

JOINT IMO/ITU EXPERTS GROUP ON
MARITIME RADIOCOMMUNICATION
MATTERS
20th meeting
Agenda item 9

IMO/ITU EG 20/9
28 October 2024
ENGLISH ONLY

REPORT TO THE NCSR SUB-COMMITTEE AND ITU

1 INTRODUCTION

1.1 The twentieth meeting of the Joint IMO/ITU Experts Group on Maritime Radiocommunication Matters (the Group) was held at the IMO Headquarters in London, from Monday, 7 to Friday, 11 October 2024, and was chaired by Mr. A. Jennings (Ireland).

1.2 The meeting was conducted in person, complemented by hybrid meeting capabilities, taking into account the relevant decisions of C 127 (C 127/D, paragraph 17.3).

1.3 The Group was attended by delegations from the following Member States:

ANGOLA	MEXICO
ARGENTINA	NAMIBIA
AUSTRALIA	NETHERLANDS (KINGDOM OF THE)
BAHAMAS	NIGERIA
BELGIUM	NORWAY
BRAZIL	PAKISTAN
CANADA	PANAMA
CHILE	PORTUGAL
CHINA	ROMANIA
CÔTE D'IVOIRE	RUSSIAN FEDERATION
EGYPT	SAUDI ARABIA
FRANCE	SOUTH AFRICA
GERMANY	SPAIN
INDIA	TOGO
INDONESIA	TÜRKİYE
IRELAND	UNITED KINGDOM
JAPAN	UNITED STATES
LIBERIA	VIET NAM
MALAYSIA	

1.4 The Group was also attended by representatives from the following United Nations specialized agency:

INTERNATIONAL TELECOMMUNICATION UNION (ITU)
WORLD METEOROLOGICAL ORGANIZATION (WMO)

by observers from the following intergovernmental organizations:

EUROPEAN COMMISSION (EC)
MARITIME ORGANISATION FOR WEST AND CENTRAL AFRICA (MOWCA)
INTERNATIONAL MOBILE SATELLITE ORGANIZATION (IMSO)
INDIAN OCEAN MEMORANDUM OF UNDERSTANDING ON PORT STATE
CONTROL (IO MoU)

and from the following non-governmental organizations in consultative status:

INTERNATIONAL CHAMBER OF SHIPPING (ICS)
INTERNATIONAL ELECTROTECHNICAL COMMISSION (IEC)
INTERNATIONAL ASSOCIATION OF MARINE AIDS TO NAVIGATION AND
LIGHTHOUSE AUTHORITIES (IALA)
COMITE INTERNATIONAL RADIO-MARITIME (CIRM)
THE NAUTICAL INSTITUTE

2 ADOPTION OF THE AGENDA (AGENDA ITEM 1)

2.1 The Group recalled that the Sub-Committee on Navigation, Communications and Search and Rescue (NCSR), at its eleventh session (4 to 13 June 2024), approved the terms of reference which were made available in Circular Letter No.4897.

2.2 The Group agreed on the provisional agenda as set out in document IMO/ITU EG 20/1.

3 BRIEFING ON THE OUTCOME OF RELEVANT IMO AND ITU BODIES (AGENDA ITEM 2)

3.1 The Group noted the information provided in documents:

- .1 IMO/ITU EG 20/2 (IMO Secretariat) on the outcomes of NCSR 11 and MSC 108; and
- .2 IMO/ITU EG 20/2/1 (ITU Secretariat) on the outcome of ITU-R Working Parties (WPs) 1A (12 to 19 June 2024), 4C (24 to 30 April 2024) and 5B (14 to 24 May 2024),

and took them into account under the deliberations of different agenda items.

4 OUTCOME OF WRC-23 AND PRELIMINARY DRAFT IMO POSITION ON WRC-27 AGENDA ITEMS (AGENDA ITEM 3)

Outcome of the ITU World Radiocommunication Conference 2023

4.1 The Group noted the information provided in document IMO/ITU EG 20/3 (Secretariat) regarding the outcome of the ITU World Radiocommunication Conference 2023 (WRC-23), in particular, on matters concerning maritime services.

4.2 With regard to the outcome of WRC-23 agenda item 1.11, Issue C, concerning the provision of GMDSS services by the BeiDou Message Service System (BDMSS), the Group noted the information provided in document IMO/ITU EG 20/3/5 (United States) on the ongoing interference issues affecting Iridium's satellite system.

4.3 In this regard, the Group noted also an update provided by the delegation of China concerning the progress made so far and the actions planned to be taken by the BDMSS system operator (i.e. China National Administration of GNSS and Applications (CNAGA)) to facilitate completion of the frequency coordination of BDMSS as soon as possible.

4.4 The Group noted that coordination and interference issues remained under the consideration of ITU.

4.5 In response to a question raised regarding the ITU mechanism to deal with developments concerning Resolution **365 (WRC-23)**, the ITU Secretariat explained that any progress made on this issue would be reported to WRC-27 by the Director of the Radiocommunication Bureau as indicated in the *instructs* part of Resolution **365 (WRC-23)**.

Preliminary draft IMO position on WRC-27 agenda items

4.6 The Group considered document IMO/ITU EG 20/3/1 (Secretariat) providing an initial draft for the development of a preliminary draft IMO position on relevant WRC-27 agenda items, taking into account the comments and proposals in document IMO/ITU EG 20/3/4 (France) concerning WRC-27 agenda items 1.11, 1.12, 1.16 and 1.19.

4.7 The Group considered also additional proposals made on WRC-27 agenda items 1.2, 1.5, 1.9, 1.11, 1.12 and 1.16, and incorporated them into the preliminary draft IMO position, in square brackets, to facilitate further discussion at NCSR 12.

4.8 After consideration, the Group prepared a preliminary draft IMO position on relevant WRC-27 agenda items, as set out in annex 1, for consideration and further development by the NCSR Sub-Committee.

4.9 The Group noted that the draft IMO position should be finalized in 2026 for approval and submission to the ITU Conference Preparatory Meeting for WRC-27, which had not been scheduled yet.

WRC-27 agenda item 1.12

4.10 The Group gave preliminary consideration to document IMO/ITU EG 20/3/2 (Secretariat), presenting a liaison statement from ITU-R WP 4C to IMO on WRC-27 agenda item 1.12, taking into account the related comments and proposals in document IMO/ITU EG 20/3/3 (United Kingdom and United States).

4.11 During the consideration, the following views were expressed:

- .1 noting the interest from other services to use the frequency band 1 645.5-1 646.5 MHz, IMO should present concrete use cases to retain this frequency band;
- .2 given that the NCSR Sub-Committee had not yet been tasked to consider the communication needs for MASS, it would be premature to suggest using this frequency band for future MASS operations; and
- .3 this frequency band remained unused since 2006 because it was only allowed to be used for distress and safety communications by L-band EPIRBs.

4.12 The Group noted diverging views on whether IMO's reply to ITU should contain a statement expressing IMO's support for using the frequency band 1 645.5-1 646.5 MHz by recognized mobile satellite service providers, noting that this had already been communicated to ITU through the IMO position on WRC-23 agenda item 1.11. With regard to the inclusion of an option for future use of this frequency band by the Fleet Safety Service (resolution MSC.450(99)), the Group was of the view that further consideration would be required. Notwithstanding the above, the Group agreed to include statements on these issues in square brackets for further consideration by the NCSR Sub-Committee.

4.13 After consideration, the Group prepared a draft liaison statement to ITU-R WP 4C, with copy to ITU-R WP 5B, on WRC-27 agenda item 1.12 concerning the current and planned use of the frequency band 1 645.5-1 646.5 MHz by systems within the purview of the IMO, as set out in annex 2, for consideration by NCSR 12.

5 REVISION OF RECOMMENDATION ITU-R M.1371-5 (AGENDA ITEM 4)

5.1 The Group considered document NCSR 11/6/6 (United States) proposing draft amendments to table 53 of Recommendation ITU-R M.1371-5, taking into account the relevant discussions at NCSR 11 and the related provisions of the draft revised AIS performance standards (NCSR 11/19, annex 15), as agreed by NCSR 11.

5.2 In this regard, the Group also gave preliminary consideration to document IMO/ITU EG 20/4 (Secretariat) presenting a liaison statement from ITU-R WP 5B to IMO on the revision of Recommendation ITU-R M.1371-5, including the latest text of the draft revision of the Recommendation.

5.3 The Group noted that the additional ship types proposed in document NCSR 11/6/6 for inclusion in table 53 of Recommendation ITU-R M.1371-5 were intended to provide more granularity in ship type identifiers to enhance the maritime domain awareness for ships and vessel traffic services. The Group noted also that document NCSR 11/6/6 proposed to replace table 53 with a new table that would better accommodate the 99 ship type identifiers.

5.4 The Group reviewed a revised proposal of ship types presented by the delegation of the United States addressing the comments and concerns expressed at NCSR 11, regarding, in particular, the proposed deletion of existing ship types, new ship type identifier Nos 26 and 27 (i.e. "self-propelled autonomous watercraft" and "self-propelled remotely operated watercraft", respectively) and carriage of dangerous goods.

5.5 The Group noted that the ship type identifier was entered into the AIS equipment during the initial installation of the equipment to provide general information on the type of the ship and that this identifier was not intended to define the activity the ship might be engaged in at any given time.

5.6 The Group noted also that any change made to the list of ship types in Recommendation ITU-R M.1371-5 would be implemented on new equipment only and that the existing AIS shipborne equipment could not be upgraded to support such change.

5.7 After a detailed review, the Group prepared a draft new table of ship types (i.e. table A7-8), containing new ship types as well as amendments to the existing ship types, for inclusion in the draft revision of Recommendation ITU-R M.1371-5. Any changes on which the Group could not reach a consensus were left in square brackets for further consideration by the NCSR Sub-Committee. The Group included an extra column in the draft new table to enable comparison between the current and the proposed new lists of ship types.

5.8 The Group recalled that NCSR 10 had previously advised ITU-R WP 5B that the proposed amendments to Recommendation ITU-R M.1371-5 concerning the VDES capability indicator would be considered after IMO had progressed the work on the introduction of VDES (NCSR 10/22/Add.1, annex 10). In anticipation of the conclusion of the necessary work on the development of VDES performance standards at NCSR 12, the Group noted general support for the inclusion of the VDES capability indicator in the revision of Recommendation ITU-R M.1371-5 and agreed that ITU-R WP 5B should be notified accordingly, subject to the relevant VDES developments at NCSR 12.

5.9 Having recalled also that NCSR 11 had agreed to a draft MSC resolution on performance standards for a universal shipborne automatic identification system (AIS) (NCSR 11/19, annex 15), which was submitted to MSC 109 for adoption, the Group prepared a consequential draft amendment to the draft revision of Recommendation ITU-R M.1371-5 to align the information regarding the entry of the IMO number in AIS with the draft MSC resolution.

5.10 After consideration, the Group prepared a draft liaison statement to ITU-R WP 5B on Revision of Recommendation ITU-R M.1371-5, as set out in annex 3, for consideration by the NCSR Sub-Committee.

5.11 The Group emphasized the need for navigation experts to consider the draft liaison statement, in particular, the proposed draft new table A7-8 at NCSR 12, for completeness and integrity of the proposals therein.

5.12 The Group finally noted that once the revision of Recommendation ITU-R M.1371-5 was completed by ITU, certain IMO instruments might require consequential amendments (e.g. resolution MSC.74(69), annex 3, the draft AIS performance standards agreed by NCSR 11 (NCSR 11/19, annex 15), MSC.1/Circ.1252 and SN/Circ.227, as amended).

6 BLOCKAGE TO AIS SIGNALS CAUSED BY VHF RADIOTELEPHONY (AGENDA ITEM 5)

6.1 The Group considered document NCSR 11/6/5 (United States) concerning the blockage of the reception of AIS signals by the operation of VHF radiotelephones nearby, providing comments on possible technical solutions and proposing a draft liaison statement for submission to ITU-R WP 5B and IEC TC80.

6.2 In this regard, the Group considered also document IMO/ITU EG 20/5 (United States) proposing a way forward to address the issue of AIS signal blockage which consisted of revising the >5MHz blocking specification in Recommendation ITU-R M.1371-5.

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

- .1 some Administrations did not observe this issue within their maritime domains nor consider it a significant problem from the safety of navigation point of view;
- .2 AIS equipment with digital receivers was more prone to this problem compared to legacy equipment with analogue receivers and some administrations expressed concerns on the potential impact to VDES;
- .3 a technical solution to address this problem needed to be developed and agreed on by ITU;

- .4 any solution ITU might develop for this problem would not be compatible with existing AIS equipment and could have cost implications for new equipment; and
- .5 depending on the solution ITU would develop, IMO instruments containing equipment installation guidelines (e.g. COMSAR.1/Circ.32/Rev.2 and SN.1/Circ.227, as amended) might require consequential amendments.

6.4 While acknowledging the issue, the Group was of the view that IMO would need to review the results of further studies and/or tests to be able to analyse the impact of the AIS signal blockage problem on safety of navigation.

6.5 After the discussion, the Group prepared a draft liaison statement to ITU-R WP 5B on Blockage of AIS signals caused by VHF radiotelephony, as set out in annex 4, for consideration by the NCSR Sub-Committee.

7 DISSEMINATION OF MSI AND SAR RELATED INFORMATION THROUGH RECOGNIZED MOBILE SATELLITE SERVICES (AGENDA ITEM 6)

7.1 The Group considered document IMO/ITU EG 20/6 (Canada and United States) proposing draft amendments to SOLAS chapter IV to facilitate the dissemination of maritime safety information (MSI) and search and rescue (SAR) related information through all operational recognized mobile satellite services (RMSSs).

7.2 During consideration, some delegations supported, in principle, the proposed draft amendments to SOLAS chapter IV/5 (provision of radiocommunication services) presented in document IMO/ITU EG 20/6. However, other proposals were also presented which consisted of:

- .1 amending SOLAS regulations V/4 (navigational warnings), 5 (Meteorological services and warnings) and 7 (search and rescue services); and
- .2 amending resolution MSC.509(105) on *Provision of Radio Services for the Global Maritime Distress and Safety System*, which was referred to in a footnote under SOLAS regulation IV/5.1, by adding a new annex on criteria when providing an international enhanced group call service in the GMDSS.

7.3 The Group noted also a proposal suggesting to amend both SOLAS chapters IV and V at the same time to accommodate the new requirement. With regard to the proposed amendments to SOLAS chapter V, concerns were expressed that this would require adding new definitions (e.g. recognized mobile satellite service) and clarifying the use of certain terms (e.g. "radiocommunication" as one word) in chapter V.

7.4 After consideration, the Group agreed to present all options for further consideration by the NCSR Sub-Committee, including a list of other instruments that might require consequential amendments, as set out in annexes 5 to 7.

7.5 The Group considered also the changes made to resolution A.707(17) with respect to Recommendation ITU-T D.90 for alignment with the IMO use of the term RMSS for recognized mobile satellite service.

7.6 The Group noted that the Telecommunication Standardization Sector (ITU-T) Membership might consider submitting relevant contributions to ITU-T, taking into account the draft revision of resolution A.707(17).

8 CONSIDERATION OF MATTERS RELATED TO NAVDAT (AGENDA ITEM 7)

Draft NAVDAT Manual

8.1 The Group reviewed the draft NAVDAT manual (NCSR 10/8, annex 3), taking into account the developments at NCSR 11 and the provisions of the relevant ITU instruments, including the ITU Radio Regulations.

8.2 During discussion, the Group noted a view indicating that the technical characteristics of the NAVDAT system were compliant with the requirements of IHO S-124 navigational warnings product specifications, but relevant field tests had not been conducted yet.

8.3 Given that the draft NAVDAT Manual had many contents that were common with other IMO instruments, such as resolutions A.705(17), as amended, A.706(17), as amended, and A.1051(27), as amended, the Group noted that the draft Manual would need to be kept updated, taking into account the future revisions of such instruments.

8.4 The Group updated relevant parts of the draft Manual mainly to align the text with the draft NAVDAT performance standards approved by the NCSR Sub-Committee (NCSR 11/19, annex 5).

8.5 The Group identified a discrepancy between the draft NAVDAT Manual and the NAVTEX Manual (i.e. MSC.1/Circ.1403/Rev.2) with respect to the message priorities and broadcast procedures. It was noted that the NAVTEX Manual prescribes three levels of message priority (i.e. VITAL, IMPORTANT and ROUTINE) whereas the NAVDAT Manual describes four priority levels (i.e. DISTRESS, URGENCY, SAFETY and ROUTINE). Noting that NAVTEX broadcast was not suitable for distress traffic, the Group was of the view that sections 11.1, 11.2, 11.3 and Appendix 2, section 3.8, of the NAVDAT Manual should be further reviewed and updated, as appropriate.

8.6 The Group noted a proposal suggesting to include the terms of reference of the IMO NAVTEX Coordinating Panel, covering both NAVTEX- and NAVDAT-related matters, in a separate document similar to the terms of reference of the IMO Enhanced Group Call Coordinating Panel (i.e. MSC.1/Circ.1635).

8.7 Following consideration, the Group updated the draft NAVDAT Manual, as set out in annex 8, for further development, taking into account the views and suggestions of the Group.

Road map on the issues to be considered regarding the introduction of NAVDAT service

8.8 The Group reviewed the road map on the issues to be considered regarding the introduction of NAVDAT service (NCSR 11/WP.8, annex 5).

8.9 The Group's considerations on the road map were summarized in annex 9.

9 ANY OTHER BUSINESS (AGENDA ITEM 8)

Revision of MSC.1/Circ.1657

9.1 The Group considered document IMO/ITU EG 20/8 (Japan) proposing draft modifications to MSC.1/Circ.1657 on *Procedure for responding to DSC distress alerts by ships* to align the operational procedures for responding to DSC distress alerts by ships with those

prescribed in Recommendation ITU-R M.541-11 on *Operational procedures for the use of digital selective calling equipment in the maritime mobile service*.

9.2 While noting general support for the proposals, the Group noted also a view suggesting that the proposed draft modifications should be reviewed by both communication and SAR experts at NCSR, taking into account the potential consequential amendments to the IAMSAR Manual.

9.3 After consideration, the Group prepared draft modifications to MSC.1/Circ.1657, aligning the operational procedures for responding to DSC distress alerts by ships with those included in Recommendation ITU-R M.541-11, as set out in annex 10, for consideration by the NCSR Sub-Committee.

Development of IMT-2030 standardization

9.4 The Group noted the information provided in document IMO/ITU EG 20/INF.3 (IALA), presenting information concerning the work undertaken by IALA on the development of use cases and service requirements for marine AtoN to support the development of IMT-2030 standardization.

Manufacturer IDs for devices using a freeform number identity

9.5 The Group noted the information provided in document IMO/ITU EG 20/INF.2 (Secretariat) presenting a liaison statement from ITU-R WP 5B, copied to IMO for information only, concerning the assignment of manufacturer IDs to companies producing devices using a freeform number identity.

ITU-R meeting schedule

9.6 The Group noted that the ITU website contains information on the schedule of all ITU meetings, including those listed below that are relevant to maritime matters:

- .1 WP 4C, from 10 to 18 October 2024 (confirmed);
- .2 SG 4, 1 November 2024 (confirmed);
- .3 WP 5B, from 19 to 28 November 2024 (confirmed);
- .4 SG 5, from 2 to 3 December 2024 (confirmed);
- .5 WP 5D, from 5 to 12 February 2025 (planned);
- .6 WP 4C, from 23 April to 2 May 2025 (planned);
- .7 WP 5B, from 28 April to 9 May 2025 (planned);
- .8 WP 1A, from 11 to 18 June 2025 (planned);
- .9 WP 5D, from 24 June to 3 July 2025 (planned);
- .10 WRC-27, from 18 October to 12 November 2027 (planned).

