components as specified in the type design (also known as "un-manned air vehicles (UAV), remotely piloted vehicles (RPV) and un-manned air systems (UAS)".
Rescue co-ordination centre (RCC)	Note: The term RCC will be used within this Manual to apply to either aeronautical, maritime or joint centres; ARCC, MRCC or JRCC will be used as the context warrants.
Rescue sub-centre (RSC)	... Note: The term RSC will be used within this Manual except where it applies only to aeronautical or maritime; then ARSC or MRSC will be used.
Self-locating datum marker buoy (SLDMB)	Droppable floating beacon, equipped with a global navigation satellite system (GNSS) sensor that transmits its location periodically, used to determine actual total water current, or to serve as a location reference.
Swell direction	The direction from which a swell is moving. The direction toward which the swell is moving is called the down swell direction.
Vessel Monitoring System (VMS)	~~A tracking system which provides for environmental and fisheries regulatory organizations to monitor position, time at a position, course and speed of commercial fishing vessels~~ Systems primarily used by environmental, fisheries and regulatory organizations, but also used by other organizations, to monitor the position, time of the position provided, course and speed of vessels

4 Section 1

- Amend page 1-2 last sub bullet as follows:
  - evaluate all reports and modify ~~search~~ action plans as necessary

5 Section 2, page 2-i

- Add new sub-section at bottom of page after "**Aircraft assisting**"

Vessel and aircraft actions on observing AIS-SART or AIS MOB device signals

- Amend page 2-1 first four bullets as follows:

  - A distress call or signal or other emergency information from another vessel at sea, either directly or by relay.
  - A distress call or message from aircraft. This will normally occur by relay from an aircraft, RCC or CRS.
  - ~~Alert from a vessel.~~
  - ~~Visual signals or sound signals from a nearby distressed craft.~~

- Amend page 2-1, second sub-bullet under *Immediate action*, 3 element as follows:

- Number of ~~POBs~~ persons on board

- Amend page 2-2, first bullet as follows:

  - Vessels should maintain communications with the distressed craft while ~~attempting to advise the SAR system~~ advising an RCC or CRS of the situation.

- Amend page 2-2, fifth bullet as follows:

  - The ship or a CRS coordinating distress traffic should establish contact with ~~the SMC~~ an RCC and pass on all available information, updating as necessary

- Amend text on page 2-5, third bullet as follows:

  - A vessel en route to assist a distressed craft should have the following equipment ready for ~~possible~~ use if possible:

- Add on page 2-5 new 1st bullet under *Life-saving and rescue equipment* as follows:

  - Specialized recovery equipment

- Amend page 2-5 existing 4th bullet under *Life-saving and rescue equipment* as follows:

  - Survival suits ~~for the crew~~

- Amend page 2-6 1st bullet under *Miscellaneous equipment* as follows:

  - ~~If fitted, a gantry~~ A crane ~~for hoisting~~ or other lifting equipment on ~~each~~ either side of the ship, fitted with a ~~cargo net for~~ recovery device ~~of survivors~~

- Amend page 2-7 second sentence of second bullet under **Aircraft assisting** *Distress call and message received* as follows:

  - This usually occurs by relay from ~~a CRS~~ an RCC

- Add new sub-section on page 2-9 before **Search function**:

Vessel and aircraft actions on observing AIS-SART or AIS MOB device signals

- Vessels at sea may observe AIS-SART or AIS MOB signals on navigation displays. Although AIS-SARTs and AIS MOB are locating signals, these signals may be related to a vessel or craft that has activated a device to draw attention to its location due to a distress situation and this should be investigated by RCCs. Therefore, AIS-SART and AIS MOB transmissions should not normally be ignored unless information is available that confirms that no response is necessary e.g. it is known to be a false alarm.

- The majority of vessels will have AIS directly linked to the electronic charting system which means that the SART should automatically be displayed on the navigation display.

- The AIS-SART and AIS MOB also display on any X band radar as a series of 12 dots for identification.

- It is recommended that any vessel at sea or aircraft that observes AIS-SART or AIS MOB signals should report this to the nearest RCC immediately. The RCC will then take appropriate actions.

- Vessels or aircraft should also be prepared to proceed to the location of the AIS-SART or AIS MOB signal, if it is safe to do so, to assist the RCC in investigating the transmission. Because AIS-SART and AIS MOB signals are likely to transmit over relativity short distances e.g. up to 10NM, a vessel should not be significantly delayed by doing this.

  - Amend page 2-9 second bullet under *Search action plan and message*, as follows:

    - The OSC and ACO (if designated) and facilities on-scene...

  - Amend page 2-9 first square bullet under *Coordination required* as follows:

    - designates the SMC, ~~and~~ OSC and ACO

- Amend page 2-9 fourth square bullet under *Coordination required* as follows:

  - OSC and ACO instructions..."

- Amend page 2-10 third square bullet under *Coordination required* as follows:

  - ...follows coordinating guidance of SMC, ~~or~~ OSC and/or ACO)

- Amend page 2-10 fourth square bullet under *Communications* as follows:

  - method for OSC and/or ACO to be identified by SAR facilities

- Amend page 2-16 first bullet under **Rescue action plan and message** as follows:

  - …implementation by the OSC and ACO (if designated) and facilities on-scene..."

- Amend page 2-17 first square bullet under *Coordination* as follows:

  - designates the SMC, ~~and~~ OSC and ACO

- Amend page 2-17 third square bullet under *Coordination* as follows:

  - ...follows coordinating guidance of SMC, ~~or~~ OSC and/or ACO)

- Amend page 2-33 by adding new first bullet under *General maritime considerations* as follows:

  - See also 'Recovery of survivors by assisting vessels', below, and the action card 'Master's checklist – Recovery of people in the water'. The IMO publication Pocket Guide to Recovery Techniques provides additional guidance.

- Amend page 2-33, third bullet under *General maritime considerations* as follows:

  - In heavy weather, an area of sea may be calmed significantly ~~calmed~~ by a large vessel circling at reduced speed

  - oil may also be used for quelling waves: vegetable oils and animal oils, including fish oils, are most suitable ~~for quelling waves~~..."

- Delete footnote on page 2-35

- Amend page 2-35 by adding new first bullet under *Recovery of survivors by assisting vessels* as follows:

  - Vessels to which Chapter III of the SOLAS Convention applies shall, and other vessels are recommended to, have ship-specific plans and procedures for recovery of people from the water. The action card 'Master's checklist – Recovery of people in the water' and the IMO publication Pocket Guide to Recovery Techniques provide additional guidance.

- Amend page 2-35 by adding new third sub- bullet under *Recovery of survivors by assisting vessels* as follows:

  - utilizing specialized recovery equipment

- Amend page 2-39 sub-bullets under bullet Questions to ask include the following as follows:
  - What was the time and date of the incident?
  - What was the last known position?
  - What was the total number of persons on board ~~the aircraft~~ prior to the accident?
  - ~~What was the total number of persons on board the vessel?~~
  - What caused the emergency?
  - Were any of the persons able to leave by lifeboat or raft?
  - How many survivors did you see in the water?
  - What flotation gear ~~had~~ did they have?
  - ~~How long was the survivor in the water?~~ If you were in the water, how long for?
  - Were search craft seen before the survivors were located and, if so, what were the dates and times of the sightings?
  - Were any signals or devices used to try to attract the attention of search craft? If so, what were they and when were they used?

In addition, for aircraft incidents:

  - Did you bail out or was the aircraft ditched?
  - If you bailed out, at what altitude?
  - How many others did you see leave the aircraft by parachute?
  - How many ditched with the aircraft?
  - How many did you see leave the aircraft after ditching?

- Amend page 2-52 fifth and sixth sub-bullets under *Radio* by combining them in one sub-bullet as follows:

Merchant ships are ordinarily informed of aircraft distress situations by broadcast messages from a CRS or RCC on the international maritime distress frequencies ~~of 2,182 kHz or 156.8 MHz (VHF channel 16)~~. Few aircraft can operate on these frequencies.

6 Section 3

- On page 3-2 delete text of 3rd bullet as follows:

  - ~~LESs may also be referred to as aeronautical ground earth stations (GESs) or maritime coast earth stations (CESs).~~

- Amend page 3-3 first bullet under **OSC duties** as follows:

  - Coordinate operations of all SAR facilities on-scene. An ACO may be designated to coordinate aircraft operations

- Amend page 3-3 second bullet under **OSC duties** as follows:

  - Carry out the ~~received~~ search action plan or rescue action plan received from the SMC...

- Amend page 3-3 third bullet under **OSC duties** as follows:

  - Modify the ~~search action or rescue action~~ plan as the situation on-scene dictates, keeping the SMC advised (~~do in consultation~~ discuss proposed modifications with the SMC when practicable).

- Amend page 3-3 second square bullet, eight bullet under **OSC duties** as follows:

  - the results of search and/or rescue action to date

- Amend page 3-3 third square bullet, eight bullet under **OSC duties** as follows:

  - any ~~actions taken~~ modifications made or suggested to the action plan

- Amend page 3-6 first square bullet, eight bullet under bullet Search and rescue… as follows:

  - the OSC may adjust the plans, based on the situation, and inform the SMC (~~do in consultation~~ discuss proposed modifications with the SMC when practicable)

- Amend page 3-7 first bullet as follows:

  - … should be appointed to assist in maintaining flight safety and to handle communications with the aircraft on scene.

- Amend page 3-8 second square bullet, under first bullet of *Situation reports* as follows:

  - … an information addressee on ~~all~~ SITREPs from the SMC

- Amend page 3-16 third bullet as follows:

  - On assuming the duty, the OSC should inform the appropriate RCC, via a CRS or ATS unit as necessary, and keep it informed of developments at regular intervals.

- Delete page 3-16 fourth bullet

- Amend page 3-35 first bullet, under **SAR briefing, debriefing and tasking** as follows:

  - The SMC, ~~or~~ OSC and/or ACO should provide information to SAR facilities..."

- Amend page 3-36 first bullet, as follows:

  - ...units should also be contacted by the SMC, ~~or~~ OSC and or ACO for debriefing

- Amend page 3-36 first and second bullets, under **Further action on ….** as follows:

  - The ~~OSC will normally consider the~~ initial phase is normally considered to have been completed when, in the absence of further information, searching ships have completed one search of the most probable area.

  - If at that stage nothing has been located, it will be necessary for the SMC, in consultation with the OSC, to consider the most effective method of continuing the search."

- Amend page 3-37 third bullet as follows:

  - The SMC and OSC should, therefore, consider using surface craft at night to ~~research~~ search again areas covered by day."

- Amend page 3-41 second bullet, under **Search unsuccessful** as follows:

  - The OSC may need to decide whether to terminate an unsuccessful search. ~~(do in consultation with the SMC when practicable)~~ This should be discussed with an RCC whenever practicable. For this determination...

- Amend page 3-42 text under the first bullet:

~~Ocean incident~~

- terminate active search and inform the RCC
- advise assisting craft to proceed on passage ~~and inform the land-based authority~~
- send a message to all ships in the area asking them to continue to keep a look-out

~~Coastal incident~~
~~F consult with land-based authorities about the termination of search~~

- Amend page 3-42, fourth bullet under **Search successful** as follows:

  - When all ~~rescuing action has been effected~~ persons in distress have been accounted for, the OSC should ~~immediately~~ inform all search facilities that the search has been terminated.

7 Section 4

- Amend page 4-i as follows:

Add new sub-section called "Guidance for Vessels" after section Evacuation by helicopter

- Amend page 4-4 as follows:

EPIRBs, ELTs and personal locator beacons (PLBs) ~~distress beacons~~

- Some ELTs and EPIRBs may also have integral GPS capabilities.
- ~~It is recommended that an activated distress beacon, even if inadvertently activated (false alarm), be kept on until the RCC is informed.~~

- ~~this enables the RCC to work with a more accurate position and identification, allowing resolution of the alert without dispatching SAR facilities needlessly~~

- ~~immediately attempt to notify the RCC by other means that the alert is false.~~

- The followings steps should be followed when a distress beacon is inadvertently activated:

  - Switch the distress beacon OFF; and

  - immediately attempt to notify the RCC that the alert is false.

In cases were the beacon cannot be turned OFF, take measures to prevent or inhibit transmission of signal (e.g. shielding of transmission, battery removal, etc.) Such actions may prevent future use of the distress beacon.

Note: There is no penalty for inadvertent activation of a distress beacon.

- Amend page 4-10 as follows:

Add new sub-section called "Guidance for Surface Vessels" after section Evacuation by helicopter

Guidance for Vessels

SRUs

Vessels taking part in a SAR mission in the vicinity of aircraft operations, should consider the following:

- keep clear of aircraft approach path (area between Final Point and distress vessel)
- keep clear of missed approach flight path

- inform ACO/OSC/SMC of any activity observed in above-mentioned areas
- ask ACO for guidance concerning the placement of the areas mentioned above in case they are unclear
- the ACO/OSC/SMC may also ask a surface SRU to remain in certain position relative to a distressed vessel to accommodate operational needs, for example act as an approach fix for aircraft airborne radar approaches
- in search missions including both airborne and surface units, keep the ACO/OSC/SMC aware of own position as advised

Distress vessel

In addition to other guidance given to vessels, in multiple aircraft SAR operations or mass evacuation situations, the Master of the vessel in distress should consider the following:

- agree on co-operation with airborne units with ACO/OSC/SMC including:

- determine landing/hoist positions
- determine working channels
- inform when ready to receive helicopters
- be prepared to provide ship manifest to RCC or SRU
- be prepared to guide rescue personnel arriving on ship
- be prepared to gather passengers to landing/hoist positions and to guide them
- determine medical triage status and number of casualties
- plan order of evacuation and relay to RCC/OSC/ACO
- update vessel position, speed and course at regular intervals; 1NM can be considered a significant difference in position for aircraft especially in poor weather conditions

- Amend page 4-14 11th bullet under Initial actions as follows:

  - Prepare ~~lifeboat for possible launching~~ recovery equipment – see Section 2, Recovery of survivors by assisting vessels

- Delete page 4-14 last bullet under Initial action

  - ~~Rig pilot ladder to assist in recovery~~

- Amend page 4-14 title of last section as follows:

Standard ~~methods of~~ recovery manoeuvres

- Delete page 4-17, fourth square bullet under *Collision*

  - ~~POB control (vessels involved)~~

8 Section 5

- Add new Section on Multiple Aircraft SAR Operations as follows:

Section 5

Multiple aircraft SAR operations

Contents

General guidance

The information in this section provides guidance for the management and conduct of multiple aircraft SAR operations. Any of the described principles and procedures might have to be modified by SMCs, ACOs and SRUs, in order to deal with specific situations. Further information on multiple aircraft SAR operations is available in IAMSAR Volume II, chapter 6.

Number of SAR Aircraft Required and Aircraft Capabilities

The RCC/OSC/ACO responsible for the SAR operation should aim to achieve the most effective blend of aircraft and surface unit capabilities for the situations that are anticipated. The operation should aim to achieve continuous or efficient use of aircraft on scene when needed, while minimising the situations in which aircraft are airborne without a mission. Where more aircraft than needed are available for a SAR operation, some can be held in reserve. These aircraft can provide additional resources if needed, or relieve other aircraft involved in the operation for reasons related to aircrew fatigue or maintenance requirements.

The RCC/OSC/ACO should define the number of aircraft to be used in a mission taking into account weather, distance from scene, nature of distress, available facilities and other operational issues. The SMC ideally has the best overall picture of ongoing SAR operations. Therefore tasks given to aircraft may not necessarily always utilise all the capabilities available.

Given tasks should not rely on aircraft and aircrew conducting flying activities beyond their abilities, or their approved types of operations. In case such a task is given, the pilot-in-command shall inform the RCC/OSC/ACO immediately.

Participation by Other Aircraft

In some situations, such as mass evacuations from offshore drilling platforms, large scale incidents over land areas etc., aircraft belonging to commercial companies or other organizations might be able to respond to incidents as part of existing emergency plans.

Refuelling Facilities

The RCC/ACO/OSC is responsible for arranging refuelling facilities in a SAR operation. The pilot-in-command is responsible for ensuring that the facilities available are suitable, taking into account endurance and all operational needs. The pilot-in-command should take appropriate actions to ensure required refuelling and keep the RCC/ACO/OSC continuously informed of changes to on-scene and overall endurance.

Area of SAR action

Definition

For IAMSAR Manual purposes, an area of SAR action is an area of defined dimensions that is established, notified or agreed for the purposes of protecting aircraft during SAR operations and within which SAR operations take place.

Entering Areas of SAR Action

SAR aircraft intending to enter an area of SAR action should normally first contact the ACO. They should not enter the area until the ACO gives them permission and provides them with sufficient information to safely join the flow of SAR aircraft involved in the operation (see also Communications). Aircraft should call an ACO as early as possible before entering an area of SAR action, in order to allow time for information to be exchanged and in case they are required to remain clear of it. As a general guide, aircraft should aim to get in touch with an ACO when at least ten minutes' flying time from the edge of an area of SAR action and pass entry information using the format described in appendix H - 5. In the event that an area of SAR action has been established but an ACO is not yet available, SAR aircraft should receive information that they require from the coordinating RCC.

Leaving Areas of SAR Action

Aircraft leaving areas of SAR action should contact the ACO before the area boundary and before changing to another frequency. Aircraft leaving should use the format described in appendix H - 5.

Flights in Areas of SAR Action by Other Aircraft

Aircraft that are not involved in a SAR operation should normally not fly within areas of SAR action. However, if such aircraft need to enter an area of SAR action, they should do so only with the approval of a SMC, ACO or coordinating ATS unit and are subject to the rules of the area or the relevant class of airspace. If a SMC or coordinating ATS unit is giving approval, the ACO should first be consulted.

Aircraft coordinator

Purpose of an ACO

The primary purpose of an ACO is to contribute to flight safety of aircraft involved in a SAR operation. The ACO should have a clear understanding of the aim of a SAR operation. The ACO organizes and coordinates the operations of aircraft involved in the SAR mission to carry out the mission effectively, paying particular attention to aircraft that are likely to operate close to each other.

Responsibility for Safety

Information from ACOs to other aircraft on scene is advisory, but should nevertheless be followed as closely as practicable. If necessary to ensure flight safety, aircraft pilots-in-command should take whatever measures they assess are needed. If aircraft pilots-in-command deviate from advice passed by an ACO, then they should inform the ACO as soon as possible. The final decision concerning the safety of an aircraft, its crew and passengers rests with the pilots-in-command of the aircraft involved.

ACO Duties

Procedures, duties and tasks involving ACOs are described throughout this Section. A list of normal duties for an ACO, also contained in IAMSAR Volume II, can include the following tasks:

(a) Contributing to flight safety:

- maintain a safe flow of aircraft
- ensure use of a common altimeter setting for all aircraft involved
- advise the SMC of on-scene weather implications
- determine a direction for entering and leaving an area of SAR action
- determine all points necessary for maintaining safe flow in an area of SAR action
- filter radio messages to and from SAR aircraft
- ensure frequencies are used in accordance with SMC directives
- coordinate with adjacent air traffic services (ATS) units

(b) Prioritizing and allocating tasks:

- ensure SAR aircraft are aware of the SMC/OSC overall plan and their own tasks
- monitor and report search area coverage
- with appropriate SMC/OSC, identify emerging tasks and direct SAR aircraft to meet them.