IMO meeting schedule

- 9.7 The Group noted that the following relevant IMO meetings had been scheduled:
- .1 the thirty-first meeting of the ICAO/IMO Joint Working Group on Harmonization of Aeronautical and Maritime Search and Rescue, from 4 to 8 November 2024 (Dublin, Ireland);
 - .2 109th session of the Maritime Safety Committee, from 2 to 6 December 2024 (at IMO);
 - .3 the twelfth session of the Sub-Committee on Navigation, Communications and Search and Rescue, from 13 to 22 May 2025 (at IMO) (subject to confirmation by MSC 109); and
 - .4 110th session of the Maritime Safety Committee, from 18 to 27 June 2025 (at IMO).

Planning for the twenty-first meeting of the Group

9.8 The Group recalled that the Committee had approved holding annual meetings of the Experts Group on a continuous basis, until decided otherwise either by IMO or ITU (MSC 107/22, paragraph 17.79.1).

9.9 In this regard, the Group noted that the twenty-first meeting of the Experts Group had been provisionally scheduled to take place at IMO Headquarters in London from 6 to 10 October 2025, subject to confirmation by the NCSR Sub-Committee, at its twelfth session.

10 REPORTS TO THE NCSR SUB-COMMITTEE AND ITU (AGENDA ITEM 9)

Actions requested of the NCSR Sub-Committee

- 10.1 The NCSR Sub-Committee is invited to note the report in general and, in particular:
- .1 note the considerations on the outcome of ITU WRC-23 (paragraphs 4.1 to 4.5);
 - .2 note the progress made on the development of the preliminary draft IMO position on relevant WRC-27 agenda items and consider developing the draft IMO position further (paragraphs 4.6 to 4.9 and annex 1);
 - .3 note the preliminary consideration of a liaison statement from ITU-R WP 4C (IMO/ITU EG 20/3/2) on WRC-27 agenda item 1.12 and consider the draft reply liaison statement prepared by the Group (paragraphs 4.10 to 4.13 and annex 2);
 - .4 note the considerations on the revision of Recommendation ITU-R M.1371-5, including the preliminary consideration of a liaison statement from ITU-R WP 5B (IMO/ITU EG 20/4), and consider the draft reply liaison statement prepared by the Group (paragraphs 5.1 to 5.12, and annex 3);

- .5 note the considerations on the blockage of the AIS signal reception by the operation of VHF radiotelephony nearby and consider the draft liaison statement prepared by the Group (paragraphs 6.1 to 6.5, and annex 4);
- .6 note the considerations concerning the development of draft amendments to the SOLAS Convention to state clearly the requirement for dissemination of MSI and SAR related information through all operational RMSSs and consider the options prepared by the Group, including the list of related instruments that might require consequential amendments (paragraphs 7.1 to 7.4, and annexes 5 to 7);
- .7 note the considerations regarding the changes made to resolution A.707(17) with respect to Recommendation ITU-T D.90, for alignment with the IMO use of the term "RMSS" for recognized mobile satellite service, and that the Telecommunication Standardization Sector (ITU-T) Membership might consider submitting relevant contributions to ITU-T, taking into account the draft revision of resolution A.707(17) (paragraphs 7.5 and 7.6);
- .8 note the progress made with the review of the draft NAVDAT manual and the consideration of issues identified in the draft revised road map regarding the introduction of the NAVDAT service (paragraphs 8.1 to 8.9, and annexes 8 and 9);
- .9 note the discussion regarding the discrepancies identified between MSC.1/Circ.1657 on *Procedure for responding to DSC distress alerts by ships* and Recommendation ITU-R M.541-11 on *Operational procedures for the use of digital selective calling equipment in the maritime mobile service* with respect to the procedures for responding to DSC distress alerts by ships and consider the draft modifications to MSC.1/Circ.1657 (paragraphs 9.1 to 9.3 and annex 10); and
- .10 endorse the holding of the twenty-first meeting of the Group from 6 to 10 October 2025 at the IMO Headquarters in London (paragraphs 9.8 and 9.9),

and take any necessary action, as appropriate.

Actions requested of ITU-R

10.2 ITU-R WP 4C is invited to note the report in general and, in particular:

- .1 note the preliminary consideration of a liaison statement from ITU-R WP 4C (Annex 5 to Document 77), including the development of the preliminary draft IMO position on WRC-27 Agenda items 1.11 and 1.12 (paragraphs 4.6 to 4.13 and annexes 1 and 2),

and take any necessary action, as appropriate.

10.3 ITU-R WP 5B is invited to note the report in general and, in particular:

- .1 note the discussions on the development of the preliminary draft IMO position on WRC-27 Agenda items 1.9 and 1.12 (paragraphs 4.6 to 4.13 and annexes 1 and 2);

- .2 note the preliminary consideration of a liaison statement from ITU-R WP 5B (Annex 21 to Document 96Rev1) on the revision of Recommendation ITU-R M.1371-5, including draft amendments related to ship type identifiers (i.e. table 53) and blockage to AIS signals caused by VHF radiotelephony (paragraphs 5.1 to 6.5 and annexes 3 and 4);
- .3 note the discussions on the review of the draft NAVDAT manual and the road map on the issues to be considered regarding the introduction of the NAVDAT service (paragraphs 8.1 to 8.9 and annexes 8 and 9);
- .4 note considerations regarding the inconsistencies identified between MSC.1/Circ.1657 on *Procedure for responding to DSC distress alerts by ships* and Recommendation ITU-R M.541-11 on *Operational procedures for the use of digital selective calling equipment in the maritime mobile service* with respect to the procedures for responding to DSC distress alerts by ships and consider the draft modifications to MSC.1/Circ.1657 (paragraphs 9.1 to 9.3 and annex 10); and
- .5 note that the next meeting of the Joint IMO/ITU Experts Group was preliminarily scheduled to take place from 6 to 10 October 2025 at the IMO Headquarters in London, (paragraphs 9.8 and 9.9),

and take any necessary action, as appropriate.

ANNEX 1

PRELIMINARY DRAFT IMO POSITION ON WRC-27 AGENDA ITEMS CONCERNING MATTERS RELATING TO MARITIME SERVICES*

General

[Shipping plays a vital role in ensuring the flow of critical goods across supply chains and keeping world trade moving – over 80% of the world trade is transported by sea. The total volume of goods transported by the international maritime trade stands strong at 11 billion tonnes per year. Dry cargo (bulk, container or packaged) accounts for about 73% of these goods while crude oil and other petroleum products (e.g. gas and chemicals) claim 27%. The international maritime industry employs about 1.89 million seafarers working on approximately 103,000 ships of 100 gross tons and above. On the other hand, some specific incidents during the last two years that caused global supply chain crises have shown the high degree of the world's dependency on a functioning maritime trade.

While facilitating global trade, the safety and security of ships and protection of the marine environment remain core principles of the maritime industry. In this context, radiocommunication services are essential to ensure safe, secure and sustainable shipping. For this very reason, maritime spectrum should be maintained, protected and expanded further based on the needs of the maritime industry.]

Agenda item 1.1

~~1.1 to consider the technical and operational conditions for the use of the frequency bands 47.2-50.2 GHz and 50.4-51.4 GHz (Earth-to-space), or parts thereof, by aeronautical and maritime earth stations in motion communicating with space stations in the fixed-satellite service and develop regulatory measures, as appropriate, to facilitate the use of the frequency bands 47.2-50.2 GHz and 50.4-51.4 GHz (Earth-to-space), or parts thereof, by aeronautical and maritime earth stations in motion communicating with geostationary space stations and non-geostationary space stations in the fixed-satellite service, in accordance with Resolution 176 (Rev.WRC-23);~~

Background

TBD

Actions to be taken:

TBD

Preliminary draft IMO position

TBD

[Agenda item 1.2

1.2 to consider possible revisions of sharing conditions in the frequency band 13.75-14 GHz to allow the use of uplink fixed-satellite service earth stations with smaller antenna sizes, in accordance with Resolution **129 (WRC-23)**;

* Agenda items that contain no proposals for preliminary draft IMO positions had been retained in this document and are shown with strikethrough.

Background

[Vessel traffic services use radars operating in the frequency band 13.75-14 GHz.]

Actions to be taken:

[To monitor studies (the responsible group is ITU-R WP 4A)]

Preliminary draft IMO position

[To ensure that any change to the regulatory provisions and technical conditions resulting from this agenda item do not adversely impact shore-based radars operating under the radionavigation services.]

Agenda item 1.3

~~1.3 — to consider studies relating to the use of the frequency band 51.4-52.4 GHz to enable use by gateway earth stations transmitting to non-geostationary satellite orbit systems in the fixed-satellite service (Earth-to-space), in accordance with Resolution **130 (WRC-23)**;~~

Background

TBD

Actions to be taken:

TBD

Preliminary draft IMO position

TBD

Agenda item 1.4

~~1.4 — to consider a possible new primary allocation to the fixed-satellite service (space-to-Earth) in the frequency band 17.3-17.7 GHz and a possible new primary allocation to the broadcasting-satellite service (space-to-Earth) in the frequency band 17.3-17.8 GHz in Region 3, while ensuring the protection of existing primary allocations in the same and adjacent frequency bands, and to consider equivalent power flux-density limits to be applied in Regions 1 and 3 to non-geostationary satellite systems in the fixed-satellite service (space-to-Earth) in the frequency band 17.3-17.7 GHz, in accordance with Resolution **726 (WRC-23)**;~~

Background

TBD

Actions to be taken:

TBD

Preliminary draft IMO position

TBD

[Agenda item 1.5

1.5 to consider regulatory measures, and implementability thereof, to limit the unauthorized operations of non-geostationary-satellite orbit earth stations in the fixed-satellite and mobile-satellite services and associated issues related to the service area of non-geostationary-satellite orbit satellite systems in the fixed-satellite and mobile-satellite services, in accordance with Resolution **14 (WRC-23)**;

Background

[Non-GSO systems provide critical communication services, including safety-of-life communications used by the maritime services.]

[The existing ITU-R regulatory measures under Article 18 of the Radio Regulations and Resolutions 22 (Rev.WRC-23) and 25 (Rev.WRC-23) address unauthorized Earth-to-space transmissions of non-GSO earth stations, and impose mandatory licensing and authorization obligations, while respecting the sovereignty and regulatory responsibilities of individual Member States, provide adequate frameworks for addressing Earth-to-space unauthorized operations of non-GSO earth stations.]

Actions to be taken:

TBD

Preliminary draft IMO position

[It is important to note that non-GSO systems provide critical communication services, including essential safety-of-life communications for maritime services. Consequently, it is important to avoid unnecessary overregulation and ensure the continuity of essential communication services, particularly in emergency and distress scenarios.]

Agenda item 1.6

~~1.6 to consider technical and regulatory measures for fixed-satellite service satellite networks/systems in the frequency bands 37.5-42.5 GHz (space-to-Earth), 42.5-43.5 GHz (Earth-to-space), 47.2-50.2 GHz (Earth-to-space) and 50.4-51.4 GHz (Earth-to-space) for equitable access to these frequency bands, in accordance with Resolution **131 (WRC-23)**;~~

Background

~~TBD~~

Actions to be taken:

~~TBD~~

Preliminary draft IMO position

~~TBD~~

Agenda item 1.7

~~1.7 — to consider studies on sharing and compatibility and develop technical conditions for the use of International Mobile Telecommunications (IMT) in the frequency bands 4 400-4 800 MHz and 7 125-8 400 MHz (or parts thereof), and 14.8-15.35 GHz taking into account existing primary services operating in these, and adjacent, frequency bands, in accordance with Resolution **256 (WRC-23)**;~~

Background

TBD

Actions to be taken:

TBD

Preliminary draft IMO position

TBD

Agenda item 1.8

~~1.8 — to consider possible additional spectrum allocations to the radiolocation service on a primary basis in the frequency range 231.5-275 GHz and possible new identifications for radiolocation service applications in frequency bands within the frequency range 275-700 GHz for millimetric and sub-millimetric wave imaging systems, in accordance with Resolution **663 (Rev.WRC-23)**~~

Background

TBD

Actions to be taken:

TBD

Preliminary draft IMO position

TBD

Agenda item 1.9

1.9 to consider appropriate regulatory actions to update Appendix **26** to the Radio Regulations in support of aeronautical mobile (OR) high frequency modernization, in accordance with Resolution **411 (WRC-23)**;

Background

[RR Appendix 15 and RR Appendix 26 have interleaving frequency allocations. This agenda item proposes creating “wideband” operations by combining both contiguous and non-contiguous channels within RR Appendix 26. There is a need to ensure we protect the integrity of the RR Appendix 15 channels.]

Actions to be taken:

[To monitor studies (the responsible group is ITU-R WP 5B)]

Preliminary draft IMO position

TBD

Agenda item 1.10

~~1.10 — to consider developing power flux-density and equivalent isotropically radiated power limits for inclusion in Article 21 of the Radio Regulations for the fixed-satellite, mobile-satellite and broadcasting-satellite services to protect the fixed and mobile services in the frequency bands 71-76 GHz and 81-86 GHz, in accordance with Resolution 775 (Rev.WRC-23);~~

Background

~~TBD~~

Actions to be taken:

~~TBD~~

Preliminary draft IMO position

~~TBD~~

Agenda item 1.11

1.11 to consider the technical and operational issues, and regulatory provisions, for space-to-space links among non-geostationary and geostationary satellites in the frequency bands 1 518-1 544 MHz, 1 545-1 559 MHz, 1 610-1 645.5 MHz, 1 646.5-1 660 MHz, 1 670-1 675 MHz and 2 483.5-2 500 MHz allocated to the mobile-satellite service, in accordance with Resolution 249 (Rev.WRC-23);

Background

Frequencies for distress and safety communications for the Global Maritime Distress and Safety System (GMDSS) are listed in Appendix 15 of the Radio Regulations. Among them, the bands 1 530-1 544 MHz, 1 544-1 545 MHz, 1 614.4225-1 618.725, 1 616.3-1 620.38 MHz, 1 621.35-1 626.5 MHz, 1 626.5-1 645.5 MHz, 1 645.5-1 646.5 MHz and 2 483.59-2 499.91 MHz are overlapping with or adjacent to the bands considered under WRC-27 agenda item 1.11.

Actions to be taken:

To monitor studies (the responsible group is ITU-R WP 4C)

Preliminary draft IMO position

The integrity of GMDSS should be protected.

[IMO supports the consideration of appropriate technical and regulatory provisions at WRC-27 to address Resolution 249 (Rev. WRC-23) and provide for accommodating

space-to-space links in the frequency bands 1 518-1 544 MHz, 1 545-1 559 MHz, 1 610-1 645.5 MHz, 1 646.5-1 660 MHz, 1 670-1 675 MHz and 2 483.5-2 500 MHz while ensuring the protection of, and without imposing additional regulatory or technical constraints on, maritime safety services in these bands and adjacent frequency bands.]

Agenda item 1.12

1.12 to consider, based on the results of studies, possible new allocations to the mobile-satellite service and possible regulatory actions in the frequency bands 1 427-1 432 MHz (space-to-Earth), 1 645.5-1 646.5 MHz (space-to-Earth) (Earth-to-space), 1 880-1 920 MHz (space-to-Earth) (Earth-to-space) and 2 010-2 025 MHz (space-to-Earth) (Earth-to-space) required for the future development of low-data-rate non-geostationary mobile-satellite systems, in accordance with Resolution **252 (WRC-23)**;

Background

The L-Band satellite EPIRB service was withdrawn on 1 December 2006 and is no longer available for such use. Nevertheless, the frequency band 1645.5-1646.5 MHz is still in appendix 15 of the RR which lists the frequencies for GMDSS and according to Article RR No. 5.375: The use of the frequency band 1 645.5-1 646.5 MHz by the mobile-satellite service (Earth-to-space) and for inter-satellite links is limited to distress, urgency and safety communications (see Article 31 of the Radio Regulations).

Actions to be taken:

To monitor studies and liaise with ITU-R WP 4C (the responsible group for this agenda item)

Preliminary draft IMO position

[To retain the frequency band 1 645.5-1 646.5 MHz for the GMDSS use.]

Agenda item 1.13

~~1.13 to consider studies on possible new allocations to the mobile-satellite service for direct connectivity between space stations and International Mobile Telecommunications (IMT) user equipment to complement terrestrial IMT network coverage, in accordance with Resolution **253 (WRC-23)**;~~

Background

TBD

Actions to be taken:

TBD

Preliminary draft IMO position

TBD

Agenda item 1.14

~~1.14 to consider possible additional allocations to the mobile-satellite service, in accordance with Resolution **254 (WRC-23)**;~~

Background

TBD

Actions to be taken:

TBD

Preliminary draft IMO position

TBD

Agenda item 1.15

~~1.15 to consider studies on frequency-related matters, including possible new or modified space research service (space-to-space) allocations, for future development of communications on the lunar surface and between lunar orbit and the lunar surface, in accordance with Resolution **680 (WRC-23)**;~~

Background

TBD

Actions to be taken:

TBD

Preliminary draft IMO position

TBD

Agenda item 1.16

1.16 to consider studies on the technical and regulatory provisions necessary to protect radio astronomy operating in specific Radio Quiet Zones, and in frequency bands allocated to the radio astronomy service on a primary basis globally, from aggregate radio-frequency interference caused by non-geostationary-satellite orbit systems, in accordance with Resolution **681 (WRC-23)**;

Background

Satellite communications supported by non-GSO satellites networks operating in bands listed in Table 1 of Resolution **681 (WRC-23)** are used for maritime activities.

Actions to be taken:

To monitor studies (the responsible group is ITU-R WP 7D)

Preliminary draft IMO position

Option 1

[IMO supports regulatory provisions to protect radio astronomy operation in specific Radio Quiet Zones, and in frequency bands allocated to the radio astronomy service on a primary basis without putting undue constraints on non-GSO satellites networks providing maritime services.]

Option 2

[IMO supports conducting the sharing and compatibility studies called for in Resolution 681 (WRC-23), *resolves* 1 to 2 and limited to the frequency bands in Table 1 of Resolution 681 (WRC-23) where the Radio Astronomy Service (RAS) is allocated on a primary basis. Concerning *resolves* 3 to 6 of Resolution 681 (WRC-23). It is important not to take actions that could impose undue constraints on non-GSO operations used for maritime safety services.]

Agenda item 1.17

~~1.17 — to consider regulatory provisions for receive-only space weather sensors and their protection in the Radio Regulations, taking into account the results of ITU Radiocommunication Sector studies, in accordance with Resolution **682 (WRC-23)**;~~

Background

~~TBD~~

Actions to be taken:

~~TBD~~

Preliminary draft IMO position

~~TBD~~

Agenda item 1.18

~~1.18 — to consider, based on the results of ITU Radiocommunication Sector studies, possible regulatory measures regarding the protection of the Earth exploration-satellite service (passive) and the radio astronomy service in certain frequency bands above 76 GHz from unwanted emissions of active services, in accordance with Resolution **712 (WRC-23)**;~~

Background

~~TBD~~

Actions to be taken:

~~TBD~~

Preliminary draft IMO position

~~TBD~~

Agenda item 1.19

1.19 to consider possible primary allocations in all Regions to the Earth exploration-satellite service (passive) in the frequency bands 4 200-4 400 MHz and 8 400-8 500 MHz, in accordance with Resolution **674 (WRC-23)**;

Background

[Sea surface temperature measurements are important for detecting and forecasting meteorological events that drastically impact the safety and security of maritime activities.]