(c) Coordinating aircraft operations:

- respond to changing factors on scene and supervise effectiveness of operations
- ensure the continuity of aircraft operations in coordination with SMC/OSC

(d) Informing SAR aircraft:

- Assign tasks to aircraft.
- Distribute all relevant flight safety information to aircraft (ref sub paragraph (a) above)
- Provide information about relevant air activity and dangers on scene.
- Provide information about search areas (if applicable) evacuation points (if applicable) and refuelling facilities.
- Provide operational information about the ongoing SAR-mission
- Provide relevant weather information.

(e) Make periodic situation reports (SITREPs) of SAR aircraft operations to the SMC and the OSC, as appropriate.

(f) Work closely with the OSC:

- assist in the execution of SMC directives
- maintain communications
- advise on how the ACO can assist.

(g) Coordinate aircraft refuelling.

ACO Location

The ACO function may be carried out from various locations, such as a fixed-wing aircraft, a helicopter, a ship, a fixed structure such as an oil rig, an ATS unit, a coordinating RCC or another appropriate land unit. The procedures used should be similar regardless of the ACO location.

Information from SAR Aircraft to the ACO

In order to enhance situational awareness for ACOs and other SAR aircraft and to assist with safety and the continuity of operations, participating aircraft should report as follows:

- Entry report.
- Reaching assigned points.
- Leaving assigned points.
- Commencing operations (search, investigation during search, approach to the surface/ship, missed approach, hoist, landing, etc.).
- Completing operations, including information regarding results.
- Leaving present altitude.
- Reaching new altitude.
- 30 minutes on scene endurance, expecting fuel at (location).
- 10 minutes to completing hoist operation.
- 10 minutes to completing search
- Exit report

Transfer of ACO tasks

Before accepting the task the new ACO should understand the details of the SAR mission and the SMC's plans. The details required include the aim of the operation, the position of the missing object, number of persons in distress, other units involved, locations of participating aircraft, communications and any limitations to the operation. When possible, basic pre-flight information should be provided by a SMC in order to simplify the transfer to the new ACO.

Checklists and Guides

ACOs and SAR aircraft are recommended to use checklists or guides containing relevant information. Units who are likely to be designated as ACOs or take part as airborne SRUs in the event of a multiple aircraft SAR operation, should always have ACO checklists or guides available whenever they are on duty.

A short reference list known as the 'Pilot Information File' (PIF) contains information useful for all aircraft involved in multiple aircraft operations. The PIF, guides and checklists suitable for ACOs and SAR aircraft are contained in appendix H - 6.

Communications

ACO Call sign

Multiple aircraft SAR operations can involve units from different organizations or SRRs, which might not routinely work together. In order to make the identity of an ACO clear to all participating units, the standard call sign: 'Air Coordinator' should be used by all ACOs.

Radio Voice Communications

There should be agreed, common, on scene procedures for the following:

(a) On Scene Coordination Frequency. An agreed coordination frequency for radio voice communications should be used within an area of SAR action or near the scene of operations. This frequency should be one that all aircraft can access, together with the ACO. Information that should be passed between an ACO and SAR aircraft are listed in appendices H-3, H-4 and H-5.

(b) Alternative Frequencies. Alternative frequencies should also be nominated by an ACO, if the agreed coordination frequency is likely to become too busy or unusable.

(c) Capabilities. Care should be taken to ensure that aircraft and surface units involved in an operation are capable of complying with the communications procedures.

(d) Communications with an OSC. Consideration should be given to enabling communications between an ACO and an OSC. However, it should not normally be necessary for SAR aircraft other than an ACO to communicate directly with the OSC.

(e) Radio Communications Failure Procedures. All SAR plans for multiple aircraft SAR operations should include procedures for use when radio communications fail. A failure of radio communications might affect aircraft, SRUs or persons in distress individually, or might involve a compromise of radio systems affecting several participants. The systems affected might include radio voice communications or radio systems designed to indicate the positions of aircraft, vessels or people, including transponders and other devices. In general, the following principles should apply to most situations in which radio communications fail:

 A backup means of radio voice communication should be determined and then nominated by an ACO, along with the normal communications plan.

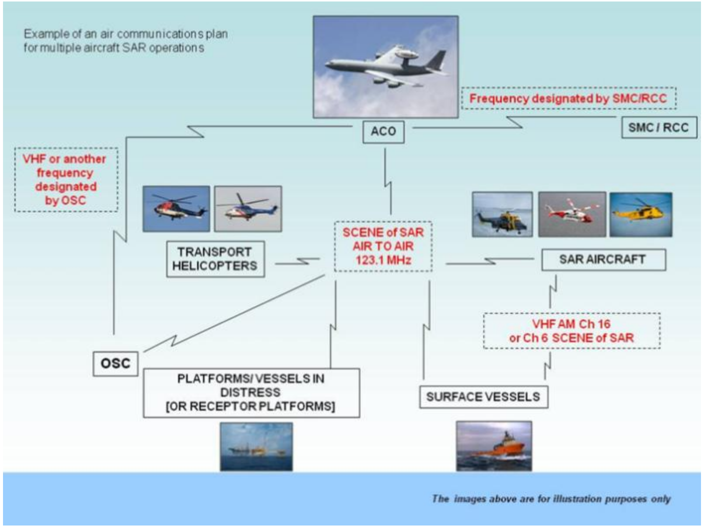
 The backup radio voice communications might include alternative frequencies, alternative radio communications systems or both. In the event of a radio communications failure, with no alternative airborne communications available, aircraft should normally continue with their planned timings, events and flight path, still transmitting all position and altitude reports, until they are clear of the immediate on scene area.

 If an aircraft has not been given a plan when a radio communications failure occurs, then it should avoid the on scene area, departing by an appropriate route and heights.

 Once clear of the on scene area, aircraft should consider moving near or landing at a suitable facility in order to establish communications by alternative methods.

If radio voice communications cannot be restored, then alternative procedures could be considered such as increasing the distances between aircraft using time. If not already included in SAR plans, then all participating airborne SRUs might have to be assembled together in order for this procedure to be briefed and understood. In most cases, this would result in considerable delays to a SAR operation.

A diagram illustrating a basic example of communications during multiple aircraft SAR operations, involving an aircraft ACO is as follows:



Long Range Radio Communications

Communications systems designed for long range SAR operations can be different from the types of communications used at shorter ranges.

Some long range communications methods include the following:

(a) High Frequency radio systems.
(b) Satellite communications systems.
(c) Position tracking systems, including those that enable two-way communications.
(d) The use of high flying aircraft to relay VHF radio communications to and from lower flying SAR aircraft.
(e) Relay of information to and from SAR aircraft through ATS units.
(f) Relay of information by ships at sea able to communicate with SAR aircraft on marine band VHF frequencies, whilst a shore based RCC uses satellite, MF or HF communications to communicate with the relaying ship(s).
(g) Relay of information by any surface units able to communicate with both SRUs and SMCs.

Search missions

General

Factors relevant to search operations are described in IAMSAR Volume II, chapters 4 and 5.

The most likely situations in which multiple aircraft might be involved in searches is when large areas need to be searched in which the confidence of the datum position is low

The procedures described below generally assume that visual search techniques are used. However, other techniques such as radar or FLIR searches might also be required or SAR aircraft might only be able to locate persons in distress by homing onto transmissions from emergency distress beacons, transponders or other devices. In these situations, techniques might have to be modified and the need for multiple SAR aircraft might have to be considered carefully.

Safety and Search Effectiveness

ACO and SAR aircraft should use procedures that ensure flight safety, without making the search ineffective. Aircraft should be given sufficient operational freedom to carry out their searches effectively, but should conform to safety procedures briefed by the ACO. The ACO should encourage a high degree of situational awareness amongst the aircraft.

Methods used to safely keep aircraft apart will depend on the on scene conditions. Beginning with good weather conditions and progressing to poor conditions, methods for keeping aircraft apart can be as follows:

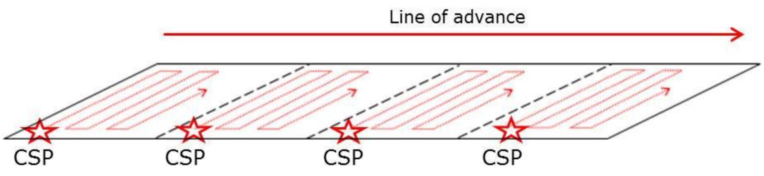
(a) Visual Methods.
(b) Flow Methods.
(c) Coordination Zones.
(d) No Fly Zones.

Visual Methods

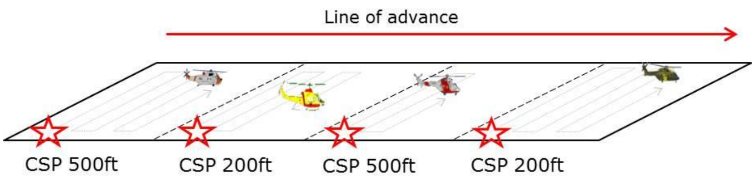
Visual methods involve the ACO allocating aircraft to search areas and aircraft avoiding each other visually. Visual methods may be the only measure necessary when weather conditions on scene are good. When using visual methods, the ACO can allow aircraft more freedom of action compared to other, more restrictive, methods. However, this freedom will not relieve the aircraft or ACOs from other duties outlined earlier in this section, for example providing information on air activity or making aircraft reports.