Actions to be taken:

[To monitor studies (the responsible group is ITU-R WP 7C)]

Preliminary draft IMO position

[IMO supports appropriate regulatory provisions to safeguard operation of Earth exploration satellite service (EESS) (passive) to perform sea surface temperature measurements, possibly with a new EESS primary allocation in the frequency bands 4 200-4 400 MHz and 8 400-8 500 MHz.]

Agenda item 2

2 to examine the revised ITU Radiocommunication Sector Recommendations incorporated by reference in the Radio Regulations communicated by the Radiocommunication Assembly, in accordance with *further resolves* of Resolution **27 (Rev.WRC-19)**, and to decide whether or not to update the corresponding references in the Radio Regulations, in accordance with the principles contained in *resolves* of that Resolution;

Background

TBD

Actions to be taken:

None identified

Preliminary draft IMO position

- 1 IMO has examined the Recommendations of relevance and commented on each as given in Annex 1;
- 2 Incorporation by reference is of importance to IMO because of the close relationship between the ITU-R Recommendations related to GMDSS equipment and their operation and the related IMO performance standards; and
- 3 IMO requests an early indication of any changes proposed by ITU to the mechanism of incorporation by reference and to the list of incorporated ITU-R Recommendations.

Agenda item 4

4 in accordance with Resolution **95 (Rev.WRC-19)**, to review the resolutions and recommendations of previous conferences with a view to their possible revision, replacement or abrogation;

Background

TBD

Actions to be taken:

None identified

Preliminary draft IMO position

IMO has reviewed the Resolutions and Recommendations of relevance and commented on each as given in Annex 2.

Agenda item 9

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-23:

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 10

10 to recommend to the ITU Council items for inclusion in the agenda for the next world radiocommunication conference, and items for the preliminary agenda of future conferences, in accordance with Article 7 of the ITU Convention and Resolution **804 (Rev.WRC-23)**,

Background

TBD

Actions to be taken:

TBD

Preliminary draft IMO position

TBD

ANNEX 1

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 chapter IV. Likely to be needed by the maritime community in 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)

Needed by IMO to support the reception of MSI by ships as required by SOLAS chapter IV.

RECOMMENDATION ITU-R M.541-11
Operational procedures for the use of digital selective-calling equipment in the maritime mobile service
(1978-1982-1986-1990-1992-1994-1995-1996-1997-2004-2015-2023)

Needed by IMO. Likely to be needed in the foreseeable future.

RECOMMENDATION ITU-R M.585-9
Assignment and use of identities in the maritime mobile service
(1982-1986-1990-2003-2007-2009-2012-2015-2022)

Required by IMO and useful for the maritime community.

RECOMMENDATION ITU-R M.633-5
Transmission characteristics of a satellite emergency position-indicating radio beacon (satellite EPIRB) system operating through a satellite system in the 406 MHz band
(1986-1990-2000-2004-2010-2023)

Used by IMO to support the Performance standards for EPIRBs.

RECOMMENDATION ITU-R M.690-3
Technical characteristics of emergency position-indicating radio beacons (EPIRBs) operating on the carrier frequencies of 121.5 MHz and 243 MHz
(1990-1995-2012-2015)

Used by IMO to define the homing signal characteristics for the 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.

RECOMMENDATION ITU-R M.1084-5
Interim solutions for improved efficiency in the use of the band 156-174 MHz by stations in the maritime mobile service
(1994-1995-1997-1998-2001-2012)

Used by IMO for the description of VHF channels.

RECOMMENDATION ITU-R M.1171-1
Radiotelephony procedures in the maritime mobile service
(1995-2023)

Required by IMO and the maritime community.

RECOMMENDATION ITU-R M.1172-0
Miscellaneous abbreviations and signals to be used for radiocommunications in the maritime mobile service
(1995)

Required by the maritime community.

RECOMMENDATION ITU-R M.1173-1
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 -2012)

Required by IMO and the maritime community and likely to be required in the foreseeable future.

RECOMMENDATION ITU-R M.1174-4
Technical characteristics of equipment used for onboard vessel communications in the bands between 450 and 470 MHz
(1995-1998- 2004-2015-2019)

Required by the maritime community and useful for IMO.

RECOMMENDATION ITU-R M.1652-1
Dynamic frequency selection in wireless access systems including radio local area networks for the purpose of protecting the radiodetermination service in the 5 GHz band
(2003-2011)

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-23)

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-19)

Protection of the systems operating in the mobile-satellite service in the frequency band 406-406.1 MHz

Retain.

RESOLUTION 207 (REV.WRC-15)

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-23)

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 radiocommunication operations between SOLAS ships and non-SOLAS ships.

RESOLUTION 344 (REV.WRC-19)

Management of the maritime identity numbering resource

Retain.

RESOLUTION 349 (REV.WRC-23)

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 (REV. WRC-23)
Distress and safety radiotelephony procedures for 2 182 kHz

Retain.

RESOLUTION 356 (REV. WRC-19)
ITU maritime service information registration

Retain.

RESOLUTION 363 (REV. WRC-23)
Considerations to improve utilization of the VHF maritime frequencies in Appendix 18

Retain. The item is in the preliminary agenda for WRC-31.

RESOLUTION 364 (WRC-23)
Coordination of services provided by the NAVDAT system

Retain.

RESOLUTION 612 (REV. WRC-12)
Use of the radiolocation service between 3 and 50 MHz to support 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 (REV. WRC-23)
Operational procedures for earth stations on board vessels (ESVs) use

Retain.

RECOMMENDATION 316 (REV. WRC-19)
Use of ship earth stations within harbours and other waters under national jurisdiction

Retain.

ANNEX 2

DRAFT LIAISON STATEMENT TO ITU-R WORKING PARTY 4C (COPY TO ITU-R WORKING PARTY 5B)

WRC-27 agenda item 1.12

1 IMO's Sub-Committee on Navigation, Communications and Search and Rescue (NCSR) would like to thank ITU-R Working Party 4C (WP 4C) for its liaison statement of 20 April 2024, containing information on the current and future use of the frequency band 1 645.5 – 1 646.5 MHz, relating to WRC-27 agenda item 1.12.

2 The NCSR Sub-Committee, at its [...] session from [...] to [...] considered the liaison statement and provided the following comments:

- .1 The IMO position on WRC-23 agenda item 1.11 supported the “*continued use of the L-Band frequencies for maritime operations and GMDSS following the removal of L-band EPIRBs*” (MSC 107/20). WRC-23 modified the provisions in RR No 5.375 to expand the use of the frequency band 1 645.5-1 646.5 MHz by the mobile-satellite service (Earth-to-space) and inter-satellite links for urgency communications in addition to the distress and safety communications.
- .2 [IMO continues to support the use of 1 MHz band by recognized MSS providers for GMDSS.]
- .3 [Proposals were made to make use of this band for maritime safety services. It is also under study to introduce a range of maritime services to expand the safety of navigation in the near future. Use of the frequency band [1 626.5] [1 645.5]-1 646.5 MHz by the mobile-satellite service (Earth-to-space) is planned for the Fleet Safety service, which is an IMO-recognized MSS (resolution MSC.450(99) refers), with testing expected in the fourth quarter of 2024, with service introduction envisaged in the third quarter of 2025.]
- .4 In progressing its studies, IMO recommends that WP 4C takes into consideration the use and protection of this band for GMDSS satellite communications by recognised MSS providers. It is expected that the technical characteristics of the satellite communication services identified for use within and adjacent to the frequency band 1645.5-1646.5 MHz will be elaborated through studies in ITU-R WP 5B, the Joint IMO/ITU Experts Group and the NCSR Sub-Committee, and then liaised to ITU-R WP 4C for further consideration.

3 IMO invites ITU-R WP 4C to consider the information provided and take action, as appropriate.

ANNEX 3

DRAFT LIAISON STATEMENT TO ITU-R WORKING PARTY 5B

Revision of Recommendation ITU-R M.1371-5

1 IMO's Sub-Committee on Navigation, Communications and Search and Rescue (NCSR) would like to thank ITU-R Working Party 5B (WP 5B) for its liaison statement to IMO (Annex 21 to Document 5B/96/Rev.1) relating to the proposed revisions of Recommendation ITU-R M.1371-5.

2 In addition to its liaison statements to ITU-R WP 5B from 4 July 2022 (i.e. Document 5B/225) and 22 June 2023 (i.e. Document 5B/755), IMO would like to further provide the following information on the subject:

Ship type identifier

IMO is of the view that the additional ship type identifiers provided in the annex, for inclusion in Table A7-8 of Recommendation ITU-R M.1371-5, as revised by ITU-R WP 5B, would enhance ship, vessel traffic services and the shore-side maritime domain awareness and assist marine spatial planning.

[VDES capability indicator

Noting that work on VDES performance standards was [concluded at NCSR12 and pending its approval at MSC [...]], IMO advises that a VDES capability indicator would be beneficial in the proposed revisions of Recommendation ITU-R M.1371-5.]

IMO number

The following text is proposed to be added as a footnote for the "IMO number" parameter contained in Table A7-7:

"IMO number parameter should be in accordance with the IMO ship identification number scheme adopted by IMO (Resolution A.1117(30)). If the ship does not have an IMO number, an official flag State number should be used."

3 IMO invites ITU-R WP 5B to consider the information provided and take action, as appropriate.

Annex

**Table A7-8
Identifiers to be used by ships to report their type**

Identifier No.	Existing Type of Ships	Proposed Type of Ships
Special purpose ship		
01	Reserved for future use	Science / Research vessel
02	Reserved for future use	Training vessel
03	Reserved for future use	Ship owned or operated by a government
04	Reserved for future use	Ice breaker
05	Reserved for future use	Buoy (Aids to Navigation) tender
06	Reserved for future use	Cable layer
07	Reserved for future use	Pipe layer
08	Reserved for future use	Reserved for future use
09	Reserved for future use	Special purpose ship, no additional information
Support vessel		
10	Reserved for future use	Reserved for future use
11	Reserved for future use	FPSO (Floating, Production, Storage, Offloading) vessel
12	Reserved for future use	Fish factory ship
13	Reserved for future use	Fish farm support vessel
14	Reserved for future use	Offshore support vessel, etc.
15	Reserved for future use	Reserved for future use
16	Reserved for future use	Reserved for future use
17	Reserved for future use	[Construction vessel]
18	Reserved for future use	[Crew boat]
19	Reserved for future use	Support vessel, no additional information
Wing-in-ground vessel		
20	WIG, all ships of this type	WIG, all ships of this type
21	WIG, carrying DG, HS, or MP, IMO hazard or pollutant category X	WIG, carrying DG, HS, or MP, IMO hazard or pollutant category X
22	WIG, carrying DG, HS, or MP, IMO hazard or pollutant category Y	WIG, carrying DG, HS, or MP, IMO hazard or pollutant category Y
23	WIG, carrying DG, HS, or MP, IMO hazard or pollutant category Z	WIG, carrying DG, HS, or MP, IMO hazard or pollutant category Z
24	WIG, carrying DG, HS, or MP, IMO hazard or pollutant category OS	WIG, carrying DG, HS, or MP, IMO hazard or pollutant category OS
25	Reserved for future use	Reserved for future use
26	Reserved for future use	Reserved for future use
27	Reserved for future use	Reserved for future use
28	Reserved for future use	Reserved for future use
29	WIG vessel, no additional information	WIG vessel, no additional information
Special craft		
30	Fishing vessel	Fishing vessel
31	Towing	Towing
32	Towing and length of the tow exceeds 200 m or breadth exceeds 25 m	Towing and length of the tow exceeds 200 m or breadth exceeds 25 m

33	Engaged in dredging or underwater operations	Dredger
34	Engaged in diving operations	Diving vessel
35	Engaged in military operations	Warship or naval auxiliary
36	Sailing vessel	Sailing vessel
37	Pleasure craft	Pleasure motor craft
38	Reserved for future use	Trawler
39	Reserved for future use	Patrol vessel
High-speed craft (HSC)		
40	HSC, all ships of this type	HSC, all ships of this type
41	HSC, carrying DG, HS, or MP, IMO hazard or pollutant category X	HSC, carrying DG, HS, or MP, IMO hazard or pollutant category X
42	HSC, carrying DG, HS, or MP, IMO hazard or pollutant category Y	HSC, carrying DG, HS, or MP, IMO hazard or pollutant category Y
43	HSC, carrying DG, HS, or MP, IMO hazard or pollutant category Z	HSC, carrying DG, HS, or MP, IMO hazard or pollutant category Z
44	HSC, carrying DG, HS, or MP, IMO hazard or pollutant category OS	HSC, carrying DG, HS, or MP, IMO hazard or pollutant category OS
45	Reserved for future use	HSC, carrying passengers
46	Reserved for future use	HSC Ro-Ro ship (vehicle / rail)
47	Reserved for future use	Reserved for future use
48	Reserved for future use	Reserved for future use
49	HSC, no additional information	HSC, no additional information
Special craft		
50	Pilot vessel	Pilot vessel
51	Search and rescue vessels	Search and rescue vessels
52	Tugs	Tugs
53	Port tenders	Port or fish tenders
54	Vessels with anti-pollution facilities or equipment	Anti-pollution or firefighting responder
55	Law enforcement vessels	Law enforcement vessels
56	Spare – for assignments to local vessels	Spare 1 – for assignments to local vessels
57	Spare – for assignments to local vessels	Spare 2 – for assignments to local vessels
58	Medical transports (as defined in the 1949 Geneva Conventions and Additional Protocols)	Medical transports (as defined in the 1949 Geneva Conventions and Additional Protocols)
59	Ships and aircraft of States not parties to an armed conflict	Ships of States not parties to an armed conflict
Passenger ships		
60	Passenger ships, all ships of this type	Passenger ships, all ships of this type
61	Passenger ships, carrying DG, HS, or MP cargo, IMO hazard or pollutant category X	Passenger ships, carrying DG, HS, or MP cargo, IMO hazard or pollutant category X
62	Passenger ships, carrying DG, HS, or MP cargo, IMO hazard or pollutant category Y	Passenger ships, carrying DG, HS, or MP cargo, IMO hazard or pollutant category Y
63	Passenger ships, carrying DG, HS, or MP cargo, IMO hazard or pollutant category Z	Passenger ships, carrying DG, HS, or MP cargo, IMO hazard or pollutant category Z
64	Passenger ships, carrying DG, HS, or MP cargo, IMO hazard or pollutant category OS	Passenger ships, carrying DG, HS, or MP cargo, IMO hazard or pollutant category OS
65	Reserved for future use	Passenger (cruise) ship
66	Reserved for future use	Passenger (ferry) ship
67	Reserved for future use	Passenger (excursion) ship (i.e., harbour cruise boat, whale watcher, etc.)
68	Reserved for future use	Reserved for future use

69	Passenger ships, no additional information	Passenger ships, no additional information
Cargo ships		
70	Cargo ships, all ships of this type	Cargo ships, all ships of this type
71	Cargo ships, carrying DG, HS, or MP, IMO hazard or pollutant category X	Cargo ships, carrying DG, HS, or MP, IMO hazard or pollutant category X
72	Cargo ships, carrying DG, HS, or MP, IMO hazard or pollutant category Y	Cargo ships, carrying DG, HS, or MP, IMO hazard or pollutant category Y
73	Cargo ships, carrying DG, HS, or MP, IMO hazard or pollutant category Z	Cargo ships, carrying DG, HS, or MP, IMO hazard or pollutant category Z
74	Cargo ships, carrying DG, HS, or MP, IMO hazard or pollutant category OS	Cargo ships, carrying DG, HS, or MP, IMO hazard or pollutant category OS
75	Reserved for future use	Cargo ship, bulk carrier
76	Reserved for future use	Cargo ship, container ship
77	Reserved for future use	Cargo ship, roll-on-roll-off carrier
78	Reserved for future use	Cargo ship, landing craft
79	Cargo ships, no additional information	Cargo ships, no additional information
Tanker(s)		
80	Tanker(s), all ships of this type	Tanker(s), all ships of this type
81	Tanker(s), carrying DG, HS, or MP, IMO hazard or pollutant category X	Tanker(s), carrying DG, HS, or MP, IMO hazard or pollutant category X
82	Tanker(s), carrying DG, HS, or MP, IMO hazard or pollutant category Y	Tanker(s), carrying DG, HS, or MP, IMO hazard or pollutant category Y
83	Tanker(s), carrying DG, HS, or MP, IMO hazard or pollutant category Z	Tanker(s), carrying DG, HS, or MP, IMO hazard or pollutant category Z
84	Tanker(s), carrying DG, HS, or MP, IMO hazard or pollutant category OS	Tanker(s), carrying DG, HS, or MP, IMO hazard or pollutant category OS
85	Reserved for future use	Tanker(s), non-hazardous or non-pollutant carrier
86	Reserved for future use	Integrated / articulated tug and tank barge (ABCD values should reflect tug and barge dimensions)
87	Reserved for future use	Reserved for future use
88	Reserved for future use	Reserved for future use
89	Tanker(s), no additional information	Tanker(s), no additional information
Other types of ship		
90	Other types of ship	Other types of ship
91	Other types of ships, carrying DG, HS, or MP, IMO hazard or pollutant category X	Other types of ships, carrying DG, HS, or MP, IMO hazard or pollutant category X
92	Other types of ships, carrying DG, HS, or MP, IMO hazard or pollutant category Y	Other types of ships, carrying DG, HS, or MP, IMO hazard or pollutant category Y
93	Other types of ships, carrying DG, HS, or MP, IMO hazard or pollutant category Z	Other types of ships, carrying DG, HS, or MP, IMO hazard or pollutant category Z
94	Other types of ships, carrying DG, HS, or MP, IMO hazard or pollutant category OS	Other types of ships, carrying DG, HS, or MP, IMO hazard or pollutant category OS
95	Reserved for future use	Reserved for future use
96	Reserved for future use	Reserved for future use
97	Reserved for future use	Reserved for future use
98	Reserved for future use	Reserved for future use
99	Other types of ship, no additional information	Other types of ship, no additional information

ANNEX 4

DRAFT LIAISON STATEMENT TO ITU-R WORKING PARTY 5B

Blockage to AIS signals caused by VHF radiotelephony

1 IMO's Sub-Committee on Navigation, Communications and Search and Rescue (NCSR), at its eleventh session (4 to 13 June 2024), considered information on the results of a technical review conducted by a Member State concerning the blockage of the reception of AIS signals by the operation of VHF radiotelephones nearby.

2 The review* indicated that, under the conditions that were analysed, the current AIS requirements were not adequate to protect the AIS equipment from VHF radiotelephone transmissions. This impact was not only limited to the own ship but would also affect nearby ships within 130 meters.

3 IMO has noted that this is not a new problem, but it may become more visible as a result of the transition from analogue receiver design to digital receiver design. It is known that AIS is one of several important sources of information available to mariners and shore facilities for the safety of navigation. Notwithstanding the above, IMO has not received any report confirming this issue of AIS signal blockage has caused immediate danger to the safety of navigation. Possible implications of blocking on VDES may also be studied.

4 IMO invites the ITU-R WP 5B to consider the information provided and take action, as appropriate. ITU-R WP 5B is also invited to notify IMO on the outcome of its considerations to enable IMO to review potential consequential changes on the operational use, testing and installation of AIS equipment.

* [RTCM Document 2023-SC101-0331 Rev.3](#), 18 Dec. 2023.

ANNEX 5

DRAFT AMENDMENTS TO THE 1974 SOLAS CONVENTION

CHAPTER IV (RADIOCOMMUNICATIONS)

Part B (Undertakings by Contracting Governments)

Regulation 5

Provision of radiocommunication services

1 A new regulation is proposed to be inserted after regulation IV/5.2, as follows:

"3 Each Contracting Government undertakes to use all operational recognized mobile satellite services in their area of responsibility when disseminating maritime safety information and search and rescue related information via the Enhanced Group Call Service."

CHAPTER V (SAFETY OF NAVIGATION)

2 Modifications are proposed to regulations V/4, 5 and 7 to ensure that MSI and SAR related information are distributed via all recognized mobile satellite services, as follows:

Regulation V/4

Navigational Warnings

"4 Each Contracting Government shall take all steps necessary to ensure that, when intelligence of any danger is received from whatever reliable source, it shall be promptly brought to the knowledge of those concerned and communicated to other interested Governments. Navigational warnings promulgated as MSI shall be sent to the related area by relevant means. Navigational warnings sent out by EGC shall be sent by all operational recognized mobile satellite services in their area of responsibility."

Regulation V/5

Meteorological services and warnings

"2.1 To warn ships of gales, storms and tropical cyclones in text/graphical form using appropriate shore-based and space-based facilities for terrestrial radiocommunication services and ~~space radiocommunication services~~ all operational recognized mobile satellite services in their area of responsibility.

2.2 To issue, at least twice daily, by terrestrial radiocommunication services and ~~space radiocommunication services~~ all operational recognized mobile satellite services in their area of responsibility, as appropriate, weather information suitable for the shipping containing data, analyses, warnings and forecasts of weather, waves and ices. Such information shall be transmitted by text and, as far as practicable, graphic form, including meteorological analysis and prognosis charts transmitted by facsimile or in digital form for reconstruction on board the ship's data processing system.

2.8 To arrange for the reception and transmission of weather messages from and to ships, using the appropriate shore-based facilities for terrestrial radio

communication services and ~~space radiocommunication services~~ all operational recognized mobile satellite services in their area of responsibility systems serving the related area."

Regulation V/7

Search and rescue services

"7 Each contracting Government undertakes to ensure that necessary arrangements are made for distress communication and coordination in their area of responsibility and for the rescue of persons in distress at sea around their coasts. Communication carried out via EGC shall make use of all operational recognized mobile satellite services in their area of responsibility. These arrangements shall include the establishment, operation and maintenance of such search and rescue facilities as are deemed practicable and necessary, having regard to the density of the seagoing traffic and the navigational danger, and shall, so far possible, provide adequate means of locating and rescuing such persons."

ANNEX 6

DRAFT AMENDMENTS TO PROVISION OF RADIO SERVICES FOR THE GLOBAL MARITIME DISTRESS AND SAFETY SYSTEM (GMDSS) (RESOLUTION MSC.509(105))

A new annex is proposed to be inserted after annex 5 (Criteria for use when providing a NAVDAT service), as follows:

"ANNEX 6

CRITERIA WHEN PROVIDING AN INTERNATIONAL ENHANCED GROUP CALL SERVICE IN THE GMDSS

This criteria should be taken into consideration for the broadcast of maritime safety information (MSI) by NAVAREA and METAREA Coordinators, and the broadcast of search and rescue (SAR) related information by SAR authorities.

Maritime safety information

Contracting Governments should ensure that MSI is appropriately disseminated through all operational Recognized Mobile Satellite Services (RMSS) providing coverage within the NAVAREA and METAREA under their responsibility. This will ensure that all ships navigating within those areas receive the information regardless of the type of the enhanced group call (EGC) equipment installed on board.

NAVAREA and METAREA coordinators should obtain an authorization from the relevant international organization to access EGC services directly.

SAR-related information

Contracting Governments should ensure that SAR-related information is appropriately disseminated through all operational RMSSs providing coverage within the SAR regions under their responsibility. This will ensure that all ships navigating within those areas receive the information regardless of the type of EGC equipment installed on board.

SAR authorities requiring to disseminate information through RMSSs should either:

- .1 establish arrangements with an existing authorized EGC information provider that can disseminate the information on their behalf; or
- .2 obtain an authorization from the IMO EGC Coordinating Panel to access EGC services directly, including through their designated rescue coordination centres (RCCs).

Guidance for the dissemination of SAR related information through the international EGC service is provided in MSC.1/Circ.1659.

Obtaining an authorization to access EGC services directly

The processes for authorization, certification and registration of EGC information providers are described in MSC.1/Circ.1635, annex 2. These processes have been established to protect the integrity of the international EGC service and the GMDSS."

ANNEX 7

**INSTRUMENTS THAT MIGHT REQUIRE CONSEQUENTIAL AMENDMENTS TO CLARIFY
THE DISSEMINATION OF MSI AND SAR RELATED INFORMATION THROUGH ALL
OPERATIONAL RMSSS**

Resolution A.705(17), as amended	Recommendation on promulgation of Maritime Safety Information
A.706(17), as amended	World-Wide Navigational Warning Service
A.1051(27), as amended	IMO/WMO Worldwide Met-Ocean Information and Warning Service - Guidance Document
MSC.1/Circ.1310/Rev.2	Joint IMO/IHO/WMO Manual on Maritime Safety Information (MSI)
MSC.1/Circ.1364/Rev.2	International SafetyNET Services Manual
MSC.1/Circ.1613/Rev.2	Iridium SafetyCast service manual
MSC.1/Circ.1645	Guidance for the reception of MSI and SAR related information as required in the GMDSS
MSC.1/Circ.1659	Guidance for the dissemination of SAR related information through the international EGC service

ANNEX 8

Draft NAVDAT Manual

Foreword

SOLAS regulation IV/12.2 states that "Every ship, while at sea, shall maintain a radio watch for broadcasts of MSI and search and rescue related information on the appropriate frequency or frequencies on which such information is broadcast for the area in which the ship is navigating".

Modern digital signal processing technology allows faster data transmission and therefore more information to broadcast. Current NAVTEX coast stations encounter difficulties as there is no possibility to allot enough broadcast time to transmit important maritime safety information (MSI). Many NAVTEX facilities of coast stations need to be replaced due to their long time in service. It could be considered appropriate to change old NAVTEX coast stations for NAVDAT coast stations, as NAVDAT transmitter can still broadcast NAVTEX messages.

NAVDAT offers the prospect of more comprehensive information delivered quicker to ships in a flexible way and a more user-friendly display. In particular, graphical information provided to the navigator has been clearly identified in the e-navigation gap-analysis. The technology allows important data rate with regard to the frequency band: rates up to 18 kbit/s are possible with NAVDAT, compared with the 100 baud of NAVTEX.

International Telecommunication Union (ITU) has published the NAVDAT technical characteristics in Recommendation ITU-R M.2010 for the NAVDAT system in the 500 kHz band and Recommendation ITU-R M.2058 for the NAVDAT system in the maritime HF frequency bands. Additionally, ITU-R has developed the Report ITU-R M.2443 NAVDAT Guidelines. This Report describes the use of the NAVDAT system operating in the maritime mobile service and gives information on the implementation of the radio parts of the NAVDAT system and on its overall understanding.

World Radiocommunication Conference held in 2023 (WRC-23) identified NAVDAT frequencies for use in the Global Maritime Distress and Safety System (GMDSS) and amended the Radio Regulations introducing the MF and HF NAVDAT system into the GMDSS provisions. WRC-23 adopted Resolution **364 (WRC-23)** Coordination of services provided by the NAVDAT system.

The digital technology allows NAVDAT to broadcast files in different modes: General broadcast to all ships; Selective broadcast to ships located in a specific area, or for groups of ships according to the ship's MMSI, and Dedicated broadcast according to ship's MMSI. There are also possibilities of encrypting sensitive files in the three modes of broadcasting. In that respect, NAVDAT can be used for more applications than the broadcasting of MSI and search and rescue related information.

The Maritime Safety Committee decided that the NAVDAT Manual will come into force on [1 January ...].

1 General information

1.1 NAVDAT is an international automated digital service for promulgation of Maritime Safety Information (MSI), (i.e. navigational and meteorological warnings, meteorological forecasts and other urgent safety-related messages to ships) and search and rescue (SAR) related information. It was developed to provide a low-cost, simple and automated means of receiving MSI and SAR related information on board ships at sea in the service area. The information transmitted may be relevant to all sizes and types of ships and the selective message-rejection feature ensures that mariners can receive MSI and SAR related information broadcasts which are tailored to their particular needs.

1.2 NAVDAT fulfils an integral role in the Global Maritime Distress and Safety System (GMDSS) developed by the International Maritime Organization (IMO) and incorporated into the 1988 amendments to the International Convention for the Safety of Life at Sea (SOLAS), 1974 as a requirement for ships to which the Convention applies.

1.3 This Manual describes the structure and operation of the NAVDAT service. It is intended primarily for use by national Administrations and others concerned with the preparation and broadcasting of MSI and SAR related information. It will also be of interest to seafarers, shipowners and others who need to receive such information in order to safely go about their business at sea. It should be used in conjunction with the latest edition of the Joint IMO/IHO/WMO Manual on Maritime Safety Information (also published as the IHO/IMO World-Wide Navigational Warning Service Guidance Document, IHO Publication [S-53]) and with relevant IHO S-100 based product specifications related to MSI and SAR related information .

2 NAVDAT service

2.1 Introduction

2.1.1 NAVDAT provides shipping with navigational and meteorological warnings, meteorological forecasts, other urgent safety-related messages and SAR related information by automatic display from a dedicated receiver. It is suitable for use in all sizes and types of ships. Figure 1 illustrates the way the service is typically structured.

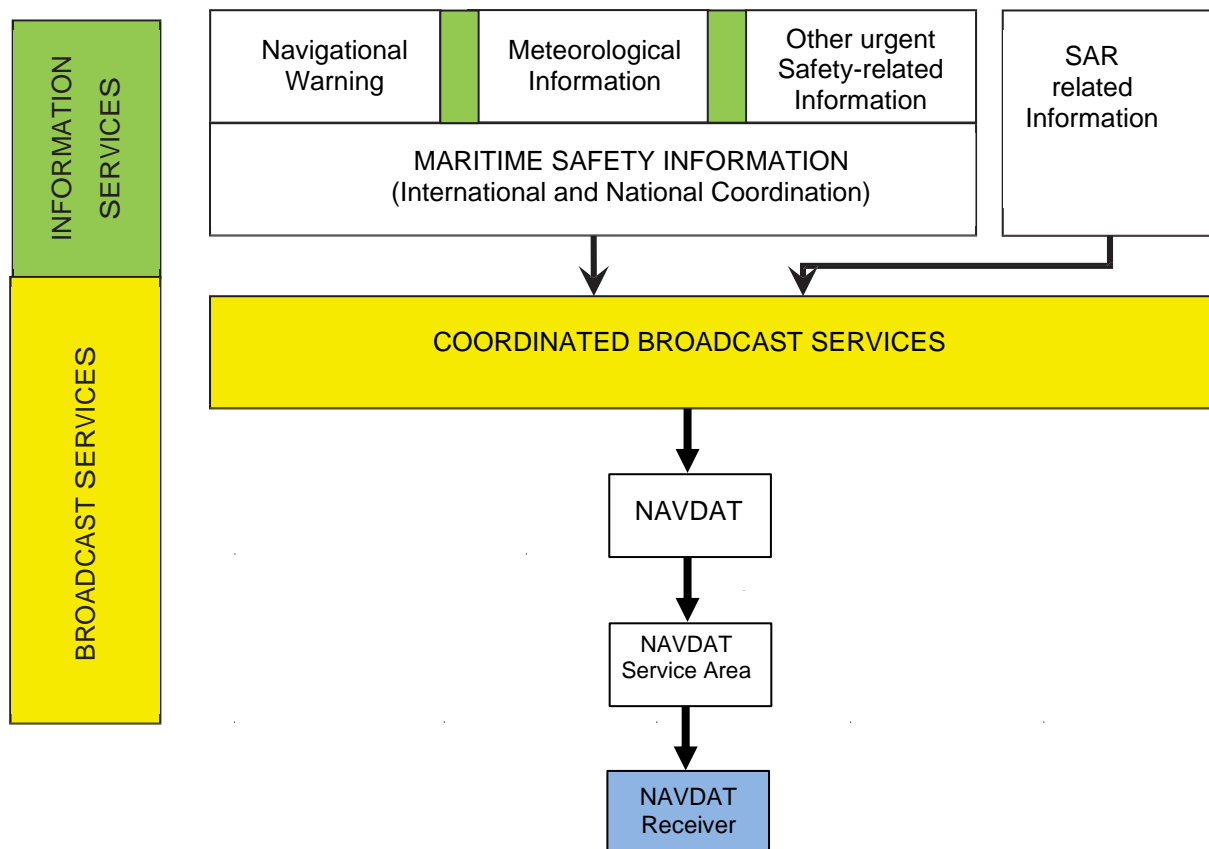


Figure 1: Basic concept of the NAVDAT system

2.1.2 NAVDAT is a component of the IMO/IHO World-Wide Navigational Warning Service (WWNWS) and of the IMO/WMO Worldwide Met-Ocean Information and Warning Service (WWMIWS) defined by resolutions A.706(17), as amended¹, and A.1051(27), as amended². It has also been included as fulfilling the requirements of an element of the GMDSS.

2.1.3 In the GMDSS, a NAVDAT receiving capability is part of the mandatory equipment which is required to be carried in certain vessels under the provisions of the SOLAS Convention.

2.1.4 Authority for coordinating the use of the international frequencies 500 kHz and 4 226 kHz for NAVDAT services worldwide was delegated by ITU to IMO at WRC-23 through Resolution **364 (WRC-23)**. IMO has vested responsibility for the overall management and coordination of the global NAVDAT services in the IMO NAVTEX Coordinating Panel. With respect to national NAVDAT broadcasts on frequencies assigned by the ITU or by national authorities, the function of the IMO NAVTEX Coordinating Panel is limited to the allocation of coast station identification codes.³ It should be noted that the provisions of the NAVDAT Manual do not apply when planning a National NAVDAT service on other nationally assigned frequencies, but the identification codes of the NAVDAT coast station for national use are allocated by the IMO NAVTEX Coordinating Panel according to the same rules. The Terms of Reference for this Panel are attached in Appendix 1.

¹ i.e. resolution MSC.469(101)

² i.e. resolution MSC.470(101)

³ The coast station identification code is a group of figures allocated to each coast station to identify the NAVDAT coast station and broadcast times, see section 5.

2.1.5 Details of operational and planned NAVDAT services are published periodically in the various national lists of radio signals, in the *List of coast stations and special service stations* (List IV) published by ITU, and in the GMDSS Master Plan published by IMO in the Global Integrated Shipping Information System (GISIS).

2.2 Definitions

2.2.1 For the purposes of this Manual, the following definitions apply:

- .1 *Coastal warning* means a navigational warning or in-force bulletin promulgated as part of a numbered series by a National Coordinator. Broadcast should be made by the International NAVDAT service to defined NAVDAT service areas and/or by an international Enhanced Group Call service to coastal warning areas. (In addition, Administrations may issue coastal warnings by other means).
- .2 *Coastal warning area* means a unique and precisely defined sea area within a NAVAREA/METAREA or Sub-area established by a coastal State for the purpose of coordinating the broadcast of coastal maritime safety information through an international Enhanced Group Call service.
- .3 *Enhanced Group Call (EGC)* means the broadcast of coordinated maritime safety information and search and rescue related information, to a defined geographical area using a recognized mobile satellite service.
- .4 *Global Maritime Distress and Safety System (GMDSS)* means a system that performs the functions set out in SOLAS regulation IV/4.
- .5 *MF/HF Digital* means Medium Frequency, High Frequency, using digital modulation as defined in the last Recommendations ITU-R M.2010 (MF band) and ITU-R M.2058 (HF bands).
- .6 *In-force bulletin* means a list of serial numbers of those NAVAREA, Sub-area or coastal warnings in force issued and broadcast by the NAVAREA Coordinator, Sub-area Coordinator or National Coordinator.
- .7 *International NAVDAT service* means the coordinated broadcast and automatic reception on 500 kHz in MF band and/or 4 226 kHz for HF band of maritime safety information by means of digital demodulation using the English language.⁴
- .8 *International Enhanced Group Call service* means the coordinated broadcast and automatic reception of maritime safety information and search and rescue related information via Enhanced Group Call, using the English language.
- .9 *Issuing Service* means a national meteorological and hydrological service (NMHS) or national authority which has accepted responsibility for ensuring that meteorological warnings and forecasts for shipping are disseminated through the international EGC service to the designated METAREA for which

⁴

As set out in this Manual

- the NMHS or national authority has accepted responsibility under the broadcast requirements of the GMDSS.⁵
- .10 *Local warning* means a navigational warning which covers inshore waters, often within the limits of jurisdiction of a harbour or port authority.
- .11 *Maritime safety information (MSI)*⁶ means navigational and meteorological warnings, meteorological forecasts and other urgent safety-related messages broadcast to ships.
- .12 *Maritime safety information service* means the internationally and nationally coordinated network of broadcasts containing information which is necessary for safe navigation.
- .13 *METAREA* means a geographical sea area⁷ established for the purpose of coordinating the broadcast of marine meteorological information. The term *METAREA* 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. (See figure 2).
- .14 *METAREA Coordinator* means the authority charged with coordinating marine meteorological information broadcasts by one or more National Meteorological Services acting as Preparation or Issuing Services within the *METAREA*.
- .15 *Meteorological information* means the marine meteorological warning and forecast information in accordance with the provisions of the International Convention for the Safety of Life at Sea, 1974.
- .16 *National Coordinator* means the national authority charged with collating and issuing coastal warnings within a national area of responsibility.
- .17 *National Enhanced Group Call service* means the broadcast and automatic reception of maritime safety information via the EGC system, using languages as decided by the Administration concerned.
- .18 *National NAVDAT service* means the broadcast and automatic reception of maritime safety information by means of a digital receiver demodulator using frequencies assigned to the NAVDAT system other than international frequencies 500 kHz and 4 226 kHz and languages as decided by the Administration concerned.
- .19 *NAVAREA* means a geographical sea area⁸ 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. (See figure 3).

⁵ As defined in WMO-No.558.

⁶ As defined in SOLAS regulation IV/2.

⁷ Which may include inland seas, lakes and waterways navigable by seagoing ships.

⁸ Which may include inland seas, lakes and waterways navigable by seagoing ships.