Flow Methods

Flow methods can be used to keep SAR aircraft apart in slightly poorer conditions, by ensuring that they fly the same search patterns (commence search point /line of advance, etc.) but in adjacent search areas. The first aircraft on scene should be allocated the search area furthest away from the LOA. This method enables aircraft to execute effective searches of areas with a minimum of radio communication.



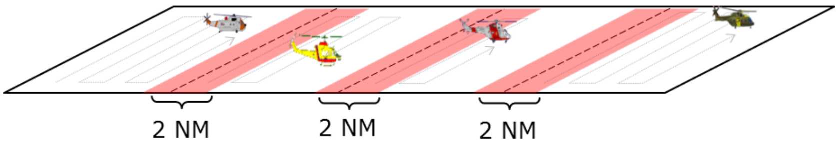
The ACO may order specific search altitudes for SRUs, to allow an extra margin of safety when aircraft operate in close proximity to each other. However, in this situation the ACO should be aware that any limit to the operational freedom of an aircraft, particularly in altitude, could reduce the effectiveness of the search. The ACO should also expect aircraft to deviate from their assigned altitudes if they need to investigate objects on the surface. **ACOs should ensure that all aircraft use the same reference for altitude.**



Coordination Zones

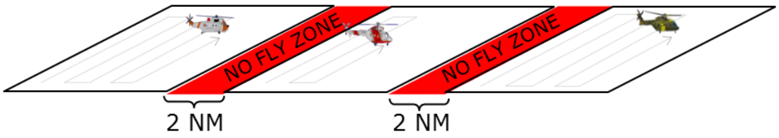
Coordination zones are border areas established by an ACO between adjacent search areas, which SAR aircraft can only enter under specific conditions. Coordination zones enable aircraft to have operational flexibility within their allocated search areas and ensure a level of safety between them.

The dimensions of a coordination zone depend on the on-scene conditions and the size of a search area. As a general guide a coordination zone might be 2 nautical miles across, but this size may be increased or decreased if needed. Before entering a coordination zone, aircraft sharing the zone should communicate with each in order to safely coordinate the entry. The aircraft should call again when leaving the zone. The ACO should ensure that the aircraft have a clear understanding of their mutual operating areas.



No Fly Zones

If on scene conditions are sufficiently difficult, no fly zones can be used in which flight is not permitted while searching is taking place in adjacent areas. The dimensions of no fly zones can be similar to coordination zones. Whenever no fly zones are used, the ACO should coordinate with the SMC and OSC to ensure that the zones are searched appropriately during the SAR mission.



Evacuation missions

Safety Flow Procedures

The main aim of on scene procedures for multiple aircraft operations should be safety. In general, there are two methods that can be used to ensure a safe flow of SAR aircraft, which are as follows:

(a) Horizontal Spacing. Horizontal spacing of aircraft should be the basic method used by SAR authorities and ACOs. It can be achieved by establishing specific routes to be flown by SAR aircraft to, from and within the area of SAR action.

(b) Vertical Spacing. For situations in which keeping aircraft apart horizontally will not ensure sufficient levels of safety, or if a cross-over of aircraft flight paths cannot be avoided then, when weather permits, vertical spacing should be considered. It may not always be necessary for SAR aircraft to fly at different altitudes, unless they are likely to fly close to each other or their flight paths cross over. If a significant possibility of collision exists, then different altitudes should be assigned for SAR aircraft.

(c) In general, altitudes for RPAs should be kept apart from altitudes allocated for other SAR aircraft.
Ideally, the most effective method to ensure a safe flow of aircraft is by using a combination of both horizontal and vertical spacing. The best way to achieve this is through planning by an ACO and a clear understanding of procedures by all of the units and authorities involved.

Aircraft Approach and Departure Flight Paths

Approach and departure flight paths are usually influenced by the prevailing wind direction; factors which might also have to be taken into account are:

(a) Fumes directly downwind from burning structures may be unsafe – the direction of approach for aircraft might have to be off-set from the wind direction.

(b) Geographic features or the design of the casualty location might compel aircraft to approach only from certain directions. Structures such as cranes, towers or vertical obstructions in line with the wind direction, might be dangerous.

Long range operations

General

Long range is any distance that significantly limits or compromises the ability of SAR aircraft to operate on scene effectively and safely.

Long range procedures

At long ranges, SAR aircraft might need to minimize the fuel used while flying in transit, in order to permit more time operating on scene. It might be necessary for SAR aircraft to fly as directly as possible to and from an incident, with the result that multiple aircraft SAR procedures have to be modified and rely on basic safety arrangements. These arrangements could include separate arrival times on scene and basic inbound and outbound height differences in order to keep aircraft safely apart. Additional considerations for long range SAR communications are described earlier in this Section.

Bringing a Casualty Vessel Within Range

If the casualty is a vessel underway, SMCs should consider the possibility of directing it to move to a point within the effective range of SAR aircraft or other forms of assistance. Alternatively, it might be possible for SAR aircraft to refuel at locations that effectively bring a casualty within their maximum radius for SAR operations. It is also effective for SMCs to use both of these options at the same time.

____

Appendix H:

H-1 Checklist for Multiple Aircraft SAR Operations
H-2 Example Radio Communications Plan
H-3 ACO Procedure Form - Mass Rescue Operations
H-4 Briefings
H-5 SAR Aircraft Entry and Exit Reports
H-6 Pilot Information File

9 Action Card

- Add new action card as follows:

Masters checklist

RECOVERY OF PEOPLE IN THE WATER

Additional information may be found in MSC.1/Circ.1182/Rev.1 GUIDE TO RECOVERY TECHNIQUES, the IMO's *Pocket Guide to Recovery Techniques*, and in IAMSAR Manual Volume III, section 2. .

ON PASSAGE TO THE INCIDENT

- Establish communications with the Rescue Coordination Centre (RCC)
- Establish communications with the On Scene Coordinator (OSC), if appointed
- Re-read the ship-specific recovery plan
- Read IMO's recovery guidance: the *Pocket Guide* or the MSC Circular (see above) and the relevant sections of the IAMSAR Manual
- Check the IMO's guidance on cold water survival: the *Pocket Guide to Cold Water Survival* or MSC Circular 1185 (MSC.1/Circ.1185/Rev.1)
- Consider on-scene conditions
- Consider the number and type of people you may have to recover, and the condition they may be in: they may be injured and/or incapable
- Consider whether to launch rescue craft
- Assess the best points of entry into the ship with the prevailing conditions in mind
- Advise RCC and/or OSC of your expected recovery capability
- Brief crew, and any passengers aboard
- Prepare recovery equipment, including control and safety measures
- Prepare additional life-saving equipment in case of accidents during recovery
- Prepare reception facilities for those recovered
- Prepare to provide assistance prior to, or instead of, recovery

Continue other side.................

- Assign crew to
    - handling the ship
    - lookout duties
    - recovery
    - care of survivors – passengers may be able to assist with this
- People who have been in the water should be lifted in a horizontal or near-horizontal position if possible
- A crew member wearing personal protective equipment may be able to go down with the lift to assist those incapable of helping themselves

APPROACHING THE SCENE

- Post lookouts, well-briefed and in communication with the Bridge
- Have recovery team(s) standing by, well-briefed, equipped with personal protective equipment, and in communication with the Bridge
- Assess your ship's manoeuvrability and recovery capability in the prevailing conditions
- Prepare to launch rescue craft, if conditions permit
- Prepare to receive craft and/or people alongside
- Think about your best approach
- Determine the priorities
- Advise RCC and/or OSC of your arrival and capabilities

DURING THE RECOVERY OPERATION

- Continue to assess the priorities
- Continue your risk assessment, including your own ongoing recovery capability, the survival chances of those not yet recovered, and the availability of other recovery resources
- Keep RCC and/or OSC advised of your progress and future capability

10 Appendix H

- Add Appendix H as follows:

Appendix H-1 Multiple Aircraft SAR Operations

Checklist for Multiple Aircraft SAR Operations

The Checklist below is for example purposes and for general guidance only. Each SAR operation is different therefore not all of the items below might be needed and additional ones might be required. Some items might also be carried out by different facilities and units from those indicated below.

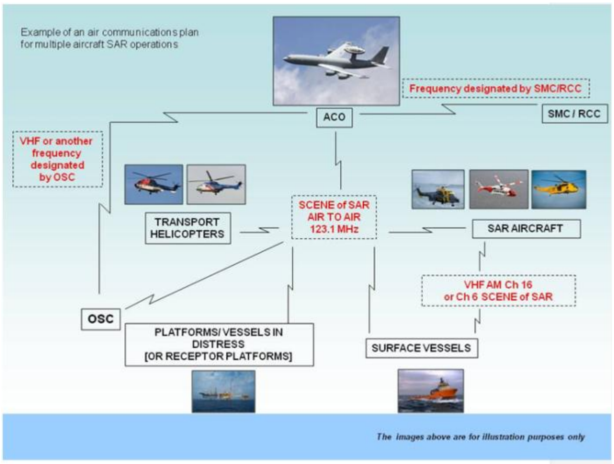
SERIAL	TASK	ACO	SMC	ATS	SRU
1	Declare Emergency Phase		X		
2	Identify Requirement for ACO		X		X
3	Designate and Notify ACO	X	X		
4	Inform ATS units & Establish Area of SAR Action		X	X	
5	Identify Aircraft And Capabilities	X	X		
6	Develop and Promulgate Plan	X	X		X
7	Establish Co-operation with OSC	X	X		
8	Co-ordination with ATS	X	X	X	X
9	Manage Aircraft Activities	X	X	X	
10	Call ACO before Entering Area	X			X
11	Call ACO when leaving Area	X			X
12	Monitor and Update On Scene Plan	X	X		
13	Provide Regular Situation Reports	X	X		
14	Manage Fuel & Numbers of airborne SRUs	X	X	X	X
15	Stand Down or Relieve the ACO	X	X		
16	Cancel/ Terminate the SAR Operation	X	X	X	X
17	Cancel Area of SAR Action	X	X	X	X

Notes:

1. **'X'** signifies action required or the receipt of information
2. For the purposes of this checklist, **'SRU'** refers to aircraft involved in the SAR operation.