- .20 *NAVAREA Coordinator* means the authority charged with coordinating, collating and issuing NAVAREA warnings for a designated NAVAREA.
- .21 *NAVAREA warning* means a navigational warning or in-force bulletin promulgated as part of a numbered series by a NAVAREA Coordinator.
- .22 *Navigational warning* means a message containing urgent information relevant to safe navigation broadcast to ships in accordance with the provisions of the International Convention for the Safety of Life at Sea, 1974.
- .23 *NAVDAT* means the system for the broadcast and automatic reception of MSI and SAR related information by means of digital modulation.
- .24 *NAVDAT Coordinator* means the authority charged with overseeing one or more NAVDAT coast stations broadcasting maritime safety information and SAR related information as part of the International NAVDAT service.
- .25 *NAVDAT coverage area* means an area defined by an arc of a circle having a radius from the coast station calculated according to the method and criteria given in resolution MSC.509(105).
- .26 *NAVDAT service area* means a unique and precisely defined sea area, wholly contained within the NAVDAT coverage area, for which maritime safety information is provided from a particular NAVDAT coast station. It is normally defined by a line that takes full account of local propagation conditions and the character and volume of information and maritime traffic patterns in the region, as given in resolution MSC.509(105).
- .27 *Other urgent safety-related information* means maritime safety information broadcast to ships that is not defined as a navigational warning or meteorological information. This may include, but is not limited to, significant malfunctions or changes to maritime communications systems, and new or amended mandatory ship reporting systems or maritime regulations affecting ships at sea.
- .28 *Rescue Coordination Centre (RCC)* means a unit responsible for promoting efficient organization of search and rescue services and for coordinating the conduct of search and rescue operations within a search and rescue region⁹.
- .29 *Recognized mobile satellite service (RMSS)* means any service which operates through a satellite system and is recognized by IMO, for use in the GMDSS.
- .30 *Search and rescue (SAR) related information* means distress alert relays and other urgent search and rescue information broadcast to ships.
- .31 *Sub-area* means a subdivision of a NAVAREA/METAREA in which a number of countries have established a coordinated system for the promulgation of maritime safety information. The delimitation of such areas is not related to and shall not prejudice the delimitation of any boundaries between States.

⁹ The term RCC will be used within this Manual to apply to either joint, aeronautical or maritime centres; JRCC, ARCC or MRCC will be used as the context warrants.

- .32 *Sub-area Coordinator* means the authority charged with coordinating, collating and issuing Sub-area warnings for a designated Sub-area.
- .33 *Sub-area warning* means a navigational warning or in-force bulletin promulgated as part of a numbered series by a Sub-area Coordinator. Broadcast should be made by the International NAVDAT service to defined NAVDAT service areas or by the international enhanced group call service (through the appropriate NAVAREA Coordinator).
- .34 *UTC* means Coordinated Universal Time which is equivalent to GMT (or ZULU) as the international time standard.
- .35 *World-Wide Met-Ocean Information and Warning Service (WWMIWS)*¹⁰ means the internationally coordinated service for the promulgation of meteorological warnings and forecasts.
- .36 *World-Wide Navigational Warning Service (WWNWS)*¹¹ means the internationally and nationally coordinated service for the promulgation of navigational warnings.
- .37 In the operating procedures, *coordination* means that the allocation of the time for data broadcast is centralized, the format and criteria of data transmissions are compliant as described in the latest edition of the Joint IMO/IHO/WMO Manual on Maritime Safety Information and that all services are managed as set out in IMO Assembly resolutions A.705(17), as amended, A.706(17), as amended, and A.1051(27), as amended.

¹⁰ As set out in resolution A.1051(27), as amended, i.e. resolution MSC.470(101).

¹¹ As set out in resolution A.706(17), as amended, i.e. resolution MSC.469(101).

2.2.2 Delimitation of METAREAs

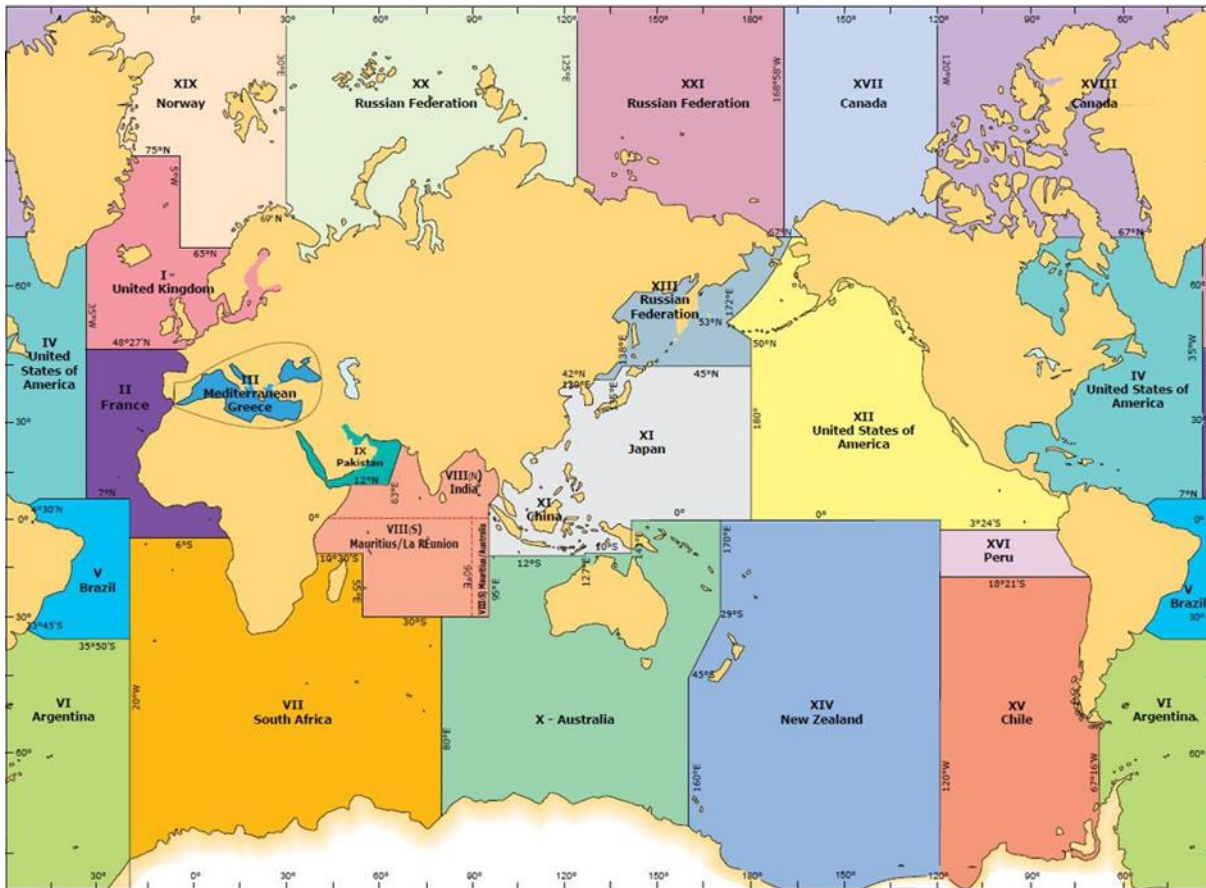


Figure 2: METAREAs for coordinating and promulgating meteorological warnings and forecasts under the World-Wide Met-ocean Information and Warning Service within the GMDSS

The delimitation of such areas is not related to and shall not prejudice the delimitation of any boundaries between States.

2.2.3 Delimitation of NAVAREAs

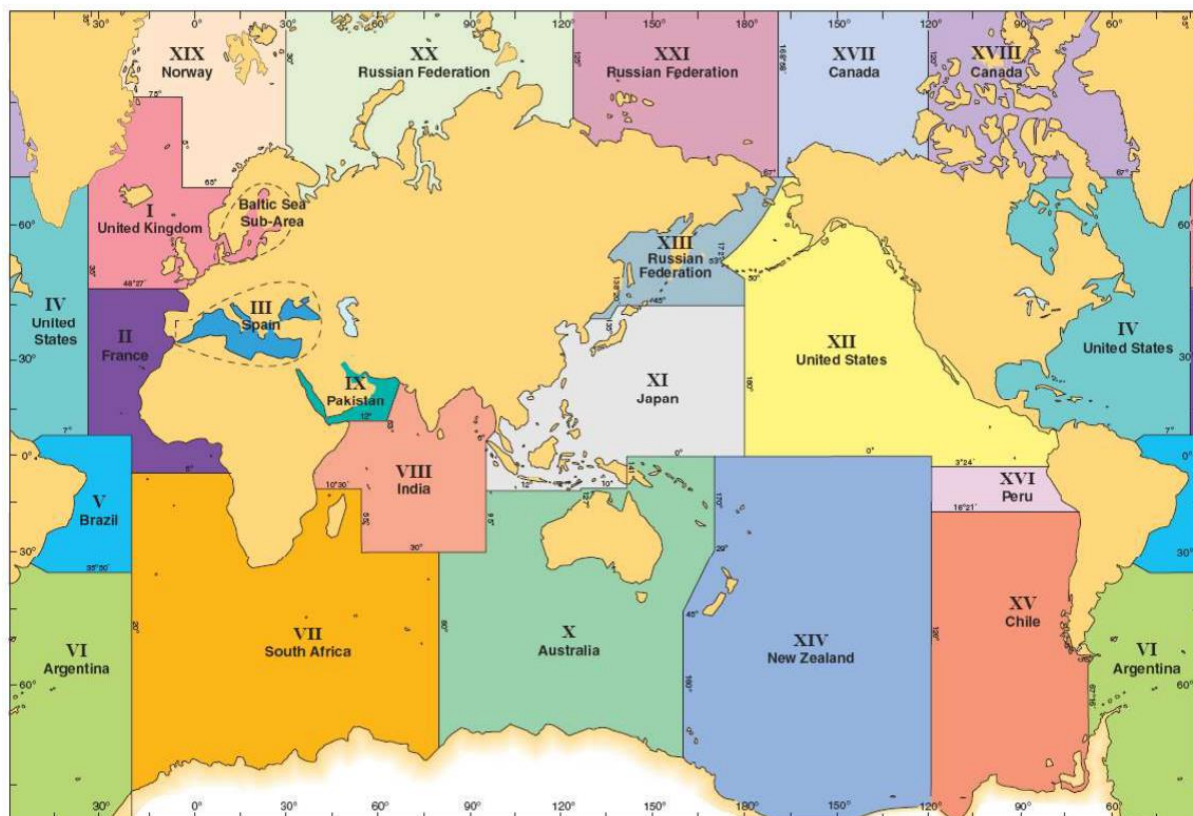


Figure 3: NAVAREAs for coordinating and promulgating navigational warnings under the World-Wide Navigational Warning Service within the GMDSS

The delimitation of such areas is not related to and shall not prejudice the delimitation of any boundaries between States

3 General features of the NAVDAT system

3.1 The principal features are:

3.1.1 Use of a single frequency in MF band or HF band, with transmissions from coast stations within and between NAVAREAs and METAREAs coordinated on a time-sharing basis to reduce the risk of mutual interference. The following frequencies may be used for NAVDAT broadcasts as indicated in table 1 below:

500 kHz and 4 226 kHz	
Type of service:	International
Content:	MSI and SAR related information
Language:	English
Coordination:	By the IMO NAVTEX Coordinating Panel with allocation of a coast station identification code
National or Regional HF frequencies specified in Appendix 15 to the Radio Regulations	
Type of service:	National
Content:	MSI and SAR related information
Language:	As selected by the Administration
Coordination:	By interested Administrations. A coast station identification code is allocated by the IMO NAVTEX Coordinating Panel.
National frequencies identified by Administrations	
Type of service:	National
Content:	As selected by the Administration
Language:	As selected by the Administration
Coordination:	By interested Administrations. A coast station identification code is allocated by the IMO NAVTEX Coordinating Panel.

Table 1 – NAVDAT frequencies

3.1.2 The NAVDAT receiver equipment should comprise a radio receiver, an appropriate antenna, a signal processor with non-volatile memory, a human-machine interface, data interfaces (see paragraph 9) and:

- .1 an integrated display; or
- .2 a connection to external equipment with a display (e.g. an integrated navigation system).

3.2 The operational and technical characteristics of the NAVDAT system are contained in the most recent version of Recommendations ITU-R M.2010 for MF and ITU-R M.2058 for HF bands. The most recent version of Report ITU-R M.2443 "NAVDAT Guidelines" describes the use of the NAVDAT system operating in the mobile maritime service. Performance standards for shipborne equipment shall conform to IMO resolution MSC.[...]12. Further information about NAVDAT ship receiver is given in appendix 3.

4 Planning NAVDAT services

4.1 When planning NAVDAT services, Administrations should take into consideration the guidance of the Organization (resolution MSC.509(105)[/Rev.1]) and obtain further guidance at an early stage from IMO, through its IMO NAVTEX Coordinating Panel. This may be particularly important when installation of new stations and/or purchase of new equipment is under consideration. Details of how to contact the Panel may be found in appendix 1. In addition, Administrations should take into account ITU Resolution **364 (WRC-23)** for frequency coordination in the NAVDAT system.

4.2 International NAVDAT services on 500 kHz or 4 226 kHz

When planning an International NAVDAT service it is essential to appreciate the high level of national and international coordination required. The central principles which should be borne in mind are as follows:

- .1 All NAVDAT coast stations are part of the strategic infrastructure of the GMDSS, WWMIWS and WWNWS.
- .2 It is essential for the efficiency and effectiveness of the service that a minimum number of coast stations are used. This may require national Administrations to either share facilities or promulgate information provided by Administrations of other nations.
- .3 Each station contributes to the overall service in a coordinated way, bearing in mind the geographical area covered by each coast station and the effective coordination and control of information to be transmitted.
- .4 The two basic areas which must be defined when establishing a NAVDAT coast station are the NAVDAT coverage area and the NAVDAT service area. Each station will provide all the information for a particular NAVDAT service area. The boundaries of the NAVDAT service area must be wholly contained within the coverage area and must not overlap with adjacent NAVDAT service areas. The IMO NAVTEX coordinating panel should be consulted to determine any new areas.
- .5 National Administrations seeking to establish NAVDAT services shall undertake preliminary discussions with the NAVAREA Coordinator, METAREA Coordinator and neighboring Administrations prior to formal application to IMO through the IMO NAVTEX Coordinating Panel. These

¹² See appendix 1.

discussions shall consider the most appropriate NAVDAT service area boundaries, possible geographical locations for coast stations to ensure optimal coverage and links with Information Providers.

- .6 The range of a NAVDAT coast station depends on the radiated RF power, local radio propagation conditions, electromagnetic noise level on receiving site, the broadcast bandwidth selected (1, 3, 5 or 10 kHz) and the modulation constellation (4, 16 or 64 QAM). The actual range achieved shall be adjusted to the minimum required for adequate reception in the specified NAVDAT service area, taking into account the needs of ships approaching from other areas.
- .7 Preliminary discussions between national Administrations seeking to establish or amend NAVDAT services and neighboring Administrations shall be coordinated by the NAVAREA Coordinator prior to formal application for a coast station identification code. After the choice of coast stations, the main need for coordination lies in the assignment of coast station identification codes (with frequency and time schedules) and the agreement of proposed NAVDAT service areas (if appropriate).
- .8 Throughout the process the IMO NAVTEX Coordinating Panel is available to advise and liaise on the final limits of NAVDAT service areas if these cannot be agreed locally.
- .9 Once a NAVDAT coast station has been declared operational, if a national Administration wishes to:
 - .9.1 move the coast station; and/or
 - .9.2 amend the limits of its NAVDAT service area,then the whole coordination process outlined above must be repeated, keeping the IMO NAVTEX Coordinating Panel informed at all times.
- .10 A National NAVDAT Coordinator shall be established to oversee the operation of the NAVDAT services established by each national Administration. The responsibilities of the NAVDAT Coordinator are defined in section 12 of this Manual.

4.3 National NAVDAT services on other frequencies

The provisions of the NAVDAT Manual do not apply when planning a national NAVDAT service on nationally assigned frequencies.

5 NAVDAT message technical coding

5.1 Overview of message coding

5.1.1 NAVDAT messages include instructions to the NAVDAT receiver for processing maritime safety information and SAR related information which consists of coding for the following data:

- .1 Coast station identification code (ID)

.2 Subject message code (SC)

5.2 Coast station identification code

5.2.1 Procedure for the allocation of coast station identification code

The coast station identification is managed by the IMO NAVTEX Coordinating Panel.

The NAVDAT coast station transmits its identity in the transmitter information stream¹³ (TIS) as follows:

- .1 One header: **ID**
- .2 The number assigned to the coast station by the NAVDAT coordinator (For station broadcasting on several frequencies several numberings will be assigned to it).
- .3 This number will be used to search automatically information inside a table memorized in the receiver, and which can be updated by the reception of the message 63¹⁴, and to extract all the parameters of the coastal station:
 - NAVAREA/METAREA: there are 21 areas (I (01) to XXI (21));
 - country;
 - geographical position (in latitude and longitude);
 - name of the coast station;
 - frequency used; and
 - allocated time slots

This information will be displayed in plain text on the screen of the NAVDAT receiver with the following data only:

- The NAVAREA/METAREA; and
- The numbering of the station

The encoding of the **I** and **D** header will be in 8-bit ASCII.

The coding of the areas will be done in binary on 5 bits, i.e. a maximum of 31 areas.

The station number allocated for a frequency will be coded on 11 bits (maximum of 2047 stations by area).

A total of 32 bits will thus be used for the identification of each pair station / frequency

¹³ See section 7 and appendix 3

¹⁴ See table 3 and section 10.1.10

5.2.2 Examples of coast station identification code:

A NAVDAT station located in NAVAREA/METAREA III (3) and transmitting on 500 kHz would have the following identity (with the numbering 85 allocated to the station):

I	01001001	8 bits ASCII
D	01000100	8 bits ASCII
3	00011	5 bits binary
85	00001010101	11 bits binary
Total		32 bits

The same NAVDAT station but for another frequency with the numbering 97 allocated to the station would have the following identity:

I	01001001
D	01000100
3	00011
97	00001100001

The IMO NAVTEX coordinating panel add some information for the reference files during the assignment of station identities by providing the:

- country;
- geographical position (in latitude and longitude);
- name of the station;
- frequency used; and
- allocated time slots

For example:

NAV/ MET Area	Country	NAVDAT Coast station	Position of the Antenna	Frequency	N0	Transmission slots	Status	Range (NM)	Other information
I	United Kingdom	Niton	50°35'.18N 001°15'.29W	500 kHz	16	12/24/36/48/60	Operational	200	
I	United Kingdom	Niton	50°35'.18N 001°15'.29W	4 226 kHz	17	3/15/27/39/51	Operational	180	
I	France	Cross Corsen	48°28''.56N 005°03'.18W	500 kHz	18	1022/34/46/58/70	Operational	200	

INTERNATIONAL NAVDAT SERVICE

5.2.3 Table 2 shows the transmission start times of coast stations in a NAVAREA/METAREA used by the IMO NAVTEX Coordinating Panel. Each coast station is allocated a maximum transmission time of 20 minutes every 4 to 12 hours. Because the NAVDAT system always utilizes a single frequency, it is fundamental to its successful operation that the following time slots are strictly adhered to, and that broadcasts do not overrun their allotted 20 minutes.

0	1h		2h			3h			4h			5h			6h			7h			8h			9h			10h			11h			12h		
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36
13h			14h			15h			16h			17h			18h			19h			20h			21h			22h			23h			24h		
37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72

Table 2: NAVDAT transmission time slots in a NAVAREA/METAREA
Time slot: the 24 hours are divided into 72 slots of 20 minutes each according to the grid below

5.2.4 In order to avoid erroneous reception and interference of transmissions from two coast stations having the same time slot, it is necessary to ensure that such coast stations have a large geographical separation.

5.2.5 Close coordination between coast stations in adjacent NAVAREAs/METAREAs is necessary to achieve this separation. For this reason, national Administrations shall request the advice of the IMO NAVTEX Coordinating Panel at an early stage in the planning of a new NAVDAT service. The Panel will allocate coast station identification codes and broadcast time slots in such a way as to minimize the risk of interference occurring.