Appendix H - 2 Multiple Aircraft SAR Operations

Example Radio Communications Plan



Appendix H - 3 Multiple Aircraft SAR Operations

ACO Procedure Form-Mass Rescue Operations

GENERAL INFORMATION	
OPERATION	
EMERGENCY LOCATION	
IDENTIFICATION (VERSION)	
TIME ZONE	
ACO INFORMATION	
ACO FREQUENCY	
ACO TEL / EMAIL	
WAYPOINTS	
REFERENCE POINT	
EXIT POINT	
HOLDING POINT	
HOLDING POINT	
HOLDING POINT	
EVACUATION SITE	
EVACUATION SITE	
REFUELING/CREW SUPPORT	
ALTITUDES	
ENROUTE/ENTRY	
HOLDING POINT(S)	
EXIT POINT	
ENROUTE/LEAVING AREA	
NATURE OF DISTRESS AND/OR SEARCH OBJECTS	
SAFETY BRIEF	
"The Air Coordinator will only provide advisory information. You (the Aircraft Commander) are responsible for the safety of your own aircraft at all times. If you, because of safety reasons, are unable to comply with instructions given by ACO, you are to notify me (ACO) immediately."	

PICTURE OF ACO PROCEDURE	
MISSED APPROACH PROCEDURE	
OPERATIONAL INFORMATION	
COMM PLAN	**WEATHER ON SCENE + QNH**
ACO 123,100 **RCC/OSC CH** **SHIPS CH** **OTHER**	**WIND** **VIS** **CLDS** **TEMP** **QNH**

Appendix H-4 Multiple Aircraft SAR Operations

Briefings

The ACO should ensure that the following information is briefed to the SAR aircraft after check in and when appropriate

SAFETY BRIEF	*"The Air Coordinator will only provide advisory information. You are responsible for the safety of you own aircraft at all times. If you because of safety reasons are unable to comply with instructions given by the Air Coordinator, you are to notify me immediately"*
QNH/ALT.	Which reference is used for common altimeter setting?
ORGANISATION ON SCENE	Who is acting Aircraft Coordinator? Who is acting On Scene Coordinator? Who is acting SMC.?
OTHER SRUs	Other airborne SRUs on scene (call sign, position, task) Ships on scene (call sign, task)
FREQUENCY PLAN	What frequencies are the SRU expected to use and/or monitor? - co ordination with other SAR aircraft - coordination with OSC/ships - hoist frequency? - frequency for transit back after mission.
WEATHER ON SCENE	Flight conditions on scene.

SEARCH MISSION	
ROUTEPOINTS	Position of: - Entry point - Exit point
PATTERN	Search directions Track spacing
SEARCH OBJECTS	Primary search object Secondary search object
ADJACENT SRU	Which SRU are operating in close proximity.
SAFETY ON SCENE	Which safety methods have been implemented.

MASS. EVACUATION	
HOIST POSITION	Position of hoist
ROUTEPOINTS	Position/altitude of: - Reference point - Holding points - Exit point
EVACUATION SITE	Position of evacuation site/post mission landing site.

Appendix H - 5 Multiple Aircraft SAR Operations

SAR Aircraft Entry and Exit Reports

Aircraft Entry Report

The Entry Report should be given to ACO/RCC before entering the area of SAR action (at least 20NM/10 minutes flight time to casualty).

1. Call sign
2. Nationality
3. Type (specify fixed-wing or helicopter and type)
4. Position
5. Altitude and altimeter setting
6. Estimated Time of Arrival
7. Endurance on scene
8. Remarks (specific equipment or limitations)
9. POB (crew, other personnel)

Example of Entry Report: *"Air Coordinator, Lifeguard 901; one Swedish S-76 rescue helicopter; position 25 NM south of Ronneby; 1500 ft. on QNH 1013; ETA holding point North 1015Z; Endurance on scene 2 hours; no limitations, 4 crew on board"*

Aircraft Exit Report

The Exit Report should be given to the ACO/RCC before leaving the area of SAR action.

1. CALL SIGN
2. Persons on Board (crew, other personnel, rescued)
3. Estimated Time of Arrival at destination
4. Requirements at destination (fuel, medical care, food etc.)
5. Estimated Time of Arrival back in operations area
6. Remarks (e.g. Hoist position, weather, etc.)

Example of Exit Report: *"Air Coordinator, Lifeguard 901; total POB 9, 4 crew and 5 rescued; ETA to EVAC 1230Z; Require fuel after landing; ETA back in area 1430Z; hoist position 5535.9N 01659E"*

Appendix H - 6 Multiple Aircraft SAR Operations

Pilot Information File

"AIR COORDINATOR" 123.100 MHz

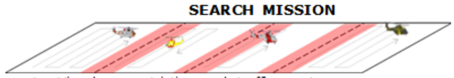
ENTRY REPORT / 20 NM before reaching area!

1. Callsign
2. Nationality
3. Type (FIXED/HELICOPTER AND TYPE)
4. Position
5. Altitude and altimeter setting
6. ETA (RELEVANT POINT OR SEARCH AREA)
7. Endurance on scene
8. Remarks (EQUIPMENT – LIMITATIONS)
9. POB (crew, other personnel)

REPORTING

- **Reaching** assigned points.
- **Leaving** assigned points.
- **Commencing** operations (search, investigation during search, approach to surface/ship, missed approach, hoist, landing etc).
- **Completing** operations, including information regarding results.
- Leaving present altitude.
- Reaching new altitude.
- 10 minutes to completing hoist operation or search.
- 30 minutes on scene endurance, expecting fuel at (location)
- Exit Report: POB, ETA and requirements at destination, ETA back in operations area and any remarks (hoist position and weather)

SEARCH MISSION



1. Visual – no restrictions, only traffic reports
2. Flow – spacing by flow: separation of ETA, CSP's
3. Coordination zones – example 1 NM on each side of border. Call neighbouring helo before entering coordination zone and when exiting 1NM
4. No fly zones – Do not enter buffer zone.

NOTE:
The ACO provides only ADVISORY information, aircraft commanders are responsible for the safety of own aircraft.
Notify ACO immediately if unable to comply with instructions received.

***

ANNEX 9

BIENNIAL STATUS REPORT

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
1.1.2.2	Response to matters related to the Radiocommunication ITU R Study Group and ITU World Radiocommunication Conference	Annual	MSC	NCSR		Completed	Completed	MSC 94/21 paragraph 9.29-9.32; NCSR 1/28, sections 16 and 17, and annexes 13, 14 and 15; NCSR 2/23, sections 12 and 13 and annexes 6 and 7
1.1.2.3	Unified interpretation of provisions of IMO safety, security, and environment related Conventions	Continuous	MSC / MEPC		III / PPR / CCC / SDC / SSE / NCSR	Ongoing	Ongoing	MSC 78/26, paragraph 22.12; NCSR 1/28, section 24, and annexes 21 and 22; NCSR 2/23, section 19
1.3.4.1	Amendments to the IAMSAR Manual	Continuous	MSC	NCSR		Ongoing	Ongoing	NCSR 1/28, section 21; NCSR 2/23,

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
								section 18 and annex 8
2.0.3.1	Further development of the Global SAR Plan for the provision of maritime SAR services (2017)	2015	MSC	NCSR		In progress	In progress	NCSR 1/28, section 20; NCSR 2/23, section 16
Notes: Recognizing that it was very important to consider the further development of the Global SAR Plan and that proposals might be submitted, the Sub-Committee agreed to invite the Committee to extend the target completion year for this output to 2017.								
2.0.3.2	Annual list of IMO documents and publications to be held by MRCCs	Annual	MSC	NCSR		Completed	N/A	
Notes: This work is always carried out as regular work under planned output 2.0.3.3. NCSR 1 deleted this output.								
2.0.3.3	Guidelines on harmonized aeronautical and maritime search and rescue procedures, including SAR training matters (2017)	2015	MSC	NCSR		Ongoing	Ongoing	NCSR 1/28, paragraph 19.13; MSC 94/21, paragraph 18.19; NCSR 2/23, section 15
Notes: As this is an ongoing item, the Committee has been requested for extension to 2017.								
2.0.3.4	Procedures for routeing distress information in the GMDSS (2017)	2015	MSC	NCSR		In progress	Completed	NCSR 1/28, section 20; NCSR 2/23, section 17

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 that no documents had been submitted on this item for several years, the Sub-Committee agreed to invite the Committee to delete this planned output.							
5.1.2.2	Measures to protect the safety of persons rescued at sea (2017)	2014	MSC / FAL	NCSR	III	Postponed	Postponed	MSC 84/24, paragraph 22.25 NCSR 1/28, section 22
Notes:	NCSR 1 invited MSC 94 to move this output to the PBA, with 2 sessions for completion.							
5.2.1.3	Review of general cargo ship safety	2014	MSC		SDC / NCSR / III / HTW	No work requested of organ by parent	No work requested of organ by parent	MSC 90/28, paragraph 25.10; MSC 93/22, paragraph 15.7
5.2.1.15	Mandatory Code for ships operating in polar waters	2015	MSC / MEPC	SDC	HTW / PPR / SSE / NCSR	Completed	N/A	MSC 86/26, paragraph 23.32; MSC 93/22, paragraph 10.44; NCSR 1/28, section 23, and annexes 18, 19 and 20
Notes:	The work on this output requested from the Sub-Committee has been completed by NCSR 1.							
5.2.1.16	Non mandatory instrument on regulations for non-convention ships	2015	MSC	III	PPR / SDC / SSE / NCSR / HTW	No work requested of organ by parent	No work requested of organ by parent	MSC 92/26, section 12;

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
5.2.1.23	Guidelines for wing-in-ground craft	2015	MSC	SDC	SSE / NCSR / HTW	No work requested of organ by parent	No work requested of organ by parent	MSC 88/26, paragraph 23.30;
5.2.2.11 (UO)	Recognition of Galileo as a component of the WWRNS (2016)	2015	MSC	NCSR		N/A	In progress	MSC 93/22, paragraph 20.22.1; NCSR 2/23, section 4
Notes:	This output was approved by MSC 93, with a target completion year of 2016							
5.2.4.1	Routeing measures and mandatory ship reporting systems	Continuous	MSC	NCSR		Ongoing	Ongoing	NCSR 1/28, section 3; NCSR 2/23, section 3 and annex 1
5.2.4.2	Updates to the LRIT system	Continuous	MSC	NCSR		Ongoing	Ongoing	NCSR 1/28 section 8 and annexes 5 and 6 NCSR 2/23, section 5 and annexes 2 and 3
5.2.4.4	Revised guidelines for the on board operational use of shipborne automatic identification systems (AIS)	2014	MSC	NCSR		Completed	N/A	NCSR 1/28, section 11 and annex 9
5.2.4.5	Consolidation of ECDIS-related IMO circulars	2014	MSC	NCSR		Completed	N/A	NCSR 1/28, section 5

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
5.2.4.6	Explanatory footnotes to SOLAS regulations V/15, V/18, V/19 and V/27	2014	MSC	NCSR		Completed	N/A	MSC 90/28, paragraph 25.27 NCSR 1/28, section 7
5.2.4.7	Approved satellite navigation system "BeiDou" in the maritime field	2014	MSC	NCSR		Completed	N/A	MSC 91/22, paragraph 19.20 NCSR 1/28, section 6 and annex 4
5.2.4.8	Guidelines on the carriage of ECDIS	2014	MSC	NCSR		Completed	N/A	NCSR 1/28, section 4
5.2.4.9	Performance standards for multi-system shipborne navigation systems	2015	MSC	NCSR		In progress	In progress	NCSR 1/28, section 10; NCSR 2/23, section 7 and annex 5
Notes:	the Performance standards have been finalized, however the Committee has been invited to modify output 5.2.4.9 to read: "Guidelines associated with multi-system shipborne radionavigation receivers dealing with the harmonized provision of PNT data and integrity information", with 2017 as the target completion year.							
5.2.5.1	Guidelines on MSI (maritime safety information) provisions	Continuous	MSC	NCSR		Ongoing	Ongoing	NCSR 1/28, section 15 and annex 12 NCSR 2/23, section 11
Notes:	NCSR 2 agreed that the consideration of issues related to the "Further development of the GMDSS master plan on shore-based facilities" could in future take place under this output and invited the Committee to rename this output as "Updating of the GMDSS Master Plan and guidelines on MSI (maritime safety information)"							

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
5.2.5.2	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 NCSR 1/28, section 13 and annexes 10 and 11; MSC 94/21, paragraph 9.26; NCSR 2/23, section 9
Notes:	Taking into account that the Detailed Review was in a very early stage and could not be finalized by NSCR 2, MSC 94 agreed to extend this planned output for an additional year (to 2018) and approved the revised Plan of work.							
5.2.5.3	Analysis of developments in maritime radiocommunication systems and technology	2014	MSC	NCSR		Postponed	Postponed	NCSR 1/28, section 12; MSC 94/21, para 18.19; NCSR 2/23, section 8
Notes:	Recognizing that it was very important to consider developments in maritime radiocommunication systems and technology and that further proposals might be submitted, the Committee has been invited to extend the target completion year for this planned output to 2017							
5.2.5.4	Analysis of information on developments in Inmarsat and Cospas-Sarsat	Continuous	MSC	NCSR		Ongoing	Ongoing	NCSR 1/28, section 18 and annex 16; NCSR 2/23, section 14

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	NCSR 1/28, section 9 and annexes 7 and 8 NCSR 2/23, section 6 and annex 4
Notes: as the work on this output has been completed, the Committee has been invited to delete this planned output from the biennial agenda								
7.1.2.2	Designated Special Areas and PSSAs and their associated protective measures	Continuous	MEPC		NCSR	No work requested of organ by parent	No work requested of organ by parent	
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 of organ by parent	No work requested of organ by parent	MSC 92/26, paragraph 22.29;

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ANNEX 10

PROPOSED BIENNIAL AGENDA FOR THE 2016-2017 BIENNIUM*

Planned output number	Description	Parent organ(s)	Coordinating organ(s)	Associated organ(s)	Target completion year
1.1.2.2	**Response to matters related to the Radiocommunication ITU R Study Group and ITU World Radiocommunication Conference**	**MSC**	**NCSR**		**Annual**
1.1.2.3	**Unified interpretation of provisions of IMO safety, security, and environment related Conventions**	**MSC/MEPC**		**III / PPR / CCC / SDC / SSE / NCSR**	**Continuous**
1.3.4.1	**Amendments to the IAMSAR Manual**	**MSC**	**NCSR**		**Continuous**
2.0.3.1	**Further development of the Global SAR Plan for the provision of maritime SAR services (2017)**	**MSC**	**NCSR**		**2017**
2.0.3.3	**Guidelines on harmonized aeronautical and maritime search and rescue procedures, including SAR training matters (2017)**	**MSC**	**NCSR**		**2017**
5.1.2.2	Measures to protect the safety of persons rescued at sea (2017)	MSC/FAL	NCSR	III	2 Sessions

* The Sub-Committee's 2014-2015 biennial agenda, as set out in annex 27 to document MSC 94/21. Outputs printed in bold have been selected for the draft provisional agenda for NCSR 3, as shown in annex 3. Struck-out text indicates proposed deletions. Output numbers are subject to change by A 29.

Planned output number	Description	Parent organ(s)	Coordinating organ(s)	Associated organ(s)	Target completion year
5.2.1.16	Non mandatory instrument on regulations for non-convention ships	MSC	III	PPR / SDC / SSE / NCSR / HTW	2015
5.2.1.23	Guidelines for wing-in-ground craft	MSC	SDC	SSE / NCSR / HTW	2016
5.2.2.11 (UO)	**Recognition of Galileo as a component of the WWRNS**	**MSC**	**NCSR**		**2016**
5.2.4.1	**Routeing measures and mandatory ship reporting systems**	**MSC**	**NCSR**		**Continuous**
5.2.4.2	**Updates to the LRIT system**	**MSC**	**NCSR**		**Continuous**
5.2.4.9*	**Guidelines associated with multi-system shipborne radionavigation receivers dealing with the harmonized provision of PNT data and integrity information**	**MSC**	**NCSR**		**2017**
To be assigned	**Interconnection of NAVTEX and Inmarsat SafetyNET receivers and their display on Integrated Navigation Display Systems**	**MSC**	**NCSR**		**2016**

* Note: the Performance standards have been finalized, however the Committee has been invited to modify output 5.2.4.9 to read: "Guidelines associated with multi-system shipborne radionavigation receivers dealing with the harmonized provision of PNT data and integrity information", with 2017 as the target completion year.

Planned output number	Description	Parent organ(s)	Coordinating organ(s)	Associated organ(s)	Target completion year
5.2.5.1*	**Updating of the GMDSS master plan and guidelines on MSI (maritime safety information) provisions**	**MSC**	**NCSR**		**Continuous**
5.2.5.2**	**Completion of the detailed review of the Global Maritime Distress and Safety System (GMDSS)**	**MSC**	**NCSR**	**HTW**	**2016**
5.2.5.2**	**Draft Modernization Plan of the Global Maritime Distress and Safety System (GMDSS)**	**MSC**	**NCSR**	**HTW**	**2017**
5.2.5.3	**Analysis of developments in maritime radiocommunication systems and technology**	**MSC**	**NCSR**		**2017**
5.2.5.4	**Analysis of information on developments in Inmarsat and Cospas-Sarsat**	**MSC**	**NCSR**		**Continuous**
7.1.2.2	Designated Special Areas and PSSAs and their associated protective measures	MEPC		NCSR	Continuous
12.1.2.1	Analysis of casualty and PSC data to identify trends and develop knowledge and risk-based recommendations	MSC/MEPC	III	HTW / PPR / CCC / SDC / SSE / NCSR	Annual

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* Note: NCSR 2invite the Committee to broaden this output to "Updating of the GMDSS master plan and guidelines on MSI (maritime safety information)"

** Note: The interim outputs for 2016 and 2017 are different. This output is to be completed in 2018.

ANNEX 11

DRAFT PROVISIONAL AGENDA FOR NCSR 3

Provisional agenda for NCSR 3

Opening of the session

1 Adoption of the agenda

2 Decisions of other IMO bodies

3 Routeing measures and mandatory ship reporting systems (5.2.4.1)

4 Recognition of Galileo as a component of the WWRNS (5.2.2.11 UO)

5 Updates to the LRIT system (5.2.4.2)

6 Guidelines associated with multi-system shipborne radionavigation receivers dealing with the harmonized provision of PNT data and integrity information (5.2.4.9)

7 Analysis of developments in maritime radiocommunication systems and technology (5.2.5.3)

8 Interconnection of NAVTEX and Inmarsat SafetyNET receivers and their display on Integrated Navigation Display Systems (TBA)

9 Completion of the detailed review of the Global Maritime Distress and Safety System (GMDSS) (5.2.5.2)

10 Updating of the GMDSS master plan and guidelines on MSI (maritime safety information) provisions (5.2.5.1)

11 Response to matters related to the Radiocommunication ITU R Study Group (1.1.2.2)

12 Response to matters related to ITU World Radiocommunication Conference (1.1.2.2)

13 Analysis of information on developments in Inmarsat and Cospas-Sarsat (5.2.5.4)

14 Guidelines on harmonized aeronautical and maritime search and rescue procedures, including SAR training matters (2.0.3.3)

15 Further development of the Global SAR Plan for the provision of maritime SAR services (2.0.3.1)

16 Amendments to the IAMSAR Manual (1.3.4.1)

17 Unified interpretation of provisions of IMO safety, security, and environment related Conventions (1.1.2.3)

18 Biennial agenda and provisional agenda for NCSR 4

19 Election of Chairman and Vice-Chairman for 2017

20 Any other business

21 Report to the Maritime Safety Committee

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ANNEX 12

STATEMENTS BY DELEGATIONS*

ITEM 1

Statement by the delegation of Malta

Thank you Mr Chairman.