5.3 Subject message coding

5.3.1 Information is grouped by subject in the NAVDAT broadcast and each subject group is allocated a subject message code from 1 to 63.

5.3.2 The subject message code is used by the receiver to identify the different classes of messages as listed in table 3.

Maritime Safety Information (MSI)				
Subject message code	Type of message	Coding	Can be rejected	
			YES	NO
Navigational warnings				
1	Sub-area warning	000001		X
2	Coastal warning	000010		X
3	Local warning (only on national NAVDAT services)	000011		X
4	drifting hazards (including derelict ships, ice, mines, containers, other large items over six metres in length, etc.)	000100		X
5	Reserve	000101		
6	Reserve	000110		
7	No message on hand	000111		X
Navigational warnings (following) – Positioning system Significant malfunctioning of radio-navigation services and shore-based maritime safety information radio or satellite services				
8	GNSS and RNSS	001000		X
9	LORAN and E LORAN/ Chayka and e Chayka	001001		X
10	Differential correction information	001010		X
11	Operating anomalies identified within ECDIS including ENC issues	001011		X
12	Areas where search and rescue (SAR) and anti-pollution operations are being carried out (for avoidance of such areas)	001100		X
13	Reserve	001101		
14	Reserve	001110		
Navigational warnings (following) – Act of piracy and armed robbery				
15	Acts of piracy and armed robbery against ships	001111		X
16	Chart of piracy attacks	010000		X
17	Reserve	010001		
Navigational warnings (following) – Tsunamis and other natural phenomena warnings				
18	Tsunami warning / Abnormal changes to sea level	010010		X
19	Reserve	010011		
Navigational warnings (following) – Security In accordance with the requirements of the international ship and port facility Security Code				
20	Security-related information	010100		X
21	Chart of security level areas	010101		X
22	Reserve	010110		
23	Reserve	010111		

Navigational warnings (following) – HEALTH Implementation of the International Health Regulation – IHR				
24	World Health Organization (WHO) health advisory information	011000		X
25	Pandemic warning	011001		X
26	Reserve	011010		
Meteorological				
27	Meteorological warnings (Including tropical cyclone, storm, gale warning)	011011		X
28	Meteorological synopses (including weather charts)	011100	X	
29	Meteorological forecast	011101	X	
30	Current and tide	011110	X	
31	Wave height and direction	011111	X	
32	Reserve	100000		X
33	Reserve	100001		X
Ice Report				
34	Ice chart	100010	X	
35	Iceberg	100011	X	
36	Polar Road Information	100100	X	
37	Icebreaker patrol information	100101	X	
Search and rescue related information				
38	Distress alert relay to all ships (MAYDAY RELAY)	100110		X
39	Ship overdue (description and/or picture of the missing ship)	100111		X
40	SAR coordination (to ships involved in the SAR operation)	101000		X
41	SAR pattern (to ships involved in the SAR operation)	101001		X
42	reserve	101010		
43	reserve	101011		
Other safety-related information				
	Pilot service			
44	Pilot service information	101100	X	
	Tug services			
45	Tug service information	101101	X	
	Port support service			
46	Time and height of the tide	101110	X	
47	Local port information	101111	X	
48	Hydrographic and environmental information	110000	X	
	Vessel Traffic Service (VTS)			

49	VTS information	110001	X	
50	Reserve	110010		
51	Reserve	110011		
	Pollution			
52	Pollution information	110100	X	
53	Pollution chart	110101	X	
Other information				
	AIS and LRIT messages			
55	AIS	110111	X	
56	LRIT	111000	X	
	Nautical chart and publications service			
57	Electronic nautical chart and publications corrections	111001	X	
58	Electronic Nautical chart and publications update	111010	X	
	Fishing information (only on national NAVDAT services)			
59	Regulations	111011	X	
60	Special maps	111100	X	
61	Fishing Quota information	111101	X	
	Encrypted message			
62	Receiving an encrypted message	111110		X
63	Updating storage table	111111		X

Table 3: List of NAVDAT subject message codes (SC)

5.3.3 Some subject message codes can be used to reject messages concerning certain subjects which may not be required by the ship (e.g. ice report messages may be rejected by deselecting the appropriate subject message code on the NAVDAT receiver on board a ship).

5.3.4 Reception of messages, transmitted using subject message codes which have been allocated for navigational warnings, meteorological warnings, search and rescue related information, acts of piracy warnings, tsunamis and other natural phenomena, are mandatory and cannot be deselected on the NAVDAT receiver. This has been designed to ensure that ships using NAVDAT always receive the most essential information.

5.3.5 Messages received which have been transmitted such as messages related to acts of piracy and armed robbery (subject message codes 15 and 16), tsunami warnings or abnormal changes to sea level (subject message code 18) and search and rescue related information (subject message codes from 38 to 41) will set off an alarm built into the NAVDAT receiver.

5.3.6 The list of NAVDAT subject message codes (Table 3), has some subject message codes in reserve for future development.

5.4 SFN mode (Single Frequency Network)

The NAVDAT system offers the possibility of operating in SFN mode. This network uses several transmitters operating on the same frequency and broadcasting the same information at the same time. This simplifies the distribution of the time slots, increases the effectiveness of the broadcast which can be longer and limits the potential interference.

When building an SFN network, particular attention will be paid so that the flux of the MIS, TIS and DS are preferably generated by a common server.

6 Message numbering

6.1 All files coming from the different MSI or SAR related information providers are concentrated on a NAVDAT server which formats, calculates the broadcasting times and assigns a message number (which represents the list order of broadcasting).

6.2 The message number is solely allocated as a component of the NAVDAT message and should not be confused with (and bears no correlation to), the series identity and consecutive number of the NAVAREA/METAREA or coastal warning contained in the message.

6.3 When a message is received for the first time by a NAVDAT receiver, the message is recorded and stored in the memory for 72 hours. This ensures that subsequent transmissions of the same message are not repeated in the display, unless they are re-received over 72 hours later.

Note: The body of the broadcast message contains the following information:

- the subject of the message;
- the origin of the message (authority that wrote the message);
- the date when the message was written (year, month, day and hour/minutes); and
- the message reference number (it's the numbering of the message). The NAVDAT server must be informed of this number when submitting the message. It will be used for the "Broadcast count".

7 Message format

7.1 NAVDAT messages must be composed in accordance with the guidelines contained in the latest edition of the Joint IMO/IHO/WMO Manual on Maritime Safety Information and IHO Publication [S-53][S-100]. The digital format of all messages can be adapted to text, data or graphical information and entered into the NAVDAT frame structure.

7.2 Figure 4 shows the NAVDAT frame structure. Inside the NAVDAT frame (duration 400 ms) we can dissociate:

- .1 the synchronous head reserved for the synchronization of the receivers;
- .2 the modulation information stream (MIS) part gives information about the spectrum occupancy, the type of transmitter information stream (TIS) and data stream (DS) modulation;

- .3 the TIS part gives information about the error encoding of DS, coast station identification code (ID), broadcast mode and mode of robustness ; and
- .4 the Data Stream (DS) contains the broadcast messages, with their allocated message numbers given by the information provider.

Head frame length is 400 ms.

Standard frame structure does not include DS stream without synchronization head, MIS or TIS. Standard frame length is 400 ms. A sequence of one head frame and N-1 standard frame constitutes a super-frame of the length of N. The NAVDAT broadcast should use a super-frame pattern of the length of 5.

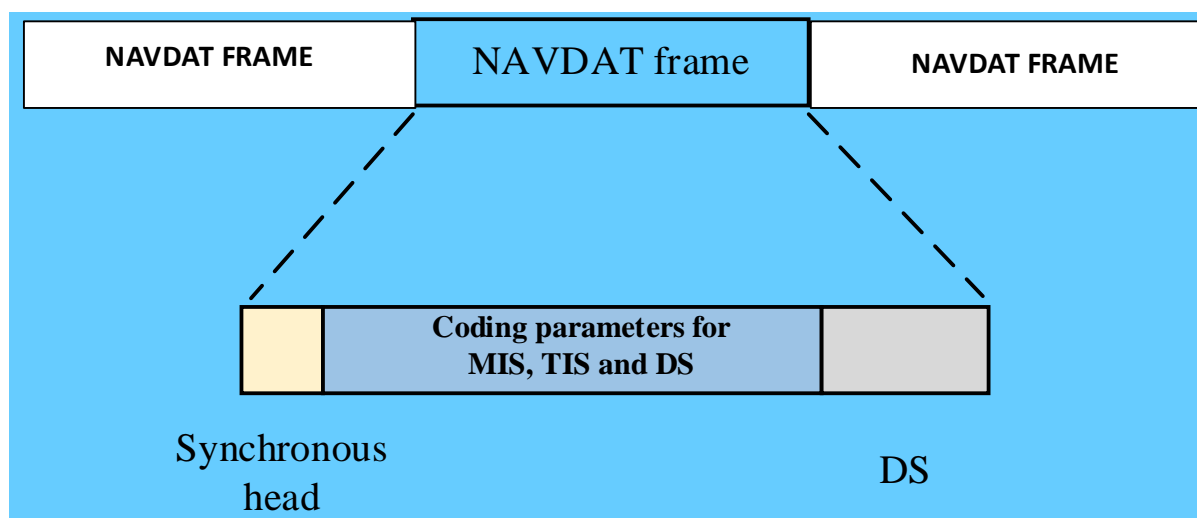


Figure 4: NAVDAT frame structure

7.3 The most recent version of Recommendations ITU-R M.2010 and ITU-R M.2058 provide details of the NAVDAT message structure and how to modulate it depending on its size.

7.4 When a message has been received error-free, a record is made by the receiver of the message. A unique identifier is used to suppress the display of repeated transmissions of the same message.

7.5 On national NAVDAT services it is important to keep to the same basic message format as that required for the International NAVDAT service. It is also important to ensure that the full broadcast does not overrun the allocated time slot. However, in order to meet national requirements, message content may deviate from the guidelines provided for the International NAVDAT Service if required.

8 Language and broadcast options

8.1 International NAVDAT service

International NAVDAT Service messages on 500 kHz and 4 226 kHz shall be broadcast in English only in accordance with resolutions A.706(17), as amended, and A.1051(27), as amended.

8.2 National/regional NAVDAT service

There is often a requirement for NAVDAT broadcasts to be produced in national or regional languages in addition to English. This shall only be achieved by the provision of a national or regional NAVDAT service. National/regional NAVDAT services use frequencies other than 500 kHz or 4 226 kHz, and languages as decided by the Administrations concerned. These national/regional NAVDAT services may be broadcast on MF or HF maritime bands, or on an alternative nationally or regionally assigned frequency.

8.3 Broadcast modes

Broadcasting NAVDAT files can be done by:

- **General broadcast:** These messages are broadcast for the attention of all ships;
- **Selective broadcast:** These messages are broadcast for the attention of a group of ships or in a specific navigation area, in this last case the message will be broadcast to all vessels located in a specific geographic area. For this purpose, it is necessary to enter the geographical coordinates in latitude, longitude of the 4 points delimiting the area (starting from the point located in N/W then, N/E, S/E and S/W; and
- **Dedicated message:** These messages are addressed to one ship, using the maritime mobile service identity (MMSI).

For example, the combination of the three modes of broadcasting can be used by an RCC for the broadcasting of SAR related information:

- General broadcast for a MAYDAY RELAY;
- Selective broadcast to ships involved in a SAR operation; and
- Dedicated message to the On-Scene Coordinator (OSC).

8.4 Encrypting

If necessary, there is the possibility of encrypting sensitive files in the 3 modes of broadcasting.

For example, security messages, using subject message codes 20 and 21, can be encrypted.

9 Information control

The time-shared nature of NAVDAT services imposes the need for strict discipline in controlling the information flow of the broadcast. In general, all messages shall be brief and clear and avoid duplication. Strict adherence to relevant guidelines in resolutions A.706(17), as amended, A.1051(27), as amended, and the latest edition of the Joint IMO/IHO/WMO Manual on Maritime Safety Information (MSC.1/Circ.1310, as revised) is recommended.

10 Message content

10.1 More detailed guidance with respect to different classes of messages is given below. Examples of the content and layout of NAVDAT messages are shown in the latest edition of the Joint IMO/IHO/WMO Manual on Maritime Safety Information and IHO Publication S-53.

This publication should be available to all personnel responsible for the drafting of messages to be broadcast by NAVDAT coast stations.

10.1.1 Navigational warnings

- .1 coastal warnings and NAVAREA warnings (subject message codes 1 to 7) issued under the guidance of resolution A.706(17), as amended, which would be of concern to ships in the NAVDAT service area allocated to the coast station should be included in the broadcast. Relevant coastal warnings should normally be repeated at every scheduled transmission for as long as they remain in force; if they are to be in force for more than six weeks the information should be promulgated by other official means, for example in notices to Mariners. When readily available to mariners by other means, the warning should not be broadcast by NAVDAT. NAVDAT Coordinators should arrange to receive NAVAREA warnings appropriate to their area for inclusion in their broadcasts;
- .2 in-force bulletins (a summary of navigational warnings in force) should normally be broadcast not less than once per week; and
- .3 local warnings should not be broadcast on International NAVDAT, i.e. information relating to inshore waters, often within the limits of jurisdiction of a harbour or port authority.

10.1.2 Meteorological warnings and forecasts

- .1 meteorological warnings (subject message code 27), e.g. gale warnings, should be allocated a priority of [IMPORTANT] (see section 11) and be repeated at subsequent scheduled transmissions for as long as the warning is in force. These messages should contain only the appropriate warnings and should be separate from the weather forecasts;
- .2 weather forecasts should be broadcast at least twice each day. This service should be carefully coordinated where transmitters are geographically close together;
- .3 routine ice reports are normally broadcast on NAVDAT once a day; and
- .4 ice accretion warnings (icing warnings) are normally included in gale warnings. If no gale warning is issued, they are to be treated as a meteorological warning (see section 10.2.2.1).

10.1.3 Search and rescue related information

- .1 the NAVDAT broadcast is suitable for distressed traffic. The initial distress message should be retransmitted on NAVDAT, using subject message code 38, in order to alert mariners to a distress situation, by setting off an audio alarm;
- .2 a single authority, which will normally be an RCC, should be designated SAR Coordinator to input information via the NAVDAT Coordinator, for a NAVDAT message. The initial shore-to-ship distress-related message should have previously been broadcast on the appropriate distress frequency prior to any related NAVDAT message being broadcast; and

- .3 further SAR related information can be broadcast on NAVDAT only to a group of ships involved in the SAR operation, using subject message codes 40 and 41.

10.1.4 Piracy warnings

Piracy warnings should be transmitted, using subject message codes 15 and 16, in order to alert mariners by setting off an audio alarm. They should be broadcast immediately on receipt and at subsequent scheduled transmissions.

10.1.5 Tsunamis and other natural phenomena warnings

Tsunamis and negative tidal surge warnings should be transmitted, using subject message code 18, in order to alert mariners by setting off an audio alarm. They should be broadcast immediately on receipt and at subsequent scheduled transmissions.

10.1.6 Pilot, tugs and VTS service messages

Pilot, tugs and VTS service message (subject message codes 44 to 51) are only to be used for broadcasting temporary alterations, movement or suspensions of pilot, tugs or VTS services. This category is for the information of all ships and is not to be used for specific instructions to individual ships or pilots.

10.1.7 No messages on hand

When there are no NAVDAT messages to be disseminated at a scheduled broadcast time, a brief text message should be transmitted to advise the mariner that there is no message traffic on hand. Subject message code 7 is to be used to announce "NO MESSAGE ON HAND".

10.1.8 Use of abbreviations

Common examples of abbreviations used in the International NAVDAT service are contained in the latest edition of the Joint IMO/IHO/WMO Manual on Maritime Safety Information and IHO Publication S-53.

10.1.9 National NAVDAT services

Transmissions on other frequencies than 500 or 4 226 kHz may simply repeat the messages broadcast over the International NAVDAT service but in a national language, or they may be tailored to meet particular national requirements, for example by providing different or additional information to that broadcast on the International NAVDAT service, targeted at recreational vessels or fishing fleets.

10.1.10 Subject message code 63

Subject message code 63 contains receiver update files such as, for example, updates of the NAVDAT coast stations table or the list of message table.

11 Message priorities, broadcast procedures and modes in the International NAVDAT service

[11.1 Message priorities

11.1.1 The national coordinator or designated authority is responsible for assessing the priority of the information and inserting the appropriate priority marking. One of four message priorities is used to dictate the timing of the first broadcast of a new warning in the NAVDAT service. In descending order of priority, they are:

DISTRESS

for immediate broadcast, subject to avoiding interference with ongoing transmissions. Distress messages shall have absolute priority over all other transmissions. Such messages cover distress alert relays (MAYDAY RELAY) and other urgent search and rescue information broadcast to ships.

URGENCY

for broadcast as soon as possible at the next available period, subject to avoiding interference to ongoing transmissions.

SAFETY

for broadcast at the next scheduled transmission.

ROUTINE

for broadcast at scheduled transmission.

11.1.2 DISTRESS messages are not broadcasted at a scheduled transmission time slot. Both URGENCY and SAFETY messages should be repeated at each scheduled transmission time slot, if the situation is still valid.

11.1.3 The message priority is a procedural instruction for the NAVDAT server to the transmitting coast station and should not be included in the message. By selecting the appropriate priority of DISTRESS, URGENCY, SAFETY and ROUTINE at the transmission server, the message will be broadcast with the correct priority.

11.1.4 In order to avoid unnecessary disruption to the service, the priority marking DISTRESS is to be used only in cases of a situation wherein there is a reasonable certainty that a person, a vessel or other craft is threatened by grave and imminent danger and require immediate assistance, i.e. to relay an initial shore-to-ship distress-related message or other urgent search and rescue information. In addition, DISTRESS messages are to be kept as brief as possible and in accordance with the latest edition of the IAMSAR Manual and the distress traffic procedures of the ITU Radio Regulations. The information provider is responsible for ensuring through the NAVDAT server, when a message should be broadcast with the priority of DISTRESS.

11.1.5 The priority marking URGENCY is to be used only in cases of extreme urgency, i.e. to relay acts of piracy warnings, tsunamis and other natural phenomena warnings. In addition, URGENCY messages are to be kept as brief as possible and in accordance with the latest edition of the Joint IMO/IHO/WMO Manual on Maritime Safety Information. The information provider is responsible for ensuring through the NAVDAT server, when a message should be broadcast with the priority of URGENCY.]

[11.2 Broadcast procedures

.1 DISTRESS priority messages

Messages rated as DISTRESS should be broadcast immediately, subject to avoiding interference with ongoing transmissions (locally or regionally). Upon receipt of a message with DISTRESS priority, the server checks the time slot of adjacent NAVDAT coast stations. If the time slot is free, the frequency which will be used for the broadcast will be checked by the monitoring receiver of the NAVDAT station which will be used. If the frequency is free, the DISTRESS message will be transmitted immediately.

.2 URGENCY priority messages

Messages rated as URGENCY should be broadcast as soon as possible during the next scheduled transmission time slot or during the next available period when the NAVDAT frequency is unused. This is to be identified by monitoring the frequency. It is expected that this level of priority will be sufficient for the majority of urgent information.

.3 SAFETY priority messages

Messages assessed as SAFETY are to be broadcast as soon as possible during the next scheduled transmission time slot. This is to be identified by monitoring the frequency. It is expected that this level of priority will be sufficient for the majority of safety information.