May I start on a positive note.
The Maltese delegation welcomes and would like to express Malta's support for the initiative of the Secretary-General together with other United Nations Agencies and, the industry in relation to unsafe mixed migration by sea. The high-level meeting hosted by IMO last week was a big step forward. It is augured that it heralds a multilateral, cooperative and comprehensive approach to address concretely this complex problem that has grave repercussions, including the huge taxing of the search and rescue forces. This initiative is a positive signal and it is important that the momentum is maintained; it has to be a sustained development. Once again, congratulations to the Secretary-General for his initiative and drive and, to the heads of the different UN agencies and, to the industry for their response.

On the other hand, this delegation is still disappointed that the only item on the agenda of this sub committee dealing with search and rescue, the disembarkation of persons rescued at sea, was, at our last meeting, downgraded to consideration, at best, once every biennium. This certainly was a rather negative signal incongruent to the precarious situation prevailing particularly in the Mediterranean that led to the Secretary-General remarking last week that the coastguards, navies and the rescue infrastructure as a whole are all being stretched to breaking point.

We indeed welcome that the Legal and the Maritime Safety Committees and the Council will be taking up this subject which has many facets and we augur that this sub committee will address the issues with urgency. It is beyond discussion that search and rescue is within the remit of this sub committee and we must not shirk away from our involvement in the crucial issues related thereto. The Secretary-General has reminded us that the sheer size and scale of situation in Europe and elsewhere today is threatening to jeopardise long-established humanitarian principles surrounding search and rescue and the treatment of people rescued from the sea. This should be of direct concern to this sub committee. We cannot ignore realities, considering, again to quote the Secretary-General, that current search and rescue capabilities are barely able to deal with the tidal wave of people needing to be picked up from the sea.

We would like this sub committee to record its great appreciation for the competent SAR authorities in Italy and Malta that, despite severe problems and capabilities stretched to breaking point, have continued rendering their services and, in the process, have rescued thousands of persons. The strenuous effort has come at the price of great risk to themselves and at considerable cost to our countries.

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* Statements have been included in this annex in the order in which they were given, sorted by agenda items, and in the language of submission (including translation into any other language if such translation was provided). Statements are available in all the official languages on audio file: http://docs.imo.org/Meetings/Media.aspx

This sub committee must also record its deep appreciation to the crews and owners of a big number of merchant ships that had been diverted from their routes to rescue persons at sea. The crews of these ships faced perils and dangers to their health and the ship owners suffered also considerable losses in order that they can render these deeply humanitarian services.

The fact and figures quoted by the Secretary-General in his opening remarks are a testimony to all this.

Finally, this time to end on a positive note, Malta agrees that there is scope for greater efforts by coastal States of departure to better manage the process of migration and to reduce the numbers of unsafe craft undertaking sea voyages. We also agree that we do not need another contact group because yes, IMO could provide a forum of Governments, UN Agencies and the shipping community to tackle the problem of mass rescue of migrants in the Mediterranean. In this regard Malta reiterates its support for the proposed actions outlined by the Secretary-General in his opening remarks.

Mr Chairman we would appreciate if this statement is included in the report of this sub committee.

Thank you.

ITEM 8

Statement by the delegation of the International Mobile Satalite Organization (IMSO)

IRIDIUM - PROGRESS REPORT TO NCSR-2

IMSO informed the Subcommittee that on 29 December 2014 formalized an agreement with Iridium Satellite LLC to perform this technical and operational evaluation of an application for recognition as provider of GMDSS satellite services. In accordance with this Agreement, IMSO is entitled to recover from Iridium the full costs for the evaluation and report, and funds have been deposited by Iridium to that end.

IMSO has therefore started to prepare for this process in the most cost-effective manner, in close cooperation with Iridium and keeping the US as sponsoring Government and IMO in its oversight role, duly informed, in particular about the establishment of a Group of Experts to perform the technical and operational evaluation which has been appointed integrating 3 independent consultant experts, 3 government seconded experts, 1 project administrator and 1 observer from US.

Independent Experts
Ms Betty Bonnardel-Azzarelli of France
Mr Ismail Cicek of Turkey
Mr Howard Feldman of United Kingdom

Seconded Expert Advisors:
Mr. Sergey Starik of Russia
Mr. Qu Yijiang of China

Observer: Mr Brad Benbow of United States Coastguard
Project Administrator: Mr. Jon Bilbao of Spain

IMSO clarified that the ToR initially adopted by the IMSO Advisory Committee back in 2005 before the work associated to such evaluation would have been assessed, have been used as the a guidance, maintaining the initial number of three independent experts supported by two additional experts seconded by interested governments at no cost to IMSO, so the GoE would be able to deal with all the five different elements identified in document MSC 94/9/2 in relation with Earth Stations, Space Segment, Mobile Terminals, Terrestrial Networks, GMDSS and Search and Rescue communications. In order to achieve higher cost-efficiency, IMSO also clarified that in consultation with all involved, a project administrator has been appointed within the GoE to manage the administrative and operational workload that the assessment process will generate to the IMSO Directorate taking into account that IMSO's in-house resources are limited and subject to daily fees which would considerably increase the costs associated to the evaluation.

IMSO expressed its appreciation to all those IMSO Member States who have offered experts on a seconded basis and to all those professionals who have registered in the roster of experts and informed that Members of the Group of Experts have accepted and signed the appropriate Terms of Engagement, including a confidential agreement. A kick off meeting of the Group of Experts will take place on 12 March 2015. It is expected that the Group of Experts will organize its own work in coordination with the IMSO Directorate, working by correspondence as far as possible and meeting as appropriate. Preliminary arrangements to visit Iridium headquarters and facilities in the United States are also in the process to be finalized.

IMSO reiterated that the scope of the technical and operational evaluation of the Iridium mobile satellite system will be to assess compliance with the criteria set out in IMO Resolution A.1001(25) on CRITERIA FOR THE PROVISION OF MOBILE SATELLITE COMMUNICATION SYSTEMS IN THE GLOBAL MARITIME DISTRESS AND SAFETY SYSTEM (GMDSS), taking into account the guidance laid down in IMO Circular MSC.1/Circ.1414 on GUIDANCE TO PROSPECTIVE GMDSS SATELLITE SERVICE PROVIDERS.

A report on the outcome of the technical and operational evaluation shall be drafted by the Group of Experts and presented by the IMSO Director General for consideration by the next NCSR-3.0

Statement by the delegation of the International Mobile Satalite Organization (IMSO)

IMSO clarified that the ToR initially adopted by the IMSO Advisory Committee back in 2005 before the work associated to such evaluation would have been assessed, have been used as a guidance, maintaining the initial number of three independent experts supported by two additional experts seconded by interested governments at no cost to IMSO, so the GoE would be able to deal with all the five different elements identified in document MSC 94/9/2 in relation with Earth Stations, Space Segment, Mobile Terminals, Terrestrial Networks, GMDSS and Search and Rescue communications. In order to achieve higher cost-efficiency, IMSO also clarified that in consultation with all involved, a project administrator has been appointed within the GoE to manage the administrative and operational workload that the assessment process will generate to the IMSO Directorate in thye most cost-effective manner taking into account that IMSO's in-house resources are limited and subject to daily fees which would considerably increase the costs associated to the evaluation.

Statement by the delegation of the United States

The US thanks the authors of NCSR-2/8 for raising their concerns. We note that similar issues were raised in NCSR 2/9/2 and are being addressed in the Communications Working Group as part of the GMDSS Modernization discussion. Nevertheless, this delegation feels it necessary to clarify certain points with regard to interoperability and terrestrial connectivity.

Before we do, let's not forget that the IMO has embraced the policy of having more than one GMDSS service provider to improve reliability, to add redundancy, to expand coverage to underserved Polar areas, and to offer competitive services and competitive pricing.

Let's also remember that this body established the requirements for a new GMDSS service provider in Resolution A.1001(25) as clarified by Circular 1414. MSC 94 agreed that the scope of the evaluation of the Iridium system was limited to the criteria set out in resolution A.1001(25).

As was recognized yesterday, the issues raised in NCSR 2/8, as well as similar concerns raised by the same authors in NCSR 2/9/2, relate to any provider of GMDSS, and to the current model for the provision of GMDSS services. This Sub-committee determined yesterday, that the matters of interoperability, network performance and incremental costs be referred to the communications working group for inclusion in the GMDSS modernization work that is underway. As such, these concerns should not alter or delay review or approval of the Iridium application in accordance with Res. 1001(25).

In response to the issue of interoperability, the U.S Delegation does not agree with the analogy offered by the distinguished Delegate from France. We all make calls to mobile phones served by any number of different carriers from our various devices and the calls are completed seamlessly. All one needs is the phone number of another subscriber and the call is completed through interconnection with the Public Switched Telephone Network (PSTN). This same scenario applies to GMDSS services whether provided by Iridium or Inmarsat – or any other carrier as long as the interconnection requirements of Resolution 1001(25) are complied with.

The GMDSS is a system of systems, all of which must be interoperable with each other. If there is compliance with Res. 1001(25), then interoperability is assured. Ship stations using just the Inmarsat network, or any combination of satellite networks are able to communicate with each other through inter-network connections using ITU standards.
RCCs will need to maintain the ability to communicate with a vessel in a distress situation regardless of the approved network the vessel elects to use. Resolution A.1001(25) specifically states that an approved network "should be connectable to the public switched telephone network" and that "satellite systems using the public switched network for routing maritime distress calls and distress traffic to and from MRCCs should, … immediately attempt to establish the connection necessary for the transfer of the distress alert or message."

Furthermore, section 4.4.1 of the Resolution states that "The satellite system should have a reliable communication links to one or more associated MRCCs. The arrangements between the system and the MRCC are subject to approval by the national administration." Therefore, in order to demonstrate compliance with Resolution A.1001(25) Iridium will have to interconnect to an MRCC using PSTN infrastructure. This interconnection will ensure that all the required functionality of GMDSS calls is provided.

Turning to the issue of additional requirements and equipment for SAR authorities and RCCs, an RCC does not need an Iridium terminal to receive or respond to distress alerts, or to transmit distress alert relays. The means used by a particular RCC or SAR authority to access the Iridium system will vary according to the particular needs and capabilities of the RCC or SAR authority. The ability to receive and to send alerts from the RCC will generally be the same methods used today for the existing GMDSS satellite provider, Inmarsat.

Iridium is discussing requirements with the RCCs and SAR authorities to determine what arrangements are necessary.

Authority to de-orbit

Under international treaties of the United Nations, space-capable nations have responsibility for operators under their jurisdiction. Accordingly, there are internationally-agreed best practices for the disposal of satellites to limit liability and risk at the end of their lives, which are developed by national space agencies then adopted by the UN. This same scenario is in place for Inmarsat, which is overseen by the UK, and for every other country in this room.

Under existing agreements with Iridium, the U.S. Government has broad authority to order the de-orbit of one or more of Iridium's ***current*** satellites. This same authority does not extend to Iridium's next generation satellites scheduled to begin launch later this year. Because Iridium's current constellation will be fully replaced over the next couple years, GMDSS services will primarily be supported by its new constellation. Therefore, the U.S. does not believe that the de-orbit provisions should be a concern, and they will not interfere with Iridium's ability to support GMDSS communications and adhere to the notice provisions of the Public Services Agreement.

Thank you.

ITEM 14

Statement by the delegation of Argentina

Declaración por doc NCSR 2/14/2

Gracias Sr. pte (buenos días a todos)

Sr. Presidente, agradecemos en primer término a Cospas-Sarsat por la presentación del documento NCSR 2/14/2 y apoyamos las solicitudes del secretariado de Cospas-Sarsat a las Administraciones de notificar los casos de no respuesta de sus (SPOCs) y de modificar la resolución A.818(19) de OMI. Además, solicitamos una corrección editorial del cuadro Nº 5 que aparece en la pagina 6 del documento y que menciona en la tercera columna como "Punto de Contacto de Búsqueda y Rescate (SPOC)" a Islas Malvinas. De acuerdo al punto 4 de la directiva editorial de Naciones Unidas ST/CS/SER.A/42 se deberá incluir una nota al pie cuando haya una referencia aislada respecto a ese territorio en disputa de soberanía como es este caso.

Sr. Presidente esta delegación solicita que nuestra declaración se incluya en el informe final.

Muchas gracias

ITEM 22

Statement by the delegation of the United States

Thank you, Mr. Chairman.

The United States refers to Assembly Resolution A.706(17), as amended, which provides guidance on the IMO/IHO World-Wide Navigational Warning Service and to MSC/Circ. 893 which appeals to all Member States to abide by Resolution A.706(17). By this resolution, member governments are asked to notify the designated coordinators of incidents which might affect the safety of navigation, in order to transmit navigational warning and maritime safety information to the ships in the sea area concerned.

In connection with this resolution, according to U.S. government information, the Democratic Peoples Republic of Korea (DPRK) on March 1 launched two Scud-class short-range ballistic missiles in an easterly direction into the sea without issuing prior notices or warnings consistent with resolution A.706(17). It is unclear how many merchant ships, fishing vessels, or any other types of vessels, were operating in or near the vicinity during the time of the reported launches.

This incident is not the first time that the DPRK launched a missile without giving prior navigational warning. The Subcommittee may recall that our delegation made a similar intervention at our first meeting in 2014, noting that in 2014 and in previous years, missiles were launched without prior warnings, thereby exposing ships and seafarers to a potentially grave threat. These unannounced missile launches are a serious threat not only to neighboring States but also to the established order of maritime safety, and are unacceptable to all IMO Member States who have interests in the safe use of the sea.

The United States would like to take this opportunity to urge all IMO Member States to conduct such exercises consistent with Resolution A.706(17). We call again on the DPRK to provide adequate notice for all operations that affect the safety of navigation.

Thank you, Mr. Chairman.

Statement by the delegation of the Republic of Korea

Thank you Mr. Chairman.

The Republic of Korea fully supports the statement of the United States.

Under IMO Resolution A.706 (17), Member States of the IMO are obliged to notify the designated coordinators of incidents which might affect the safety of navigation, including the launch of missiles, in order to transmit navigational warning and maritime safety information to States and ships in the sea area concerned.

This resolution was established to remove threats to navigational safety in international waters before they occur.

In this context, the Republic of Korea would like to highlight that the Democratic People waters before they occur. ents which might affect the safety of navigation, including the launch of missiles, in or

Thank you Mr. Chairman.

Statement by the delegation of the Democratic Peoples' Republic of Korea

Thank you Mr. Chairman.
Good afternoon the distinguished delegates.

With regard to the issue raised by the United States, the missile fire by the Korean People's Army were conducted based on a scientific calculation of the whole course of the rocket firing and the scrupulous security check and search for flight orbit and targeted waters.

It had no slight impact not only on the regional peace and security but on international navigation order and ecological environment.

The self-defensive missile fires which are performed in the DPRK's territorial waters constitute a legitimate and sovereign right of the independent state, which can never be abandoned as long as danger of aggression exists against it.

It is none other than the U.S. that posed serious threats to maritime safety and international navigation by which conducting joint military exercise with Republic of Korea and all kinds of cutting-edge weapon test-fires in the Korean peninsula and its surrounding waters.

Mr. Chairman, as you may be well aware, U.S. started Key Resolve and Foal Eagle joint military exercises, war exercise for invading the DPRK with south Korea from 2nd March to 24th April despite our repeated warnings.

The exercises are intolerable aggression moves pursuant to the U.S. Korea strategy designed to "bring down" the socialist system chosen by the Korean people and at the same time, the U.S. also seeks to keep the situation on the peninsula tense and maintain the pretext for arms buildup in the Asia-Pacific region.

The U.S. has no right to make an issue of the self-defensive step by the DPRK.
The DPR Korea will, as in the past, so also in the future, fulfil its responsibility and role as an independent IMO member by acting strictly in conformity with requirements of the IMO resolutions.

Mr. Chairman, last but not least, this delegation would like to highlight that this organization is inappropriate place to discuss the self-defensive military exercise in a member state's territorial waters and hence kindly request your sub-committee that this kind of issue should not be raised in the further meetings.

Thank you, sir.

Statement by the delegation of Japan

Thank you, Mr. Chairman,

Japan fully supports the points made by the United States, in respect to the danger to navigation raised by the Democratic People's Republic of Korea's launch of missiles without giving navigational warnings.

Recognizing that such acts should be taken as a serious problem by all IMO Member States from the viewpoint of navigational safety, Japan joins the United States and others in calling on the Democratic People's Republic of Korea to provide adequate advance notice for all operations that affect the safety of navigation, as provided in the IMO Assembly resolution A.706(17), as amended.

Thank you, Mr. Chairman.

Statement by the delegation of France

Si il est une mission qui est au cœur des compétences de l'OMI c'est bien la sécurité de la navigation. Or, un tir de missile sans information préalable présente un danger réel pour la navigation et c'est à ce titre que nous soutenons la déclaration faite par la délégation des Etats Unis d'Amérique.

Statement by the delegation of the Marshall Islands

Mr. Chairman,

This is not the first occasion we have spoken on this issue, which we recollect was raised at our last session (NCSR 1). Mr Chairman, the Marshall Islands would support the statements which we have received in this connection and we would agree with the concerns that any un-notified activities of this nature could have safety implications for shipping and seafarers. We would also note that Member Governments should abide by and implement the relevant IMO Resolutions.

Thank you Sir.

Statement by the delegation of Australia

Australia supports the statements of the United States, the Republic of Korea, Japan, France and the Marshall Islands.

The firing of missiles into the sea poses a threat to the safety of navigation and life at sea. This risk is dramatically heightened when there is no notification that such a test may occur. Australia is firmly of the view that international shipping and seafarers should not be exposed to such risk. It is an appropriate opportunity to remind Member States of obligations under chapter V of SOLAS and of the need for sufficient notification through the World Wide Navigational Warning Service.