.4 ROUTINE priority messages

Messages assessed as ROUTINE, are to be broadcast at scheduled transmission time. This level of priority will be appropriate for almost all messages broadcast on NAVDAT and is always to be used unless special circumstances dictate the use of the procedures for SAFETY, URGENCY or DISTRESS priority message.]

[11.3 Meteorological NAVDAT messages

The following priorities are to be assigned to meteorological NAVDAT messages:

- | | | | |
|----|---|---|---------|
| .1 | Tsunami warnings | = | URGENCY |
| .2 | Meteorological warnings | = | SAFETY |
| .3 | Meteorological forecasts | = | ROUTINE |
| .4 | For other natural phenomena warnings, either VITAL or IMPORTANT may be used.] | | |

11.4 Broadcast modes

It is possible to broadcast NAVDAT messages to only a group of ships or to a single ship in addition to all ships in the area. NAVDAT service defines three types of broadcast modes:

- .1 General broadcast (as a standard mode);
- .2 Dedicated messages to a ship; and
- .3 Selective broadcast:
 - .1 to a group of ships; and
 - .2 to a selective area.

11.5 National NAVDAT services

The broadcast procedures concerning differing message priorities are the same for both the international and national NAVDAT services.

12 Responsibilities of a NAVDAT Coordinator

12.1 The NAVDAT Coordinator is responsible for the coordination of information providers to each coast station under its control.

12.2 The NAVDAT Coordinator is responsible for maintaining the NAVDAT server up to date and for proper coordination of the coast stations under its control.

12.3 The NAVDAT Coordinator is responsible to participate in the IMO NAVTEX Coordinating Panel.

13 Mutual interference between NAVDAT coast stations

13.1 The two principal causes of interference are:

- .1 transmission overruns; and
- .2 excessive power output.

13.2 Excessive power output causes interference between coast stations with the same time slot, but located in different regions. This is particularly possible at night, as the number of operational NAVDAT coast stations will increase. Occasionally, this can be caused by atmospheric conditions, but is generally caused by excessive power output from one of the coast stations and reflection on the ionospheric layer D. It is recommended that Administrations restrict the power output from their transmitters to that required to cover the designated NAVDAT service area, particularly at night, in order to avoid interference.

13.3 When interference is detected, particularly when it affects the service to system users, the matter should be addressed immediately. When the interference is with adjacent coast stations, attempts should be made to resolve the problem locally. Advice may also be sought from the NAVAREA Coordinator. In addition, the IMO NAVTEX Coordinating Panel should be alerted to the problem.

14 Notification of NAVDAT services

National Administrations should ensure that ITU and IMO be advised to include updated information on the ITU Maritime mobile Access and Retrieval System (MARS) and IMO GISIS webpages and that mariners are informed of the establishment of, and/or changes to, NAVDAT services by inclusion of full details in Notices to Mariners and lists of radio signals. In addition, full details should be forwarded to the appropriate NAVAREA Coordinator, METAREA Coordinator and:

International Maritime Organization 4 Albert Embankment London SE1 7SR United Kingdom Telephone: +44 (0)20 7735 7611 Telefax: +44 (0)20 7587 3210 E-mail: ncsr@imo.org and navtex.panel@UKHO.gov.uk (In subject line add: for Chair IMO NAVTEX Coordinating Panel)	International Telecommunication Union Radiocommunication Bureau Place des Nations 1211 Genève 20 Switzerland Telephone: +41 22 7305560 Telefax: +41 22 7305785 E-mail: brmail@itu.int
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Appendix 1

IMO NAVTEX Coordinating Panel

Terms of reference

1 Terms of reference

- .1 advise Administrations planning to implement a NAVTEX service on the frequencies 518 kHz, 490 kHz or 4 209.5 kHz and/or a NAVDAT service on the frequencies 500 kHz, 4 226 kHz or other HF frequencies specified in Appendix 15 to the Radio Regulations, on the operational aspects of the systems. In particular, advise on the optimum number of stations, the allocation of coast station identification code and broadcast message criteria;
- .2 coordinate with Administrations over the operational aspects of NAVTEX and NAVDAT in the planning stages in order to prevent mutual interference owing to the number of stations, transmitter power, or transmission identifying codes;
- .3 remain aware of system problems which arise, through reports from sea and correspondence with operational NAVTEX and NAVDAT Coordinators.
- .4 when problems are identified, liaise with appropriate Administrations involved, NAVAREA Coordinators, METAREA Coordinators, the Sub-Committee on Navigation, Communications and Search and Rescue (NCSR), and IHO or WMO, as appropriate, to recommend solutions or mitigating measures and, when agreed, coordinate their implementation; and
- .5 prepare documentation supporting the system for the NCSR Sub-Committee including those that are needed by Administrations to guide their operations, and those needed to inform the user of the service (mariner, shipowner and operator).

2 Contact addresses

The NAVTEX Coordinating Panel can be contacted at the following addresses:

The Chairman
IMO NAVTEX Coordinating Panel
International Maritime Organization
4 Albert Embankment London SE1 7SR United Kingdom

Telephone: +44 (0)20 7735 7611
Telefax: +44 (0)20 7587 3210
E-mail: ncsr@imo.org and navtex.panel@UKHO.gov.uk (In subject line add: for Chair IMO NAVTEX Coordinating Panel)

3 Panel membership and participation

3.1 The IMO NAVTEX Coordinating Panel is open to membership by all Member Governments and also includes one member nominated by each of the following international organizations:

- .1 International Maritime Organization (IMO);
- .2 World Meteorological Organization (WMO);
- .3 International Hydrographic Organization (IHO); and
- .4 International Mobile Satellite Organization (IMSO).

3.2 The following may be represented as observers on the Panel:

- .1 IHO World-Wide Navigational Warnings Service Sub-Committee;
- .2 IMO Enhanced Group Call Coordinating Panel; and
- .3 WMO Services Commission (SERCOM).

3.3 The work of the Panel is conducted mainly by correspondence. Meetings, when appropriate, are announced in advance and normally scheduled to be held in the margins of other IMO or IHO meetings.

Appendix 2

NAVDAT system

This annex explains basically the NAVDAT message structure and the modulation parameters to optimize the size of the NAVDAT message to transmit. Further details, operational and technical characteristics of the NAVDAT system are contained in the most recent versions of Recommendations ITU-R M.2010 for MF and ITU-R M.2058 for HF bands. The most recent version of Report ITU-R M.2443 "NAVDAT Guidelines" describes the use of the NAVDAT system operating in the mobile maritime service.

1 The NAVDAT frame structure

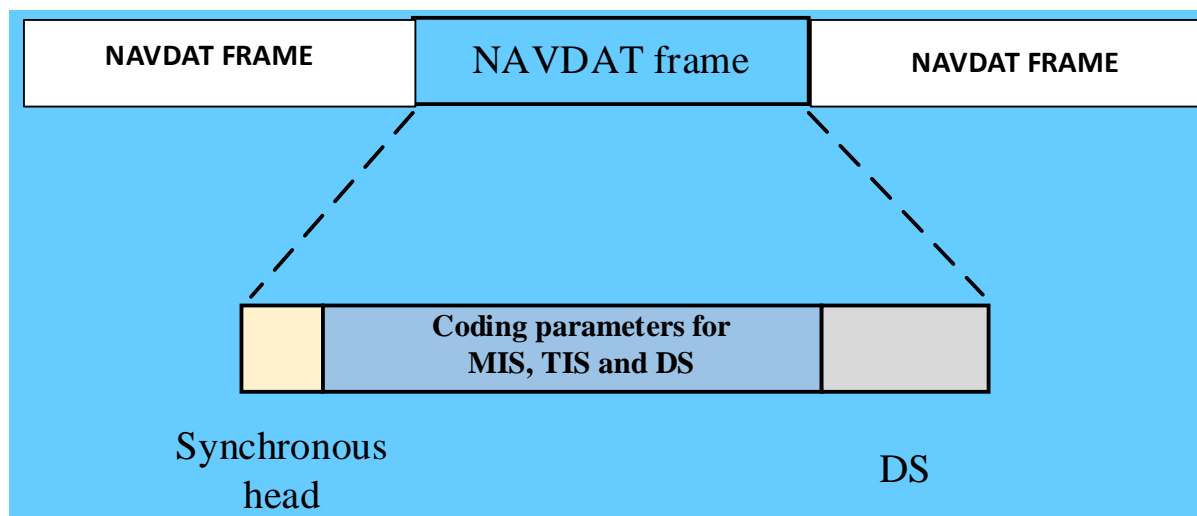


Figure 1:NAVDAT frame structure

1.1 Terminology:

- BW: Occupied bandwidth
- Code Rate: Ratio between error correction data and useful data
- DS: Data stream
- MIS: Modulation information stream
- TIS: Transmitter information stream
- QAM: Quadrature Amplitude Modulation

2 Size of files to broadcast on NAVDAT

The propagation channel depends on the propagation mode and the frequency used. Report ITU-R BS.2144 describes the broadcast Digital Radio Mondiale (DRM) with an Orthogonal frequency division multiplexing (OFDM) modulation.

ITU has defined several criteria concerning the propagation channel from which four modes can be defined as follows:

Mode	Robustness	Typical propagation condition	Usable frequency band
A	Surface wave channels with minor fading	Surface Wave	MF (500 kHz)
B	Time and frequency selective channel with longer delay spread	Surface wave and Sky Wave	MF and HF
C	As B but with higher Doppler spread	Sky Wave	only HF long range
D	As B but with severe delay and Doppler spread	Sky Wave	only HF long range

Table 1: 4 Basic propagation modes

For all robustness modes (A to D) three different modulations schemes (4, 16 or 64 QAM) can be used with code rate of 0.5 or 0.75.

Mode D is not recommended for NAVDAT.

2.1 Reference table for file transfer time

Table 2 gives the transmission rates and the broadcasting time for a 10 kB file for different parameters.

Memory: 1o (1 octet) = 8 bits = 1 byte (1 B); 1 kB = 8000 bits = 1 kilobyte

Note: the standard or short frame (400 ms) allows file transfer without repetition. In the case of the long frame, the file is repeated three times in order to obtain redundancy in the decoding of the signals by the receiver. The useful flow is in this case divided by three.

This table is given for estimate reference only.

Mode	BW kHz	QAM	kB by second for Code Rate = 0.5		kB by second for Code Rate = 0.75		Time (min) to broadcast a 10 kB file with 0.5		Time (min) to broadcast a 10 kB file with 0.75	
			Short frame	Long frame	Short frame	Long frame	Short frame	Long frame	Short frame	Long frame
A	10	16	1.19	0.40	1.85	0.60	0.14	0.42	0.09	0.28
	10	64	1.763	0.58	2.77	0.92	0.095	0.29	0.06	0.18
	5	16	0.58	0.19	0.92	0.30	0.29	0.86	0.18	0.55
	5	64	0.9	0.3	1.36	0.46	0.19	0.57	0.13	0.37
	3	16	0.35	0.12	0.55	0.18	0.48	1.42	0.30	0.92
	3	64	0.53	0.175	0.82	0.27	0.32	0.95	0.21	0.61
	1	16	0.12	0.039	0.18	0.060	1.43	4.28	0.92	2.75
	1	64	0.175	0.058	0.27	0.090	0.95	2.9	0.61	1.83
B	10	16	0.96	0.36	1.66	0.56	0.16	0.47	0.10	0.30
	10	64	1.66	0.52	2.45	0.83	0.10	0.32	0.068	0.2
	5	16	0.52	0.173	0.83	0.27	0.32	0.96	0.20	0.62
	5	64	0.76	0.26	1.19	0.41	0.22	0.64	0.14	0.41
	3	16	0.32	0.10	0.49	0.16	0.53	1.6	0.34	1.02
	3	64	0.46	0.16	0.73	0.25	0.36	1.06	0.23	0.68
	1	16	0.093	0.031	0.14	0.047	1.8	5.42	1.16	3.5
	1	64	0.14	0.046	0.22	0.072	1.20	3.6	0.77	2.32
C	10	16	0.84	0.28	1.39	0.45	0.2	0.6	0.12	0.37
	10	64	1.28	0.43	2	0.67	0.13	0.39	0.083	0.25
	5	16	0.43	0.15	0.67	0.22	0.39	1.16	0.25	0.75
	5	64	0.64	0.22	0.98	0.33	0.26	0.77	0.17	0.5
	3	16	0.26	0.086	0.40	0.13	0.65	1.94	0.41	1.24
	3	64	0.39	0.13	0.6	0.2	0.43	1.29	0.28	0.83
	1	16	0.083	0.028	0.13	0.043	2	6	1.28	3.85
	1	64	0.13	0.042	0.2	0.064	1.33	4	0.86	2.6

Table 2: Transmission rates and the broadcasting time for a 10 kB file

Example :

In mode A

Calculate the broadcast time for a file of 15 kB with the following parameters:

BW = 10 kHz
QAM = 64
Error code = 0.75
Long frame

We found in the table 0.92 kB by sec.
For 15 kB: $15/0.92 = 16.3$ sec, i.e. $16.30/60 = 0.27$ min

2.2 Reference table for file transfer size

Table 3 indicates the total size of files (in kB) that can be broadcast in 10, 15 or 20 min for all BW, QAM and broadcast mode.

This table is given for estimate reference only.

Mode	BW	QAM	Short frame 0.5 (min)			Long frame 0.50 (min)			Short frame 0.75(min)			Long frame 0.75 (min)		
			10	15	20	10	15	20	10	15	20	10	15	20
A	10	16	714	1071	1428	240	432	480	1092	1638	2184	360	540	720
	10	64	1058	1587	2116	348	522	696	2304	3456	4608	768	1152	1536
	5	16	348	522	696	114	171	228	540	810	1080	180	270	360
	5	64	540	810	1080	180	270	360	816	1224	1632	276	414	552
	3	16	210	315	420	72	108	144	330	495	660	108	162	216
	3	64	318	477	636	105	158	210	492	738	984	162	243	324
	1	16	72	108	144	23.4	35	47	108	162	216	36	54	72
	1	64	105	158	210	34.8	52	70	162	243	324	54	81	108
B	10	16	576	864	1152	210	324	432	996	1494	1992	336	504	672
	10	64	996	1494	1992	312	468	624	1470	2205	2940	498	747	996
	5	16	312	468	624	103.8	158	208	498	747	996	162	243	324
	5	64	456	684	912	156	234	312	714	1071	1428	246	369	492
	3	16	192	288	384	60	90	120	294	441	588	96	144	192
	3	64	276	414	552	96	144	192	438	657	876	150	225	300
	1	16	55.8	84	112	18.6	28	37	84	126	168	28.2	42	56
	1	64	84	126	168	27.6	41	55	132	198	264	43.2	65	86
C	10	16	504	756	1008	168	252	336	834	1251	1668	270	405	540
	10	64	768	1152	1536	258	387	516	1200	1800	2400	402	603	804
	5	16	258	387	516	90	135	180	402	603	804	132	198	264
	5	64	384	576	768	132	198	264	588	882	1176	198	297	396
	3	166	156	234	312	51.6	77	103	240	360	480	78	117	156
	3	64	234	351	468	78	117	156	360	540	720	120	180	240
	1	16	50	75	100	16.8	25	33	78	117	156	25.8	39	52
	1	64	78	117	156	25.2	38	50	120	180	240	38.4	58	77

Table 3: Total size of files (in kB) that can be broadcast in 10, 15 or 20 min

3 The NAVDAT server

3.1 General description

The NAVDAT server constitutes the IT equipment to help the NAVDAT Coordinator which:

- receives the various digital files (data, texts, graphics, images, etc.) from various information providers such as hydrographic office, weather office or RCC; and
- allows to select the broadcast parameters.

It can be installed either on:

- the NAVDAT coast station site;
- an RCC; and
- any information provider building.

It is connected to the network by secure and dedicated accesses.

It is connected also to the NAVDAT controller, located near the transmitter, and which will assemble the data to obtain the frame NAVDAT OFDM format.

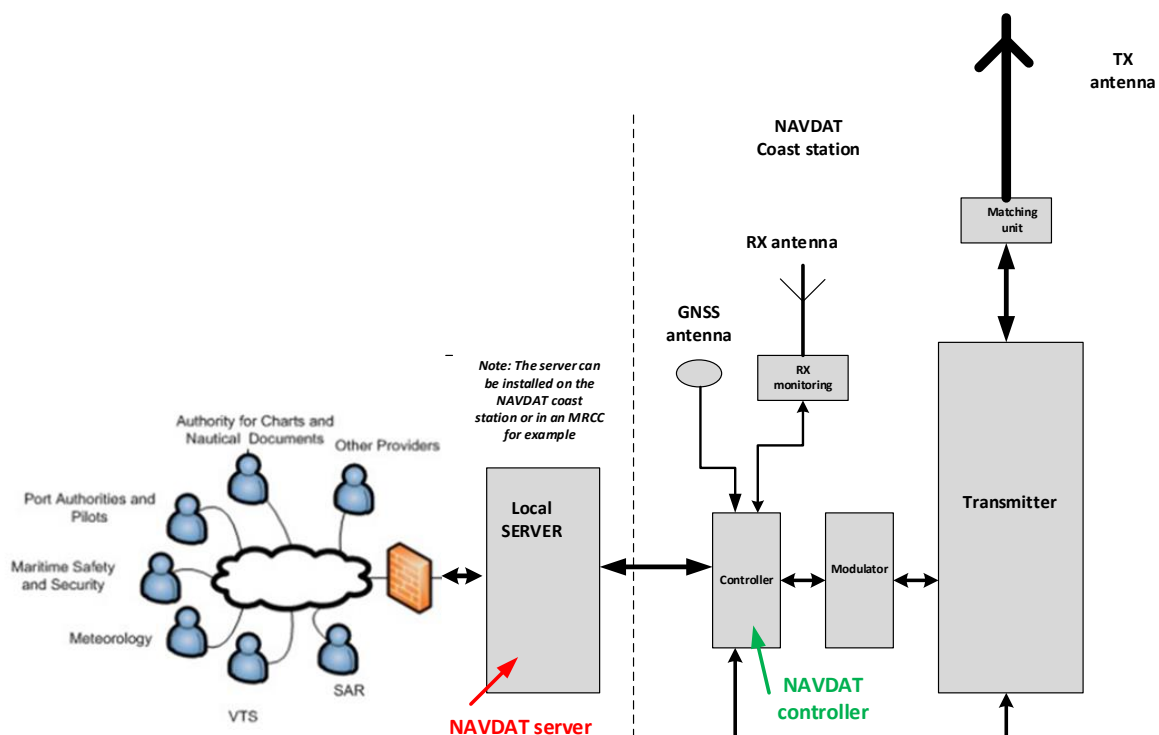


Figure 2: NAVDAT broadcast chain

3.2 Principle of operation

Each authorized information provider can access the NAVDAT server with a specific authenticated address.

Each file prepared by the information provider will have a heading giving the title of the document as well as the identification number of this document.

When connecting to the NAVDAT server, a window will open allowing the information provider to upload the file (or files) and configure the broadcast (periodicity and order of priority).

After validation by the information provider, the file will be entered in the NAVDAT server's log list and a message number will be assigned to each file transmitted. At the same time, a confirmation copy of the validated log is sent to the provider at the origin of the message.

For each file the NAVDAT server will calculate the broadcasting time in relation to the size of the file and the selected parameters. It will verify that all the files submitted by the information provider can be broadcast inside the 20-minute slot. Otherwise, the last ROUTINE message(s) will be transferred to other slots and will inform the information provider of this situation.

3.3 Broadcast settings

The following parameters can be selected by the information provider:

- Frequency used for international broadcasting

The server will only display the possible choices (for example 500 kHz only)

- National broadcast
The server will display the possible choices
- Information of spectrum occupancy
Choice between: 1, 3, 5 or 10 kHz
- Information of TIS modulation
Choice between: 4 or 16 QAM
- Information of DS modulation
Choice between: 4, 16 or 64 QAM
- Error encoding (code rate)
Choice between: 0.5 or 0.75 for each bandwidth and each modulation
- Mode of robustness: A, B, C and optional D
- Subject message code: 1 to 63
- Broadcast mode
Choice between:
 - General broadcast** (as a standard mode)
 - Dedicated message** to a ship: with the ship ID (MMSI)
 - Selective Broadcast:**
 - To a Group of ships: with group ID
 - To a Selective area: with the geographical coordinates of the defined area (The geographical areas used regularly can be stored in memory and recalled by the information provider).
- Time slots
The broadcast slots are allocated by the IMO NAVTEX Coordinating Panel and cannot be modified.
The information provider can however select the time slot(s) used for broadcasting.
- Repetition
It is possible to select the automatic replay of messages on 1 or more consecutive days.

- Short-frame or super-frame

This function is configured in the server in the default parameters.

3.4 Default settings

The server can be configured by default, during its installation, to facilitate the deposit of files by the information providers. However, these parameters can be changed at any time with administrator password.

3.5 Propagation-related parameters

It may be necessary to modify the following parameters depending on whether it is day time or night time:

Mode of robustness **A** during the day and **B** during the night

RF power: Can be reduced at night to X %

This information can be taken into account in the default settings.

One for the day and the other for the night (switchable automatically by the server depending on the current slot).

3.6 Identity of the coast station

The code corresponding to the coast station identification is allocated by the IMO NAVTEX Coordinating Panel.

It cannot be modified by the coast station's service provider.

It is different depending on the frequency used (main international frequencies 500 kHz or 4 226 kHz or national/regional frequency).

3.7 Day and Time

The NAVDAT server will display the year, month, day and time (hour/minutes/seconds).

The NAVDAT server will calculate, for each file uploaded, the broadcasting time in relation to the parameters selected previously and will give the duration of the message in minutes and seconds.

It will also display the hour, minutes and seconds of broadcast start time of each file.

[3.8 Priority message

There are four priorities messages for the NAVDAT service:

Coding	Priority
00	Routine
01	Safety
10	Urgency
11	Distress

DISTRESS

Priority message that should be broadcast immediately.

If the time slot is free, the frequency which will be used for the broadcast will be checked by the monitoring receiver of the NAVDAT station which will be used. If the frequency is free, the DISTRESS message will be transmitted immediately.

URGENCY

Priority message that should be broadcast as soon as possible.

Can be broadcast outside the broadcast normal time slot. In this case, the NAVDAT server will give the following instructions to the controller of the NAVDAT station:

Check that you are outside the time slots allocated to adjacent NAVDAT coast stations in the area.

Check that the frequency planned for the broadcast is free.

Broadcast the URGENCY message.

SAFETY

The NAVDAT server will position these messages in the first row to be broadcast.

If a SAFETY message is sent by an information provider when the mailing list has already been prepared by the NAVDAT server, the NAVDAT server will change the broadcast order accordingly. If necessary, the NAVDAT server will shift routine messages for subsequent broadcasts.

ROUTINE

Standard message with no particular priority.

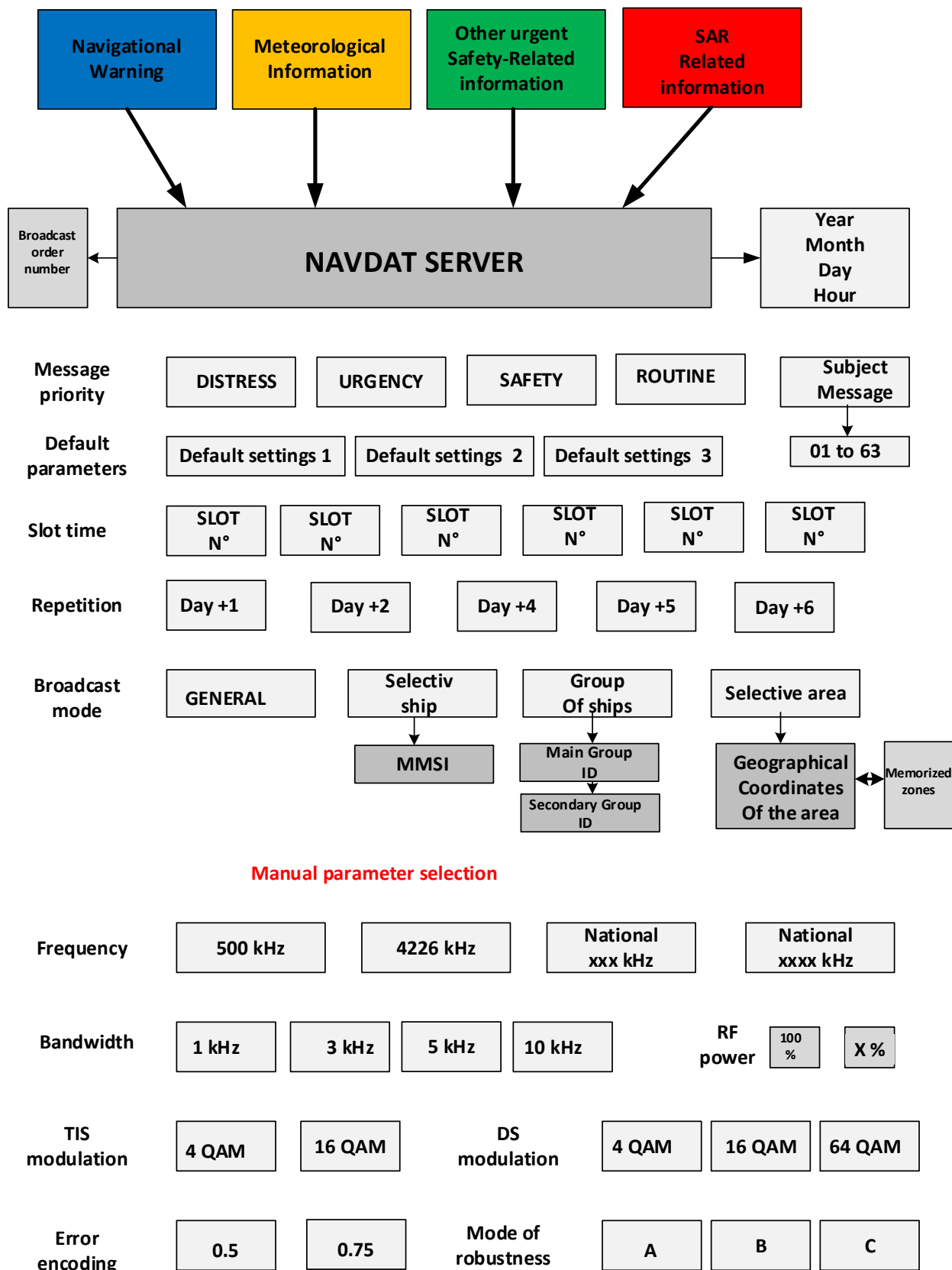


Figure 3: Simplified NAVDAT server diagram]

Appendix 3

NAVDAT ship receiver description

1 General description

A typical NAVDAT 500 kHz and NAVDAT HF digital receiver is composed of several basic blocks:

- .1 reception antenna and GNSS antenna;
- .2 RF front end;
- .3 demodulator;
- .4 file demultiplexer;
- .5 controller;
- .6 Control and display unit (CDU);
- .7 data interface; and
- .8 power supply.

2 Frequency management

2.1 The NAVDAT ship receiver should receive the main MF channel (500 kHz) and the main HF channel (4 226 kHz) simultaneously.

2.2 It should also be possible to receive, via a scanning function, at least one (or more) another frequency allocated to NAVDAT at international, national or regional level (in MF or HF maritime bands).

2.3 The NAVDAT ship receiver may decode the main MF channel (500 kHz) and the main HF channel (4 226 kHz) simultaneously.

2.4 The decoding of frequency(s) received by scanning can be demodulated in real time or in time delay.

2.5 The receiver can be a stand-alone equipment with an integrated display and interface to other external equipment or a black box type equipment.

3 Reception antenna and global navigation satellite antenna

3.1 The receiving antenna can be a vertical H field antenna (recommended on an EMC noisy ship) or an E field antenna. The ship's NAVDAT receiver can also receive NAVDAT MF and HF bands. The omnidirectional receiving antenna system will have a minimum band from 400 kHz to 30 000 kHz.

3.2 A GNSS antenna (or connection to the existing ship GNSS receiver) is also needed in order to obtain the ship's position and time.

4 RF front end

This block includes the RF filter, RF amplifier and baseband output. High sensitivity and high dynamic range are necessary with protection against strong RF fields from ship transmitting antennas or lighting. It is recommended to place a notch filter on the MF broadcasting bands (from 526.5 kHz).

5 Scan function

As indicated in 1, the ship's NAVDAT receiver permanently monitors the frequencies 500 kHz and 4 226 kHz and can simultaneously decode the signals received on these two frequencies.

5.1 To allow reception of national or regional frequencies assigned to the NAVDAT system, the receiver uses a scan function on the following maritime frequency bands:

:

- .1 the MF band from 415 kHz to 526.5 kHz (except 500 kHz);
- .2 the channels assigned to NAVDAT in Appendix 15 to the ITU Radio regulations: 6 337.5 kHz, 8 443 kHz, 12 663.5 kHz, 16 909.5 kHz and 22 450.5 kHz; and
- .3 the frequency bands assigned to wideband digital transmissions of Appendix 17 of ITU Radio regulations in the bands 4, 6, 8, 12, 16, 19, 22 and 26 MHz (except 4 226 kHz, 6 337.5 kHz, 8 443 kHz, 12 663.5 kHz, 16 909.5 kHz and 22 450.5 kHz).

5.2 The signals received on the frequency selected by scan can be decoded in real time or in time shifted according to the resources of the NAVDAT receiver computer at this moment.

5.3 To ensure proper operation of the receiver scan function, the transmitters of active national or regional NAVDAT coast stations should transmit, before the NAVDAT broadcast, a sequence of known data during 400 ms repeated eight times for a total duration of 3.2 seconds. To ease receiver demodulation of the NAVDAT broadcast, known data is using the same bandwidth and the same modulation constellation as the subsequent NAVDAT broadcast. Known data uses a one length super-frame pattern.

Appendix 4

Frequencies for NAVDAT HF system identified by ITU

Channel	Maritime frequency band	Central frequency (kHz)	Limits (kHz)
C1	4 MHz	4 226	4 221 to 4 231
C2	6 MHz	6 337.5	6 332.5 to 6 342.5
C3	8 MHz	8 443	8 438 to 8 448
C4	12 MHz	12 663.5	12 658.5 to 12 668.5
C5	16 MHz	16 909.5	16 904.5 to 16 914.5
C6	22 MHz	22 450.5	22 445.5 to 22 455.5

Appendix 5

Procedure for amending the NAVDAT Manual

1 Proposals for amendment or enhancement of the NAVDAT Manual should be submitted to the Maritime Safety Committee through the Sub-Committee on Navigation, Communications and Search and Rescue (NCSR).

2 Amendments to this Manual should normally be approved at intervals of approximately two years or at such longer periods as may be determined by the Maritime Safety Committee. Amendments approved by the Maritime Safety Committee will be notified to all concerned and will come into force on 1 January of the following year, or at another date as decided by the Committee.

3 The agreement of the International Hydrographic Organization and World Meteorological Organization, and the active participation of other bodies, shall be sought according to the nature of the proposed amendments.

ANNEX 9

PROGRESS REPORT RELATED TO THE REVISED ROAD MAP ON THE ISSUES TO BE CONSIDERED REGARDING THE INTRODUCTION OF NAVDAT SERVICE (NCSR 11/WP.8, ANNEX 5)

1 Identify the areas where NAVDAT can complement NAVTEX/GMDSS in providing maritime safety information to ships at sea and what identified gap(s) it is potentially filling.

NAVDAT complements NAVTEX by addressing MSC.1/Circ.1595 on E-navigation Strategy Implementation Plan, particularly noting that all Maritime Services should be S-100 conformant as a baseline with integration and presentation of available information in graphical displays received via communication equipment.

2 Determine if the intent is for NAVDAT to eventually replace NAVTEX, and if so, what are the time frame and regulatory amendments required.

The two systems will coexist. It could be considered appropriate to deploy NAVDAT coast stations when renewing or modernizing ageing NAVTEX coast stations, noting that NAVDAT transmitters would support the broadcast of both NAVTEX and NAVDAT messages.

3 Determine if NAVDAT can support the S-100 data model for providing maritime safety information to ships at sea, for navigational warnings, meteorological warnings and forecasts and ice information.

NAVDAT may support broadcast of IHO S-100 based data products for MSI and SAR related information. This needs to be demonstrated.

4 Develop performance (IMO), technical (ITU), test and certification (IEC) standards for the integration of NAVDAT into GMDSS.

The development status is as follows:

- .1 Draft MSC resolution on performance standards for the reception of MSI and SAR related information by MF and HF digital navigational data (NAVDAT) system was approved at NSCR 11 and submitted to MSC 109 for adoption;*
- .2 Draft revision of resolution MSC.509(105) on Provision of radio services for the Global Maritime Distress and Safety System (GMDSS) was approved at NSCR 11 and submitted to MSC 109 for adoption;*
- .3 Recommendation ITU-R M.2010-2 was approved;*
- .4 Recommendation ITU-R M.2058-1 was approved ;*
- .5 Report ITU-R M.2443-0 NAVDAT Guidelines was approved; and*
- .6 IEC test and certification standards to be drafted.*

5 Determine if equipment for shore-based transmission and/or shipborne reception simultaneously supports NAVDAT and NAVTEX, and in what capacity, i.e. forward and backward compatibility, or only backward compatibility.

The NAVDAT shore-based transmitter can be used to broadcast NAVTEX and NAVDAT messages. NAVDAT shipborne receiver capabilities, as per draft MSC resolution on the NAVDAT performance standard, will also be backward compatible with NAVTEX shipborne receiver capabilities.

Questions and comments for further consideration:

- .1 Can a shore station with multiple transmitters transmit NAVTEX and NAVDAT broadcasts simultaneously?*
- .2 Do NAVTEX and NAVDAT services require different time frames for transmissions?*
- .3 Will new shore stations support both forward and backwards compatibility (i.e. NAVTEX and NAVDAT) or only backwards compatibility?*
- .4 Will NAVDAT service keep to the current time slots?*
- .5 NAVDAT may need to transmit for longer periods than NAVTEX due to richer content and larger size of NAVDAT messages?*
- .6 The existing NAVTEX receivers will not be able to receive NAVDAT broadcasts.*
- .7 NAVDAT receivers will be able to receive both NAVTEX and NAVDAT broadcasts.*
- .8 Regarding the shore side transmitters, which instrument requires NAVDAT stations to transmit also NAVTEX broadcasts?*

6 Conduct pilot projects to test the integration of NAVDAT into GMDSS and evaluate the impact on the provisions of MSI and SAR-related information services.

ITU-R Report M.2443-0 approved. Information on two pilot projects conducted are as follows:

- .1 China established an MF NAVDAT system, which included a transmission station, a central control system, two monitoring stations and eight terminals that were deployed on ships or coastal stations. The experiments conducted with this set up showed that the MF NAVDAT system was capable of broadcasting information in various formats, such as text, images and electronic chart update packages, in different directions and at different times. In the 4QAM modulation mode, stable transmission was achieved at around 300 nautical miles, while the distances were 196 nautical miles and 103 nautical miles in the 16QAM and 64QAM modes, respectively; and*
- .2 France was in the process of establishing two NAVDAT coastal stations; one at CROSS Corsen for the Atlantic sea; and the other at CROSS Lagarde for the Mediterranean sea. These stations are expected to provide the NAVDAT service starting in spring 2025 in addition to the NAVTEX service they are currently providing.*

7 Engage with the IHO and WMO on the development of guidelines and procedures for the integration process, including a NAVDAT manual and operational implementation plan as a component of the WWNWS and WWMIWS.

.1 The NAVDAT Manual was under review by EG IMO/ITU with participation of WMO; and

.2 Identified MSI instruments impacted by NAVDAT implementation as follows:

.1 Resolution MSC.468(101) on Amendments to recommendation on promulgation of Maritime Safety Information;

.2 Resolution MSC.469(101) on Amendments to world-wide navigational warning service;

.3 Resolution MSC.470(101) on Amendments to IMO/WMO Worldwide Met-Ocean Information And Warning Service guidance document;

.4 MSC.1/Circ.1310/Rev.2 ON Joint IMO/IHO/WMO Manual on MSI; and

.5 MSC.1/Circ.1645 ON Guidance for the reception of maritime safety information and search and rescue related information as required in the Global Maritime Distress and Safety System (GMDSS).

8 Taking into account the NAVDAT pilot project results and the NAVDAT Manual, evaluate the potential cost impacts, including installation, implementation and operational cost, training, equipment and associated cost, to MSI and SAR-related information providers and shipping industry.

To be further developed.

From the general discussion at the twentieth meeting of the Joint IMO/ITU Experts Group on Maritime Radiocommunication Matters, the cost of shore and shipborne infrastructure will tend to be more expensive for NAVDAT than NAVTEX.

9 Develop training, familiarization and certification standards for ship operators, seafarers and shore-based personnel.

To be further developed.

10 Amend the terms of reference for the NAVTEX Coordinating Panel to monitor and evaluate the integration of the NAVDAT system to encourage ensure compliance with standards, guidelines and procedures. Articulate the process for determining service areas and the process for formal recognition of applications.

Creation of a Terrestrial MSI panel encompassing NAVTEX and NAVDAT for coordination and planning is considered. This will be discussed at the International IMO NAVTEX Coordinating Panel. Refer also to resolution MSC.509(105).

ANNEX 10

**DRAFT MODIFICATIONS TO
PROCEDURE FOR RESPONDING TO DSC DISTRESS ALERTS BY SHIPS
(MSC.1/Circ.1657)**

ANNEX

PROCEDURE FOR RESPONDING TO DSC DISTRESS ALERTS BY SHIPS

1 Paragraph 2.3 is amended as follows:

"2.3 Recommendation ITU-R M.541 on Operational procedures for the use of digital selective-calling equipment in the maritime mobile service identifies only two situations in which a ship would transmit a distress call relay (distress alert relay):

.1 on receiving a distress alert on an HF channel, which is not acknowledged by a coast station within five minutes, the ship should inform a coast station or a rescue coordination center and, if instructed by the coast station or the rescue coordination center, transmits ~~The the~~ distress call relay ~~addressed to the appropriate coast station~~ (annex 1, paragraph A1-3.4.2 and annex 3, paragraph A3-6.1.4);" and

.2 on knowing that another ship in distress is not itself able to transmit the distress alert and the master of the ship considers that further help is necessary. The distress call relay should preferably be addressed to ~~"all ships"~~ or to the appropriate an individual coast station or rescue coordination center (annex 3, paragraph A3-1.4.2)."

FLOW DIAGRAM 2

ACTIONS BY SHIPS UPON RECEPTION OF A HF DSC DISTRESS ALERT

2 The flowchart box at the end of the first row is amended as follows:

