European Committee for drawing up Standards in the field of Inland Navigation
(CESNI)

Edition 2021/1

European Standard
-
River Information Services

(ES-RIS)

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PART I
STANDARD ELECTRONIC CHART DISPLAY AND INFORMATION SYSTEM FOR INLAND NAVIGATION

CHAPTER 1
PERFORMANCE STANDARD FOR INLAND ECDIS

Article 1.01
General provisions

1.   Electronic chart display and information system for inland navigation (Inland ECDIS) is composed of hardware, software for the operating system and application software.

2.   Inland ECDIS aims to contribute to the safety and efficiency of inland shipping.

3.   Inland ECDIS can be designed for both **information mode** and **navigation mode**, or for **information mode only**.

     The minimum requirements for Inland ECDIS equipment designed for **information mode only**, specified in Part I, Article 1.04(1) and Chapter 5, are mandatory on waterways where carriage requirements are enacted by the responsible legislative organs. In other regions they are recommended.

4.   For **navigation mode** Inland ECDIS (Operating System Software, Application Software and Hardware) as specified in Part I, Chapter 5 shall have a high level of reliability and availability; at least of the same level as other means of navigation.

5.   Inland ECDIS shall use chart information as specified in Part I, Chapters 2 and 3.

6.   National authorities and international bodies are recommended to consider transitional provisions when they are introducing carriage requirements for Inland ECDIS.

7.   Inland ECDIS shall meet all the requirements of the Inland ECDIS performance standard set out in this Part.

8.   The terms "skipper" and "boatmaster" used in this Part shall be deemed to be equivalent with the term "ship master" used in the RIS Guidelines – Commission Regulation (EC) no 414/2007[1] or in the Guidelines and Recommendations for River Information Services, Edition 2.0, 2004, published by the Central Commission for the Navigation of the Rhine (CCNR).

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[1]   Commission Regulation (EC) no° 414/2007 of 13 March 2007 concerning the technical guidelines for the planning, implementation and operational use of river information services (RIS) referred to in Article 5 of Directive 2005/44/EC of the European Parliament and of the Council on harmonised river information services (RIS) on inland waterways in the Community (OJ L 105, 23.4.2007, p. 1).

9.   The producer or supplier of Inland ECDIS software must document in the user manual of the software which requirements for equipment (hardware) referred to in (3) need to be fulfilled for Inland ECDIS in information mode on waterways where carriage requirements are enacted by the responsible legislative organs.

10.   When the Inland ECDIS equipment provides essential services as defined in Directive (EU) 2016/1148 concerning measures for a high common level of security of network and information systems across the Union, the provisions of the said legislation apply.

11.   AIS is an automatic identification system for maritime vessels that complies with the technical and performance standards laid down in Chapter V of the SOLAS Convention (Safety of Life at Sea), as defined in the document referred to in Part I, Article 1.02(18). Inland AIS refers to the automatic identification system for inland waterway vessels as set out in the document referred to in Part I, Article 1.02(16). In this Part, whenever AIS is mentioned it refers to both maritime AIS and Inland AIS, unless specified otherwise.

Article 1.02
References

1.   IHO Special Publication No S-57 'IHO Transfer Standard for Digital Hydrographic Data', Edition 3.1, Supplement No 2, June 2009 with all Appendices and Annexes.

2.   IHO Special Publication No S-62 'ENC Producer Codes', Edition 2.5, December 2009.

3.   IHO Special Publication No S-52 'Specifications for Chart Content and Display Aspects of ECDIS', 6th Edition, March 2010, with all Appendices and Annexes, including:
        a) S-52 Appendix 1 'Guidance on Updating the Electronic Chart', Edition 4.0, April 2012.
        b) Former S-52 Appendix 2 "Colours & Symbols Specifications", Edition 4.3 (Jan 2008)
        c) Former S-52 Appendix 3 "Glossary of ECDIS-RELATED Terms Specifications" (now S-32, Appendix 1 (Sep 2007))
        d) Annex A to former S-52, Appendix 2, "Presentation Library", Edition 3.4 (2008).

4.   IMO Resolution MSC.232(82) 'Revised Performance Standards for Electronic Chart Display and Information Systems (ECDIS)', December 2006.— Appendix 3 NAVIGATIONAL ELEMENTS AND PARAMETERS.

5.   IEC-Guideline 61174, edition 3.0 'ECDIS — Operational and performance requirements, methods of testing and required test results', September 2008.

6.   Annex 5, Sections I to III of the ES-TRIN 2017: Requirements applicable to radar installations and rate-of-turn indicators.

7.   IHO Special Publication No S-32 Appendix 1 'Glossary of ECDIS-related Terms'.

8.   ES-RIS, Annex 1.

9.   ES-RIS, Annex 2.

10.   ES-RIS, Annex 3.

11.   European Standard EN 60945 : 2002 + corr.1 : 2010: Marine navigational equipment; General requirements — Methods of testing and required test results.

12.   European Standards IEC 61162 is a collection of standards for "Digital interfaces for navigational equipment within a ship". The European Standards 61162 are developed in Working Group 6 (WG6) of Technical Committee 80 (TC80) of the IEC.

13.   IENC Domain in the S-100 Registry.

14.   IEHG Product Specification for Inland ENCs.

15.   IEHG Inland ENC Feature Catalogue.

16.   ES-RIS, Part II

17.   ES-TRIN 2017/1[2].

18.   Directive 2002/59/EC establishing a Community vessel traffic monitoring and information system.

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[2]   European Standard laying down Technical Requirements for Inland Navigation vessels (ES-TRIN) ES-TRIN 2017/1; CESNI Resolution 2017-II-1 dated 6 July 2017.

Article 1.03
Contents, provision and updating of chart information

1. Contents and provision of Inland Electronic Navigational Charts (Inland ENCs) and bathymetric Inland ENCs

    a) The chart information to be used in Inland ECDIS shall be the latest edition of information.

    b) Provisions shall be made to prevent the user from altering the contents of original Inland ENC and bathymetric Inland ENC editions.

    c) At least the following features shall be included in the ENC:

        -   waterway axis with kilometres indication,

        -   links to the external xml-files with operation times of restricting structures, in particular locks and bridges,

        -   location of ports and transhipment sites,

        -   reference data for water level gauges relevant to navigation,

        -   bank of waterway (at mean water level),

        -   shoreline construction (e.g. groin, longitudinal control dam, training wall – any facility that is considered a hazard to navigation),

        -   contours of locks and dams,

        -   boundaries of the fairway/navigation channel (if defined),

        -   isolated dangers in the fairway/navigation channel under water,

        -   isolated dangers in the fairway/navigation channel above water level, such as bridges, overhead cables etc.,

        -   official aids-to-navigation (e.g. buoys, beacons, lights, notice marks).

        If the chart producer is using overlay files or bathymetric Inland ENCs, the features may be included in different chart cells, but the whole package must fulfil the minimum requirements listed in the indents above.

    d) Where the chart is intended to be used for **navigation mode** (Part I, Article 1.05(2)), the respective competent authority shall decide for each waterway or harbour which of the features referred to in (c) are to be verified. After verification, the respective competent authority shall declare which Inland ENCs and bathymetric Inland ENCs are approved for **navigation mode** within its geographical area of responsibility (for details see Part I, Chapter 3).

    e) The System Electronic Navigational Chart (SENC) shall be stored in the Inland ECDIS.

2. Updates

    a) Inland ECDIS shall be capable of accepting updates to the Inland ENC data provided in conformity with the Product Specification for Inland ENCs and updates of the depth information provided in conformity with the Product Specification for bathymetric Inland ENCs. Those updates shall be applied to the SENC automatically. The implementation procedure of the update shall not interfere with the display in use.

    b) Inland ECDIS shall allow for the display of updates, so that the skipper may review their contents and ascertain that they have been included in the SENC.

    c) Inland ECDIS shall be capable of revoking automatically applied updates of the Inland ENC data.

d) Original Inland ENC editions and later updates shall never be merged.

e) The Inland ENC and all updates to it shall be displayed without any degradation of their information content.

f) The Inland ENC data and updates to it shall be clearly distinguishable from other information.

g) Inland ECDIS shall ensure that the Inland ENC and all updates to it have been correctly loaded into the SENC.

h) Inland ECDIS shall keep a record of updates, including the time of application to the SENC.

i) The contents of the SENC to be used shall be adequate and up-to-date for the intended voyage.

Article 1.04
Presentation of information

1. Display requirements

   a) The display method shall ensure that the displayed information is clearly visible to more than one observer in the typical conditions of light experienced in the wheelhouse of a vessel by day and night.

   b) In navigation mode the display size of the chart presentation shall be at least 270 mm by 270 mm for equipment designed and admitted for the **navigation mode**.

   c) In information mode ergonomic aspects shall determine the size. The information displayed must be readily visible from the conning position.

   The display diagonal shall be equal to or larger than 199 mm (7,85 inches). Under all conditions the boatmaster must be capable of perceiving the displayed information sufficiently in accordance with Human Machine Interface guidelines.

   If the software is sold without a display, the manufacturer's documentation shall include the information that it may only be used as Inland ECDIS in information mode if the display fulfils the requirements of Part I, Article 1.04(1).

   d) The following criteria must be fulfilled in navigation mode as well as in information mode:

   - Alphanumeric data and text shall be presented using a clearly legible non-italic sans-serif font.

   - The font size shall be appropriate for the viewing distance from user positions (i.e. with respect to reading distance and viewing angles) likely to be experienced in the wheelhouse of a vessel.

   - The character height and the size of AIS symbols in millimetres shall not be less than 3,5 times the nominal viewing distance in metres.

   - The minimum size of AIS symbols and the minimum character height of AIS information shall be 3,5 mm.

   - The manufacturer's documentation shall identify the nominal viewing distance for the display equipment.

   e) The display requirements shall be complied with, whether in landscape or in portrait format.

f)   In information mode for the size of the display it is recommended to use the size as specified for navigation mode. In the event that space for the installation of the display is a problem, the display size might be reduced taking into account the nominal viewing distance for the display.

2.   Display ranges (scales)

a)   In **information mode** (refer to Part I, Article 1.05(1)) all scales and ranges are permitted.

b)   In **navigation mode** (refer to Part I, Article 1.05(2)), only the successive switchable ranges (scales) specified in Part I, Article 5.04(7) are permitted.

3.   Image positioning and orientation

a)   In **information mode** all kinds of chart orientation are permitted (see Part I, Article 1.05(1))

b)   In **navigation mode** the chart shall be automatically positioned and oriented in the relative motion, head-up orientation with the own vessel's position in the screen centre or off-centred (see Part I, Article 1.05(2)).

4.   Display of SENC information

a)   The display of SENC information shall be divided into the following three display categories:

-    Display Base,
-    Standard Display (Standard Information Density),
-    All Display.

The allocation of the feature classes to the display categories is given in detail in the Look-up Tables of the document referred to in Part I, Article 1.02(9).

b)   The Display Base category shall contain at least the following features:

-    bank of waterway (at mean water level),
-    shoreline construction (e.g. groin, longitudinal control dam, training wall – any facility that is considered a hazard to navigation),
-    contours of locks and dams,
-    boundaries of the fairway/navigation channel (if defined),
-    isolated dangers in the fairway/navigation channel under water,
-    isolated dangers in the fairway/navigation channel above water level, such as bridges, overhead wires etc.,
-    official aids-to-navigation (e.g. buoys, lights and beacons).

c)   The Standard Display (Standard Information Density) category shall contain at least the following features:

-    the objects of Display Base category,
-    prohibited and restricted areas,
-    piers for commercial vessels (cargo and passenger),
-    kilometre and hectometre or mile marks on the banks.

d)   The All Display category shall display all features that are contained in the Inland SENC, individually on demand.

e) When starting the Inland ECDIS, it shall come up with the Standard Information Density as defined in the document referred to in Part I, Article 1.02(3) and the Glossary of Terms in Part I, Chapter 8.

f) Inland ECDIS shall be switchable to the Standard Information Density at any time by a single operator action.

g) Inland ECDIS shall clearly indicate the information density in use at all times.

h) Time variable depth information in the ENC shall be displayed independently of the three display categories referred to in (a).

5. Display of radar information

a) In **navigation mode** the radar image shall have the highest display priority and shall only be permitted to be presented in the relative motion, head-up mode. If the system is also type approved for maritime ECDIS, true motion and north-up mode may be implemented, but only for working in **information mode**.

b) The underlaid SENC shall match in position, range and orientation. The radar image and the position from the position sensor shall both be adjustable for the antenna offset to the conning position.

c) The overlaid radar image shall conform to the minimum requirements as specified in Part I, Article 5.04(14).

d) The overlaid radar image may contain additional navigational information. Any additional navigational information and tracking and tracing symbols shall however in no way degrade the display of the original radar content.

6. Display of other navigational information

a) Inland ECDIS and additional navigational information (Inland AIS) shall use a common conventional geodetic coordinate reference system.

b) It shall be possible to display the skipper's own vessel's position on the screen.

c) It shall be possible for the skipper to select safety depth limits.

d) Inland ECDIS shall indicate the falling short of the safety depth limits.

7. Colours and symbols

a) The display of colours and symbols to represent SENC information shall at least be able to comply with the regulations of Part I, Chapter 4. Additionally other user-selectable symbol sets are permitted.

b) To present navigational elements and parameters as listed in the document referred to in Part I, Article 1.02(4) other colours and symbols than those mentioned in Part I, Article 1.04(7)(a) shall be used.

8. Data and display accuracy

a) The accuracy of the calculated data that are presented shall be independent of the display characteristics and shall be consistent with the SENC accuracy.

b) The Inland ECDIS in **navigation mode** shall provide an indication as to whether the display uses a smaller display range than the accuracy of the Inland ENC data offers (over-scale indication).

c) The accuracy of all calculations performed by Inland ECDIS shall be independent of the characteristics of the output device and shall be consistent with the SENC accuracy.

d) Bearings and distances drawn on the display or those measured between features already drawn on the display shall have accuracy no less than that afforded by the resolution of the display.

Article 1.05
Operation

1. Information mode

    a) **Information mode** shall be used for information only and not for navigation.

    b) In **information mode** all kinds of chart orientation, rotation, zooming and panning are allowed. However, it is recommended to use the same fixed ranges as in the **navigation mode** and the chart orientation whether:

    - to north, or

    - to the fairway axis at the actual position, or

    - to the actual vessels heading.

    c) It shall be possible to scroll the chart manually on the screen with the fairway axis in line with the vertical screen axis.

    d) Inland ECDIS may be connected to a positioning sensor to scroll the chart picture automatically and to display the section of chart matching the actual surrounding, namely in the operator-selected range.

    e) Information regarding the position and orientation of other vessels, gathered by communication links like AIS, shall be only displayed if they are up-to-date (nearly real-time) and accurate. If the heading of other vessels is not available, the position and the orientation of those other vessels shall not be presented by:

    - a directed triangle, or

    - a true outline (to scale).

    In this case the usage of a generic symbol is recommended.

    The following time out values are recommended (from IEC 62388):

Category of vessel	Nominal reporting interval class A	Maximum time out value class A	Nominal reporting interval class B	Maximum time out value class B
Vessel at anchor or moored and not moving faster than 3 knots (class B not moving faster than 2 knots)	3 min	18 min	3 min	18 min
Vessel at anchor or moored and moving at more than 3 knots	10 s	60 s	3 min	18 min
Vessel operating in SOLAS mode, moving 0 to 14 knots	10 s	60 s	30 s	180 s
Vessel operating in SOLAS mode, moving 0 to 14 knots and changing course	3 1/3 s	60 s	30 s	180 s
Vessel operating in SOLAS mode, moving 14 to 23 knots	6 s	36 s	30 s	180 s
Vessel operating in SOLAS mode, moving 14 to 23 knots and changing course	2 s	36 s	30 s	180 s

Category of vessel	Nominal reporting interval class A	Maximum time out value class A	Nominal reporting interval class B	Maximum time out value class B
Vessel operating in SOLAS mode, moving faster than 23 knots	2 s	30 s	30 s	180 s
Vessel operating in SOLAS mode, moving faster than 23 knots and changing course	2 s	30 s	30 s	180 s
Vessel operating in inland waterway mode	2 – 10 s	60 s	-	-

The AIS targets should be marked as outdated if the position information of moving vessels is older than 30 seconds.

Information on the intention (blue sign) or the number of blue cones of other vessels, the status of signals, weather warnings (from Meteoalarm: www.meteoalarm.eu) and the water level received via Inland AIS may be displayed. The information on the intention (blue sign) shall only be displayed on the right side of the symbol, if the heading of the vessel is available. If no heading information is available the information shall only be displayed in a direction independent form.

The following table is providing an example for the display:

Visualisation of Blue Sign status 0 to 2 and dangerous goods						
Blue sign		Not connected or not available		Not Set		Set
Blue cones		no	1 to 3	no	1 to 3	no	1 to 3

f) Information regarding AIS base stations, AIS Aids to Navigation (ATON) and AIS Search and Rescue Transmitters (SART) may be displayed, if the symbols can be distinguished from other symbols (e.g. symbols 2.10 and 2.11 of IEC 62288 Edition 2, Table A.2).

g) Information received by an AIS device and required by local police regulations shall be displayed.

h) It shall be possible to display all information transmitted by an AIS on user request.

2.   Navigation mode

    a)   In **navigation mode**, the Inland ECDIS display shall be integrated with the own vessel's radar information.

        The radar information shall be clearly distinguishable from the SENC information.

    b)   The integrated display shall be in accordance with the requirements for radar on inland waterways as specified in Part I, Article 5.04(14).

    c)   The chart and the radar image shall match in size, position and orientation within the limits as specified in Part I, Articles 5.03(4) and 5.08(3)(b).

    d)   The integrated display shall only be presented in the head-up orientation. Other orientations are permitted in systems with an additional maritime ECDIS type approval. If such a system is used in true motion and/or north-up mode on European inland waterways, it is considered to be working in **information mode**.

    e)   It shall be possible for the operator to adjust the off-set values between the positions of the position sensor and the radar antenna of the vessel so that the SENC display matches the radar image.

    f)   It shall be possible to temporarily remove either the ECDIS or the radar information by a single operator action.

    g)   The vessel's position shall be derived from a continuous positioning system, the accuracy of which is consistent with the requirements of safe navigation.

    h)   **Navigation mode** shall provide an indication when the input from the position-fixing system is lost.

        Navigation mode shall also repeat, but only as an indication, any alarm or indication passed to it from a position fixing system.

    i)   The positioning system and the SENC shall be based on the same geodetic datum.

    j)   In **navigation mode**, the data referred to in Part I, Article 1.03(1)(c), first to seventh indent, and the following elements shall always be visible and shall not be obscured by other objects:

        -   Headline line (as required by ETSI EN 302 194-1, see document referred to in Part I, Article 1.02(6)),

        -   Bearing line (as required by ETSI EN 302 194-1, see document referred to in Part I, Article 1.02(6)),

        -   Range rings (as required by ETSI EN 302 194-1, see document referred to in Part I, Article 1.02(6)),

        -   Navigation lines (as required by ETSI EN 302 194-1, see document referred to in Part I, Article 1.02(6)),

        -   P-Lines,

        -   Buoys,

        -   Inland AIS symbols,

        -   Inland AIS labels (if displayed),

        -   AtoN information.

        The transparency of the radar overlay shall therefore be user defined. It shall be possible to switch Inland AIS labels off either manually or on base of a configured timeout value.

k) Information regarding the position and orientation of other vessels, gathered by other communication links than the own radar, may be displayed only if they are up-to-date (nearly real-time) and meet the accuracy that is required for the support of tactical and operational navigation. Position information of the own vessel that is received from a repeater station shall not be displayed.

l) As tracking and tracing information (for example AIS) of other vessels is useful for the planning of the passing, but of no use during passing itself, tracking and tracing (AIS) symbols shall not disturb the radar image during passing and shall be faded out therefore. Preferably the application shall allow the skipper to define the area where the symbol is faded out.

m) If the heading of other vessels is available, the position and the orientation of those other vessels may be presented by

- a directed triangle, or

- a true outline (to scale).

In all other cases a generic symbol shall be used (an octagon is recommended, a circle shall not be used for applications which are certified according to maritime standards).

n) Information that another vessel is carrying blue cones or lights may be displayed by a different colour of the vessel symbol. The number of the blue cones/lights shall only be displayed in the pick report.

o) Information on the intention of another vessel to pass on starboard (blue sign) may only be displayed on the right side of the directed triangle symbol or of the scaled shape if the heading of this vessel is available. If no heading information is available the information shall only be displayed in a direction independent form.

p) Information regarding the position of AIS base stations, AIS Aids to Navigation (ATON) and AIS Search and Rescue Transmitters (SART) may be displayed, if the symbols can be distinguished from other symbols (e.g. symbols 2.10 and 2.11 of International Standard IEC 62288 Edition 2, Table A.1).

3. Operation and control elements

a) Inland ECDIS shall be designed having regard to ergonomic principles for user-friendly operation.

b) The Inland ECDIS equipment shall have a minimum of operation and control elements (see Part I, Chapter 5).

c) Operation and control elements, and indicators for connected sensors, may be integrated in Inland ECDIS.

d) Standard settings and user-defined settings shall be easily retrievable.

Article 1.06
Connection with other equipment

1. Inland ECDIS shall not affect the performance of any connected equipment adversely. Similarly the connection of optional equipment shall not degrade the performance of Inland ECDIS.

2. Inland ECDIS shall be capable of generating information to other systems, e.g. for the purpose of electronic reporting.

3. The relevant requirements of controls and indicators to connected equipment shall be fulfilled.

Article 1.07
Indication and alarms

1.   Built in Test Equipment (BITE)

Inland ECDIS in navigation mode shall be provided with the means for carrying out on-board tests of major functions either automatically or manually. In case of a failure, the module at fault shall be shown.

2.   Malfunctions
   a)   Inland ECDIS in **navigation mode** shall provide a suitable alarm or indication of system malfunctions (refer to Part I, Article 5.09).
   b)   Inland ECDIS in **information mode** shall provide a suitable alarm or indication of missing input from – if connected – GNSS receiver, AIS and heading device.
   c)   Inland ECDIS shall provide appropriate alarms or indications of malfunction of the equipment with respect to the displayed information.

Article 1.08
Fall-back arrangements

1.   Insufficient accuracy of the SENC-positioning

In **navigation mode** the SENC shall be automatically switched off, if the SENC positioning does not match the radar picture within the limits set out in Part I, Article 5.05(1) and (2).

2.   Defects
   a)   If the Inland ECDIS system in navigation mode has an evident defect, it shall provide a suitable alarm (refer to Part I, Articles 5.04(16) and 5.09).
   b)   Facilities enabling a safe take-over of the functions of Inland ECDIS in navigation mode shall be provided in order to ensure that an Inland ECDIS failure does not result in a critical situation.

Article 1.09
Power supply in navigation mode

The Inland ECDIS shall have its own separate fused power supply.

CHAPTER 2
DATA STANDARD FOR INLAND ENCs

Article 2.01
Introduction

1.   The Data Standard for Inland ENCs describes the technical specifications to be used

   a)   for the exchange of digital hydrographic data between national inland waterway authorities, and

   b)   for its distribution to manufacturers, skippers and other users.

2.   This Data Standard shall be used for the production of Inland ENCs and bathymetric Inland ENCs. The transfer and distribution of Inland ENCs and bathymetric Inland ENCs shall take place in such a way that data integrity is ensured.

3.   This Data Standard is based on the document referred to in Part I, Article 1.02(1) ('S-57').

4.   This Data Standard describes the necessary additions and clarifications to S-57 and the application of S-57 for the purpose of use in Inland ECDIS applications.

5.   The Data Standard shall be compliant to standards and regulations indicated in Part I, Article 1.02(8) and (10).

Article 2.02
Theoretical data model

The description of the theoretical data model in Part 2 of S-57 shall apply to the theoretical data model of Inland ENCs and bathymetric Inland ENCs.

Article 2.03
Data structure

The description of the data structure in Part 3 of S-57 shall apply to the data structure of Inland ENCs and bathymetric Inland ENCs.

Article 2.04
Product specifications for inland encs and bathymetric Inland ENCs

1.   The Product Specifications for Inland ENCs and for bathymetric Inland ENCs enable chart producers to produce a consistent Inland ENC or bathymetric Inland ENC, and manufacturers to use that data efficiently in an Inland ECDIS that satisfies the Performance Standard for Inland ECDIS set out in Part 1.

2.   Data for ENCs shall be made available to all manufacturers of applications. An Inland ENC shall be produced in accordance with the rules laid down in the document referred to in Part I, Article 1.02(8) and shall be encoded using the following documents referred to therein:

   a)   the Inland ENC Feature Catalogue and

   b)   the rules described in the Inland ENC Encoding Guide.

3.   A bathymetric Inland ENC shall be produced in accordance with the rules laid down in the document referred to in Part I, Article 1.02(10) and shall be encoded using:

   a)   the bathymetric Inland ENC Feature Catalogue referred to in Part I, Article 1.02(10) and

   b)   the rules described in the Inland ENC Encoding Guide referred to in Part I, Article 1.02(8).

4.   Inland ENCs and bathymetric Inland ENCs approved for navigation mode shall be produced in accordance with the 'Data Standard' and the 'Product Specification' referred to in this Chapter.

CHAPTER 3
CODES FOR PRODUCERS AND WATERWAYS (IN ADDITION TO IHO–S-62 ENC PRODUCER CODES

1.   Codes for producers of Inland ENCs as well as the registration procedure are those mentioned in the document referred to Part I, Article 1.02(2)('IHO S-62').

2.   Administrations or private companies which produce Inland ENCs and which are not mentioned in IHO-S-62 and administrations or private companies which decide to produce Inland ENCs shall register a producer code at the S-100 registry of IHO at http://registry.iho.int

3.   Since a producer code alone is not sufficient to establish whether an Inland ENC is appropriate to be used in navigation mode, the competent authorities referred to in Article 8 of Directive 2005/44/EC shall maintain and provide via their official website an up-to-date list of Inland ENCs approved for navigation mode within their geographical area of responsibility. The list shall include the file name of the ENC cell, the stretch of the inland waterway that is covered, the edition number, the issue date and a list of available update files to the currently valid edition also with their issue dates. The list shall include all Inland ENC for which the cell complies with the requirements as regards the minimum content and is approved for navigation mode.

4.   The notification of competent authorities in accordance with Article 8 of Directive 2005/44/EC shall include information on the geographical area of responsibility and the official website of the competent authorities. Member States shall notify the Commission immediately of any changes.

5.   The following Codes for Waterways shall be used in the file name of IENCs:

Waterway Code	Waterway Name	Remark
AC	Albertkanaal/Canal Albert	
AKL	Afleidingskanaal van de Leie	
BA	Balaton	
BCR	Branche de la Croyère	
BED	Benedendijle	
BEN	Beneden-Nete	
BEZ	Beneden-Zeeschelde	
BH	Kanaal Bocholt - Herentals	
BK	Boudewijn Kanaal	
BLO	Branche de La Louvière	
BME	Basse-Meuse	
BN	Kanaal Briegden - Neerharen	
BOS	Bovenschelde	
BOZ	Boven-Zeeschelde	

Waterway Code	Waterway Name	Remark
BRW	Beetzsee-Riewendsee-Wasserstraße	
BSK	Berlin-Spandauer Schifffahrtskanal	including Westhafenkanal and Charlottenburger Verbindungskanal
BZ	Beneden Zeeschelde	
CCB	Canal Charleroi-Bruxelles	
CCG	Canal du Centre a Grand Gabarit	
CHV	Canal de Haccourt a Vise	
CLA	Canal de Lanaye	
CMO	Canal de Monsin	
CPC	Canal Pommeroeul-Conde	
D	Danube	including Sulina branch
DA	Danube Chilia branch	
DAW	Dahme-Wasserstraße	
DB	Dunare Borcea	
DCC	Danube Cernovoda canal	
DE	Dortmund-Ems Kanal	
DEN	Dender	
DHK	Datteln-Hamm-Kanal	
DDT	Dijledoortocht	
DKW	Kanaal Dessel - Kwaadmechelen	
DR	Drava	
DTS	Kanaal Dessel - Turnhout - Schoten	
DUK	Ráckevei-Duna	
DUM	Mosoni-Duna	
DUR	Gekanaliseerde Durme (Beneden-Durme)	
DUS	Szentendrei-Duna	
DV	Dunarea Veche	
EL	Elbe	
ELK	Elbe-Lübeck-Kanal	
EH	Elbe-Havel-Kanal	
EMS	Ems	
EPP	Embranchement Principal	

Waterway Code	Waterway Name	Remark
ES	Elbe-Seiten-Kanal	
EV	Estuaire Vaart	Estuary shipping between Zeebrugge and Dutch border
GA	Sf. Gheorghe-Arm	
GMO	Grand Large de Mons	
GPE	Grand Large de Péronnes	
HES	Haut-Escaut	
HO	Havel-Oder-Wasser-straße	
HVK	Havelkanal	
IJZ	Ijzer	
KB	Kanaal naar Beverlo	
KBK	Kanaal Bossuit - Kortrijk	
KGO	Kanaal Gent-Oostende	
KGT	Kanaal Gent-Terneuzen	
KK	Küstenkanal	
KLD	Kanaal Leuven - Dijle	
KND	Kanaal Nieuwpoort - Duinkerken	
KPN	Kanaal Plassendale- Nieuwpoort	
KRL	Kanaal Roeselare - Leie	
KTR	Kanaltrave	
KVE	Kanaal van Eeklo	
LA	Lahn	
LOK	Lokanaal	
LR	Leie/Lys River	
MA	Main	
MD	Main-Donau-Kanal	
ME	Mueritz-Elde- Wasserstraße	
MEU	Meuse	
ML	Mittelland-Kanal	
MMI	Meuse Mitoyenne Sud	
MO	Mosel	
MOE	Moervaart	
N	Dnipro	
NBP	Canal Nimy-Blaton-Peronnes	

Waterway Code	Waterway Name	Remark
NE	Neckar	
ND	Desna	
NOK	Nord-Ostsee-Kanal	
NPR	Prypiat	
NSU	Sula	
NTK	Netekanaal	
NVO	Vorskla	
OD	Oder	
OL	Olt	
PE	Peene	
PHV	Potsdamer Havel	
PK	Plassendale Kanaal	
RH	Rhine	
RHK	Rhein-Herne-Kanal	
RL	Nederrijn/Lek	
ROG	Ringvaart om Gent	
RU	Ruhr	
RUP	Rupel	
SA	Sava	
SAM	Sambre	
SE	Schelde	
SI	Sió-csatorna	
SKH	Stichkanal Mittelland-Kanal - Hildesheim	
SKL	Stichkanal Mittelland-Kanal - Hannover-Linden	
SKO	Stichkanal Mittelland-Kanal - Osnabrück	
SKS	Stichkanal Mittelland-Kanal - Salzgitter	
SL	Saale	
SM	Smeermaas	
SO	Spree-Oder-Wasserstraße	
SPI	Spierekanaal	
SR	Saar	
SRV	Schelde-Rijnverbinding	
TEK	Teltowkanal	

Waterway Code	Waterway Name	Remark
TI	Tisza	
TLE	Toeristische Leie (Leie)	
UH	Untere Havel- Wasserstraße	
UWE	Unterweser	from km UWE 0,00
VKN	Verbindingskanaal Nieuwpoort	
WA	Waal	
WDK	Wesel-Datteln-Kanal	
WE	Mittelweser	until km 366,65/UWE 0,00
WOD	Westoder	
ZBS	Zeekanaal Brussel-Schelde	
ZUL	Vertakking van Zulte	
ZWV	Zuid-Willemsvaart	

CHAPTER 4
PRESENTATION STANDARD FOR INLAND ECDIS

Article 4.01
Introduction

1. This Presentation Standard for Inland ECDIS describes the technical specifications to be used for the presentation of Inland ECDIS data. The presentation shall take place in such a way that none of the information is lost.

2. This Presentation Standard is based on the document referred to in Part I, Article 1.02(3) ('S-52').

3. This Presentation Standard describes the necessary additions and clarifications to S-52 and the application of S-52 for the purpose of use in Inland ECDIS applications.

4. The presentation of Inland ECDIS data shall meet the requirements of the Presentation Standard described in Chapter 4 and the Presentation Library referred to in Part I, Article 1.02(9).

5. Definitions of terms may be found in:
    a) Part 1, clause 5 of IHO-S-57,
    b) the document referred to in Part I, Article 1.02(7),
    c) the 'Glossary for Inland ECDIS' in Part I, Chapter 8.

Article 4.02
The presentation library for Inland ECDIS

S-57 data sets describe the data standard for Inland ENCs, however, they do not contain any information about how the data is going to be presented. The chart presentation is generated online in the Inland ECDIS application. For that purpose, the Inland ECDIS application uses machine-readable symbolisation instructions for each feature, which is drawn on the screen. For the presentation of ENCs the IHO S-52 standard is mandatory. The S-52 standard contains all rules which are necessary for the symbolisation and presentation of ENCs on the screen.

Since the features, attributes and attribute values for ENCs were extended for Inland ENCs and bathymetric Inland ENCs, an extension of the S-52 standard is necessary in order to be able to display also the Inland specific features. All extensions apply to the document referred to in Part I, Article 1.02(3)(c).

1. Components of S-52 and Inland ECDIS Presentation Library
    a) The major components of the S-52 presentation library are:
        i)   a <u>library</u> of symbols, line styles and fill styles,
        ii) a <u>colour coding scheme</u> which includes the IHO colour tables for day, dusk and night time,

    iii) a <u>set of symbology command words</u> from which machine readable instructions can be assembled. The result is a symbology instruction, which is processed to symbolise ENC features in turn,

    iv) a <u>set of conditional symbology procedures</u> to decide the appropriate symbolisation in cases determined by the mariner's selection (e.g. safety contour) or for complex symbols (e. g. top marks on buoys and beacons),

    v) a <u>set of look-up tables</u> that link feature descriptions from the ENC to the appropriate symbology instructions depending on whether:

    vi) the link is straight forward, i.e. a direct relationship between a feature's description and its presentation such as a buoy or a land area. In this case, the look-up table provides the symbology <u>instruction</u> to show a symbol, an area fill, or a line style,

    vii) the link is conditional, i.e. depending on circumstances, for example a depth area, whose colour fill depends on the choice of the safety contour. In this case the look-up table refers the decision to a <u>conditional symbology procedure</u> that selects the appropriate symbology instructions later.

b) Inland ECDIS shall use all S-52 components plus extensions in:

    i) Lookup tables,

    ii) Symbol library,

    iii) Conditional symbology procedures.

The extensions are described in the document referred to in Part I, Article 1.02(9).

2. Look-up tables

a) For each geometry type (point, line, area) there is a separate look-up table. Each entry in a look-up table consists of the following fields:

    i) 6-character code of the feature class (acronym);

    ii) Attribute combination;

    iii) Symbolisation instructions;

    iv) Display priority, 0-9 (comparable with drawing layers);

    v) Radar code;

    vi) Display category (Display base, standard, all other);

    vii) 'Viewing group', more refined grouping of features than the display categories.

Figure 1

Example entry of a look-up table

"LNDMRK","CATLMK17|","SY(TOWERS01)","7","O","OTHER","32250"

In this case the feature LNDMRK is shown by the symbol TOWERS01 with priority 7, if the attribute CATLMK equals 17. The feature lies over the radar.

The presentation of features in a specific area that are contained in different cells of the same usage follows the entries in the look-up tables.

    b)   The Presentation Library provides five look-up tables:
  - i)   paper chart point symbols,
  - ii)   simplified point symbols,
  - iii)   line symbols,
  - iv)   plain area boundary symbols,
  - v)   symbolised area boundary symbols.

Article 4.03

3.   Conditional symbology procedures (CS)

CS procedures shall be generated for features of which the symbolisation
  - a)   depends on application settings, e.g. safety contour,
  - b)   depends on other features, e.g. top marks and their structure,
  - c)   is too complex to be defined in a direct look-up table entry.

CS procedures, which shall be modified or implemented in an Inland ECDIS additional to the CS procedures of S-52 are described in the document referred to in Part I, Article 1.02(9).

Article 4.04

4.   Colours

Colours used in an ECDIS are defined in an absolute manner, independently from the monitor used (using CIE coordinates). This ensures that ECDIS charts look similar on monitors of different suppliers. CIE values are converted into RGB values by means of colour calibration software which must be used by the manufacturer.

Commercial displays usual in the trade are seen as matching those requirements.

Due to the fact that various light conditions might occur on the bridge of a vessel, it is necessary to offer presentations with different brightness levels. For each level a separate colour table exists.

The represented colour scheme shall be chosen on the basis of ergonomical and physiological factors and the representation of indications in different colours shall not result in mixed colours by superimposing.

Article 4.05

5.   Presentation of notice marks

Notice marks which are located at the river bank are presented in the chart displayed by generic symbols (notmrk01, notmrk02 and notmrk03). This does not apply to the notice marks on bridges.

Additionally, applications are required to be able to display the detailed symbol, which is similar to the real world indication, and the full set of object information of a user-selected notice mark.

Notice marks that are located at bridges, shall be symbolised according to the orientation of the bridge.

Notice marks which specify distances or a velocity shall not be symbolised with the number itself, but only with that symbol which gives the general regulation or information.

CHAPTER 5
OPERATIONAL AND PERFORMANCE REQUIREMENTS, METHODS OF TESTING AND REQUIRED TEST RESULTS

Article 5.01
Introduction

This Chapter specifies the minimum requirements contained in Part I, Chapter 1 and describes the test procedures and the required results concerning the hardware, the software, the functions, the operation, the display and the interfaces to other equipment on board of vessels.

Article 5.02
Operating modes and system configuration

1. Operating modes

    a) The Inland ECDIS technical specifications distinguish two operating modes: **navigation mode** and **information mode**.

    b) Inland ECDIS equipment designed for operating in **navigation mode** shall fulfil the requirements of this Part and the standards on navigational radar equipment and rate-of-turn indicators. For Inland ECDIS in navigation mode a type approval is required by competent authorities referred to Part I, Article 1.02(17).

    c) For Inland ECDIS equipment designed for **information mode** only, the requirements of this Chapter 5 are to be understood as technical (operational and performance) requirements. The producer has to document the conformity with these technical requirements. A type approval is not required for Inland ECDIS in information mode. The documentation shall be made available to competent authorities and users on request.

2. System configurations

    a) System configuration 1: Inland ECDIS equipment, stand-alone-system without connection to radar

        In this system configuration only operation in **information mode** is possible (see Chapter 7, Figure 1).

    b) System configuration 2: Inland ECDIS equipment, parallel installation and connection to radar

        This system configuration allows operation in **information mode** as well as in **navigation mode** (see Chapter 7, Figure 2).

    c) System configuration 3: Inland ECDIS equipment, monitor shared with connected radar equipment

        In this system configuration, the monitor of the radar equipment is shared with the Inland ECDIS equipment. Prerequisite for this mode are matching graphic parameters for both video signals and a video switch, which allows a fast switchover of the video sources (see Chapter 7, Figure 3).

This system configuration allows operation in **information mode** as well as in **navigation mode**.

d) System configuration 4: Radar equipment with integrated Inland ECDIS functionality

This system configuration is a radar installation with integrated Inland ECDIS functionality that can be operated in information mode as well as in **navigation mode** (see Chapter 7, Figure 4).

Article 5.03
Performance requirements

1. Hardware performance

   a) Inland ECDIS in navigation mode equipment shall be designed and manufactured to withstand typical environmental conditions prevailing on board of a vessel without any degradation in quality and reliability. Furthermore, it shall not disturb other communication and navigation equipment.

   b) In the configuration as described in Part I, Article 5.02(2)(d), all components of Inland ECDIS equipment installed inside the wheelhouse shall fulfil the requirements of the class b) 'protected from weather' equipment as specified in the European Standard EN 60945 with the exception that the test temperature range is limited to 0 °C to + 40 °C (whereas the test temperature range in the European Standard EN 60945 is specified from − 15 °C to + 55 °C) unless specified differently in this Part. For the configurations described in Part I, Article 5.02(2)(b) and (c) CE conformity is sufficient.

2. Software performance

   Software for the operation, visualisation, and functionality of Inland ECDIS equipment shall be designed, developed, implemented, and tested in accordance with the software requirements described in Part I, Chapter 6.

3. Performance of operation controls

   a) The operation of the system shall be simple, appropriate and conform to common human interface standards. The operational state of the system and the connected technical sub devices has to be clearly indicated.

   b) The number of operational controls shall be as low as possible and restricted to the required number.

   c) Wireless remote controls are not permitted.

   d) The ON/OFF switch shall perform and shall be arranged in such a way that inadvertent operation is not possible.

   e) The symbols of the operating controls shall have a minimum character height of 4 mm and shall be readable under all conditions that may exist in a wheelhouse.

   f) The brilliance and the illumination of the operating controls shall be adjustable to the required value.

4.   Display performance

The provisions of Part I, Article 5.03(4)(b) to (g) are recommended for Inland ECDIS in information mode.

a)   Display dimensions

i)   In **navigation mode** the minimum chart and radar display area shall be at least 270 mm by 270 mm.

ii)   In information mode the requirements of Part I, Article 1.04(1)(c) shall be applicable.

b)   Display orientation

i)   A rectangular display may be mounted in landscape or in portrait orientation under the prerequisite that the minimum dimensions set out in Part I, Article 5.03(4)(a) are fulfilled.

ii)   Because of the limited space available in the typical wheelhouse of an inland vessel and the fact that a vessel usually follows the fairway-axis, the display shall be installed preferably in the portrait orientation.

c)   Display resolution

A display resolution of 5 m in the 1200 m range is required. This leads to a maximum pixel dimension of 2,5 m × 2,5 m, i.e. about 1000 pixels at the short edge of the display.

d)   Display colours

The system shall be able to display ergonomically proven colour combinations for day and night.

e)   Display brilliance

The brilliance of the display shall be adjustable to every operational required value. This is especially valid for the lowest value during operation at night.

f)   Picture renewal

i)   The picture renewal rate shall not be shorter than that of the radar picture (≥ 24 pictures per minute).

ii)   Between two consecutive renewals no fluctuations of brilliance shall occur.

iii)   On raster scan displays, the frame repetition rate shall not be lower than 60 Hz.

g)   Display technology

Display systems that are insensitive to the magnetic fields that may occur in the wheelhouse of an inland vessel shall be used.

Article 5.04
Operational functions

1. Operating mode

   a) If the equipment is able to work in both operation modes it shall provide for the possibility of switching between **navigation mode** and **information mode**.

   b) The operation mode in use shall be displayed.

   c) Suitable measures are required to prevent the inadvertent switching off of the navigation mode.

2. Equipment pre-sets (store/recall) in **navigation mode**

   a) After starting the Inland ECDIS equipment shall come up with a moderate brilliance pre-set which neither blinds in a dark environment nor makes the picture invisible in a bright environment.

   b) Other parameters may come up with their values at the time before switching off or from stored settings.

3. Presentation of SENC information in **navigation mode**

   a) The radar picture shall be clearly distinguishable from the chart independent of the chosen colour table.

   b) Only a monochrome presentation of the actual radar picture is permitted.

   c) The presentation of chart information shall not mask or degrade important parts of the radar picture. This shall be ensured by appropriate entries into the look-up tables (refer to Part I, Article 4.02(2), field 'radar code'). The transparency of the radar overlay shall therefore be user-defined.

   d) Chart and radar picture presentation shall have the same scale.

   e) The heading line shall be always visible.

   f) Additionally, the mariner's own vessel's contour and the safety contours may be inserted.

4. Chart orientation, positioning and shifting

   a) In **navigation mode**, only the chart orientation 'relative motion, head up' and the 'centred' or 'off centred' presentations, as required for the radar picture, are permitted.

   b) In **information mode**, at least the chart orientations 'north' and 'parallel to the waterway axis' as well as positioning are recommended. By connection of a positioning sensor, the displayed part of the chart can automatically follow the mariner's own vessel's position.

5. Position and bearing of the own vessel

   a) In **navigation mode**, the own vessel's position shall always be visible in the display area, whether 'centred' or 'off centred' as specified in the document referred to in Part I, Article 1.02(6).

   b) In **navigation mode** the heading line, which runs from the display centre to the top and which shall be always visible, shall represent the heading of the mariner's own vessel.

6.   Information density

The information density shall be at least adjustable to the three switch steps: 'Base', 'Standard' and 'All Information'. The latter displays all other features in addition to the 'Standard' display, individually on demand. All corresponding visible features are defined in the 'Performance Standard' and the 'Presentation Standard' (incl. the 'Presentation Library for Inland ECDIS') (Part I, Chapters 1 and 4).

7.   Ranges/Range rings
   a)   In **navigation mode** the following fixed ranges and range rings are prescribed according to the radar regulations:

Range	Range rings
500 m	100 m
800 m	200 m
1 200 m	200 m
1 600 m	400 m
2 000 m	400 m
4 000 m	800 m

   b)   Smaller and larger ranges with a minimum of four and a maximum of six range rings are permitted.
   c)   Inland ECDIS equipment in **navigation mode** shall have fixed range rings with the intervals set out in (a) and (b) and at least one variable range marker (VRM).
   d)   Switching on/off of fixed and variable range markers shall be independent of each other and their display shall be clearly distinguishable.
   e)   The position of the VRM and the corresponding displayed distance shall use the same increments and resolution.
   f)   The functions of the VRM and the electronic bearing line (EBL) may additionally be realised by a cursor and by a corresponding numerical display, showing range and bearing of the cursor position.

8.   Picture brilliance in navigation mode
   a)   The brightness of the display shall be adjustable to the operationally necessary value. This applies in particular to operation in darkness.
   b)   Chart and radar picture shall have separate brightness controls.
   c)   Because of the strongly different environment brightness of bright day and dark night, another control for the basic brightness of the display shall be available additionally to the colour tables in the menu.

9.   Picture colours

At least the colour combinations included in the IHO-S-52 Presentation Library, 6.0 (colour tables) for day, dusk and night shall be supported.

10.   Pick report
   a)   It shall be possible to get all underlying textual and/or graphical information concerning user selections of the features that are displayed in the chart.
   b)   This additional textual and/or graphical information shall not hamper the view of the waterway in the navigational chart.

11.   Measuring features
   a)   Measuring features for distances and bearings are required.
   b)   Resolution and accuracy shall at least be the same as those of the display, but may not suggest better values than those of the chart data.

12.   Input and editing of skippers' own chart entries
   a)   Inland ECDIS equipment shall allow input, storing, modifying and deletion of additional chart information by the skipper (skippers' own features) in navigation mode as well as in information mode.
   b)   These own chart entries shall be distinguishable from the SENC data, and shall not overlay or degrade the radar picture in navigation mode.

13.   Loading and updating of SENCs
   a)   All **manual** activities concerning loading or updating of charts shall be possible only outside the **navigation mode**.
   b)   **Automatic** updating shall not downgrade the performance of the navigation display.
   c)   A rollback function shall be implemented to allow restoring to the last working combination.

14.   Radar picture presentation and overlay
   a)   The radar image representation is mandatory for operation in the **navigation mode**.
   b)   The dimensions, resolution and attributes of the radar presentation shall fulfil the relevant radar requirements.
   c)   The radar picture shall not be degraded by other contents of the picture (see also Part I, Article 5.04(3)(c)).
   d)   Provided the functional requirements are fulfilled, overlaying of different information layers is permitted.
   e)   The overlay of information regarding the position and orientation of other vessels is only allowed when:
       i)   the information is up-to-date (real-time), and
       ii)   the age of information does not exceed the maximum time out values provided in the first table in Part I, Article 1.05(1)(e). The symbols shall be marked as outdated, if the age of the information exceeds 30 seconds for moving vessels. The position information of the own vessel shall only be displayed when the position is detected by an on board subsystem and not if the position is received from a repeater station.

f)   The overlaid information derived from tracking and tracing devices regarding the position and orientation of other vessels shall be faded out at a user-definable range. The activation of this feature and the selected range of the restricted area shall be indicated on the display.

g)   Only if the heading of other vessels is available, the position and the orientation of those other vessels may be presented by:

    i)   a directed triangle, or

    ii)   a true outline (to scale).

    In all other cases a generic symbol shall be used (an octagon is recommended, a circle shall be used for inland applications only).

h)   It shall be possible to switch off the chart and any other information layer and to display only the radar picture by one easily accessible control element or menu area.

i)   If the quality and plausibility monitoring of the Inland ECDIS equipment detect that the chart cannot be oriented and/or positioned with the accuracy required by this Part, an alarm shall be presented on the display and the chart shall be switched off automatically. If there is no radar signal, the information mode shall be displayed. In both cases a warning or an alarm shall be given. The switching shall always be possible by manual action.

15.   Inland ECDIS functions with immediate access

    a)   The following operational functions require direct access:

        i)   RANGE

        ii)   BRILLIANCE

        iii)   COLOURS

        iv)   INFORMATION DENSITY

    b)   These functions shall have either own control elements or own menu areas, which are arranged in the highest menu level and are permanently visible.

16.   Permanently visible function parameters

    The following function parameters shall always be visible:

    a)   actual RANGE

    b)   sensor STATUS (in **navigation mode**: radar tuning, position quality, alarms; in **information mode**: if connected, GNSS receiver, AIS and heading)

    c)   selected WATER LEVEL (if available)

    d)   selected SAFETY DEPTH (if available)

    e)   selected INFORMATION DENSITY

Article 5.05
Service functions

Service functions shall be protected by password or other suitable measures against unauthorised access. They shall not be selectable in **navigation mode**.

The requirements of Part I, Article 5.05(1) to (3) are only applicable to **navigation mode**.

1. Static correction of the chart position

    a) The position of the mariner's own vessel shall be presented 'centred' or 'off centred' on the display in accordance with the radar requirements. The chart position shall match the radar image. Assuming an absolute position's input the permissible static difference between actual radar position and displayed radar centre shall not exceed 1 m.

    b) It shall be possible to correct an offset error (distance between the positions of the position sensor and the radar sensor).

2. Static correction of the chart orientation

    a) The difference between the heading line orientation and the vessel's axis shall not be greater than ± 1,0 degree.

    b) Chart and radar image shall have the same orientation. The static directional error between heading line and chart orientation shall be less than ± 0,5 degree.

3. Configuration of interfaces

    a) It shall be possible to configure interfaces for connected sensors, actors and signals.

    b) Interfaces shall comply with existing interface specifications as defined in the document referred to in Part I, Article 1.02(12) and the interface specifications for rate of turn indicators (20 mV/deg/min) as defined in the document referred to in Part I, Article 1.02(4).

Article 5.06
Hardware test and required certificates

The test shall consist of a comparison between the Equipment Under Test (EUT) and the requirements of this Part.

Proved equivalent tests, and proved and documented test results shall be accepted without renewed tests.

The entire Article 5.06 is valid for navigation mode, but the requirements that do not contain a specific reference to navigation mode are also valid for information mode.

1. Resistance to environmental conditions in navigation mode

    a) Inland ECDIS equipment, as described in Part I, Article 5.02(2)(d), shall fulfil the requirements of the document referred to in Part I, Article 1.02(11) concerning the resistance to environmental conditions (humidity, vibration and temperature; the latter reduced according to Part I, Article 5.03(1) and concerning electromagnetic compatibility.

    b) The provider or his representative shall submit a relevant conformity declaration of an accredited laboratory.

2. Equipment documentation

The technical documentation shall be checked to assure that it is complete, appropriate, and understandable, and that it is sufficient for unproblematic installation, configuration and operation of the equipment.

3. Interfaces
   a) All interfaces shall be documented correctly and completely.
   b) Electronic circuits shall be designed failsafe, mechanically as well as electronically, and shall not have degrading repercussions on connected equipment.

4. Characteristics of operation controls

All operation controls shall be checked regarding the ergonomic and functional mode of operation and shall fulfil the requirements of this Part.

5. Characteristics of the display in navigation mode

The display shall fulfil all requirements of this Part concerning dimension, displayable colours, resolution, and variation of brilliance.

Article 5.07
Test of the chart presentation, operation and functionality

1. Preparation of the EUT

The EUT shall be installed, assembled and connected according to the installation manual. After switching on the test SENC shall be loaded.

2. Test of the operation modes

All operating modes as described in the operating manual shall be successively started up and tested. The requirements of Part I, Article 5.04 shall be fulfilled.

3. Test of the displayed features

Whether all features included in the test SENC are visible and correctly displayed shall be tested. For this test, the information density shall be switched to 'all features'. The system shall be capable to at least display all features according to the Presentation Standard for Inland ECDIS (Part I, Article 5.03). Additionally other user-selectable symbol sets are allowed.

If symbols that deviate from the document referred to in Part I, Article 1.02(9), the Inland ECDIS Presentation Library, are used for the presentation of any chart information, then they shall:
a) be legible,
b) be certain and unambiguous in their meaning,
c) be of sufficient size to support the nominal viewing distance.

Symbols added to the ECDIS Presentation Library shall be clearly distinguishable from Presentation Library symbols.

4. Test of the scale dependent information density (SCAMIN)
   a) Whether the SCAMIN functionality (the minimum scale at which the feature may be used for ECDIS presentation) is installed correctly shall be tested.
   b) For this test, the range shall be used at which the feature shall be visible according to its SCAMIN enumeration (see ES-RIS, Annex 1 referred to in Part I, Article 1.02(8)).

5. Test of brilliance variation in navigation mode

   The Inland ECDIS equipment shall be operated in a dark room and the brilliance shall be brought to its lowest level. The brilliance of the features shall not exceed a value of 15 cd/m^2, and the background a value of 0,5 cd/m^2.

6. Test of the colours

   All user selectable S-52 colour tables shall be sequentially tested to conform to this Part.

7. Test of the measurement functions
   a) All numeric displayed values of the EBL and the VRM shall exactly match with the analogue positions of the EBL and the VRM (or correspond with the cursor coordinates).
   b) The resolution and increments of the numerical display shall be identical with the analogue values of EBL and VRM.

8. Test of the chart update function

   Before and after each test step the version numbers of the loaded SENCs and updates shall be recalled as described in the operation manual and showed on the display.
   a) Step 1: Loading of the test SENC,
   b) Step 2: Update of the test SENC,
   c) Step 3: Test of the roll-back function,
   d) Step 4: Loading of a new SENC.

   After an update it shall be possible to recall and display all concerned features.

9. Test of displayed features in more than one cell for the same area
   a) It shall be tested whether all features included in the test SENC and in the additional overlay test SENC are visible and correctly displayed. For this test the information density shall be switched to 'all features'.
   b) It shall be tested whether it is possible to select one or more specific cells for presentation if there are several cells from different producers for the same area with the same usage.
   c) It shall be tested whether the test bathymetric Inland ENC is displayed correctly together with the base SENC in accordance with ES-RIS, Annex 2 referred to in Part I, Article 1.02(9).

Article 5.08
Test of radar picture presentation and operation in navigation mode

1.   Preparations

   a)   For the test purposes, the manufacturer or provider shall provide a serial interface at the system to be approved (EUT) which delivers the same actual values (as strings compliant with the document referred to in Part I, Article 1.02(12)) of position and heading that are used to position and orient the chart.

   b)   During the test, a reference system shall be used of which position and heading values are compared with those of the EUT.

   c)   The EUT shall be connected to any type approved radar equipment (to the choice of the provider).

   d)   The radar picture shall be adjusted in range and bearing with reference to the heading line.

2.   Test of the radar picture without under laid chart

   a)   If the Inland ECDIS equipment displays the radar picture but the radar operation control remains at the radar equipment (See Chapter 7, Figures 2 and 3), the radar picture of the Inland ECDIS equipment shall be considered as the 'daughter display' of an item of radar equipment. In that case, the radar picture shall fulfil <u>the display and picture-relevant requirements</u> of the requirements for radar and rate-of-turn indicators as defined in the document referred to in Part I, Article 1.02(6).

   b)   If the EUT is a radar installation with integrated Inland ECDIS functionality (See Chapter 7, Figure 4), <u>all</u> <u>requirements</u> of the standards for radar equipment and rate-of-turn indicators as defined in the document referred to in Part I, Article 1.02(6) shall be fulfilled.

3.   Test of the radar picture, overlaid information from other vessels and the underlying chart

   The Inland ECDIS equipment shall be installed in a reference environment. This may be real (on a vessel) or simulated. Position and orientation information of other vessels (according to the Inland AIS technical specifications) shall be applied with several information ages.

   a)   Test of the radar overlay

      i)   The radar image shall not be degraded by the chart picture (refer to Part I, Article 5.04(3)(c)).

      ii)   The overlay of information regarding the position and orientation of other vessels shall be only displayed when:

         -     the information is up-to-date (nearly real-time), and

         -     the age of information does not exceed the maximum time out values provided in the first table in Part I, Article 1.05(1)(e), Performance Standard for Inland ECDIS. The symbols shall be marked as outdated, if the age of the information exceeds 30 seconds for moving vessels. The position information of the own vessel shall not be displayed, if it is received from a repeater station.

      iii)   The overlay of information derived from tracking and tracing devices regarding the position and orientation of other vessels shall be faded out at a user-definable range. The activation of this feature and the selected range of the restricted area shall be indicated on the display.

iv) If the heading of other vessels is available, the position and the orientation of those other vessels shall be displayed by:

- a directed triangle, or
- a true outline (to scale)

For all other vessels a generic symbol shall be used (an octagon is recommended, a circle shall be used for inland applications only).

v) It shall be possible to switch off the chart and any other information layer and to display only the radar picture by one easily accessible control element or menu area.

vi) The chart picture shall be renewed not later than the radar picture.

b) Test of the chart positioning and orientation

i) The static offset of the chart position shall be less than ± 5 m in all ranges up to 2 000 m.

ii) The static azimuth orientation offset error between radar and chart image shall be less than ± 0,5 degree.

iii) The correction of the parameters referred to in (a) and (b) shall be demonstrated in the service mode.

iv) The dynamic deviation of the chart orientation at rates of turn less than ± 60 degree/min shall be less than ± 3 degree.

v) These tests shall be performed visually or by evaluation of measured data.

c) Test of scale conformity

The chart's information shall be compared with well-known reference points contained in the radar picture in order to test whether the chart scale sufficiently conforms to the radar scale.

Article 5.09
Test of alarms and indications

1. The alarms generated from Inland ECDIS equipment itself as well as the passed alarms delivered to the ECDIS by the connected sensors shall be tested.

2. The test procedure in **navigation mode** shall comprise the following situations:
   a) any error in the Inland ECDIS equipment (built-in test equipment — BITE),
   b) missing positioning signal,
   c) missing radar signal,
   d) missing rate of turn signal,
   e) missing heading signal,
   f) radar map matching not possible,
   g) missing AIS signal.

3. The test procedure in **information mode** shall comprise the following situations:
   a) any error in the Inland ECDIS equipment (built-in test equipment - BITE),
   b) missing positioning signal,
   c) missing heading signal,
   d) missing AIS signal.

The Inland ECDIS manufacturers have to confirm in their system documentation that the system includes those test procedures and signal indicators in information mode.

Article 5.10
Test of fall back arrangements in navigation mode

1. This test shall demonstrate the reaction of the Inland ECDIS equipment to a failure of any internal or external component and the possible and required actions by the operator.

2. In addition, the operating manual shall be checked to determine whether the measures required by the operator are described adequately and appropriately.

CHAPTER 6
MEASURES TO ENSURE SOFTWARE QUALITY

Article 6.01
General requirements

Software used in **navigation mode** is a safety-relevant part of a navigation system. Providers of navigation systems shall make sure that all software components used in **navigation mode** allow safe navigation in every situation.

Requirements in (1) to (5) are only applicable to **navigation mode**, while requirements in (6) and (7) are applicable to both **navigation mode and information mode.**

1.   Software design requirements

      Software components shall be clearly designed by means of established software design methods. The design specification shall indicate how safety requirements are addressed in the software design.

      A software style guide shall be provided that specifies code writing style, documentation style, modularisation, conflict analyses and testing of software components. For every software component documents describing specification and design are required.

2.   Implementation requirements

      Implementation of software modules shall be done by qualified developers, fully understanding the design and safety requirements.

      If more than one developer is working on the navigation system software, a version control system shall be used that guarantees conflict-free development.

      The implementation shall be according to the design specification and shall reflect the software style guide. Moreover, well known implementation problems (depending on the language used) shall be addressed in the implementation. This includes but is not restricted to:
      a)   null pointer handling,
      b)   un-initialised variables,
      c)   range checking,
      d)   array size verification,
      e)   memory allocation and de-allocation,
      f)   exception handling.

      If parallel processing is used (e.g. multiple threads, tasks or processes) problems of conflict-free processing shall be addressed in the implementation. This includes but is not restricted to:
      a)   race conditions,
      b)   re-entrance problems,
      c)   priority inversion,
      d)   deadlocks.

3.	Test requirements

In accordance with the design specification, software modules shall be tested. The test results shall be compared with the design guidelines and documented in test reports.

Tests shall incorporate module as well as system tests. Providers of a navigation system shall use extensive simulator-based tests to ensure stability of their system. The simulator shall allow the simulation of a complete navigation environment including all required external sensors.

4.	Third party components requirements

Third party components, such as OEM (original equipment manufacturer) products, include software not developed by the navigation system provider. This includes but is not restricted to:

a)	static or dynamic linked libraries,

b)	computer aided design and engineering tools producing source or object code,

c)	operating systems.

Third party software components shall be chosen according to the general safety requirements. The navigation system provider shall prove that third party components meet the high standards necessary for safe navigation either by providing acceptable quality certificates or by extensive and provable testing of the components.

5.	Requirements for additional services in navigation mode

Navigation systems may support additional services in **navigation mode** if they are useful. These services shall not interfere with other requirement in navigation mode.

The navigation system provider is responsible for additional test equipment, necessary to verify interface specification, protocol specification and compliance tests with the Inland ECDIS technical specifications.

6.	Language

Additional national versions of a type-approved Inland ECDIS shall reapply for type approval to be checked for the translation of the user interface. The type approval process is only foreseen for systems in navigation mode.

The qualified institution which performs the type approval process of an Inland ECDIS system may request an expertise by a certified translator regarding the correct translation in a specific language from the system manufacturer.

7.	Documentation requirements for users

The documentation (manuals) shall contain comprehensive information on the equipment, the installation, the operation and the service of the navigation system. The presentation of user-relevant information shall be clear, understandable and without unnecessary technical terms. The user manual shall at least be available in English, French, German and Dutch. The technical system description may be made available in English only.

Article 6.02
Methods of testing and required results

1. Navigation mode operation test

    a) Performance requirements

    The navigation system shall make reliable estimations of position and heading. Moreover, the estimations of position and heading shall be checked by the system for conformity with the required accuracy.

    Position and heading information shall be calculated and displayed for the same reference position. This shall normally be the centre of the radar antenna. A new position estimate shall at least be available with every revolution of the radar antenna.

    i) Position

    The navigation system shall estimate and display the position of the vessel. The following minimal requirements shall be fulfilled under normal operation conditions:

    -   The average position estimation shall not deviate more than 5 meters from the true position and shall cover all systematic errors.

    -   The standard deviation σ shall be less than 5 meters and shall be based on random errors only.

    -   The system shall be capable to detect deviations of more than 3σ within 30 seconds.

    These results shall be verified by a realistic test of at least 60 minutes.

    ii) Heading

    The navigation system shall estimate and display the heading of the vessel. The following minimal requirements shall be fulfilled:

    -   The average heading angle estimation shall not deviate more than 1 degree from the radar heading direction and shall cover all systematic errors. The offset between vessel heading direction and radar heading shall be less than 1 degree.

    -   The standard deviation σ shall be less than 2 degrees and shall be only based on random errors.

    These results shall be verified by a realistic test of at least 60 minutes.

    b) Sensor failure

    The navigation system shall check proper operation of the position and heading estimation online. Problems shall be detected within 30 seconds. In case of malfunction, the navigation system shall inform the user about the problem and its consequences for navigation.

    If a critical sensor alarm signalises that the position or the heading does not meet the required accuracy criteria, the navigation chart shall be switched off.

    c) Performance test interface

    A navigation system provider shall equip navigation systems during the compliance test with a Standard IEC 61162-1 interface sending the position and heading information used by the navigation system. This information shall be encoded by Standard IEC 61162-1 sentences (see the document referred to in Part I, Article 1.02(11) known as Global Positioning System Fix Data (GGA) and Heading True (HDT). Additional sentences like Recommended Minimum Navigation Information (RMC), Rate Of Turn (ROT) and Track made good and Ground speed (VTG) are accepted.

Those strings shall be sent preferably every 0,1 second, at least every second. Position and heading shall be according to the definitions in Part I, Article 6.02(1)(a)(i) and (ii).

2. General software tests

   a) Equipment documentation

   The following documents shall be provided for admittance and shall be shipped with every Inland ECDIS used in navigation mode:

   i) User's manual,

   ii) Installation manual,

   iii) Service manual.

   The following documents and files shall be provided during the admittance procedure and are not required for end users:

   i) design specification,

   ii) software style guide,

   iii) certificates of third party software components or test and simulation protocols.

   The documents and files provided shall allow for a complete verification of compliance with the Inland ECDIS technical specifications.

   A user's manual shall be shipped with every Inland ECDIS system.

   b) Endurance test for navigation mode

   The navigation system shall pass an endurance test of 48 hours of uninterrupted operation under normal operation conditions. The system shall provide standard interfaces for performance and resource monitoring during operation. Monitoring the system shall show no indication of system instability, memory leaking or any kind of performance loss over time. Navigation systems supporting additional services while running in navigation mode shall provide the necessary test equipment including all documents mentioned in Part I, Article 6.01(7).

Article 6.03
Changes to certified navigation systems

1. General requirements

   Navigation systems installed on board shall be functionally equivalent to a system certified by authorities. For every system the navigation system provider shall ship a statement of compliance with the Inland ECDIS technical specifications and its functional equivalence to the certified system.

   The competent authority is entitled to check Inland ECDIS compliance of installed systems at any time.

2.   Hardware and software changes

The navigation system provider may change software or hardware as long as Inland ECDIS compliance is maintained. Changes shall be fully documented and submitted to the competent authority, together with an explanation of how the navigation system is affected by those changes. The competent authority may require a partial or complete renewal of certification if considered necessary. The aforementioned also applies to the use of an approved Inland ECDIS with another national version of the operating system.

The following changes do not affect certification of the system and require only a notice to the competent authority:

a)   minor changes on third party components (e.g. operation system or library updates),

b)   use of equivalent or better hardware components (e.g. faster microprocessor, newer chip revisions, equivalent graphic card, etc.),

c)   minor changes in source code or documentation.

CHAPTER 7
SYSTEM CONFIGURATIONS (FIGURES)

Figure 1

**Inland ECDIS equipment, self-sufficient system without connection to radar
(system configuration 1)**
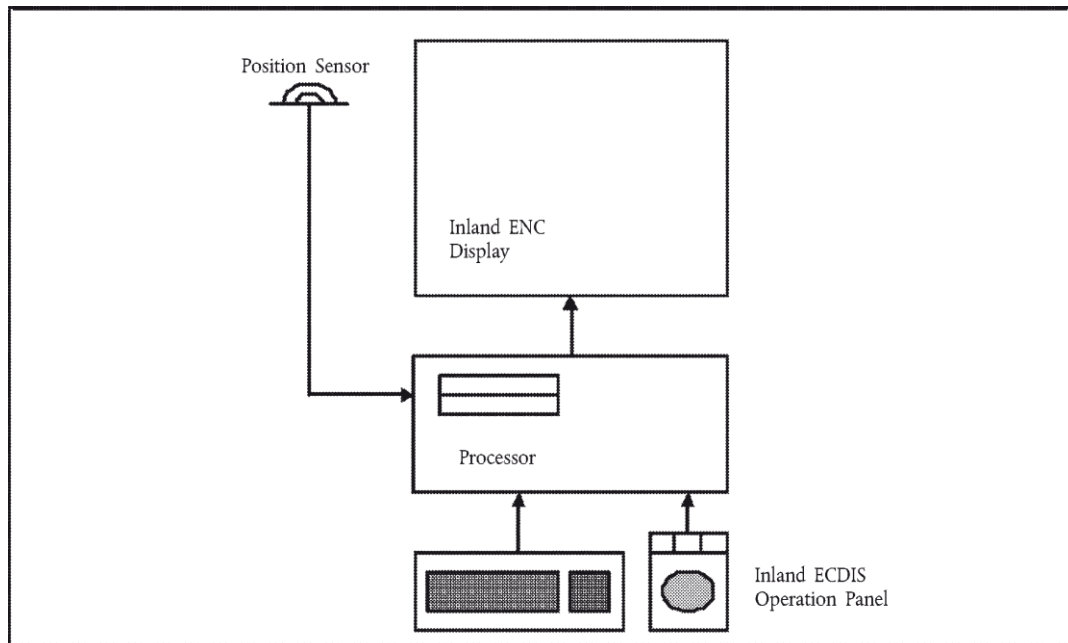
Figure 2

Inland ECDIS equipment, parallel installation with connection to radar (system configuration 2)
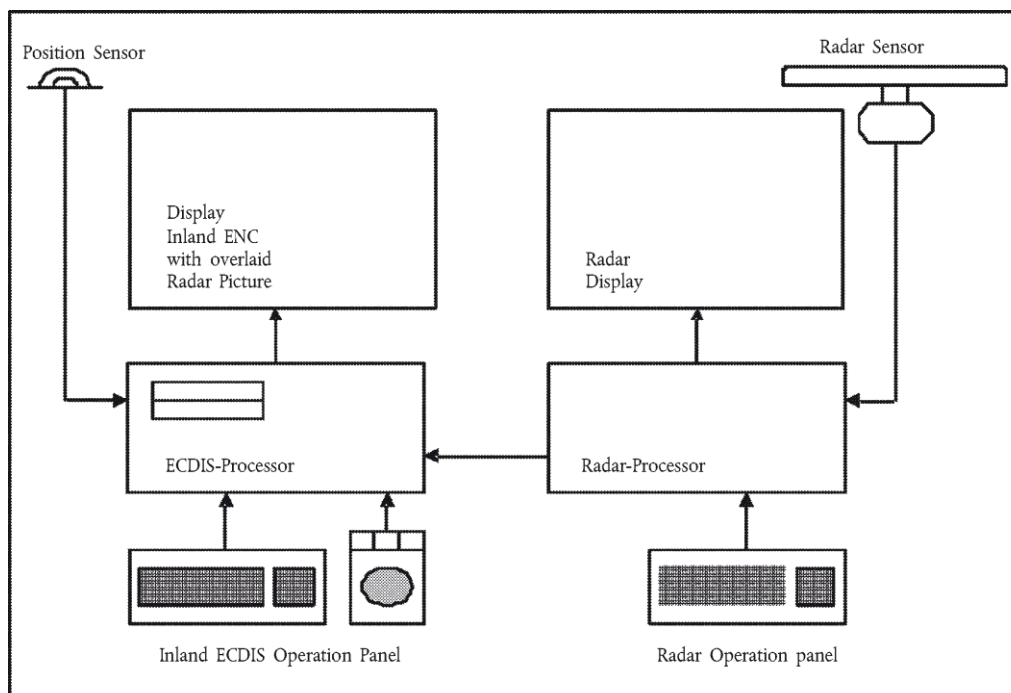
Figure 3

Inland ECDIS equipment with connection to radar and shared monitor (system configuration 3)
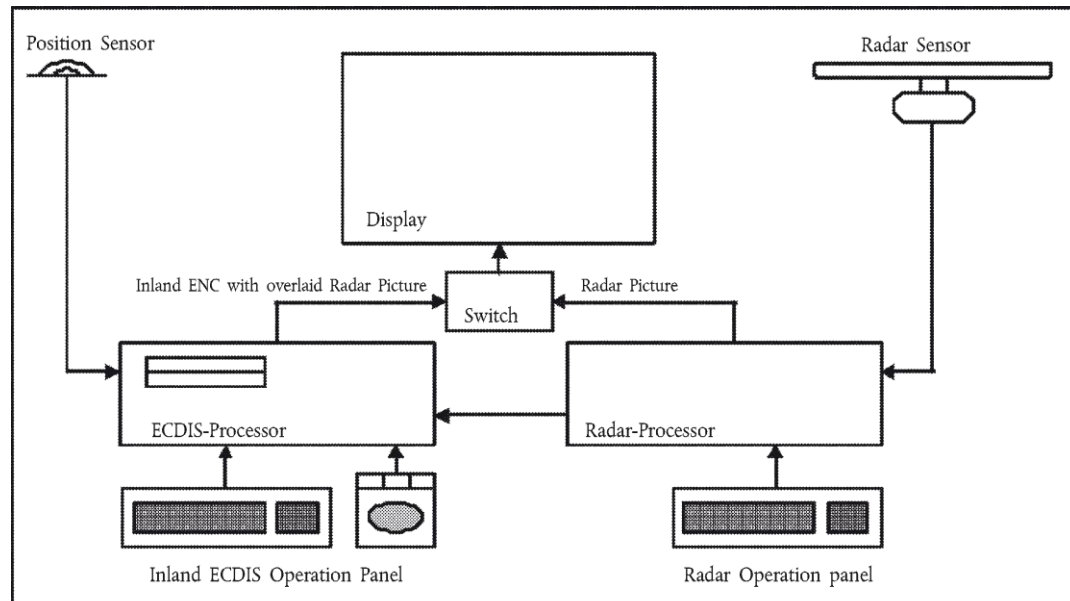
Figure 4

Navigational radar equipment with integrated Inland ECDIS functionality (system configuration 4)
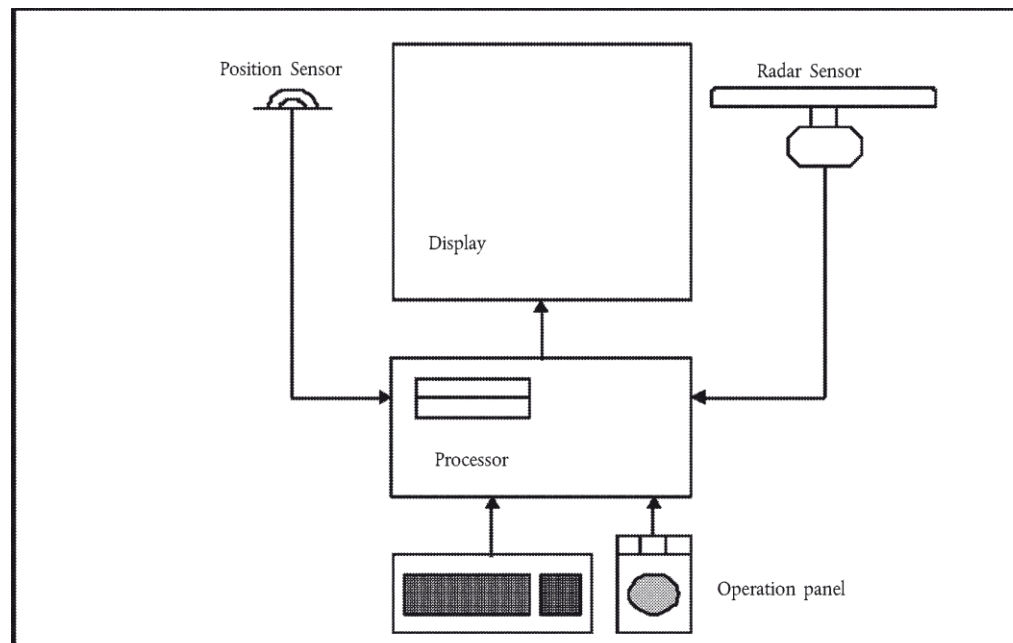
CHAPTER 8
GLOSSARY OF TERMS

Term or abbreviation	Definition	Source
Acronym	6-character-code of the feature/of the attribute.	Document referred to in Part I, Article 1.02(1)
Actor	An actor transforms an electrical quantity into another physical quantity (e.g. optical). An actor is the opposite of a sensor.	
AIS	On-board equipment allowing automatic identification of ships for enhanced ship monitoring as well as voyage data recording and other functions. The automatic identification system should comply with the technical and performance standards laid down in Chapter V of the SOLAS Convention (Safety of Life at Sea).	Document referred to in Part I, Article 1.02(18)
All information density	All information density (all display) means the maximum amount of SENC information. Here, in addition to the standard display (Standard Information Density), also all other objects are displayed, individually on demand.	Part I, Chapter 1
Attribute	A defined characteristic of an entity (e.g. the category of a light, the sector limits, the light characteristics etc.). Definitions for diverse attributes may be derived from the Feature Catalogue for Inland ENCs referred to inPart I, Article 1.02(8).	Document referred to in Part I, Article 1.02(1)
Cell (chart cell)	A cell is a geographical area containing Inland ENC or bathymetric Inland ENC data.	Document referred to in Part I, Article 1.02(1)
CIE colour calibration	Procedure to confirm that the colour specified in IHO S-52 is correctly reproduced on the ECDIS display.	Document referred to in Part I, Article 1.02(3)
Datum	A set of parameters specifying the reference surface or the reference coordinate system used for geodetic control in the calculation of coordinates of points on the earth. Commonly datums are defined as horizontal and vertical datums separately. For the practical use of the datum it is necessary to have one or more well distinctive points with coordinates given in that datum. The horizontal datum is a set of parameters specifying the reference for horizontal geodetic control, commonly the dimensions and the location of a reference ellipsoid. (The horizontal datum must be compliant with WGS 84.) The vertical datum is a surface to which elevations and/or depths (soundings and tide heights) are referred. For elevations commonly a level (equipotential) surface, approximately the mean sea level is used, for depths in many cases low water.	Document referred to in Part I, Article 1.02(3) and Document referred to in Part I, Article 1.02(14)

Term or abbreviation	Definition	Source
Display base	Minimum information density; means the minimum amount of SENC information that is presented and which cannot be reduced by the operator, consisting of information that is required at all times in all geographic areas and under all circumstances.	Document referred to in Part I, Article 1.02(4)
Display scale	The ratio between a distance on the display and a distance on the ground, normalised and expressed as a ratio, e.g. 1:10 000.	Document referred to in Part I, Article 1.02(3)
EBL	Electronic Bearing Line	Part I, Chapter 5
ECDIS	Electronic Chart Display and Information System (ECDIS) means a navigation information system which with adequate back-up arrangements can be accepted as complying with the up-to-date chart required by regulations V/19 and V/27 of the 1974 SOLAS Convention, as amended, by displaying selected information from a system electronic navigational chart (SENC) with positional information from navigation sensors to assist the mariner in route planning and route monitoring, and if required display additional navigation-related information.	Document referred to in Part I, Article 1.02(4)
Edge	A one-dimensional spatial object, located by two or more coordinate pairs (or two connected nodes) and optional interpolation parameters.	Document referred to in Part I, Article 1.02(1)
Electronic chart	Very broad term to describe the data, the software, and the electronic system, capable of displaying chart information. An electronic chart may or may not be equivalent to the paper chart required by SOLAS Convention.	Document referred to in Part I, Article 1.02(3)
ENC	Electronic Navigational Chart; the data base, standardised as to content, structure and format, issued for use with ECDIS on the authority of government authorised hydrographic offices. The ENC contains all the chart information necessary for safe navigation and may contain supplementary information in addition to that contained in the paper chart (e.g. sailing directions) which may be considered necessary for safe navigation.	Document referred to in Part I, Article 1.02(4)
ENC cell	The geographic division of ENC data for distributing purposes.	Document referred to in Part I, Article 1.02(5)
ETSI	European Telecommunications Standards Institute	
EUT	Equipment Under Test	Document referred to in Part I, Chapter 5
Enumeration	A specific quality or quantity assigned to an attribute (e.g. 'leading light', the limiting angles, the code specifying the light's colour – see attribute).	Document referred to in Part I, Article 1.02(15)

Term or abbreviation	Definition	Source
Feature	An identifiable set of information. A feature may have attributes and may be related to other features. A digital representation of all or a part of an entity by its characteristics (attributes), its geometry, and (optionally) its relationships to other features (e.g., the digital description of a light sector specifying, amongst others, sector limits, the colour of the light, the visibility range, etc., and a link to a light tower, if any). Definitions for diverse features may be derived from the Feature Catalogue for Inland ENCs referred to in Part I, Article 1.02(8) .	Document referred to in Part I, Article 1.02(3)
Feature catalogue	The comprehensive list of currently identified features, attributes and enumerations which are allowed for the use in Inland ENCs.	Document referred to in Part I, Article 1.02(15)
File	An identified set of S-57 records collected together for a specific purpose. The file content and structure must be defined by a product specification.	Document referred to in Part I, Article 1.02(3)
GGA	Global Positioning System Fix Data)	Document referred to in Part I, Article 6.02(1)(c)
GNSS	Global Navigation Satellite System (GNSS) is a system that uses satellites to provide autonomous geo-spatial positioning.	
HDT	Heading True	Document referred to in Part I, Article 6.02(1)(c)
Heading	The direction in which the longitudinal axis of a craft is pointed, usually expressed as an angular distance from north clockwise through 360 degrees (true, magnetic or compass).	Document referred to in Part I, Article 1.02(3)
Head-up display	The information shown on the display (radar or ECDIS) is directed so that the vessel's heading is always pointing upward. This orientation corresponds to the visual view from the bridge in direction of the vessel's heading. This orientation may require frequent rotations of the display content. Changing the vessel's course, or yawing of the vessel may render this unstabilised orientation mode illegible.	Document referred to in Part I, Article 1.02(3)
Human Machine Interface (HMI)	The user interface or human–machine interface is the part of the machine that handles the human–machine interaction. The engineering of the human–machine interfaces is enhanced by considering ergonomics (human factors). There are many ways to develop human-machine interface (HMI) screens for machine and process automation applications. Guidelines, standards, and handbooks covering HMI design include those published by ISA, ASM, ISO, and NUREG.	

Term or abbreviation	Definition	Source
IEC	International Electrotechnical Commission: An international (non-governmental) organisation which produces world standards for electrical and electronical engineering with the objective of facilitating international trade.	Document referred to in Part I, Article 1.02(3)
IHO	International Hydrographic Organization: Coordinates the activities of national hydrographic offices; promotes standards and provides advice to developing countries in the fields of hydrographic surveying and production of nautical charts and publications.	Document referenced in Part I, Article 1.02(3)
IHO registry	IHO Geospatial Information Infrastructure Registry. A registry is the information system on which a register is maintained. In the case of S-100 IHO hosts a registry that provides a facility to store various registers of hydrographic-related information.	Document referenced in Part I, Article 1.02(13)
IMO	International Maritime Organization: formerly called IMCO, the IMO is the specialised agency of the United Nations responsible for maritime safety, efficiency of navigation and prevention of marine pollution from vessels.	Document referenced in Part I, Article 1.02(3)
Information Mode	Means the use of the Inland ECDIS for information purposes only without overlaid radar image.	Part I, Chapter 1
Inland AIS	Automatic identification system for inland waterway vessels as set out in ES-RIS, Part II for vessel tracking and tracing systems.	Document referenced in Part I, Article 1.02(16)
Inland ECDIS	An Electronic Chart Display and Information System for inland navigation, displaying selected information from an Inland System Electronic Navigational Chart (Inland SENC) and optionally, information from other navigation sensors.	Part I, Chapter 1
Inland ENC (IENC)	Inland Electronic Navigational Chart (IENC) means the database, standardised as to content, structure and format, for use with inland electronic chart display and information systems operated on-board of vessels transiting inland waterways. An IENC is issued by or on the authority of a competent government agency, and conforms to standards initially developed by the International Hydrographic Organization (IHO) and refined by the Inland ENC Harmonization Group. An IENC contains all the chart information necessary for safe navigation on inland waterways and may contain supplementary information in addition to that contained in the paper chart (e.g. sailing directions, machine-readable operating schedules, etc.) which may be considered necessary for safe navigation and voyage planning.	Part I, Chapter 1
Inland ENC domain	Domain within the IHO Geospatial Information Infrastructure Registry dedicated for Inland ENC – related entries.	Document referenced in Part I, Article 1.02(13)

Term or abbreviation	Definition	Source
Inland SENC	Inland System Electronic Navigational Chart: a database resulting from the trans- formation of the Inland ENC by Inland ECDIS for appropriate use, updates to the Inland ENC by appropriate means and other data added by the mariner. It is this database that is actually accessed by the Inland ECDIS for the display generation and other navigational functions. The Inland SENC may also contain information from other sources.	Part I, Chapter 1
Integrated display	Means a head-up, relative-motion picture consisting of the Inland SENC overlaid with the radar-image with matching scale, offset and orientation.	Part I, Chapter 1
Look-up table	A table giving symbology instructions to link SENC objects to point, line or area symbolisation and providing display priority, radar priority, IMO category and optional viewing group.	Document referred to in Part I, Article 1.02(3)
Navigation mode	Means the use of the Inland ECDIS for conning the vessel with overlaid radar image.	Part I, Chapter 1
North-up display	Information shown on the display (radar or ECDIS) with the north direction upward.	Document referred to in Part I, Article 1.02(3)
Other navigational information	Navigational Information not contained in the SENC, that may be displayed by an ECDIS, such as radar information.	Document referred to in Part I, Article 1.02(3)
Own vessel	The term which identifies the vessel upon which an ECDIS is operating.	Document referred to in Part I, Article 1.02(3)
Own vessel's safety contour	The contour related to the own vessel selected by the mariner from the contours provided for in the SENC, to be used by ECDIS to distinguish on the display between the safe and the unsafe water, and for generating anti-grounding alarms.	Document referred to in Part I, Article 1.02(3)
Performance standard for ECDIS	Standard developed under the authority of IMO to describe the minimum performance requirements for navigational devices and other fittings required by the SOLAS Convention, included in MSC.232(82), as adopted by IMO on 5 December 2006.	Document referred to in Part I, Article 1.02(3)
Pick report (feature report)	The result of querying a displayed point-symbol, line or area for further information from the data base which is not represented by the symbol.	Document referred to in Part I, Article 1.02(3)
Presentation library for ECDIS	A set of mostly digital specifications, composed of symbol libraries, colour schemes, look-up tables and rules, linking every feature and attribute of the SENC to the appropriate presentation of the ECDIS display. Published by IHO as Annex A, Special Publication No 52 (S-52).	Document referred to in Part I, Article 1.02(3)

Term or abbreviation	Definition	Source
Product specification	A defined subset of the entire specification combined with rules, tailored to the intended usage of the transfer data. (The ENC Product specification specifies the content, structure and other mandatory aspects of an ENC.)	Document referred to in Part I, Article 1.02(3)
(Radar) range	Distance from the radar antenna. For inland navigation the radar range has to be sequential switchable according to the Radar Regulations.	Document referred to in Part I, Article 1.02(17)
ROT	Rate Of Turn	Document referred to in Part I, Article 6.02(1)(c)
RMC	Recommended Minimum Navigation Information	Document referred to in Part I, Article 6.02(1)(c)
Relative motion display	A relative motion display shows the chart information and radar targets moving relative to the vessel position fixed on the screen.	Document referred to in Part I, Article 1.02(3)
Route planning	An ECDIS function in which the area is displayed which is needed to study the intended route, to select the intended track, and to mark the track, its way points and navigational notes.	Document referred to in Part I, Article 1.02(4)
SCAMIN	The minimum scale at which the feature may be used e.g. for ECDIS presentation.	Document referred to in Part I, Article 1.02(1)
SENC	System Electronic Navigational Chart: An internal data base in an Inland ECDIS which results out of the transformation of ENCs and their update files and other data added by the boatmaster. It is this data base that is actually accessed by the ECDIS for the display generation and other navigational functions. The SENC may also contain information from other sources.	Document referred to in Part I, Article 1.02(3)
Spatial object	An object which contains locational information about real world entities.	Document referred to in Part I, Article 1.02(3)
Standard Information Density	The default amount of SENC information that shall be visible when the chart is displayed when ECDIS is switched on. A screen with Standard Information Density (standard display) is the default state of the Inland ECDIS.	Part I, Chapter 1
[Vessel] Tracking and Tracing	Tracking: function of maintaining status information on the vessel, possibly combined with information on cargo and consignments; tracing: and the retrieval of information concerning the whereabouts of the vessel, possibly combined with information on cargo, consignments and equipment, as set out in ES-RIS, Part II for vessel tracking and tracing systems.	Document referred to in Part I, Article 1.02(16)
True motion display	A display in which the own vessel and each radar target moves with its own true motion, while the position of all charted information remains fixed.	Document referred to in Part I, Article 1.02(3)

Term or abbreviation	Definition	Source
User-defined settings	Means the possibility to use and store a profile of display and operation controls- settings.	Part I, Chapter 1
VRM	Variable Range Marker.	Part I, Chapter 5
VTG	Track made good and Ground speed.	Document referred to in Part I, Article 6.02(1)(c)
WGS 84	World Geodetic System: The geodetic basis for the 'Navigational Satellite Timing and Ranging — Global Positioning System', which enables the surveying of the earth and its entities and was developed by the United States Department of Defence. This global geodetic reference system is recommended by IHO for hydrographic and cartographic use.	Document referred to in Part I, Article 1.02(14)

PART II
STANDARD VESSEL TRACKING AND TRACING FOR INLAND NAVIGATION

CHAPTER 1
GENERAL PROVISIONS

Article 1.01
Introduction

The technical specifications for Vessel Tracking and Tracing (VTT) systems is based on the work carried out in this field by relevant international organizations, namely already existing standards and technical specifications in inland navigation, maritime or other relevant areas.

Due to the application of VTT systems in mixed traffic areas including both inland and maritime navigation environments, like sea ports and coastal areas VTT systems shall be compatible with the AIS Class A mobile stations as referred to in Chapter V of the SOLAS convention.

When VTT systems provide essential services as defined in Directive (EU) 2016/1148[1] concerning measures for a high common level of security of network and information systems across the Union, the provisions of that Directive apply.

Article 1.02
References

The following international agreements, recommendations, standards and guidelines are referred to in thisPart:

Document title	Organisation	Publication date
The World Association for Waterborne Transport Infrastructure (PIANC) Guidelines and Recommendations for River Information Services	PIANC	2011
International Convention of Safety Of Life At Sea (SOLAS) by the International Maritime Organisation (IMO), Chapter V Safety of navigation, 1974, as amended	IMO	1974
International Maritime Organisation (IMO) MSC.74(69) Annex 3, 'Recommendation on Performance Standards for a Ship-borne Automatic Identification System (AIS)', 1998	IMO	1998
IMO Resolution A.915(22), 'Revised Maritime Policy and Requirements for a future Global Navigation Satellite System (GNSS)', 2002	IMO	2002

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[1] Directive (EU) 2016/1148 of the European Parliament and of the Council of 6 July 2016 concerning measures for a high common level of security of network and information systems across the Union (OJ L 194, 19.7.2016, p. 1).

Document title	Organisation	Publication date
IMO Resolution A.1106(29) Revised Guidelines for the Onboard Operational Use of Shipborne Automatic Identification System (AIS), 2015	IMO	2015
Recommendation by the International Telecommunication Union ITU-R M.585 'Assignment and use of identities in the maritime mobile service', 2015	ITU	2015
Recommendation by the International Telecommunication Union ITU-R M.1371 'Technical characteristics for a universal shipborne automatic identification system using time division multiple access in the VHF maritime mobile band'	ITU	2014
International Standard by International Electrotechnical Commission (IEC) 61993-2, 'Maritime navigation and radio communication equipment and systems - Automatic Identification system, Part 2: Class A shipborne equipment of the universal automatic identification system (AIS)'	IEC	2018
International Standard IEC 61162-Serie, 'Maritime navigation and radio communication equipment and systems - Digital interfaces': Part 1: Single talker and multiple listeners; Part 2: Single talker and multiple listeners, high speed transmission	IEC	Part 1: 2016 Part 2: 1998
International Standard by International Electrotechnical Commission (IEC): 62287-Series, Maritime navigation and radio communication equipment and systems — Class B shipborne equipment of the automatic identification system (AIS) Part 1: Carrier-sense time division multiple access (CSTDMA) techniques; Part 2: Self-organising time division multiple access (SOTDMA) techniques	IEC	2017
Radio Technical Commission's for Maritime Services (RTCM) Recommended Standards for Differential GNSS (Global Navigation Satellite Systems) Service	RTCM	2010
UNECE recommendation No 28 'Codes for Types of Means of Transport'	UNECE	2010

Article 1.03
Definitions

The following definitions are used in this Part:

1.   Automatic Identification System

1.1   Automatic Identification System (AIS)

'Automatic Identification System (AIS)' means an automatic communication and identification system intended to improve the safety of navigation by assisting in the efficient operation of vessel traffic services (VTS), ship reporting, ship-to-ship and ship-to-shore operations.

1.2   Inland AIS

'Inland AIS' means AIS for the use in inland navigation and interoperable with (maritime) AIS-technically enabled by amendments and extensions to the (maritime) AIS.

1.3   Track and Trace

'Track and Trace' means the process of monitoring and recording the past and present whereabouts of a ship shipment, as it passes through different handlers on its way to its destination, through a network. Tracing refers to where the product has been, while tracking refers to where it is going next.

1.4   Track

'Track' means the path followed or to be followed between one position and another.

2.   Services

2.1   River Information Services (RIS)

'River Information Services (RIS)' means services provided in accordance with Article 3(a) of Directive 2005/44/EC of the European Parliament and of the Council[1].

2.2   Vessel Traffic Management (VTM)

'Vessel Traffic Management (VTM)' means the functional framework of harmonised measures and services to enhance the safety, security, efficiency of shipping and the protection of the marine environment in all navigable waters.

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[1]   Directive 2005/44/EC of the European Parliament and of the Council of 7 September 2005 on harmonised river information services (RIS) on inland waterways in the Community (OJ L 255, 30.9.2005, p. 152).

2.3   Inland Vessel Traffic Services (VTS)

'Inland Vessel Traffic Services (VTS)' means services within the meaning of (2.5) of the Annex to Commission Regulation (EC) no 414/2007[1] or Guidelines and Recommendations for River Information Services, Edition 2.0, 2004 published by the Central Commission for the Navigation of the Rhine (CCNR).

2.4   Navigational information

'Navigational information' means information provided to the skipper on board to support in on-board decision-making.

2.5   Tactical Traffic Information (TTI)

'Tactical Traffic Information' means the information affecting immediate navigation decisions in the actual traffic situation and the close geographic surroundings. Tactical Traffic Information is used to generate a Tactical Traffic Image.

2.6   Strategic Traffic Information (STI)

'Strategic Traffic Information' means the information affecting the medium and long-term decisions of RIS users. Strategic Traffic Information is used to generate a Strategic Traffic Image.

2.7   Vessel Tracking and Tracing (VTT)

'Vessel Tracking and Tracing' means a function within the meaning of (2.12) of the Annex to Regulation (EC) no 414/2007 or ~~the VTT Standard, Edition 1.2~~ Guidelines and Recommendations for River Information Services, Edition 2.0, 2004 published by the Central Commission for the Navigation of the Rhine (CCNR).

2.8   Maritime Mobile Service Identity (MMSI)

'Maritime Mobile Service Identity (MMSI)' means series of nine digits which are transmitted over the radio path in order to uniquely identify ship, stations, coast stations and group calls.

2.9   Electronic Reporting International (ERI)

'Electronic Reporting International (ERI)' means the Technical guidelines and specifications established in accordance with Article 5(1)(b) of Directive 2005/44/EC.

2.10   Inland Electronic Chart Display and Information System (Inland ECDIS)

'Inland Electronic Chart Display and Information System (Inland ECDIS)' means the Technical guidelines and specifications established in accordance with Article 5(1)(a) of Directive 2005/44/EC.

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[1]   Commission Regulation (EC) no 414/2007 of 13 March 2007 concerning the technical guidelines for the planning, implementation and operational use of river information services (RIS) referred to in Article 5 of Directive 2005/44/EC of the European Parliament and of the Council on harmonised river information services (RIS) on inland waterways in the Community (OJ L 105, 23.4.2007, p. 1).

3. Players

3.1 Shipmaster

'Shipmaster' means the person on board of the ship being in command and having the authority to take all decisions pertaining to navigation and ship management. The terms 'shipmaster', 'boatmaster' and 'skipper' shall be deemed to be equivalent.

3.2 Conning skipper

'Conning skipper (Navigating skipper)' means the person who navigates the vessel, according to the voyage plan instructions of the shipmaster.

3.3 Competent Authority for RIS

The Competent Authority for RIS means the authority designated by the Member State in accordance with Article 8 of Directive 2005/44/EC.

3.4 RIS operator

'RIS operator' means a person performing one or more tasks related to the provision of RIS services.

3.5 RIS users

'RIS users' means all different user groups as defined in Article 3(g) of Directive 2005/44/EC.

Article 1.04
Vessel Tracking and Tracing services and minimum requirements of Vessel Tracking and Tracing systems

1. VTT systems shall be able to support the following services:
   a) Navigation,
   b) Traffic Information,
   c) Traffic Management,
   d) Calamity Abatement,
   e) Transport Management,
   f) Enforcement,
   g) Waterway dues and port infrastructure charges,
   h) Fairway Information Services,
   i) Statistics.

This is without prejudice to the provisions of Regulation (EC) no 414/2007 or the Guidelines and Recommendations for River Information Services, Edition 2.0, 2004, published by the Central Commission for the Navigation of the Rhine (CCNR) applicable to those services.

2. The most important information of VTT relates to vessel identity and its position. VTT shall be capable of providing - at minimum - the following information on an automatic and periodical basis to other vessels and shore stations, provided these vessels or shore stations are appropriately equipped:

    a) Unique vessel ID: unique European vessel identification number (ENI)/International Maritime Organisation number (IMO number),

    b) Vessel name,

    c) Vessel call sign,

    d) Navigational status,

    e) Type of vessel or convoy,

    f) Dimensions of vessel or convoy,

    g) Draught,

    h) Dangerous cargo indication (number of blue cones in compliance with ADN),

    i) Loading status (loaded/unloaded),

    j) Destination,

    k) Estimated Time of Arrival (ETA) at destination,

    l) Number of persons on board,

    m) Position (+ quality indication),

    n) Speed (+ quality indication),

    o) Course Over Ground (COG) (+ quality indication),

    p) Heading (HDG) (+ quality indication),

    q) Rate Of Turn (ROT),

    r) Blue sign information,

    s) Timestamp of position fix.

    These minimum requirements indicate the user needs and the necessary data for VTT systems in inland navigation.

    A VTT system is designed to offer sufficient flexibility to accommodate future additional requirements.

CHAPTER 2
INLAND VESSEL TRACKING AND TRACING FUNCTIONS

Article 2.01
Introduction

This Chapter sets out the requirements relating to VTT information for different RIS service categories. Requirements for each service category are listed describing the user groups and usage of the VTT information.

The overview of VTT information needs is provided in Part II, Article 2.08, Table 1.

Article 2.02
Navigation

Vessel tracking and tracing can be used to support the active navigation on board. Main user group are the conning skippers.

The process navigation can be divided in three phases:
a)   navigation, medium-term ahead,
b)   navigation, short-term ahead,
c)   navigation, very short-term ahead.

The user requirements are different for each phase.

1.   Navigation, medium-term ahead

     Navigation, medium-term ahead, is the navigation phase in which the skipper observes and analyses the traffic situation looking some minutes up to an hour ahead and considers the possibilities of where to meet, pass or overtake other vessels.

     The traffic image needed is the typical 'looking around the corner' feature and is mainly outside the scope of the on-board radar range.

     The update rate is depending on the task and differs from the situation in which the vessel is involved.

2.   Navigation, short-term ahead

     Navigation, short-term ahead, is the decision phase in the navigation process. In this phase traffic information has relevance for the process of navigation, including collision avoidance measures if necessary. This function deals with the observation of other vessels in the close surroundings of the own vessel.

     The actual traffic information shall be exchanged continuously at least every 10 seconds. For some routes the authorities may set a predefined update rate (maximum two seconds).

3.   Navigation, very short-term ahead

Navigation, very short-term ahead, is the operational navigation process. It consists of execution of the decisions that were made beforehand, on the spot and monitoring their effects. The traffic information needed from other vessels especially in this situation is related to its own vessel conditions, such as relative position, relative speed. It is necessary to follow highly accurate information in this phase.

Therefore, Tracking and Tracing information cannot be used for very short-term navigation.

Article 2.03
Vessel traffic management

Vessel traffic management (VTM) comprises at least of the following elements:

1.   Vessel traffic services

Vessel traffic services consist of the following services:
a)   an information service,
b)   a navigational assistance service,
c)   a traffic organisation service.

The user groups of Vessel Traffic Services (VTS) are VTS operators and conning skippers.

The user needs related to traffic information are indicated in (a) to (c).

a)   Information service

An information service is provided by broadcasting information at fixed times and intervals or when deemed necessary by the VTS or at the request of a vessel, and may include reports on the position, identity and intentions of other vessels, waterway conditions, weather conditions, hazardous situations or any other factors that may influence the vessel's transit.

For the information services an overview of traffic in a network or on fairway stretch is required.

The competent authority may set a predefined update rate if needed for safe and reliable passage through the area.

b)   Navigational assistance service

A navigational assistance service informs the conning skipper on difficult navigational or meteorological circumstances or assists the conning skipper in case of defects or deficiencies. This service is normally rendered at the request of a vessel or by the VTS when deemed necessary.

To provide individual information to a conning skipper, the VTS operator needs an actual detailed traffic image.

The actual traffic information has to be exchanged continuously (every three seconds, almost real time or another predefined update rate set by the competent authority).

All other information has to be made available on request of the VTS operator or in special occasions.

c) Traffic organisation service

A traffic organisation service concerns the operational management of traffic and the planning of vessel movements to prevent congestion and dangerous situations, and is particularly relevant in times of high traffic density or when the movement of special transports may affect the flow of other traffic. The service may also include establishing and operating a system of traffic clearances or VTS sailing plans or both in relation to priority of movements, allocation of space (such as berthing places, lock space, sailing routes), mandatory reporting of movements in the VTS area, routes to be followed, speed limits to be observed or other appropriate measures which are considered necessary by the VTS Authority.

2.   Lock planning and operation

The lock planning processes - long- and medium-term - and lock operation process are described in (a) to (c). Main user groups are lock operators, conning skippers, shipmasters and fleet managers.

a) Lock planning, long-term

Long-term lock planning is dealing with the planning of a lock some hours up to a day ahead.

In this case the traffic information is used to improve the information on waiting and passing times at locks, which are originally based on statistical information.

Estimated Time of Arrival (ETA) shall be available on demand or shall be exchanged if the deviation from the original ETA exceeds the deviation allowed by the competent authority. Requested time of arrival (RTA) is the response to an ETA report or may be sent from a lock to propose a locking time.

b) Lock planning, medium-term

Medium-term lock planning is dealing with the planning of a lock up to two or four lock cycles ahead.

In this case the traffic information is used to map the arriving vessels to the available lock cycles and based on the planning to inform the conning skippers about the RTA.

ETA shall be available on request or shall be exchanged if the deviation from the original ETA exceeds the deviation allowed by the competent authority. All other information shall be available once at the first contact or on request. RTA is the response to an ETA report or may be sent from a lock to propose a locking time.

c) Lock operation

In lock operation phase the actual locking process take place.

The actual traffic information has to be exchanged continuously or another predefined update rate set by the competent authority.

The accuracy of VTT information does not allow for high-precision applications like closing of lock gates.

3.   Bridge planning and operation

The bridge planning processes — medium- and short-term — and bridge operation process are described in (a) to (c). Main user groups are bridge operators, conning skippers, shipmasters and fleet managers.

a)   Bridge planning, medium-term

The bridge planning process on medium term is dealing with the optimisation of the traffic flow in such a way that the bridges are opened in time for passing of vessels (green wave). The planning horizon varies between 15 minutes to two hours. The timeframe depends on the local situation.

ETA and position information shall be available on request, or such information shall be exchanged as soon as the deviation between the updated ETA and the original ETA exceeds a pre-defined value set by the competent authority. All other information shall be available once at the first contact or on request. RTA is the response on an ETA report or may be sent from a bridge to propose a passage time.

b)   Bridge planning, short-term

In case of bridge planning on a short term, decisions are made on the basis of the strategy for opening of the bridge.

Actual traffic information on the position, speed and direction, shall be available on request or exchanged in accordance with predefined update rate, for example, every five minutes, set by the competent authority. ETA and position information shall be available on request, or such information shall be exchanged as soon as the deviation between the updated ETA and the original ETA exceeds a pre-defined value set by the competent authority. All other information shall be available once at the first contact or on request. RTA is the response on an ETA report or may be sent from a bridge to propose a passage time.

c)   Bridge operation

In bridge operation phase the actual opening and passing of the vessel through the bridge take place.

The actual traffic information shall be exchanged continuously or at another update rate set by the competent authority.

The accuracy of VTT information does not allow for high-precision applications like opening or closing of the bridge.

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Article 2.04
Calamity abatement

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Calamity abatement in this context focuses on repressive measures: dealing with real accidents and providing assistance during emergencies. Main user groups are operators in calamity centre, VTS operators, conning skippers, shipmasters and the competent authorities.

In the case of an accident the traffic information can be provided automatically or the responsible organisation shall ask for the respective information.

Article 2.05
Transport management

Transport management (TS) is divided into the following four activities:
1. voyage planning,
2. transport logistics,
3. port and terminal management,
4. cargo and fleet management.

Main user groups are shipmasters, freight brokers, fleet managers, consignors, consignees, supply forwarders, port authorities, terminal operators, lock operators and bridge operators.

1.   Voyage planning

        Voyage planning in this context focuses on the planning on-trip. During the voyage the shipmaster shall check his original planned voyage.

2.   Transport logistics

        Transport logistics consist of the organisation, planning, execution and control of the transport.

        All traffic information is needed on request by the ship-owner or logistic stakeholders.

3.   Intermodal port and terminal management

        Intermodal port and terminal management considers the planning of resources in ports and at terminals.

        The terminal and port manager shall request for traffic information or shall agree that in predefined situations the traffic information will be sent automatically.

4.   Cargo and fleet management

        Cargo and fleet management considers the planning and optimising the use of vessels, arranging cargo and transportation.

        The shipper or ship-owner shall request the traffic information or traffic information shall be sent in predefined situations.

Article 2.06
Enforcement

The scope of the enforcement task is limited to the services on dangerous goods, immigration control and customs. Main user groups are customs, competent authorities and shipmasters.

The traffic information shall be exchanged with appropriate authorities. The traffic information exchange shall take place on request or at fixed predefined points or in special circumstances defined by the responsible authority.

Article 2.07
Waterway dues and port infrastructure charges

In various locations in the Union, usage of the waterway and ports is subject to the payment of fees. Main user groups are competent authorities, shipmasters, fleet managers, waterway authorities and port authorities.

The traffic information shall be exchanged on request or at fixed points, defined by the competent waterway or port authority.

Article 2.08
Information needs

Part II, Table 1 provides an overview of the information needs of the different services.

Table 1

Overview of information needs

	Identification	Name	Call sign	Navigational status	Type	Dimensions	Draught	Dangerous cargo	Loading status	Destination	ETA at destination	Number of persons	Position and time	Speed	Course/direction	Heading	Rate of turn	Blue sign	Other information
Navigation – medium-term	X	X		X	X	X		X	X	X			X	X	X			X	
Navigation - short-term	X	X		X	X	X		X	X	X			X	X	X	X		X	
Navigation - very short-term	Requirements are currently not met by VTT																		
VTM — VTS services	X	X		X	X	X	X	X	X	X		X	X	X	X			X	
VTM — lock operation	X	X		X	X		X	X					X		X				Air draught
VTM — lock planning	X	X		X	X	X	X	X					X	X	X				number of assisting tugboats, air draught, ETA/RTA
VTM — bridge operation	X	X			X	X							X	X	X				Air draught
VTM — bridge planning	X	X		X	X	X							X	X	X				Air draught, ETA/RTA

	Identification	Name	Call sign	Navigational status	Type	Dimensions	Draught	Dangerous cargo	Loading status	Destination	ETA at destination	Number of persons	Position and time	Speed	Course/direction	Heading	Rate of turn	Blue sign	Other information
Calamity abatement	X	X			X			X	X	X		X	X		X				
TM — voyage planning	X	X				X	X		X	X			X	X					Air draught, ETA/RTA
TM — transport logistics	X	X									X		X		X				
TM — port and terminal management	X	X	X	X	X			X	X				X		X				ETA/RTA
TM — cargo and fleet management	X	X	X				X		X	X			X		X				ETA/RTA
Enforcement	X	X	X	X				X		X	X	X	X		X				
Waterway and port infrastructure charges	X	X			X	X	X			X			X						

CHAPTER 3
INLAND AIS TECHNICAL SPECIFICATION

Article 3.01
Introduction

In maritime navigation, the IMO has introduced the carriage of automatic identification system (AIS): all seagoing vessels on international voyage falling under Chapter V of the SOLAS convention have to be equipped with AIS Class A mobile stations since the end of 2004.

Directive 2002/59/EC of the European Parliament and of the Council[1] establishes a Community vessel traffic monitoring and information system for seagoing vessels carrying dangerous or polluting goods using AIS for Ship Reporting and Monitoring.

AIS is considered as a suitable solution for automatic identification and Vessel Tracking and Tracing in inland navigation. Especially the real time performance of AIS and the availability of worldwide standards and guidelines are beneficial for safety related applications.

To serve the specific requirements of inland navigation, AIS has to be further developed to the so-called Inland AIS technical specification while preserving full compatibility with maritime AIS and already existing standards and technical specifications in inland navigation.

Because Inland AIS is compatible with the maritime AIS it enables a direct data exchange between seagoing and inland vessels navigating in mixed traffic areas.

AIS is:

a)   a system introduced by the IMO to support maritime safety of navigation; mandatory carriage requirement for all vessels in accordance with Chapter V of SOLAS convention,

b)   operating in direct ship-to-ship mode as well as in a ship-to-shore, shore-to-ship mode,

c)   a safety system with high requirements regarding availability, continuity and reliability,

d)   a real time system thanks to the direct ship-to-ship data exchange,

e)   an autonomously operating system in a self-organised manner without master station. There is no need for a central controlling intelligence,

f)   based on international standards and procedures in accordance with Chapter V of SOLAS convention,

g)   a type approved system to enhance safety of navigation following a certification procedure,

h)   globally interoperable.

The purpose of this section is to define all necessary technical requirements, amendments and extensions to the existing AIS Class A mobile stations in order to create an Inland AIS mobile station for use in inland navigation.

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[1]   Directive 2002/59/EC of the European Parliament and of the Council of 27 June 2002 establishing a Community vessel traffic monitoring and information system repealing Council Directive 93/75/EEC (OJ L 208, 5.8.2002, p. 10).

Article 3.02
Scope

The AIS is a ship-borne radio data system, exchanging static, dynamic and voyage related vessel data between equipped vessels and between equipped vessels and shore stations. Ship-borne AIS stations broadcast the vessel's identity, position and other data in regular intervals. By receiving these transmissions, ship-borne or shore-based AIS stations within the radio range can automatically locate, identify and track AIS equipped vessels on an appropriate display like radar or electronic chart display systems such as the Inland Electronic Chart Display and Information System (Inland ECDIS) as defined in Part I. AIS is intended to enhance safety of navigation in ship-to-ship use, surveillance (VTS), Vessel Tracking and Tracing, and calamity abatement support.

AIS mobile stations are divided into following types:

a)   Class A mobile stations to be used by all sea going vessels falling under carriage requirements of Chapter V of SOLAS convention;

b)   Inland AIS mobile station, having full Class A functionality on VHF Data Link level, deviating in supplementary functions designed for the use by inland vessels;

c)   Class B SO/CS mobile stations with limited functionality which may be used by vessels not falling under carriage requirements for Class A or Inland AIS mobile stations;

d)   AIS shore stations, including AIS base stations and AIS repeater stations.

The following modes of operation can be distinguished:

a)   ship-to-ship operation: all AIS equipped vessels are able to receive static and dynamic information from all other AIS equipped vessels within the radio range;

b)   ship-to-shore operation: data from AIS equipped vessels can also be received by AIS shore stations connected to the RIS centre where a traffic image (Tactical Traffic Image and/or Strategic Traffic Image) can be generated;

c)   shore-to-ship operation: voyage and safety related data from shore to vessel can be transmitted.

A characteristic of AIS is the autonomous mode, using self-organised time division multiple access (SOTDMA), without any need for an organising master station. The radio protocol is designed in a way that vessel stations operate autonomously in a self-organised manner by exchanging link access parameters. Time is divided into one minute frames with 2250 time slots per radio channel which are synchronised by GNSS UTC time. Each participant organises its access to the radio channel by choosing free time slots considering the future use of time slots by other stations. There is no need for a central intelligence controlling the slot assignment.

An Inland AIS mobile station consists in general of the following components:

a)   VHF transceiver (one transmitter, two receivers);
b)   GNSS receiver;
c)   data processor.

Universal ship-borne AIS, as defined by IMO, ITU and IEC, and recommended for the use in inland navigation uses SOTDMA in the VHF maritime mobile band. AIS operates on the internationally designated VHF frequencies AIS 1 (161,975 MHz) and AIS 2 (162,025 MHz) and can be switched to other frequencies in the VHF maritime mobile band.

To serve the specific requirements of inland navigation, AIS has to be further developed to the so called Inland AIS while preserving compatibility with the maritime AIS.

Vessel Tracking and Tracing systems in inland navigation shall be compatible with AIS Class A mobile stations, as defined by IMO. Therefore, Inland AIS messages shall be able to provide the following types of information:

a)   static information, such as official vessel number, call sign of vessel, name of vessel, type of vessel;

b)   dynamic information, such as vessels position with accuracy indication and integrity status;

c)   voyage related information, such as length and beam of convoy, dangerous cargo on board;

d)   inland navigation specific information, such as number of blue cones/lights according to ADN or ETA at lock/bridge/terminal/border.

For moving vessels the update rate for dynamic information on tactical level shall be between 2 and 10 seconds. For vessels at anchor it is recommended to have an update rate of several minutes, or an update triggered when information is amended.

Inland AIS mobile station does not replace, but supports navigational services such as radar target tracking and VTS. Inland AIS mobile station provides an additional input for navigational information: its value added is to provide means of surveillance and tracking of vessels equipped with Inland AIS. The position accuracy derived from Inland AIS mobile station using the internal (uncorrected) GNSS is typically above 10 metres. When the position is corrected using DGNSS from either maritime beacon differential correction service, AIS Message 17 or EGNOS (SBAS) the accuracy is typically below 5 metres. Due to their different characteristics, Inland AIS mobile station and radar complement each other.

Article 3.03
Requirements

1.   General requirements

      Inland AIS mobile station is based on the AIS Class A mobile station in accordance with SOLAS convention.

      Inland AIS mobile station shall cover the main functionality of AIS Class A mobile stations while considering the specific requirements for inland navigation.

      Inland AIS shall be compatible to the maritime AIS and shall enable a direct data exchange between seagoing and inland vessels navigating in a mixed traffic area.

      The requirements set out in Part II, Articles 3.03 to 3.05 are complementary or additional requirements for Inland AIS, which differs from the AIS Class A mobile stations.

The Inland AIS mobile station design shall take into account the 'Technical clarifications on the Vessel Tracking and Tracing standard'.

The default setting of the transmission power shall be high power and shall only been set to low power if directed so by the competent authority.

2.   Information content

Only Tracking and Tracing and safety related information shall be transmitted via Inland AIS mobile station.

The information content set out in (a) to (e) below shall be implemented in a way that it can be sent from an Inland AIS mobile station without the need for an external application.

The Inland AIS messages shall contain following information (items marked with '*' have to be handled differently as for seagoing vessels):

a)   Static vessel information

The static vessel information for inland vessels shall have the same parameters and the same structure as in the AIS Class A mobile stations as far as it is applicable. Any conversions from inland to maritime parameters shall be done automatically where feasible. Unused parameter fields shall be set to 'not available'.

Inland specific static vessel information shall be added.

Static vessel information is broadcast autonomously from vessel or on request.

User identifier (MMSI)	in all messages
Name of vessel	AIS Message 5
Call sign of the vessel	AIS Message 5
IMO number	AIS Message 5 (not available for Inland vessels)
Type of vessel/convoy and cargo *	AIS Message 5 + Inland FI 10
Overall length (decimetre accuracy) *	AIS Message 5 + Inland FI 10
Overall beam (decimetre accuracy) *	AIS Message 5 + Inland FI 10
Unique European vessel identification number (ENI)	Inland FI 10
Reference point of reported position on the vessel (location of antenna) *	AIS Message 5

b)   Dynamic vessel information

The dynamic vessel information for inland vessels shall have the same parameters and the same structure as in AIS Class A mobile stations as far as it is applicable. Not used parameter fields shall be set to 'not available'.

Inland specific dynamic vessel information shall be added.

Dynamic vessel information is broadcasted autonomously from vessel or on request.

Position according to World Geodetic System from 1984 (WGS 84)	AIS Message 1, 2 and 3
Speed Over Ground (SOG)	AIS Message 1, 2 and 3
Course COG	AIS Message 1, 2 and 3
Heading HDG	AIS Message 1, 2 and 3
Rate of turn ROT	AIS Message 1, 2 and 3
Position accuracy (GNSS/DGNSS)	AIS Message 1, 2 and 3
Time of electronic position fixing device	AIS Message 1, 2 and 3
Navigational status	AIS Message 1, 2 and 3
Status of Blue sign *	AIS Message 1, 2 and 3
Quality of speed information	Inland FI 10
Quality of course information	Inland FI 10
Quality of heading information	Inland FI 10

c) Voyage related vessel information

The voyage related vessel information for inland vessels shall have the same parameters and the same structure than in AIS Class A mobile stations as far as it is applicable. Unused parameter fields shall be set to 'not available'.

Inland specific voyage related vessel information shall be added.

Voyage related vessel information is broadcasted autonomously from vessel or on request.

Destination (ISRS location code)	AIS Message 5
Category of dangerous cargo	AIS Message 5
ETA	AIS Message 5
Maximum present static draught *	AIS Message 5 + Inland FI 10
Dangerous cargo indication	Inland FI 10
Loaded/unloaded vessel	Inland FI 10

d) Number of persons on board

The number of persons on board is transmitted either as a broadcast message or as an addressed message from vessel to shore on request or on event.

Number of crew members on board	Inland FI 55
Number of passengers on board	Inland FI 55
Number of shipboard personnel on board	Inland FI 55

e) Safety related messages

Safety related messages (i.e. text messages) are transmitted when required as broadcast or as addressed messages.

Addressed Safety related message	AIS Message 12
Broadcasted Safety related message	AIS Message 14

3.   Reporting interval of information transmission

The different information types of Inland AIS messages shall be transmitted with different reporting rates.

The reporting rate for dynamic information can be switched between autonomous mode and assigned mode for moving vessels in inland waterway areas. The reporting rate can be increased up to 2 seconds in assigned mode. The reporting behaviour shall be switchable from an AIS base station (via AIS Message 23 for group assignment or Message 16 for individual assignment) and by commands from external ship-borne systems, via IEC 61162 interface as defined in Annex 5.

For static and voyage related the reporting rate shall be 6 minutes, on request, or if information is amended. Following reporting rates shall be applicable:

Static vessel information:	Every 6 minutes, on request or when data has been changed
Dynamic vessel information:	Depends on navigational status and vessel operating mode, either autonomous (default) or assigned mode, see Table 2
Voyage related vessel information:	Every 6 minutes, on request or when data has been changed
Number of persons on board:	As required or on request
Safety related messages:	As required
Application Specific Messages:	As required (to be defined by competent authority)

Table 2

Update rate of dynamic vessel information

Vessel dynamic conditions	Nominal reporting interval
Vessel status 'at anchor' and not moving faster than 3 knots	3 minutes[1]
Vessel status 'at anchor' and moving faster than 3 knots	10 seconds[1]
Vessel operating in autonomous mode, moving 0 to 14 knots	10 seconds[1]
Vessel operating in autonomous mode, moving 0 to 14 knots and changing course	3 1/3 seconds[1]
Vessel operating in autonomous mode, moving 14 to 23 knots	6 seconds[1]
Vessel operating in autonomous mode, moving 14 to 23 knots and changing course	2 seconds
Vessel operating in autonomous mode, moving faster than 23 knots	2 seconds
Vessel operating in autonomous mode, moving faster than 23 knots and changing course	2 seconds
Vessel operating in assigned mode[2]	assigned between 2 seconds and 10 seconds
[1] When a mobile station determines that it is the semaphore (refer to ITU-R M.1371, Annex 2, § 3.1.1.4), the reporting rate shall increase to once per two seconds (refer to ITU-R M.1371, Annex 2, § 3.1.3.3.2).	
[2] Shall be switched by competent authority, when necessary.	

4.   Technology platform

The platform for Inland AIS mobile station is the AIS Class A mobile station.

The technical solution of Inland AIS mobile station is based on the same technical standards as AIS Class A mobile stations (ITU-R M.1371 and international standard IEC 61993-2).

5.   Compatibility to AIS Class A mobile stations

Inland AIS mobile stations shall be compliant to AIS Class A mobile stations and shall be capable of receiving and processing all AIS messages (according to ITU-R M.1371 and technical clarifications on ITU-R M.1371 by International Association of aids to navigation and Lighthouse Authorities (IALA)) and in addition the messages defined in Part II, Article 3.04.

6.   Unique identifier

In order to guarantee the compatibility with maritime vessels, the Maritime Mobile Service Identifier (MMSI) number shall be used as a unique station identifier (radio equipment identifier) for the Inland AIS mobile stations.

7.   Application requirements

Information referred to (2) shall be input, stored and displayed directly within the Inland AIS mobile station.

The Inland AIS mobile station shall be capable of storing also the inland specific static data in the internal memory, in order to keep the information when the unit is without power supply.

Necessary data conversions for the Minimum Keyboard Display (MKD) of the Inland AIS information content (e.g. knots into km/h) or MKD input and display of information concerning inland vessel types shall be handled within the Inland AIS mobile station.

Application Specific Messages (ASM) should be entered/displayed by an external application with the exemption of Inland AIS ASM DAC = 200 FI = 10 (Inland Ship static and voyage related data) and DAC = 200 FI = 55 (inland number of persons on board) which are implemented directly in the Inland AIS mobile station.

In order to program the inland specific data into the AIS transponder the digital interface sentences are defined in Annex 5.

The Inland AIS mobile station shall provide — as a minimum — an external interface for the input of DGNSS correction and integrity information according to the provisions of the Radio Technical Commission for Maritime Services Special Committee 104 on DGNSS.

8.   Type-approval

Inland AIS mobile station shall be type-approved for compliance with these technical specifications.

Article 3.04
Protocol amendments for Inland AIS mobile station

Due to evolution of the ITU-R M.1371, several parameters allow for the use of new status codes. This does not harm the functioning of the AIS but may result in display of unrecognized status codes in equipment based on previous revisions of the standard.

1.   Table 3 Position report

Table 3

Position report

Parameter	Number of bits	Description
Message ID	6	Identifier for this message 1, 2 or 3
Repeat indicator	2	Used by the repeater to indicate how many times a message has been repeated
User ID (MMSI)	30	0-3; Default = 0; 3 = do not repeat any more
Navigational Status	4	0 = under way using engine; 1 = at anchor; 2 = not under command; 3 = restricted manoeuvrability; 4 = constrained by her draught; 5 = moored; 6 = aground; 7 = engaged in fishing; 8 = under way sailing; 9 = reserved for future amendment of Navigational Status for a highspeed craft; 10 = reserved for future amendment of Navigational Status for Wing In Ground (WIG); 11 = power-driven vessel towing astern (regional use)[1] ; 12 = power-driven vessel pushing ahead or towing alongside (regional use) [1]; 13 = reserved for future use; 14 = AIS-SART (active); 15 = not defined = default (also used by AIS)
Rate of turn ROT AIS	8	0 to + 126 = turning right at up to 708° per min or higher 0 to - 126 = turning left at up to 708° per min or higher Values between 0 and 708° per min coded by ROTAIS = 4.733 SQRT (ROTsensor) degrees per min where ROTsensor is the Rate of Turn as input by an external Rate of Turn Indicator. ROTAIS is rounded to the nearest integer value + 127 = turning right at more than 5° per 30 s (No Turn Indicator available) - 127 = turning left at more than 5° per 30 s (No Turn Indicator available) - 128 (80 hexadecimal) indicates no turn information available (default). ROT data should not be derived from COG information
Speed over ground	10	Speed over ground in 1/10 knot steps (0-102,2 knots) 1 023 = not available; 1 022 = 102,2 knots or higher[2]

Parameter	Number of bits	Description
Position accuracy	1	The position accuracy (PA) flag should be determined in accordance with ITU-R M. 1371 1 = high (≤10 m) 0 = low (> 10 m) 0 = default
Longitude	28	Longitude in 1/10 000 min (± 180o, East = positive (as per 2's complement), West = negative (as per 2's complement), 181= (6791AC0 hexadecimal) = not available = default)
Latitude	27	Latitude in 1/10 000 min (± 90o, North = positive (as per 2's complement), South = negative (as per 2's complement), 91= (3412140 hexadecimal) = not available = default)
Course over ground	12	Course over ground in 1/10° (0-3599). 3 600 (E10 hexadecimal) = not available = default; 3 601 — 4 095 shall not be used
True heading	9	Degrees (0-359) (511 indicates not available = default).
Time stamp	6	UTC second when the report was generated by the electronic positioning fixing system (EPFS) (0-59, or 60 if time stamp is not available, which shall also be the default value, or 61 if positioning system is in manual input mode, or 62 if Electronic Position Fixing System operates in estimated (dead reckoning) mode, or 63 if the positioning system is inoperative)
Special manoeuvre indicator: blue sign	2	Indication if blue sign is set[3] 0 = not available = default, 1 = not engaged in special manoeuvre = blue sign not set 2 = engaged in special manoeuvre = blue sign is set yes, 3 is not used
Spare	3	Not used. Should be set to zero. Reserved for future use.
RAIM-flag	1	Receiver autonomous integrity monitoring (RAIM) flag of electronic position fixing device; 0 = RAM not in use = default; 1 = RAIM in use. RAIM-flag should be determined in accordance with ITU-R M. 1371
Communication state	19	Communication state should be determined in accordance with ITU-R M. 1371
Total	**168**	**Occupies one slot**

[1] Not applicable within the Union for the purpose of this Regulation.

[2] Knots shall be calculated in km/h by external on-board equipment.

[3] Shall only be evaluated if the report is coming from an Inland AIS mobile station and if the information is derived by automatic means (direct connection to switch).

2.   Ship static and voyage related data (Message 5)

Table 4

Ship static and dynamic data report

Parameter	Number of bits	Description
Message ID	6	Identifier for this message 5
Repeat indicator	2	Sent by the repeater to indicate how many times a message has been repeated 0-3; Default = 0; 3 = do not repeat any more
User ID (MMSI)	30	MMSI number
AIS version indicator	2	0 = Station compliant with ITU-R M. 1371-1; 1 = Station compliant with ITU-R M. 1371-3 (or later), 2 = Station compliant with ITU-R M.1371-5 (or later), 3 = Station compliant with future editions
IMO number	30	0 = not available = default — not applicable to Search And Rescue aircraft 0000000001-0000999999 not used 0001000000-0009999999 = valid IMO number; 0010000000-1073741823 = official flag state number.[1] .
Call sign	42	7 x 6 bit ASCII characters, '@@@@@@@' = not available = default Craft associated with a parent vessel, should use 'A' followed by the last 6 digits of the MMSI of the parent vessel. Examples of these craft include towed vessels, rescue boats, tenders, lifeboats and liferafts
Name	120	Maximum 20 characters 6 bit ASCII, see ITU-R M. 1371; @@@@@@@@@@@@@@@@@@@@ = not available = default. For Search And Rescue (SAR) aircraft, it should be set to 'SAR AIRCRAFT NNNNNNN' where NNNNNNN equals the aircraft registration number
Type of vessel and cargo	8	0 = not available or no vessel = default; 1 — 99 = as defined in ITU-R M. 1371;[2] 100 — 199 = preserved, for regional use; 200 — 255 = preserved, for future use Not applicable to SAR aircraft
Overall dimensions of vessel/convoy and reference for position	30	Reference point for reported position; Also indicates the dimension of vessel in metres (see ITU-R M. 1371). For SAR aircraft, the use of this field may be decided by the responsible administration. If used it should indicate the maximum dimensions of the craft. As default should A = B = C = D be set to '0' [3) 4) 5)]

Parameter	Number of bits	Description
Type of electronic position fixing device	4	0 = Undefined (default), 1 = GPS, 2 = GLONASS, 3 = Combined GPS/GLONASS, 4 = Loran-C, 5 = Chayka, 6 = Integrated Navigation System, 7 = surveyed, 8 = Galileo 9 — 14 = not used 15 = internal GNSS
ETA	20	ETA; MMDDHHMM UTC Bits 19 — 16: month; 1 — 12; 0 = not available = default; Bits 15 — 11: day; 1 — 31; 0 = not available = default; Bits 10 — 6: hour; 0 — 23; 24 = not available = default; Bits 5 — 0: minute; 0 — 59; 60 = not available = Default For SAR aircraft, the use of this field may be decided by the responsible administration
Maximum present static draught	8	in 1/10 m, 255 = draught 25,5 m or greater, 0 = not available = default[6]
Destination	120	Maximum 20 characters using 6-bit ASCII; @@@@@@@@@@@@@@@@@@@@ = not available.[7]
Data Terminal Equipment (DTE)	1	Data terminal ready (0 = available, 1 = not available = default)
Spare	1	Spare. Not used. Shall be set to zero. Reserved for future use
Total	**424**	**Occupies two slots**

[1] Shall be set to 0 for inland vessels.

[2] Best applicable vessel type shall be used for inland navigation (see Annex 6).

[3] The dimensions shall be set to the maximum rectangle size of the convoy.

[4] The decimetre accuracy of the inland information shall be rounded upwards.

[5] The reference point information has to be taken out of the SSD interface sentence by distinguishing the field 'source identifier'. Position reference point information with source identifier AI, has to be stored as internal one. Other source identifiers shall lead to reference point information for the external reference point.

[6] The centimetre accuracy on the inland information shall be rounded upwards.

[7] The ISRS Location Codes as part of the RIS Index shall be used derived from the European Reference Data Management System (ERDMS) kept by the European Commission.

Figure 1

Reference point for reported position and overall dimension of vessel/convoy

	Number of bits	Bit fields	Distance (m)	
A	9	Bit 21 — Bit 29	0 — 511 511 = 511 m or greater	Reference Point for reported position
B	9	Bit 12 — Bit 20	0 — 511 511 = 511 m or greater	
C	6	Bit 6 — Bit 11	0 — 63 63 = 63 m or greater	
D	6	Bit 0 — Bit 5	0 — 63 63 = 63 m or greater	
L = A + B	Defined in Inland FI 10			Overall dimension used in Inland AIS mobile station
W = C + D				
The dimension should be in the direction of the transmitted heading information (bow).				
Reference point of reported position not available, but dimensions of vessel/convoy are available: A = C = 0 and B * 0 and D * 0.				
Neither reference point of reported position nor dimensions of vessel/convoy are available: A = B = C = D = 0 (= default).				
For use of the message table, A = most significant field. D = least significant field.				

3.   Group assignment command (Message 23)

Inland AIS mobile stations shall be addressed for group assignment by Message 23 using station type '6 = inland waterways'.

Article 3.05
Inland AIS Messages

1.   Additional Inland AIS messages

To comply with the information needs, specific Inland AIS messages are defined. In addition to the information content which shall be implemented directly in the Inland AIS station, the Inland AIS mobile station may transmit additional information through Application Specific Messages (ASM). This information content is normally handled by an external application, such as Inland ECDIS.

The use of Inland AIS ASM is in the responsibility of the river commission or the competent authorities.

2.   Application identifier for Inland AIS Application Specific Messages

The application specific messages consist of the AIS Class A mobile stations framework according ITU-R M.1371 (message ID, repeat indicator, source ID, destination ID), the Application Identifier (AI = DAC + FI) and the data content (variable length up to a given maximum).

The 16-bit application identifier (AI = DAC + FI) consists of the following elements:
a)   10-bit designated area code (DAC): international (DAC = 1) or regional (DAC > 1);
b)   6-bit function identifier (FI) — allows for 64 unique application specific messages.

For the European harmonized Inland AIS Application Specific Messages the DAC '200' is used.

In addition national (regional) DAC may be used in local ASM e.g. test pilots. Nevertheless it is strongly recommended to avoid the usage of regional ASM.

3.   Information content through Application Specific Messages

Inland AIS ASM DAC = 200 FI = 10 (Inland Ship static and voyage related data) and DAC = 200 FI = 55 (inland number of persons on board) are implemented directly in the Inland AIS mobile station (see (a) and (b)).
a)   Inland ship static and voyage related data (Inland specific Message FI 10)
       This message shall be used by inland vessels only, to broadcast vessel static and voyage related data in addition to message 5. The message shall be sent with binary message 8 as soon as possible (from the AIS point of view) after message 5.

Table 5

Inland vessel data report

	Parameter	Number of bits	Description
	Message ID	6	Identifier for message 8; always 8
	Repeat indicator	2	Used by the repeater to indicate how many times a message has been repeated. 0-3; Default = 0; 3 = do not repeat any more
	Source ID	30	MMSI number
	Spare	2	Not used, shall be set to zero. Reserved for future use
Binary data	Application identifier	16	DAC = 200, FI = 10
	Unique European vessel identification number (ENI)	48	8*6 Bit ASCII characters 00000000 = ENI not assigned = default
	Length of vessel/convoy	13	1 — 8 000 (rest not to be used) length of vessel/convoy in 1/10 m 0 = default
	Beam of vessel/convoy	10	1 — 1 000 (rest not to be used) beam of vessel/convoy in 1/10 m; 0 = default
	Vessel and convoy type	14	Numeric vessel and convoy type as described in Annex 6. 0 = not available = default
	Dangerous cargo indication	3	Number of blue cones/lights 0 — 3; 4 = B-Flag, 5 = default = unknown
	Maximum present static draught	11	1 — 2 000 (rest not used) draught in 1/100 m, 0 = default = unknown
	Loaded/unloaded	2	1 = loaded, 2 = unloaded, 0 = not available/default, 3 shall not be used
	Quality of speed information	1	1 = high, 0 = low/GNSS = default (*)
	Quality of course information	1	1 = high, 0 = low/GNSS = default (*)
	Quality of heading information	1	1 = high, 0 = low = default (*)
	Spare	8	Not used, shall be set to zero. Reserved for future use
Total		**168**	**Occupies one slot**
(*) Shall be set to 0 if no type approved sensor (e.g. gyro) is connected to the transponder.			

b) Number of persons on board (Inland specific message FI 55)

This message shall be sent by inland vessels only, to inform about the number of persons (passengers, crew, shipboard personnel) on board. The message shall be sent with binary message 6 preferably on event or on request using International Application Identifier binary functional message 2.

Table 6

Number of Persons on board report

	Parameter	Bit	Description
	Message ID	6	Identifier for message 6; always 6
	Repeat indicator	2	Used by the repeater to indicate how many times a message has been repeated. 0-3; Default = 0; 3 = do not repeat any more
	Source ID	30	MMSI number of source station
	Sequence number	2	0 — 3
	Destination ID	30	MMSI number of destination station
	Retransmit flag	1	Retransmit flag shall be set upon retransmission: 0 = no retransmission = default; 1 = retransmitted.
	Spare	1	Not used, shall be set to zero. Reserved for future use
Binary data	Application identifier	16	DAC = 200, FI = 55
	Number of crew members on board	8	0 — 254 crew members, 255 = unknown = default
	Number of passengers on board	13	0 — 8 190 passengers, 8 191 = unknown = default
	Number of shipboard personnel on board	8	0 — 254 shipboard personnel, 255 = unknown = default
	Spare	51	Not used, shall be set to zero. Reserved for future use.
	Total	**168**	**Occupies one slot**

CHAPTER 4
OTHER AIS MOBILE STATIONS ON INLAND WATERWAYS

Article 4.01
Introduction

Vessels not obliged to operate Inland AIS mobile stations may use other AIS mobile stations. The following mobile stations can be used:

a)   AIS Class A mobile station in accordance with Articles 35(2) and 35(3) of Commission Directive 2014/90/EU[1];

b)   AIS Class B mobile station in accordance with Part II, Article 4.02.

The use of such stations in inland waterways is up to the decision of the Competent Authority responsible for the navigation in that area.

If such stations are used on a voluntary basis, the shipmaster shall keep the manually entered AIS data constantly up to date. No incorrect data shall be transmitted over AIS.

Article 4.02
General requirements for AIS Class B mobile stations on inland waterways

AIS Class B has restricted functionalities compared to Inland AIS mobile stations. The messages sent out by an AIS Class B mobile station are transmitted with a lower priority in comparison to Inland AIS mobile stations.'

In addition to the requirements resulting from other Union legal acts, in particular, Directive 1999/5/EC of the European Parliament and of the Council[2] and Commission Decision 2005/53/EC[3], AIS Class B mobile stations installed on vessels navigating on Union inland waterways shall meet the requirements set out in:

a)   ITU-R M. 1371;

b)   IEC International Standard 62287 (including DSC channel management).

Note: It is the responsibility of the Competent Authority responsible for the navigation in that area to ascertain the conformity of AIS Class B mobile stations to the standards and requirements listed in the second subparagraph prior to issuing a ship station license, assigning a Maritime Mobile Service Identifier (MMSI) number, for example by type approval of the relevant AIS Class B mobile stations.

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[1]   Commission Directive 2014/90/EU of 23 July 2014 on marine equipment and repealing Council Directive 96/98/EC (OJ L 257, 28.8.2014, p. 146).

[2]   Directive 1999/5/EC of the European Parliament and of the Council of 9 March 1999 on radio equipment and telecommunications terminal equipment and the mutual recognition of their conformity (OJ L 91, 7.4.1999, p. 10).

[3]   Commission Decision 2005/53/EC of 25 January 2005 on the application of Article 3(3)(e) of Directive 1999/5/EC of the European Parliament and of the Council to radio equipment intended to participate in the Automatic Identification System (AIS) (OJ L 22, 26.1.2005, p. 14).

CHAPTER 5
AIS AIDS TO NAVIGATION IN INLAND NAVIGATION

Article 5.01
Introduction

A navigational aid (also known as Aids to Navigation, or AtoN) is a marker which provides support during navigation. Such aids include markings for lighthouses, buoys, fog signals, and day beacons. A list of types of AtoNs is included in Table 8.

The AIS technology provides the possibility to dynamically transfer information about AtoNs.

For the use in inland navigation the maritime AIS AtoN report (Message 21) needs to be extended to reflect the specifics of the inland buoyage system.

The maritime AIS AtoN report is based on the IALA buoyage system. For inland navigation the AIS AtoN report needs to reflect the European Inland AtoN system described in Part II, Chapter 5.

The AIS AtoN report transfers the position and the meaning of the AtoN as well as information if a buoy is on the required position (on position) or not (off position).

Article 5.02
Use of Message 21: Aids to Navigation report

For the use on inland waterways the AIS AtoN report (Message 21) as defined in ITU-R M.1371 is being used. The additional European Inland types of AtoN are coded using the 'AtoN status' bits.

Table 7

AIS AtoN Report
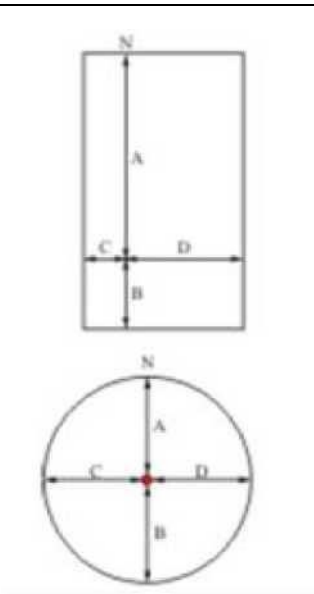
Parameter	Number of bits	Description
Message ID	6	Identifier for this message 21
Repeat indicator	2	Used by the repeater to indicate how many times a message has been repeated 0-3; Default = 0; 3 = do not repeat any more
ID	30	MMSI number, (see Article 19 of the Radio Regulations (RR) and ITU-R M.585)
Type of Aids-to-Navigation	5	0 = not available = default; refer to appropriate definition set up by IALA; see Figure 5.1[1)]
Name of Aids-to-Navigation	120	Maximum 20 characters 6-bit ASCII, as defined in Table 47 *'@@@@@@@@@@@@@@@@@@@@'* = not available = default. The name of the AtoN may be extended by the parameter 'Name of Aids-to-Navigation Extension' below

Parameter	Number of bits	Description
Position accuracy (PA)	1	1 = high (< 10 m) 0 = low (> 10 m) 0 = default. The PA flag should be determined in accordance with ITU-R M.1371 table 'Determination of position accuracy information'
Longitude	28	Longitude in 1/10 000 min of position of an AtoN (± 180°, East = positive, West = negative 181 = (6791AC0h) = not available = default)
Latitude	27	Latitude in 1/10 000 min of an AtoN (± 90°, North = positive, South = negative 91 = (3412140h) = not available = default)
Dimension / reference for position	30	Reference point for reported position; also indicates the dimension of an AtoN (m) (see Figure 5.1), if relevant [2]
Type of electronic position fixing device	4	0 = Undefined (default) 1 = GPS 2 = GLONASS 3 = Combined GPS/GLONASS 4 = Loran-C 5 = Chayka 6 = Integrated Navigation System 7 = surveyed. For fixed AtoN and virtual AtoN, the charted position should be used. The accurate position enhances its function as a radar reference target 8 = Galileo 9-14 = not used 15 = internal GNSS
Time stamp	6	UTC second when the report was generated by the EPFS (0-59 or 60) if time stamp is not available, which should also be the default value or 61 if positioning system is in manual input mode or 62 if electronic position fixing system operates in estimated (dead reckoning) mode or 63 if the positioning system is inoperative)
Off-position indicator	1	For floating AtoN, only: 0 = on position; 1 = off position. NOTE 1 — This flag should only be considered valid by receiving station, if the AtoN is a floating aid, and if time stamp is equal to or below 59. For floating AtoN the guard zone parameters should be set on installation
AtoN status	8	Reserved for the indication of the AtoN status 00000000 = default[3]
RAIM-flag	1	RAIM (Receiver autonomous integrity monitoring) flag of electronic position fixing device; 0 = RAIM not in use = default; 1 = RAIM in use; see ITU-R M.1371 table 'Determination of position accuracy information'

Parameter	Number of bits	Description
Virtual AtoN flag	1	0 = default = real AtoN at indicated position; 1 = virtual AtoN, does not physically exist[4]
Assigned mode flag	1	0 = Station operating in autonomous and continuous mode = default 1 = Station operating in assigned mode
Spare	1	Spare. Not used. Should be set to zero. Reserved for future use
Name of Aids-to-Navigation Extension	0, 6, 12, 18, 24, 30, 36, ... 84	This parameter of up to 14 additional 6-bit-ASCII characters for a 2-slot message may be combined with the parameter 'Name of Aids-to-Navigation' at the end of that parameter, when more than 20 characters are needed for the name of the AtoN. This parameter should be omitted when no more than 20 characters for the name of the AtoN are needed in total. Only the required number of characters should be transmitted, i.e. no @-character should be used
Spare	0, 2, 4, or 6	Spare. Used only when parameter 'Name of Aids-to-Navigation Extension' is used. Should be set to zero. The number of spare bits should be adjusted in order to observe byte boundaries
Total	**272-360**	**Occupies two slots**

[1] In case an inland AtoN type code is being transmitted, this field (type of AtoN) shall be set to 0 = undefined.

[2] When using Figure 2 for AtoN the following shall be observed:

- For fixed AtoN, virtual AtoN, and for offshore structures, the orientation established by the dimension A shall point to true north.

- For floating aids larger than 2 m * 2 m the dimensions of the AtoN shall always be given approximated to a circle, i.e. the dimensions shall always be as follows A = B = C = D * 0. (This is due to the fact that the orientation of the floating AtoN is not transmitted. The reference point for reported position is in the centre of the circle.)

- A = B = C = D = 1 shall indicate objects (fixed or floating) smaller than or equal to 2 m * 2 m. (The reference point for reported position is in the centre of the circle.)

- Floating offshore structures that are not fixed, such as rigs, shall be considered as Code 31 type from Table 8. These structures shall have their 'Dimension/reference for position' parameter as determined above in Note (1).

  For fixed offshore structures, Code 3 type from Table 8, shall have their 'Dimension/reference for position' parameter as determined above in Note (1). Hence, all offshore AtoN and structures have the dimension determined in the same manner and the actual dimensions are contained in Message 21.

[3] For Inland AIS AtoN report this field shall be used to indicate the Inland AtoN type using page 001

[4] When transmitting virtual AtoN information, i.e. the virtual/pseudo AtoN Target Flag is set to one (1), the dimensions shall be set to A = B = C = D = 0 (default). This shall also be the case, when transmitting 'reference point' information.

Figure 2

Reference point for reported position of a maritime AtoN, or the dimension of an AtoN

		Number of bits	Bit Fields	Distance (m)
	A	9	Bit 21 — Bit 29	0-511 511 — 511 m or greater
	B	9	Bit 12 — Bit 20	0-511 511 — 511 m or greater
	C	6	Bit 6 — Bit 11	0-63 63 — 63 m or greater
	D	6	Bit 0 — Bit 5	0-63 63 — 63 m or greater

If the type of AtoN to be transmitted is covered within the existing IALA types of AtoN (according to Table 8) no changes need to be applied.

Table 8

Types of Aids to Navigation

Code		Definition Maritime
	0	Default, Type of AtoN not specified
	1	Reference point
	2	RACON
	3	Fixed structures offshore, such as oil platforms, wind farms. (NOTE 1 — This code should identify an obstruction that is fitted with an AtoN AIS station)
	4	Emergency Wreck Marking Buoy
Fixed AtoN	5	Light, without sectors
	6	Light, with sectors
	7	Leading Light Front
	8	Leading Light Rear
	9	Beacon, Cardinal N
	10	Beacon, Cardinal E
	11	Beacon, Cardinal S

Code		Definition Maritime
	12	Beacon, Cardinal W
	13	Beacon, Port hand
	14	Beacon, Starboard hand
	15	Beacon, Preferred Channel port hand
	16	Beacon, Preferred Channel starboard hand
	17	Beacon, Isolated danger
	18	Beacon, Safe water
	19	Beacon, Special mark
Floating AtoN	20	Cardinal Mark N
	21	Cardinal Mark E
	22	Cardinal Mark S
	23	Cardinal Mark W
	24	Port hand Mark
	25	Starboard hand Mark
	26	Preferred Channel Port hand
	27	Preferred Channel Starboard hand
	28	Isolated danger
	29	Safe Water
	30	Special Mark
	31	Light Vessel/LANBY/Rigs

Note 1   The types of AtoN listed above are based on the IALA Maritime Buoyage System, where applicable.

Note 2   There is potential for confusion when deciding whether an aid is lighted or unlighted. Competent authorities may wish to use the regional/local section of the message to indicate this.

Article 5.03
Extension of Message 21 with inland-specific type of AtoN

The parameter field 'AtoN status' is used for the extension of Message 21 with inland-specific type of AtoN.

The parameter field 'AtoN status' is organised in eight pages, of which page ID 0 is 0 = default, page ID 1 to 3 is for regional use and page ID 4 to 7 is for international use. The first three bits of the AtoN status filed defines the page ID, the remaining 5 bits contains the information of the page.

The region, in which page ID 1 to 3 is applicable is defined by the Maritime Identification Digits within the MMSI of the transmitting AIS AtoN station. Thus the bit coding of the 5 information bits in the AtoN status field is only applicable in this specific region.

As regards Union inland waterways page ID 1 of the AtoN status field contains the list of inland-specific type of AtoN used.

To set an inland-specific type of AtoN in Message 21 two steps have to be made. First the parameter 'Type of aids-to-navigation' in Message 21 needs to be set to '0 = Default, type of AtoN not specified'. Second, the parameter 'AIS status' needs to be set to page ID 1 and the appropriate code of the Inland-specific type of AtoN, as follows:

Msg 21 — AtoN status:

Bits:	001	XXXXX	LSB
Coding:	Page ID	Type of AtoN (0 – 31)	

CHAPTER 6
ABBREVIATIONS

AI	Application Identifier
AIS	Automatic Identification System
ADN	European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways
ASCII	American Standard Code for Information Interchange
ASM	Application Specific Message
AtoN	Aids to Navigation
DAC	Designated Area Code
DGNSS	Differential GNSS
FI	Functional Identifier
GLONASS	(Russian) GLObal NAvigation Satellite System
GNSS	Global Navigation Satellite System
GPS	Global Positioning System
HDG	Heading
IAI	International Application Identifier
ID	Identifier
ITU	International Telecommunication Union
MMSI	Maritime Mobile Service Identifier as referred to in ITU-R M585
ROT	Rate Of Turn
Class B SO/CS	Class B mobile stations using either carrier-sense time division multiple access (CSTDMA) technique ('CO'), or Self-organising time division multiple access (SOTDMA) technique ('SO')
SOLAS	Safety Of Life At Sea
SQRT	Square root
UTC	Universal Time Coordinated
VHF	Very High Frequency
VTS	Vessel Traffic Services

PART III
INLAND AIS SHIPBORNE EQUIPMENT OPERATIONAL AND PERFORMANCE REQUIREMENTS, METHODS OF TEST AND REQUIRED TEST RESULTS
(TEST STANDARD INLAND AIS)

CHAPTER 1
SCOPE

This Standard specifies the minimum operational and performance requirements, methods of testing and required test results for Inland AIS shipborne stations.

This edition incorporates the technical characteristics of Class A shipborne equipment included in ITU-R M.1371-5 and further described by Standard IEC 61993-2 "Class A shipborne equipment of the universal automatic identification system (AIS) – Operational and performance requirements, methods of test and required test results" as applicable.

CHAPTER 2
NORMATIVE REFERENCES

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

a)	European Committee for drawing up Standards in the field of Inland Navigation (CESNI)	Edition 2021	European Standard laying down Technical Requirements for Inland Navigation vessels (ES-TRIN)
b)	European Committee for drawing up Standards in the field of Inland Navigation (CESNI)	Edition 2021	European Standard – River Information Services (ES-RIS, Part II)
c)	Recommendation	ITU-R M.1371-5	Technical characteristics for an automatic identification system using time division multiple access in the VHF maritime mobile band.
d)	International Standard	IEC 61993-2 :2018	Maritime navigation and radiocommunication equipment and systems - Part 2: Class A shipborne equipment of the universal automatic identification system (AIS) - Operational and performance requirements, methods of test and required test results.
e)	RTCM	SC-104	Interface to receive and process differential correction data

CHAPTER 3
ABBREVIATIONS

AI	Application Identifier
AIS	Automatic Identification System
BIIT	built-in integrity tests
CESNI	European Committee for drawing up Standards in the field of Inland Navigation
COG	Course Over Ground
DAC	Designated Area Code
DGNSS	Differential GNSS
DSC	Digital Selective Calling
ECDIS	Electronic Chart Display and Information System
ENI	Unique European vessel identification number
EPFS	electronic position fixing systems
ES-TRIN	European Standard laying down Technical Requirements for Inland Navigation vessels
ETA	Estimated Time of Arrival
EUT	equipment under test
FI	Functional Identifier
GNSS	Global Navigation Satellite System
GPS	Global Positioning System
ID	Identifier
IEC	International Electrotechnical Commission
IFM	international function message (DAC 001)
IMO	International Maritime Organization
ITU	International Telecommunication Union
LR	Long Range
MHz	Megahertz (Megacycles per second)
MKD	Minimum Keyboard and Display
MMSI	Maritime Mobile Service Identifier
PI	presentation interface
RAI	Regional Application Identifier
RAIM	Receiver Autonomous Integrity Monitoring
RF	radio frequency
RFM	Inland specific regional function message (DAC 200)

RIS	River Information Services
ROT	Rate Of Turn
RTA	Requested Time of Arrival
Rx	Receive
SAR	Search And Rescue
SOG	Speed Over Ground
SOLAS	Safety Of Life At Sea
TDMA	Time Division Multiple Access
Tx	Transmit
UNECE	United Nations Economic Commission for Europe
UTC	Universal Time Coordinated
VDL	VHF Data Link
VHF	Very High Frequency

CHAPTER 4
GENERAL REQUIREMENTS

Inland AIS Shipborne Equipment is based on the specification of AIS Class A shipborne equipment in accordance with ITU-R M.1371-5 and International Standard IEC 61993-2 unless otherwise stated.

Article 4.01
Class A functions not required

Inland AIS Shipborne Equipment has to fulfil all requirements of AIS Class A shipborne equipment as defined in IEC 61993-2 except:

a) Long range application by interface to other equipment,

b) Interface for long range port.

Article 4.02
Functions in addition to Class A

Additionally the following functions are required:

a) Initiate and transmit inland specific messages as specified in Table 1;

b) Process and display received inland specific messages as specified in Table 2;

c) Act upon group assignment for station type "inland waterways";

d) Interface to receive and process differential correction data (RTCM SC-104);

e) Interface for Blue Sign function (switch and use of data field in VSD sentence);

f) Suppress the transmission of certain ABM/BBM sentences from PI port as specified in Table 1;

g) Inland specific message RFM 10 shall be transmitted with a reporting interval of 6 minutes, alternating between both channels, following message 5;

h) All speed information shall be displayed in km/h on MKD and all range information shall be displayed in km.

Article 4.03
Manuals

The manuals shall also cover the methods necessary to support the Inland AIS specific function.

CHAPTER 5
ENVIRONMENTAL, POWER SUPPLY, SPECIAL PURPOSE AND SAFETY REQUIREMENTS

The same requirements as for AIS Class A mobile station shall be fulfilled.

CHAPTER 6
PERFORMANCE REQUIREMENTS

Article 6.01
Composition

An interface (RTCM SC-104) shall be provided to input the correction data to the internal GNSS receiver.

The Inland AIS station shall be able to process Group Assignment Commands (AIS message 23) for station type "inland waterways" and act accordingly.

The Inland AIS station shall be able to process the Blue Sign information and set the special manoeuvre indicator in AIS VDL Message 1, 2, 3 accordingly.

The Inland AIS station shall be able to process Inland specific Regional Function messages (RFM) with the Designated Area Code (DAC) "200"[1]

1. Blue Sign input

The Blue Sign information shall be input in two ways:

a) Blue Sign input via the IEC 61162-1 VSD sentence

The VSD field "regional application flags" defines 4 bit (values 0...15). The two most significant bits of the regional application flags set the "Special manoeuvre indicator" parameter. The remaining two bits of the VSD sentence shall be ignored.

The following Table describes the translation from the VSD field "regional application flags" to the VDL Message 1, 2, 3 "Special manoeuvre indicator" parameter.

Table 1

Translation from VSD sentence to VDL message

VSD sentence regional application flag	VDL Message 1,2,3 Special manoeuvre indicator	Blue Sign description
0 (00xx)	0 (00)	Not available (default)
4 (01xx)	1 (01)	Not set
8 (10xx)	2 (10)	Set
12 (11xx)	0 (00)	Invalid input, results in not available

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[1] Unless otherwise stated "RFM" in this document refers to Inland specific Regional Function Messages (RFM) as defined in ITU-R M.1371-5 with an Application identifier (AI) consisting of DAC = 200 and the defined Function Identifier (FI) (e.g.: RFM 10 = DAC "200" + FI "10").

The special manoeuvre indicator (Blue Sign) parameter shall only be set if the VSD sentence is received with a valid regional application flag value and an interval of at least two seconds. After a time out of two seconds the special manoeuvre indicator shall be set to not available.

b) Blue Sign status via a dedicated input port

The input for the Blue Sign status shall provide preferably a tri-state or alternatively a two-state input which can be controlled by a single switch where the switch circuit open means "Blue Sign not set" and the switch circuit closed means "Blue Sign set".

The presence of the direct connected switch shall be made available by automatic means or manual configuration.

2. Internal GNSS receiver

The Inland AIS station shall provide an internal GNSS receiver as UTC source, for own positioning, COG and SOG. The internal GNSS receiver shall meet the appropriate requirements of the International Standards series IEC 61108 as defined in IEC 61993-2. The internal GNSS receiver shall be capable of processing differential correction data from a dedicated RTCM SC-104 interface and via VDL Message 17.

Article 6.02
Information

Information provided by the Inland AIS shall be as defined in Vessel Tracking and Tracing Standard for Inland Navigation as stated in Chapter 2 "Normative reference". (ES-TRIN, Article 1.01(7.9).

The static, dynamic and voyage related ship information for inland vessels shall have the same parameters and the same structure than in ITU-R M.1371-5 as far as it is applicable. Not used parameter fields shall be set to "not available". Inland specific static ship information shall be added.

Article 6.03
Information processing

1. Inland AIS Data input

The figure 1 in Annex 10 illustrates the parameters and the usage to calculate the dimensions for both message 5 and RFM 10.

a) All dimensions/reference input values of own ship shall be input in decimeter resolution.

b) The total convoy length LC and convoy beam BC are calculated in dm and shall be transmitted by RFM 10.

c) Draught: input always in cm, automatic conversion to next higher value (rounding up) for message 5.

d) The ship and cargo type of message 5 shall be automatically converted from Inland-ship type (Inland vessel and convoy types; see Annex 6).

e) IMO ship and cargo type can be overwritten according to the Class A rules.

    f)   The number of blue cones can be entered independently of IMO ship and cargo type.

    g)   For backwards compatibility the PI sentences IWWIVD and IWWSSD shall be maintained for dimensions/reference input for inland navigation mode.

2.   Inland AIS Data storage and message compilation

For data input of the required information for transmission either means for manual input or the proposed digital interface sentences for Inland AIS ($--SSD, $--VSD, $PIWWSSD and $PIWWIVD) shall be used. This requires means for input and storage of the inland specific data. Only inputs that change the stored data (manual input or $--SSD, $--VSD, $PIWWSSD, $--EPV, $PIWWIVD) shall generate a transmission where applicable.

The following tables define the behaviour of the Inland AIS mobile station regarding inland specific functional messages.

    a)   Initiation of an inland specific functional message

The following table defines the initiator of international function messages (IFM) and inland specific functional messages (RFM) to be transmitted by the Inland AIS mobile station.

(ABM/BBM = via standard Presentation Interface, MKD = via Minimum Keyboard and Display, Inland ECDIS = via connected Inland ECDIS (recommendation only). On VDL request = autonomous reaction when an IFM 2 or 3 interrogation is received).

Table 1

Transmission of inland specific functional messages

Message	Description	Addr/ Bc	TX INITIATED BY			
			ABM/ BBM	MKD	Auto-matically gene-rated	On VDL request
RFM 10	Inland static data [1]	Bc	No	---	x	Opt [1] [2]
RFM 55	Inland number of persons [2]	Addr	x	Opt	No	x
RFM 55	Inland number of persons	Bc	x	x	No	No
IFM 4 a)	Capability response [2]	Addr	x	---	No	x
´X´ = required; ´Opt´ = Optional; ´No´ = Not allowed; ´---´ = Not applicable						

[1]   Autonomously provided in conjunction with AIS VDL message 5 by the Inland AIS mobile station.

[2]   Message is provided only if interrogation is addressed to own station.

b) Processing of received inland specific functional messages

The following table defines the behaviour (internal processing and reaction) of the Inland AIS mobile station, when an international function message (IFM) or an inland specific functional message (RFM) is received.

(VDM = output via Presentation Interface, MKD = displayed on Minimum Keyboard and Display, Inland ECDIS = displayed on connected Inland ECDIS (recommendation only), VDL response = autonomous reaction on a received VDL message).

Table 2

Reception of inland specific functional messages

Message	Description	Addr/Bc	Processing		
			VDM	MKD	VDL Response
RFM 10	Inland static data	Bc	x	X	---
RFM 55	Inland number of persons [1]	Addr	x	X [2]	---
RFM 55	Inland number of persons	Bc	x	X [2]	---
IFM 2	Interrogation [3] [1]	Addr	x	---	x
IFM 3	Capability interrogation [3] [1]	Addr	x	---	x
IFM 16	Number of persons [1]	Addr	x	X	---
IFM 16	Number of persons	Bc	x	X	---
´X´ = required; ´Opt´ = Optional; ´No´ = Not allowed; ´---´ = Not applicable					

[1] Messages are processed only if addressed to own station.

[2] Only the display of total number of persons on board is required.

[3] Messages are provided only if interrogation is addressed to own station.

c) Inland specific RFM 10 (Inland ship static and voyage related data) and Inland specific RFM 55 (Persons on board)

The compilation of the RFM 10 and RFM 55 for transmission is part of the Inland AIS station itself:

i) The RFM 10 shall be used by Inland AIS only, to broadcast ship static and voyage related data in addition to message 5. The message shall be sent not later than 4 seconds after message 5 by using a message 8 / RFM 10;

ii) Message 5 and RFM 10 shall be transmitted with a reporting interval of 6 minutes, alternating between both channels;

iii) The Inland AIS station must be able to respond to an interrogation for VDL message 5 (received message 15) automatically with message 5 and message 8 / RFM 10;

iv) The Inland AIS station must be able to initiate a message 8 / RFM 55 by MKD and to respond on a request for "Inland number of persons on board" automatically with the message 6 / RFM 55.

d) Inland specific RFM's other than RFM 10 or RFM 55

The following option is available for the compilation of inland specific messages other than RFM 10 or 55.

The compilation of inland specific message shall be provided by an external application outside the Inland AIS shipborne station and is input via the Presentation Interface using IEC 61162-1 ABM or BBM sentences as applicable. External applications could be:

i) a connected Inland ECDIS equipment or Radar equipment,

ii) a connected dedicated software application (without Inland ECDIS capability).

3. Alarms and status information

Means shall be provided to selectively disable alarms during installation which are not applicable for that specific installation, i.e. external EPFS lost (25), heading lost/invalid (32), no valid ROT information (35). This feature has to be password protected.

Article 6.04
Minimum Keyboard and Display (MKD)

1. Display of received Messages

In addition to AIS Class A following information shall be displayed on a MKD:

a) Inland AIS static data

Where information is delivered both by message 5 and RFM 10 the Inland AIS specific date shall preferably be displayed (dimension, draught, ship type, dangerous cargo category).

b) Number of persons on board

RFM 55 shall have preference above IFM 16

c) Blue sign information

d) Speed information shall be displayed in km/h

e) Range information shall be displayed in km.

Table 3

Following information in RFM 10 shall be displayed:

Parameter	Displayed on MKD
ENI	Yes
Length of ship or convoy	Yes
Beam of ship or convoy	Yes
Inland vessel and convoy type	Yes
Number of blue cones	Yes
Draught	Yes
Loaded/unloaded	Yes
Quality of speed information	Optional
Quality of course information	Optional
Quality of heading information	Optional

2.   Input of Data

In addition to AIS Class A following data shall be entered via MKD:

a)   Inland AIS static data

Where information is contained in both message 5 and RFM 10 the Inland AIS specific date shall input only once to avoid conflicts, i.e. dimension/reference, draught, ship type, dangerous cargo category.

b)   Number of persons on board

RFM 55 shall have preference above IFM 16.

Table 4

Following information in RFM 10 and RFM 55 shall be input via MKD:

Parameter	Category	Remark
ENI	Static	[1]
Length of ship (LS)	Static	[1] Shall also be used for the calculation of message 5 and RFM 10
Distance from reference point to stern (BI) (for internal and external position source)	Static	[1] Shall also be used for the calculation of message 5 and RFM 10
Beam of ship (BS)	Static	[1] Shall also be used for the calculation of message 5 and RFM 10
Distance from reference point to port (CI) (for internal and external position source)	Static	[1] Shall also be used for the calculation of message 5 and RFM 10

Parameter	Category	Remark
Extension for length of convoy (EA, EB)	Voyage related	[2] Shall also be used for the calculation of message 5 and RFM 10
Extension for beam of convoy (EC, ED)	Voyage related	[2] Shall also be used for the calculation of message 5 and RFM 10
Inland vessel and convoy type	Voyage related	[2]
Number of blue cones	Voyage related	[2]
Draught	Voyage related	[2]
Loaded/unloaded	Voyage related	[2]
Persons on board (crew members, passengers and shipboard personnel)	Voyage related	[2]
Quality of speed information	Static	On installation, shall be set to 0 if not derived from a type approved sensor
Quality of course information	Static	On installation, shall be set to 0 if not derived from a type approved sensor
Quality of heading information	static	On installation, shall be set to 0 if not derived from a type approved sensor

[1]   On installation, data shall be protected by the administrator password.
[2]   Voyage related, data shall not be protected by the administrator password.

3.   Initiation of transmission of RFM 55 via MKD

Means on the MKD shall be provided to initiate the transmission of broadcast RFM 55.

CHAPTER 7
TECHNICAL REQUIREMENTS

Article 7.01
Response to Assignment Commands

An Inland AIS station shall process assignment commands in accordance with ITU-R M.1371-5 and ES-RIS, Part II. The Inland AIS mobile station shall act upon group assignment for station type "inland waterway" and not for station type "Class A mobile station".

An assignment command, with a reporting interval less than the autonomous reporting interval, received via the digital interface sentence for Inland AIS $PIWWIVD shall decrease the reporting interval defined by ITU-R M.1371-5. An assignment command shall not increase the reporting interval above the autonomous reporting interval.

Article 7.02
Presentation interface

1.   Required ports

      The Presentation Interface of the Inland AIS shall comprise the data ports listed in Table 5 (also see Annex 8).

Table 5

Presentation Interface Access

General Function	Mechanism
Automatic Input of Sensor Data (Sensor data input from shipboard equipment)	(3) IEC 61162-2 input ports, also configurable as IEC 61162-1 input ports
High Speed Input / Output Ports (Operator controlled commands and data input; AIS VHF Data Link (VDL) data; and AIS equipment status)	(2) IEC 61162-2 paired input and output ports
BITT Alarm Output	(1) Isolated normally-closed (NC) contact circuit

      Note: Pilot port is not required

2.   Input data and formats

      The Inland AIS shall as a minimum be able to receive and process the input data shown in Table 6. The details of these sentences are contained in International Standard IEC 61162-1. Manufacturer's proprietary data may also be entered using these high-speed ports.

Table 6

AIS High-speed input data and formats

Data	IEC 61162-1 Sentences
Normal Access - Parameter Entry	
Voyage information: Vessel type and cargo category Navigational status Draught, max. actual static Destination ETA date and time Regional application flags Reporting rate settings Number of blue cones air draught of ship Number of assisting tugboat Number of crew members on board Number of passengers on board Number of shipboard personnel on board Convoy extensions	VSD - Voyage static data EPV – Equipment property value PIWWIVD – Inland Waterway voyage data
Station information: Vessel name (administrator password protected) Call sign (administrator password protected) Antenna location length and beam ENI number (administrator password protected) Inland vessel and convoy type Quality of speed information Quality of course information Quality of heading information	SSD - Station static data PIWWSSD – Inland Waterway static ship data
Initiate VHF Data-link Broadcasts	
Safety messages	ABM - Addressed Binary Message BBM - Broadcast Binary Message
Binary messages	ABM - Addressed Binary Message BBM - Broadcast Binary Message
Interrogation Message	AIR - AIS Interrogation Information
AIS Equipment - Parameter Entry	
AIS VHF channel selection AIS VHF power setting AIS VHF channel bandwidth Transmit/Receive mode control	ACA - AIS Channel Assignment Message
MMSI	EPV-Equipment property value (administrator password protected)
IMO number	EPV-Equipment property value (administrator password protected)
Other AIS equipment controls	EPV-Equipment property value (administrator password protected)
BIIT Input	
Alarm / indication acknowledgement	ACK Acknowledgement message

Note: Information which is not marked with "administrator password protected" shall be accepted if no administrator password is provided even if there is protected information in the same sentence. In this case the protected information is ignored.

3.   Output data and formats

In addition to the AIS Class A station, an Inland AIS station outputs PIWWSSD and PIWWIVD sentences on the two high speed ports as response on a query.

Query sentences is used as defined in IEC 61162-1 with sentence formatters SSD and IVD. On query for SSD the unit will respond with both an SSD sentence and a PIWWSSD sentence.

CHAPTER 8
OPERATIONAL TESTS

Article 8.01
Operating modes/capability

1. Interrogation response

   a) Method of measurement

   Set up standard test environment and operate EUT in autonomous mode. Apply an interrogation message (message 15; EUT as destination) to the VDL for responses with message 3, message 5 and slot offset set to defined value. Record transmitted messages and frame structure.

   b) Required results

   Check that the EUT transmits the appropriate interrogation response message as requested after defined slot offset. Confirm that the EUT transmits the response on the same channel as where interrogation was received. Confirm that the EUT transmits message 5 and "Inland ship static and voyage related data" RFM 10 using binary broadcast message (message 8) to the VDL. Confirm that the "Inland ship static and voyage related data" RFM 10 follows message 5 within 4 seconds. Confirm that ITDMA is used if possible.

Article 8.02
Reporting intervals

1. Static data reporting rates

   a) Method of measurement

   Set up standard test environment and operate EUT in autonomous mode.

   i) Record the transmitted messages and check for static and voyage related data (message 5 and RFM 10).

   ii) Change static and/or voyage related station data. Record the transmitted messages and check for static and voyage related data (message 5).

   b) Required results

   i) Confirm that the EUT transmits message 5 with a reporting interval of 6 minutes and the inland specific RFM 10 not later than 4 seconds after message 5 on the same channel using ITDMA if possible. The ITDMA access scheme shall replace a scheduled position report message 1 with a message 3.

   ii) Confirm that the EUT transmits message 5 and RFM 10 within 1minute reverting to a reporting interval of 6 minutes.

Article 8.03
Alarms and indicators, fall-back arrangements

1. Method of measurement

   Disable the alarms according Part III, Article 6.03(3).

2.   Required results

Confirm that the alarms can be disabled. Confirm that the disabling of alarms is administration password protected.

Article 8.04
Input of Data on MKD

1.   Method of measurement

Input all static and voyage related data according to 0 Table 4.

2.   Required results

Confirm that all data according to 0 Table 4 can be input with the appropriate accuracy.

Confirm that the input of data is protected by password according to 0 Table 4.

Confirm that the ship and cargo type of message 5 is automatically converted from Inland ship type (Inland vessel and convoy types; see Annex 6) when the Inland vessel and convoy types is input.

Confirm that the IMO ship and cargo type can be overwritten according to the Class A rules.

Article 8.05
Display of Data on MKD

1.   Method of measurement

Apply a message 1, 9, 18, 19 to the VDL.

2.   Required results

Confirm that the speed is displayed in km/h and the range is displayed in km.

CHAPTER 9
SPECIFIC TESTS OF LINK LAYER

Article 9.01
Group assignment

1.   Assignment by $PIWWIVD

Group assignment commands have precedence of assignments by input via $PIWWIVD.

a)   Method of measurement

Address the EUT with an AIS message 23 to bring the EUT in assigned mode. Record VDL and verify the reaction of the EUT. Apply an assignment by $PIWWIVD input with a different reporting interval.

b)   Required results

Verify that the EUT ignores the assignment by input via $PIWWIVD.

2.   Assignment by message 16

Messages which are addressed directly to an AIS Transponder have precedence of group assignment commands and manual assignments. Following test shall verify the assignment priority of these messages.

a)   Method of measurement

Set up the standard test environment and operate EUT in autonomous mode. Input sensor data to achieve a reporting interval of 10 seconds.

   i)   Address the EUT with an AIS message 16 to bring the EUT in assigned mode with a reporting interval of 5 seconds. Record VDL and verify the reaction of the EUT.

   ii)   Apply a message 23 with a reporting interval of 2 seconds. Construct message 23 in that way that the EUT will be addressed by the message.

   iii) Apply a $PIWWIVD assignment input with a reporting interval of 2 seconds.

b)   Required results

   i)   Verify that the reporting interval is 5 seconds.

   ii)   Verify that the EUT ignores the command given by message 23.

   iii) Verify that the EUT ignores the assignment command given by $PIWWIVD.

3. Increased reporting interval assignment

   a) Increased reporting interval assignment by $PIWWIVD

       i) Method of measurement

           Set up the standard test environment and operate EUT in autonomous mode.

           - Apply a $PIWWIVD assignment to the EUT with a reporting interval greater than the autonomous reporting interval.

           - Apply a $PIWWIVD assignment to the EUT with a reporting interval shorter than the autonomous reporting interval.

           Record transmitted messages.

       ii) Required results

           - Confirm that the EUT transmits position reports with the autonomous reporting interval in $PIWWIVD.

           - Verify that EUT switches to assigned mode and transmits position reports with 2 seconds reporting interval. Verify that EUT reverts to autonomous mode after timeout period.

4. Addressing by station type

   a) Method of measurement

       Set up standard test environment and operate EUT in autonomous mode with a reporting interval of 10 seconds.

       i) Transmit a Group Assignment command (message 23) to the EUT (define geographic region so that the EUT is inside this region). Set the reporting interval to 2 seconds and the station type to 0 (all stations).

       ii) Transmit a Group Assignment command (message 23) to the EUT (define geographic region so that the EUT is inside this region). Set the reporting interval to 2 seconds and the station type to 1 (Class A), 2 (Class B), 3 (SAR aircraft), 4 (Class B SO), 5 (Class B CS).

       iii) Transmit a Group Assignment command (message 23) to the EUT (define geographic region so that the EUT is inside this region). Set the reporting interval to 5 seconds and the station type to 6 (Inland Waterway). Apply this message to the VDL again within 4 minutes. Record VDL and check reaction of the EUT.

   b) Required result

       i) Verify that EUT switches to assigned mode and transmits position reports with 2 seconds reporting interval. Verify that EUT reverts to autonomous mode after timeout period.

       ii) Verify that EUT declines message 23.

       iii) Verify that EUT switches to assigned mode and transmits position reports with 5 seconds reporting interval. Verify that EUT reverts to autonomous operation mode after timeout period of second transmitted group assignment.

Article 9.02
Inland AIS message formats

1. Received Inland specific messages

    a) Method of measurement

        Set up standard test environment and operate EUT in autonomous mode.

        i) Apply following Inland specific messages using binary message (message 8) to the VDL:

            Inland ship static and voyage related data Inland specific RFM 10 (DAC 200 / FI 10);

            Inland number of persons onboard Inland specific RFM 55 (DAC 200 / FI 55);

            Number of persons on board International Function message 16 (DAC 001 / FI 16).

        ii) Apply following addressed Inland specific messages using binary message (message 6; EUT as destination) to the VDL.

            Inland number of persons onboard Inland specific RFM 55 (DAC 200 / FI 55);

            Number of persons on board International Function message 16 (DAC 001 / FI 16).

        iii) Apply an addressed Inland specific message using addressed binary message (message 6; other station as destination) to the VDL.

        iv) Apply position report (message 1, 2 or 3) with parameter "Blue Sign set" and static and voyage related data (message 5) to the VDL.

        Record transmitted messages and frame structure.

    b) Required results

        i) Confirm that EUT outputs the received message via the presentation interface properly. If implemented confirm that EUT displays received Inland specific message accordingly. Confirm that the content of RFM 10 is displayed according to Table 3.

        ii) Confirm that EUT outputs the received message via the presentation interface properly. Check that EUT transmits the appropriate acknowledgement message for addressed messages. If implemented confirm that EUT displays received Inland specific message accordingly.

        iii) Confirm that the EUT does not output the message 6 (addressed to other station) on the presentation interface. If implemented confirm that EUT does not display the received Inland specific message addressed to other station as destination.

        iv) Confirm that EUT outputs the received message via the presentation interface properly. If implemented confirm that EUT displays the information "Blue Sign set" only when Inland ship static and voyage related data RFM 10 (using message 8) has been received before.

2.   Transmitted inland specific messages

Set up standard test environment and operate EUT in autonomous mode. Apply all static, dynamic and voyage related data to the EUT (over MKD, $--SSD, $--VSD, $PIWWIVD and $PIWWSSD). Record all messages on VDL and check the contents of the relevant messages. For all sub-points make sure that values transmitted to the EUT by MKD or PI sentences are stored in the EUT even after disconnecting the power supply. Examine VDL messages of EUT and figure out if defined values are used.

a)   Position report message 1, 2 or 3

Blue Sign information may be derived by a direct connected switch or by the regional bits of the periodically received PI sentence ($--VSD). The presence of the direct connected switch shall be made available by automatic means or manual configuration. Ensure that Blue Sign information derived from direct connected switch has precedence of transferred IEC 61162-1 commands (regional bits of $--VSD sentence).

i)   Method of measurement

Set up standard test environment and operate EUT in autonomous mode.

-       Apply a valid VSD sentence with the regional application flag set to:

        "Blue Sign not set" (0100bin),

        "Blue Sign is set" (1000bin),

        "Blue Sign information is not available" (0000bin).

-       Set the input data for Blue Sign information in VSD to invalid (e.g. wrong checksum).

-       Apply a valid VSD sentence with the regional application flag set to 2. Disconnect VSD input for Blue Sign information.

-       Connect Blue Sign switch to EUT in a way that the Blue Sign value is set to 1 (= not set).

-       Change Blue Sign value to 2 (= set) by direct connected switch to EUT.

-       Change Blue Sign value to 1 (= not set) by applying VSD sentence (regional bits of VSD sentence) to EUT.

-       Disconnect Blue Sign switch from EUT in a way that Blue Sign value is set to 0 (= not available).

    ii)   Required results

- Check the parameter Blue Sign in VDL message 1, 2, 3:

  1 = not engaged in special manoeuvre (Blue Sign not set),

  2 = engaged in special manoeuvre (Blue Sign set),

  0 = not available.

  Confirm that EUT transmits message 1 or 2 or 3 with Blue Sign value accordingly.

  Confirm that EUT does not transmit message 5 for unchanged data derived from PI sentence (VSD).

- Confirm that EUT switches Blue Sign value to 0 (= not available) within 2 seconds after invalid input (check PI Output, VDO sentence) and that EUT transmits message 1 or 2 or 3 with Blue Sign value 0 (= not available).

- Confirm that EUT switches Blue Sign value to 0 (= not available) within 2 seconds after invalid input (check PI Output, VDO sentence) and that EUT transmits message 1 or 2 or 3 with Blue Sign value 0 (= not available).

- Confirm that EUT transmits message 1 or 2 or 3 with Blue Sign value 1 (= not set).

- Confirm that EUT transmits message 1 or 2 or 3 with Blue Sign value 2 (= set).

- Confirm that EUT ignores Blue Sign information derived from VSD sentence.

- Confirm that EUT transmits message 1 or 2 or 3 with Blue Sign value 0 (= not available).

  b)   Ship static and voyage related data (Message 5 and RFM 10)

    i)   Method of measurement

Operate EUT in autonomous mode and record messages on VDL.

- Configure several relevant ship and convoy combinations (in minimum it shall be tested for all extensions set to 0 (own ship only) and all extensions set to values not 0 and for internal and external position source).

- Configure several Inland vessel and convoy types.

- Configure ship and cargo type for message 5.

- Configure draught in dm.

- Switch off EUT by disconnecting power supply. Reconnect Power and record messages on VDL.

    ii)   Required results

- Confirm that EUT transmits the correct A, B, C, D values rounded up in message 5 and correct length and beam in RFM 10 according to the calculations defined in Part III, Article 6.03(1) with the specified accuracy.

- Confirm that EUT transmits the correct Inland vessel and convoy type in RFM 10 and the converted ship and cargo type in message 5.

- Confirm that EUT transmits the correct ship and cargo type in message 5.
- Confirm that EUT transmits the correct draught in cm in RFM 10 and in dm rounded up in message 5.
- Confirm that the EUT transmits message 5 and RFM 10 with values unchanged.

c) Persons on board RFM 55 (DAC 200 / FI 55)

This message shall be used by inland vessels only, to send the number of persons on Board to a competent authority in order to inform about the number of persons on board. The message shall be sent with binary message 6 RFM 55 (DAC 200, FI 55).

i) Method of measurement

- Initiate transmission of persons on board message as RFM 55 by MKD.
- Initiate transmission of persons on board message as RFM 55 by ABM.
- Initiate transmission of persons on board message as RFM 55 by BBM.

ii) Required results

- Confirm that EUT transmits AIS message 6 with proper content (check all numbers) as RFM 55.
- Confirm that EUT transmits AIS message 6 with proper content as RFM 55.
- Confirm that EUT transmits AIS message 8 with proper content as RFM 55.

3. Transmit inland specific interrogation messages

a) Transmit an interrogation for a specific FM (IFM 2)

i) Method of measurement

Set up standard test environment and operate EUT in autonomous mode.

Apply an ABM sentence containing an IFM 2 (Interrogation for a specific FM) using binary message 6 to request "Inland ship and voyage related data (RFM 10)". Record transmitted messages.

- Send an IFM 2, request DAC = 200 and requested FI = 10.
- Send an IFM 2, request DAC = 200 and requested FI = 55.
- Send an IFM 2, request DAC = 303 and requested FI = 10.

ii) Required results

Check that EUT reacts as follows:

- Verify that EUT sends interrogation message on VDL using binary message 6 and that DAC FI and requested DAC are correct;
- Verify that EUT sends interrogation message on VDL using binary message 6 and that DAC FI and requested DAC are correct;
- Verify that EUT sends interrogation message on VDL using binary message 6 and that DAC FI and requested DAC are correct.

4.   Response to inland specific interrogation messages

   a)   Response to "Capability interrogation" (IFM 3) with "Capability reply" (IFM 4)

      i)   Method of measurement

         Set up standard test environment and operate EUT in autonomous mode.

         -   Apply an IFM 3 (Capability interrogation) using addressed binary message (message 6) to the VDL with requested DAC = 200. Record transmitted messages.

         -   Repeat the test with DAC = 303.

         -   Repeat the test with DAC = 001.

      ii)   Required results

         -   Check that the EUT transmits the appropriate response "Capability reply" (IFM 4) using addressed binary message (message 6) addressed to the interrogator. Check the content of this message in accordance to the specification in ITU-R M.1371-5. Bit order of ´FI capability table´:

first	sec.	first	sec.	first	sec.				first	sec.	first	sec.
FI 0		FI 1		FI 2					FI 62		FI 63	

         Verify that at least the DAC 200 / FI 10 and DAC 200 / FI 55 for Inland AIS are included in the binary structure. Confirm that the EUT transmits the response on the same channel as where the request was received.

         -   Check that the EUT transmits the appropriate response "Capability reply" (IFM 4) using addressed binary message (message 6) addressed to the interrogator. Check the content of this message in accordance to the specification in ITU-R M.1371-5. Confirm that the EUT does respond with all values set to 0. Confirm that the EUT transmits the response on the same channel as where the request was received.

         -   Check that the EUT transmits the appropriate response "Capability reply" (IFM 4) using addressed binary message (message 6) addressed to the interrogator. Check the content of this message in accordance to the specification in ITU-R M.1371-5.

         Verify that at least the DAC 001 / FI 3 is included in the binary structure. Confirm that the EUT transmits the response on the same channel as where the request was received.

   b)   Response to interrogation for "Inland ship static and voyage related data" (RFM 10)

      i)   Method of measurement

         Set up standard test environment and operate EUT in autonomous mode. Apply an IFM 2 (Interrogation for a specific FM) using binary message 6 to request "Inland ship and voyage related data" (RFM 10) to the VDL. Record transmitted messages.

         -   Request "Inland ship and voyage related data" (RFM 10) with DAC = 200, FI 10.

         -   Request "Inland ship and voyage related data" (RFM 10) with DAC = 303, FI 10.

    ii)   Required results

        Check that EUT reacts as follows:

- EUT shall respond to interrogation with "Inland ship and voyage related data" (RFM 10) using binary message 6;
- EUT shall not respond.

c)   Response to interrogation for "Number of Persons on board" (RFM 55 and IFM 16)

    i)   Method of measurement

        Set up standard test environment and operate EUT in autonomous mode.

        Apply an International Function message IFM 2 (Interrogation for a specific FM) using binary message 6 to request Inland number of persons onboard to the VDL. Record transmitted messages.

- Request "number of persons on board" with DAC = 200, FI 55.
- Request "number of persons on board" with DAC = 303, FI 55.

    ii)   Required results

        Check that EUT reacts as follows:

- Confirm that EUT transmits AIS message 6 with proper content (check all numbers) as inland specific RFM 55;
- EUT shall not respond.

CHAPTER 10
HIGH SPEED INPUT

This test checks the configuration of the Inland AIS unit using the high speed input port.

Article 10.01
Voyage data configuration

1. Method of measurement
   a) Apply a VSD sentence with voyage related data.
   b) Apply a PIWWIVD sentence with Inland specific voyage data.
   c) Apply a VSD sentence with voyage related data with draught deviating from b.
   d) Apply a query for VSD.

2. Required result
   a) Confirm that all data are accepted with exception of the draught.
   b) Confirm that all Inland specific voyage data are accepted with full resolution with EPV sentence and IWWIVD sentence.
   c) Confirm that the draught from VSD is ignored.
   d) Confirm that a VSD and a PIWWIVD sentence are output with correct data.

Article 10.02
Static data configuration

1. Method of measurement
   a) Apply a PIWWSSD sentence with static data, no preceding SPW sentence.
   b) Apply a PIWWSSD sentence with static data, preceding SPW sentence with incorrect password.
   c) Apply a PIWWSSD sentence with static data, preceding SPW sentence with correct password.
   d) Apply a SSD sentence with static data different to the currently stored values, preceding SPW sentence with correct password.
   e) Apply a query for SSD.

2. Required result
   a) Confirm that the data which are protected according to Table 6 are not accepted. Confirm that the other data are accepted.
   b) Confirm that the data which are protected according to Table 6 are not accepted. Confirm that the other data are accepted.
   c) Confirm that all static data of the PIWWSSD sentence are accepted.
   d) Confirm that the A, B, C, D values are ignored and all other static data of the SSD sentence are accepted.
   e) Confirm that a SSD and a PIWWSSD sentence are output with correct data and accuracy.

CHAPTER 11
LONG RANGE FUNCTIONALITY TESTS

Not mandatory for Inland AIS.

PART IV
STANDARD ELECTRONIC SHIP REPORTING IN INLAND NAVIGATION

CHAPTER 1
MESSAGE IMPLEMENTATION MANUAL CONVENTION

Article 1.01
Introduction

These technical specifications define the structure of four messages for electronic ship reporting in inland navigation, based on the United Nations rules for Electronic Data Interchange for Administration, Commerce and Transport (UN/EDIFACT)[1] message structure and customised, where required, for the purpose of inland navigation.

In the case that electronic ship reporting in inland navigation is required by national or international law, these technical specifications shall be applied.

The exact use of the messages, data elements and codes are defined in the Annexes (Message Implementation Manuals) in order to ensure a common understanding and usage of the messages.

The messages are:

1.   (Dangerous) goods reporting message (IFTDGN) — ERINOT (Annex 11)
2.   Passenger and crew lists message (PAXLST) (Annex 12)
3.   ERINOT response and receipt message (APERAK) — ERIRSP (Annex 13)
4.   Berth management port notification message (BERMAN) (Annex 14)

For sharing of information the use of XML technology is another possibility apart from the UN/EDIFACT standards.

Article 1.02
UN/EDIFACT message structure

The message structure is based on ISO 9735.

UN/EDIFACT messages are composed of segments. The structure of a message is described in a branching diagram indicating the position and the mutual relationship of the segments and segment groups.

For each segment data elements are defined: some data elements are combined to form composite data elements. A segment and a data element within a segment are either mandatory (M) or conditional (C). Mandatory segments and/or data elements contain important data for a receiving application and shall be filled with valid data.

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[1]   Abbrevations used in this Part are explained in the list in Article 2.05.

Each message starts with two or three segments, the 'interchange header' (UNB) and the 'message header' (UNH). Where required, also the 'service string advice' (UNA) is used as a first segment to define which character sets are used in the message. Each message finishes with the segments 'message trailer' (UNT) and 'interchange trailer' (UNZ). Thus, each message is contained in one interchange, and an interchange contains only one single message.

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Article 1.03
Introduction to message types

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As mentioned in Part IV, Article 1.01, the four message types are:

1.   (Dangerous) goods reporting message (IFTDGN) — ERINOT
2.   Passenger and crew lists message (PAXLST)
3.   ERINOT response and receipt message (APERAK) — ERIRSP
4.   Berth management port notification message (BERMAN)

In addition, messages can fulfill the following functions:

-   new message (identifier '9');
-   modification of message (identifier '5');
-   cancellation of message (identifier '1');
-   end of voyage (identifier '22');
-   interruption of voyage (identifier '150');
-   restart of voyage (identifier '151').

1.   ERINOT

The ERI notification message (ERINOT) shall be used for the reporting of voyage related information and of information on dangerous and non-dangerous cargo carried on-board vessels sailing on inland waterways. The ERINOT message is a specific use of the UN/EDIFACT 'International Forwarding and Transport Dangerous Goods Notification (IFTDGN)' message. For the data and codes contained in the message applications based on these message specifications, use has been made of the UN Directory D98B.

The ERINOT message encompasses the following types:
-   transport notification from vessel to authority (identifier 'VES'), from ship to shore;
-   transport notification from carrier to authority (identifier 'CAR'), from shore to shore;
-   passage notification (identifier 'PAS'), from authority to authority.

2.   PAXLST

The PAXLST message is based on the UN/EDIFACT message PAXLST. It shall be used for the exchange of data in inland navigation between the captain/skipper or carrier and designated authorities such as customs, immigration, police or terminals falling under the International Ship and Port Facility Security (ISPS) Code, as defined in Regulation (EC) No 725/2004 of the European Parliament and of the Council[1].

The message shall be also used to transfer passenger/crew data from a designated authority in the country of departure to the appropriate authorities in the country of arrival of the means of transport.

3.   ERIRSP

The ERI response message (ERIRSP) is derived from the UN/EDIFACT APERAK message. It may be generated by the system of the designated authority. The response to a 'modification' or a 'cancellation' contains information whether or not the 'modification' or 'cancellation' has been processed by the receiving system.

4.   BERMAN

The Berth Management (BERMAN) message combines the pre-arrival notification, respectively general declaration, into one single notification which is based on the EDIFACT message BERMAN from the UN/EDIFACT D04B directory.

The BERMAN message shall be sent by vessels sailing on inland waterways before arriving at or departing from a berth or a port and provides information about the time of arrival and the services required to ensure a prompt handling, to support procedures and to facilitate controls.

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[1]   Regulation (EC) No 725/2004 of the European Parliament and of the Council of 31 March 2004 on enhancing ship and port facility security (OJ L 129, 29.4.2004, p. 6).

CHAPTER 2
CODES AND REFERENCES

Article 2.01
Introduction

Codes and references, as defined in this Chapter, shall be used in electronic ship reporting for inland navigation. The use of codes and references serves the purpose of unambiguousness: it eliminates the possible misinterpretation and facilitates the translation of messages into other languages.

Therefore the usage of codes and references is mandatory for the data elements indicated in the message implementation manuals. Those codes and references are also available electronically in the European Reference Data Management System (ERDMS) operated by the Commission.

Those codes and references shall be used whenever data is interchanged between various computer applications and between parties using different languages, even beyond the message types in the subject of this Part.

Article 2.02
Definitions

For the purposes of this Part, the following definitions shall apply.

1. Agent means any person mandated or authorised to act for or to supply information on behalf of the (transport) operator of the vessel.

2. Barge means a vessel that has no propulsion of its own.

3. Blue cones means signals that inland vessels carrying out transport operations involving dangerous substances are required to show pursuant to the European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways (ADN), namely one, two or three blue cones by day and one, two or three blue lights at night.

4. Carrier or transport operator means the person responsible for the carriage of goods, either directly or using a third party.

5. Cargo means any goods, wares, merchandise and articles carried on a ship. So ship carries cargo consisting of one or more consignments (with the necessary equipment) each consisting of one or more goods items.

6. Code means a character string used as an abbreviated means of
    a) recording or identifying information
    b) to represent or identify information using a specific symbolic form that can be recognised by a computer.

7. Common access reference means a common key to relate all subsequent transfers of data to the same business case or file (Data Element 0068 TDED). The common access reference shall be regarded as a common denominator[1] linking through a unique number documents, electronic messages and other communications with the same objective and characteristics.

8. A consignment means a separate identifiable number of goods transported from one consignor (port of loading) to one consignee (port of discharge) and identified and specified in one single transport document. A container as equipment shall in this context be seen as a separate identifiable packing unit for which separate bookings are done and as such shall be considered a single consignment.

9. Consignee means the party such as mentioned in the transport document by whom the goods, cargo or containers are to be received.

10. Consignor means the merchant by whom, in whose name or on whose behalf a contract of carriage of goods has been concluded with a carrier or any party by whom, in whose name or on whose behalf the goods are actually delivered to the consignee in relation to the contract of carriage (Synonyms: shipper, cargo sender).

11. Container means an item of equipment for transport purposes with the following characteristics:
    a) a permanent character and accordingly strong enough to be suitable for repeated use;
    b) specially designed to facilitate the carriage of goods, by one or more modes and means of transport;
    c) fitted with devices permitting its ready handling, particularly from one mode of transport to another;
    d) so designed as to be easy to fill and to empty.

    The term container includes neither vehicles nor conventional packing.

12. Dangerous goods means the following categories, referred to in the relevant international instruments as defined in Directive 2002/59/EC of the European Parliament and of the Council[2]:
    a) goods classified in the UNDG Code,
    b) goods classified in the ADN Code,
    c) goods classified in the IMDG Code,
    d) dangerous liquid substances listed in the IBC Code,
    e) liquefied gases listed in the IGC Code,
    f) solids referred to in Appendix B of the BC Code.

13. Data element means a unit of data which, in a certain context, is considered indivisible and for which the identification, description and value representation has been specified.

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[1] The common denominator means an attribute that is common to all members of a category.

[2] Directive 2002/59/EC of the European Parliament and of the Council of 27 June 2002 establishing a Community vessel traffic monitoring and information system and repealing Council Directive 93/75/EEC (OJ L 208, 5.8.2002, p. 10).

14.   Deadweight tonnage (DWT) means the maximum displacement of a ship after deduction of the weight of the ship.

15.   Displacement ton means a unit for measuring the displacement of ships equal to 35 ft^3; this is approximately equal to the volume of a long ton (1016,06 kg) of sea water.

16.   EDI number means the electronic address of the sender or receiver of a message (e.g. the sender and receiver of the cargo). This may be an email address, an agreed identifier or e.g. a number of the European Article Numbering Association (EAN number).

17.   Electronic data interchange (EDI) means the transfer of structured data by agreed standards from applications on the computer of one party to applications on the computer of another party by electronic means.

18.   Goods means movable property, merchandise or wares.

19.   Goods item means whole or part of the cargo (consignment) received from the shipper, including any packaging material such as pallets supplied by the shipper.

20.   Gross tonnage (GRT) means the measure of the overall size of a vessel determined in accordance with the provisions of the international convention on measurement of vessels, usually expressed in register ton.

21.   Gross weight means the weight (mass) of goods including packing, but excluding the carriers equipment expressed in whole kilograms.

22.   Message implementation manual means a manual that describes in detail how a certain standard message will be implemented and which segments, data elements, codes and references will be used and how.

23.   Location means any named geographical place, such as a port, an inland freight terminal, an airport, a container freight station, a terminal or any other place where customs clearance or regular receipt or delivery of goods can take place, with permanent facilities used for goods movements associated with international trade or transport and used frequently for those purposes. The location shall be recognised as such by a competent national body.

24.   Means of transport means the type of vehicle used for the transport of goods such as barge, truck, vessel or train.

25.   Metric ton means a unit of weight equivalent to 1000 kg.

26.   Mode of transport means a method of transport used for the conveyance of goods e.g. by rail, by road, by sea, by inland waterways.

27.   Next port of call means the consecutive place (port of call) where a ship will arrive after having made a voyage. The term is used, by the master only, to indicate the subsequent competent authority in accordance with the applicable regulations.

28.   Passage point means a defined distinguishable spot which serves as a marker to determine parts of a voyage of a vessel and triggering a certain action. It may take the form a virtual line perpendicular on the fairway axis running from side to side of the fairway.

29.   Port of call means a place where a vessel actually drops anchor, moors or otherwise comes to rest for a certain period of time to execute any necessary operations related to ship, cargo or crew.

30.   Qualifier means a data element whose value is expressed as a code that gives specific meaning to the function of another data element or a segment.

31.   Reference number means a number that serves to refer to or mention a relation or where applicable a restriction.

32.   Register ton means a unit of internal capacity of ships equal to 100 cubic feet (2831,7 m^3).

33.   Segment means a predefined and identified set of functionally related data elements values which are identified by their sequential positions within the set. A segment starts with a segment tag and ends with a segment terminator. It can be a service segment or a user data segment.

34.   Segment code means a code which uniquely identifies each segment as specified in a segment directory.

35.   Shipmaster means the person on-board of the ship being in command and having the authority to take all decisions pertaining to navigation and ship management (Synonyms: captain, skipper, boatmaster).

36.   Tag means a unique identifier for a segment or data element.

37.   Transport notification means the announcement of an intended voyage of a ship to a competent authority.

38.   UN/EDIFACT means the UN rules for Electronic Data Interchange for Administration, Commerce and Transport. They comprise a set of standards, directories and guidelines for the electronic interchange of structured data, and in particular that related to trade in goods or services between independent computerised information systems. Recommended within the framework of the UN, the rules are approved and published by the UNECE in the UN Trade Data Interchange Directory (UNTDID) and are maintained under agreed procedures.

39.   Vessel traffic services (VTS) means services as defined in (2.5) of the Annex to Commission Regulation (EC) No 414/2007[1] or in the Guidelines and Recommendations for River Information Services, Edition 2.0, 2004, published by the Central Commission for the Navigation of the Rhine (CCNR).

40.   Voyage means the journey of a vessel between the port(s) of loading and the first port of discharge of a consignment.

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[1]   Commission Regulation (EC) no 414/2007 of 13 March 2007 concerning the technical guidelines for the planning, implementation and operational use of river information services (RIS) referred to in Article 5 of Directive 2005/44/EC of the European Parliament and of the Council on harmonised river information services (RIS) on inland waterways in the Community (OJ L 105, 23.4.2007, p. 1).

Article 2.03
Classifications and code descriptions

The following classifications shall be used in inland ship reporting:

1.   Vessel and convoy type (UN Recommendation 28)

2.   IMO ship identification number (IMO)

3.   Unique European vessel identification number (ENI)

4.   Harmonised Commodity Description and Coding System (HS) including Combined Nomenclature

5.   Standard goods classification for transport statistics (NST)

6.   International maritime dangerous goods code (IMDG)

7.   European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways (ADN)

8.   UN country code

9.   UN location code (UN/LOCODE)

10. Fairway section code

11. Terminal code

12. Container size and type code

13. Container identification code

14. Package type code

15. Handling instructions

16. Purpose of call

17. Nature of cargo

In the following, details and remarks on the application of those codes in inland navigation and user guidelines are given.

1.   Vessel and convoy type (UN Recommendation 28)

FULL TITLE	Codes for types of means of transport Annex 2, Chapter 2.5: Inland water transport
ABBREVIATION	UN Recommendation 28
ORIGINATING AUTHORITY	UNECE/CEFACT http://www.unece.org/cefact
LEGAL BASIS	UN Recommendation 28, ECE/Trade/276; 2001/23
CURRENT STATUS	Operational
IMPLEMENTATION DATE	March 2001
AMENDMENT	UN/CEFACT 2010 or most current one.
STRUCTURE	4-digit alphanumeric code: digit: '1' for maritime navigation, '8' for 'inland navigation' digits for vessel or convoy 1 digit for subdivision

SUCCINCT DESCRIPTION	That recommendation establishes a common code list for the identification of the type of means of transport. It has a particular relevance to transport organisations and providers, customs and other authorities, statistical offices, forwarders, shippers, consignees and other parties concerned with transport.
LINKED CLASSIFICATIONS	UN Recommendation No 19
MEDIA THROUGH WHICH AVAILABLE	http://www.unece.org/cefact/recommendations/rec_index.htm
	European Reference Data Management Service (ERDMS) operated by the European Commission (EC).
LANGUAGES	English
ADDRESS OF RESPONSIBLE AGENCY	UNECE
REMARKS	The main set of code values is governed by an international body (UNECE). To ensure harmonisation, one single set of code values representing also additional vessel types may be used by all RIS applications.

Example	
8010	Motor freighter (Inland)
1500	General cargo vessel (sea)
Usage in the implementation manuals	TDT/C228/8179 (convoy)
	EQD(B)/C224/8155 (vessel)

2.   IMO ship identification number (IMO)

FULL TITLE	IMO ship identification number
ABBREVIATION	IMO No
ORIGINATING AUTHORITY	International Maritime Organisation/Lloyds
LEGAL BASIS	IMO Resolution A.600(15), SOLAS Chapter XI, regulation 3
CURRENT STATUS	Operational
IMPLEMENTATION DATE	—
AMENDMENT	Updated daily
STRUCTURE	Lloyd's Register of Shipping (LR) number (seven digits).
SUCCINCT DESCRIPTION	The IMO Resolution aims at assigning a permanent number to each ship for identifying purposes.
LINKED CLASSIFICATIONS	—
USAGE	For seagoing ships
MEDIA THROUGH WHICH AVAILABLE	www.ships-register.com
LANGUAGES	English

ADDRESS OF RESPONSIBLE AGENCY	International Maritime Organisation 4 Albert Embankment London SEI 7SR United Kingdom

Example	
Vessel dwt 2774	Danchem East 9031624
Usage in the implementation manuals.	TDT/C222/8213
	EQD(1)/C237/8260
	SGP/C237/8260

ADDRESS OF RESPONSIBLE AGENCY	International Maritime Organisation 4 Albert Embankment London SEI 7SR United Kingdom

3.   Unique European vessel identification number (ENI)

FULL TITLE	Unique European vessel identification number
ABBREVIATION	ENI
ORIGINATING AUTHORITY	European Union
LEGAL BASIS	ES-TRIN 2019/1
CURRENT STATUS	—
IMPLEMENTATION DATE	—
LIMIT OF OPERATIONAL LIFE	—
AMENDMENT	Continuously
STRUCTURE	8-digit-number
SUCCINCT DESCRIPTION	The unique European vessel identification number aims at assigning a permanent number to each vessel for identifying purposes.
LINKED CLASSIFICATIONS	IMO number
USAGE	In electronic ship reporting, tracking and tracing and certification of vessels for inland vessels.
MEDIA THROUGH WHICH AVAILABLE	Competent authorities keep a register. Access will be granted to competent authorities of other Member States. European Hull Data Base Contracting States of the Mannheim Convention and other parties based on administrative agreements.
LANGUAGES	—
ADDRESS OF RESPONSIBLE AGENCY	European Union Member States and the Contracting States of the Mannheim Convention
REMARK	The unique European vessel identification number (ENI) consists of eight Arabic numerals. The first three digits are the code of the assigning competent authority. The next five digits are a serial number.

Example	
12345678	
Usage in the implementation manuals	TDT, EQD (V1 and V2-V15) CNI/GID and CNI/GID/DGS, Tag 1311

4. Harmonised Commodity Description and Coding System (HS) including Combined Nomenclature

FULL TITLE	Harmonised commodity description and coding system
ABBREVIATION	HS; Harmonised System
ORIGINATING AUTHORITY	World Customs Organisation
LEGAL BASIS	International Convention on the Harmonised Commodity Description and Coding System
CURRENT STATUS	Operational
IMPLEMENTATION DATE	1 January 2007
AMENDMENT	In principle revised every five years. The latest version to be used.
STRUCTURE	7 466 headings, organised in four hierarchical levels Level 1: sections coded by Roman numerals (I to XXI) Level 2 chapters identified by two-digit numerical codes Level 3: headings identified by four-digit numerical codes Level 4: subheadings identified by six-digit numerical code
SUCCINCT DESCRIPTION	HS convention is a classification of goods by criteria based on raw material and the stage of production of commodities. HS is the heart of the whole process of harmonisation of international economic classifications being jointly conducted by the United Nations Statistics Division and Eurostat. Its items and sub-items are the fundamental terms on which industrial goods are identified in product classifications. Objectives: to harmonise (a) external trade classifications to guarantee direct correspondence; and (b) countries external trade statistics and to guarantee that those are comparable internationally.
LINKED CLASSIFICATIONS	Harmonised System (HS): full agreement on six-digit-level; Combined Nomenclature (CN)
	NST on 3-digit level
USAGE	Products
MEDIA THROUGH WHICH AVAILABLE	World Customs Organisation Rue de l'Industrie, 26-39 1040 Brussels, BELGIUM www.wcoomd.org Customs Cooperation Council, Brussels
LANGUAGES	All European Union official languages
ADDRESS OF RESPONSIBLE AGENCY	A subset of the codes used for electronic reporting will be maintained through the ERI Expert Group.
	European Reference Data Management Service (ERDMS) operated by the European Commission.
REMARKS	The HS classification is further subdivided at European Union level into a classification called Combined Nomenclature (CN)

Example	
730110	Sheet piling of iron or steel
310210	Mineral or chemical fertilisers, ammonium sulphate
Usage in the implementation manuals	CNI/GID/FTX(1)/C108/4440
	CNI/GID/FTX(2)/C108/4440

5.   Standard goods classification for transport statistics (NST)

FULL TITLE	Nomenclature uniforme de marchandises pour les statistiques de transport/Standard goods classification for transport statistics/revised
ABBREVIATION	NST 2007
ORIGINATING AUTHORITY	European Commission (Statistical Office/Eurostat)
LEGAL BASIS	Commission Regulation (EC) No 1304/2007[1]
CURRENT STATUS	—
IMPLEMENTATION DATE	1 January 2007
AMENDMENT	Regularly every two years. The latest version to be used
STRUCTURE	2 digit NST 2007
	Level 1: a 2-digit CPA subdivision
SUCCINCT DESCRIPTION	Commodity Classification for Transport Statistics in Europe (CSTE)
LINKED CLASSIFICATIONS	Harmonised commodity description and coding system (HS)
	Combined Nomenclature (CN)
USAGE	Products
MEDIA THROUGH WHICH AVAILABLE	http://ec.europa.eu/eurostat/ramon/nomendatures/index.cfm?
	TargetUrl=LST NOM DTL&StrNom=NST 2007&StrLanguageCode=EN&IntPcKey= &StrLayoutCode=HIERARCHIC
	European Reference Data Management Service (ERDMS) operated by the European Commission.
LANGUAGES	All European Union official languages
ADDRESS OF RESPONSIBLE AGENCY	Statistical Office of the European Communities Eurostat)
	Unit C2 Bâtiment BECH A3/112
	2920 Luxembourg, LUXEMBOURG
REMARKS	—

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[1]   Commission Regulation (EC) no 1304/2007 of 7 November 2007 amending Council Directive 95/64/EC, Council Regulation (EC) No 1172/98, Regulations (EC) no 91/2003 and (EC) No 1365/2006 of the European Parliament and of the Council with respect to the establishment of NST 2007 as the unique classification for transported goods in certain transport modes (OJ L 290, 8.11.2007, p. 14).

6.   International maritime dangerous goods code (IMDG)

FULL TITLE	International maritime dangerous goods code
ABBREVIATION	IMDG code
ORIGINATING AUTHORITY	International Maritime Organisation IMO
LEGAL BASIS	—
CURRENT STATUS	Operational
IMPLEMENTATION DATE	18 May 1965
AMENDMENT	1 January 2001 (30th amendment) approximately every 2 years
STRUCTURE	2-digit numerical code: 1-digit numerical for class 1-digit numerical for division
SUCCINCT DESCRIPTION	The IMDG code governs the vast majority of shipments of hazardous material by water. The code is recommended to governments for adoption as the basis for national regulations in conjunction with the SOLAS convention.
LINKED CLASSIFICATIONS	The code is based on the UN Recommendations on the transport of dangerous goods (UNDG)
USAGE	Maritime transport of dangerous and harmful goods
MEDIA THROUGH WHICH AVAILABLE	www.imo.org European Reference Data Management Service (ERDMS) operated by the European Commission. (Included in the ADN table)
LANGUAGES	Dutch, English, French, German
ADDRESS OF RESPONSIBLE AGENCY	International Maritime Organisation 4 Albert Embankment London SE1 7SR UNITED KINGDOM
REMARKS	For inland shipping the IMO code may be used as this code is often already known, where necessary an ADN corresponding with the IMDG code shall be inserted

Example	
32	Flammable liquid, not otherwise specified (Ethanol)
Usage in the implementation manuals	CNI/GID/DGS/C205/8351

7.   Agreement on Dangerous Goods (ADN)

FULL TITLE	European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways (ADN)
ABBREVIATION	ADN
ORIGINATING AUTHORITY	UN Economic Commission for Europe (English, French and Russian version of ADN) Central Commission for the Navigation of the Rhine (German version of ADN)
LEGAL BASIS	Directive 2008/68/EC of the European Parliament and of the Council[1] or CCNR résolution 2009-II-20
CURRENT STATUS	Operational
IMPLEMENTATION DATE	Operational
AMENDMENT	Regularly every two years as indicated
STRUCTURE	For goods on dry cargo vessel: - UN number -Name of the substance (in accordance with table A of part 3 of ADN) -Class - Danger classification code - Packing group - Hazard Identification placard (label) For goods on tank vessels: - UN number - Name of substance (in accordance with table C of part 3 of ADN) - Class - Packing group
SUCCINCT DESCRIPTION	The ADN, the European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways which will replace the various regional agreements.
LINKED CLASSIFICATIONS	ADN, ADR, RID
USAGE	Transport of dangerous goods in inland navigation
MEDIA THROUGH WHICH AVAILABLE	https://www.unece.org/trans/danger/publi/adn/adn_e.html www.ccr-zkr.org http://www.danubecommission.org/ European Reference Data Management Service (ERDMS) operated by the European Commission.
LANGUAGES	English, French, German
ADDRESS OF RESPONSIBLE AGENCY	UN Economic Commission for Europe, Palais des Nations, CH-1211 Geneva 10, SWITZERLAND Central Commission for the Navigation of the Rhine, 2, Place de la Republique, 67082 Strasbourg Cedex, FRANCE

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[1]   Directive 2008/68/EC of the European Parliament and of the Council on the inland transport of dangerous goods (OJ L 260, 30.9.2008, p. 13).

| REMARKS | The provisions of the European Agreement concerning the international carriage of dangerous goods by inland waterways (ADN) are applicable on all European waterways (including the Rhine and the Danube). The 2017 edition of ADR/RıD/ADN is harmonised with the 20th revised edition of the UN Model Regulations and has entered into force on 1 January 2017. |

Example	
for dry cargo vessel:	for tank vessel:
1203; petrol; 3; F1; III; 3	1203; petrol; 3; III;
Usage in the implementation manuals	CNI/GID/DGS/C205/8078

8.   UN country code

FULL TITLE	International standard codes for the representation of the names of countries
ABBREVIATION	ISO 3166-1
ORIGINATING AUTHORITY	International Organisation for Standardisation (ISO)
LEGAL BASIS	UN Recommendation 3 (codes for the representation of the names of countries)
CURRENT STATUS	Operational
IMPLEMENTATION DATE	1974
AMENDMENT	As per ISO 3166-1
STRUCTURE	Two-letter-alpha code (to be used in principle) Three-digit numeric code (alternatively)
SUCCINCT DESCRIPTION	ISO provides a unique two-letter code for each country listed, as well as a three-digit numeric code which is intended as an alternative for all applications that need to be independent of the alphabet.
LINKED CLASSIFICATIONS	UN/LOCODE
USAGE	This code is used as one element in the combined location code in Part IV Article 2.04
MEDIA THROUGH WHICH AVAILABLE	UNECE http://www.unece.org/cefact/locode/welcome.html European Reference Data Management Service (ERDMS) operated by the European Commission.
LANGUAGES	English
ADDRESS OF RESPONSIBLE AGENCY	http://www.unece.org/cefact
REMARKS	See Part IV Article 2.04 for the combination of the alpha country code with the location code.

Example	
BE	Belgium
Usage in the implementation manuals	ERINOT Message:
	TDT/C222/8453
	NAD(1)/3207
	NAD(2)/3207
	ERIRSP Message:
	NAD(1)/3207

9.   UN location code (UN/LOCODE)

FULL TITLE	UN code for trade and transport locations
ABBREVIATION	UN/LOCODE
ORIGINATING AUTHORITY	UNECE/CEFACT
LEGAL BASIS	UNECE Recommendation 16
CURRENT STATUS	Operational
IMPLEMENTATION DATE	1980
AMENDMENT	2018-2 (December 2018)
STRUCTURE	ISO 3166-1 country code (alpha 2-digit) followed by a space and a 3-digit-alpha code for the place names (5 digits)
	Place name (a..29)
	Subdivision ISO 3166-2, optional (a..3)
	Function, mandatory (an..5)
	Remarks, optional (an..45)
	Geographical coordinates (000N 0000 W, 000 S 00000 E)
SUCCINCT DESCRIPTION	UN recommends a five-letter alphabetic code for abbreviating the names of locations of interest to international trade, such as ports, airports, inland freight terminals, and other locations were customs clearance of goods can take place, and whose names need to be represented unambiguously in data interchange between participants in international trade.
LINKED CLASSIFICATIONS	UN country code
USAGE	This code is used as one element in the combined location code in Part IV Article 2.04 .
MEDIA THROUGH WHICH AVAILABLE	http://www.unece.org/cefact/locode/welcome.html
	European Reference Data Management Service (ERDMS) operated by the European Commission.
LANGUAGES	English
ADDRESS OF RESPONSIBLE AGENCY	UNECE
REMARKS	See also Part IV Article 2.04 .

Example	
BEBRU	Belgium Brussels
Usage in the implementation manuals	TDT/LOC (1..9)/C517/3225 CNI/LOC(1..2)/C517/3225

10.   Fairway section code

FULL TITLE	Fairway section code
ABBREVIATION	
ORIGINATING AUTHORITY	National administrations of waterways
LEGAL BASIS	—
CURRENT STATUS	operational
IMPLEMENTATION DATE	—
AMENDMENT	—
STRUCTURE	5-digit numerical code
SUCCINCT DESCRIPTION	The waterway network is divided into sections. These may be whole rivers and canals over several 100 km or small sections. The position of a location inside a section may be given by hectometre or by the name (code) of a terminal or passage point.
LINKED CLASSIFICATIONS	UN/LOCODE
USAGE	Numbering of the waterways in a national network. This code is used as one element in the combined location code in Part IV Article 2.04 .
MEDIA THROUGH WHICH AVAILABLE	European Reference Data Management Service (ERDMS) operated by the European Commission
LANGUAGES	—
ADDRESS OF RESPONSIBLE AGENCY	National administrations of waterways
REMARKS	See also Part IV Article 2.04.

Example	
03937	Rhein, Rüdesheimer Fahrwasser
02552	Oude Maas at Dordrecht
Usage in the implementation manuals	TDT/LOC/C517/3225 CNI/LOC/C517/3225
See:	See this document and implementation manuals Definition of the revised location and terminal code
Remark 1:	If there is no fairway code available, the field shall be filled in with zeros.
Remark 2:	See also Part IV Article 2.04.

11.   Terminal code

FULL TITLE	Terminal code
ABBREVIATION	—
ORIGINATING AUTHORITY	National waterway authorities or user communities
LEGAL BASIS	—
CURRENT STATUS	Version 2, April 2000
IMPLEMENTATION DATE	—
AMENDMENT	Regularly
STRUCTURE	Type of terminal (1-digit numeric) number of terminal (5-digit alphanumeric)
SUCCINCT DESCRIPTION	A further specification of the location of a terminal within the location of the port in the country.
LINKED CLASSIFICATIONS	UN/LOCODE
USAGE	This code is used as one element in the combined location code in Part IV Article 2.04.
MEDIA THROUGH WHICH AVAILABLE	European Reference Data Management Service (ERDMS) operated by the European Commission.
LANGUAGES	—
ADDRESS OF RESPONSIBLE AGENCY	National administrations of waterways or respective user communities.
REMARKS	It is of the utmost importance that maintenance of the codes is done in such way that maximum stability and consistency is achieved to ensure that no changes are necessary apart from additions and deletions. See also Part IV Article 2.04 .

Example	
LEUVE	Leuvehaven at Rotterdam, NL
Usage in the implementation manuals	TDT/LOC/C517/3225 CNI/LOC/C517/3225
See:	Implementation manuals and this document Definition of the revised location and terminal code
Remark 1:	If there is no terminal code available, the field shall be filled in with zeros
Remark 2:	Each national RIS-authority will be responsible for its own data.

12. Container size and type code

FULL TITLE	Freight containers — coding, identification and marking
ABBREVIATION	—
ORIGINATING AUTHORITY	International Organisation for Standardisation (ISO)
LEGAL BASIS	ISO 6346, chapter 4 and annexes D and E
CURRENT STATUS	Operational
IMPLEMENTATION DATE	—
AMENDMENT	3rd edition 1 December 1995
STRUCTURE	Container size: two alphanumeric characters(first for length, second for combination of height and width) Container type: two alphanumeric characters
SUCCINCT DESCRIPTION	Size and type codes established for each sort of containers
LINKED CLASSIFICATIONS	ISO 6346 coding identification and marking
USAGE	Whenever known and indicated in the commercial exchange of information
MEDIA THROUGH WHICH AVAILABLE	www.iso.ch/iso/en European Reference Data Management Service (ERDMS) operated by the European Commission.
LANGUAGES	English
ADDRESS OF RESPONSIBLE AGENCY	—
REMARKS	The size type codes are displayed on the containers and as such shall be used in the electronic reporting whenever available from other exchanged information e.g. during the booking. Size type codes shall be used as a whole i.e. the information shall not be broken into its component parts (ISO 6346:1995)

Example	
42	Length: 40 ft.; height: 8 ft. 6 in.; width: 8 ft.
Example for type	
GP	General purpose container
BU	Dry bulk container
Usage in the implementation manuals	Where appropriate EQD segment

13.   Container identification code

FULL TITLE	Freight containers — coding, identification and marking
ABBREVIATION	—
ORIGINATING AUTHORITY	International Organisation for Standardisation
LEGAL BASIS	ISO 6346, Chapter 3, Annex A
CURRENT STATUS	Implemented throughout the world on all freight containers
IMPLEMENTATION DATE	1995
AMENDMENT	—
STRUCTURE	Owner code: Three letters Equipment category identifier: one letter Serial number: six numerals Check digit: one numeral
SUCCINCT DESCRIPTION	The identification system is intended for general application, for example in documentation, control and communications (including automatic data processing systems), as well as for display on the containers themselves
LINKED CLASSIFICATIONS	ISO 668, ISO 1496, ISO 8323
USAGE	—
MEDIA THROUGH WHICH AVAILABLE	www.iso.ch/iso/en
LANGUAGES	English
ADDRESS OF RESPONSIBLE AGENCY	Bureau International des Conteneurs (BIC), 167 rue de Courcelles, 75017 Paris, France, http://www.bic-code.org/
REMARKS	—

Example	
KNLU4713308	NEDLLOYD maritime freight container with serial number 471330, (8 is the check digit)
Usage in the implementation manuals	CNI/GID/DGS/SGP/C237/8260

14.   Package type

FULL TITLE	Codes for types of packages and packing materials
ABBREVIATION	UNECE Recommendation 21
ORIGINATING AUTHORITY	UN/CEFACT
LEGAL BASIS	—
CURRENT STATUS	operational
IMPLEMENTATION DATE	August 1994 (ECE/TRADE/195)
AMENDMENT	Trade/CEFACT/2002/24
STRUCTURE	2-character alphanumeric code value Code-value name 2-digit numeric code value description
SUCCINCT DESCRIPTION	A numeric code system to describe the appearance of goods as presented for transport to facilitate identification, recording, handling, and establishing handling tariffs.
LINKED CLASSIFICATIONS	—
USAGE	—
MEDIA THROUGH WHICH AVAILABLE	www.unece.org/cefact European Reference Data Management Service (ERDMS) operated by the European Commission.
LANGUAGES	English, French, German
ADDRESS OF RESPONSIBLE AGENCY	—
REMARKS	The numeric code value is not used in this standard

Example	
BG	Bag
BX	Box
Usage in the implementation manuals	CNI/GID/C213/7065

15.   Handling instructions

FULL TITLE	Handling instruction description code
ABBREVIATION	UN/EDIFACT data element 4079
ORIGINATING AUTHORITY	UN CEFACT
LEGAL BASIS	—
CURRENT STATUS	Operational
IMPLEMENTATION DATE	25 July 2005
AMENDMENT	Trade/CEFACT/2005/

STRUCTURE	Repr: an..3
	Code-value name
	3-digit alpha code value description
SUCCINCT DESCRIPTION	An alpha code system to describe handling instructions for the tasks to be executed in a port to facilitate the handling of the vessel and establishing handling tariffs.
LINKED CLASSIFICATIONS	—
USAGE	un/edifact messages
MEDIA THROUGH WHICH AVAILABLE	www.unece.org/cefact
LANGUAGES	English
ADDRESS OF RESPONSIBLE AGENCY	—
REMARKS	The numeric code value is not used in this standard

Example	
LOA	Loading
DIS	Discharge
RES	Re-stow
Usage in the implementation manuals	LOC/HAN/C524/4079

16.   Purpose of call

FULL TITLE	Conveyance call purpose description code
ABBREVIATION	POC C525
ORIGINATING AUTHORITY	UN CEFACT
LEGAL BASIS	—
CURRENT STATUS	Operational
IMPLEMENTATION DATE	25 July 2005
AMENDMENT	Trade/CEFACT/2005
STRUCTURE	Repr an..3
	2-character numeric code value
	Code-value name
SUCCINCT DESCRIPTION	A numeric code system to describe the purpose of the call of the vessel to facilitate identification and recording
LINKED CLASSIFICATIONS	HAN
USAGE	edifact messages
MEDIA THROUGH WHICH AVAILABLE	www.unece.org/cefact
LANGUAGES	English

ADDRESS OF RESPONSIBLE AGENCY	—
REMARKS	The numeric code value is used in this standard

Example	
1	Cargo operations
23	Waste disposal
Usage in the implementation manuals	TSR/POC/C525/8025

17. Nature of cargo

FULL TITLE	Cargo type classification code
ABBREVIATION	UN/EDIFACT 7085 cargo type
ORIGINATING AUTHORITY	UN CEFACT
LEGAL BASIS	—
CURRENT STATUS	Operational
IMPLEMENTATION DATE	25 July 2005
AMENDMENT	Trade/CEFACT/2005
STRUCTURE	an..3 2-character numeric code value Code-value name 2-digit numeric code value description
SUCCINCT DESCRIPTION	A numeric code system to specify the classification of a type of cargo as transported to facilitate identification, recording, handling, and establishing tariffs.
LINKED CLASSIFICATIONS	HAN
USAGE	edifact messages
MEDIA THROUGH WHICH AVAILABLE	www.unece.org/cefact
LANGUAGES	English
ADDRESS OF RESPONSIBLE AGENCY	—
REMARKS	The numeric code value is used in these technical specifications

Example	
5	Other non-containerised
30	Cargo in bulk
Usage in the implementation manuals	TSR/LOC/HAN/C703/7085

Article 2.04
Location codes

The ISRS Location Code is defined in Implementing Regulation (EU) 2018/2032.

Article 2.05
List of abbreviations

Abbreviations	Description
ADN	European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways (Directive 2008/68/EC of the European Parliament and of the Council of 24 September 2008 on the inland transport of dangerous goods or CCNR Resolution 2009-II-20)
ADR	European Agreement concerning the International Carriage of Dangerous Goods by Road (ADR)
BERMAN	Berth management (EDI message)
CCNR	Central Commission for the Navigation of the Rhine
DWT	Dead weight
EDI	Electronic data interchange
ENI	Unique European vessel identification number
ERDMS	European Reference Data Management Service
ERI	Electronic reporting international
ERINOT	ERI notification (message)
ERIRSP	ERI response (message)
ETA	Estimated time of arrival
ETD	Estimated time of departure
HS Code	Harmonised commodity description and coding system of WCO
IFTDGN	International forwarding and transport dangerous goods notification (message)
IMDG	International maritime dangerous goods code (number)
IMO	International Maritime Organisation
IMO-FAL	Convention on the Facilitation of International Maritime Traffic, 1965, with amendments
ISO	International Standardisation Organisation
ISPS	International ship and port facility security (code)
LOCODE	UNECE location code for ports and freight stations
NST 2007	Standard goods classification for transport statistics (to be used from 2007 onwards)
PAXLST	Passenger list (message)

Abbreviations	Description
PROTECT	International Organisation of North Europeans Ports dealing with dangerous goods message implementation
RID	Regulations Concerning the International Carriage of Dangerous Goods by Rail (RID)
RIS	River information services
SOLAS	Safety of Lives at Sea IMO Convention
TARIC	Integrated Tariff of the European Communities
UN/CEFACT	UN Centre for Trade Facilitation and Electronic Business
UNECE	United Nations Economic Commission for Europe
UN/EDIFACT	Electronic data interchange for administration, commerce and transport
UN/LOCODE	United Nations location code
UNDG	United Nations dangerous goods (number)
UNTDID	United Nations trade data interchange directory
URL	Uniform resource allocator (Internet address)
VTM	Vessel traffic management
WCO	World Customs Organisation
XML	Extended markup language

PART V
STANDARD NOTICES TO SKIPPERS

CHAPTER 1
GENERAL PROVISIONS

Article 1.01
Definitions

Fairway Information Services (FIS) mean geographical, hydrological and administrative information regarding the waterway (fairway) that are used by boatmasters and fleet managers to plan, execute and monitor a voyage. The terms 'boatmaster' and 'skipper' used in Part V, Annexes 11 to 14 shall be deemed to be equivalent with the term 'shipmaster' used in the River Information Services (RIS) Guidelines (Commission Regulation (EC) No 414/2007[1] or in the Guidelines and Recommendations for River Information Services, Edition 2.0, 2004 published by the Central Commission for the Navigation of the Rhine (CCNR), while the term 'fleet managers' is defined as follows "A person planning and observing the actual (navigational) status of a number of vessels moving or working under one command or ownership".

FIS provide dynamic information (such as water levels, water level predictions) as well as static information (such as operating times of locks and bridges) regarding the use and status of the inland waterway infrastructure, and thereby support tactical and strategic navigation decisions.

Traditional means to supply FIS include visual aids to navigation, notices to skippers published on paper, provided by broadcast and by fixed telephone on locks. The mobile phone has added new possibilities of voice and data communication, but cellular network is not available in all places and at all times. Tailor-made FIS for the waterways can be supplied by radiotelephone service on inland waterways, Internet service or electronic navigational chart service, such as the Inland Electronic Chart Display and Information System (Inland ECDIS) with Electronic Navigational Chart (ENC).

Article 1.02
Primary functions and performance requirements for Notices to Skippers (NtS)

This technical specification for NtS provides rules for the data transmission of fairway information via Internet.

NtS shall:

a)   provide information related to fairway conditions, traffic, weather, water levels and ice for Fairway Information Services;

b)   provide automatic translation of the most important content of notices, using standard vocabulary based on code lists (the NtS Reference Tables as provided in Annex 19);

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[1]   Commission Regulation (EC) No 414/2007 of 13 March 2007 concerning the technical guidelines for the planning, implementation and operational use of river information services (RIS) referred to in Article 5 of Directive 2005/44/EC of the European Parliament and of the Council on harmonised river information services (RIS) on inland waterways in the Community (OJ L 105, 23.4.2007, p. 1).

c) be provided in a standardised structure of data-sets to facilitate the integration of notices in voyage planning systems;

d) be compatible with the data-structure of the RIS Index and ES_RIS, Part I to facilitate integration of NtS into Inland ECDIS (ES-RIS, Part I) as stipulated by Directive 2005/44/EC of 7 September 2005 on harmonised RIS on inland waterways in the Community.

The technical specifications for NtS facilitate the data-exchange among NtS systems of different countries and towards other applications making use of NtS data, including Inland ECDIS (ES-RIS, Part I).

Some information contained within NtS messages can be standardised, some cannot.

The standardised part shall cover all the information which is:

a) important for the safety of inland navigation (for example: sunken small craft on the right side of the fairway at the Danube, river-km 2010);

b) needed for voyage planning including closure of locks and reduction of vertical clearance.

Additional information that is not relevant for safety or voyage planning, including the cause of the closure of a lock, may be given as free text, without automatic translation. The use of free text shall be restricted to a minimum.

CHAPTER 2
PROVISION OF NOTICES TO SKIPPERS

Member States shall ensure that NtS messages are accessible online and via standardised NtS web service, in accordance with the technical specifications described in this Part and Annexes 15 to 19.

The standardised NtS web service specification is included in Annex 18 in the form of a 'Web Service Description Language' (WSDL).

The standardised NtS web services shall provide the user with the possibility to select messages on the grounds of at least one of the following criteria:
a) a specific waterway section;
b) a specific part of a waterway, defined by the river-km of the starting and the end point;
c) time of validity of the notice (start date and end date of validity period);
d) date of publication of the notice (date and time of publication).

NtS messages that comply with the standards referred to in this Part can be provided, among other tools, by:
a) mobile applications (apps);
b) E-mail services.

Data exchange among the NtS systems operated in different countries may be carried out. All systems using the standards described in this Part may integrate NtS of other systems in their own services, provided the content of the message is not modified. Users shall be informed in case the connection to a source of integrated NtS is interrupted or not available.

CHAPTER 3
NTS MESSAGE TYPES

NtS messages are essential messages that are standardised to the highest part possible.

There are four NtS message types, namely:

a)   fairway and traffic related message;
b)   water related message;
c)   ice related message;
d)   weather related message.

CHAPTER 4
STRUCTURE OF NTS AND ENCODING OF NTS MESSAGES

This Chapter describes the structure and encoding of standardised electronic NtS messages.

An NtS message is a structured message using standardised elements, wherever possible. The use of free text in the data elements shall be restricted to a minimum.

The standardised NtS extended markup language (XML) schema definition, referred to as XSD in this Part, contains the standardised code values and possible formats is included in Annex 17.

The standardised code values and the XML tags, their meaning and translation are provided in the NtS Reference Tables in Annex 19 and are also available electronically in the European Reference Data Management System (ERDMS) operated by the European Commission.

Article 4.01
General structure

An NtS message consists of the following sections:
a) identification section;
b) section defining the applicable object(s) or fairway section(s) the message is related to;
c) limitation(s) for a fairway and traffic related message, measurement(s) for a water related message, ice condition(s) for an ice related message or weather report(s) for a weather related message.

Figure 1

Notice to Skippers message structure
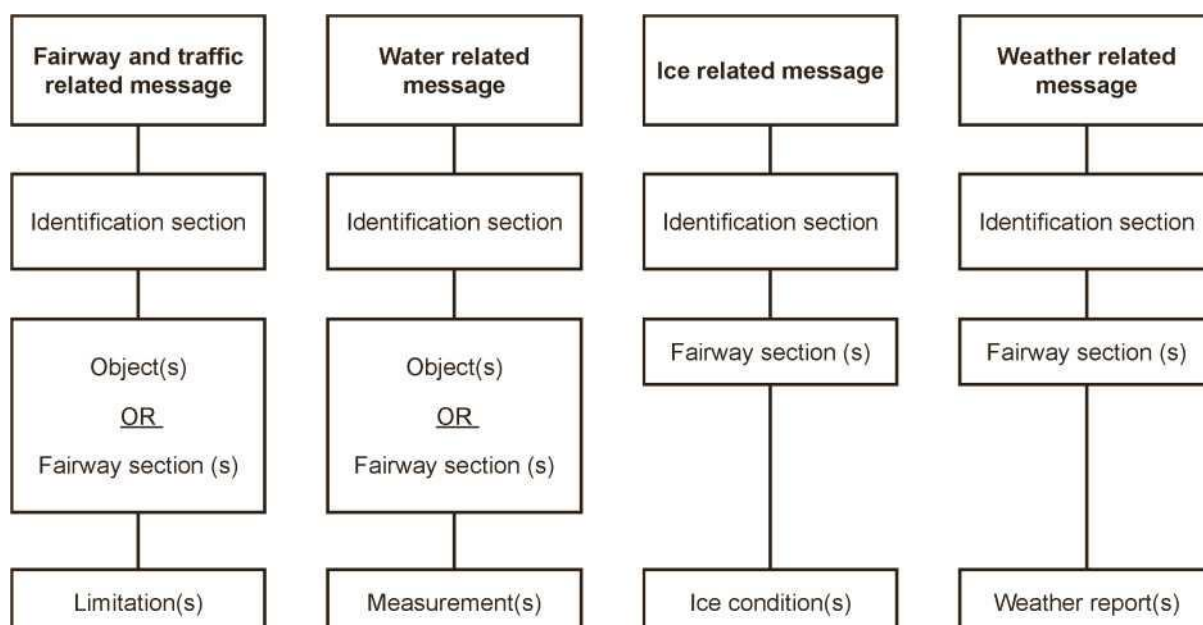
1.   Identification section

      Each message must contain an identification section. The identification section contains general
      information about the issuer and date of publication of the message.

2.   Fairway and traffic related message

      The fairway and traffic related message contains information for fairway section(s) or object(s),
      and it is used to indicate limitation(s) for the following purposes:

      a)   **'Warning'**: relevant for safety. The warning must contain at least one limitation that results
            in direct and concrete endangerment of persons, crafts or facilities, such as welding works
            on a bridge producing sparks, inspection cage/workers hanging from a bridge, obstacle in
            the fairway,

      b)   **'Announcement'**: relevant for voyage planning or safety. The announcement may contain
            limitations, such as blockage of a lock chamber due to maintenance works, dredging on the
            fairway,

      c)   **'Info service'**: general information that is not directly linked to voyage planning or safety.
            The info service must not contain specific limitations, therefore it is not directly relevant to
            voyage planning or safety. Such information might include general information such as
            local rules of traffic, Inland ECDIS Update.

3.   Water related message

      The water related section contains values or predictions for:

      a)   water level;
      b)   least sounded depth;
      c)   vertical clearance;
      d)   barrage status;
      e)   discharge;
      f)   regime.

      Usually, water related information is created and published automatically based on data
      received from sensor equipment (such as tide gauge), systems (such as water level model) or
      infrastructure (such as barrage status). There may be different triggers for publication, such as
      periodical publication or reaching certain value.

4.   Ice related message

      The ice related message contains information about the actual or predicted ice conditions for
      fairway section(s). Ice related information is usually generated by competent personnel based
      on local observation and professional assessment.

5.   Weather related message

      The weather related message contains information about (dangerous) weather conditions for
      inland navigation.

      In order to facilitate the distribution of hydro-meteo information from hydro-meteo networks to
      skippers, weather related messages may be published.

Article 4.02
Explanation of XML tags and code values in the NtS Reference Tables

The meaning of the different elements used in the NtS XML schema definition (XSD) is described in the NtS Reference Tables provided in Annex 19. The structure, format and possible values of all XML elements are described in the NtS XSD in Annex 17.

a) Latitude and longitude coordinates are encoded according to the World Geodetic System 1984 and are presented in degrees and minutes with at least three, but preferable four decimals ([d]d mm.mmm[m] N, [d][d]d mm.mmm [m] E).

b) Decimals in numeric fields are indicated with a decimal point ('.'). No separators for thousand are used.

c) NtS messages shall only use the following units for the values included in the XML message: cm, m^3/s, h, km/h and kW, m/s (wind), mm/h (rain) and degree Celsius. National applications may convert the units for user- friendly display.

Article 4.03
Identification of fairway sections and objects in NtS messages

To fulfil the minimum data requirements for provision of information about objects relevant for Inland navigation as referred to in Article 4(3)(a) of Directive 2005/44/EC, the ISRS Location Code has to be used in the object section. The ISRS Location Code is used to uniquely identify objects and fairway sections and to ensure interoperable RIS Systems and Services (such as to combine information about infrastructure from the RIS Index, ES-RIS, Part I and V for voyage planning).

The ISRS Location Code is a 20-digit alphanumerical code used to establish a unique and standardized relation between objects in River Information Services. It consists of the following mandatory data elements, arranged in four information blocks:

a) Block 1: UN/LOCODE (5 letters, alphanumerical), comprising
   - Country code (2 digits, alphanumerical)[1], and
   - Location code (3 digits, alphanumerical, 'XXX' if not available)

b) Block 2: Fairway section code (5 digits, alphanumerical, to be determined by the national authority)

c) Block 3: Object Reference Code (5 digits, alphanumerical, 'XXXXX' if not available)

d) Block 4: Fairway section hectometre (5 digits, numerical, hectometre at the centre of the area or '00000' if not available).

The ISRS Location Codes and the reference data of objects are maintained by the Member States in the RIS Index and submitted to the ERDMS operated by the European Commission according to the Maintenance procedures for the RIS Index published on the ERDMS website.

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[1] The UN country codes are defined in accordance with point 2.4.2.12 of the Annex to Commission Regulation (EU) No 164/2010 (OJ L 57, 6.3.2010, p. 1). The UN country codes are identical to the ISO 3166-1 Alpha-2 country codes.

Article 4.04
Rules for encoding of NtS messages

NtS messages shall be encoded in line with the NtS Encoding Guide for editors (Annex 15) and in line with the NtS Encoding Guide for application developers (Annex 16).

EUROPEAN STANDARD ANNEXES

ANNEX 1
PRODUCT SPECIFICATION FOR INLAND ENCS

Contents

1.   Introduction

Inland Electronic Navigational Chart (IENC) means the database, standardized as to content, structure and format, for use with inland electronic chart display and / or information systems operated onboard of vessels transiting inland waterways. An IENC is issued by or on the authority of a competent government agency, and conforms to standards developed by the International Hydrographic Organization (IHO) and refined by the Inland ENC Harmonization Group. An IENC contains all the chart information necessary for safe navigation on inland waterways and may contain supplementary information in addition to that contained in the paper chart (e.g. sailing directions, machine-readable operating schedules, etc) which may be considered necessary for safe navigation and voyage planning.

This Product Specification for Inland ENC (IENC) is a set of specifications intended to enable ENC manufacturers to produce consistent IENC, and to use data efficiently in applications. An IENC shall be produced in accordance with the regulations defined in:

-    this Product Specification for Inland ENC

-    the Feature Catalogue for Inland ENC

-    the Encoding Guide for Inland ENC

The numbering correlates to the ENC Product Specification, S-57 Appendix B.1, Edition 2.0

2.   General Information

2.1   Navigational purpose (usage)

IENC data is compiled for a variety of navigational purposes. The navigational purpose for which an individual IENC has been compiled is indicated in the "Data Set Identification" [DSID] field, "Intended Usage" [INTU] subfield and in the name of the data set files. The following codes are used:

Nr.		Navigational purpose **(usage)**	Intended use
1	S57	Overview	For route planning and oceanic crossing.
2	S57	General	For navigating oceans, approaching coasts and route planning.
3	S57	Coastal	For navigating along the coastline, either inshore or offshore.
4	S57	Approach	Navigating the approaches to ports or mayor channels or through intricate or congested waters.
5	S57	Harbour	Navigating within ports, harbours, bays, rivers and canals, for anchorages.
6	S57	Berthing	Detailed data to aid berthing.
7	*new*	*River*	*Navigating the inland waterways (skin cell).*
8	*new*	*River harbour*	*Navigating within ports and harbours on inland waterways (skin cell).*
9	*new*	*River berthing*	*Detailed data to aid berthing manoeuvring in inland navigation (skin cell).*
A	*new*	*Overlay*	*Overlay cell to be displayed in conjunction with skin cells*

The navigational purposes 1 to 8 and A may be used by authorities as well as private bodies. Navigational purpose 9 should be used by private bodies only.

It is allowed to assign a range of usages to overlay cells (see clause 5.6.3).

Overlay cells may not contain skin-of-the-earth features (see clause 3.10).

2.2   Cells

In order to facilitate the efficient processing of ENC data the geographic coverage of a given usage must be split into cells. Each cell of data must be contained in a physically separate, uniquely identified file on the transfer medium, known as a data set file (see clauses 5.4 and 5.6.3).

The geographic extent of the cell must be chosen by the ENC producer to ensure that the resulting data set file contains no more than 5 Megabytes of data. Subject to this consideration, the cell size must not be too small in order to avoid the creation of an excessive number of cells.

The coordinates of the borders of the cell are encoded in decimal degrees in the "Catalogue Directory" [CATD] field.

Point or line feature objects which are at the border of two cells with the same navigational purpose must be part of only one cell. They are put in the south or west cell (i.e. north and east borders of the cell are part of the cell, south and west borders are not).

When a feature object exists in several cells its geometry must be split at the cell boundaries and its complete attribute description must be repeated in each cell.

In IENC, skin-of-the-earth features (group 1) within two overlapping cells with the same navigational purpose must not overlap. Features of overlay cells (always group 2) are allowed to overlap other features in other cells.

The minimum size of coverage at both sides of the waterway should be outside the radar coverage.

2.3   Topology

ENC data must be encoded using chain-node topology (see S-57 Part 2, clause 2.2.1.2).

3.   Features and attributes

3.1   Feature object identifiers

Each feature object must have a unique world-wide identifier. This identifier, called the feature object identifier, is formed by the binary concatenation of the contents of the subfields of the "Feature Object Identifier" [FOID] field.

For IENC the feature object identifier may be used to identify multiple instances of the same feature. For example, the same feature may appear in different usages, or an feature may be split by the cell structure. In these circumstances each instance of this feature may have the same identifier. Feature object identifiers must not be reused, even when a feature has been deleted.

3.2 Standard features and attributes

Only features, attributes and enumerations which are defined in the IENC Feature Catalogue at http://ienc.openecdis.org may be used in an IENC.

3.3 Features permitted for use in IENC and their geometric primitives

The geometric primitives of the features permitted for use in IENC can be found in the Inland ENC Encoding Guide.

3.4 Meta features

The maximum use must be made of meta features to reduce the attribution on individual features. In a base data set (EN Application profile, see clause 6.3), some meta features are mandatory (see Inland ENC Encoding Guide).

3.5 Geo and meta feature attributes

3.5.1 Missing enumerations

In a base data set (EN application profile), when an attribute code is present but the enumeration is missing, it means that the producer wishes to indicate that this enumeration is unknown.

In a revision data set (ER application profile), when an attribute code is present but the enumeration is missing it means:

- that the enumeration of this attribute is to be replaced by an unknown enumeration if it was present in the original data set,
- that an unknown enumeration is to be inserted if the attribute was not present in the original data set.

In both cases the missing enumeration is encoded by the means described in S-57 Part 3, clause 2.1.

3.5.2 Mandatory attributes

For mandatory attributes of features see Inland ENC Encoding Guide.

3.5.3 Prohibited attributes

not applicable.

3.5.4 Numeric enumerations

Floating point or integer enumerations must not be padded by non-significant zeroes.

E.g.: For a signal period of 2.5 sec, the enumeration of SIGPER must be 2.5 and not 02.500.

3.5.5 Text enumerations

The lexical level used for the "Feature Record Attribute" [ATTF] field must be 1 (ISO 8859-1). Lexical level 1 or 2 may be used for the "Feature Record National Attribute" [NATF] field. Format effecting (C0) characters as defined in S-57 Part 3, Annex B are prohibited. The delete character is only used in the update mechanism (see S-57 part 3, clause 8.4.2.2.a and 8.4.3.2.a).

3.5.6 Hierarchy of meta data

The following table indicates:

- individual attributes that supersede meta feature attributes,
- meta feature attributes that supersede the data set subfields (see clauses 6.3.2 and 6.4.2).

Field	Subfield	Meta feature class	Meta feature attribute	Geo or spatial feature attribute
DSPM	VDAT	m_vdat	Verdat	verdat
DSPM	SDAT	m_sdat	Verdat	verdat
DSPM	CSCL	M_CSCL	CSCALE	
		m_nsys	Marsys	marsys
		M_QUAL	CATZOC	POSACC,SOUACC and TECSOU
		M_QUAL	SOUACC	SOUACC
		M_QUAL	POSACC	POSACC
		M_SREL	QUASOU	QUASOU
		M_SREL	SURATH	SORIND
		M_SREL	SUREND	SORDAT
		M_SREL	SURSTA	SORDAT
		M_SREL	TECSOU	TECSOU

When there is no meta feature attribute, an individual attribute can supersede a data set subfield.

It is prohibited to use an attribute on an individual feature, if this attribute has the same enumeration as the general enumeration defined by the meta feature or the equivalent data set subfield.

It is prohibited to use a meta feature, if the information given by this meta feature is the same as the enumeration given by the equivalent data set subfield.

3.6 Cartographic features

not applicable.

3.7   Time varying features

The IENC may contain information about magnetic variation, tides, tidal streams and currents. The IENC may contain time independent depth information in accordance with the Inland ENC Encoding Guide.

3.8   Geometry

Edges must be encoded using SG2D fields only. ARCC fields (curves) must not be used. Despite the saving in data volume offered by the use of arcs/curves, the disadvantages are such (e.g. during updating, generating warnings/alarms) that they must not be used for IENC.

Linear features must not be encoded at a point density greater than 0,3 mm at compilation scale.

The presentation of symbolised lines may be affected by line length. Therefore, the encoder must be aware that splitting a line into numerous small edges may result in poor symbolisation.

In certain circumstances, the symbolisation of an edge may need to be suppressed. This is done using the value {1} in the "Masking Indicator" [MASK] subfield of the "Feature Record to Spatial Record Pointer" [FSPT] field. If the value in the "Usage Indicator" [USAG] subfield is set to {3} (exterior boundary truncated by the data limit), the MASK subfield must be set to {255} (null), in all other cases it must set to {2}.

3.9   Relationships

There are two ways to define relationships between features:
-     nominated master feature record,
-     collection features of classes "aggregation" (C_AGGR), or "association" (C_ASSO).

The use of the Catalogue Cross Reference record is prohibited.

All hierarchical relationships (master to slave) must be encoded by using a nominated "master" feature record carrying the pointers to the "slave" features in the "Relationship Indicator" [RIND] subfield in the "Feature Record to Feature Object Pointer" [FFPT] field with the value {2} = slave.

All association or aggregation relationships using collection features are assumed to be peer to peer. The "Relationship Indicator" [RIND] subfield of these collection feature records must be {3} = peer.

The use of these relationships is described in the Encoding Guide.

3.10   Groups

There are two groups defined for IENC. These are Group 1 (skin of the earth) and Group 2 for all other geo feature objects.

The group number is indicated in the "Group" [GRUP] subfield of the "Feature Record Identifier" [FRID] field.

3.10.1 Group 1 (skin of the earth)

Each area covered by a meta feature M_COVR with CATCOV = 1 must be totally covered by a set of geo features of type area that do not overlap each other (the skin of the earth).

These features make up Group 1.

The list below contains the features that must always be in Group 1, if they appear in the dataset and if they are of type area.

DEPARE, depare, DRGARE, FLODOC, HULKES, LNDARE, PONTON, UNSARE;

flodoc, hulkes and ponton are not Group 1 features.

3.10.2 Group 2 (all other features)

All feature objects which are not in Group 1 are in Group 2.

3.11 Language and alphabet

3.11.1 Language

See Inland ENC Encoding Guide.

3.11.2 Use of lexical level 2

If the national language cannot be expressed in lexical levels 0 or 1, the following rules apply:
- the exact spelling in the national language is encoded in the "National Attributes" [NATF] field using lexical level 2.
- translated text, including transliterated or transcribed national geographic names is encoded in the "International Attributes" [ATTF] field using lexical level 0 or 1.

Where possible international standards should be used for the transliteration of non-Latin alphabets.

4. Cartographic framework

4.1 Horizontal datum

The horizontal datum must be WGS 84. Therefore, the "Horizontal Geodetic Datum" [HDAT] subfield in the "Data Set Parameter" [DSPM] field must have the value of {2}.

The mariner may have to display information other than IENC data and IENC updates. In cases where this information is based on a horizontal datum other than WGS 84, it can be converted to WGS 84 by means of the meta feature Horizontal datum shift parameter (M_HOPA).

In the case that the data are transformed to WGS-84 from a local datum the responsible authority shall define the area where the local transformation parameters apply. Within this area, the difference between transformed coordinates and the surveyed WGS-84 coordinates may not exceed 0,5 m. For approval purposes, the responsible authority shall define appropriate reference points (surveyed WGS-84 coordinates) preferably exactly at the limit line of two adjacent areas. Reference points, transformation parameters and the algorithm shall be published and shall be the basis for IENC production for that area.

4.2 Vertical and sounding datum

The various levels which are used on paper charts for elevations and soundings will be used. The default values are encoded in the "Vertical Datum" [VDAT] subfield and the "Sounding Datum" [SDAT] subfield in the "Data Set Parameter" [DSPM] field.

4.3 Projection

No projection is used, therefore the "Data Set Projection" [DSPR] field must not be used. Coordinates must be encoded as geographical positions (latitude, longitude).

4.4 Units

Units to be used in an IENC are:
- Position: latitude and longitude in decimal degrees (converted into integer values, see below).
- Depth: metres.
- Height: metres.
- Positional accuracy: metres.
- Distance: nautical miles, statute miles, kilometres or metres as defined in the Feature Catalogue.

The default values for depth units, height units and positional accuracy units are encoded in the "Units of Depth Measurement" [DUNI], "Units of Height Measurement" [HUNI] and "Units of Positional Accuracy" [PUNI] subfields in the "Data Set Parameter" [DSPM] field.

Latitude and longitude values are converted from decimal degrees to integers by means of the "Coordinate Multiplication Factor" [COMF] subfield value in the "Data Set Parameter" [DSPM] field. The integer values are encoded in the "Coordinate in Y-axis" [YCOO] subfield and the "Coordinate in X-axis" [XCOO] subfield. The number of decimal digits is chosen by the data producer and is valid throughout the data set.

E.g.: If the producer chooses a resolution of 0.0001° (10-4), then the value of COMF is 10 000 (104).

A longitude = 34.5678° is converted into XCOO = longitude * COMF = 34.5678*10 000 = 345678.

The integer value of the converted coordinate is encoded in binary form.

Depths are converted from decimal meters to integers by means of the "3-D (Sounding) Multiplication Factor" [SOMF] subfield value in the "Data Set Parameter" [DSPM] field. The integer values are encoded in the "3-D (Sounding) Value" [VE3D] subfield. Soundings are never encoded with a resolution greater than one decimetre, so the value of SOMF must be 10 encoded in binary form.

5.   Provision of data

5.1   Implementation

The binary implementation of S-57 must be used for IENC. Therefore, the "Implementation" [IMPL] subfield of the "Catalogue Directory" [CATD] field must be set to "BIN" for the data set files.

5.2   Compression

The use of compression algorithms is prohibited.

5.3   Encryption

IENC data may be protected from unauthorised use, possibly by the use of encryption algorithms.

5.4   Exchange set

5.4.1   Content of the exchange set

The records defined in the main part of this standard are grouped in two file types: catalogue and data set files.

An exchange set is composed of one and only one catalogue file and at least one data set file. Text and picture files may also be included in the IENC exchange set. These files may be included in an exchange set by a data producer to provide additional information such as that normally contained in sailing directions or coastal pilots. For format of these files see Encoding Guide.

An exchange set may also contain a README file.

```
Exchange set
        |
        |--<1>-- README file
        |
        |--<1>-- Catalogue file
        |
        |--<R>-- Data set file
        |
        |--<R>-- Text file
        |
        |--<R>-- Picture file
```

The README file is an optional ASCII file of general information.
The catalogue file acts as the table of contents for the exchange set.

Each data set file contains data for one cell (see clause 2.2). This includes:
-       data set descriptive information that is specific to the data set,
-       the description and location of the real-world entities.

Text and picture files do not conform to ISO/IEC 8211 and are not described. These files are specific to this Product Specification.

5.4.2 Volume naming

An exchange set may be split across several media volumes, therefore, each media volume must be uniquely identified within the exchange set. A file must not be split across volumes. Individual volumes must conform to the following naming convention:
VSSXNN

where:

V   is the mandatory first character.
SS   is the sequence number of the specific volume within the exchange set.
X   is the mandatory separator character.
NN   is the total number of media volumes within the exchange set.

For example, volume one of a three volume exchange set would be named V01X03.

5.4.3 Directory structure

The following directory structure is mandatory.

On each volume within an exchange set there must be a root directory called ENC_ROOT. The catalogue file for the exchange set must be in the ENC_ROOT directory of the first volume of the exchange set. The ENC_ROOT directory of the first volume may also contain a README file, containing ASCII text. Further directories and sub-directories may be defined under the root directory on any volume in the exchange set. The following example shows an example directory structure for a MS-DOS volume:

Volume in drive A is V01X02

Directory of A:\ENC_ROOT

```
.                    <DIR>                  09-15-96 12:40p          .
..                   <DIR>                  09-15-96 12:40p          ..
CATALOG      031          1,584            09-15-96 12:46p      CATALOG.031
NL600021     000          45,584           09-15-96 12:50p      NL600021.000
NL600021     001          1,095            09-15-96 12:54p      NL600021.001
NL600021     002          722              09-15-96 12:54p      NL600021.002
README       TXT          504              09-15-96 12:44p      README.TXT
        5 file(s)      49,489 bytes
        2 dir(s)       1,405,952 bytes free
```

For each file in the exchange set the catalogue file must contain the name of the volume on which it is held and the full path name relative to the root directory of that volume. The full path name relative to the root directory must be encoded in the FILE subfield of the "Catalogue Directory" [CATD] field. The LFIL subfield of the CATD field may be used for other purposes. The full path name of the NL600021.000 file shown in the example is NL600021.000.

5.5   Data sets

Four kinds of data sets may be produced:

- new data set: no IENC data has previously been produced for this area and for the same navigational purpose.
- update: changing some information in an existing data set.
- re-issue of a data set: including all the updates applied to the original data set up to the date of the reissue. A re-issue does not contain any new information additional to that previously issued by updates.
- new edition of a data set: including new information which has not been previously distributed by updates.

Each new data set, re-issue, or new edition is called a base cell file.

A data set containing updates to one base cell file is called an update cell file.

5.6   File naming

5.6.1 README file

README.TXT is the mandatory name for this file.

5.6.2 Catalogue file

The catalogue file of the exchange set must be named CATALOG.EEE.

Where EEE is the edition number of S-57 used for this exchange set, i.e. 031 for the currently [2006] used edition (3.1).

No other file may be named CATALOG.

5.6.3 Data set files

A valid data set file must be uniquely identified world wide by its name.

The data set files are named according to the specifications given below:

```
CCPRRRRR.EEE
|  |  |       |
|  |  |       |-----  EEE    = update number
|  |  |
|  |  |----------------  RRRRR  = waterway code and waterway distance (kilometre) or
|  |                             identification of the equivalent paper chart number (in Brazil)
|  |--------------------  P      = navigational purpose (usage)
|------------------------  CC     = producer code
```

The main part forms an eight-character identifier where:

The first two characters (CC) identify the producer. This list is published in the S-100 registry at http://registry.iho.int. The list includes all producers which aren't already mentioned in IHO S-62.

The third character (P) indicates the navigational purpose (see clause 2.1).

The letter "L" (in the position "usage") indicates, that the cell is displayed as overlay over other cells within a range of usages. The range of usages of overlay cells is indicated in the Data Set Identification Field of the header of the overlay cell (see S57, Part 3, Data Structure, ch. 7.3.1.1). The 8th bit of the intended usage subfield (INTU) has to be set. The other seven bits describe the range:

Definition of range	from	to
Mathematical description	(INTU-128) div 10	(INTU-128) mod 10
Example (INTU=207)	(207-128) div 10 = 7	(207-128) mod 10 = 9

- The fourth to eighth characters (RRRRR) identify the waterway and the waterway distance.
- For waterways with a length of more than 999 km: e.g. D1923
- For waterways with a length of more than 99 km: e.g. RH123
- For waterways with a length of more than 9 km: e.g. DCC23

The use of the fourth to eighth characters is only a recommendation. In Brazilian waterways they identify the equivalent paper chart number.

The primarily produced base cell file has the extension (EEE) 000.

The extension is used for updating. Update cell files have the same name as the original base cell file, with an extension number greater than or equal to 001. They cover the same geographical area as the base cell file to which they apply.

5.6.4 Text and picture files

The text and picture files must be named according to the Inland ENC Encoding Guide.

5.7 Updating

In order to ensure that updates are incorporated into the SENC in the correct sequence without any omission, the file extension and a number of subfields in the "Data Set Identification" [DSID] field are used in the following way:

file extension   every new data set, re-issue or new edition must have a "000" extension. For update cell files the extension is the number of the update, ranging from "001" to "999". These numbers must be used sequentially, without omission. Number "001" is the first update after a new data set or a new edition, but not after a re-issue. The update sequence is not interrupted by a re-issue. After a re-issue, subsequent updates may be incorporated into the SENC created from this re-issue or to the SENC created from the original data and kept continuously updated.

edition number   when a data set is initially created, the edition number 1 is assigned to it. The edition number is increased by 1 at each new edition. Edition number remains the same for a re-issue.

update number   update number 0 is assigned to a new data set. The first update cell
                       file associated with this new data set must have update number 1.
                       The update number must be increased by one for each consecutive
                       update, until a new edition is released. The new edition must have
                       update number 0. A re-issue of a data set must have the update
                       number of the last update applied to the data set. In the case of an
                       update cell file the file extension is the same as the update number.

update application   this date is only used for the base cell files (i.e. new data sets, re-
                       issue and new edition), not update cell files. All updates dated on or
                       before this date must have been applied by the producer.

issue date   date on which the data was made available by the data producer.

The Table below gives examples of the way to manage the file extension, the "Edition Number"
[EDTN], the "Update Number" [UPDN], the "Update Application Date" [UADT] and the "Issue
Date" [ISDT] subfields.

Event	File extension	EDTN	UPDN	UADT	ISDT
New data set	.000	1	0	19950104	19950104
Update 1	.001	1	1	prohibited	19950121
Update 2	.002	1	2	prohibited	19950225
...					
Update 31	.031	1	31	prohibited	19950905
Re-issue of a data set	.000	1	31	19950905	19950910
Update 32	.032	1	32	prohibited	19951023
...					
Update 45	.045	1	45	prohibited	19951112
New edition	.000	2		19951201	19951201
Update 1 to edition 2	.001	2	1	prohibited	19960429
...					

This example table relates to the specifications given in S-52 App 1, "Guidance on Updating the
Electronic Navigational Chart", in the following way:

- The update information encoded in each individual cell file is called a sequential update.

- The collection of the update information encoded in the update cell files which have been
  issued since the last new data set, the last re-issue of a data set or since the last update
  was applied to the SENC is called a cumulative update. In the example, the cumulative
  update for the new data set starts with update number 1. The cumulative update for the re-
  issue of a data set starts with update number 32. The cumulative update for a data set to
  which update number n has been applied starts with update number n+1.

- The update information which has been incorporated in a re-issue of a data set is called a compilation update.

Each re-issue or new edition of a data set must have the same name as the base cell file which it replaces.

The update mechanism is described in S-57 Part 3, clause 8.

In order to delete a data set, an update cell file is created, containing only the Data Set General Information record with the "Data Set Identifier" [DSID] field. The "Edition Number" [EDTN] subfield must be set to 0. This message is only used to cancel a base cell file.

To inform the mariner that a new edition is available, an update cell file is created, containing only the Data Set General Information record with the "Data Set Identifier" [DSID] field. The "Edition Number" [EDTN] subfield must contain a value one higher than the current edition number.

In order to modify a text, picture or application file, a new file with the same name is created.

When a feature pointing to a text, picture or application file is deleted or updated so that it no longer references the file, the ECDIS software should check to see whether any other feature reference the same file, before that file is deleted.

An exchange set may contain base cell files and update cell files for the same cells. Under these circumstances the update cell files must follow on in the correct sequential order from the last update applied to the base cell file.

The record version of each feature or vector record is indicated in the "Record Version" [RVER] subfield of the "Feature Record Identifier" [FRID] field or the "Vector Record Identifier" [VRID] field. At each update of a record, this version number is incremented by 1.

5.8   Media

Data must be made available on CD-ROM . It may also be made available on any other physical media by private arrangement.

Data may be provided via telecommunication links.

5.9   Error detection

File integrity checks are based on the CRC-32 algorithm (a 32 bit Cyclic Redundancy Check algorithm) as defined in ANSI/IEEE Standard 802.3 (= IEEE Standards for Local Area Networks, Carrier Sense Multiple Access with Collision Detection (CSMA/CD) Access Method and Physical Layer Specifications).

5.9.1 Implementation

The checksums for each data set are held in the "CRC" [CRCS] subfield of the "Catalogue Directory" [CATD] field. They allow the integrity of each file in the exchange set to be checked on receipt. The CRC value computed on the received file must the same as the CRC value transmitted.

The CRC values are recorded in ASCII as a hexadecimal number least significant byte first.

5.9.2 Processing

Encoding is defined by the following generating polynomial :

$$G\,(x) = \ x^{32} + \ x^{26} + \ x^{23} + \ x^{22} + \ x^{16} + \ x^{12} + \ x^{11} + \ x^{10} + \ x^8 + \ x^7 + \ x^5 + \ x^4 + \ x^2 + x + 1$$

Processing is applied to relevant files as they appear in the exchange set.

The CRC value of the file is defined by the following process :
1. The first 32 bits of the data are complemented.
2. The n bits of the data are then considered to be the coefficients of a polynomial M(x) of degree n^{-1}.
3. M(x) is multiplied by x^{32} and divided by G(x), producing a remainder R(x) of degree < 31.
4. The coefficients of R(x) are considered to be a 32-bit sequence.
5. The bit sequence is complemented and the result is the CRC.

The hexadecimal format of CRCs are converted to ASCII characters and stored in the "Catalogue Directory" [CATD] field.

An example of coding in C language is given in Annex B of the ENC Product Specification.

6.   Application profiles

6.1   General
The application profiles define the structure and content of the catalogue file and data set file in an exchange set.

6.1.1 Catalogue and data set files

These files are composed of the records and fields defined in the following tree structure diagrams (see clauses 6.2.1, 6.3.1 and 6.4.1).

The order of data in each base or update cell file is described below :

Data set file
    Data set general information record
    Data set geographic reference record (for EN application profile)
    Vector records
        Isolated nodes (SG3D)
        Isolated nodes (SG2D)
        Connected nodes
        Edges
    Feature records
        Meta features
        Geo features (ordered from slave to master)
        Collection features

This order of records will enable the import software to check that the child record exists each time the parent record references it (i.e. it will already have read the child record so it will know if it exists or not).

6.1.2 Records

Records and fields that do not appear in the following tree structure diagrams are prohibited. The order of records in the files must be the same as that described in these tree structure diagrams.

The combination of the file name and the "Name" of the record must provide a unique world-wide identifier of the record.

6.1.3 Fields

For base cell files, some fields may be repeated (indicated by <R>) and all of their content may be repeated (indicated by *). In order to reduce the volume of data, the encoder should repeat the sequence of subfields, in preference to creating several fields.

6.1.4 Subfields

Mandatory subfields must be filled by a non-null value.

Prohibited subfields must be encoded as missing subfields values (see S-57 Part 3, clause 2.1). The exact meaning of missing enumerations is defined in clause 3.5.1.

In the tables following the tree structure diagrams, mandatory subfields are shown by "M" in the "use" column and prohibited subfields by "P" in the same column. If there is nothing in this column, it means that the use of this subfield is optional. When a subfield value is prescribed, it is indicated in the "value" column. The "comment" column contains general comments and an indication of whether the subfield is ASCII or binary coded.

6.2 Catalogue file

The catalogue has the same structure for EN and ER application profiles.

6.2.1 Catalogue file structure

```
Catalogue file
  |
  |--<R>-Catalogue Directory record
        |
        |--0001-- ISO/IEC 8211 Record identifier
              |
              |--<1>-- CATD - Catalogue directory field
```

6.2.2 Catalogue Directory field - CATD

NB : All subfield values are encoded as ASCII.

Tag	subfield name	use	value	comment
RCNM	Record name	M	CD	
RCID	Record identification number	M		
FILE	File name	M		full path from ENC_ROOT directory
LFIL	File long name			
VOLM	Volume	M		name of volume on which file appears
IMPL	Implementation	M	ASC BIN TXT TIF ...	for the catalogue file for the data set files for ASCII text files (including the README.TXT file) for picture files or any other usual file extension for file provided through private agreements (see clause 5.6.4)
SLAT	Southernmost latitude			mandatory for data set files
WLON	Westernmost longitude			mandatory for data set files
NLAT	Northernmost latitude			mandatory for data set files
ELON	Easternmost longitude			mandatory for data set files
CRCS	CRC	M		except for README and catalogue files
COMT	Comment			

6.3 EN application profile

The EN application profile applies to any base cell file (i.e. new data set, re-issue and new edition of a data set).

6.3.1 Base cell file structure

```
Base cell file
 |
 |--<1>---Data Set General Information record
 |   |
 |   |--0001 - ISO/IEC 8211 Record Identifier
 |   |    |
 |   |    |--<1>-- DSID - Data Set Identification field
 |   |              |
 |   |              |--<1>--DSSI   - Data Set Structure Information field
 |
 |--<1>---Data Set Geographic Reference record
 |   |
 |   |--0001 - ISO/IEC 8211 Record Identifier
 |   |    |
 |   |    |--<1>--DSPM - Data Set Parameter field
 |
 |--<R>--Vector record
 |   |
 |   |--0001 - ISO/IEC 8211 Record Identifier
 |   |    |
 |   |    |--<1>--VRID - Vector Record Identifier field
 |   |              |
 |   |              |--<R>--ATTV*   - Vector Record Attribute field
 |   |              |
 |   |              |--<R>--VRPT*   - Vector Record Pointer field
 |   |              |
 |   |              |     |--<R>--SG2D*    - 2-D Coordinate field
 |   |              |--or---|
 |   |                    |--<R>--SG3D*     - 3-D Coordinate (Sounding array) field
 |
 |--<R>--Feature record
     |
     |--0001 - ISO/IEC 8211 Record Identifier
        |
        |--<1>--FRID - Feature Record Identifier field
                 |
                 |--<1>--FOID      - Feature Object Identifier field
                 |
                 |--<R>--ATTF*    - Feature Record Attribute field
                 |
                 |--<R>--NATF*    - Feature Record National Attribute field
                 |
                 |--<R>--FFPT*    - Feature Record to Feature Object Pointer field
                 |
                 |--<R>--FSPT*    - Feature Record to Spatial Record Pointer field
```

6.3.2 Field content (EN)

6.3.2.1 Data set identification field - DSID

NB: Subfield values are encoded as ASCII or binary as indicated.

IENCs are considered as an independent product besides ENCs. To recognise a S-57 dataset as an IENC the content of the subfields PRSP and PRED differs from S-57.

tag	subfield name	use	value	comment
RCNM	Record name	M	{10}	= DS, binary
RCID	Record identification number	M		Binary
EXPP	Exchange purpose	M	{1}	Data set is new, binary
INTU	Intended usage	M	{1} to {9}, {A}	Navigational purpose, see clause 2.1 and 5.6.3, binary
DSNM	Data set name	M		File name with extension excluding path, ASCII
EDTN	Edition number	M		See clause 5.7, ASCII
UPDN	Update number	M		ASCII
UADT	Update application date	M		ASCII
ISDT	Issue date	M		ASCII
STED	Edition number of S-57	M	03.1	ASCII
PRSP	Product Specification	M	{10}	= IENC, binary
PSDN	Product specification description	P		Empty, ASCII
PRED	Product Specification Edition Number	M	2.4	=ASCII
PROF	Application profile identification	M	{1}	= EN, binary
AGEN	Producing agency	M		Binary
COMT	Comment			ASCII

6.3.2.2 Data Set Structure Information field – DSSI

NB : All subfield values are encoded as binary.

Tag	subfield name	use	Value	comment
DSTR	Data structure	M	{2}	= chain node
AALL	ATTF lexical level	M	{0} or {1}	
NALL	NATF lexical level	M	{0}, {1} or {2}	
NOMR	Number of meta records	M		
NOCR	Number of cartographic records	M	{0}	cartographic records are not permitted
NOGR	Number of geo record	M		
NOLR	Number of collection records	M		
NOIN	Number of isolated node records	M		

Tag	subfield name	use	Value	comment
NOCN	Number of connected node records	M		
NOED	Number of edge records	M		
NOFA	Number of face records	M	{0}	faces are not permitted in chain node structure

6.3.2.3 Data Set Parameter field - DSPM

NB : Subfield values are encoded as ASCII or binary as indicated.

Tag	subfield name	use	Value	comment
RCNM	Record name	M	{20}	= DP, binary
RCID	Record identification number	M		binary
HDAT	Horizontal geodetic datum	M	{2}	= WGS 84, binary
VDAT	Vertical datum	M		binary
SDAT	Sounding datum	M		binary
CSCL	Compilation scale of data	M		binary
DUNI	Units of depth measurement	M	{1}	=metres, binary
HUNI	Units of height measurement	M	{1}	=metres, binary
PUNI	Units of positional accuracy	M	{1}	=metres, binary
COUN	Coordinate units	M	{1}	= lat/long, binary
COMF	Coordinate multiplication factor	M		binary, see clause 4.4
SOMF	3-D (sounding) multiplication factor	M	{10}	binary, see clause 4.4
COMT	Comment			ASCII

6.3.2.4 Vector Record Identifier field - VRID

NB: All subfield values are encoded as binary.

Tag	subfield name	use	value	Comment
RCNM	Record name	M	{110} or {120} or {130}	= VI, isolated node = VC, connected node = VE, edge
RCID	Record identification number	M		
RVER	Record version	M		
RUIN	Record update instruction	M	{1}	= insert

6.3.2.5 Vector Record Attribute field - ATTV

NB : Subfield values are encoded as ASCII or binary as indicated.

Tag	subfield name	use	value	comment
ATTL	Attribute label/code	M		binary code for an attribute
ATVL	Enumeration	M		ASCII value. Missing enumeration = attribute is relevant but value is unknown.

6.3.2.6 Vector Record Pointer field - VRPT

NB : All subfield values are encoded as binary.

Tag	subfield name	use	value	comment
NAME	Name	M		
ORNT	Orientation	M	{255}	= null
USAG	Usage indicator	M	{255}	= null
TOPI	Topology indicator	M	{1} or {2}	= beginning node = end node
MASK	Masking indicator	M	{255}	= null

6.3.2.7 2-D Coordinate field - SG2D

NB : All subfield values are encoded as binary.

Tag	subfield name	use	value	comment
YCOO	Coordinate in Y axis	M		latitude (see clause 4.4)
XCOO	Coordinate in X axis	M		longitude (see clause 4.4)

6.3.2.8 3-D Coordinate (Sounding array) field - SG3D

NB : All subfield values are encoded as binary.

Tag	subfield name	use	value	comment
YCOO	Coordinate in Y axis	M		latitude (see clause 4.4)
XCOO	Coordinate in X axis	M		longitude (see clause 4.4)
VE3D	3-D (sounding) value	M		value of sounding (see clause 4.4)

6.3.2.9 Feature Record Identifier field - FRID

NB : All subfield values are encoded as binary.

Tag	subfield name	use	value	comment
RCNM	Record name	M	{100}	= FE
RCID	Record identification number	M		
PRIM	Feature geometric primitive	M	{1} or {2} or {3} or {255}	= point = line = area = no geometry
GRUP	Group	M	{1} or {2}	Group 1, see clause 3.10.1 Group 2, see clause 3.10.2
OBJL	Feature label	M		binary code for an feature class
RVER	Record version	M		
RUIN	Record update instruction	M	{1}	= insert

6.3.2.10 Feature Object Identifier field - FOID

NB : All subfield values are encoded as binary.

Tag	subfield name	use	value	comment
AGEN	Producing agency	M		
FIND	Feature identification number	M		
FIDS	Feature identification subdivision	M		

6.3.2.11 Feature Record Attribute field - ATTF

NB : Subfield values are encoded as ASCII or binary as indicated.

Tag	subfield name	use	value	comment
ATTL	Attribute label/code	M		binary code for an attribute
ATVL	Enumeration			ASCII value. Missing enumeration = attribute is relevant but value is unknown.

6.3.2.12 Feature Record National Attribute field - NATF

NB : Subfield values are encoded as ASCII or binary as indicated.

Tag	subfield name	use	value	comment
ATTL	Attribute label/code	M		binary code for an attribute
ATVL	Enumeration			ASCII value. Missing enumeration = attribute is relevant but value is unknown

6.3.2.13 Feature Record to Feature Object Pointer field - FFPT

NB : Subfield values are encoded as ASCII or binary as indicated.

Tag	subfield name	use	value	comment
LNAM	Long name	M		binary
RIND	Relationship indicator	M	{2} or {3}	= slave, binary = peer, binary
COMT	Comment			ASCII

6.3.2.14 Feature Record to Spatial Record Pointer field - FSPT

NB : All subfield values are encoded as binary.

Tag	subfield name	use	value	comment
NAME	Name	M		
ORNT	Orientation	M	{1} or {2} or {255}	= forward = reverse = null
USAG	Usage indicator	M	{1} or {2} or {3} or {255}	= exterior = interior = exterior boundary, truncated by the data limit = null
MASK	Masking indicator	M	{1} or {2} or {255}	= mask = show = null

6.4   ER application profile

The ER application profile only applies to update cell files.

6.4.1   Update cell file structure

```
Update cell file
  |
  |--<1>--Data Set General Information record
  |    |
  |    |--0001 - ISO/IEC 8211 Record Identifier
  |        |
  |        |--<1>--DSID - Data Set Identification field
  |                    |
  |                    |--<1>--DSSI - Data Set Structure Information field
  |
  |--<R>--Vector record
  |    |
  |    |--0001 - ISO/IEC 8211 Record identifier
  |        |
  |        |--<1>--VRID - Vector Record Identifier field
  |                    |
  |                    |--<R>--ATTV* - Vector Record Attribute field
  |                    |
  |                    |--<1>--VRPC  - Vector Record Pointer Control field
  |                    |
  |                    |--<R>--VRPT* - Vector Record Pointer field
  |                    |
  |                    |--<1>--SGCC  - Coordinate Control field
  |                    |
  |                    |    |--<R>--G2D* - 2-D Coordinate field
  |                 |---or-- |
  |                    |--<R>--G3D* - 3-D Coordinate (Sounding array) field
  |
  |--<R>--Feature record
        |
        |--0001 - ISO/IEC 8211 Record identifier
            |
            |--<1>--FRID - Feature Record Identifier field
                        |
                        |--<1>--FOID   - Feature Object Identifier field
                        |
                        |--<R>--ATTF* - Feature Record Attribute field
                        |
                        |--<R>--NATF* - Feature Record National Attribute field
                        |
                        |--<1>--FFPC  - Feature Record to Feature Object Pointer Control field
                        |
                        |--<R>--FFPT* - Feature Record to Feature Object Pointer field
                        |
                        |--<1>--FSPC  - Feature Record to Spatial Record Pointer Control field
                        |
                        |--<R>--FSPT* - Feature Record to Spatial Record Pointer field
```

6.4.2   Field content (ER)

6.4.2.1 Data Set Identification Field - DSID

NB: Subfield values are encoded as ASCII or binary as indicated.

IENCs are considered as an independent product besides ENCs. To recognise a S-57 dataset as an IENC the content of the subfields PRSP and PRED differs from S-57.

tag	subfield name	use	value	comment
RCNM	Record name	M	{10}	= DS, binary
RCID	Record identification number	M		Binary
EXPP	Exchange purpose	M	{2}	Data set is a revision, binary
INTU	Intended usage	M	{1} to {9}, {A}	Navigational purpose, see clause 2.1 and 5.6.3, binary
DSNM	Data set name	M		File name with extension excluding path, ASCII
EDTN	Edition number	M		See clause 5.7, ASCII
UPDN	Update number	M		ASCII
UADT	Update application date	M		ASCII
ISDT	Issue date	M		ASCII
STED	Edition number of S-57	M	03.1	ASCII
PRSP	Product Specification	M	{10}	= IENC, binary
PSDN	Product specification description	P		Empty, ASCII
PRED	Product Specification Edition Number	M	2.4	= ASCII
PROF	Application profile identification	M	{2}	= ER, binary
AGEN	Producing agency	M		Binary
COMT	Comment			ASCII

6.4.2.2 Data Set Structure Information field – DSSI

NB: All subfield values are encoded as binary.

Tag	subfield name	use	value	comment
DSTR	Data structure	M	{2}	= chain node
AALL	ATTF lexical level	M	{0} or {1}	
NALL	NATF lexical level	M	{0} or {1} or {2}	
NOMR	Number of meta records	M		
NOCR	Number of cartographic records	M	{0}	cartographic records are not permitted
NOGR	Number of geo records	M		
NOLR	Number of collection records	M		
NOIN	Number of isolated node records	M		
NOCN	Number of connected node records	M		
NOED	Number of edge records	M		
NOFA	Number of face records	M	{0}	faces are not permitted in chain node structure

6.4.2.3 Vector Record Identifier field - VRID

NB : All subfield values are encoded as binary.

Tag	subfield name	use	value	comment
RCNM	Record name	M	{110} or {120} or {130}	= VI, isolated node = VC, connected node = VE, edge
RCID	Record identification number	M		
RVER	Record version	M		
RUIN	Record update instruction	M	{1} or {2} or {3}	= insert = delete = modify

6.4.2.4 Vector Attribute field – ATTV

NB : Subfield values are encoded as ASCII or binary as indicated.

Tag	subfield name	use	value	comment
ATTL	Attribute label/code	M		binary code for an attribute
ATVL	Enumeration			ASCII value, missing enumeration = enumeration is deleted or unknown (see clause 3.5.1)

6.4.2.5 Vector Record Pointer Control field – VRPC

NB : All subfield values are encoded as binary.

Tag	subfield name	use	value	comment
VPUI	Vector record pointer update instruction	M	{1} or {2} or {3}	= insert = delete = modify
VPIX	Vector record pointer index	M		
NVPT	Number of vector record pointers	M		

6.4.2.6 Vector Record Pointer field – VRPT

NB : All subfield values are encoded as binary.

Tag	subfield name	use	value	comment
NAME	Name	M		
ORNT	Orientation	M	{255}	= null
USAG	Usage indicator	M	{255}	= null
TOPI	Topology indicator	M	{1} or {2}	= beginning node = end node
MASK	Masking indicator	M	{255}	= null

6.4.2.7 Coordinate Control field – SGCC

NB : All subfield values are encoded as binary.

Tag	subfield name	use	value	comment
CCUI	Coordinate update instruction	M	{1} or {2} or {3}	= insert = delete = modify
CCIX	Coordinate index	M		
CCNC	Number of coordinates	M		

6.4.2.8 2-D Coordinate field - SG2D

NB: All subfield values are encoded as binary.

Tag	subfield name	use	value	comment
YCOO	Coordinate in Y axis	M		latitude (see clause 4.4)
XCOO	Coordinate in X axis	M		longitude (see clause 4.4)

6.4.2.9 3-D Coordinate (Sounding array) field - SG3D

NB : All subfield values are encoded as binary.

Tag	subfield name	use	value	comment
YCOO	Coordinate in Y axis	M		latitude (see clause 4.4)
XCOO	Coordinate in X axis	M		longitude (see clause 4.4)
VE3D	3-D (sounding) value	M		value of sounding (see clause 4.4)

6.4.2.10 Feature Record Identifier field - FRID

NB : All subfield values are encoded as binary.

Tag	subfield name	use	value	comment
RCNM	Record name	M	{100}	= FE
RCID	Record identification number	M		
PRIM	Feature geometric primitive	M	{1} or {2} or {3} or {255}	= point = line = area = no geometry
GRUP	Group	M	{1} or {2}	Group 1, see clause 3.10.1 Group 2, see clause 3.10.2
OBJL	Feature label	M		binary code for an feature class
RVER	Record version	M		
RUIN	Record update instruction	M	{1} or {2} or {3}	= insert = delete = modify

6.4.2.11 Feature Object Identifier field - FOID

NB : All subfield values are encoded as binary.

Tag	subfield name	use	value	comment
AGEN	Producing agency	M		
FIND	Feature identification number	M		
FIDS	Feature identification subdivision	M		

6.4.2.12 Feature Record Attribute field - ATTF

NB : Subfield values are encoded as ASCII or binary as indicated.

Tag	subfield name	use	value	comment
ATTL	Attribute label/code	M		binary code for an attribute
ATVL	Enumeration			ASCII value. Missing enumeration = enumeration is deleted or unknown (see clause 3.5.1)

6.4.2.13 Feature Record National Attribute field - NATF

NB: Subfield values are encoded as ASCII or binary as indicated.

Tag	subfield name	use	value	Comment
ATTL	Attribute label/code	M		Binary code for an attribute
ATVL	Enumeration			ASCII value. Missing enumeration = enumeration is deleted.

6.4.2.14 Feature Record to Feature Object Pointer Control field - FFPC

NB: All subfield values are encoded as binary.

Tag	subfield name	use	value	Comment
FFUI	Feature object pointer update instruction	M	{1} or {2} or {3}	= insert = delete = modify
FFIX	Feature object pointer index	M		
NOPT	Number of feature object pointers	M		

6.4.2.15 Feature Record to Feature Object Pointer field – FFPT

NB : Subfield values are encoded as ASCII or binary as indicated.

Tag	subfield name	use	value	Comment
LNAM	Long name	M		Binary
RIND	Relationship indicator	M	{2} or {3}	= slave, binary = peer, binary
COMT	Comment			ASCII

6.4.2.16 Feature Record to Spatial Record Pointer Control field – FSPC

NB : All subfield values are encoded as binary.

Tag	subfield name	use	value	Comment
FSUI	Feature to spatial record pointer update instruction	M	{1} or {2} or {3}	= insert = delete = modify
FSIX	Feature to spatial record pointer index	M		
NSPT	Number of feature to spatial record pointers	M		

6.4.2.17 Feature Record to Spatial Record pointer field – FSPT

NB: All subfield values are encoded as binary.

Tag	subfield name	use	value	comment
NAME	name	M		
ORNT	orientation	M	{1} or {2} or {255}	= forward = reverse = null
USAG	usage indicator	M	{1} or {2} or {3} or {255}	= exterior = interior = exterior boundary, truncated by the data limit = null
MASK	Masking indicator	M	{1} or {2} or {255}	= mask = show = null

7. Maintenance

Every member of the Inland ECDIS Expert Group or the Inland ENC Harmonization Group (IEHG) is entitled to publish proposals for amendments or changes of
- this Product Specification for Inland ENCs including
- the IENC Feature Catalogue and
- the IENC Encoding Guide

on the IEHG discussion forum at http://ienc.openecdis.org. Each proposal has to contain an explanation, why the amendment or the change is needed.

Proposals for amendments of the IENC Feature Catalogue have to include a proposal for an amendment of the IENC Encoding Guide with regard to the use of these amendments.

The members of the Inland ECDIS Expert Group and the IEHG are requested to react as soon as possible. A veto against a proposal has to contain an explanation for the objection. If there is no veto within six weeks, the proposal is adopted. If there is a veto, there are the following possibilities to proceed:

- The party, which has transmitted the proposal, can decide to withdraw the proposal.
- If an updated proposal is transmitted, it is handled as a new proposal.
- If the party, which has transmitted the proposal, wants to keep up the original proposal without any changes, the proposal will be discussed and decided upon at the next meeting of the IEHG.

The members of the IEHG discussion forum, who have actively participated in the development of the Product Specification and its annexes within the twelve months before a meeting of the IEHG, are entitled to take part in this meeting.

Each new version of the Feature Catalogue for Inland ENC results in a new version of the Product Specification for Inland ENCs.

Appendix 1
IENC Feature Catalogue, Edition 2.4 (Corr.2), 2015-10-30

and

Appendix 2
Encoding Guide for Inland ENCs, Edition 2.4.1, 20 March 2018

(Distributed separately)

ANNEX 2
PRESENTATION LIBRARY FOR INLAND ENCS

Contents

1.   Lookup Tables

The up-to-date Look-up Tables for areas, lines and points are published at
http://ienc.openecdis.org.

2.   Conditional Symbology Procedures

2.1   Top marks

The CS (TOPMAR01) of S-52 has to be modified because in this CS it is checked on which
structure the top mark is fixed. Since the ENC feature BOYLAT was copied, in the CS the
feature boylat has to be added to the list of floating structures. If the top mark is located on a
boylat the symbols TOPMA1* have to be drawn according the top shape and colour.

2.2   Daymars

A new CS DAYMAR01 has to be introduced. This CS is similar to the CS TOPMAR01 (see
clause 2.1) with the exception that there is no need for the distinction of floating and fixed
structures, because daymarks exists only for beacons, i.e. fixed structures.

2.3   Restricted areas

Since the ENC feature RESARE and the attribute RESTRN were copied the CS (RESARE03)
of S-52 has to be modified because in this CS the values of the attribute RESTRN are checked.
That means that in the case that RESTRN is not given it has to be checked for the copied
attribute restrn instead.

2.4   Lights

The CS for LIGHTS (LIGHTS05) of S-52 is affected because in this CS there is a check whether
a light is located on a floating object or on a fixed object. The list of floating platforms must be
extended by the new feature "boylat". To avoid a copy of this CS which would lead to a copy of
the official feature LIGHTS, the Inland ECDIS manufacturers have to extend the official CS for
LIGHTS as described above.

2.5   Bridges

A new CS for bridges has to be introduced to be able to indicate for bridge arches
a)   the maximum vertical clearance depending on the given beam
b)   the available space depending on the given beam and air draft.

The condition for this is the encoding of a bridge arch as it is described in the Encoding Guide.

The Inland ECDIS manufacturers have to calculate the vertical clearance of aggregated bridge
objects according to the given beam of the ship.

Maximum available vertical clearance depending on the beam

Available space depending on the air draft

- Increased beam
- Same air draft

-> reduced max. vertical clearance
-> same available space

- Same beam
- Increased air draft

-> same max. vertical clearance
-> reduced available space

- Increased beam
- Increased air draft

-> reduced max. vertical clearance
-> reduced / no available space
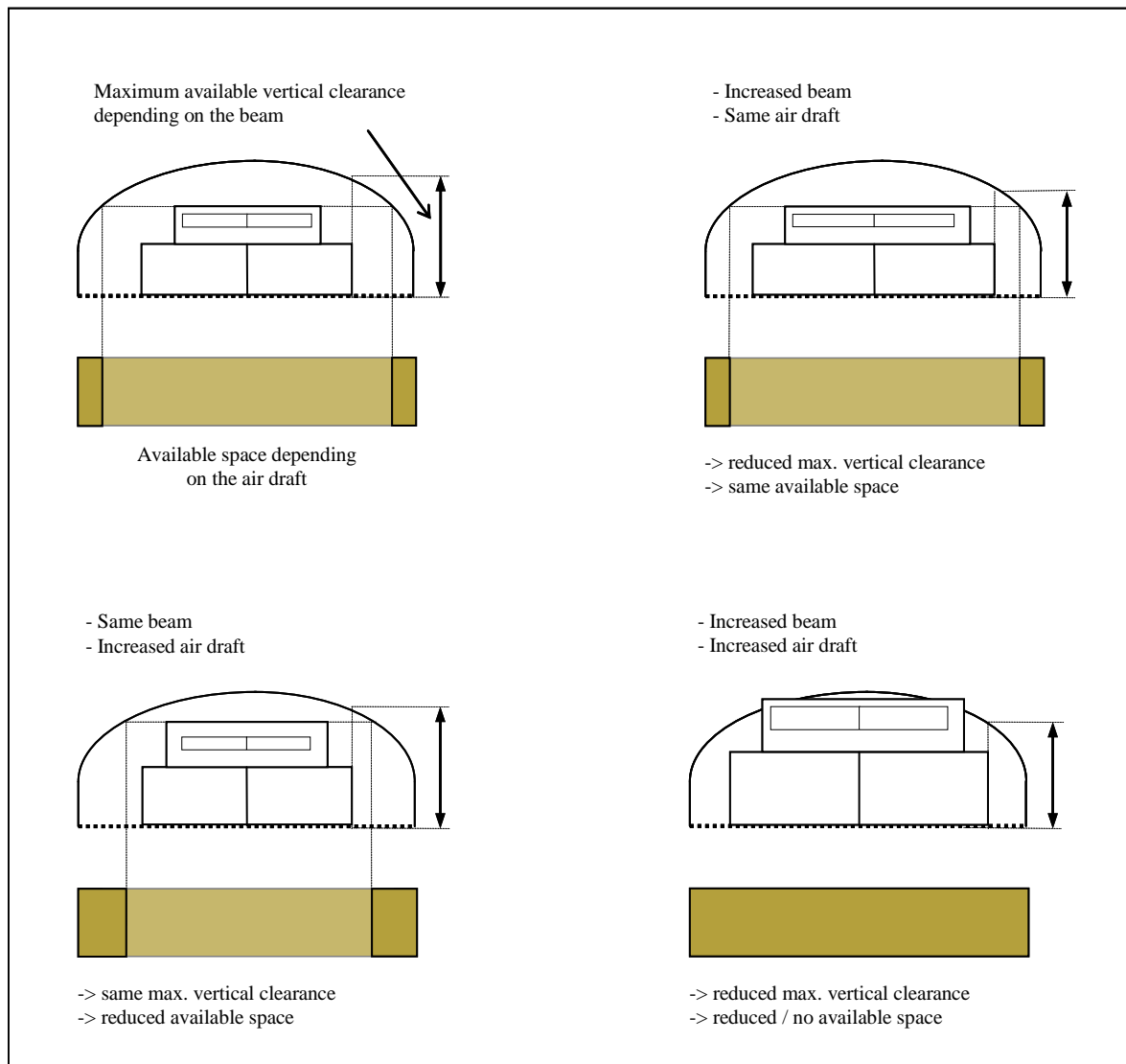
If the vertical clearance of a single bridge object of the aggregation is less than the calculated vertical clearance, this single bridge object must be symbolized by the symbol instruction "AC(CHBRN,3);TX('clr %.1f',1,2,3,'14108',1,1,CHBLK,11)"

If the vertical clearance of a single bridge object of the aggregation is larger or equal than the calculated vertical clearance, this single bridge object must be symbolized by the symbol instruction "AC(CHBRN,2)" without the indication of the non sufficient vertical clearance.

The boundaries of the bridge sequences which are not safe for navigation must be symbolized with the symbol instruction "LS(SOLD,2,DEPSC)".

The boundaries of the bridge sequences which are safe for navigation must be symbolized with the symbol instruction "LS(SOLD,1,CHGRD)".

The boundaries of the single bridge objects inside a bridge sequence, either safe or not safe for navigation, may not be symbolized.

2.6   Notice marks

A new CS has to be introduced for notice marks. If there are several notice marks at the same point the fnctnm attributes have to be evaluated for the selection of the correct symbol:

-     if there is at least one notice mark with fnctnm = 1 (prohibition mark), the symbol notmrk04 has to be used;

-     if there is no prohibition mark, but at least one notice mark with fnctnm = 2 (regulation mark) or fnctnm = 3 (restriction mark), the symbol notmrk05 has to be used;

-     if there are only notice marks with fnctnm = 4 (recommendation mark) and/or notice marks with fnctnm = 5 (information mark), the symbol notmrk06 has to be used.

The symbols NMKREG21, NMKREG22, NMKREG23, NMKREG24, NMKRCD07, NMKRCD08, and NMKINF60 shall only be used if the attribute ORIENT is encoded and only for an optional display of detailed notice mark symbols. If ORIENT is not encoded, the symbols NMKREG02, NMKREG03, NMKREG10, NMKREG11, NMKRCD05, NMKRCD06, and NMKINF38 have to be used.

2.7   M_COVR

The CS (DATCVR02) of S-52 has to be modified for the display of bathymetric Inland ENCs. The M_COVR object of the bIENC shall be displayed with a blue outline for a clear distinction between areas which are covered by bIENCs and areas which are not.

2.8   Anchorage areas, depth areas, exceptional navigational structures, shoreline constructions and underwater rocks

The CS procedures for

-     anchorage areas (RESTRN01),

-     depth areas and exceptional navigational structures (DEPARE02),

-     shoreline contructions (SLCONS03) and

-     underwater rocks (OBSTRN07)

of S-52 have to be modified to include the display of achare, depare, excnst, slcons and uwtroc.

3.   Symbols for Inland ECDIS

Symbols can be defined in vector format or in raster format. Symbols which will be rotated must be defined in vector format. The size of vector symbols is adapted automatically to the resolution and size of the screen. In case of raster symbols, different symbol sets must be designed to meet the requirements of a readable display.

A list of all Inland ECDIS symbols and their pictures is in (4) and (5). The symbols are supplied in digital form at **http://ienc.openecdis.org**.

4. List of symbol names

4.1 New Symbols to be shown on the chart display

4.1.1 Raster symbols

a) Symbols in general

BORDER01:	check point, border
BUNSTA01:	bunker station, diesel oil station
BUNSTA02:	bunker station, water
BUNSTA03:	bunker station, ballast
CUSTOM01:	control point, custom
DISMAR05:	distance mark on river axis
HECMTR01:	hectometre point, 100 m
HECMTR02:	hectometre point, 1 km
HGWTMK01:	high water mark
LIFEBUOY:	rescue station with life buoy, ring buoy, life ring or life saver
NOTMRK01:	notice mark, prohibition
NOTMRK02:	notice mark, regulation, restriction
NOTMRK03:	notice mark, information, recommendation
NOTMRK04:	several notice marks, at least one prohibition mark
NOTMRK05:	several notice marks, no prohibition mark, at least one regulation or restriction mark
NOTMRK06:	several notice marks, only information and/or recommendation marks
REFDMP01:	refuse dump
SSENTR01:	port entry
SSLOCK01:	signal station, lock
SSWARS01:	signal station, Wahrschau
TRNBSN01:	turning basin
VEHTRF01:	vehicle transfer
VTCLMK01:	vertical clearance mark at bridges
WTLVGG02:	gauge, height of water

b) Navigational aids

BCNSTK03:	river beacon, stake – pole
BCNLAT23:	river beacon, separation - simplified
BOYLAT25:	river buoy, fairway separation – simplified
BOYLAT26:	river buoy, obstruction at the right side
BOYLAT27:	river buoy, obstruction at the left side
BOYINL01:	river buoy right-hand side of the fairway (1.B of CEVNI, can be combined with a LIGHTS to 1.A or a TOPMA114 to 1.C or 1.D)
BOYINL02:	river buoy left-hand side of the fairway (2.B of CEVNI, can be combined with a LIGHTS to 2.A or a TOPMA115 to 2.C or 2.D)

BOYINL03:	river buoy bifurcation of the fairway (3.B of CEVNI, can be combined with a LIGHTS to 3.A, a TOPMA117 to 3.C or 3.D, a TOPMA114 to 3.E or 3.F and a TOPMA115 to 3.E1 or 3.F1)
BOYINL08:	river buoy yellow float (8.C of CEVNI)
TOPMA100:	beacon top mark, red cone, point down
TOPMA101:	beacon top mark, red boarded cone, point down
TOPMA102:	beacon top mark, green cone, point up
TOPMA103:	beacon top mark, green boarded cone, point up
TOPMA104:	beacon top mark, red boarded cone, point down, green boarded cone, point up, simplified
TOPMA105:	beacon top mark, red boarded cone, point down, green boarded cone, point up, simplified
TOPMA106:	beacon top mark, white-red square board, vertical
TOPMA107:	beacon top mark, red boarded square board, vertical
TOPMA108:	beacon top mark, white-green square board, diagonal
TOPMA109:	beacon top mark, green boarded square board, diagonal
TOPMA110:	beacon top mark, yellow-black square board, vertical
TOPMA111:	beacon top mark, yellow St. Georg cross
TOPMA112:	beacon top mark, yellow-black square board, diagonal
TOPMA113:	beacon top mark, yellow Andreas-cross
TOPMA114:	buoy top mark, red cylinder
TOPMA115:	buoy top mark, green cone, point up
TOPMA116:	buoy top mark, red-white-red board, entry prohibited
TOPMA117:	buoy top mark, red-green sphere

c) Harbour facilities and terminals

HRBFAC10:	default harbour facility
HRBFAC11:	harbour facility naval base
HRBFAC12:	harbour facility ship yard
HRBFAC13:	harbour facility harbour-master's office
HRBFAC14:	harbour facility pilot
HRBFAC15:	water police
HRBFAC16:	customs office
HRBFAC17:	harbour facility service and repair
HRBFAC18:	harbour facility quarantine station
TERMNL01:	terminal, passenger terminal
TERMNL02:	terminal, ferry terminal
TERMNL03:	terminal, Container trans-shipment
TERMNL04:	terminal, Bulk trans-shipment
TERMNL05:	terminal, Oil trans-shipment
TERMNL06:	terminal, Fuel trans-shipment
TERMNL07:	terminal, Chemical trans-shipment
TERMNL08:	terminal, Liquid Goods trans-shipment

TERMNL09:   terminal, Explosive goods trans-shipment
TERMNL10:   terminal, Fish trans-shipment
TERMNL11:   terminal, Car trans-shipment
TERMNL12:   terminal, General Cargo trans-shipment
TERMNL13:   terminal, RoRo Terminal

4.1.2 Vector symbols for European inland waterways (must be rotated, the numbers refer to CEVNI)

- NMKPRH02:   no entry (A.1)
- NMKPRH12:   no passing on left side (A.10)
- NMKPRH13:   no passing on right side (A.10)
- NMKRCD01:   recommended channel in both directions (D.1a)
- NMKRCD02:   recommended channel only in the direction indicated (D.1b)
- NMKRCD03:   you are recommended to keep on right side (D.2)
- NMKRCD04:   you are recommended to keep on left side (D.2)
- NMKINF01:   entry permitted (E.1)
- NMKREG50:   wreck pontoon, passage allowed on side showing red-white sign
- NMKREG51:   wreck pontoon, passage allowed on both sides

4.2   New symbols to be shown in the "information window on notice marks"

   a)   Notice marks for European inland waterways (the numbers refer to CEVNI)
      - NMKPRH03:   sections closed to use, no entry except for non-motorized small craft(A.1.a)
      - NMKPRH04:   no overtaking (A.2)
      - NMKPRH05:   no overtaking of convoys by convoys (A.3)
      - NMKPRH06:   no passing or overtaking (A.4)
      - NMKPRH07:   no berthing (i.e. no anchoring or making fast to the bank) on the side of the waterway on which the sign is placed (A.5)
      - NMKPRH08:   no anchoring or trailing of anchors, cables or chains on the side of the waterway on which the sign is placed (A.6)
      - NMKPRH09:   no making fast to the bank on the side of the waterway on which the sign is placed (A.7)
      - NMKPRH10:   no turning (A.8)
      - NMKPRH11:   do not create wash likely to cause damage (A.9)
      - NMKPRH14:   motorized craft prohibited (A.12)
      - NMKPRH15:   sports or pleasure craft prohibited (A.13)
      - NMKPRH16:   water skiing prohibited (A.14)
      - NMKPRH17:   sailing vessels prohibited (A.15)
      - NMKPRH18:   all craft other than motorized vessels or sailing craft prohibited (A.16)
      - NMKPRH19:   use of sail boards prohibited (A.17)
      - NMKPRH20:   water bikes prohibited (A.20)
      - NMKPRH21:   end of zone authorized for high speed navigation of small sport and pleasure craft (A.18)
      - NMKPRH22:   no launching or beaching of vessels (A.19)
      - NMKREG01:   there are restrictions on navigation: make enquiries (with additional sign at bottom of main sign) (C.4)
      - NMKREG02:   proceed in left direction (B.1)
      - NMKREG03:   proceed in right direction (B.1)

- NMKREG04:	move to the side of the fairway on your port side (B.2a)	
- NMKREG05:	move to the side of the fairway on your starboard side (B.2b)	
- NMKREG06:	keep the side of the fairway on your port side (B.3a)	
- NMKREG07:	keep the side of the fairway on your starboard side (B.3b)	
- NMKREG08:	cross fairway to port (B.4a)	
- NMKREG09:	cross fairway to starboard (B.4b)	
- NMKREG10:	stop as prescribed in the regulations (B.5)	
- NMKREG11:	give a sound signal (B.7)	
- NMKREG12:	keep a particularly sharp outlook (B.8)	
- NMKREG13:	do not enter the main waterway until certain that this will not oblige vessels proceeding on it to change their course or speed (B.9a)	
- NMKREG14:	do not cross the main waterway until certain that this will not oblige vessels proceeding on it to change their course or speed (B.9b)	
- NMKREG15:	obligation to enter in a radiotelephone link on the channel as indicated on the board (B.11)	
- NMKREG16:	depth of water limited(C.1)	
- NMKREG17:	headroom limited (C.2)	
- NMKREG18:	width of passage or channel limited (C.3)	
- NMKREG19:	the channel lies at a distance from the left bank (C.5)	
- NMKREG20:	the channel lies at a distance from the right bank (C.5)	
- NMKREG21:	proceed in left direction (B.1), orientation encoded-NMKREG22:proceed in right direction (B.1), orientation encoded	
- NMKREG23:	stop as prescribed in the regulations (B.5), orientation encoded	
- NMKREG24:	give a sound signal (B.7), orientation encoded	
- NMKRCD05:	you are recommended to proceed in the left direction (D.3)	
- NMKRCD06:	you are recommended to proceed in the right direction (D.3)	
- NMKRCD07:	you are recommended to proceed in the left direction (D.3), orientation encoded	
- NMKRCD08:	you are recommended to proceed in the right direction (D.3), orientation encoded	
- NMKINF02:	overhead cable crossing (E.2)	
- NMKINF03:	weir (E.3)	
- NMKINF04:	ferry-boat not moving independently (E.4)	
- NMKINF05:	ferry-boat moving independently (E.4b)	
- NMKINF06:	berthing (i.e. anchoring or making fast to the bank) permitted on the side of the waterway on which the sign is placed (E.5)	
- NMKINF07:	berthing area reserved for pushing navigation vessels that are not required to carry blue lights or blue cones on the side of the waterway on which the sign is placed (E.5.4)	
- NMKINF08:	berthing area reserved for pushing navigation vessels that are required to carry one blue light or one blue cone on the side of the waterway on which the sign is placed (E.5.5)	

- NMKINF09:	berthing area reserved for pushing navigation vessels that are required to carry two blue lights or two blue cones on the side of the waterway on which the sign is placed (E.5.6)
- NMKINF10:	berthing area reserved for pushing navigation vessels that are required to carry three blue lights or three blue cones on the side of the waterway on which the sign is placed (E.5.7)
- NMKINF11:	berthing area reserved for vessels other than pushing navigation vessels that are not required to carry blue lights or blue cones on the side of the waterway on which the sign is placed (E.5.8)
- NMKINF12:	berthing area reserved for vessels other than pushing navigation vessels that are required to carry one blue light or one blue cone on the side of the waterway on which the sign is placed (E.5.9)
- NMKINF13:	berthing area reserved for vessels other than pushing navigation vessels that are required to carry two blue lights or two blue cones on the side of the waterway on which the sign is placed (E.5.10)
- NMKINF14:	berthing area reserved for vessels other than pushing navigation vessels that are required to carry three blue lights or three blue cones on the side of the waterway on which the sign is placed (E.5.11)
- NMKINF15:	berthing area reserved for all vessels that are not required to carry blue lights or blue cones on the side of the waterway on which the sign is placed (E.5.12)
- NMKINF16:	berthing area reserved for all vessels that are required to carry one blue light or one blue cone on the side of the waterway on which the sign is placed (E.5.13)
- NMKINF17:	berthing area reserved for all vessels that are required to carry two blue lights or two blue cones on the side of the waterway on which the sign is placed (E.5.14)
- NMKINF18:	berthing area reserved for all vessels that are required to carry three blue lights or three blue cones on the side of the waterway on which the sign is placed (E.5.15)
- NMKINF19:	anchoring or trailing of anchors, cables or chains permitted on the side of the waterway on which the sign is placed (E.6)
- NMKINF20:	making fast to the bank permitted on the side of the waterway on which the sign is placed (E.7)
- NMKINF21:	berthing area reserved for loading and unloading vehicles (E.7.1)
- NMKINF22:	turning area (E.8)
- NMKINF23:	crossing with secondary waterway ahead (E.9a)
- NMKINF24:	secondary waterway ahead on the right (E.9.b)
- NMKINF25:	secondary waterway ahead on the left (E.9.c)
- NMKINF26:	secondary waterway ahead (main waterway right)
- NMKINF27:	secondary waterway ahead (main waterway left)
- NMKINF28:	secondary waterway left (main waterway right)
- NMKINF29:	secondary waterway right (main waterway left)
- NMKINF30:	secondary waterway ahead and left (main waterway right)
- NMKINF31:	secondary waterway ahead and right (main waterway left)
- NMKINF32:	crossing with main waterway ahead (E.10.a)

- NMKINF33:   junction with main waterway ahead (E.10.b)
- NMKINF34:   junction with main waterway ahead and right
- NMKINF35:   junction with main waterway ahead and left
- NMKINF36:   junction with main waterway ahead and right (secondary waterway left)
- NMKINF37:   junction with main waterway ahead and left (secondary waterway right)
- NMKINF38:   end of prohibition or obligation applying to traffic in one direction only, or end of restriction (E.11)
- NMKINF39:   drinking water supply(E.13)
- NMKINF40:   telephone (E.14)
- NMKINF41:   motorized vessels permitted (E.15)
- NMKINF42:   sport and pleasure craft permitted (E.16)
- NMKINF43:   water skiing permitted (E.17)
- NMKINF44:   sailing vessels permitted (E.18)
- NMKINF45:   craft other than motorized vessels or sailing craft permitted (E.19)
- NMKINF46:   use of sailboards permitted (E.20)
- NMKINF47:   possibility of obtaining nautical information by radio-telephone on the channel indicated (E.23)
- NMKINF48:   water bikes permitted(E.24)
- NMKINF49:   zone authorized for high speed navigation of small sport and pleasure craft (E.21)
- NMKINF50:   launching or beaching of vessels permitted (E.22)
- NMKINF51-55: maximum number of vessels permitted to berth abreast (E.5.3)
- NMKINF56:   electrical power supply point (E.25)
- NMKINF57:   winter harbour (E.26)
- NMKINF58:   winter shelter (E.27)
- NMKINF59:   use of spuds permitted (E.6.1)
- NMKINF60:   end of prohibition or obligation applying to traffic in one direction only, or end of restriction (E.11), orientation encoded

b) Notice marks for Russian inland waterways
    (the numbers refer to GOST 26600-98)
    - NMKPR101:   no anchoring or trailing of anchors, cables or chains (1.1)
    - NMKPR102:   no passing or overtaking of convoys (1.2)
    - NMKPR103:   no passing or overtaking (1.3)
    - NMKPR104:   do not create wash (1.4)
    - NMKPR105:   small crafts prohibited (1.5)
    - NMKRE101:   Attention! (keep caution) (2.1)
    - NMKRE102:   fairway crossing (2.2)
    - NMKRE103:   headroom limited (2.4)
    - NMKIN101:   turning area (3.2)
    - NMKIN102:   shipping inspection point (3.3)

c)   Auxiliary panels (CEVNI Annex 7, Section II)
- ADDMRK01:   right (triangle to the right)
- ADDMRK02:   left (triangle to the left)
- ADDMRK03:   bottom (rectangle, portrait main board)
- ADDMRK04:   top (rectangle, portrait main board)
- ADDMRK05:   bottom (rectangle)
- ADDMRK06:   top (rectangle)
- ADDMRK07:   right (triangle to the right, landscape main board)
- ADDMRK08:   left (triangle to the left, landscape main board)
- ADDMRK09:   bottom (triangle to the bottom)
- ADDMRK10:   bottom (triangle to the bottom, portrait main board)

5.   Pictures of Inland ECDIS symbols

5.1   Raster symbols

5.1.1 Symbols in general

BORDER01	BUNSTA01	BUNSTA02	BUNSTA03	CUSTOM01
DISMAR05	HECMTR01	HECMTR02	HGWTMK01	LIFEBUOY01
NOTMRK01	NOTMRK02	NOTMRK03	NOTMRK04	NOTMRK05
NOTMRK06	REFDMP01	SSENTR01	SSLOCK01	SSWARS01
TRNBSN01	VEHTRF01	VTCLMK01	WTLVGG02	

5.1.2 Navigational aids

BCNSTK03	BCNLAT23	BOYLAT25
BOYLAT26	BOYLAT27	TOPMA100
TOPMA101	TOPMA102	TOPMA103
TOPMA104	TOPMA105	TOPMA106
TOPMA107	TOPMA108	TOPMA109
TOPMA110	TOPMA111	TOPMA112
TOPMA113	TOPMA114	TOPMA115
TOPMA116	TOPMA117	

BOYINL01	BOYINL02	BOYINL03
BOYINL08		
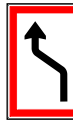
5.1.3 Harbour facilities, terminals
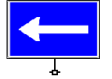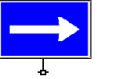
HRBFAC10	HRBFAC11
HRBFAC12	HRBFAC13
HRBFAC14	HRBFAC15
HRBFAC16	HRBFAC17
HRBFAC18	TERMNL01
TERMNL02	TERMNL03
TERMNL04	TERMNL05
TERMNL06	TERMNL07
TERMNL08	TERMNL09
TERMNL10	TERMNL11
TERMNL12	TERMNL13

5.2 Symbols for the "information window on notice marks"

NMKPRH03	NMKPRH04	NMKPRH05
NMKPRH06	NMKPRH07	NMKPRH08
NMKPRH09	NMKPRH10	NMKPRH11
NMKPRH14	NMKPRH15	NMKPRH16
NMKPRH17	NMKPRH18	NMKPRH19
NMKPRH20	NMKPRH21	NMKPRH22

NMKPR101	NMKPR102	NMKPR103
NMKPR104	NMKPR105	

NMKREG01	NMKREG02	NMKREG03	NMKREG04	NMKREG05	NMKREG06
NMKREG07	NMKREG08	NMKREG09	NMKREG10	NMKREG11	NMKREG12
NMKREG13	NMKREG14	NMKREG15	NMKREG16	NMKREG17	NMKREG18
NMKREG19	NMKREG20	NMKREG21	NMKREG22	NMKREG23	NMKREG24
NMKRE101	NMKRE102	NMKRE103			

NMKRCD05	NMKRCD06	NMKRCD07	NMKRCD08	NMKINF02	NMKINF03
NMKINF04	NMKINF05	NMKINF06	NMKINF07	NMKINF08	NMKINF09
NMKINF10	NMKINF11	NMKINF12	NMKINF13	NMMINF14	NMKINF15
NMKINF16	NMKINF17	NMKINF18	NMKINF19	NMKINF20	NMKINF21
NMKINF22	NMKINF38	NMKINF39	NMKINF40	NMKINF41	NMKINF42
NMKINF43	NMKINF44	NMKINF45	NMKINF46	NMKINF47	NMKINF48
NMMINF49	NMKINF50	NMKINF51	NMKINF52	NMKINF53	NMKINF54

NMKINF55	NMKINF56	NMKINF57	NMKINF58	NMKINF59	NMKINF60
NMKIN101	NMKIN102				

NMKINF23	NMKINF24
NMKINF25	NMKINF26
NMKINF27	NMKINF28
NMKINF29	NMKINF30
NMKINF31	NMKINF32
NMKINF33	NMKINF34
NMKINF35	NMKINF36
NMKINF37	

ADDMRK01	ADDMRK02
ADDMRK03	ADDMRK04
ADDMRK05	ADDMRK06
ADDMRK07	ADDMRK08
ADDMRK09	ADDMRK10

5.3 Vector symbols

NMKINF01	NMKPRH02	NMKPRH12	NMKPRH13	NMKRCD01	NMKRCD02
NMKRCD03	NMKRCD04	NMKREG50	NMKREG51		

6.   Bathymetric Inland ENCs

Bathymetric Inland ENCs must be displayed as complementary layer only. It is not allowed to display bIENCs if the respective geographic area is not fully covered by an IENC or ENC. The usage of the respective ENCs/IENCs must be within the usage band of the bIENC. This means for example a bIENC with usage 5 to 7 may not be displayed together with an IENC of usage 4.

The bIENC has display priority over:

depare
DEPARE
DRGARE
DEPCNT
SOUNDG
UNSARE
M_COVR

and over the safety contour of the ENC or IENC. The bIENC must not have display priority over any other features of the IENC.

ANNEX 3
PRODUCT SPECIFICATION FOR BATHYMETRIC INLAND ENCS

Introduction

The bathymetric Inland ENC is a S-57 based product in addition to the already existing products (ENC, Inland ENC).

The content of bathymetric ENCs is limited to the bathymetry data only. The depth information can be encoded by means of the object classes depth area (DEPARE, depare), dredged area (DRGARE), depth contour (DEPCNT) and soundings (SOUNDG). Navigable areas without depths information are encoded as unsurveyed areas (UNSARE). Meta data is used to provide information about the pre-mentioned feature objects (e.g. accuracy and quality information).

Due to its limited content a bathymetric Inland ENC does not comply with the existing ENC Product Specification. And it complies with the Product Specification for Inland ECDIS Edition 2.0, 2.1, 2.2, 2.3 neither.

bathymetric Inland ENCs must be regarded as bathymetric complement to ENCs and Inland ENCs. To make use of bathymetric Inland ENCs a dedicated Product Specification for bathymetric Inland ENCs is required. This Product Specification describes the dataset structure, topology, contents, meta information, object classes/attributes etc.

The use of bathymetric Inland ENCs facilitates the incorporation of survey-sensor based depth information during the ENC production process. This is because the bathymetry is stored in separate datasets which are simply replaced when new depth data is available.

1.   Introduction

<changed>

The bathymetric Inland ENC is a S-57 based product in addition to the already existing products (ENC, Inland ENC).

The content of bathymetric ENCs is limited to the bathymetry data only. The depth information can be encoded by means of the object classes depth area (DEPARE, depare), dredged area (DRGARE), depth contour (DEPCNT) and soundings (SOUNDG). Navigable areas without depths information are encoded as unsurveyed areas (UNSARE). Meta data is used to provide information about the pre-mentioned feature objects (e.g. accuracy and quality information).

Due to its limited content a bathymetric Inland ENC does not comply with the existing ENC Product Specification. And it complies with the Product Specification for Inland ECDIS Edition 2.0, 2.1, 2.2, 2.3 neither.

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The use of bathymetric Inland ENCs facilitates the incorporation of survey-sensor based depth information during the ENC production process. This is because the bathymetry is stored in separate datasets which are simply replaced when new depth data is available.

Unless it is specifically stated different in this document the Inland ENC Product Specification is applicable for bathymetric Inland ENCs. In the following the modifications changes and/or extensions are listed.

A bathymetric Inland ENC shall be produced in accordance with the regulations defined in:
- this Product Specification for bathymetric Inland ENC
- the Feature Catalogue for bathymetric Inland ENC
- the Encoding Guide for Inland ENC (especially pages C.1.1, C.1.4, C.1.6, C.1.7, C.1.8, I.1.1, I.1.2, I.1.3, I.1.6, I.1.7, I.1.8, I.1.9 and I.2.1)

The numbering correlates to the ENC Product Specification, S-57 Appendix B.1, Edition 2.0

1.1 Definitions

<adopted with modifications>

1.2 Contents of the document

The bENC Product Specification contains one application profile for the basic bENC used to populate the SENC (EN application profile). An application profile for updating of the SENC (ER application profile) is not defined. The application profile is described in S-57 Part 3, clause 1.4.2.

2. General information

2.1 Navigational purpose

<changed>

bathymetric Inland ENCs make use of the same navigational purposes as ENCs (1 to 6) and Inland ENCs (1 to 9). However, a bathymetric Inland ENC has a range of categories of navigational purposes (e.g. from usage 4 to 9) it belongs to.

The INTU field of the S-57 Data Set Identification Record is used to indicate the navigational purpose of a cell. The expected input must be a binary value of type "unsigned integer". This is why each possible range of bIENC navigational purpose categories must be mapped to a value of this type.

The mapping is done by means of the following formula:

$$V_{INTU} = NP_{LC} \cdot 10 + NP_{HC} + 128$$

Where V_{INTU}: value of INTU field
N_{PLC} :   lower category of navigational purpose
N_{PHC}:   higher category of navigational purpose

Example: A usage range from 4 to 9 is mapped to the value 4*10+9+128 = 177.

2.2   Cells

<changed>

In order to facilitate the efficient processing of bathymetric Inland ENC data the geographic coverage of a given usage must be split into cells. Each cell of data must be contained in a physically separate, uniquely identified file on the transfer medium, known as a data set file (see clauses 5.4 and 5.6.3).

The geographic extent of the cell must be chosen by the bathymetric Inland ENC producer to ensure that the resulting data set file contains no more than 5 Megabytes of data. Subject to this consideration, the cell size must not be too small in order to avoid the creation of an excessive number of cells.

The coordinates of the borders of the cell are encoded in decimal degrees in the "Catalogue Directory" [CATD] field.

Point or line feature objects which are at the border of two cells with the same navigational purpose must be part of only one cell. They are put in the south or west cell (i.e. north and east borders of the cell are part of the cell, south and west borders are not).

When a feature object exists in several cells its geometry must be split at the cell boundaries and its complete attribute description must be repeated in each cell.

bathymetric Inland ENCs do not have to be rectangular. The meta-object M_COVR with CATCOV1 is used to represent the geographic area containing data.

Data within bathymetric cells of the same navigational purpose must not overlap.

2.3   Topology

<changed>

bathymetric Inland ENCs use planar graph topology without faces (edges must not cross).

3.   Features and attributes

3.1   Feature object identifiers

<adopted>

3.2   Standard features and attributes

<adopted with amendments>

Object classes defined in the Feature Catalogue for Inland ENCs, but not listed in the following section of this document are prohibited for use in bIENCs.

3.3 Objects permitted for use in bENC and their geometric primitives

<changed>

Following is a list of those features allowed in a bathymetric Inland ENC and the geometric primitives allowed for each of them (P = point, L = line, A = area).

#		P	L	A
1	DEPCNT		L	
2	DEPARE			A
3	DRGARE			A
4	UNSARE			A
5	SOUNDG	P		
6	M_COVR			A
7	M_QUAL			A
8	M_SREL			A
9	M_SDAT			A
10	M_CSCL			A
11	M_NPUB			A
12	depare			A
13	m_sdat			A

The attributes and enumerations which may be used for the features are defined in the Feature Catalogue for bathymetric Inland ENCs.

3.4 Meta features

<adopted with modifications>

A meta feature M_COVR is not required to cover any part of the cell that does not contain geographical data.

The meta features M_NSYS and m_nsys are not used.

3.5 Geo and meta feature attributes

3.5.1 Missing enumerations

3.5.2 Mandatory attributes

<changed>

The following table gives the attributes which are mandatory for each feature. When a feature is not in the list it means that there are no mandatory attributes for this feature.

Feature	Attributes				
DEPCNT	VALDCO				
DEPARE	DRVAL1	DRVAL2			
DRGARE	DRVAL1				
M_COVR	CATCOV 1				
M_QUAL	either:	CATZOC	or:	POSACC	SOUACC
M_SDAT	VERDAT				
M_CSCL	CSCALE				
depare	DRVAL1	DRVAL2	hunits	wtwdis	
m_sdat	verdat				

3.5.3 Prohibited attributes

<adopted>

3.5.4 Numeric enumerations

<adopted>

3.5.5 Text enumerations

<adopted>

3.5.6 Hierarchy of meta data

<adopted>

3.6 Cartographic features

<adopted>

3.7 Time varying objects

<adopted>

3.8 Geometry

3.9   Relationships

      <n/a>

3.10   Groups

      <adopted>

3.10.1 Group 1 (skin of the earth)

      <adopted with modifications>

      The list below contains the features that must always be in Group 1, if they appear in the dataset and if they are of type area.

      DEPARE DRGARE UNSARE depare

3.10.2 Group 2 (all other features)

      <adopted>

3.11   Language and alphabet

3.11.1 Language

      <adopted>

3.11.2 Use of lexical level 2

      <adopted>

4.   Cartographic framework

4.1   Horizontal datum

      <adopted>

4.2   Vertical and sounding datum

      <adopted>

4.3   Projection

      <adopted>

4.4   Units

      <adopted>

5. Provision of data

5.1 Implementation

<adopted>

5.2 Compression

<adopted>

5.3 Encryption

<adopted>

5.4 Exchange set

If bIENC data is made available via SENC distribution section 5.4 is not applicable.

5.4.1 Content of the exchange set

<adopted with modifications>

Picture files must not be included

5.4.2 Volume naming

<adopted>

5.4.3 Directory structure

<adopted>

5.5 Data sets

<modified>

Two kinds of data sets may be produced :

new data set :   no bathymetric Inland ENC data has previously been produced for this area
                     and for the same navigational purpose.

new edition of a data set : new information which has not been previously distributed.

Updates and re-issues must not be produced.

5.6 File naming

5.6.1 README file

5.6.2 Catalogue file

<adopted with modifications>

Not applicable in case of SENC distribution.

5.6.3 Data set files

<modified>

The data set files are named according to the specifications given below:

```
CCBRRRRR.000
|   || |   |     |
|   || |   |     |------ 000 = extension*
|   || |   |-------------- RRRRR = waterway code and waterway distance (kilometre) or other
|   || |                      individual cell code.
|   | |-----------------
|    |-------------------- B = Product Id (bathymetric ENC)
|------------------------ CC = producer code
```

The main part forms an eight character identifier where:
-    the first two characters identify the producer.
-    the third character indicates the Product Id
-    the fourth to eighth characters are used for the cell code. This code can be used in any
     way (e.g. to identify the waterway and the waterway distance) by the producer to provide
     the unique file name. If characters other than numbers are used only uppercase letters are
     allowed.

A valid base cell file must be uniquely identified worldwide by its name, and have the extension
000.

*In case of SENC distribution the extension may vary.

5.6.4 Text and picture files

<adopted with modifications>

Picture files are not used.

5.7   Updating

<changed>

In order to ensure that new editions are incorporated into the SENC in the correct sequence
without any omission, the file extension and a number of subfields in the Data Set Identification
[DSID] field are used in the following way:

file extension	every new data set or new edition must have a 000 extension. In case of SENC distribution the extension may vary.
edition number	when a data set is initially created, the edition number 1 is assigned to it. The edition number is increased by 1 at each new edition.

update number   update number 0 is assigned to a new data set.

update application   update application date

issue date   date on which the data was made available by the data producer.

Each new edition of a data set must have the same name as the base cell file which it replaces. The ENC update mechanism is described in S-57 Part 3, clause 8.

In order to modify a text file, a new file with the same name is created.

5.8 Media

<adopted>

5.9 Error detection

<adopted>

6. Application profiles

6.1 General

<adopted>

6.2 Catalogue file

<adopted with modifications>

This section is not applicable in case of SENC distribution.

6.3 EN application profile

<adopted with modifications>

Data Set Identification field - DSID

The value of the INTU sub-field must be "unsigned binary". It is determined by means of the following formula:

$$V_{INTU} = NP_{LC} \cdot 10 + NP_{HC} + 128$$

Where V_{INTU}: value of INTU field
N_{PLC} :   lower category of navigational purpose
N_{PHC}:   higher category of navigational purpose

Example: A usage range from 4 to 9 is mapped to the value 4*10+9+128 = 177

In the PRSP (Product specification) subfield the value {200} is used as the indicator for a bathymetric ENC. The Product specification edition number is 1.0 (PRED sub-field).

Data Set Parameter field – DSPM

In the VDAT (vertical datum) sub-field the value {255} (= null) is used.
In the SOMF (sounding multiplication factor) sub-field the value {100} is used.

6.4   ER application profile

<n/a>

ES-RIS

Annex 4
Comparison of the structures of the standard for (Maritime) ECDIS and of the technical specifications for Inland ECDIS

ANNEX 4
COMPARISON OF THE STRUCTURES OF THE STANDARD FOR (MARITIME) ECDIS AND OF THE TECHNICAL SPECIFICATIONS FOR INLAND ECDIS

(Maritime) ECDIS	Inland ECDIS	OPEN ECDIS FORUM http://ienc.openecdis.org
IMO MSC.232(82) revised Performance Standards for ECDIS, December 2006 Appendix 1: Reference Documents Appendix 2: SENC Information available for display during route planning and route monitoring Appendix 3: Navigational Elements and Parameters Appendix 4: Areas for which special conditions exist Appendix 5: Alarms and Indicators Appendix 6: Back-up requirements Appendix 7: RCDS mode of operation	CHAPTER 1: Performance Standard for Inland ECDIS	
IHO S-57: Transfer Standard for Digital Hydrographic Data, Edition 3.1, Supplement No 2, June 2009 Part 1: General Introduction Part 2: Theoretical Data Model Part 3: Data Structure	CHAPTER 2: Data Standard for Inland ENCs	

(Maritime) ECDIS	Inland ECDIS	OPEN ECDIS FORUM http://ienc.openecdis.org
Appendix A: IHO Object catalogue Introduction Chapter 1: Object Classes Chapter 2: Attributes Annex B: Attributes/Object Classes Cross Reference Appendix B: Product specifications Appendix B.1: ENC Product Specification Annex A: Use of The Object Catalogue for ENC Annex B: Example of CRC Coding Appendix B.2: IHO Object Catalogue Data Dictionary Product Specification		Inland ENC Feature Catalogue Bathymetric Inland ENC Feature Catalogue Product Specification for Inland ENCs Product Specification for bathymetric Inland ENCs IENC Encoding Guide
IHO S-62 ENC Producer Codes, Edition 2.5, December 2009	CHAPTER 3: Codes for Producers and Waterways	Codes for Producers and Waterways
IHO S-52 Specification for Chart Content and Display Aspects of ECDIS, Edition 6, March 2010 Annex A: IHO ECDIS Presentation Library Annex B: Procedure for initial calibration of colour displays Annex C: Procedure for maintaining the calibration of displays Appendix 1: Guidance on Updating the Electronic Chart Annex A: Definitions and Acronyms Annex B: Current Updating Practice for Paper Charts Annex D: Estimate of Data Volume	CHAPTER 4: Presentation Standard for Inland ECDIS	Presentation Library for Inland ECDIS Look-up Tables Symbols Conditional Symbology Procedures

ES-RIS

Annex 4
Comparison of the structures of the standard for (Maritime) ECDIS and of the technical specifications for Inland ECDIS

(Maritime) ECDIS	Inland ECDIS	OPEN ECDIS FORUM http://ienc.openecdis.org
IEC 61174 Edition 3.0: ECDIS — Operational and Performance Requirements, Methods of Testing and Required Test Results, 2008-09	CHAPTER 5: Operational and Performance Requirements, Methods of Testing and Required Test Results CHAPTER 6: Measures to Ensure Software Quality CHAPTER 7 : System Configurations	
S-32 Appendix 1: Hydrographic Dictionary – Glossary of ECDIS-Related Terms	CHAPTER 8: Glossary of Terms	

ES-RIS

Annex 4
Comparison of the structures of the standard for (Maritime) ECDIS and of the technical specifications for Inland ECDIS

ANNEX 5
DIGITAL INTERFACE SENTENCES FOR INLAND AIS

1.   Input sentences

The serial digital interface of the AIS is supported by existing IEC 61162 sentences. The detailed descriptions for the digital interface sentences are found in IEC 61162.

In addition the following digital interface sentences are defined for Inland AIS mobile station.

2.   Inland waterway static ship data

This sentence is used to change settings, which are not covered by SSD and VSD.

$PIWWSSD,cccccccc,xxxx,x.x,x.x,x,x,x,x.x,x.x,x.x,x.x*hh<CR><LF>

field 1 2 3 4 5 6 7 8 9 10 11

Field	Format	Description
1	cccccccc	ENI number
2	xxxx	Inland vessel type according to Annex 6
3	x.x	Length of vessel 0 to 800,0 metre
4	x.x	Beam of vessel 0 to 100,0 metre
5	x	Quality of speed information 1 = high or 0 = low
6	x	Quality of course information 1 = high or 0 = low
7	x	Quality of heading information 1 = high or 0 = low
8	x.x	B value for internal reference position (distance reference point to stern)
9	x.x	C value for internal reference position (distance reference point to port side)
10	x.x	B value for external reference position (distance reference point to stern)
11	x.x	C value for external reference position (distance reference point to port side)

3.   Inland waterway voyage data

This sentence is used to enter inland navigation voyage vessel data into an Inland AIS mobile station. For setting the inland voyage related data the sentence $PIWWIVD with the following content is used

$PrWWIVD,x,x,x,x.x,x.x,x,xxx,xxxx,xxx,x.x,x.x,x.x,x.x*hh<CR><LF>

field 1 2 3 4 5 6 7 8 9 10 11 12 13

Field	Format	Description
1	x	See ITU-R M.1371 Msg 23 reporting interval settings, default setting: 0
2	x	Number of blue cones: 0-3, 4 = B-Flag, 5 = default = unknown
3	x	0 = not available = default, 1 = loaded, 2 = unloaded, rest not used
4	x.x	Static draught of vessel 0 to 20,00 metres, 0 = unknown = default, rest not used
5	x.x	Air draught of vessel 0 to 40,00 metres, 0 = unknown = default, rest not used
6	x	Number of assisting tugboats 0-6, 7 = default = unknown, rest not used
7	xxx	Number of crew members on board 0 to 254, 255 = unknown = default, rest not
8	xxxx	Number of passengers on board 0 to 8 190, 8 191 = unknown = default, rest not used
9	xxx	Number of shipboard personnel on board 0 to 254, 255 = unknown = default, rest not used
10	x.x	Convoy extension to bow in (metre.decimetre = resolution in dm)
11	x.x	Convoy extension to stern in (metre.decimetre = resolution in dm)
12	x.x	Convoy extension to port side in (metre.decimetre = resolution in dm)
13	x.x	Convoy extension to starboard side in (metre.decimetre = resolution in dm)

In case of null fields the corresponding configuration setting shall not be changed.

ANNEX 6
INLAND VESSEL AND CONVOY TYPES

This correspondence table is based on an excerpt of the 'Codes for Types of Means of Transport' according to UNECE Recommendation 28 and the maritime ship types as defined in ITU-R M.1371 'Technical characteristics for a universal shipborne automatic identification system using time division multiple access in the VHF maritime mobile band'.

Vessel and convoy type		Maritime ship type	
code	Vessel name	1st digit	2nd digit
8000	Vessel, type unknown	9	9
8010	Motor freighter	7	9
8020	Motor tanker	8	9
8021	Motor tanker, liquid cargo, type N	8	0
8022	Motor tanker, liquid cargo, type C	8	0
8023	Motor tanker, dry cargo as if liquid (e.g. cement)	8	9
8030	Container vessel	7	9
8040	Gas tanker	8	0
8050	Motor freighter, tug	7	9
8060	Motor tanker, tug	8	9
8070	Motor freighter with one or more ships alongside	7	9
8080	Motor freighter with tanker	8	9
8090	Motor freighter pushing one or more freighters	7	9
8100	Motor freighter pushing at least one tank-ship	8	9
8110	Tug, freighter	7	9
8120	Tug, tanker	8	9
8130	Tug, freighter, coupled	3	1
8140	Tug, freighter/tanker, coupled	3	1
8150	Freightbarge	9	9
8160	Tankbarge	9	9
8161	Tankbarge, liquid cargo, type N	9	0
8162	Tankbarge, liquid cargo, type C	9	0
8163	Tankbarge, dry cargo as if liquid (e.g. cement)	9	9
8170	Freightbarge with containers	8	9

Vessel and convoy type		Maritime ship type	
8180	Tankbarge, gas	9	0
8210	Pushtow, one cargo barge	7	9
8220	Pushtow, two cargo barges	7	9
8230	Pushtow, three cargo barges	7	9
8240	Pushtow, four cargo barges	7	9
8250	Pushtow, five cargo barges	7	9
8260	Pushtow, six cargo barges	7	9
8270	Pushtow, seven cargo barges	7	9
8280	Pushtow, eigth cargo barges	7	9
8290	Pushtow, nine or more barges	7	9
8310	Pushtow, one tank/gas barge	8	0
8320	Pushtow, two barges at least one tanker or gas barge	8	0
8330	Pushtow, three barges at least one tanker or gas barge	8	0
8340	Pushtow, four barges at least one tanker or gas barge	8	0
8350	Pushtow, five barges at least one tanker or gas barge	8	0
8360	Pushtow, six barges at least one tanker or gas barge	8	0
8370	Pushtow, seven barges at least one tanker or gas barge	8	0
8380	Pushtow, eight barges at least one tanker or gas barge	8	0
8390	Pushtow, nine or more barges at least one tanker or gas barge	8	0
8400	Tug, single	5	2
8410	Tug, one or more tows	3	1
8420	Tug, assisting a vessel or linked combination	3	1
8430	Pushboat, single	9	9
8440	Passenger ship, ferry, red cross ship, cruise ship	6	9
8441	Ferry	6	9
8442	Red cross ship	5	8
8443	Cruise ship	6	9
8444	Passenger ship without accommodation	6	9
8445	Day-trip high speed vessel	6	9
8446	Day-trip hydrofoil vessel	6	9

Vessel and convoy type		Maritime ship type	
8447	Sailing cruise ship	6	9
8448	Sailing passenger ship without accommodation	6	9
8450	Service vessel, police patrol, port service	9	9
8451	Service vessel	9	9
8452	Police patrol vessel	5	5
8453	Port service vessel	9	9
8454	Navigation surveillance vessel	9	9
8460	Vessel, work maintenance craft, floating derrick, cable-ship, buoy-ship, dredge	3	3
8470	Object, towed, not otherwise specified	9	9
8480	Fishing boat	3	0
8490	Bunkership	9	9
8500	Barge, tanker, chemical	8	0
8510	Object, not otherwise specified	9	9
1500	General cargo Vessel maritime	7	9
1510	Unit carrier maritime	7	9
1520	Bulk carrier maritime	7	9
1530	Tanker	8	0
1540	Liquefied gas tanker	8	0
1850	Pleasure craft, longer than 20 metres	3	7
1900	Fast ship	4	9
1910	Hydrofoil	4	9
1920	Catamaran fast	4	9

ANNEX 7
(INFORMATIVE) BLOCK DIAGRAM OF AIS
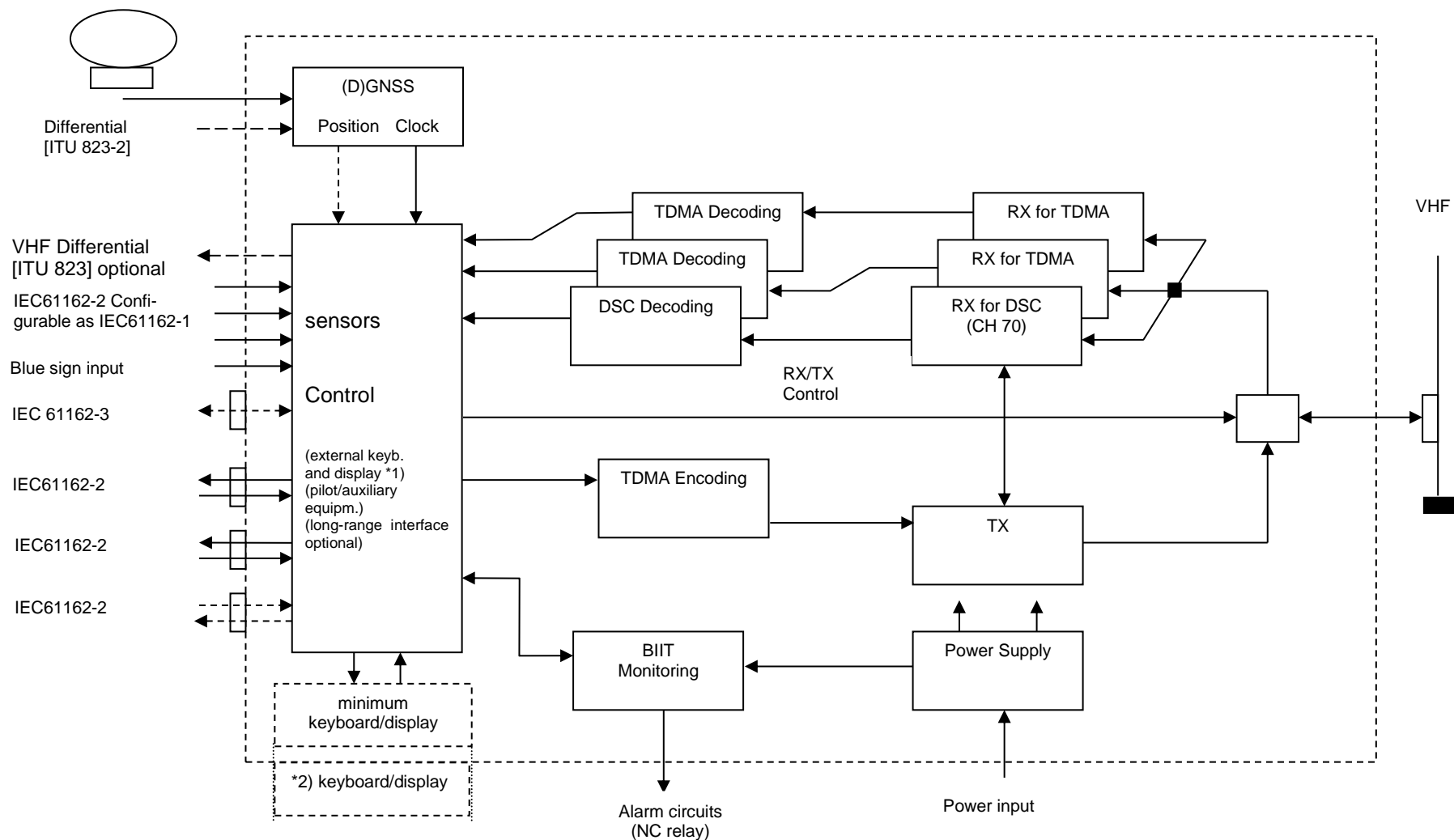
*1)   The external keyboard/display may be e.g. a radar, ECDIS or dedicated devices.
*2)   The internal keyboard/display may be optionally

ANNEX 8
(NORMATIVE) AIS INTERFACE OVERVIEW

Sensor Inputs

| CH1 | 61162-1 61162-2 |

Minimum required input sentences:

Position	GNS, GLL, RMC	int/ext*
SOG	RMC, VBW, VTG	int/ext*
COG	RMC, VBW, VTG	int/ext*
Heading	HDT	ext
Rate of Turn	ROT	ext
RAIM	GBS	ext

*for priorities see IEC 61993-2

| CH2 | 61162-1 61162-2 |

| CH3 | 61162-1 61162-2 |

| CH11 | Blue Sign |

Input / Output of AIS Data

| CH4 | external Display 61162-2 |

INPUT
manual data input:
Voyage
VSD, EPV and $PIWWIVD
Static

SSD, EPV and $PIWWSSD

VDL-messages:
ABM
BBM
AIR   interrogation

Other:
ACA   channel ass.
ACK   alarm ack.

OUTPUT
VDL-messages:
VDM

(Data block of VDM representing binary Data contents of VDL messages)

Other:

VDO	own ship data
ALR	alarm status
ABK	VDL ack.
TXT	sensor status
ACA	channel management information

| CH5 | aux. Display/ pilot port 61162-2 |

| CH6 | optional 61162-3 |

| CH8 | Long Range 61162-2 |

Long Range Port (optional)

| INPUT   LRI, LRF | OUTPUT   LRF, LR1,2,3 |

| CH9 | DGNSS Data 823-2 |

DGNSS-Data Port

Correction data information

| CH10 | BIIT NC relay |

BIIT Output Port

ANNEX 9
(NORMATIVE) ADDITIONAL PI PORT SENTENCES FOR INLAND AIS

1.   Inland Waterway voyage data

$PIWWIVD,x,x,x,x.x,x.x,x,xxx,xxxx,xxx,x.x,x.x,x.x,x.x*hh<CR><LF>
field   1 2 3 4   5 6 7   8   9 10 11 12 13

Field	Format	Description
1	x	See ITU-R M.1371-5 message 23 for Reporting interval settings, default setting: 0
2	x	Number of blue cones: 0-3, 4=B-Flag, 5=default=unknown
3	x	0=not available=default, 1=loaded, 2=unloaded, rest not used
4	x.x	Static draught of ship 0 to 20,00 meters, 0=unknown=default, rest not used
5	x.x	Air draught of ship 0 to 40,00 meters, 0=unknown=default, rest not used
6	x	Number of assisting tugboat 0-6, 7=default=unknown, rest not used
7	xxx	Number of crew members on board 0 to 254, 255=unknown=default, rest not
8	xxxx	Number of passengers on board 0 to 8190, 8191=unknown=default, rest not used
9	xxx	Number of shipboard personnel on board 0 to 254, 255=unknown=default, rest not used
10	x.x	Convoy extension to bow in (meter.decimeter = resolution in dm)
11	x.x	Convoy extension to stern in (meter.decimeter = resolution in dm)
12	x.x	Convoy extension to port side in (meter.decimeter = resolution in dm)
13	x.x	Convoy extension to starboard side in (meter.decimeter = resolution in dm)

In case of null fields, the corresponding configuration setting shall not be changed.

2.   Inland Waterway Static Ship data

This sentence is used to change settings, which are not covered by SSD and VSD.

$PIWWSSD,cccccccc,xxxx,x.x,x.x,x,x,x,x.x,x.x,x.x,x.x*hh<CR><LF>
field   1   2   3 4 5 6 7 8   9   10 11

Field	Format	Description
1	cccccccc	ENI number
2	xxxx	Inland vessel and convoy type (see Annex 6)
3	x.x	Length of ship 0 to 800,0 meter
4	x.x	Beam of ship 0 to 100,0 meter
5	x	Quality of speed information 1=high or 0=low
6	x	Quality of course information 1=high or 0=low
7	x	Quality of heading information 1=high or 0=low
8	x.x	B value for internal reference position (distance reference point to stern)
9	x.x	C value for internal reference position (distance reference point to port side)
10	x.x	B value for external reference position (distance reference point to stern)
11	x.x	C value for external reference position (distance reference point to port side)

ANNEX 10
SHIP DIMENSIONS

Figure 1

Parameters and the usage to calculate the dimensions for both RFM 10 and message 5

Input parameters using IWWSSD: (own ship)
Password protected
BI (dm) and LS (dm)
CI (dm) and BS (dm)

Input parameters using SSD:
(own ship)
Password protected
AI (=A_{SSD}), BI (=B_{SSD}), CI (=C_{SSD}), DI (=D_{SSD}) (dm)

Input parameters using EPV and IWWIVD:
(convoy extension)
Not password protected
EA (dm)
EB (dm)
EC (dm)
ED (dm)

Calculated internally:
Using IWWSSD
AI (dm) = LS - BI
DI (dm) = BS - CI
BC (dm) = BS + EC + ED
LC (dm) = LS + EA + EB

Using SSD
LC (dm) = AI + EA + BI +EB
BC (dm) = CI + EC + DI + ED

A (m) = AI + EA (rounded upwards)
B (m) = BI + EB (rounded upwards)
C (m) = CI + EC (rounded upwards)
D (m) = DI + ED (rounded upwards)

Output Msg 5:
A (m)
B (m)
C (m)
D (m)

Output RFM 10:
LC (dm)
BC (dm)
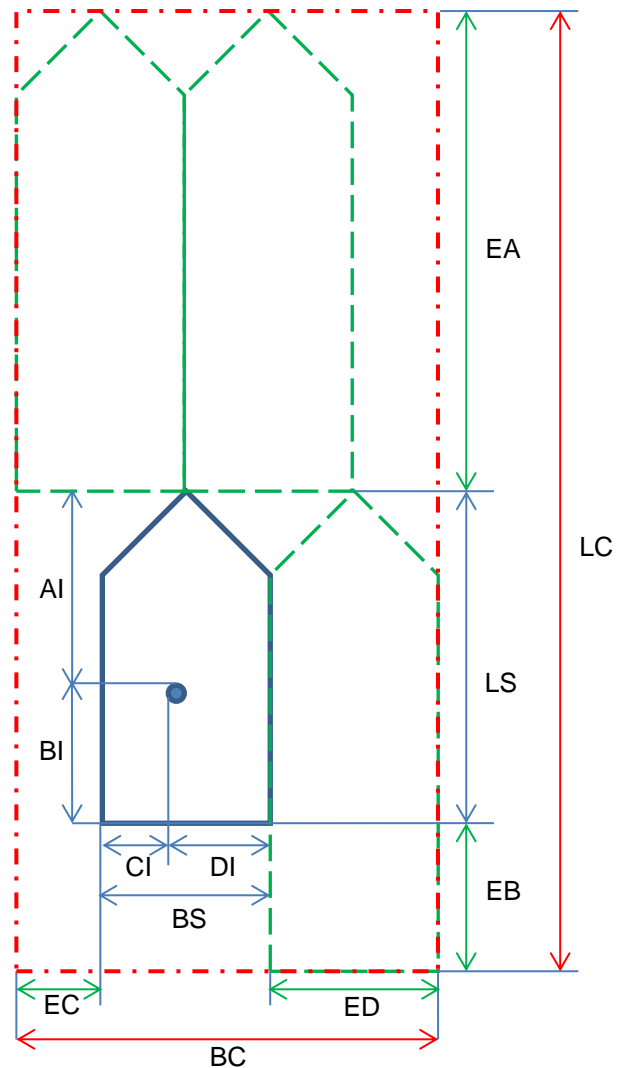
ANNEX 11
(DANGEROUS) GOODS REPORTING (IFTDGN) — ERINOT

1.   ERI notification message

The ERI notification message (ERINOT) is a specific use of the UN/EDIFACT 'International Forwarding and Transport Dangerous Goods Notification (IFTDGN)' message as it has been developed within the PROTECT organisation. The ERINOT message is based on EDIFACT directory 98.B and Protect version 1.0.

The segment table of ERINOT message is depicted in (1)(d). The branching diagram of the ERINOT message is depicted in (1)(e).

To ensure the usage of the message also under special circumstances such as a convoy of ships, some extra qualifiers have been introduced for the RFF segments in the TDT group.

a)   Field of application

The ERI notification message (ERINOT) shall be used by skippers and on behalf of skippers by transport operators and agents for the reporting of dangerous and non-dangerous cargo carried by inland waterway vessels.

The message supports the implementation — by means of EDI — of the following reporting needs:

-    applicable police regulations either on Member States level or locally (eg. specific requirements in specific ports);

-    reporting requirements set by river commissions (eg. on the Rhine set by CCNR);

-    goods reporting for statistics purposes (Member States level or Eurostat).

b)   Principles

The ERINOT message is a specific standard implementation and use of the UN/EDIFACT 'International Forwarding and Transport Dangerous Goods Notification (IFTDGN)' message such as has been developed within the PROTECT seaports organisation.

This standard message implementation guideline has been accepted by the IMO for the reporting of dangerous goods to authorities. It has been designated as the message from the party responsible to report 'dangerous' goods to the authority performing the control and checks on conformance with the legal requirements. The message is conveying information on the 'dangerous' goods being loaded, discharged or in transit relating to a means of transport.

Where reporting is mandatory and if technically feasible, an ERI notification message is to be composed and sent to the competent authority for each inland waterway transport.

However all vessels are invited to report electronically to the competent authorities whenever possible. Where available, this may be done through a Single Window[1] to come to the envisioned reduction of procedures.

---

[1]   UN/CEFACT Recommendation No 33, Recommendation and Guidelines on establishing a Single Window.

The notification message based on this standard message can be depicted as follows:

'ERI (Electronic Reporting International) Notification Message' with the following types:

- transport notification from vessel to authority from ship to shore;
- transport notification from carrier to authority from shore to shore;
- passage notification from authority to authority.

c) Segment index (alphabetical sequence by tag)

BGM Beginning of message

CNI Consignment information

COM Communication contact

CTA Contact information

DGS Dangerous goods

DTM Date/time/period

EQD Equipment details

FTX Free text

GID Goods item details

HAN Handling instructions

LOC Place/location identification

MEA Measurements

NAD Name and address

RFF Reference

SGP Split goods placement

TDT Details of transport

UNH Message header

UNT Message trailer

d) Segment table

[S] Status, [R] Recurrence, [M] Mandatory, [C] Conditional, [D] Dependent on business rules

Pos	Tag	Name	S	R
0010	UNH	Message header	M	1
0020	BGM	Beginning of message	M	1
0040	FTX	Free text	C	3
0050	HAN	Handling instructions	D [1]	1
0060		Segment Group 1	C	3
0070	REF	Reference	M	1
0090		Segment Group 2	M	1
0100	TDT	Details of transport	M	1
0110	RFF	Reference	M	9
0120	LOC	Place/location identification	M	9
0130	DTM	Date/time/period	M	2

Pos	Tag	Name	S	R
0140		Segment Group 3	M	2
0150	NAD	Name and address	M	1
0160		Segment Group 4	C	1
0170	CTA	Contact information	M	1
0180	COM	Communication contact	C	4
0190		Segment Group 5	M	99
0200	EQD	Equipment details	M	1
0210	MEA	Measurements	M	5
0220		Segment Group 6	M	999
0230	CNI	Consignment information	M	1
0240	HAN	Handling instructions	D [1]	1
0250	DTM	Date/time/period	C	2
0260	LOC	Place/location identification	C	2
0300		Segment Group 8	C	2
0310	NAD	Name and address	M	1
0360		Segment Group 10	M	99
0370	GID	Goods item details	M	1
0380	FTX	Free text	C	2
0400		Segment Group 11	C	99
0410	SGP	Split goods placement	M	1
0420	MEA	Measurements	M	1
0430		Segment Group 12	M	1
0440	DGS	Dangerous goods	M	1
0450	FTX	Free text	D[5]	7
4600	MEA	Measurements	M	1
4700	LOC	Place/location identification	C	0
0480	RFF	Reference	C	0
0490		Segment Group 13	C	99
0500	SGP	Split goods placement	M	1
0510	LOC	Place/location identification	C	1

Pos	Tag	Name	S	R
0520	MEA	Measurements	D[6]	2
0530	UNT	Message trailer	M	1

Business rules	
D[1]	The HAN-segment has to appear once, either in the vessel voyage details, on message level, or in the cargo details
D[5]	If mandatory by the applicable police regulations, this data shall be given in compliance with police regulations and then in accordance with the ADN
D[6]	The message shall contain at least one MEA-segment
	For the transport of liquid cargo the MEA with the measurement purpose qualifier 'VOL' shall be used
	For container transport the MEA with the measurement purpose qualifier WT' shall be used
	In case of a tank container both measurement purpose qualifiers are required
D[USE 1]	If the code is XXXXX, then this data-element shall be completed
D[USE 2]	If containers are carried, then this data shall be given
D[USE 3]	HS-code has preference
D[USE 4]	If the container type is known, then this data shall be given
D[USE 5]	If mandatory by the applicable police regulations, this data shall be given in compliance with police regulations and then in accordance with the ADN
D[USE 6]	The HAN-segment shall be present at least once
D[USE 7]	The transport equipment verified gross mass or estimated gross weight shall be given

e)   Branching diagram (ERI notification message)
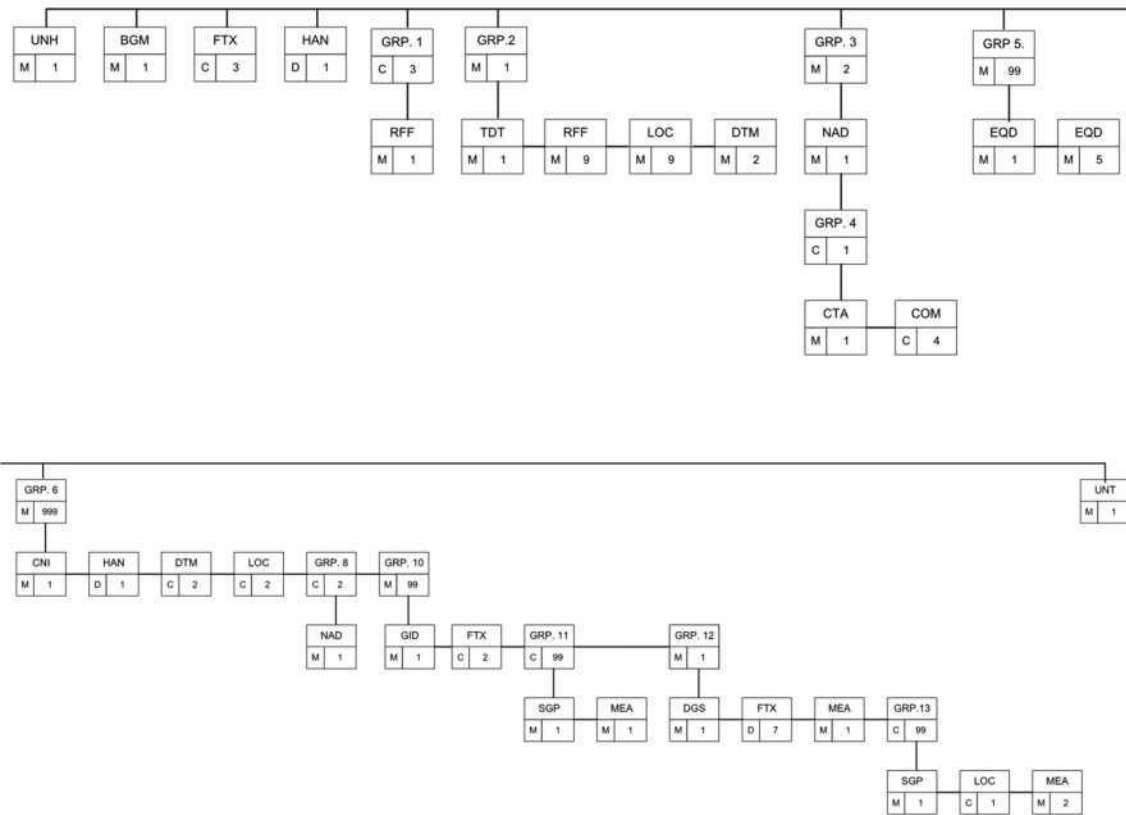
2.   ERINOT message structure

Table 1 defines the structure of the segments and the data elements of the ERI notification message.

Table 1

ERI notification message ERINOT

Segment Group	Segment Composite data element (C) Data element TAG	Level	Status	Format	Name	Description Qualifiers in quotation marks
1	2	3	4	5	6	7
	UNB	0	M		*INTERCHANGE HEADER*	
	S001		M		SYNTAX IDENTIFIER	
	0001		M	a4	Syntax identifier	'UNOA' Controlling agency level A
	0002		M	n1	Syntax version number	'2'
	S002		M		INTERCHANGE SENDER	
	0004		M	an..35 (an25)	Sender identification	Mailbox number or unique name or the unique identifier of a RIS-centre or traffic post
	0007		C	an..4	Partner identification code qualifier	n.a.
	0008		C	an..14	Address for reverse routing	n.a.
	S003		M		INTERCHANGE RECIPIENT	
	0010		M	an..35 (an25)	Recipient identification	Mailbox number or unique name or the unique identifier of a RIS-centre or traffic post

1	2	3	4	5	6	7
	0007		C	an..4	Partner identification code qualifier	n.a.
	0014		C	an..14	Routing address	n.a.
	S004		M		DATE/TIME OF PREPARATION	
	0017		M	n6	Date	Generation date, YYMMDD
	0019		M	n4	Time	Generation time, HHMM
	0020		M	an..14	Interchange control reference	First 14 positions of the message reference number
	S005				RECIPIENTS REFERENCE, PASSWORD	n.a
	0022			an..14	Recipient's reference/password	n.a.
	0025			an2	Recipient's reference, password qualifier	n.a.
	0026			an..14	Application reference	n.a.
	0029			a1	Processing priority code	n.a.
	0031		C	n1	Acknowledgement request	'1' = Sender requests acknowledgement, i.e. UNB and UNZ segments received and identified
	0032			an..35	Communications agreement id	n.a.
	0035		C	n1	Test indicator	'1' = The interchange relates to a test message
	UNH	0	M		*MESSAGE HEADER*	Identification, specification and heading of a message
	0062		M	an..14	Message reference number	First 14 positions of the message reference number
	S009		M		MESSAGE IDENTIFIER	

1	2	3	4	5	6	7
		0065		M	an..6	Message type	'IFTDGN', message type
		0052		M	an..3	Message version number	'D'
		0054		M	an..3	Message release number	'98B'
		0051		M	an..2	Controlling agency	'UN'
		0057		M	an..6	Association assigned code	'ERI13', ERI Version 1.3
	0068			O	an..35	Common access reference	This unique reference code is meant to have a common denominator for all messages for the same voyage
	S010					STATUS OF THE TRANSFER	n.a.
		0070			n..2	Sequence of transfers	n.a.
		0073			a1	First and last transfer	n.a.
	BGM		0	M		*BEGINNING* OF *MESSAGE*	Identification of the type and function of the message
	C002			M		DOCUMENT/MESSAGE NAME	
		1001		M	an..3	Document/message name code	*Type* of message: 'VES', from vessel to RIS authority message 'CAR', from carrier to RIS authority message 'PAS', passage report from RIS authority to RIS authority (also see Annex 11(2)(g))
		1131			an..3	Code list qualifier	n.a.
		3055			an..3	Code list responsible agency	n.a.

1	2	3	4	5	6	7
		1000			an..35	Document/message name	n.a.
	C106			M		DOCUMENT/MESSAGE IDENTIFICATION	
		1004		M	an..35 (an15)	Document identifier	Message reference number. This number shall be as unique as possible, both for sender and for receiver. If a message is received and then passed on to another receiver, the original message reference number shall be used. The transitional system shall in this case not generate another message reference number
		1056			an..9	Version	n.a.
		1060			an..6	Revision number	n.a.
		1225		M	an..3	Message function code	*Function* of message: '1' = cancellation message '9' = new message, (original) '5' = modification message '22' = Final transmission (End of voyage) '150' = Interruption of voyage '151' = Restart of voyage
		4343		C	an..3	Response type code	AQ
	FTX (1)		0	C		*FREE TEXT*	To notify the number of *persons on board* and the number of *blue cones*
		4451		M	an..3	Text subject code qualifier	'SAF' for safety explanation

1	2	3	4	5	6	7
	4453			an..3	Free text function code	n.a.
	C107				TEXT REFERENCE	
	4441			an..17	Free text identification	n.a.
	1131			an..3	Code list qualifier	n.a.
	3055			an..3	Code list responsible agency	n.a.
	C108		M		TEXT LITERAL	Text
	4440		M	an..70 (n4)	Free text	Total number of persons on board (If the total number of persons is not known or indicated, this field shall be filled with '9999')
	4440		C	an..70 (an1)	Free text	'0', '1', '2', '3' for number of cones (inland vessel) 'B' for red signal flag (maritime vessel) 'V' for special permit Note: Number of cones '0' will indicate that this is the result of the system which calculated zero blue cones, if the field is left blank this will indicate that no data is available.
	4440		C	an..70 (n4)	Free text	Number of passengers
	4440			an..70	Free text	n.a.
	4440			an..70	Free text	n.a.
	3453			an..3	Language, coded	n.a.
	4447			an..3	Text formatting, coded	n.a.

1	2	3	4	5	6	7
	FTX (2)	0	C		*FREE TEXT*	*To indicate whether the information in the message may be forwarded by the receiver to other authorities*
	4451		M	an..3	Text subject code qualifier	'ACK' for 'Privacy statement' or 'Confidential nature'
	4453			an..3	Free text function code	n.a.
	C107				TEXT REFERENCE	
	4441			an..17	Free text identification	n.a.
	1131			an..3	Code list qualifier	n.a.
	3055			an..3	Code list responsible agency	n.a.
	C108		M		TEXT LITERAL	
	4440		M	an..70 (a1)	Free text	'Y = Yes, 'N' = No
	4440			an..70	Free text	n.a.
	4440			an..70	Free text	n.a.
	4440			an..70	Free text	n.a.
	4440			an..70	Free text	n.a.
	3453			an..3	Language, coded	n.a.
	4447			an..3	Text formatting, coded	n.a.

1	2	3	4	5	6	7
	FTX(3)	0	C		FREE TEXT	*Reason for cancellation*
	4451		M	an..3	Text subject code qualifier	'ACD' cancellation reason
	4453			an..3	Free text function code	n.a.
	C107		M		TEXT REFERENCE	Text identification
	4441		M	an..17	Free text identification	'CAM' mistake in notification 'CAO' transport does not take place 'CAV' the main transport destination has changed 'CHD' the time of arrival has changed
	1131			an..3	Code list qualifier	n.a.
	3055			an..3	Code list responsible agency	n.a.
	C108		M			Text
	4440		M	an..70	Free text	Free description of the reason
	4440		C	an..70	Free text	Free text for further explanation
	4440		C	an..70	Free text	Free text for further explanation
	4440		C	an..70	Free text	Free text for further explanation
	4440		C	an..70	Free text	Free text for further explanation
	3453			an..3	Language, coded	n.a.
	4447			an..3	Text formatting, coded	n.a.
	HAN(1)	0	D[6]			

1	2	3	4	5	6	7
	C524		M		HANDLING INSTRUCTIONS	
	4079		M	an..3	Handling instructions, coded	Default T T = Transit LLO = Loading LDI = Unloading TSP = Transit in the same port
	1131				Code list qualifier	n.a.
	3055				Code list responsible agency, coded	n.a.
	4078				Handling instructions	n.a.
	C218				HAZARDOUS MATERIAL	n.a.
	7419				Hazardous material class code, identification	n.a.
	1131				Code list qualifier	n.a.
	3055				Code list responsible agency, coded	n.a.
	7418				Hazardous material class	n.a.
GRP 1	**RFF (1)**	1	C		*REFERENCE*	Reference to the message for which the current message is a *replacement*. Mandatory if the message is a modification or a cancellation message
	C506		M		REFERENCE	
	1153		M	an..3	Reference qualifier	'ACW' for reference number to previous message

1	2	3	4	5	6	7
	1154		M	an..35 (an15)	Reference number	Message reference number from BGM, TAG 1004 of the message this message replaces
	1156			an..6	Line number	n.a.
	4000			an..35	Reference version number	n.a.
	1060			an..6	Revision number	n.a.
GRP 1	**RFF (2)**	1	C		*REFERENCE*	Reference to *transport document*
	C506		M		REFERENCE	
	1153		M	an..3	Reference qualifier	'FF' for 'freight forwarder's reference number'
	1154		M	an..35	Reference number	Reference number of the transport document
	1156			an..6	Line number	n.a.
	4000			an..35	Reference version number	n.a.
	1060			an..6	Revision number	n.a.
GRP 1	**RFF (3)**	1	C		*REFERENCE*	Reference to a *test scenario*
	C506		M		REFERENCE	
	1153		M	an..3	Reference qualifier	'ADD' for test number
	1154		M	an..35	Reference number	Test scenario identification, which shall be known at the receiving party
	1156			an..6	Line number	n.a.

1	2	3	4	5	6	7
	4000			an..35	Reference version number	n.a.
	1060			an..6	Revision number	n.a.
GRP 2	**TDT**	1	M		*DETAILS* OF *TRANSPORT*	Specification of the means of transport, the *naming vessel within a convoy* (a single vessel without barge is also a convoy in this context)
	8051		M	an..3	Transport stage code qualifier	'20' for main carriage transport
	8028		C	an..17	Conveyance reference number	Voyage number, defined by sender of the message
	C220		M		MODE OF TRANSPORT	
	8067		M	an..3	Mode of transport, coded	'8' for Inland water transport, '1' for maritime transport (see UNECE Rec. 19)
	8066			an..17	Mode of transport	n.a.
	C228		M		TRANSPORT MEANS	
	8179		M	an..8 (an4)	Type of means of transport identification, *convoy type*	Code for ship and convoy types of means of transport from UN/CEFACT Rec. 28, see Part IV, Article 2.03(1)
	8178			an..17	Type of means of transport	n.a.
	C040				CARRIER	n.a.
	3127			an..17	Carrier identification	n.a.
	1131			an..3	Code list qualifier	n.a.
	3055			an..3	Code list responsible agency	n.a.

1	2	3	4	5	6	7
	3128			an..35	Carrier name	n.a.
	8101			an..3	Transit direction, coded	n.a.
	C401				EXCESS TRANSPORTATION INFORMATION	
	8457			an..3	Excess transportation reason	n.a.
	8459			an..3	Excess transportation responsibility	n.a.
	7130			an..17	Customer authorisation number	n.a.
	C222		M		TRANSPORT IDENTIFICATION	
	8213		M	an..9 (an7..8)	ID. of means of transport identification	Vessel *number:* 7 digits for IMO indication or unique European vessel identification number (ENI)
	1131		M	an..3	Code list qualifier	'IMO' for an IMO-number, see Part IV, Article 2.03(2) 'ENI' for a unique European vessel identification number, see Part IV, Article 2.03(3)
	3055			an..3	Code list responsible agency	n.a.
	8212		M	an..35	Id. of the means of transport	*Name of the ship;* If the name results in more than 35 positions, the name of the vessel is shortened
	8453		M	an..3	Nationality of means of transport	ISO two-alpha country code 3166-1, see Part IV, Article 2.03(8). If the nationality of the means of transport is not known, the 3-digit code of the competent authority which issued the European vessel identification number shall be used.

1	2	3	4	5	6	7
	8281			an..3	Transport ownership	n.a.
TDT	**RFF (1)**	1	M		*REFERENCE*	Dimensions of the transport, *length*
	C506		M		REFERENCE	
	1153		M	an..3	Reference qualifier	'LEN' = Length
	1154		M	an..35 (n..5)	Reference number	Total length of the convoy in centimetres
	1156			an..6	Line number	n.a.
	4000			an..35	Reference version number	n.a.
	1060			an..6	Revision number	n.a.
TDT	**RFF (2)**	1	M		*REFERENCE*	Dimensions of the transport, *width*
	C506		M		REFERENCE	
	1153		M	an..3	Reference qualifier	'WID'
	1154		M	an..35 (n..4)	Reference number	Total width of the convoy in centimetres
	1156			an..6	Line number	n.a.
	4000			an..35	Reference version number	n.a.
	1060			an..6	Revision number	n.a.
TDT	**RFF (3)**	1	M		*REFERENCE*	Dimensions of the transport, *draught*

1	2	3	4	5	6	7
	C506		M		REFERENCE	
	1153		M	an..3	Reference qualifier	'DRA'
	1154		M	an..35 (n..4)	Reference number	Draught of the convoy in centimetres (If due to legal restriction this data cannot be submitted, the value of this field shall be '9999')
	1156			an..6	Line number	n.a.
	4000			an..35	Reference version number	n.a.
	1060			an..6	Revision number	n.a.
TDT	**RFF (4)**	1	C		*REFERENCE*	Dimensions of the transport, *height*
	C506		M		REFERENCE	
	1153		M	an..3	Reference qualifier	'HGT'
	1154		M	an..35 (n..4)	Reference number	Height of the convoy above the waterline in centimetres
	1156			an..6	Line number	n.a.
	4000			an..35	Reference version number	n.a.
	1060			an..6	Revision number	n.a.
TDT	**RFF (5)**	1	M		*REFERENCE*	Dimensions of the transport, *tonnage*
	C506		M		REFERENCE	Reference

1	2	3	4	5	6	7
	1153		M	an..3	Reference qualifier	'TON'
	1154		M	an..35 (n..6)	Reference number	Maximum capacity of the convoy in metric tonnes
	1156			an..6	Line number	n.a.
	4000			an..35	Reference version number	n.a.
	1060			an..6	Revision number	n.a.
TDT	**RFF (6)**	1	C		*REFERENCE*	*National voyage reference, Belgium, France, Germany*
	C506		M		REFERENCE	Reference
	1153		M	an..3	Reference qualifier	'GNB' = Belgium 'GNF'= France 'GNG' = Germany 'GN1' = reserved
	1154		M	an..35	Reference number	Government reference of Belgium
	1156			an..6	Line number	n.a.
	4000			an..35	Reference version number	n.a.
	1060			an..6	Revision number	n.a.
TDT	**RFF (7)**	1	C		*REFERENCE*	*LNG installation indicator*
	C506		M		REFERENCE	Reference

1	2	3	4	5	6	7
	1153		M	an..3	Reference qualifier	'LNG'
	1154		M	an..35 (an1)	Reference number	*Y* = Yes
	1156			an..6	Line number	n.a.
	4000			an..35	Reference version number	n.a.
	1060			an..6	Revision number	n.a.
TDT	**LOC (1)**	1	M		*PLACE/LOCATION IDENTIFICATION*	*Port of departure,* the port where the transport starts
	3227		M	an..3	Place/location qualifier	'5' place of departure
	C517		M		LOCATION IDENTIFICATION	
	3225		M	an..25 (an5)	Place/location identification	UNECE location code (Rec. 16), see Part IV , Article 2.03(9)
	1131			an..3	Code list qualifier	n.a.
	3055			an..3	Code list responsible agency	n.a.
	3224		C	an..70 (an..17)	Place/location	Full name of the port location
	C519		C		RELATED LOCATION ONE IDENTIFICATION	
	3223		M	an..25 (an..5)	Related place/location one identification	Terminal code, see Part IV, Article 2.03(11)
	1131			an..3	Code list qualifier	n.a.

1	2	3	4	5	6	7
	3055			an..3	Code list responsible agency	n.a.
	3222		D [Use 1]	an..70	Related place/location one	Full name of the terminal.
	C553		C		RELATED LOCATION TWO IDENTIFICATION	
	3233		M	an..25 (an5)	Related place/location two identification	Fairway section code, see Part IV, Article 2.03(10)
	1131			an..3	Code list qualifier	n.a.
	3055			an..3	Code list responsible agency	n.a.
	3232		C	an..70 (an..5)	Related place/location two	Fairway section hectometre
	5479			an..3	Relation	n.a.
TDT	**LOC (2)**	1	C		*PLACE/LOCATION IDENTIFICATION*	*Passage point that has already been passed* by the ship. This segment and the TDT/DTM(2) segment with qualifier 186 are mandatory for passage reports.
	3227		M	an..3	Place/location qualifier	'172' for passage point
	C517		M		LOCATION IDENTIFICATION	
	3225		M	an..25 (an5)	Place/location identification	UNECE location code (Rec. 16) of the passage point (lock, bridge, traffic centre), see Part IV, Article 2.03(9)
	1131			an..3	Code list qualifier	n.a.
	3055			an..3	Code list responsible agency	n.a.

1	2	3	4	5	6	7
		3224		C	an..70 (an..17)	Place/location	Full name of the passage point
	C519			C		RELATED LOCATION ONE IDENTIFICATION	
		3223		M	an..25 (an..5)	Related place/location one identification	Passage point code
		1131			an..3	Code list qualifier	n.a.
		3055			an..3	Code list responsible agency	n.a.
		3222			an..70	Related place/location one	n.a.
	C553			C		RELATED LOCATION TWO IDENTIFICATION	
		3233		M	an..25 (an5)	Related place/location two identification	Fairway section code, see Part IV, Article 2.03(10)
		1131			an..3	Code list qualifier	n.a.
		3055			an..3	Code list responsible agency	n.a.
		3232		C	an..70 (an..5)	Related place/location two	Fairway section hectometre
	5479				an..3	Relation	n.a.
TDT	**LOC (3)**		1	C		*PLACE/LOCATION IDENTIFICATION*	*Next passage point*
	3227			M	an..3	Place/location qualifier	'61' for next port of call
	C517			M		LOCATION IDENTIFICATION	

1	2	3	4	5	6	7
	3225		M	an..25 (an5)	Place/location identification	UNECE location code (Rec. 16) of the passage point (lock, bridge, VTS centre), see Part IV, Article 2.03(9)
	1131			an..3	Code list qualifier	n.a.
	3055			an..3	Code list responsible agency	n.a.
	3224		C	an..70 (an..17)	Place/location	Full name of the passage point
	C519		C		RELATED LOCATION ONE IDENTIFICATION	
	3223		M	an..25	Related place/location one identification	Passage point code
	1131			an..3	Code list qualifier	n.a.
	3055			an..3	Code list responsible agency	n.a.
	3222			an..70	Related place/location one	n.a.
	C553		C		RELATED LOCATION TWO IDENTIFICATION	
	3233		M	an..25 (an5)	Related place/location two identification	Fairway section code, see Part IV, Article 2.03(10)
	1131			an..3	Code list qualifier	n.a.
	3055			an..3	Code list responsible agency	n.a.
	3232		C	an..70 (an..5)	Related place/location two	Fairway section hectometre
	5479			an..3	Relation	n.a.

1	2	3	4	5	6	7
TDT	**LOC (4..8)**	1	C		*PLACE/LOCATION IDENTIFICATION*	*Further future passage points* (information on intended route). At most five intermediate points on the route may be given. The order of passage shall be the order within the message.
	3227		M	an..3	Place/location qualifier	'92' for routing
	C517		M		LOCATION IDENTIFICATION	
	3225		M	an..25 (an5)	Place/location identification	UNECE location code (Rec. 16) of the passage point (lock, bridge, traffic centre), see Part IV, Article 2.03(9)
	1131			an..3	Code list qualifier	n.a.
	3055			an..3	Code list responsible agency	n.a.
	3224		C	an..17	Place/location	Full name of the passage point
	C519		C		RELATED LOCATION ONE IDENTIFICATION	
	3223		M	an..25 (an..5)	Related place/location one identification	Passage point code
	1131			an..3	Code list qualifier	n.a.
	3055			an..3	Code list responsible agency	n.a.
	3222		C	an..70	Passage datetime	YYMMDDHHMM as '201' of DTM 2379

1	2	3	4	5	6	7
	C553		C		RELATED LOCATION TWO IDENTIFICATION	
	3233		M	an..25 (an5)	Related place/location two identification	Fairway section code, see Part IV, Article 2.03(10)
	1131			an..3	Code list qualifier	n.a.
	3055			an..3	Code list responsible agency	n.a.
	3232		C	an..70 (an..5)	Related place/location two	Fairway section hectometre
	5479			an..3	Relation	n.a.
TDT	**LOC (9)**	1	M		*PLACE/LOCATION IDENTIFICATION*	*Port of destination.* This is the first port where the transport is bound.
	3227		M	an..3	Place/location qualifier	'153' for place of call
	C517		M		LOCATION IDENTIFICATION	
	3225		M	an..25 (an5)	Place/location identification	UNECE location code (Rec. 16) of the port, see Part IV, Article 2.03(9)
	1131			an..3	Code list qualifier	n.a.
	3055			an 3	Code list responsible agency	n.a.
	3224		C	an..70 (an..17)	Place/location	Full name of the port location
	C519		C		RELATED LOCATION ONE IDENTIFICATION	

1	2	3	4	5	6	7
	3223		M	an..25 (an..5)	Related place/location one identification	Terminal code, see Part IV, Article 2.03(11)
	1131			an..3	Code list qualifier	n.a.
	3055			an..3	Code list responsible agency	n.a.
	3222		D [Use 1]	an..70	Related place/location one	Full name of the terminal
	C553		C		RELATED LOCATION TWO IDENTIFICATION	
	3233		M	an..25 (an5)	Related place/location two identification	Fairway section code, see Part IV, Article 2.03(10)
	1131			an..3	Code list qualifier	n.a.
	3055			an..3	Code list responsible agency	n.a.
	3232		C	an..70 (an..5)	Related place/location two	Fairway section hectometre
	5479			an..3	Relation	n.a.
TDT/LOC(1)	**DTM (1)**	2	C		*DATE/TIME/PERIOD*	*Departure time* (estimated)
	C507		M		DATE/TIME/PERIOD	
	2005		M	an..3	Date or time or period function code qualifier	'133' for departure date/time, estimated
	2380		M	an..35	Date or time period value	Value of departure time
	2379		M	an..3	Date or time or period format code	'201' for YYMMDDHHMM

1	2	3	4	5	6	7
TDT/LOC(2)	**DTM (2)**	2	C		DATE/TIME/PERIOD	Passage time, as recorded by the traffic centre
	C507		M		DATE/TIME/PERIOD	
	2005		M	an..3	Date or time or period function code qualifier	'186' for departure time, actual
	2380		M	an..35	Date or time period value	Value of passage time: YYMMDDHHMM
	2379		M	an..3	Date or time or period format code	'201' for YYMMDDHHMM
TDT/LOC(9)	**DTM (3)**	2	C		*DATE/TIME/PERIOD*	*Estimated time of arrival at port of destination*
	C507		M		DATE/TIME/PERIOD	
	2005		M	an..3	Date or time or period function code qualifier	'132' for arrival time, estimated
	2380		M	an..35	Date or time period value	Value of arrival time: YYMMDDHHMM
	2379		M	an..3	Date or time or period format code	'201' for YYMMDDHHMM
GRP 3	**NAD (1)**	1	M		*NAME and ADDRESS*	name and address of *message sender*
	3035		M	an..3	Party function code qualifier	'MS' for message sender
	C082		C		PARTY IDENTIFICATION DETAILS	
	3039		M	an..35	Party identification	Identification code. For notifications to the Port of Rotterdam this element is mandatory. ERI fills this element with '900000000'.

1	2	3	4	5	6	7
	1131			an..3	Code list qualifier	n.a.
	3055			an..3	Code list responsible agency	n.a.
	C058				NAME AND ADDRESS	n.a.
	3124			an..35	Name and address line	n.a.
	3124			an..35	Name and address line	n.a.
	3124			an..35	Name and address line	n.a.
	3124			an..35	Name and address line	n.a.
	3124			an..35	Name and address line	n.a.
	C080		M		PARTY NAME	
	3036		M	an..35	Party name	Sender name
	3036			an..35	Party name	n.a.
	3036			an..35	Party name	n.a.
	3036			an..35	Party name	n.a.
	3036			an..35	Party name	n.a.
	3045			an..3	Party name format, coded	n.a.
	C059		C		STREET	
	3042		M	an..35	Street and number/PO box	Street and number or post office box
	3042			an..35	Street and number/PO box	n.a.
	3042			an..35	Street and number/PO box	n.a.

1	2	3	4	5	6	7
	3042			an..35	Street and number/PO box	n.a.
	3164		C	an..35	City name	City
	3229			an..9	Country sub-entity identification	n.a.
	3251		C	an..9	Postcode identification	Postal identification code
	3207		C	an..3	Country	ISO 3166-1 two alpha country code, see Part IV, Article 2.03(8)
GRP 4 NAD	**CTA**	2	C		*CONTACT INFORMATION*	Sender contact details
	3139			an..3	Contact function	n.a.
	C056		M		DEPARTMENT OR EMPLOYEE DETAILS	
	3413			an..17	Department or employee identification	n.a.
	3412		M	an..35	Department or employee	'ERI', dummy value
NAD/CTA	**COM**	2	C		*COMMUNICATION CONTACT*	Sender communication contact details (maximum 4 times)
	C076		M		COMMUNICATION CONTACT	
	3148		M	an..70	Communication number	Communication number

1	2	3	4	5	6	7
	3155		M	an..3	Communication channel qualifier	'TE' for telephone number 'FX' for fax number 'EM' for email address 'EI' for EDI mailbox number (EDI number *or* email address for NAD 1 is mandatory if a response in the form of an ERIRSP message is requested for. If no response is requested, the EDI number and email address is not to be used).
NAD	**NAD (2)**	1	C		*NAME and ADDRESS*	Name and address of *agent/invoicee*
	3035		M	an..3	Party function code qualifier	'CG' for agent/invoice address (for VNF this segment is mandatory)
	C082		C		PARTY IDENTIFICATION DETAILS	
	3039		M	an..35	Party identification	Identification code. For notifications to the Port of Rotterdam this element is mandatory. ERI fills this element with '900000000'
	1131			an..3	Code list qualifier	n.a.
	3055			an..3	Code list responsible agency	n.a.
	C058				NAME AND ADDRESS	n.a.
	3124			an..35	Name and address line	n.a.
	3124			an..35	Name and address line	n.a.
	3124			an..35	Name and address line	n.a.
	3124			an..35	Name and address line	n.a.

1	2	3	4	5	6	7
	3124			an..35	Name and address line	n.a.
	C080		M		PARTY NAME	
	3036		M	an..35	Party name	Sender name.
	3036		C	an..35 (an..25)	Invoice number	Invoice number of the agent/invoicee
	3036			an..35	Party name	n.a.
	3036			an..35	Party name	n.a.
	3036			an..35	Party name	n.a.
	3045			an..3	Party name format, coded	n.a.
	C059		C		STREET	Street
	3042		M	an..35	Street and number/PO box	Address (street name + number or post office box number)
	3042			an..35	Street and number/PO box	n.a.
	3042			an..35	Street and number/PO box	n.a.
	3042			an..35	Street and number/PO box	n.a.
	3164		C	an..35	City name	City
	3229			an..9	Country sub-entity identification	n.a.
	3251		C	an..9	Postcode identification	Postal code
	3207		C	an..3	Country	ISO 3166-1 two alpha country code, see Part IV, Article 2.03(8)

1	2	3	4	5	6	7
GRP 5	**EQD (1)**	1	M		*EQUIPMENT DETAILS*	Specification of the VESSELS within the convoy (for each vessel 1 segment, also the main vessel), *propulsed vessel*
	8053		M	an..3	Equipment type code qualifier	'BRY' for vessel participating in the propulsion
	C237		M		EQUIPMENT IDENTIFICATION	
	8260		M	an..17 (an7..8)	Equipment identification number	Vessel number: 7 digits for IMO indication or 8 digits for unique European vessel identification number (ENI)
	1131		M	an..3	Code list qualifier	'IMO' for an IMO number, see Part IV, Article 2.03(2) 'ENI' for a unique European vessel identification number, see Part IV, Article 2.03(3)
	3055			an..3	Code list responsible agency	n.a.
	3207			an..3	Country	n.a.
	C224		M		EQUIPMENT SIZE AND TYPE	
	8155		M	an..10 (an..4)	Equipment size and type identification, *vessel type*	Code for ship and convoy types of means of transport from UN/CEFACT Rec. 28, see Part IV, Article 2.03(1)
	1131			an..3	Code list qualifier	n.a.
	3055			an..3	Code list responsible agency	n.a.
	8154		M	an..35	Equipment size and type	*Name* of the vessel. If the name results in more than 35 positions, the name of the vessel is shortened

1	2	3	4	5	6	7
	8077			an..3	Equipment supplier	n.a.
	8249			an..3	Equipment status	n.a.
	8169			an..3	Full/empty indicator	n.a.
EQD	**EQD (V) (2 - 15)**	1	C		*EQUIPMENT DETAILS*	Specification of the VESSELS within the convoy (for each vessel 1 segment, also the main vessel) *not propulsed vessels*
	8053		M	an..3	Equipment type code qualifier	'BRN' for vessel not participating in the propulsion
	C237		M		EQUIPMENT IDENTIFICATION	
	8260		M	an..17 (an7..8)	Equipment identification number	Vessel number: 7 digits for IMO indication, 8 digits for unique European vessel identification number
	1131		M	an..3	Code list qualifier	'IMO' for an IMO number, see Part IV, Article 2.03(2) 'ENI' for a unique European vessel identification number, see Part IV, Article 2.03(3)
	3055			an..3	Code list responsible agency	n.a.
	3207			an..3	Country	n.a.
	C224		M		EQUIPMENT SIZE AND TYPE	
	8155		M	an..10 (an..4)	Equipment size and type identification, *vessel type*	Code for ship and convoy types of means of transport from UN/CEFACT Rec. 28, see Part IV, Article 2.03(1)
	1131			an..3	Code list qualifier	n.a.
	3055			an..3	Code list responsible agency	n.a.

1	2	3	4	5	6	7
	8154		M	an..35	Equipment size and type	*Name* of the vessel. If the name results in more than 35 positions, the name of the vessel is shortened
	8077			an..3	Equipment supplier	n.a.
	8249			an..3	Equipment status	n.a.
	8169			an..3	Full/empty indicator	n.a.
EQD	**MEA (1)**	1	M		*MEASUREMENTS*	*Vessel length*
	6311		M	an..3	Measurement purpose qualifier	'DIM' for dimension
	C502				MEASUREMENT DETAILS	
	6313		M	an..3	Property measured	'LEN' for length
	6321			an..3	Measurement significance	n.a.
	6155			an..17	Measurement attribute identification	n.a.
	6154			an..70	Measurement attribute	n.a.
	C174		M		VALUE/RANGE	
	6411		M	an..3	Measurement unit qualifier	'CMT' for centimetre (UNECE Rec. 20, Annex 3. Common code)
	6314		M	an..18 (n5)	Measurement value	Length
	6162			n..18	Range minimum	n.a.
	6152			n..18	Range maximum	n.a.

1	2	3	4	5	6	7
	6432			n..2	Significant digits	n.a.
	7383			an..3	Surface/layer indicator	n.a.
EQD	**MEA (2)**	1	M		*MEASUREMENTS*	*Vessel width*
	6311		M	an..3	Measurement purpose code qualifier	'DIM' for dimension
	C502				MEASUREMENT DETAILS	
	6313		M	an..3	Property measured	'WID' for width
	6321			an..3	Measurement significance	n.a.
	6155			an..17	Measurement attribute identification	n.a.
	6154			an..70	Measurement attribute	n.a.
	C174		M		VALUE/RANGE	
	6411		M	an..3	Measurement unit qualifier	'CMT' for centimetre (UNECE Rec. 20, Annex 3: Common code)
	6314		M	an..18 (n4)	Measurement value	Width
	6162			n..18	Range minimum	n.a.
	6152			n..18	Range maximum	n.a.
	6432			n..2	Significant digits	n.a.
	7383			an..3	Surface/layer indicator	n.a.

1	2	3	4	5	6	7
EQD	**MEA (3)**	1	M		*MEASUREMENTS*	*Vessel draught*
	6311		M	an..3	Measurement purpose code qualifier	'DIM' for dimension
	C502		M		MEASUREMENT DETAILS	Size details
	6313		M	an..3	Property measured	'DRA' for draught
	6321			an..3	Measurement significance	n.a.
	6155			an..17	Measurement attribute identification	n.a.
	6154			an..70	Measurement attribute	n.a.
	C174		M		VALUE/RANGE	
	6411		M	an..3	Measurement unit qualifier	'CMT' for centimetre (UNECE Rec. 20, Common code)
	6314		M	an..18 (n4)	Measurement value	Draught of the vessel in centimetres (If due to legal restriction this data cannot be submitted, the value of this field shall be '9999')
	6162			n..18	Range minimum	n.a.
	6152			n..18	Range maximum	n.a.
	6432			n..2	Significant digits	n.a.
	7383			an..3	Surface/layer indicator	n.a.
EQD	**MEA (4)**	2	C		*MEASUREMENTS*	*Vessel tonnage*
	6311		M	an..3	Measurement purpose code qualifier	*VOL' for volume*

1	2	3	4	5	6	7
	C502		M		MEASUREMENT DETAILS	Size details
	6313		M	an..3	Property measured	'AAM' for gross tonnage
	6321			an..3	Measurement significance	n.a.
	6155			an..17	Measurement attribute identification	n.a.
	6154			an..70	Measurement attribute	n.a.
	C174		M		VALUE/RANGE	
	6411		M	an..3	Measurement unit qualifier	'TNE' for metric ton (UNECE Rec. 20, Common code)
	6314		M	an..18 (n6)	Measurement value	Tonnage (capacity)
	6162			n..18	Range minimum	n.a.
	6152			n..18	Range maximum	n.a.
	6432			n..2	Significant digits	n.a.
	7383			an..3	Surface/layer indicator	n.a.
GRP 5	**EQD (1-15)**	1	D[Use 2]		*EQUIPMENT DETAILS*	Specification of the number of *CONTAINERS*
	8053		M	an..3	Equipment type code qualifier	'CN' for container
	C237				EQUIPMENT IDENTIFICATION	
	8260			an..17	Equipment identification number	n.a.

1	2	3	4	5	6	7
	1131			an..3	Code list qualifier	n.a.
	3055			an..3	Code list responsible agency	n.a.
	3207			an..3	Country	n.a.
	C224		M		EQUIPMENT SIZE AND TYPE	
	8155		M	an..10 (an5)	Equipment size and type identification	Container *range:* 'RNG20' for containers having a length between 20 and 29 feet 'RNG30' for containers having a length between 30 and 39 feet 'RNG40' for containers having a length of 40 feet or more
	1131			an..3	Code list qualifier	n.a.
	3055			an..3	Code list responsible agency	n.a.
	8154			an..35	Equipment size and type	n.a.
	8077			an..3	Equipment supplier	n.a.
	8249			an..3	Equipment status	n.a.
	8169		M	an..3	Full/empty indicator	Container *status:* '5' for loaded, '4' for empty, '6' for no volume available
EQD	**MEA (5)**	1	M	*EQD(2)*	*MEASUREMENTS*	Specification of the *number of containers*

1	2	3	4	5	6	7
	6311		M	an..3 (an2)	Measurement purpose qualifier	'NR' for number
	C502				MEASUREMENT DETAILS	n.a.
	6313			an..3	Property measured	n.a.
	6321			an..3	Measurement significance	n.a.
	6155			an..17	Measurement attribute identification	n.a.
	6154			an..70	Measurement attribute	n.a.
	C174		M		VALUE/RANGE	
	6411		M	an..3	Measurement unit qualifier	'NUM' for number (see UNECE Rec. 20, common code)
	6314		M	an..18 (n1..4)	Measurement value	Number of containers of the given type and status.
	6162			n..18	Range minimum	n.a.
	6152			n..18	Range maximum	n.a.
	6432			n..2	Significant digits	n.a.
	7383			an..3	Surface/layer indicator	n.a.
GRP 6	**CNI**	1	M		*CONSIGNMENT INFORMATION*	*Consignment* (similar source/destination) specification of the transported *cargo*
	1490		M	n..4	Consolidation item number	Sequence number of the consignment. For modifications, the same sequence number is to be used

1	2	3	4	5	6	7
	C503				DOCUMENT/MESSAGE DETAILS	n.a.
	1004			an..35	Document/message number	n.a.
	1373			an..3	Document/message status, coded	n.a.
	1366			an..70	Document/message source	n.a.
	3453			an..3	Language, coded	n.a.
	1056			an..9	Version	n.a.
	1060			an..6	Revision number	n.a.
	1312			n..4	Consignment load sequence number	n.a.
CNI	**HAN(1)**	1	D[1]			
	C524		M		HANDLING INSTRUCTIONS	
	4079		M		Handling instructions, coded	Default T T = Transit LLO = Loading LDI = Unloading TSP = Transit in the same port
	1131				Code list qualifier	n.a.
	3055				Code list responsible agency, coded	n.a.
	4078				Handling instructions	n.a.
	C218				HAZARDOUS MATERIAL	n.a.

1	2	3	4	5	6	7
	7419				Hazardous material class code, identification	n.a.
	1131				Code list qualifier	n.a.
	3055				Code list responsible agency, coded	n.a.
	7418				Hazardous material class	n.a.
CNI	**DTM (1)**	1	C		*DATE/TIME/PERIOD*	Estimated *arrival time* at the discharge place
	C507		M		DATE/TIME/PERIOD	
	2005		M	an..3	Date or time or period function code qualifier	'132' for arrival time, estimated
	2380		M	an..35	Date or time period value	Value of arrival time: YYMMDDHHMM
	2379		M	an..3	Date or time or period format code	'201' for YYMMDDHHMM
CNI	**DTM (2)**	1	C		*DATE/TIME/PERIOD*	Estimated *departure time* from the loading place
	C507		M		DATE/TIME/PERIOD	
	2005		M	an..3	Date or time or period function code qualifier	'133' for departure time, estimated
	2380		M	an..35	Date or time period value	Time: YYMMDDHHMM
	2379		M	an..3	Date or time or period format code	'201'

1	2	3	4	5	6	7
CNI	**LOC (1)**	1	C		*PLACE/LOCATION IDENTIFICATION*	Specification of the *loading place* of the cargo
	3227		M	an..3	Place/location qualifier	'9' for place/port of loading
	C517		M		LOCATION IDENTIFICATION	
	3225		M	an..25 (an5)	Place/location identification	UNECE location code (Rec. 16), of the loading place, see Part IV, Article 2.03(9)
	1131			an..3	Code list qualifier	n.a.
	3055			an..3	Code list responsible agency	n.a.
	3224		C	an..70 (an..17)	Place/location	Full name of the port location
	C519		C		RELATED LOCATION ONE IDENTIFICATION	
	3223		M	an..25 (an..5)	Related place/location one identification	Terminal code, see Part IV, Article2.03(11)
	1131			an..3	Code list qualifier	n.a.
	3055			an..3	Code list responsible agency	n.a.
	3222		D [Use 1]	an..70 (an..17)	Related place/location one	Full name of the terminal
	C553		C		RELATED LOCATION TWO IDENTIFICATION	
	3233		M	an..25 (an5)	Related place/location two identification	Fairway section code, see Part IV, Article 2.03(10)
	1131			an..3	Code list qualifier	n.a.

1	2	3	4	5	6	7
	3055			an..3	Code list responsible agency	n.a.
	3232		C	an..70 (an..5)	Related place/location two	Fairway section hectometre
	5479			an..3	Relation	n.a.
CNI	**LOC (2)**	1	C		*PLACE/LOCATION IDENTIFICATION*	Specification of the *discharge place* of the cargo
	3227		M	an..3	Place/location qualifier	'11' for place/port of discharge
	C517		M		LOCATION IDENTIFICATION	
	3225		M	an..25 (an5)	Place/location identification	UNECE location code (Rec. 16), see Part IV, Article 2.03(9)
	1131			an..3	Code list qualifier	n.a.
	3055			an..3	Code list responsible agency	n.a.
	3224		C	an..70 (an..17)	Place/location	Full name of the port
	C519		C		RELATED LOCATION ONE IDENTIFICATION	
	3223		M	an..25 (an..5)	Related place/location one identification	Terminal code, see Part IV, Article 2.03(11)
	1131			an..3	Code list qualifier	n.a.
	3055			an..3	Code list responsible agency	n.a.
	3222		D [1]	an..70 (an..17)	Related place/location one	Full name of terminal

1	2	3	4	5	6	7
	C553		C		RELATED LOCATION TWO IDENTIFICATION	
	3233		M	an..25 (an5)	Related place/location two identification	Fairway section code, see Part IV, Article 2.03(10)
	1131			an..3	Code list qualifier	n.a.
	3055			an..3	Code list responsible agency	n.a.
	3232		C	an..70 (an..5)	Related place/location two	Fairway section hectometre
	5479			an..3	Relation	n.a.
GRP 8 CNI/NAD	**NAD (1)**	2	C		*NAME AND ADDRESS*	*Cargo sender* name
	3035		M	an..3	Party function code qualifier	'SF for ship from
	C082		C		PARTY IDENTIFICATION DETAILS	
	3039		M	an..35 (an..25)	Party identifier	EDI number of cargo sender
	1131			an..3	Code list qualifier	n.a.
	3055			an..3	Code list responsible agency	n.a.
	C058		M		NAME AND ADDRESS	
	3124		M	an..35	Name and address line	Name of the Sender
	3124			an..35	Name and address line	n.a.

1	2	3	4	5	6	7
	3124			an..35	Name and address line	n.a.
	3124			an..35	Name and address line	n.a.
	3124			an..35	Name and address line	n.a.
	C080		M		PARTY NAME	
	3036		M	an..35	Party name	Ship from name
	3036		C	an..35 (an..25)	Party name	Invoice number
	3036			an..35	Party name	n.a.
	3036			an..35	Party name	n.a.
	3036			an..35	Party name	n.a.
	3045			an..3	Party name format, coded	n.a.
	C059		O		STREET	Street
	3042			an..35	Street and number or post office box	Address (street name and number or post office box number)
	3042			an..35	Street and number/PO box	n.a.
	3042			an..35	Street and number/PO box	n.a.
	3042			an..35	Street and number/PO box	n.a.
	3164		C	an..35	City name	City
	3229			an..9	Country sub-entity identification	n.a.
	3251		C	an..9	Postcode identification	Postal Code

1	2	3	4	5	6	7
	3207		C	an..3	Country	ISO 3166-1 two alpha country code, see Part IV, Article 2.03(8)
CNI/NAD	**NAD (2)**	2	C		*NAME AND ADDRESS*	*Cargo receiver* name
	3035		M	an..3	Party function code qualifier	'ST' for ship to
	C082		M		PARTY IDENTIFICATION DETAILS	
	3039		M	an..35 (an..25)	Party identification	EDI number of receiver of cargo
	1131			an..3	Code list qualifier	n.a.
	3055			an..3	Code list responsible agency	n.a.
	C058		M		NAME AND ADDRESS	
	3124		M	an..35	Name and address line	Name of the recipient.
	3124			an..35	Name and address line	n.a.
	3124			an..35	Name and address line	n.a.
	3124			an..35	Name and address line	n.a.
	3124			an..35	Name and address line	n.a.
	C080		M		PARTY NAME	
	3036		M	an..35	Party name	Ship to name
	3036		C	an..35 (an..25)	Party name	Invoice number
	3036			an..35	Party name	n.a.

1	2	3	4	5	6	7
	3036			an..35	Party name	n.a.
	3036			an..35	Party name	n.a.
	3045			an..3	Party name format, coded	n.a.
	C059				STREET	Street
	3042			an..35	Street and number/PO box	Address (street name and number or post office box number)
	3042			an..35	Street and number/PO box	n.a.
	3042			an..35	Street and number/PO box	n.a.
	3042			an..35	Street and number/PO box	n.a.
	3164		M	an..35	City name	City
	3229			an..9	Country sub-entity identification	n.a.
	3251			an..9	Postcode identification	Postal Code
	3207			an..3	Country	ISO 3166-1 two alpha country code, see Part IV, Article 2.03(8)
CNI	**GID (1..99)**	2	M		*GOODS ITEM DETAILS*	per *vessel* and per *good* a new GID segment
	1496		M	n..5	Goods item number	Sequence number of the good within a consignment. Unique within the CNI group
	C213		C		NUMBER AND TYPE OF PACKAGES	
	7224		C	n..8	Number of packages	For containers and tanks the default value is '1'

1	2	3	4	5	6	7
	7065		C	an..17	Type of packages identification	see Part IV, Article 2.03(14)
	1131			an..3	Code list qualifier	n.a.
	3055			an..3	Code list responsible agency	n.a.
	7064			an..35	Type of packages	n.a.
	7233			an..3	Packaging related information, coded	n.a.
	C213				NUMBER AND TYPE OF PACKAGES	n.a.
	7224			n..8	Number of packages	n.a.
	7065			an..17	Type of packages identification	n.a.
	1131			an..3	Code list qualifier	n.a.
	3055			an..3	Code list responsible agency	n.a.
	7064			an..35	Type of packages	n.a.
	7233			an..3	Packaging related information	n.a.
	C213		C		NUMBER AND TYPE OF PACKAGES	
	7224		M	n..8	Number of packages	Number of inner *packages*
	7065		M	an..17 (a2)	Type of packages identification	UNECE recommendation No 21, see Part IV, Article 2.03(14)
	1131			an..3	Code list qualifier	n.a.
	3055			an..3	Code list responsible agency	n.a.
	7064			an..35	Type of packages	n.a.
	7233			an..3	Packaging related information	n.a.

1	2	3	4	5	6	7
GRP 10 CNI/GID	**FTX (1)**	2	C		*FREE TEXT*	*Extra goods information*
	4451		M	an..3	Text subject code qualifier	'ACB' for additional information
	4453			an..3	Free text function code	n.a.
	C107				TEXT REFERENCE	
	4441			an..17	Free text identification	n.a.
	1131			an..3	Code list qualifier	n.a.
	3055			an..3	Code list responsible agency	n.a.
	C108		M		TEXT LITERAL	
	4440		M	an..70 (an1)	Free text	*type of good:* 'D' for Dangerous 'N' for Non-dangerous
	4440		C	an..70 (n6..10)	Free text	*HS code,* may be left blank if unknown and/good is dangerous, see (2)(f) of this Annex
	4440		C	an..70 (a..4)	Free text	Customs status: 'C' = Union goods 'F = Union goods from non-fiscal area 'N' = All other goods
	4440		C	an..70 (an..35)	Free text	Customs document reference *number* if any

1	2	3	4	5	6	7
	4440		C	an..70 (an1)	Free text	Overseas destination ´Y = with overseas destination 'N' = without an overseas destination
	3453			an..3	Language	n.a.
	4447			an..3	Text formatting	n.a.
CNI/GID	**FTX (2)**	3	C		*FREE TEXT*	*Goods description of non-dangerous cargo*
	4451		M	an..3	Text subject code qualifier	'AAA' for goods description
	4453			an..3	Free text function code	n.a.
	C107				TEXT REFERENCE	n.a.
	4441			an..17	Free text identification	n.a.
	1131			an..3	Code list qualifier	n.a.
	3055			an..3	Code list responsible agency	n.a.
	C108		M		TEXT LITERAL	
	4440		M	an..70	Free text	Goods name of the non-dangerous cargo
	4440					n.a.
	4440		D [Use 3]	an..70 (n6..10)	Free text	*HS code* of the non-dangerous cargo, see Part IV, Article 2.03(4)
	4440		D [Use 3]	an..70 (n4)	Free text	NST code of the non-dangerous cargo, see Part IV, Article 2.03(5)
	4440			an..70	Free text	n.a.

1	2	3	4	5	6	7
	3453			an..3	Language, coded	n.a.
	4447			an..3	Text formatting	n.a.
GRP 11 CNI/GID	**SGP (1..99)**	3	C		SPLIT *GOODS* PLACEMENT	*Specification of the location of the non-dangerous cargo within the means of transport*
	C237		M		EQUIPMENT IDENTIFICATION	
	8260		M	an..17 (an7..8)	Equipment identification number	*Ship number: 7 digits for IMO indication, 8 digits for unique European vessel identification number (ENI)*
	1131		M	an..3	Code list qualifier	'IMO' for an IMO number, see Part IV, Article 2.03(2) 'ENI' for a unique European vessel identification number, see Part IV, Article 2.03(3)
	3055			an..3	Code list responsible agency	n.a.
	3207			an..3	Country	n.a.
	7224			n..8	Number of packages	n.a.
CNI/GID/SGP	**MEA**	3	M		*MEASUREMENTS*	*Specification of the weight of a non-dangerous good on board the vessel*
	6311		M	an..3	Measurement purpose qualifier	WT for weights
	C502		M		MEASUREMENT DETAILS	
	6313		M	an..3	Property measured	'AAL' for net weight including normal packing
	6321			an..3	Measurement significance	n.a.

1	2	3	4	5	6	7
	6155			an..17	Measurement attribute identification	n.a.
	6154			an..70	Measurement attribute	n.a.
	C174		M		VALUE/RANGE	
	6411		M	an..3	Measurement unit qualifier	'KGM' for kilogram (UNECE Rec. 20)
	6314		M	an..18 (n9)	Measurement value	weight in kilogram
	6162			n..18	Range minimum	n.a.
	6152			n..18	Range maximum	n.a.
	6432			an..2	Significant digits	n.a.
	7383			an..3	Surface/layer indicator	n.a.
CNI/GID/SGP	**MEA**	3	C		*MEASUREMENTS*	*Specification of the tonnage of a non-dangerous good on board the vessel*
	6311		M	an..3	Measurement purpose qualifier	'VOL' for volume
	C502		M		MEASUREMENT DETAILS	
	6313		M	an..3	Property measured	'AAX' The observed volume after adjustment for factors such as temperature or gravity
	6321			an..3	Measurement significance	n.a.
	6155			an..17	Measurement attribute identification	n.a.
	6154			an..70	Measurement attribute	n.a.

1	2	3	4	5	6	7
	C174		M		VALUE/RANGE	
	6411		M	an..3	Measurement unit qualifier	'TNE' for metric ton (UNECE Rec. 20)
	6314		M	an..18 (n9)	Measurement value	Tonnage
	6162			n..18	Range minimum	n.a.
	6152			n..18	Range maximum	n.a.
	6432			an..2	Significant digits	n.a.
	7383			an..3	Surface/layer indicator	n.a.
GRP 12 CNI/GID	**DGS**	3	M		*DANGEROUS GOODS*	*Dangerous goods identification*
	8273		M	an..3	Dangerous goods regulations	'ADN' for inland vessels (UNECE ADN Code) 'IMD' for sea going vessels (IMO IMDG code)
	C205		M		HAZARD CODE	
	8351		D[USE 5]	an..7	Hazard code identification	*ADN* Classification *(Column 3a), or IMDG code,* see Part IV, Article 2.03(7) or 2.03(6)
	8078		D[USE 5]	an..7	Additional hazard classification identifier	ADN Classification (Column 3b), see Part IV, Article 2.03(7)
	8092			an..10	Hazard code version number	n.a.
	C234		M		UNDG INFORMATION	

1	2	3	4	5	6	7
	7124		M	n4	UNDG number	UN number or identification number (Column 1) (UNNR code), see Part IV, 2.03(7), or IMDG number, see 2.03(6)
	7088			an..8	Dangerous goods flashpoint	n.a.
	C223		C		DANGEROUS GOODS SHIPMENT FLASHPOINT	
	7106		M	n..3	Shipment flashpoint	*Flashpoint* of the good transported
	6411		M	an..3	Measure unit qualifier	'CEL' for Celsius 'FAH' for Fahrenheit
	8339		C	an..3	Packing group	Packing group (column 4) '1' for great danger '2' for medium danger '3' for minor danger Empty if not available
	8364		C	an..6	EMS number	Emergency procedures
	8410		C	an..4	MFAG number	Medical first aid guide
	8126			an..10	TREM card number	n.a.
	C235		C		HAZARD IDENTIFICATION PLACARD DETAILS	*Placards* mandatory for dangerous goods on dry cargo vessels
	8158		M	an..4	Hazard identification number, upper part	see ADN
	8186		M	an..4	Substance identification number, lower part	see ADN

1	2	3	4	5	6	7
	C236		D[USE 5]		DANGEROUS GOODS LABEL	Dangerous labels.
	8246		M	an..4	Dangerous goods label marking	ADN Labels, (Column 5)
	8246			an..4	Dangerous goods label marking	n.a.
	8246			an..4	Dangerous goods label marking	n.a.
	8255			an..3	Packing instruction	n.a.
	8325			an..3	Category of means of transport	n.a.
	8211			an..3	Permission for transport	n.a.
CNI/GID/DGS	**FTX (1)**	3	M		*FREE TEXT*	*Dangerous good description*
	4451		M	an..3	Text subject code qualifier	'AAD' for dangerous goods, proper shipping name and *technical* name
	4453			an..3	Free text function code	n.a.
	C107		D[USE 5]		TEXT REFERENCE	*GOODS HAZARD LIMITED QUANTITIES INDICATOR*
	4441		M	an..17	Free text identification	*'TLQ' Transport of dangerous goods in limited quantities*
	1131			an..3	Code list qualifier	n.a.
	3055			an..3	Code list responsible agency	n.a.
	C108		M		TEXT LITERAL	

1	2	3	4	5	6	7
	4440		M	an..70	Free text	Name of dangerous good (*proper shipping* name) *Proper shipping name, supplemented as necessary with the correct technical name, by which a dangerous substance or article may be correctly identified or which is sufficiently informative to permit identification by reference to generally available literature.*
	4440		D[USE 5]	an..70	Free text value	Correct Technical Name
	4440			an..70	Free text	n.a.
	4440			an..70	Free text	n.a.
	4440			an..70	Free text	n.a.
	3453		M	an..3	Language	as specified in ISO 639-1
	4447			an..3	Text formatting	n.a.
CNI/GID/DGS						
CNI/GID/DGS	**MEA**	3	M		*MEASUREMENTS*	*Total weight of the dangerous good within a transport*
	6311		M	an..3	Measurement purpose qualifier	WT for weights
	C502		M		MEASUREMENT DETAILS	
	6313		M	an..3	Property measured	'AAL' for net weight including normal packing
	6321			an..3	Measurement significance, coded	n.a.

1	2	3	4	5	6	7
	6155			an..17	Measurement attribute identification	n.a.
	6154			an..70	Measurement attribute	n.a.
	C174		M		VALUE/RANGE	
	6411		M	an..3	Measurement unit qualifier	'KGM' for kilogram (UNECE Rec. 20)
	6314		M	an..18 (n9)	Measurement value	Weight of the dangerous good in the consignment
	6162			n..18	Range minimum	n.a.
	6152			n..18	Range maximum	n.a.
	6432			n..2	Significant digits	n.a.
	7383			an..3	Surface/layer indicator	n.a.
CNI/GID/DGS	**MEA**	3	M		*MEASUREMENTS*	*Total volume of the dangerous good within a transport*
	6311		M	an..3	Measurement purpose qualifier	'VOL' for volume
	C502		M		MEASUREMENT DETAILS	
	6313		M	an..3	Property measured	'AAX' The observed volume after adjustment for factors such as temperature or gravity
	6321			an..3	Measurement significance, coded	n.a.
	6155			an..17	Measurement attribute identification	n.a.
	6154			an..70	Measurement attribute	n.a.

1	2	3	4	5	6	7
	C174		M		VALUE/RANGE	
	6411		M	an..3	Measurement unit qualifier	'TNE' for metric ton (UN/ECE Rec. 20)
	6314		M	an..18 (n9)	Measurement value	Tonnage
	6162			n..18	Range minimum	n.a.
	6152			n..18	Range maximum	n.a.
	6432			n..2	Significant digits	n.a.
	7383			an..3	Surface/layer indicator	n.a.
GRP 13 CNI/GID/DGS	SGP (1..99)	4	M		SPLIT *GOODS* PLACEMENT	*Specification of the location of the goods.* For the transported cargo, this segment shall contain the identification of the vessel (barge) the cargo is stowed on. Remark: Cargo means, in this context, container, liquid cargo and general cargo
			M		EQUIPMENT IDENTIFICATION	
	C237		M	an..17 (an7..8)	Equipment identification number	Ship number: 7 digits for IMO indication, 8 digits for unique European vessel identification number (ENI)
	8260		M	an..3	Code list qualifier	'IMO' for an IMO-number, see Part IV, Article 2.03(2) 'ENI' for a unique European vessel identification number, see Part IV, Article 2.03(3)
	1131			an..3	Code list responsible agency	n.a.

1	2	3	4	5	6	7
	3055			an..3	Country	n.a.
	3207			n..8	Number of packages	n.a.
	7224					
CNI/GID/DGS/SGP	**MEA**	5	M		*MEASUREMENTS*	*Total of the goods within the vessel*
	6311		M	an..3	Measurement purpose qualifier	WT for weights
	C502		M		MEASUREMENT DETAILS	
	6313		M	an..3	Property measured	'AAL' for net weight including normal packing
	6321			an..3	Measurement significance, coded	n.a.
	6155			an..17	Measurement attribute identification	n.a.
	6154			an..70	Measurement attribute	n.a.
	C174		M		VALUE/RANGE	
	6411		M	an..3	Measurement unit qualifier	'KGM' for kilogram (UNECE Rec. 20)
	6314		M	an..18 (n9)	Measurement value	Weight of the goods in the vessel
	6162			n..18	Range minimum	n.a.
	6152			n..18	Range maximum	n.a.
	6432			n..2	Significant digits	n.a.
	7383			an..3	Surface/layer indicator	n.a.

1	2	3	4	5	6	7
CNI/GID/DGS/SGP	**MEA**	5	C		*MEASUREMENTS*	*Total tonnage of the goods within the vessel*
	6311		M	an..3	Measurement purpose qualifier	'VOL' for volume
	C502		M		MEASUREMENT DETAILS	
	6313		M	an..3	Property measured	'AAX' The observed volume after adjustment for factors such as temperature or gravity
	6321			an..3	Measurement significance, coded	n.a.
	6155			an..17	Measurement attribute identification	n.a.
	6154			an..70	Measurement attribute	n.a.
	C174		M		VALUE/RANGE	
	6411		M	an..3	Measurement unit qualifier	'TNE' for metric ton (UNECE Rec. 20)
	6314		M	an..18 (n9)	Measurement value	Tonnage
	6162			n..18	Range minimum	n.a.
	6152			n..18	Range maximum	n.a.
	6432			n..2	Significant digits	n.a.
	7383			an..3	Surface/layer indicator	n.a.
CNI/GID/DGS	**SGP**	4	C		SPLIT *GOODS* PLACEMENT	*The location of the goods if in containers or tanks.* If the goods are transported in containers or tanks at least one SGP combination specifying the ship on which the cargo is stowed shall be specified.

1	2	3	4	5	6	7
	C237		M		EQUIPMENT IDENTIFICATION	Identification
	8260		M	an..17	Equipment identification number	*For containers the Container identification* code shall be used(owner code, identifier, serial number. check digit), see Part IV, Article 2.03(13) For the transport of liquid cargo the code 'NA' shall be used.
	1131			an..3	Code list qualifier	n.a.
	3055			an..3	Code list responsible agency	n.a.
	3207			an..3	Country	n.a.
	7224			n..8	Number of packages	n.a.
CNI/GID/DGS/SGP	**LOC**	4	C		*PLACE/LOCATION IDENTIFICATION*	*Stowage location*
	3227		M	an..3	Place/location qualifier	For containers: '147' for stowage cell For tanks and other cargo: 'ZZZ' Mutually defined
	C517		M		LOCATION IDENTIFICATION	

1	2	3	4	5	6	7
	3225		M	an..25	Place/location identification	For containers 'BBBRRTT' for bay/row/tier (In accordance with ISO 9711-1 (1990)) For tanks: LLnn where - LL describes the location of the tank (PS for port side, SB for starboard, CC for Center side, CP for Center portside, CS for Center starboard (in case of 4-width configuration)) - nn describes the sequence number of the tank, starting with 01 from front to nn to the back.
	1131			an..3	Code list qualifier	n.a.
	3055			an..3	Code list responsible agency	n.a.
	3224			an..70	Place/location	n.a.
	C519				RELATED LOCATION ONE IDENTIFICATION	n.a.
	3223			an..25	Related place/location one identification	n.a.
	1131			an..3	Code list qualifier	n.a.
	3055			an..3	Code list responsible agency	n.a.
	3222			an..70	Related place/location one	n.a.
	C553				RELATED LOCATION TWO IDENTIFICATION	n.a.
	3233			an..25	Related place/location two identification	n.a.
	1131			an 3	Code list qualifier	n.a.

1	2	3	4	5	6	7
	3055			an..3	Code list responsible agency	n.a.
	3232			an..70	Related place/location two	n.a.
	5479			an 3	Relation	n.a.
CNI/GID/DGS/SGP	**MEA**	4	D[6]		*MEASUREMENTS*	*Specification of the weight of the good in the container*
	6311		M	an..3	Measurement purpose qualifier	WT for weights
	C502		M		MEASUREMENT DETAILS	
	6313		M	an..3	Property measured	'AAL' for net weight including normal packing
	6321			an..3	Measurement significance, coded	n.a.
	6155			an..17	Measurement attribute identification	n.a.
	6154		D[Use 4]	an..70	Measurement attribute	Container type (ISO 6346 chapter 4 and annexes D and E)
	C174		M		VALUE/RANGE	
	6411		M	an..3	Measurement unit qualifier	'KGM' for kilogram (UNECE Rec. 20)
	6314		M	an..18 (n9)	Measurement value	Weight of the good in this container
	6162			n..18	Range minimum	n.a.
	6152			n..18	Range maximum	n.a.
	6432			n..2	Significant digits	n.a.

1	2	3	4	5	6	7
	7383			an..3	Surface/layer indicator	n.a.
CNI/GID/DGS/SGP	**MEA**	4	D[6]		*MEASUREMENTS*	*Total tonnage of the goods within the vessel*
	6311		M	an..3	Measurement purpose qualifier	'VOL' for weights
	C502		M		MEASUREMENT DETAILS	
	6313		M	an..3	Property measured	'AAX' The observed volume after adjustment for factors such as temperature or gravity
	6321			an..3	Measurement significance, coded	n.a.
	6155			an..17	Measurement attribute identification	n.a.
	6154			an..70	Measurement attribute	n.a.
	C174		M		VALUE/RANGE	
	6411		M	an..3	Measurement unit qualifier	'TNE' for metric ton (UNECE Rec. 20)
	6314		M	an..18 (n9)	Measurement value	Tonnage
	6162			n..18	Range minimum	n.a.
	6152			n..18	Range maximum	n.a.
	6432			n..2	Significant digits	n.a.
	7383			an..3	Surface/layer indicator	n.a.
CNI/GID/DGS	**SGP**	4	C		SPLIT *GOODS* PLACEMENT	*The total weight of the container.*

1	2	3	4	5	6	7
	C237		M		EQUIPMENT IDENTIFICATION	Identification
	8260		M	an..17	Equipment identification number	*For containers the Container identification* code shall be used (owner code, identifier, serial number, check digit), see Part IV, Article 2.03(13) For the transport of liquid cargo the code 'NA' shall be used.
	1131			an..3	Code list qualifier	n.a.
	3055			an..3	Code list responsible agency	n.a.
	3207			an..3	Country	n.a.
	7224			n..8	Number of packages	n.a.
CNI/GID/DGS/SGP	**MEA**	4	D[USE 7]		*MEASUREMENTS*	*Specification of the verified gross mass of this container*
	6311		M	an..3	Measurement purpose qualifier	WT for weights
	C502		M		MEASUREMENT DETAILS	
	6313		M	an..3	Property measured	'VGM' Transport equipment verified gross mass
	6321			an..3	Measurement significance, coded	n.a.
	6155			an..17	Measurement attribute identification	n.a.
	6154			an..70	Measurement attribute	n.a.
	C174		M		VALUE/RANGE	
	6411		M	an..3	Measurement unit qualifier	'KGM' for kilogram (UNECE Rec. 20)

1	2	3	4	5	6	7
	6314		M	an..18 (n9)	Measurement value	Verified gross mass (Weight) of this container
	6162			n..18	Range minimum	n.a.
	6152			n..18	Range maximum	n.a.
	6432			n..2	Significant digits	n.a.
	7383			an..3	Surface/layer indicator	n.a.
CNI/GID/DGS/SGP	**MEA**	4	D[USE 7]		*MEASUREMENTS*	*Specification of the Estimated gross weight of this container*
	6311		M	an..3	Measurement purpose qualifier	WT for weights
	C502		M		MEASUREMENT DETAILS	
	6313		M	an..3	Property measured	'ACN' Estimated gross weight
	6321			an..3	Measurement significance, coded	n.a.
	6155			an..17	Measurement attribute identification	n.a.
	6154			an..70	Measurement attribute	n.a.
	C174		M		VALUE/RANGE	
	6411		M	an..3	Measurement unit qualifier	'KGM' for kilogram (UNECE Rec. 20)
	6314		M	an..18 (n9)	Measurement value	Estimated gross weight of this container
	6162			n..18	Range minimum	n.a.

1	2	3	4	5	6	7
	6152			n..18	Range maximum	n.a.
	6432			n..2	Significant digits	n.a.
	7383			an..3	Surface/layer indicator	n.a.
	UNT	0	M		*MESSAGE TRAILER*	*End and control of completeness of the message*
	0074		M	n..6	Number of segments in a message	
	0062		M	an..14	Message reference number	First 14 positions of the message reference number
	UNZ		M		*INTERCHANGE TRAILER*	*End and control of the interchange*
	0036		M	n..6	Interchange control count	'1' for number of messages contained in the interchange
	0020		M	an..14	Interchange control reference	First 14 positions of the message reference number

a) Clarification regarding the use of the CNI and GID segments

Segment Group	Segment Composite data element (C) Data element TAG	Level	Status	Format	Name	Description Qualifiers in quotation marks
CNI	**GID (1..99)**	**2**	**M**		**GOODS ITEM DETAILS**	per *vessel* and per *good* a new GID segment
	1496		M	n..5	Goods item number	Sequence number of the good within a consignment. Unique within the CNI group

Clarification:

i) Each item shall be separately identified by means of the line (goods) item number and particulars.

ii) Goods item number: The sequence number of the good within a consignment. This means, if a consignment consists of several goods items, all the goods items shall be represented as unique goods items (GID). If the consignment only consists of one line (goods) item, the shipper (cargo sender) shall represent this in one line. It is important that commercial information remains unchanged in the respective messages and does not disappear.

iii) The division of an ERINOT message can be explained as follows:

- A means of transport may contain in its cargo one or more consignments. Each consignment may contain one or more goods items, each with its own particulars. Consignments, including the goods within this respective consignment, may be divided over one or more vessels (e.g. in a convoy in one voyage).

- Each container in itself is represented in the ERINOT message as separate consignment information group; as a result, the number of consignments will increase with each container.

b) Dummy segments

In some cases, amongst others in the passage message ERINOT(PAS), 'dummy' segments shall be used as part of mandatory groups of segments. For these 'dummy' segments the following rules apply:

CNI group:

- CNI: sequence number: '9999"

CNI/GID group:

- GID: sequence number: '99999"

CNI/GID/DGS group:

- DGS:
    - Class type: 'IMD"
    - Classification: '0.0"
    - UNDG number: '0000"
- FTX AAD: good name: 'DUMMY"
- MEA: weight: 0

c) Empty vessels

If an empty vessel is reported, the following rules apply for the mandatory segment groups:

i) Empty of non-dangerous goods or unknown previous cargo:

CNI group:

- CNI: sequence number: '9999"

CNI/GID group:

- GID: sequence number: '99999"

CNI/GID/DGS group:

- DGS:
    - Class type: 'IMD'
    - Classification: '0.0'
    - UNDG number: '0000'
- FTX AAD: good name: 'DUMMY'
- MEA: weight: 0

    ii)   Empty of dangerous goods (in the case previous dangerous cargo were reported):

        CNI group:

- CNI: valid sequence number
- LOC: source and destination (current voyage)

        CNI/GID group:

- GID: valid sequence number
- FTX ACB: type of good: 'D', HS code of (previous) dangerous good

        CNI/GID/DGS group:

- DGS: dangerous goods details (previous cargo)
- FTX AAD: dangerous good name
- MEA: weight: 0
- SGP: details of the empty vessel
- MEA: weight: 0

d)   Container transport with non-dangerous goods

If containers are transported, the following extra rules apply for the mandatory groups if a container does not carry dangerous goods:

CNI group:

- CNI: valid sequence number
- LOC: source and destination

CNI/GID group:

- GID: valid sequence number
- FTX ACB: type of good: 'N', HS code of the good
- FTX AAA, good name, NST code of the good, HS code of the good
- SGP: details of the vessel
- MEA: total weight of the non-dangerous good in the vessel

CNI/GID/DGS group:

- DGS:
    - Class type: 'IMD'
    - Classification: '0.0'
    - UNDG number: '0000'
- FTX AAD: good name: 'DUMMY'
- MEA: weight: 0
- SGP group (1):
    - SGP: vessel details
    - MEA: weight of the good in the vessel
- SGP group (2-99):
    - SGP: Container number
    - MEA: weight of the good in the container

This way of entering data for a container loaded with non-dangerous goods follows the way the data for a container with dangerous goods are entered. Due to compatibility reasons with previous versions, the vessel details are entered twice.

e) Stowage encoding for 30' and 45'containers

If for a 30'container the front of the container falls between two 20' slots, the highest bay number is used for the encoding of the 30' container.

The 45' container is used in similar manner as a 40' container (even bay slot number). The container type will be used to uniquely determine that the slot contains a 45' container.

f) Containers with unknown details on the goods or empty containers

If containers are transported where the details of the goods in the containers are not known, or empty containers are transported, the following extra rules apply:

EQD group:

EQD: container range

MEA: number of containers in the given range

CNI group:

CNI: valid sequence number

LOC: source and destination

CNI/GID group:

GID: valid sequence number

FTX ACB: type of good: 'N', HS code

FTX AAA: good name, NST code, HS code

SGP: details of the vessel

MEA: total weight of the containers in the given range

CNI/GID/DGS group:

dummy group

Depending on the range of containers the following codes shall be used:

	HS code	
Containers 20 ft empty	8609000002	
Containers 30 ft empty	8609000004	
Containers 40 ft empty	8609000003	
Containers 20 ft loaded	8609000007	
Containers 30 ft loaded	8609000008	
Containers 40 ft loaded	8609000009	

g) Exchanging information between RIS authorities

When exchanging information between RIS authorities, a passage message type shall be used by specifying 'PAS' in the BGM segment (element 1001).

In this PAS message the following information regarding the voyage shall be included:
- BGM element 1001 = 'PAS'.
- TDT group:
  - LOC(1), type '5' = Place of departure.
  - LOC(2), type '172' = Passage point.
  - LOC(9), type '153' = Place of destination (first port where transport is bound).
  - DTM(2), type '186' = Passage time of LOC(2).
  - DTM(3), type '132' = ETA of LOC(9) only if available.
- CNI groups with all the (known) cargo onboard.

The CNI group may be empty only if it is a passage message notifying another (local) party of the last position/passage point of that vessel.

h) Cancelling a notification or notifying an interruption/a restart of a voyage

When cancelling a notification or when notifying an interruption/a restart of a voyage, the following information shall be specified:
- BGM element 1225 = '1' or '150' or '151' (according to message function).
- RFF(ACW) element 1154 refers to the last message sent.
- All other segments (TDT, CNI, etc.) contain the same information as specified in the last notification message sent.

ANNEX 12
PASSENGER AND CREW LIST — (PAXLST)

1. UN/EDIFACT standard message PAXLST

The passenger respectively crew list notification is based on the UN/EDIFACT message PAXLST.

a) Functional definition

The passenger/crew list message (PAXLST) permits the transfer of passenger or crew data, or both. The message shall be used for the exchange of data in inland navigation between the captain/skipper or carrier and designated authorities such as ISPS terminals, customs, immigration, police.

The message shall be also used to transfer passenger/crew data from a designated authority in the country of departure to the appropriate authorities in the country of arrival of the means of transport.

b) Field of application

The passenger list message can be used for both national and international applications. It is based on general practice in administration, commerce and transport, and it is not dependent on the type of business or industry, neither on the mode of transport. The basic concept of the PAXLST message is that there is one message for all crew members for a specified ship on a specified voyage, and another message for the passengers on that voyage whilst also possible stowaways can be reported through a separate message. The messages can be transmitted separately or combined into one transmission.

The message supports the implementation — by means of EDI — of the following reporting needs:

- national reporting requirements with respect to crew/passengers and stowaway
- Regulation (EC) No 725/2004 on enhancing ship and port facility security also has provisions related to crew and passenger lists.

Moreover, in accordance with recommended practice set out in the Convention on the Facilitation of International Maritime Traffic, maritime authorities are not to require more than the following information in the crew list:

- Name and nationality of ship (country/area of registration)
- Family name
- Given names
- Nationality
- Rank or rating
- Date and place of birth
- Nature and number of identity document
- Port and date of arrival
- Arriving from

In addition, in accordance with the requirements of the competent authorities in inland shipping, the following information might be required:

- Names of visitors to a vessel
- Licence plates of the vehicles
- Exact place and time of boarding and going ashore

- Required services such as deliveries, stores and spares
- Names of repair people together with company name
- Changes of crew
- Children of the crew.

All these details can be exchanged through the PAXLST message.

2.   Message structure

The structure for implementation of the crew or passenger list notification message is as follows:

a)   Segment index (alphabetical sequence by tag)

UNH Message header
BGM Beginning of message
ATT Attribute
DOC Document/message details
DTM Date/time/period
FTX Free text
LOC Place/location identification
NAD Name and address
RFF Reference
TDT Details of transport
UNT Message trailer

b)   Segment table

Pos	Tag	Name	S	R
	UNA		C	1
	UNB		M	1
0010	UNH	Message header	M	1
0020	BGM	Beginning of message	M	1
0090		Segment group 2		
0100	TDT	Details of transport	M	1
0110	DTM	Date/time/period	M	1
0120		Segment group 3	M	4
0130	LOC	Place/location identification	M	1
0140	DTM	Date/time/period	M	1
0150		Segment group 4	C	999
0160	NAD	Name and address	M	1
0170	ATT	Attribute	C	1
0180	DTM	Date/time/period	M	1
0210	FTX	Free text	C	1

Pos	Tag	Name	S	R
0220	LOC	Place/location identification	C	3
0270		Segment group 5	C	1
0280	DOC	Document/message details	M	1
0290	DTM	Date/time/period	C	1
0320	LOC	Place/location identification	C	1
0440	UNT	Message trailer	M	1

c) Branching diagram
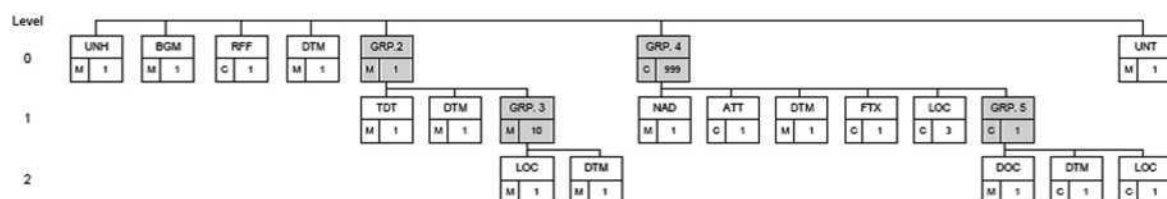
d)   Passenger / Crew list message format

Segment Group	Segment Composite data element (C) Data element TAG	Level	Status	Format	Name	Description Qualifiers in quotation marks
1	2	3	4	5	6	7
	UNA	**0**	**C**		**Service String Advice**	
			M	an1	Component data element separator	
			M	an1	Segment Tag and Data element separator	+
			M	an1	Decimal notation	
			M	an1	Release indicator	?
			M	an1	Reserved future use	space
			M	an1	Segment terminator	'
					Advised string: UNA:+.? '	6 characters
	UNB	**0**	**M**		**Interchange header**	
	S001		M		SYNTAX IDENTIFIER	
	0001		M	a4	Syntax identifier	'UNOC' Controlling agency
	0002		M	n1	Syntax version number	'2'
	S002		M		INTERCHANGE SENDER	

1	2	3	4	5	6	7
	0004		M	an..35 (an25)	Sender identification	Mailbox number or unique name or the unique identifier of a RIS-centre or traffic post
	0007			an..4	Partner identification code qualifier	n.a.
	0008			an..14	Address for reverse routing	n.a.
	S003		M		INTERCHANGE RECIPIENT	
	0010		M	an..35 (an25)	Recipient identification	Mailbox number or unique name or the unique identifier of a RIS-centre or traffic post
	0007			an..4	Partner identification code qualifier	n.a.
	0014			an..14	Routing address	n.a.
	S004		M		DATE/TIME OF PREPARATION	
	0017		M	n6	Date	Generation date, YYMMDD
	0019		M	n4	Time	Generation time, HHMM
	0020		M	an..14	Interchange reference identification.	First 14 positions of the message reference number
	S005		C		RECIPIENTS REFERENCE, PASSWORD	n.a
	0022			an..14	Recipient's reference/password	n.a.
	0025			an2	Recipient's reference, password qualifier	n.a.
	0026			an..14	Application reference	n.a.
	0029			a1	Processing priority code	n.a.
	0031		C	n1	Acknowledgement request	'1' = Sender requests acknowledgement, i.e. UNB and UNZ segments received and identified

1	2	3	4	5	6	7
	0032			an..35	Communications agreement id	n.a.
	0035		C	n1	Test indicator	'1' = the interchange relates to a test message
	UNH		**M**		**MESSAGE HEADER**	Identification, specification and heading of a message
	0062		M	an..14	Message reference number	First 14 positions of the message number
	S009		M		MESSAGE IDENTIFIER	Message identification
	0065		M	an..6	Message type	'PAXLST', message type
	0052		M	an..3	Message version number	'D', message version number
	0054		M	an..3	Message release number	'05A', message release number
	0051		M	an..2	Controlling agency	'UN', controlling agency
	0057		M	an..6	Association assigned code	'ERI13', ERI Version 1.3
	0068		M	an..35	Common access reference	Common access reference Reference to all messages related to one common file
	S010				STATUS OF THE TRANSFER	Transfer status
	0070			n..2	Sequence of transfers	n.a.
	0073			a1	First and last transfer	n.a.
	BGM	**0**	**M**		**BEGINNING OF MESSAGE**	*Identification of the type and function of the message*

1	2	3	4	5	6	7
	C002				Document/message name	Message name
	1001		M	an..3	Document name code	Message type: '250' crew list 745' passenger list '10' stowaway list
	1131			an..17	Code list identification code	n.a.
	3055			an..3	Code list responsible agency code	n.a.
	1000		M	an..35	Document name	Document name: 'CREW LIST' 'PASSENGER LIST' 'STOWAWAY LIST' *(one PAXLST message contains one document)*
	C106		M		Document/message identification	
	1004		M	an..35 an(15)	Document identifier	message reference number
	1056		C	an..9	Version identifier	version identifier
	1060		C	an..6	Revision identifier	revision identifier

1	2	3	4	5	6	7
	1225		M	an..3	MESSAGE FUNCTION CODE	Function of message '1' = cancellation message '9' = new message (original) '5' = modification message '22' = Final transmission (End of voyage) '150' = Interruption of voyage '151' = Restart of voyage
	4343			an..3	RESPONSE TYPE CODE	QA
	RFF	**0**	**C**		**REFERENCE**	Reference to the message which is changed, mandatory if the message is a modification message
	C506		M		REFERENCE	Reference
	1153		M	an..3	Reference qualifier	'ACW'
	1154		M	an..35	Reference number	(an14) message reference number of the BGM, tag 1004 of the message the current message refers to
	1156			an..6	Line number	n.a.
	4000			an..35	Reference version number	n.a.
	1060			an..35	Revision number	n.a.
	DTM	**0**	**M**		**DATE/TIME/PERIOD**	
	C507		M		DATE/TIME/PERIOD	Date/time/period

1	2	3	4	5	6	7
	2005		M	an..3	Date or time or period function code qualifier	'184' Notification date
	2380		M	an..35	Date or time period value	Time: CCYYMMDD
	2379		M	an..3	Date or time or period format code	'102'
	TDT	*1*	**M**		**Specification of the means of transport**	Specification of the means of transport, the naming vessel within a convoy (a single vessel without barge is also a convoy in this context)
	8051		M	an..3	'20' (main transport)	Transport stage code qualifier
	8028		C	an..17	Conveyance reference number	Voyage number, defined by sender of the message
	C220		M		Transport modality	n.a.
	8067		M	an..3	Mode of transport, coded	'8' for inland water transport, '1' for maritime transport (see UNECE Rec. 19)
	8066			an..17	Transport mode name	n.a.
	C001		M		Type of means of transport identification, *convoy type*	Code for ship and convoy types of means of transport from UNCEFACT Rec. 28, see Part IV, Article 2.03(1)
	8179			an..8	Transport means description code	n.a.
	1131			an..17	Code list identification code	n.a.
	3055			an..3	Code list responsible agency code	n.a.
	8178			an..17	Transport means description	n.a.

1	2	3	4	5	6	7
	C040				Carrier	
	3127			an..17	Carrier identifier	n.a.
	1131			an..17	Code list identification code	n.a.
	3055			an..3	Code list responsible agency code	n.a.
	3128			an..35	Carrier name	n.a.
	8101			an..3	Transit direction indicator code	n.a.
	C401				Excess transportation information	n.a.
	8457			an..3	Excess transportation reason code	n.a.
	8459			an..3	Excess transportation responsibility code.	n.a.
	7130			an..17	Customer shipment autorisation identifier	n.a.
	C222		M		Transport identification	
	8213		M	an..9 (an7..8)	ID. of means of transport identification	Vessel number: 7 digits for IMO indication, 8 digits for unique European vessel identification number (ENI)
	1131		M	an..17	Code list qualifier	'IMO' for an IMO number, see Part IV, Article 2.03(2) 'ENI' for a unique European vessel identification number, see Part IV, Article 2.03(3)
	3055			an..3	Code list responsible agency code	n.a.
	8212		M	an..35	Name of the vessel	*Name of the ship.* If the name results in more than 35 positions, the name of the vessel is shortened.

1	2	3	4	5	6	7
	8453		M	an..3	(an2) Nationality, ISO 3166 country code	ISO two-alpha country code 3166-1, see Part IV, Article 2.03(8) Dependency note. If the nationality of the inland vessel is not available the code for the country or area of registration shall be stated here in line with the ENI number specifications.
	8281			an..3	Transport means ownership indicator code.	n.a.
TDT	**DTM**	**1**	**M**	**TDT(20)**	**Estimated time of arrival/departure**	
	C507				Date/time/period	
	2005		M	an..3	Date or time or period function code qualifier	'132' for arrival '133' for departure
	2380		M	an..35	Date or time period value	Given in the local time of the place of arrival
	2379		M	an..3	Date or time or period format code	'203' for CCYYMMDDHHMM
TDT	**LOC(1)**	**1**	**M**		**PLACE/LOCATION IDENTIFICATION**	*Port of departure,* the port where the transport starts
	3227		M	an..3	Place/location qualifier	'5' place of departure
	C517		M		LOCATION IDENTIFICATION	
	3225		M	an..35 (an5)	Place/location identification	UNECE location code (Rec. 16), see Part IV, Article 2.03(9)
	1131			an..17	Code list qualifier	n.a.
	3055			an..3	Code list responsible agency	n.a.

1	2	3	4	5	6	7
	3224		D[Use 1]	an..256 (an..17)	Place/location	Full name of the port location
	C519		C		RELATED LOCATION ONE IDENTIFICATION	
	3223		M	an..25 (an..5)	Related place/location one identification	Terminal code, Part IV, Article 2.03(11)
	1131			an..17	Code list qualifier	n.a.
	3055			an..3	Code list responsible agency	n.a.
	3222		D[Use 1]	an..70	Related place/location one	Full name of the terminal
	C553		C		RELATED LOCATION TWO IDENTIFICATION	
	3233		M	an..25 (an5)	Related place/location two identification	Fairway section code, see Part IV, Article 2.03(10)
	1131			an..17	Code list qualifier	n.a.
	3055			an..3	Code list responsible agency	n.a.
	3232		C	an..70 (an..5)	Related place/location two	Fairway section hectometre
	5479			an..3	Relation	n.a.
TDT/LOC1	**DTM**	**1**	**M**		**Estimated time of departure**	
	C507				Date/time/period	

1	2	3	4	5	6	7
	2005		M	an..3	Date or time or period function code qualifier	'133' for departure
	2380		M	an..35	Date or time period value	Given in the local time of the place of arrival
	2379		M	an..3	Date or time or period format code	'203' for CCYYMMDDHHMM
TDT	**LOC(2)**	**1**	**M**		**PLACE/LOCATION IDENTIFICATION**	First port of call
	3227		M	an..3	Place/location qualifier	'87'
	C517		M		LOCATION IDENTIFICATION	
	3225		M	an..35 (an5)	Place/location identification	UNECE location code (Rec. 16), see Part IV, Article 2.03(9)
	1131			an..17	Code list qualifier	n.a.
	3055			an..3	Code list responsible agency	n.a.
	3224		D[Use 1]	an..256 (an..17)	Place/location	Full name of the port location
	C519		C		RELATED LOCATION ONE IDENTIFICATION	
	3223		M	an..25 (an..5)	Related place/location one identification	Terminal code, see Part IV, Article 2.03(11)
	1131			an..17	Code list qualifier	n.a.
	3055			an..3	Code list responsible agency	n.a.
	3222		D[Use 1]	an..70	Related place/location one	Full name of the terminal

1	2	3	4	5	6	7
	C553		C		RELATED LOCATION TWO IDENTIFICATION	
	3233		M	an..25 (an5)	Related place/location two identification	Fairway section code, see Part IV, Article 2.03(10)
	1131			an..17	Code list qualifier	n.a.
	3055			an..3	Code list responsible agency	n.a.
	3232		C	an..70 (an..5)	Related place/location two	Fairway section hectometre
	5479			an..3	Relation	n.a.
TDT/LOC 2	**DTM**	**1**	**M**		**Estimated time of first port of call**	
	C507				Date/time/period	
	2005		M	an..3	Date or time or period function code qualifier	'252' Arrival date/time at initial port
	2380		M	an..35	Date or time period value	Given in the local time of the place of arrival
	2379		M	an..3	Date or time or period format code	'203' for CCYYMMDDHHMM
TDT	**LOC(3)**	**1**	**M**		**PLACE/LOCATION IDENTIFICATION**	Last port of call
	3227		M	an..3	Place/location qualifier	'125'
	C517		M		LOCATION IDENTIFICATION	

1	2	3	4	5	6	7
	3225		M	an..35 (an5)	Place/location identification	UNECE location code (Rec. 16), see Part IV, Article 2.03(9)
	1131			an..17	Code list qualifier	n.a.
	3055			an..3	Code list responsible agency	n.a.
	3224		D[Use 1]	an..256 (an..17)	Place/location	Full name of the port location
	C519		C		RELATED LOCATION ONE IDENTIFICATION	
	3223		M	an..25 (an..5)	Related place/location one identification	Terminal code, see Part IV, Article 2.03(11)
	1131			an..17	Code list qualifier	n.a.
	3055			an..3	Code list responsible agency	n.a.
	3222		D[Use 1]	an..70	Related place/location one	Full name of the terminal
	C553		C		RELATED LOCATION TWO IDENTIFICATION	
	3233		M	an..25 (an5)	Related place/location two identification	Fairway section code, see Part IV, Article 2.03(10)
	1131			an..17	Code list qualifier	n.a.
	3055			an..3	Code list responsible agency	n.a.
	3232		C	an..70 (an..5)	Related place/location two	Fairway section hectometre
	5479			an..3	Relation	n.a.

1	2	3	4	5	6	7
TDT/LOC 3	**DTM**	**1**	**M**		**Estimated time of arrival/departure**	
	C507				Date/time/period	
	2005		M	an..3	Date or time or period function code qualifier	'253' Departure date/time from last port of call
	2380		M	an..35	Date or time period value	Given in the local time of the place of arrival
	2379		M	an..3	Date or time or period format code	'203' for CCYYMMDDHHMM
TDT	**LOC(4)**	**1**	**M**		**PLACE/LOCATION IDENTIFICATION**	**Port of arrival**
	3227		M	an..3	Place/location qualifier	'60'
	C517		M		LOCATION IDENTIFICATION	
	3225		M	an..35 (an5)	Place/location identification	UNECE location code (Rec. 16), see Part IV, Article 2.03(9)
	1131			an..17	Code list qualifier	n.a.
	3055			an..3	Code list responsible agency	n.a.
	3224		D[Use 1]	an..256 (an..17)	Place/location	Full name of the port location
	C519		C		RELATED LOCATION ONE IDENTIFICATION	
	3223		M	an..25 (an..5)	Related place/location one identification	Terminal code, see Part IV, Article 2.03(11)

1	2	3	4	5	6	7
	1131			an..17	Code list qualifier	n.a.
	3055			an..3	Code list responsible agency	n.a.
	3222		D[Use 1]	an..70	Related place/location one	Full name of the terminal
	C553		C		RELATED LOCATION TWO IDENTIFICATION	
	3233		M	an..25 (an5)	Related place/location two identification	Fairway section code, see Part IV, Article 2.03(10)
	1131			an..17	Code list qualifier	n.a.
	3055			an..3	Code list responsible agency	n.a.
	3232		C	an..70 (an..5)	Related place/location two	Fairway section hectometre
	5479			an..3	Relation	n.a.
TDT/LOC 4	**DTM**	**1**	**M**		**Estimated time of arrival/departure**	
	C507				Date/time/period	
	2005		M	an..3	Date or time or period function code qualifier	'132' for arrival
	2380		M	an..35	Date or time period value	Given in the local time of the place of arrival
	2379		M	an..3	Date or time or period format code	'203' for CCYYMMDDHHMM
GRP 4	**NAD**	**0**	**M**		**NAME and ADDRESS**	Name and address details of person

1	2	3	4	5	6	7
	3035		M	an..3	Party function code qualifier	Name type: 'FM' for crew member 'FL' for passenger 'BV' for stowaway persons
	C082		C		PARTY IDENTIFICATION DETAILS	Name identification
	3039			an..35	Party identification	Code or textual description of the relation
	1131			an..17	Code list qualifier	n.a.
	3055			an..3	Code list responsible agency	n.a.
	C058		M		NAME AND ADDRESS	n.a.
	3124		M	an..35	Name and address line	Family name
	3124		M	an..35	Name and address line	Given names
	3124		C	an..35	Name and address line	Prefix (gender)
	3124			an..35	Name and address line	n.a.
	3124			an..35	Name and address line	n.a.
	C080		C		PARTY NAME	
	3036			an..35	Party name	n.a.
	3036			an..35	Party name	n.a.
	3036			an..35	Party name	n.a.
	3036			an..35	Party name	n.a.
	3036			an..35	Party name	n.a.

1	2	3	4	5	6	7
	3045			an..3	Party name format, coded	n.a.
	C059		C		STREET	
	3042		C	an..35	Street and number/PO box	Street and number or post office box
	3042			an..35	Street and number/PO box	n.a.
	3042			an..35	Street and number/PO box	n.a.
	3042			an..35	Street and number/PO box	n.a.
	3164		C	an..35	City name	City
	C819		C		Country sub-entity identification	n.a.
	3229		C	an..9	Country sub-entity name code	Postal identification code
	1131		C	an..17	Code list identification code	n.a.
	3055			an..3	Code list responsible agency code	n.a.
	3228			an..70	Country sub-entity name	n.a.
	3251		C	an..17	postal code	
	3207		M	an..3	(an2) nationality, ISO3166 country code	ISO 3166-1 two alpha country code, see Part IV, Article 2.03(8)
GRP 4	**ATT**	**1**	**C**		**Rank/title**	Rank/title
	9017		M	an..3	Attribute function qualifier	'5' Professional title '1' Crew member
	C955		C		Attribute type	

1	2	3	4	5	6	7
	9021			an..17	Attribute type, coded	
	1131			an..17	Code list identification code	n.a.
	3055			an..3	Code list responsible agency code	n.a.
	9020			an..70	Attribute type description	n.a.
	C956		C		Attribute detail	
	9019			an..17	Attribute description code	n.a
	1131			an..17	Code list identification code	n.a.
	3055			an..3	Code list responsible agency code	n.a.
	9018		M	an..256	Attribute description	Rank/title name e.g. Chief officer
NAD	**DTM**	**1**	**M**		**DATE/TIME/PERIOD**	Date of birth
	C507				Date/time/period	Date/time/period
	2005		M	an..3	Date or time or period function code qualifier	'329'
	2380		M	an..35	Date or time period value	Date: CCYYMMDD
	2379		M	an..3	Date or time or period format code	'102'
NAD	*FTX*	*1*	*C*		*Free text*	General information

1	2	3	4	5	6	7
	4451		M	an..3	Text subject qualifier	Text subject type 'AAI' General Information
	4453			an..3	Text function, coded	
	C107		C		Text reference	
	4441		M	an..17	Free text, coded	Call information related to boarding of persons. General information on the call of the vessel.
	1131			an..17	Code list qualifier	n.a.
	3055			an..3	Code list responsible agency, coded	n.a.
	C108		C		Text literal	
	4440		C	an..512	Free text	License number vehicle
	4440		C	an..512	Free text	Visitor
	4440		C	an..512	Free text	Company name of service provider and other details
	4440		C	an..512	Free text	Names and duration of visit of the visiting children
	4440		D[Use 2]	an..512	Free text	Health Status
	3453			an..3	Language, coded.	
	4447			an..3	Text formatting, coded	
NAD	**LOC(1)**		**M**		**PLACE/LOCATION IDENTIFICATION**	Place of birth
	3227		M	an..3	Place/location qualifier	'180'

1	2	3	4	5	6	7
	C517		M		LOCATION IDENTIFICATION	
	3225		C	an..35 (an5)	Place/location identification	ISO 3166-1 two alpha country code, see Part IV, Article 2.03(8)
	1131			an..17	Code list qualifier	n.a.
	3055			an..3	Code list responsible agency	n.a.
	3224		M	an..256 (an..35)	Place/location	Place of birth
	C519		C		RELATED LOCATION ONE IDENTIFICATION	n.a.
	3223			an..35	Related place/location one identification	n.a.
	1131			an..17	Code list qualifier	n.a.
	3055			an..3	Code list responsible agency	n.a.
	3222			an..70	Related place/location one	n.a.
	C553				RELATED LOCATION TWO IDENTIFICATION	n.a.
	3233			an..25	Related place/location two identification	n.a.
	1131			an..17	Code list qualifier	n.a.
	3055			an..3	Code list responsible agency	n.a.
	3232			an..70	Related place/location two	n.a.
	5479			an..3	Relation	n.a.

1	2	3	4	5	6	7
NAD	**LOC(2)**		**M**		**PLACE/LOCATION IDENTIFICATION**	Place of Embarkation
	3227		M	an..3	Place/location qualifier	'178' for place of Embarkation
	C517		M		LOCATION IDENTIFICATION	
	3225		C	an..35 (an5)	Place/location identification	UNECE location code (Rec. 16) of the port, see Part IV, Article 2.03(9)
	1131			an..17	Code list qualifier	n.a.
	3055			an..3	Code list responsible agency	n.a.
	3224		D[Use 1]	an..256	Place/location	Full name of the port location
	C519		C		RELATED LOCATION ONE IDENTIFICATION	
	3223		M	an..35 (an5)	Related place/location one identification	Terminal code, see Part IV, Article 2.03(11)
	1131			an..17	Code list qualifier	n.a.
	3055			an..3	Code list responsible agency	n.a.
	3222		D[Use 1]	an..70	Related place/location one	Full name of the terminal
	C553		C		RELATED LOCATION TWO IDENTIFICATION	
	3233		M	an..35 (an5)	Related place/location two identification	Fairway section code, see Part IV, Article 2.03(10)
	1131			an..17	Code list qualifier	
	3055			an..3	Code list responsible agency	n.a.

1	2	3	4	5	6	7
				3232	C	an..70 (an5)	Related place/location two	Fairway section hectometre
	5479			an..3	Relation	n.a.
NAD	*LOC(3)*		*M*		*PLACE/LOCATION IDENTIFICATION*	*Place of Disembarkation*
	3227		M	an..3	Place/location qualifier	'179' for place of disembarkation
	C517		M		LOCATION IDENTIFICATION	
		3225	C	an..35 (an5)	Place/location identification	UNECE location code (Rec. 16) of the port, see Part IV, Article 2.03(9)
		1131		an..17	Code list qualifier	n.a.
		3055		an..3	Code list responsible agency	n.a.
		3224	D[Use 1]	an..256	Place/location	Full name of the port location
	C519		C		RELATED LOCATION ONE IDENTIFICATION	
		3223	M	an..25 (an5)	Related place/location one identification	Terminal code, see Part IV, Article 2.03(11)
		1131		an..17	Code list qualifier	n.a.
		3055		an..3	Code list responsible agency	n.a.
		3222	D[Use 1]	an..70	Related place/location one	Full name of the terminal
	C553		C		RELATED LOCATION TWO IDENTIFICATION	

1	2	3	4	5	6	7
	3233		M	an..25 (an5)	Related place/location two identification	Fairway section code, see Part IV, 2.03(10)
	1131			an..17	Code list qualifier	
	3055			an..3	Code list responsible agency	n.a.
	3232		C	an..70 (an5)	Related place/location two	Fairway section hectometre
	5479			an..3	Relation	n.a.
NAD	**DOC**	**1**	**M**		**Travel document details**	Travel document details
	C002		M		Document/message name	Document/message name
	1001		M	n..3	Document/message name, coded	Document type: '39' Passport '36' Identity card 'SMB' Seaman's book '40' Driving licence (national) '41' Driving licence (international) '483' Visa
	1131			an..17	Code list qualifier	n.a.
	3055			an..3	Code list responsible agency, coded	n.a.
	1000		C	an..35	Document name	Type of Visa
	C503		M		Document/message details	

1	2	3	4	5	6	7
	1004		M	an..35	Document/message number	Document identifier
	1373			an..3	Document/message status, coded	n.a.
	1366			an..70	Document/message source	n.a.
	3453			an..3	Language, coded	n.a.
	1056			an..9	Version	n.a.
	1060			an..6	Revision number	n.a.
	3153			an..3	Communication channel identifier, coded	n.a.
	1220			n..2	Number of copies of document required	n.a.
	1218			n..2	Number of originals of document required	n.a.
DOC	**DTM**	**2**	**C**		**DATE/TIME/PERIOD**	Expiration date
	C507				Date/time/period	Date/time/period
	2005		M	an..3	Date or time or period function code qualifier	'192'
	2380		M	an..35	Date or time period value	Date: CCYYMMDD
	2379		M	an..3	Date or time or period format code	'102'
TDT	**LOC(1)**	**1**	**M**		**PLACE/LOCATION IDENTIFICATION**	Place of issue of document
	3227		M	an..3	Place/location qualifier	'44'

1	2	3	4	5	6	7
	C517		M		LOCATION IDENTIFICATION	
	3225		C	an..35 (an5)	Place/location identification	UNECE location code (Rec. 16), see Part IV, Article 2.03(9)
	1131			an..17	Code list qualifier	n.a.
	3055			an..3	Code list responsible agency	n.a.
	3224			an..256	Place/location	n.a.
	C519				RELATED LOCATION ONE IDENTIFICATION	n.a.
	3223			an..25	Related place/location one identification	n.a.
	1131			an..17	Code list qualifier	n.a.
	3055			an..3	Code list responsible agency	n.a.
	3222			an..70	Related place/location one	n.a.
	C553				RELATED LOCATION TWO IDENTIFICATION	n.a.
	3233			an..25	Related place/location two identification	n.a.
	1131			an..17	Code list qualifier	n.a.
	3055			an..3	Code list responsible agency	n.a.
	3232			an..70 (an..5)	Related place/location two	n.a.
	5479			an..3	Relation	n.a.

1	2	3	4	5	6	7
	UNT	**0**	**M**		**MESSAGE TRAILER**	End and control of completeness of the message
	0074		M	n..6	Number of segments in the message	
	0062		M	an..14	First 14 positions of the message reference number	First 14 positions of the message reference number
	UNZ		**M**		**INTERCHANGE TRAILER**	End and control of the interchange
	0036		M	n..6	Interchange control count	'1' for number of messages contained in the interchange
	0020		M	an..14	Interchange control reference	First 14 positions of the message reference number

Business rules	
D[USE 1]	If the code is XXXXX, then this data-element shall be completed.
D[USE 2]	This data-element is mandatory if person requires additional support.

ANNEX 13
ERINOT RESPONSE AND RECEIPT MESSAGE (APERAK) — ERIRSP

1. APERAK general response and receipt message

   This message shall be used to provide where required answering and response functions to sent messages.

   The function of this message is:

   - to inform a message issuer that his message has been received by the addressee's application and has been rejected due to errors encountered during its processing in the application;

   - to acknowledge to a message issuer the receipt of his message by the addressee's application.

   a) Field of application

      The application error and acknowledgement message can be used for both national and international applications. It is not dependent on the type of business or industry, neither it is a legal requirement: it is based on business practices related to administration and transport.

   b) Principles

      A message can first be controlled at system level (e.g. the CONTRL message) to detect syntax errors and to acknowledge its receipt. It shall be then transmitted to the application process to be processed.

      When an acknowledgement is necessary an APERAK message shall be sent specifying the reasons of acknowledgement. If an error is detected at the application level, which prevents its complete processing, an APERAK message shall be sent to the original message issuer providing details of the error(s) encountered. In case of application error, the APERAK message shall be transmitted manually.

      In case of acknowledgement the APERAK message shall be processed automatically or manually, at recipient's discretion.

2. ERI RESPONSE MESSAGE ERIRSP

   The ERIRSP message is derived from the UN/EDIFACT APERAK message. The response messages to the functions (new, modification or cancellation) of the notification message ERINOT have all the same structure. The response to a 'modification' or a 'cancellation' contains information whether or not the 'modification' or 'cancellation' has been processed by the receiving system. A response is required only if the NAD (1)/COM segment, with qualifier 'EI', contains the mailbox number, or with qualifier 'EM', contains the email address where the response is to be returned to.

   a) Segment index (alphabetical sequence by tag)

      BGM Beginning of message

      COM Communication contact

      DTM Date/time/period

      ERC Application error information

      FTX Free text

NAD Name and address
RFF Reference
UNH Message header
UNT Message trailer

b) Segment table

Pos	Tag	Name	S	R
	UNB		M	1
0010	UNH	Message header	M	1
0020	BGM	Beginning of message	M	1
0030	DTM	Date/time/period	M	1
0060		Segment group 1	C	2
0070	RFF	Reference	M	1
0090		Segment group 2	C	1
0100	NAD	Name and address	M	1
0120	COM	Communication contact	C	3
0130		Segment group 3	D[1]	9
0140	ERC	Application error information	M	1
0150	FTX	Free text	M	1
0190	UNT	Message trailer	M	1

Business rules	
D[1]	This segment-group is to be used if any application error(s) occur.

c) Branching diagram
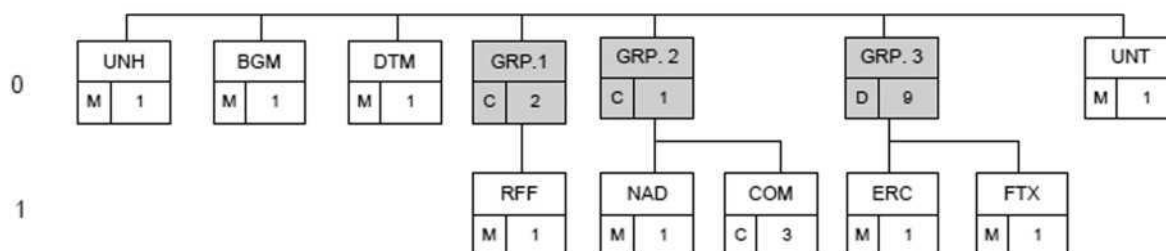
d)   ERIRSP message structure

Table 2 defines the segments of the ERI response messages.

Table 2

ERI response message ERIRSP

Segment Group	Segment Composite data element (C) Data element TAG	Level	Status	Format	Name	Description Qualifiers in quotation marks
1	2	3	4	5	6	7
	UNB	**0**	**M**		**INTERCHANGE HEADER**	
	S001		M		SYNTAX IDENTIFIER	
	0001		M	a4	Syntax identifier	'UNOA' Controlling agency
	0002		M	n1	Syntax version number	'2'
	S002		M		INTERCHANGE SENDER	
	0004		M	an..35 (an25)	Sender identification	Mailbox number or unique name or the unique identifier of a RIS-centre or traffic post
	0007			an..4	Partner identification code qualifier	n.a.
	0008			an..14	Address for reverse routing	n.a.
	S003		M		INTERCHANGE RECIPIENT	
	0010		M	an..35 (an25)	Recipient identification	Mailbox number or unique name or the unique identifier of a RIS-centre or traffic post

1	2	3	4	5	6	7
	0007			an..4	Partner identification code qualifier	n.a.
	0014			an..14	Routing address	n.a.
	S004		M		DATE/TIME OF PREPARATION	ho
	0017		M	n6	Date	Generation date, YYMMDD
	0019		M	n4	Time	Generation time, HHMM
	0020		M	an..14	Interchange control reference	First 14 positions of the message reference number
	S005				RECIPIENTS REFERENCE, PASSWORD	
	0022			an..14	Recipient's reference/password	n.a.
	0025			an2	Recipient's reference, password qualifier	n.a.
	0026			an..14	Application reference	n.a.
	0029			a1	Processing priority code	n.a.
	0031			n1	Acknowledgement request	n.a.
	0032			an..35	Communications agreement id	n.a.
	0035		C	n1	Test indicator	'1' = the interchange relates to a test message
	UNH	**0**	**M**		**MESSAGE HEADER**	Identification, specification and heading of a message
	0062		M	an..14	Message reference number	First 14 positions of the message reference number
	S009		M		MESSAGE IDENTIFIER	

1	2	3	4	5	6	7
	0065		M	an..6	Message type	'APERAK', message type
	0052		M	an..3	Message version number	'Ο'
	0054		M	an..3	Message release number	'98B'
	0051		M	an..2	Controlling agency	'UN'
	0057		M	an..6	Association assigned code	'ERI13', ERI Version 1.3
	0068			an..35	Common access reference	n.a.
	S010				STATUS OF THE TRANSFER	
	0070			n..2	Sequence of transfers	n.a.
	0073			a1	First and last transfer	n.a.
	BGM	**0**	**M**		**BEGINNING OF MESSAGE**	Identification of the type and function of the message
	C002		M		DOCUMENT/MESSAGE NAME	
	1001		M	an..3	Document/message name code	Type of message received for which this message contains the acknowledgement information: 'VES', from vessel to RIS authority message 'CAR', from carrier to RIS authority message 'PAS', passage report from RIS authority to RIS authority
	1131			an..3	Code list qualifier	n.a.
	3055			an..3	Code list responsible agency	n.a.

1	2	3	4	5	6	7
	1000			an..35	Document/message name	n.a.
	C106		M		DOCUMENT/MESSAGE IDENTIFICATION	
	1004		M	an..35 (an15)	Document identifier	Message reference number. This number shall be as unique as possible, both for sender and for receiver. If a message is received and then passed on to another receiver, the original message reference number shall be used. The transitional system shall in this case not generate another message reference number.
	1056			an..9	Version	n.a.
	1060			an..6	Revision number	n.a.
	1225		M	an..3	Message function code	Function of message: '9' = new message (original)
	4343		M	an..3	Response type code	'AP' accepted 'RE' rejected. The notification is rejected if the transport is already arrived at its destination.
	DTM	**1**	**M**		**DATE/TIME/PERIOD**	The date/time that the receiving application encounters the approval or rejection
	C507		M		DATE/TIME/PERIOD	
	2005		M	an..3	Date or time or period function code qualifier	'137' for document/message date/time
	2380		M	an..35	Date or time period value	Value of arrival time: YYMMDDHHMM

1	2	3	4	5	6	7
	2379		M	an..3	Date or time or period format code	'201' for YYMMDDHHMM
GRP 1	**RFF (1)**	**1**	**C**		**REFERENCE**	Reference to previous message
	C506		M		REFERENCE	
	1153		M	an..3	Reference qualifier	'ACW' for reference number to previous message
	1154		M	an..35	Reference number	Message reference number from BGM, TAG 1004 of the message this message refers to
	1156			an..6	Line number	n.a.
	4000			an..35	Reference version number	n.a.
	1060			an..6	Revision number	n.a.
GRP 1	**RFF (2)**	**1**	**C**		**REFERENCE**	Reference to transaction/invoice number
	C506		M		REFERENCE	
	1153		M	an..3	Reference qualifier	'AAY' for reference number to transaction
	1154		M	an..35	Reference number	Reference number assigned by the receiving authority. The reference number shall start with the UN country code followed by three positions for the assigning system. The final part is the actual reference number.
	1156			an..6	Line number	n.a.
	4000			an..35	Reference version number	n.a.

1	2	3	4	5	6	7
	1060			an..6	Revision number	n.a.
GRP 2	**NAD**	**1**	**M**		**NAME and ADDRESS**	Name and address of the sender of the notification
	3035		M	an..3	Party function code qualifier	'MS' for message sender
	C082				PARTY IDENTIFICATION DETAILS	n.a.
	3039			an..35	Party identification	n.a.
	1131			an..3	Code list qualifier	n.a.
	3055			an..3	Code list responsible agency	n.a.
	C058				NAME AND ADDRESS	n.a.
	3124			an..35	Name and address line	n.a.
	3124			an..35	Name and address line	n.a.
	3124			an..35	Name and address line	n.a.
	3124			an..35	Name and address line	n.a.
	3124			an..35	Name and address line	n.a.
	C080		M		PARTY NAME	
	3036		M	an..35	Party name	Name of the sender of the notification
	3036			an..35	Party name	n.a.
	3036			an..35	Party name	n.a.
	3036			an..35	Party name	n.a.

1	2	3	4	5	6	7
	3036			an..35	Party name	n.a.
	3045			an..3	Party name format, coded	n.a.
	C059		C		STREET	
	3042		M	an..35	Street and number/PO box	Street and number or post office box
	3042			an..35	Street and number/PO box	n.a.
	3042			an..35	Street and number/PO box	n.a.
	3042			an..35	Street and number/PO box	n.a.
	3164		C	an..35	City name	City
	3229			an..9	Country sub-entity identification	n.a.
	3251		C	an..9	Postcode identification	Postal identification code
	3207		C	an..3	Country	ISO 3166-1 two alpha country code, see Part IV, Article 2.03(8)
NAD	*COM*	*2*	*C*		*COMMUNICATION CONTACT*	Sender communication contact details (maximum 3 times)
	C076		M		COMMUNICATION CONTACT	
	3148		M	an..70	Communication number	Communication number
	3155		M	an..3	Communication channel qualifier	'TE' for telephone number 'FX' for fax number 'EM' for Email address

1	2	3	4	5	6	7
GRP 3	ERC	1	C		APPLICATION ERROR INFORMATION	
	C901		M		APPLICATION ERROR DETAIL	
	9321		M	an..8	Application error	Application error code
	1131			an..3	Code list qualifier	n.a.
	3055			an..3	Code list responsible agency	n.a.
ERC	**FTX**	2	M		**FREE TEXT**	To communicate the reason for rejection
	4451		M	an..3	Text subject code qualifier	'AAO' for free text error description
	4453			an..3	Free text function code	n.a.
	C107				TEXT REFERENCE	
	4441			an..17	Free text identification	n.a.
	1131			an..3	Code list qualifier	n.a.
	3055			an..3	Code list responsible agency	n.a.
	C108		C		TEXT LITERAL	Text
	4440		M	an..70	Free text	Further description
	4440		C	an..70	Free text	Further description
	4440		C	an..70	Free text	Further description
	4440		C	an..70	Free text	Further description
	4440		C	an..70	Free text	Further description

1	2	3	4	5	6	7
	3453			an..3	Language, coded	n.a.
	4447			an..3	Text formatting, coded	n.a.
	UNT		**M**		**MESSAGE TRAILER**	End and control of completeness of the message
	0074		M	n..6	Number of segments in a message	
	0062		M	an..14	Message reference number	First 14 positions of the message reference number
	UNZ		**M**		**INTERCHANGE TRAILER**	End and control of the interchange
	0036		M	n..6	Interchange control count	'1' for number of messages contained in the interchange
	0020		M	an..14	Interchange control reference	First 14 positions of the message reference number

3. Error codes

For data attribute: MESSAGE *REFERENCE ANSWERED TO ERROR DESCR CODE,* the error codes available electronically in the European Reference Data Management System (ERDMS) operated by the European Commission shall be used in in segment ERC, data element 9321.

ANNEX 14
BERTH MANAGEMENT PORT NOTIFICATION (BERMAN)

1. Necessary data in accordance with the FAL convention

In the FAL General Declaration[1], public authorities shall not require more than the following information:

1. name and description of the ship
2. nationality of ship
3. particulars regarding registry
4. particulars regarding tonnage
5. name of master
6. name and address of ship's agent
7. brief description of cargo
8. number of crew
9. number of passengers
10. brief particulars of voyage
11. date and time of arrival, date of departure
12. port of arrival or departure
13. position of the ship in the port
14. the ships requirements in terms of waste and residue reception facilities
15. purpose of call

In addition the following particulars are to be included for ISPS[2] purposes:

16. name of the ships security officer
17. security certificate (ISSC) number and authority
18. security level at which ship is operating level 1, 2 or 3
19. information on number of persons and vehicles

2. Message function

a) Functional definition

The BERMAN message is a message from a carrier, its agent or a vessel to the responsible port authority, requesting a berth, giving details of the call, ship, berth requirements and expected operations[3]. It is based on the EDIFACT BERMAN message as published in the UN/EDIFACT D 04B directory.

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[1] IMO Compendium on facilitation and electronic business, FAL.5/Cic.35, 9 September 2011; referred to in the Annex to Directive 2010/65/EU of the European Parliament and of the Council of 20 October 2010 on reporting formalities for ships arriving in and/or departing from ports of the Member States and repealing Directive 2002/6/EC (OJ L 283, 29.10.2010, p. 1).

[2] The International Ship and Port Facility Security Code (ISPS code) was adopted by the IMO in 2002; it is mandatory under the SOLAS Convention entering in force on 1 July 2004.

[3] In accordance with the IMO Compendium, the BERMAN message can be used as a substitute for the IMO General Declaration (CUS- REP) for the purpose of the announcement of the expected arrival of a ship in a certain port.

b) Field of application

The message is based on and supports the implementation by means of EDI of the following international and European legislation:

i) the IMO FAL Form 1 (as also contained in the IMO Compendium on Facilitation and electronic business, document FAL.5/Circ.15, dated 19 February 2001 and also contained in Directive 2010/65/EU of the European Parliament and of the Council[1]);

ii) International ship and port facility security (ISPS) code, adopted by the Conference of Contracting Governments of the International Maritime Organisation (IMO) on 12 December 2002, in the amendments to the annex to the International Convention of Safety of Life at Sea (SOLAS), 1974 and Regulation (EC) No 725/2004.

c) Message principles

The following principles shall apply to the BERMAN message as defined in these technical specifications for the purpose of electronic ship reporting in inland navigation:

1. A message shall contain information on only one means of transport/conveyance.

2. One message shall relate to one visit of a ship to one port of call.

3. The visit of the vessel shall be identified by a unique call reference number that is issued by or on behalf of the authority in the port (e.g. the port authority or the customs authority).

4. The message shall incorporate the information related to applicable requirements regarding the notification of a ship to a port. It shall support one request for the ship — be it for entering the port, berthing on arrival of the ship, leaving the berth on departure of the ship or shifting of berths for the ship within the port or for only transiting through the port area.

5. The arrival notification shall contain all details regarding the movement of the ship from outside the port area to the first berth in the port area. The additional services to be arranged for arrival at the first berth (e.g. arrangement of pilots, VTS, tugboats, and linesmen) may be specified. The ETA (estimated time of arrival) at the entry point and previous port of call of the ship shall be given.

6. A shift berthing request shall contain all details as to the movement from one berth to the next berth in the same port area. The additional services to be arranged (e.g. arrangement of tugboats, pilots or linesman) may be specified for each berth separately. The ETD (estimated time of departure) for the first berth is mandatory. The shift berthing request shall further contain the other berths that are planned to be visited during the ship's call, including the ETA at those berths.

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[1] Directive 2010/65/EU of the European Parliament and of the Council of 20 October 2010 on reporting formalities for ships arriving in and/or departing from ports of the Member States and repealing Directive 2002/6/EC (OJ L 283, 29.10.2010, p. 1).

7. A departure request shall contain all details related to the departure of the ship from the (last) berth in the port area. Additional services to be arranged for departure from the berth (e.g. arrangement of tugboats, pilots or linesman) may be specified. The ETD from the berth and the next port of call of the ship shall be given upon departure.

8. The message shall cater for the provision of sending a replacement or a cancellation of a previously sent original message.

9. The message content shall be uniquely identified by means of the message reference (in BGM 1004) and the message sender identification (in NAD(MS) 3039). All other identifying data, such as the unique ship ID of the ship or the voyage number, are secondary references. The sending of replacements and updates also makes use of this principle.

3. Message structure

    a) Segment index (alphabetical sequence by tag)

       BGM Beginning of message

       COM Communication contact

       CTA Contact information

       DTM Date/time/period

       FTX Free text

       GDS Nature of cargo

       HAN Handling instructions

       LOC Place/location identification

       MEA Measurements

       NAD Name and address

       POC Purpose of call

       QTY Quantity

       RFF Reference

       TDT Transport information

   TSR Transport service requirements

       UNH Message header

       UNT Message Trailer

b) Segment table

Pos	Tag	Name	S	R
	UNA		C	1
	UNB		M	1
0010	UNH	Message header	M	1
0020	BGM	Beginning of message	M	1
0030	DTM	Date/time/period	M	1
0040	FTX	Free text	C	1
0050	RFF	Reference	C	9
0070		Segment Group 1	M	4
0080	NAD	Name and address	M	1
0090		Segment Group 2	C	1
0100	CTA	Contact information	M	1
0110	COM	Communication contact	C	4
0120		Segment Group 3	M	1
0130	TDT	Transport information	M	1
0140	RFF	Reference	C	2
0150	DTM	Date/time/period	C	1
0160	MEA	Measurements	C	7
0170	FTX	Free text	C	9
0190		Segment Group 4	M	5
0200	LOC	Place/location identification	M	1
0210	DTM	Date/time/period	M	1
0300		Segment Group 7	M	9
0310	TSR	Transport service requirements	M	1
0320	QTY	Quantity	C	3
0340		Segment Group 8	M	9
0350	LOC	Place/location identification	M	1
0370	DTM	Date/time/period	C	1
0380	QTY	Quantity	C	2
0390	POC	Purpose of call	C	9
0400	FTX	Free text	C	1

Pos	Tag	Name	S	R
0410		Segment Group 9: HAN	C	8
0420	HAN	Handling instructions	M	1
0440		Segment Group 10: GDS	C	9
0450	GDS	Nature of cargo	M	1
0470	MEA	Measurements	C	1
0500	UNT	Message Trailer	M	1

c) Branching diagram
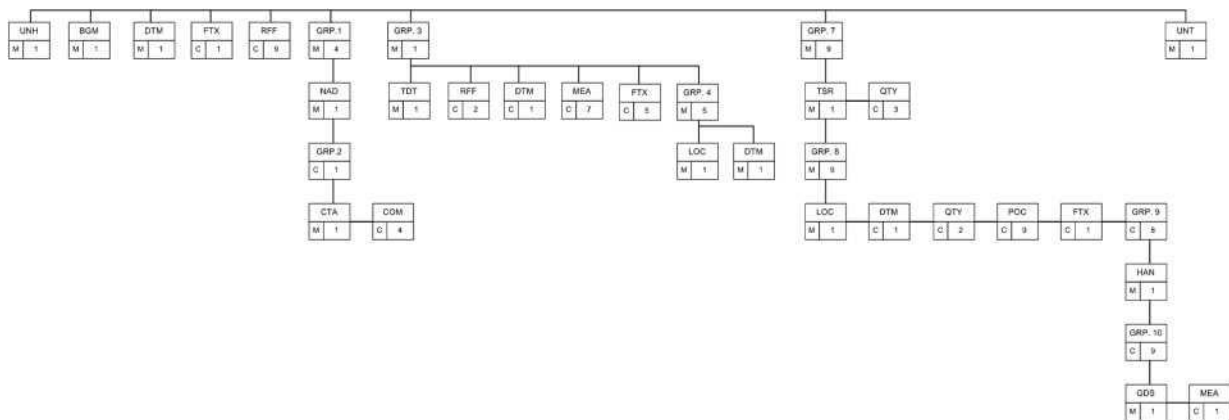
The pre-arrival notification message format for the berth management message is as follows:

Segment Group	Segment Composite data element (C) Data element TAG	Level	Status	Format	Name	Description Qualifiers in quotation marks
1	2	3	4	5	6	7
	UNA		**C**		**SERVICE STRING ADVICE**	
			M	an1	Component data element separator	:
			M	an1	Segment tag and data element separator	+
			M	an1	Decimal notation	.
			M	an1	Release indicator	?
			M	an1	Reserved future use	*Space*
			M	an1	Segment terminator	'
					Advised string: UNA:+.? '	*6 characters*
	UNB		**M**		**INTERCHANGE HEADER**	
	S001		M		SYNTAX IDENTIFIER	
	0001		M	a4	Syntax identifier	'UNOC' Controlling agency
	0002		M	n1	Syntax version number	'2'
	S002		M		INTERCHANGE SENDER	

1	2	3	4	5	6	7
	0004		M	an..35 (an25)	Sender identification	Mailbox number or unique name or the unique identifier of a RIS-centre or traffic post
	0007			an..4	Partner identification code qualifier	n.a.
	0008			an..14	Address for reverse routing	n.a.
	S003		M		INTERCHANGE RECIPIENT	
	0010		M	an..35 (an25)	Recipient identification	Mailbox number or unique name or the unique identifier of a RIS-centre or traffic post
	0007		C	an..4	Partner identification code qualifier	n.a.
	0014		C	an..14	Routing address	n.a.
	S004		M		DATE/TIME OF PREPARATION	
	0017		M	n6	Date	Generation date, YYMMDD
	0019		M	n4	Time	Generation time, HHMM
	0020		M	an..14	Interchange reference identification	First 14 positions of the message reference number
	S005		C		RECIPIENTS REFERENCE, PASSWORD	n.a
	0022			an..14	Recipient's reference/password	n.a.
	0025			an2	Recipient's reference, password qualifier	n.a.
	0026			an..14	Application reference	n.a.
	0029			a1	Processing priority code	n.a.
	0031		C	n1	Acknowledgement request	'1' = Sender requests acknowledgement, i.e. UNB and UNZ segments received and identified

1	2	3	4	5	6	7
	0032			an..35	Communications agreement id	n.a.
	0035			C	Test indicator	Test indicator '1' = the interchange relates to a test message
	UNH		**M**		**IDENTIFICATION, SPECIFICATION AND HEADING OF A MESSAGE**	
	0062		M	an..14	Message reference number	First 14 positions of the message number
	S009		M		MESSAGE IDENTIFIER	Message identification
	0065		M	an..6	Message type	'BERMAN', message type
	0052		M	an..3	Message version number	'D', message version number
	0054		M	an..3	Message release number	'05B', message release number
	0051		M	an..2	Controlling agency	'UN', controlling agency
	0057		M	an..6	Association assigned code	'ERI13', ERI version 1.3
	0068		C	an..35	Common access reference	Reference to all messages related to one common file
	S010				STATUS OF THE TRANSFER	
	0070			n..2	Sequence of transfers	n.a.
	0073			a1	First and last transfer	n.a.
	BGM		**M**		**BEGINNING OF MESSAGE**	Identification of the type and function of the message

1	2	3	4	5	6	7
	C002				DOCUMENT/MESSAGE NAME	
	1001		M	an..3	Document/message name code	Message Type:
						'22' = Final transmission (End of voyage)
						23 Status information Information regarding the status of a related message.
						185 Conveyance declaration (arrival) Declaration to the public authority upon arrival of the conveyance.
						186 Conveyance declaration (departure) Declaration to the public authority upon departure of the conveyance.
						187 Conveyance declaration (combined) Combined declaration of arrival and departure to the public authority.
						318 Application for shifting from the designated place in port Document to apply for shifting from the designated place in port.
						282 Modification of existing message Requesting a change to an existing message.
						Note: 187 to be used as continued voyage indicator
	1131			an..17	Code list qualifier	n.a.
	3055			an..3	Code list responsible agency	n.a.
	1000			an..35	Document/message name	n.a.
	C106		M		DOCUMENT/MESSAGE IDENTIFICATION	
	1004		M	an..35	Document identifier	Use max. (an15) for message reference number

1	2	3	4	5	6	7
	1056			an..9	Version	
	1060			an..6	Revision number	
	1225		M	an..3	Message function code	*Function* of message: '9' = new message, original '5' = modification message by replacement '1' = cancellation '22' = Final transmission (End of voyage) '150' = Interruption of voyage' '151' = Restart of voyage
	4343			an..3	Response type code	'QA'
	DTM		**M**		**DATE/TIME/PERIOD**	
	C507		M		DATE/TIME/PERIOD	
	2005		M	an..3	Date or time or period function code qualifier	'137' Date of preparation
	2380		M	an..35	Date or time period value	Date: CCYYMMDD
	2379		M	an..3	Date or time or period format code	'102' For CCYYMMDDHHMM use '203'
	FTX		C		FREE TEXT	
	4451		M	an..3	Text subject code qualifier	'CHG' = Change information

1	2	3	4	5	6	7
	4453			an..3	Free text function code	n.a.
	C107				TEXT REFERENCE	
	4441		C	an..17	Free text identification	General information on the call of the vessel CAM = mistakes in previous message CAN = cancelled because of cargo change GIV = General info vessel
	1131			an..17	Code list qualifier	n.a.
	3055			an..3	Code list responsible agency	n.a.
	C108		C			
	4440		C	an..512	Free text	Free text: Vessel defects info (vessel, nautical equipment, cargo handling, protruding parts, fire, overheating, smoke)
	4440			an..512	Free text	n.a.
	4440			an..512	Free text	n.a.
	4440			an..512	Free text	n.a.
	4440			an..512	Free text	n.a.
	3453			an..3	Language, coded	n.a.
	4447			an..3	Text formatting, coded	n.a.

1	2	3	4	5	6	7
	RFF		**C**		**REFERENCE**	Reference to the message which is changed, mandatory if the message is a modification message
	C506		M		REFERENCE	
	1153		M	an..3	Reference qualifier	'ACW' Reference to previous message
	1154		M	an..70	Reference number	Use (an15) message reference number of the BGM, tag 1004 of the message this current message refers to
	1156			an..6	Line number	n.a.
	4000			an..35	Reference version number	n.a.
	1060			an..6	Revision number	n.a.
	RFF		**C**		**REFERENCE**	Reference information
	C506		M		REFERENCE	Only if known
	1153		M	an..3	Reference qualifier	'ATZ' Ship's stay reference number 'GDN' General Declaration number 'AAE' Goods declaration number
	1154		M	an..70	Reference identifier	Reference number or declaration number
	1156			an..6	Line number	n.a.
	4000			an..35	Reference version number	n.a.
	1060			an..6	Revision number	n.a.

1	2	3	4	5	6	7
	RFF		**C**		**REFERENCE**	REFERENCE INFORMATION
	C506		M		REFERENCE	
	1153		M	an..3	Reference qualifier	EPC = Electronic port clearance (single window)
						'ACE' Related document number
						'EPC' Referenced document is sent via EDI and an EPC application
						'ROB' Referenced document is available but remains on board
	1154		M	an..70	Reference identifier	'799' Ship's stores declaration
						'797' Maritime declaration of health
						'745' Passenger list
						'744' Crew's effects declaration
						'250' Crew list declaration
						'85' Cargo declaration
	1156			an..6	Line number	n.a.
	4000			an..35	Reference version number	n.a.
	1060			an..6	Revision number	n.a.
NAD Gr 1	**NAD**		**M**		**Name and address**	

1	2	3	4	5	6	7
	3035		M	an..3	Party function code qualifier	Sender, carrier's agent and/or vessel master are mandatory Name type: 'MS' Message sender 'CG' Carrier's agent 'CPE' Vessel captain (master) 'AM' Authorised official (security officer)
	C082		C		PARTY IDENTIFICATION DETAILS	Code if known at receiver, otherwise other fields
	3039		M	an..35	Party identification	EAN number
	1131			an..17	Code list qualifier	n.a
	3055			an..3	Code list responsible agency	n.a
	C058				NAME AND ADDRESS	n.a.
	3124			an..35	Name and address line	n.a.
	3124			an..35	Name and address line	n.a.
	3124			an..35	Name and address line	n.a.
	3124			an..35	Name and address line	n.a.
	3124			an..35	Name and address line	n.a.
	C080				PARTY NAME	n.a.
	3036			an..35	Party name	n.a.
	3036			an..35	Party name	n.a.
	3036			an..35	Party name	n.a.
	3036			an..35	Party name	n.a.

1	2	3	4	5	6	7
	3036			an..35	Party name	n.a.
	3045			an..3	Party name format, coded	n.a.
	C059				STREET	n.a.
	3042			an..35	Street and number/PO box	n.a.
	3042			an..35	Street and number/PO box	n.a.
	3042			an..35	Street and number/PO box	n.a.
	3042			an..35	Street and number/PO box	n.a.
	3164			an..35	City Name	n.a.
	C819				Country sub-entity details	n.a.
	3229			an..9	n.a.	n.a.
	1132			an..17	n.a.	n.a.
	3055			an..3	n.a.	n.a.
	3228			an..70	n.a.	n.a.
	3251		C	an..17	Postcode identification	Postal identification code
	3207		C	an..3	Country	ISO 3166-1 two digit alpha country code, see Part IV, Article 2.03(8)
NAD Gr 2	**CTA**		**M**	**NAD**	**CONTACT INFORMATION**	Sender contact details
	3139		M	an..3	Contact function	'IC' = Information contact

1	2	3	4	5	6	7
	C056				DEPARTMENT OR EMPLOYEE DETAILS	
	3413			an..17	Department or employee identification	n.a.
	3412		C	an..35	Department or employee	Contact person, name or function
CTA	**COM**		**C**	*NAD/ CTA*	**COMMUNICATION CONTACT**	Sender communication contact details
	C076				COMMUNICATION CONTACT	
	3148		M	an..512	Communication number	Communication number
	3155		M	an..3	Communication channel qualifier	'TE' for telephone number 'FX' for fax number 'EM' for email address 'EI' for EDI mailbox number (EDI number *or* email address for NAD 1 is mandatory if a response in the form of an APERAK message is requested for. If no response is requested, the EDI number and email address is not to be used).
TDT Gr 3	**TDT**		**M**		**TRANSPORT INFORMATION**	Specification of the means of transport, the *naming vessel within a convoy* (a single vessel without barge is also a convoy in this context)
	8051		M	an..3	Transport stage code qualifier	'20' for main carriage transport
	8028		M	an..17	Conveyance reference number	Voyage number, defined by sender of the message
	C220		M		MODE OF TRANSPORT	

1	2	3	4	5	6	7
	8067		M	an..3	Mode of transport, coded	'8' for inland water transport' '1' for maritime transport see UNECE Rec. 19
	8066			an..17	Mode of transport	n.a.
	C228		M		TRANSPORT MEANS	
	8179		M	an..8	Type of means of transport identification, convoy type	Code for ship and convoy types of means of transport from UN/CEFACT Rec. 28, see Part IV, Article 2.03(1)
	8178			an..17	Type of means of transport	n.a.
	C040				CARRIER	n.a.
	3127			an..17	Carrier identification	n.a.
	1131			an..17	Code list qualifier	n.a.
	3055			an..3	Code list responsible agency	n.a.
	3128			an..35	Carrier name	n.a.
	8101			an..3	Transit direction, coded	n.a.
	C401				EXCESS TRANSPORTATION INFORMATION	
	8457			an..3	Excess transportation reason	n.a.
	8459			an..3	Excess transportation responsibility	n.a.
	7130			an..17	Customer authorization number	n.a.
	C222		M		TRANSPORT IDENTIFICATION	

1	2	3	4	5	6	7
	8213		M	an..9 (an7..8)	ID. of means of transport identification	Vessel *number:* 7 digits for IMO indication, 8 digits for unique European vessel identification number (ENI)
	1131			an..17	Code list qualifier	'IMO' for an IMO number, see Part IV, Article 2.03(2) 'ENI' for a unique European vessel identification number, see Part IV, Article 2.03(3)
	3055			an..3	Code list responsible agency	n.a.
	8212		M	an..35	ID of the means of transport	*Name of the ship.* If the name results in more than 35 positions, the name of the vessel is shortened.
	8453		M	an..3	Nationality of means of transport	ISO two-alpha country code 3166-1, see Part IV, Article 2.03(8). If the nationality of the means of transport is not known, the 3 digit code of the competent authority which issued the European vessel identification number shall be used.
	8281			an..3	Transport ownership	n.a.
TDT	**RFF**		**C**	**TDT**	**REFERENCE**	
	C506		M		REFERENCE	
	1153		M	an..3	Reference qualifier	'VM' Vessel identification 'PEX' Pilotage exemption number
	1154		M	an..70	Reference number	Radio call sign if applicable or the identity of each barge/ vessel in a combination (ERI ID) Number of exemption

1	2	3	4	5	6	7
	1156			an..6	Line number	n.a.
	4000			an..35	Reference version number	n.a.
	1060			an..6	Revision number	n.a.
TDT	**DTM**		**C**	**TDT**	**DATE/TIME/PERIOD**	
	C507		M		DATE/TIME/PERIOD	
	2005		M	an..3	Date or time or period function code qualifier	Local time at the place of arrival Code '132' = ETA
	2380		M	an..35	Date or time period value	Date/time: CCYYMMDDHHMM
	2379		M	an..3	Date or time or period format code	'203'
TDT	**MEA**		**C**	**TDT**	**MEASUREMENTS**	
	6311		M	an..3	Measurement purpose qualifier	Measurement application qualifier: 'AAE' Measurement
	C502		M		MEASUREMENT DETAILS	

1	2	3	4	5	6	7
	6313		M	an..3	Property measured	Measurement dimension: 'AAM' Gross tonnage of vessel, BT 'AAN' Net tonnage of vessel 'ACS' Length overall, 'ADS' Length bow to bridge 'WM' Width, maximum 'DP' Draft, maximum (depth) 'HM' Height maximum above the water (air draft)
	6321			an..3	Measurement significance	n.a.
	6155			an..17	Measurement attribute identification	n.a.
	6154			an..70	Measurement attribute	n.a.
	C174		M		VALUE/RANGE	
	6411		M	an..3	Measurement unit qualifier	Measure unit qualifier: 'TNE' Metric tons 'CMT' Centimetre 'MTR' Metre
	6314		M	n..18	Measurement value	
	6162			n..18	Range minimum	n.a.
	6152			n..18	Range maximum	n.a.
	6432			n..2	Significant digits	n.a.
	7383			an..3	Surface/layer indicator	n.a.

1	2	3	4	5	6	7
TUT	**FTX**		**C**	**TDT**	**FREE TEXT**	
	4451		M	an..3	Text subject code qualifier	General subject indicator
						Text subject type
						'ACB' Additional information
						'AFJ' Defect description
						'HAZ' Hazardous
						'AAA' General goods description
						'WAS' Waste reporting
						'VES' vessel particulars
	4453		C	an..3	Free text function code	If text subject is ACB, WAS, AAA or AFJ, here the dangerous goods can be indicated through:
						'DGN' = No dangerous goods
						'DGY' = Dangerous goods on board
	C107		C		TEXT REFERENCE	

1	2	3	4	5	6	7
	4441		C	an..17	Free text identification	'WEX' = Waste report exempt for 'WAS' 'CGS' = Cargo is gassed for 'ACB' For 'HAZ': Co0 = 0 Cone Co1 = 1 Cones Co2 = 2 Cones Co3 = 3 Cones 'B' = Red Flag (B) for IMO 'V' special permit
	1131			an..17	Code list qualifier	n.a.
	3055			an..3	Code list responsible agency	n.a.
	C108		M			
	4440		C	an..512	Free text	Text description of defects such as AIS, Navigation equipment radar, engine, rudder, etc.
	4440			an..512	Free text	n.a.
	4440			an..512	Free text	n.a.
	4440			an..512	Free text	n.a.
	4440			an..512	Free text	n.a.
	3453			an..3	Language, coded	n.a.
	4447			an..3	Text formatting, coded	n.a.

1	2	3	4	5	6	7
TDT GR 4	**LOC**		**M**	TDT	**PLACE/LOCATION IDENTIFICATION**	Port.
	3227		M	an..3	Place/location qualifier	Place/location qualifier: '5' Place of departure '94' Previous of port of call '61' Next port of call '89' Place of registration '153' Port of call
	C517		M		LOCATION IDENTIFICATION	
	3225		M	an..25 (an5)	Place/location identification	UNECE location code (Rec. 16) of the port, see Part IV, Article 2.03(9)
	1131			an..17	Code list qualifier	n.a.
	3055			an..3	Code list responsible agency	n.a.
	3224		C	an..256	Place/location	Full name of the port
	C519		C		RELATED LOCATION ONE IDENTIFICATION	
	3223		M	an..25 (an..5)	Related place/location one identification	Terminal code, see Part IV, Article 2.03(11)
	1131			an..17	Code list qualifier	n.a.
	3055			an..3	Code list responsible agency	n.a.
	3222		D[Use 1]	an..70 (an..17)	Related place/location one	Full name of the terminal

1	2	3	4	5	6	7
	C553		C		RELATED LOCATION TWO IDENTIFICATION	
	3233		C	an..25 (an..5)	Related place/location two identification	Fairway section code, see Part IV, Article 2.03(10)
	1131			an..17	Code list qualifier	
	3055			an..3	Code list responsible agency	n.a.
	3232		C	an..70 (an..5)	Related place/location two	Fairway section hectometre
	5479			an..3	Relation	n.a.
	DTM		**C**	**TDT/LOC**	**DATE/TIME/PERIOD**	Required if place of registration is given
	C507		M		DATE/TIME/PERIOD	
	2005		M	an..3	Date or time or period function code qualifier	'259' Registration date
	2380		M	an..35	Date or time period value	Date: CCYYMMDD
	2379		M	an..3	Date or time or period format code	'102' date format
TSR Gr 7	**TSR**		**M**		**Transport service requirements**	
	C536				Contract and carriage condition	n.a.
	4065			an..3	Contract and carriage condition code	n.a.
	1131			an..17	Code list identification code	n.a.

1	2	3	4	5	6	7
	3055			an..3	Code list responsible agency code	n.a.
	C233		M		Service	
	7273		M	an..3	Service requirement code	Service requirement: 'BER' Request for mooring service at a berth 'PIL' Request for pilot service 'VTS' Request for Vessel Traffic Services 'TUG' Request for tugboat service 'MAR' Planned handling of MARPOL substances 'SEC' Security services
	1131			an..17	Code list identification code	n.a.
	3055			an..3	Code list responsible agency code	n.a.
	7273			an..3	Service requirement code	n.a.
	1131			an..17	Code list identification code	n.a.
	3055			an..3	Code list responsible agency code	n.a.
	C537				Transport priority	
	4219			an..3	Transport service priority code	n.a.
	1131			an..17	Code list identification code	n.a.
	3055			an..3	Code list responsible agency code	n.a.
	C703				Nature of cargo	
	7085			an..3	Cargo type classification code	n.a.

1	2	3	4	5	6	7
	1131			an..17	Code list identification code	n.a.
	3055			an..3	Code list responsible agency code	n.a.
TSR	QTY		C	*TSR/QTY*	QUANTITY	To indicate the number of crew, passengers and others such as pets or other animals
	C186		M		Quantity details	
	6063		M	an..3	Quantity type code qualifier	'115' = Total number of crew on board including the master '114' = Total number of people on board '14' = Total number of animals on board
	6060		M	an...35	Quantity	Number e.g. 4
	6411		C	an..8	Measure unit code	n.a.
TSR Gr 8	LOC		**M**	**TSR**	**PLACE/LOCATION IDENTIFICATION**	Port
	3227		M	an..3	Place/location qualifier	Place/location qualifier: '5' Place of departure '94' Previous of port of call '61' Next port of call '89' Place of registration '153' Port of call
	C517		M		LOCATION IDENTIFICATION	

1	2	3	4	5	6	7
	3225		M	an..25 (an5)	Place/location identification	UNECE location code (Rec. 16) of the port, see Part IV, Article 2.03(9)
	1131			an..17	Code list qualifier	n.a.
	3055			an..3	Code list responsible agency	n.a.
	3224		C	an..256 (an..17)	Place/location	Full name of the port location
	C519		C		RELATED LOCATION ONE IDENTIFICATION	
	3223		M	an..25 (an..5)	Related place/location one identification	Terminal code, see Part IV, Article 2.03(11)
	1131			an..17	Code list qualifier	n.a.
	3055			an..3	Code list responsible agency	n.a.
	3222		D[Use 1]	an..70 (an..35)	Related place/location one	Full name of the terminal
	C553		C		RELATED LOCATION TWO IDENTIFICATION	
	3233		M	an..25 (an..5)	Related place/location two identification	Fairway section code, see Part IV, Article 2.03(10)
	1131			an..17	Code list qualifier	
	3055			an..3	Code list responsible agency	n.a.
	3232		C	an..70 (an..5)	Related place/location two	Fairway section hectometre
	5479			an..3	Relation	n.a.

1	2	3	4	5	6	7
Gr 8	**DTM**		C	TSR/LOC	**DATE/TIME/PERIOD**	Date and time of the start of the transport service requirement
	C507		M		DATE/TIME/PERIOD	
	2005		M	an..3	Date or time or period function code qualifier	'132' Arrival date/time, estimated
	2380		M	an..35	Date or time period value	Time: CCYYMMDDHHMM
	2379		M	an..3	Date or time or period format code	'203'
Gr 8	**QTY**		C	TSR/LOC	**QUANTITY**	
	C186		M		Quantity details	Quantity details
	6063		M	an..3	Quantity type code qualifier:	Quantity type code qualifier: '1' Discrete quantity
	6060		M	an..35	Quantity	Number of tugboats required Number of linesman
	6411			an..3	Measurement unit code	n.a.
Gr 8	**POC**		M	TSR	**PURPOSE OF CALL**	
	C525		M		Purpose of conveyance call	Purpose of conveyance call

1	2	3	4	5	6	7
	8025		M	an..3	Conveyance call purpose description code	'1' Cargo operation
						'2' Passenger movement
						'3' Taking bunkers
						'4' Changing crew
						'5' Goodwill visit
						'6' Taking supplies
						'7' Repair
						'8' Laid-up
						'9' Awaiting orders
						'10' Miscellaneous
						'11' Crew movement
						'12' Cruise, leisure and recreation
						'13' This is a visit to a port which has been ordered by government
						'14' Quarantine inspection
						'15' Refuge
						'16' Tank cleaning
						'17' Waste disposal
	1131			an..17	Code list identification code	n.a.
	3055			an..3	Code list responsible agency code	n.a.
	8024			an..35	Conveyance call purpose description	n.a.
Gr 8	**FTX**		**C**	**TSR/LOC**	**FREE TEXT**	*Only to be used for security information*

1	2	3	4	5	6	7
	4451		M	an..3	Text subject code qualifier	The security information may be given in 4441 'SEC' Current security information
	4453			an..3	Free text function code	n.a.
	C107		M		TEXT REFERENCE	
	4441		M	an..17	Free text identification	Level of security S1 Security level 1 S2 Security level 2 S3 Security level 3
	1131			an..17	Code list qualifier	n.a.
	3055			an..3	Code list responsible agency	n.a.
	C108		M			
	4440		M	an..512	Free text	Further remarks 'PER' followed by the number of persons on board.
	4440		C	an..512	Free text	ISSC information 'SCN' Security certificate not available 'SCY' Security certificate on board
	4440		C	an..512	Free text	Here the brand of the car and licence plate number can be given 'CAR' licence number
	4440		C	an..512	Free text	Free text: Name of the service provider requested for in the TSR segment

1	2	3	4	5	6	7
	4440			an..512	Free text	n.a.
	3453			an..3	Language, coded	n.a.
	4447			an..3	Text formatting, coded	n.a.
LOC Gr 9	**HAN**		**C**	**TSR/LOC**	**HANDLING INSTRUCTIONS**	
	C524		M		HANDLING INSTRUCTIONS	Handling instructions
	4079		M	an..3	Handling instructions, coded	Handling instructions coded: 'LLO' 'LOA' = Loading 'LDI' 'DIS' = Discharge 'RES' 'RES' = Re-stow 'T' 'TRA' = Transit 'TSP' 'CTC' = Cargo tank cleaning 'BUN' 'BUN' = Bunkering only 'DRY' 'RED' = Repairs in dry-dock 'WET' 'REW' = Repairs in wet-dock 'NCO' = No cargo operation
	1131			an..17	Code list qualifier	n.a.
	3055			an..3	Code list responsible agency, coded	n.a.
	4078		C	an..70	Handling instructions	Bolder numbers, preferred side for berthing, pilot embarkation point, MFO, MDF, fresh water, etc.
	C218				HAZARDOUS MATERIAL	

1	2	3	4	5	6	7
	7419			an..7	Hazardous material class code, identification	n.a.
	1131			an..17	Code list qualifier	n.a.
	3055			an..3	Code list responsible agency coded	n.a.
	7418			an..35	Hazardous material class	n.a.
HAN Gr 10	**GDS**		**M**	**TSR/LOC /HAN**	**NATURE OF CARGO**	
	C703		M		Nature of cargo	

1	2	3	4	5	6	7
	7085		M	an..3	Cargo type classification code	Nature
						'5' Other non-containerised
						'6' Vehicles
						'7' Roll-on roll-off
						'8' Palletised
						'9' Containerised
						'10' Break bulk
						'11' Hazardous cargo
						'12' General cargo
						'13' Liquid cargo
						'14' Temperature controlled cargo
						'15' Environmental pollutant cargo
						'16' Not-hazardous cargo
						'17' Diplomatic
						'18' Military
						'19' Obnoxious
						'21' Household goods
						'22' Frozen cargo
						'30' Cargo in bulk (sand, gravel, ore, etc.)
	1131			an..17	Code list identification code.	n.a.
	3055			an..3	Code list responsible agency, coded	n.a.

1	2	3	4	5	6	7
	MEA		**C**	TSR/LOC /HAN/ GDS	**MEASUREMENTS**	
	6311		M	an..3	Measurement purpose qualifier	Measurement application qualifier: 'AAE' Measurement
	C502		M		MEASUREMENT DETAILS	Measurement details
	6313		M	an..3	Property measured	Measurement dimension: 'G' Gross weight
	6321			an..3	Measurement significance	n.a.
	6155			an..17	Measurement attribute identification	n.a.
	6154			an..70	Measurement attribute	n.a.
	C174		M		VALUE/RANGE	
	6411		M	an..3	Measurement unit qualifier	Measure unit qualifier: 'KGM' Kilogram 'TNE' Metric tons
	6314		M	n..18	Measurement value	Weight
	6162			n..18	Range minimum	n.a.
	6152			n..18	Range maximum	n.a.
	6432			n..2	Significant digits	n.a.
	7383			an..3	Surface/layer indicator	

1	2	3	4	5	6	7
	UNT		**M**		**MESSAGE TRAILER**	End and control of completeness of the message
	0074		M	n..10	Number of segments in a message	
	0062		M	an..14	Message reference number	First 14 positions of the message reference number
	UNZ		**M**		**INTERCHANGE TRAILER**	End and control of the interchange
	0036		M	n..6	Interchange control count	'1' for number of messages contained in the interchange
	0020		M	an..14	Interchange control reference	First 14 positions of the message reference number

Business rules	
D[USE 1]	If the code is XXXXX, then this data-element shall be completed.

ANNEX 15
NOTICES TO SKIPPERS ENCODING GUIDE FOR EDITORS

Contents

Abbreviations:

Abbreviation	Meaning
CEVNI	European Code for Inland Waterways (http://www.unece.org/trans/main/sc3/ sc3res.html)
ENC	Electronic Navigational Chart
FTM	Fairway and Traffic related Message
ICEM	ICE Message
Inland ECDIS	Inland Electronic Chart Display and Information System
ISRS Location Code	'International Ship Reporting Standard' Location Code
NtS	Notices to Skippers
RIS	River Information Services
VHF	maritime mobile band
WERM	Weather Related Message
WRM	Water Related Message
WSDL	Web Services Description Language
XML	Extended Markup Language
XSD	XML Schema Definition

1. Background, structure and purpose of NtS Encoding Guides

Part V is continuously being improved. A major step forward was the release of the NtS web service facilitating exchange of NtS messages between authorities as well as between authorities and NtS users.

Two documents have been developed to facilitate the harmonised encoding of NtS messages nationally and internationally: the NtS Encoding Guide for editors and the NtS Encoding Guide for application developers. These Guides apply to NtS XSD 4.0 and the NtS Web Service WSDL 2.0.4.0.

Considering increased use of the NtS web service, NtS messages shall be further harmonised to ensure proper display of content on third party systems. Uniform encoding of messages is also a prerequisite for consideration of messages in voyage planning applications.

Elements that would contain only standard or default values shall be omitted if they are conditional, because they lead to message overhead with no added value.

The NtS Encoding Guide for editors is intended for those editing (and publishing) of NtS messages, including step- by-step instructions to create the proper message types as well as an explanation of codes. The NtS Encoding Guide explains the applicability of the four NtS message types, provides filling instructions as well as codes to be used in certain events. The NtS Encoding Guide for editors is included in Annex 15.

The NtS Encoding Guide for application developers includes guidelines for NtS application development and implementation, explaining its logic, processes and auto/default values. The NtS Encoding Guide for application developers is included in Annex 16.

2. Selection of the NtS message type
   a) FTM: Choose this type if you want to create a 'Fairway and traffic related message' for waterways or objects on the waterway. [go to (3) below]
   b) WRM: Choose this type if you want to create a 'Water related message', which enables provision of information on current and predicted water levels as well as other information. The water related message contains information for an object or a fairway section. The object is identified by its ISRS Location Code, the fairway section is defined by its begin- and end-ISRS Location Codes.
   c) ICEM: Choose this type if you want to create an 'Ice related message'. The Ice message section contains information about the ice conditions for a fairway stretch defined by its begin- and end-ISRS Location Codes.
   d) WERM: Choose this type if you want to create a 'Weather related message', which enables provision of information on current as well as forecasted weather situations on a waterway stretch defined by its begin- and end-ISRS Location Codes.

3.   FTM basic considerations, steps towards publication of an FTM

        Detailed information which codes have to be used is given in (4). The considerations beginning
        from (3.3) are not necessarily in the input order of an FTM editor tool.

3.1   Is there a need to publish information via NtS FTM according to Part V? All relevant information
        concerning safety and voyage planning has to be published via NtS messages. Information that
        is not relevant in terms of safety and voyage planning may be published. Each
        topic/incident/event has to be published in a separate message.

3.2   Does a valid FTM already exist related to the current situation (related to the content as well as
        to the time of validity)?

3.2.1   Yes:

        The already existing FTM has to be updated. The respective published message has to be
        selected and updated in the FTM editor tool. An expired FTM cannot be updated any more.

3.2.2   No:

        A new FTM has to be compiled. In case a similar event is already coded in an existing FTM the
        respective FTM can be used as draft for the creation of a new FTM (if this function is available),
        or a template may be used (if this function is available).

3.3   The geographical range of validity is to be set

3.3.1   In case the FTM is related to a specific stretch of a waterway, the waterway stretch has to be
        included, defined by its begin- and end points. If the content applies to several sections of the
        same waterway or different waterways they can all be listed in one FTM.

3.3.2   In case the FTM is related to a specific object (e.g. bridge, lock etc.) on the waterway the
        respective object is to be selected out of the list of available objects (if selection is available).
        There is no need to define a waterway stretch within the message. In case an FTM applies to
        several objects they can all be included in one FTM.

3.3.3   Combination of object- and fairway-related information is possible within one message as long
        as the information relates to one specific cause/event (same subject and reason code).

3.3.4   Although the coordinates are conditional they shall be provided to support the display on maps
        (often these coordinates are automatically provided by the NtS application).

3.4   Content of the FTM is to be entered

        All information that can be expressed using the NtS Reference Tables has to be coded in the
        standardised message fields. Only additional information (which is not encodable otherwise)
        shall be stated in free text fields.

3.5   The target group(s) concerning the type of vessels and affected directions is/are to be entered if applicable.

3.5.1   In case the message is valid for all crafts (all types of vessels) in all directions the target group shall be left out in order to only code essential information. If the message/limitation is addressed to a specific target group or direction the respective codes are to be selected.

3.5.2   In case the whole message is valid for specific target groups, the target group information is to be provided in the general part of the FTM (and not repeated in the limitation section(s)).

3.5.3   In case there are different target groups applicable to different limitations the target group information is to be provided within the respective limitations (and not repeated in the general part of the FTM).

3.5.4   In case exemptions from limitations are granted to individual vessels or local traffic by the competent authorities (e. g. vessels participating in an event for which a general blockage is applicable, local ferry traffic in blocked areas) such exemptions need not be taken into account for coding of the target group(s). Such information may be stated in the free text field for additional information.

3.6   The communication section is to be entered if applicable

        If additional information is available via a specific source it should be stated in this section. If there is an additional obligation to report via a specific medium it is to be stated in this section.

3.7   The limitation section is to be entered if applicable

        If limitations are applicable the limitation section is to be filled. If values bound to limitations are known they have to be stated. It is mandatory to provide values for ship dimensions, the speed limit and the available space for navigation.

        All limitations have to include the limitation periods in order to allow proper calculations within voyage planning applications (to ease the work there might be a function provided by the NtS application to copy limitation periods or to select more than one limitation for a limitation period).

3.8   The start date of the validity of the message is to be set

        In case the end date of the validity of a message is already known it shall be set as well. The validity end date must not be before the present date.

        Note that the validity period information will be used by applications to select the messages, which are to be displayed to users for a requested time.

        In case the message is withdrawn:
        a)   before its validity period has begun the start date and end date have to be set to the date of withdrawal;
        b)   and the validity period has already started, the new end dates for all limitations are to be set to the past, the validity date end has to be set to the date of withdrawal.

3.9.   The message can be published

4.   FTM explanation of codes

4.1   Subject_code:

Definition of use of Subject Codes:
-    ''Warning': relevant for safety. The warning must contain at least one limitation that results in direct and concrete endangerment of persons, crafts or facilities, e.g. welding works on a bridge producing sparks, inspection cage/workers hanging from a bridge, obstacle in the fairway,
-    'Announcement': relevant for voyage planning or safety. The announcement may contain limitations, e.g. blockage of a lock chamber due to maintenance works, dredging on the fairway, rules of traffic in addition to national legislation,
-    'Info service': general information that is not directly linked to voyage planning or safety. The info service must not contain specific limitations, therefore it is not directly relevant to voyage planning or safety. Such information might include e.g. local rules of traffic, Inland ECDIS Update. The validity period is used to specify the time the Info service Message is displayed to the users, not for the period of validity of the provided information (e.g. 1 month or as defined in the national procedures).
-    'Notice withdrawn'
    The subject code 'Notice withdrawn' is only used if

    •   present date is before the start date of validity. In this case only the content of the field 'additional information in national language' may be altered, the further content of the message has to stay unchanged. In this case 'Notice withdrawn' is used to pull back a notice before it gets valid. This means that 'Notice withdrawn' is used for notices that did not reach the start date of the validity and/or for planned measures that will not be carried out (e.g. dredging was planned but cannot be started due to high water level),

    •   the validity period has already started and the new end dates for all limitations are set to the past. The validity date end has to be set to the date of withdrawal.

    In this case measures/events end before the initially set validity period of an already existing FTM has finished.

4.2   Reason code

The Reason code should be filled to give additional information to the skippers.

Definition of use of Reason codes:

building work	Announcement of construction works
calamity	Warning of a calamity
changes of the fairway	Announcement of changes of the fairway
change marks	Announcement of changes of waterway marks
constriction of fairway	Announcement of a reduced width of the fairway if no other reason_code is applicable
damaged marks/signs	Announcement about damaged marks/signs
diver under the water	Warning about diver under water
dredging	Announcement of dredging works
event	Announcement of events e.g. swimming-, sailing- or rowing competition
exercises	Announcement of exercises e.g. rescue- or military exercises
explosives clearing operation	Announcement of explosives clearing operation
extensive sluicing	Announcement of higher discharge rate as usual through weirs or locks for water management reasons
falling material	Announcement of falling material e.g. icicles, limbs of trees
false radar echos	Announcement of the possibility of false radar echoes
fireworks	Announcement of fireworks
floating material	Announcement regarding floating materials above the water level (visible) and below the water level (invisible)
flow measurement	Announcement of measurement works
health risk	Warning or announcement regarding e.g. through oak processionary caterpillar, leaking gas, etc.
high voltage cable	Announcement of an intersecting high voltage cable
high water	Announcement of a high water situation before the prohibitory water level is reached
ice	Announcement of ice; further information will be sent out via ice-information (Ice-related Message)
Inland ECDIS update	Info service regarding an Inland ECDIS update
inspection	Announcement of inspection works; only used in case of inspection; not used for (repair/building) works. There may be limitations because of inspection cars/cages or scaffolds

launching	Announcement of a vessel leaving a dockyard
local rules of traffic	Info service regarding supplementary or changed rules of valid law or regulation without special limitations, dates of limitations or dates of validity
low water	Announcement of low water situation before the prohibitory water level is reached
lowering water level	Announcement of a controlled lowering of the water level for inspections or works or water management reasons
minimum sluicing	Announcement of lower discharge rate as usual through weirs or locks for water management reasons
new object	Announcement of information regarding a new available object e.g. bridge, berth
obstacle	Announcement of a reduced clearance height and/or reduced width of the fairway because of an obstacle above water level
obstruction under water	Announcement of a reduced available depth and/or for a reduced width of the fairway because of an obstacle under water
prohibitory water level	Announcement of a water level (high water or low water) which causes prohibited navigation
radio coverage	Announcement regarding radio coverage
removal of object	Announcement of removed objects
repair	Announcement in case something is broken or out of order and must be repaired e.g. a lock control system, it can also be used for planned repairs
rising water level	Announcement of natural rising water levels, not because of water management
siltation	Announcement of a reduced available depth because of siltation
sounding works	Announcement of sounding works
special marks	Announcement of the use of special marks e.g. for the blocking from water areas or fishing areas
special transport	Announcement of special transports
strike	Announcement regarding strike of the operating personnel having impact on availability of waterway infrastructure
water level of cautious navigation	Announcement of a water level (high water or low water) by which particular caution for navigation is needed
work	Announcement of general works at objects, at the banks and/or beds of waterways (rivers- or canals)
limitations	Shall only be used as indication for existing limitations if no other reason code is applicable
others	Shall not be used, in case no other reason code fits, the reason code shall not be filled

4.3   Limitation_code:

Definition of use of Limitation codes:

a)   blockage:

In case no form of navigation is possible:

- through a lock chamber,
- through a bridge opening,
- through a specified point on the fairway,
- on a specified section of the fairway.

b)   partial obstruction:

All parts of infrastructure (e.g. lock chambers, bridge openings) shall have an own ISRS Location Code. In case such codes are still missing partial obstruction may be used in case limited navigation is possible (e.g. only lock area object available for a lock having two parallel chambers)

- through one or more lock chambers of a lock, leaving at least one open,
- through one or more bridge openings, leaving at least one open.

c)   no service:

shall be used in case a movable bridge is not operated during a specified period. This period should be within the normal operating hours.

No service of a movable bridge means that passing under the bridge is still possible. Otherwise it is a 'Blockage'. No service of a lock is to be encoded as 'Blockage'.

d)   changed service:

shall be used in case the normal operating hours of objects (e.g. locks, (moveable) bridges) change, are extended or reduced.

e)   If there are limitations related to allowed vessel/convoy dimensions (not in direct relation with infrastructure), the limitation is to be encoded with the following text elements:

- vessel draught,
- vessel breadth,
- convoy breadth,
- vessel length,
- convoy length,
- vessel air draught.

If available an absolute value shall be provided.

f)   If there are limitations related to available size of an object or a waterway section, the following codes are used:

- clearance height,
- available length,
- clearance width,
- available depth.

If available an absolute value shall be provided.

g) least depth sounded: shall be used in case depth may cause problems (e.g. due to siltation). A value for the absolute depth (referred to a reference value) or the reduction of depth shall be provided. If available an absolute value shall be provided.

h) delay: shall be used in case an obstruction/incident with a limited duration occurs at an object or on a waterway section between a specified start and end date.

The estimated maximum duration of the obstruction/incident should be encoded. Delay shall not be used in cases when one of several lock chambers of a lock is not available.

i) If specific manoeuvres or actions are prohibited, the respective limitations are to be encoded. These limitations shall only be encoded if they are not already announced via navigational signs or regulations that are encoded in the official Inland ENC:

- minimum power,

- alternate traffic direction,

- no turning,

- no passing,

- no overtaking,

- no berthing,

- no mooring,

- no anchoring,

- no wash of waves,

- speed limit,

- not allowed to go ashore.

If available an absolute value shall be provided for speed limit and minimum power.

j) special caution: In cases the FTM (or a part of an FTM) is related to a fairway/waterway this limitation shall be used to indicate on which position of the fairway/river/canal/lake an incident occurs.

Furthermore it shall be used in cases if it is not possible to describe the limitation in detail but it is helpful or necessary to warn or inform skippers that they have to watch out and pay attention to radio information.

k) no limitation: should only be used in case it shall be explicitly stated that there are no limitations in a certain time period.

4.4 Limitation interval_code: Definition of use of interval codes:

a) 'continuous': shall be used for limitations that are applicable from a start date/time until an end date/time without interruption (e.g. blockage from 01.01.2016, 00:00 hrs, until 31.03.2016, 23:59 hrs, but also blockage on 17.09.2016 from 08:00 hrs until 18:00 hrs).

b) 'daily': shall be used for regularly repeated application of a limitation (e.g. no wash of waves during working hours at a dredging site — 07.04.2016 until 11.04.2016, daily from 06:00 hrs until 18:00 hrs).

c) day-time (as it is defined in CEVNI): The term 'day' means the period between sunrise and sunset.

d) night-time (as it is defined in CEVNI): The term 'night' means the period between sunset and sunrise.

e) Days of the week: If there are intervals related to different days of the week these have to be selected from the following text elements:
- Monday,
- Tuesday,
- Wednesday,
- Thursday,
- Friday,
- Saturday,
- Sunday,
- Monday to Friday,
- Saturday and Sunday.

f) 'in case of restricted visibility': shall be used if the limitation is only in force in case of conditions in which visibility is reduced owing to fog, haze, snow, rain or other reasons.

g) 'with the exception of: It must not be used; Interrupted intervals have to be given as separate limitation periods within the same limitation. This is due to the fact that voyage planning software is not able to interpret this code correctly as not taking place at the given date or time. Thus it is not possible to calculate proper ETAs.

h) 'Monday to Friday except public holidays': is only to be used if public holidays are within the validity period of the limitation. As a service for the users public holiday may be stated in the free text section of the FTM. Voyage planning software will not be able to take national public holidays into account for the calculation of ETAs.

4.5 Indication_code:

The Indication_code is intended to be used for information about specific values with regard to certain limitations (e.g. speed limit, minimum power, available depth). In order to determine certain dimensions a reference to either an external reference system (geographical or hydrological) (e.g. clearance height, available depth, least depth sounded) or relative to known dimensions of artificial structures (e.g. available length, clearance width) is necessary.

4.5.1 If absolute dimensions or references are known they have to be used. Only if it is not possible to refer to an external reference system relative values should be used.

4.5.2 reduced by this is a relative value

4.5.3 maximum this   is an absolute value

4.5.4 minimum this   is an absolute value

4.5.5 If the dimension indicating a limitation refers to a geographical or hydrological co-ordinate, the respective reference system has to be indicated in the NtS message (e.g. clearance height min. 4 m referred to highest navigable water level; available depth min. 1,7 m referred to regulated low water level)

4.5.6 If the dimension indicating a limitation refers to a dimension of an artificial structure (e.g. bridge, lock), the reference may be given relative to known dimensions (e.g. clearance height reduced by 1,5 m, available length reduced by 27 m).

4.6   Position_code (objects):

Wherever possible the Position_code shall refer to the side of the fairway where the object is located relative to the fairway axis (left/middle/right) or other commonly known information (old/new) or geographic direction (north/ south/east/west). The position_code for objects may be prefilled automatically from the RIS Index reference data. The left/right side of the fairway is defined looking downstream direction.

4.7   Position_code (fairways/waterways):

A Position_code for an FTM (or a part of an FTM) that is related to a fairway or waterway is not provided. To indicate on which side of the fairway/canal/river/lake an incident occurs the limitation 'special caution' in combination with the proper limitation Position_code is used.

4.8   Position_code (limitations):

4.8.1   Wherever possible the Position_code shall refer to the side of the fairway or object where the limitation occurs (left/ right). The left/right side of the fairway is defined looking downstream direction.

4.8.2   The Position_code shall direct the attention of the skipper to the side of the fairway where e.g. an area of special interest, a danger or an obstacle is located. Therefore a rough indication (e.g. left bank — left — middle — right — right bank) is sufficient. A finer subdivision is not intended.

4.8.3   If necessary, more precise position information should preferably be given by way of maps or sketches (attachment, see (3.6))

4.8.4   For sections where the usual position indication by fairway side (left/right) does not seem appropriate (e.g. harbour basins, certain canal sections without distinct direction of flow) the cardinal points (north/east/south/west) may be used.

4.9   Target_group_code (see (3.5))

4.10   Reporting_code

4.10.1 The Reporting_code shall, as a general rule, only be used in case there is a special need for communication (e.g. additional duty to report to local authority with regard to on-site traffic regulation) or where additional information is available (e.g. VHF contact point like channel name or call-sign for current position of dredger) with direct relevance for the FTM.

4.10.2 A routine reiteration of publicly available communication data (e.g. telephone numbers of local authorities, VHF channels of locks, etc.) shall be avoided if there is no direct cause for such communication with reference to the FTM.

4.10.3 Generally applicable means of communication according to official regulation (e.g. ship-to-ship and ship-to-shore VHF communication as laid down by CEVNI or regional or national rules for navigation) shall, as a general rule, not be repeated by the Reporting_code if there is no direct cause for such communication with reference to the FTM).

4.11 Communication_code

The following format shall be used (examples):
- VHF 'number, call sign': '10, Schifffahrtsaufsicht Wien'
- Phone or Fax number: '+43123456789, Schifffahrtsaufsicht Wien'
- Internet address: 'http://example.com'
- Sound signalling: 'long blast / langer Ton'
- E-mail: 'example@authority.eu'
- EDI mailbox number: '900012345@edi.bics.nl'
- Teletext: 'ARD, 992 — 995'

4.12 Type_code:
- A waterway is either a canal, lake or river.
- anchoring area
- bank
- beacon
- berth — border control
- bridge
- bridge opening
- buoy
- cable overhead
- canal (The term 'canal' is used if a message is relating to the whole canal (not just the fairway))
- canal bridge: aqueduct
- culvert
- fairway (The term 'fairway' means that part of the waterway that can actually be used by shipping).
- ferry
- floating dock
- flood gate (A flood gate is used to protect an area in high water situations)
- harbour
- harbour facility
- harbour master's office
- lake (The term 'lake' is used if a message is relating to the whole lake (not just the fairway))
- light
- lock basin: individual lock chamber
- lock: whole lock complex
- mooring facility
- notice mark

- pipeline
- pipeline overhead
- ramp
- refuse dump
- reporting point
- reservoir
- river (The term 'river' is used if a message is relating to the whole river (not just the fairway))
- ship lift
- shipyard
- signal station
- terminal
- tide gauge
- tunnel
- turning basin
- vessel traffic centre
- weir (A weir is used to control the water level in rivers).

5.   WRM basic considerations

Water related messages shall, as a general rule, be generated automatically. Where this is not possible the manual generation of WRM shall follow the processes set out for automatically generated WRM (see NtS Encoding Guide for Developers) as closely as possible.

6.   ICEM basic considerations, steps towards publication of an ICEM

Ice Messages depend on local observation and assessment and will usually be generated by authorised staff.

An ICEM shall be issued in case of ice. Ice does not necessarily cause limitation for navigation however information about ice condition not hindering navigation may be provided.

6.1   Is there a need to publish information via NtS ICEM?

The first ice message for a stretch shall only be published in case of ice at the waterway or tributaries, also in case there are no limitations.

6.2   Does a valid ICEM already exist for the affected stretch of the waterway?

6.2.1 Yes:

If a message for the affected stretch is (still) valid the already existing message shall be updated. It is possible to update existing ice messages even if the area of applicability changes (e.g. ice is expanding increasing the size of affected stretch).

6.2.2 No:

In case there is no valid ice message available for the affected stretch, a new message is to be created.

6.3   However information about ice condition not hindering navigation may be provided.

6.4   One ICEM is always valid for one single stretch of the waterway. The geographical range of validity is to be set by defining the waterway and the respective begin- and end-(hectometre)points (or choosing certain consecutive sections, depending on national implementation).

6.5   Measurement time is to be entered. The respective ice conditions are to be entered by using at least one of the code lists (depending on national requirements).

6.5.1   Ice_condition_code

6.5.2   Ice_accessibility_code

6.5.3   Ice_classification_code

6.5.4   Ice_situation_code (the ice situation code should always be provided to allow presentation of ice situation on a map using 'traffic light' colours).

6.6   The ICEM can be published. Ice messages will be valid automatically until the next day after publication or until as defined in national procedures.

7.   WERM basic considerations

        Taking into account the abundance of available Web Services and apps for weather forecasts and weather warnings WERM should only be used for weather information of specific importance for navigation which is not covered by general weather information services.

        Weather related messages shall, as a general rule, be generated automatically. Where this is not possible the manual generation of WERM shall follow the processes set out for automatically generated WERM as closely as possible (see NtS Encoding Guide for application developers).

8.   Rules for certain elements

8.1   Rules for the element 'name' related to objects

        Object names are usually prefilled by the NtS editor tool based on RIS Index reference data. Names shall be entered in local language, thus also e.g. diacritics or Cyrillic letters may be used. (e.g. Baarlerbrücke, Volkeraksluis or Mannswörth).

        Do not include information on characteristics of feature, the type of object shall not be repeated in the name unless additional information to the object type is given.

        E.g.: The lock 'Schleuse Freudenau' shall only be named 'Freudenau', the object type 'lock' is added automatically based on the type_code.

        E:g.: The object name for the Railway bridge in Krems (AT) is 'Eisenbahnbrücke Krems'. The information 'railway bridge' is included in the object name as it adds information in addition to the type_code 'bridge'.

E.g.: The object name for a bridge in Linz (AT) is 'Nibelungenbrücke'. The word 'brücke' stays within the object name as it is part of the bridge name itself.

E.g.: The waterway gauge 'Pegelstelle Wildungsmauer' is named 'Wildungsmauer' as the information that this object is a gauge is already coded in the type_code.

If a waterway section is the borderline between two countries with different languages, the national object name can be provided in both languages (e.g. 'Staatsgrenze AT-SK/Statna hranica AT-SK').

8.2   Rules for the element 'name' related to fairways

Fairway names are usually prefilled by the NtS editor tool based on RIS Index reference data. The field 'name' shall contain the local name of the respective fairway section (e.g. 'Rhein') Depending on national processes it may be possible to edit the fairway name to include commonly used local names or additions (e.g. 'Rhein am Deutschen Eck').

8.3   Rules for the elements 'value' and 'unit' within limitations

Unless stated otherwise only cm, m^3/s, h, km/h and kW, m/s (wind), mm/h (rain) and degree Celsius are allowed to be used as units within NtS messages.

ANNEX 16
NOTICES TO SKIPPERS ENCODING GUIDE FOR APPLICATION DEVELOPERS

Contents

1.   Background & Structure

Notices to Skippers (NtS) were being implemented in various European countries based on NtS Standard Edition 1.2.1 published by the Central Commission for the Navigation of the Rhine (CCNR) or Commission Regulation 416/2007/EC of the European Parliament and of the Council concerning the technical specifications for Notices to Skippers as referred to in Article 5 of RIS directive 2005/44/EC. The NtS standard is in the continuous process of enhancement, a major step forward was the release of the NtS Web Service facilitating exchange of NtS messages between authorities as well as between authorities and NtS users as well as NtS XSD 4.0 streamlining the encoding of NtS messages.

1.1   Purpose of NtS Encoding Guide

The NtS Encoding Guide explains the applicability of the four NtS message types as well as codes to be used in case of certain events. It provides NtS editors with NtS message filling instructions, thus allows nationally and internationally harmonised encoding of NtS messages.

Considering increased use of the NtS web service, NtS messages shall be further harmonised to ensure proper display of content on third party systems. Uniform encoding of messages is also a prerequisite for consideration of messages in voyage planning applications. The NtS Encoding Guide version 1.0 applies to NtS XSD 4.0 and the NtS Web Service WSDL 2.0.4.0.

1.1.1 NtS Encoding Guide for editors

The NtS Encoding Guide for editors is intended for personnel editing (and publishing) NtS messages including step- by-step creation instructions for the proper message types as well as explanation of codes. The encoding guide for editors also includes relevant information for application developers.

1.1.2 NtS Encoding Guide for application developers (this document)

The NtS Encoding Guide for developers includes guidelines for NtS application implementation explaining logic, processes and auto/default values.

2.   NtS messages and sections

An NtS message consists of the following:
a)   the identification section,
b)   section defining the applicable object(s) or fairway section(s) the message is related to,
c)   one or more of the following sections according to the message type:
      -    limitation(s) for the Fairway and traffic related message,
      -    measurement(s) for the Water level related message,
      -    ice condition(s) for the Ice related message,
      -    weather report(s) for the Weather related message.

Figure 2

Visualisation of the NtS message structure: mandatory element (1), mandatory element that may occur one or two times (1...2), mandatory element that has to occur two times (2), mandatory elements that may occur as often as necessary (1-n), optional element that may occur as often as necessary (0...n)
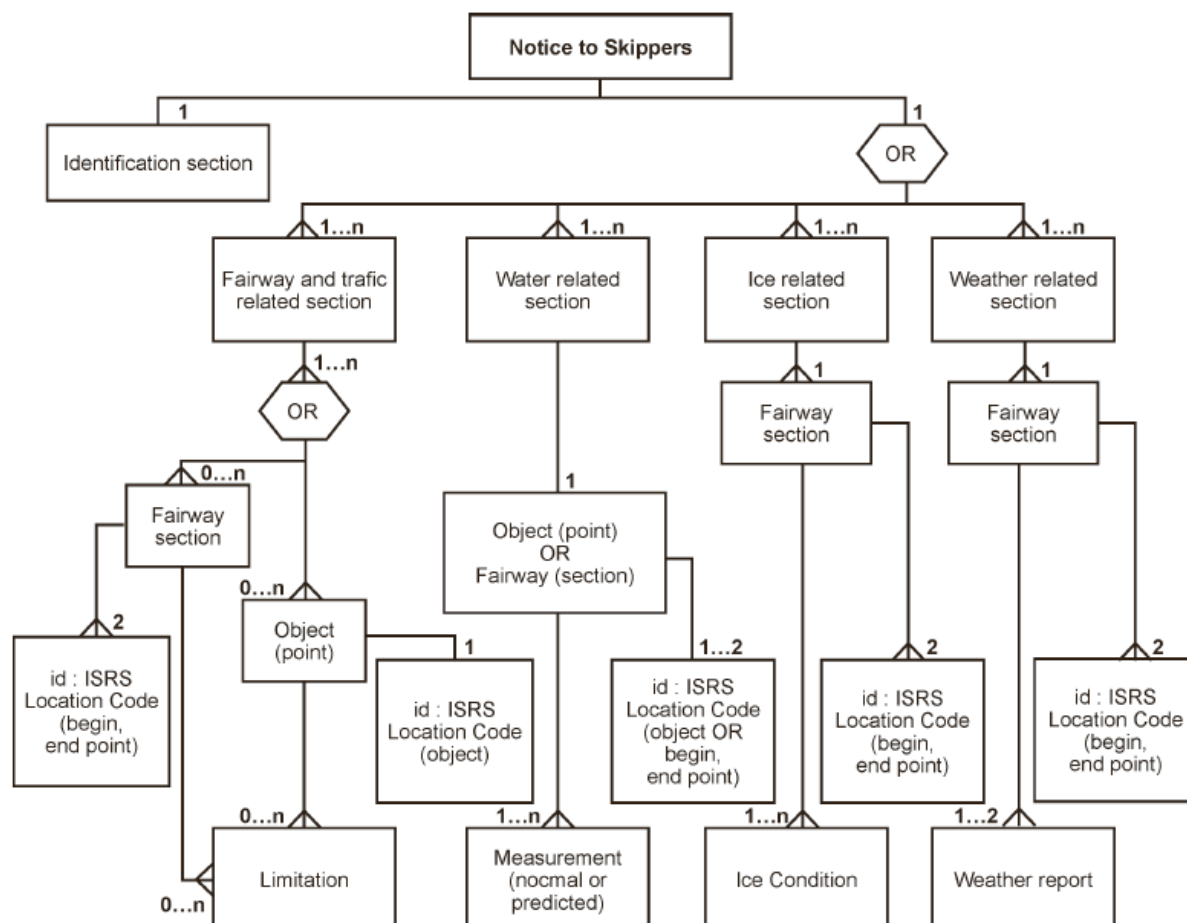
The identification section is mandatory and includes general information about the message originator, sender, date issue, country and original language and is provided together with one of the four different NtS message section types:

- Fairway and traffic related section: a 'Fairway and Traffic related Message' (FTM) is usually created by NtS editors following the NtS Encoding Guide for editors. It is related to stretches of waterways (defined by its begin and end ISRS Location Codes and/or objects on the waterway defined by their respective ISRS Location Code. [go to (6)]

- Water level related section: a 'Water Related Message' (WRM) facilitates provision of information on current and predicted water levels as well as other information. Usually WRM are created automatically (and periodically) based on sensor measurements or infrastructure status not requiring NtS editor interaction. The water related message section contains information for an object (e.g. gauge station) or a fairway section (e.g. least sounded depth for a stretch, applicable regime at a waterway section). The object is identified by its ISRS Location Code, the fairway section is defined by its begin- and end-ISRS Location Codes. [go to (3)]

- Ice related section: an 'ICE Message' (ICEM) contains information about the ice conditions for a fairway stretch defined by its begin- and end-ISRS Location Codes. [go to (4)]
- Weather related section: a 'WEather Related Message' (WERM) enables provision of information on current as well as forecasted weather situations on a waterway stretch defined by its begin- and end-ISRS Location Codes. [go to (5)]

In addition, the ISRS Location Code (International Ship Reporting Standard) is used to define the applicable object(s) or fairway section(s) the message is related to.

The ISRS location code is defined in Part V (4.3).

3.   WRM basic considerations

Water level information is very important for voyage planning as well as safety. At the moment there is no common standard of referencing water level information. The values of gauges are referring to different sea-levels or to special reference points. To provide a proper reference, the respective 'reference_code' shall always be provided together with the value. WRM may be used to provide the following information:
-     Water level (including predictions),
-     Least sounded depth (including predictions),
-     Vertical clearance (including predictions),
-     Discharge (including predictions),
-     Barrage status,
-     Regime.

Clarifications for translations in the spreadsheet 'reference_code' are provided in (7.11).

Usually WRM are created and published automatically based on information received from sensor equipment or information received from infrastructure (e.g. predictions, barrage status). There may be different triggers for WRM publication, e.g. periodically or when certain values are reached.

3.1   Filling of nts_number section in the WRM

In NtS XSD 4.0 the NtS number is optional within WRM messages. If it is provided every number has to be unique (Organisation/Year/Number/Serial) per message type and it is up to the organisation providing the WRM to ensure unique numbers (it is not required to have consecutive numbers).

3.2   Filling of WRM including predictions

The date_start of validity_period has to be filled with present date (date_issue) and the date_end of validity_period has to be filled with the next day after date_issue.

To provide changes in e.g. water level in a user-friendly way the difference to a previous comparative measurement may be provided in the WRM difference section. Besides the change in the value (e.g. - 5 [cm]) also the time difference to the comparative measurement has to be provided.

In case of predictions the 'measure_date' is the date/time the prediction is valid for.

Water level predictions always include a factor of uncertainty. Usually models with different parameters (e.g. weather forecast) are calculated leading to different predicted water level values. To enable provision of a minimum and maximum predicted value e.g. visualisation of a water level prediction confidence interval, two additional optional data fields are included in the WRM 'measure' section.

An illustration of water level prediction confidence interval is given in the following figure:

Figure 3

Visualisation of water level prediction confidence interval: most probable value (black), confidence interval upper boarder (violet), confidence interval lower boarder (red), measured water level (blue)

(The x-axis shows the time; the y-axis shows the water level in cm)
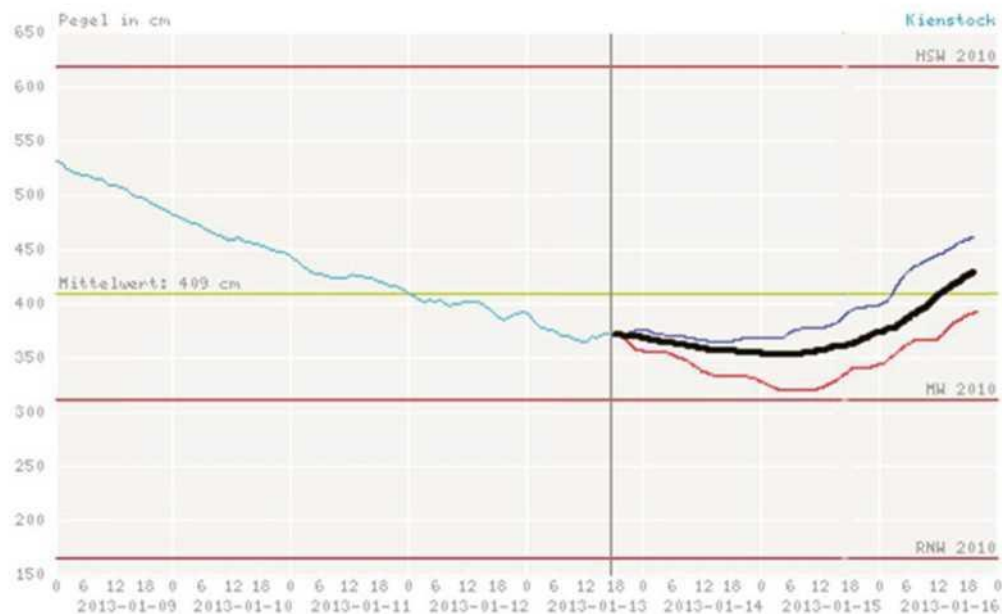
Two elements are available in the NtS XSD:

<value min> lowest value of confidence interval

<value_max> highest value of confidence interval

Besides predicted water levels the confidence interval may also be used to state the uncertainty of published least sounded depth and vertical clearance information.

The confidence interval value_min and value_max enable provision of WRM value confidence interval via standardised NtS WRM Message to use it in graphs. The raw data itself shall not be displayed to IWT users (e.g. in code format).

The measure_code 'NOM' must not be used. In case there is no measurement for a certain type of WRM the value elements have to be omitted if a message should be sent anyhow.

4.   ICEM processes

Ice Messages depend on local observation and assessment and will usually be generated manually (in case of automatic generation the rules for manual creation have to be followed, see NtS Encoding Guide for editors).

The ICEM is published for a certain fairway_section defined by its begin and end ISRS Location Codes and contains the ice_condition at a certain measurement date.

The validity of the ICEM starts at the date of publication (automatically set by the NtS application). In order to avoid ICEM being displayed to users that are not valid any more, the validity date_end has to be filled automatically by the NtS application with the day after publication (unless it is ensured by national processes that messages will get a validity date end as soon as the information included in the message is not up-to-date any more).

In the NtS Encoding Guide for editors it is described under which circumstances an NtS editor creates a new ICEM or updates an existing ICEM. The following processes apply:

4.1   New ICEM

1.   NtS applications may offer NtS editors:
   a)   to use existing notices as draft upon creation of new ICEM (e.g. if ice conditions are similar to the existing notice); and/or
   b)   to use notice templates for certain situations.

2.   The content (e.g. time of measurement or respective ice conditions) has to be entered by the editor in line with (6) of the NtS Encoding Guide for editors. The date and time of measurement could also be set by the application according to national definitions.

3.   When an NtS editor/publishers triggers the publish action:
   a)   it is checked if all mandatory content is provided in line with the NtS XSD (if not go back to (2));
   b)   the nts_number is generated by the NtS application:
      i)   the 'organisation' is filled with the name or code of the responsible organisation depending on the role of the publishing user;
      ii)   the 'year' is filled with the current year;

iii)   the next available 'number' is assigned;

iv   the 'serial number' 0 is assigned;

c)   'date_issue' is automatically filled with the actual date/time of publish action;

d)   'validity_period' — 'date_start' is automatically filled with the actual date of publication;

e)   'validity_period' — 'date_end' is automatically filled with the next day after the date of publication (unless it is ensured by national processes that messages will get a validity date end as soon as the information included in the message is not up-to-date any more).

4.2   Update of an existing ICEM

1.   The respective published message has to be selected to be updated in the ICEM editor tool. The original ICEM has to be copied or altered in the DB (depending on national processes). Expired ICEM (which passed the validity_date_end) cannot be updated any more, if this is the case NtS editors have to create a new ICEM.

2.   The content (e.g. time of measurement or respective ice conditions) has to be altered by the editor in line with (6) of the NtS Encoding Guide for editors. The date and time of measurement could also be altered by the application according to national definitions.

3.   When an NtS editor/publisher triggers the publish action:

a)   it is checked if all mandatory content is provided in line with the NtS XSD (if not, go back to (2));

b)   the nts_number is generated by the NtS application:

i)   the 'organisation' stays unchanged;

ii)   the 'year' stays unchanged;

iii)   the 'number' stays unchanged;

iv)   the 'serial number' is incremented (increased by 1);

c)   'date_issue' is automatically filled with the actual date/time of publish action;

d)   'validity_period' — 'date_start' is automatically filled with the actual date of publication;

e)   'validity_period' — 'date_end' is automatically filled with the next day after the date of publication (unless it is ensured by national processes that messages will get a validity date end as soon as the information included in the message is not up-to-date any more).

5.   WERM basic considerations

Usually WERM are created and published automatically based on information received from sensor equipment or information received from infrastructure. The date_start of validity_period has to be filled with present date (date_issue) and the date_end of validity_period has to be filled with the next day after date_issue.

The fairway section in WERM is indicated as a stretch between two points on the fairway, i.e. area of applicability of the weather station (gauge).

Date and time of measurement/forecast have to be provided even if it is not mandatory in WERM messages.

In case of forecasts the 'measure date' is the date/time the forecast is valid for.

5.1   Filling of nts_number section in the WERM

In NtS XSD 4.0 the NtS number is optional within WERM messages. If it is provided every number has to be unique (Organisation/Year/Number/Serial) per message type and it is up to the organisation providing the WERM to ensure unique numbers (it is not required to have consecutive numbers).

5.2   Filling of WERM 'weather_category_code'

The wind speed in 'weather_category_code' (values 0 to 12) shall be provided in line with the Beaufort scale published by the World Meteorological Organization in its Manual on Marine Meteorological Services 'WMO- No 558'.

The visibility in 'weather_category_code' (values 13 to 22) shall be provided as defined in the following table:

Value, meaning	Visibility	Additional information
13, thick fog	below 50 metres	
14, dense fog	below 100 metres	
15, moderate fog	below 200 metres	
16, fog	below 1 000 metres	Fog consists of water droplets.
17, mist	from 1 km to 4 km	Mist consists of water droplets. Mist is used in case of 'dry fog', this phenomenon usually takes place before sunrise.
18, haze	from 1 km to 4 km	Haze consists of dry particles.
19, light haze	from 4 km to 10 km	
20, clear	from 10 km to 20 km	
21, very clear	no limitation of visibility	
22, no fog		'no fog' is used to state that there is no fog depending on national/local requirements.

6.   FTM processes

In the NtS Encoding Guide for editors it is described under which circumstances an NtS editor creates a new FTM or updates an existing FTM. The following processes apply:

6.1   New FTM

1.   NtS applications may offer NtS editors to:
  a)   use existing notices as draft upon creation of new FTM; and/or
  b)   use notice templates for certain situations.

2.   The content (e.g. time of validity, limitations) has to be entered by the editor in line with (3) and (4) of the NtS Encoding Guide for editors.

3.   When an NtS editor/publisher triggers the publish action:
  a)   it is checked if all mandatory content is provided in line with the NtS XSD (if not go back to (2));
  b)   the nts_number is generated by the NtS application:
    i)   the 'organisation' is filled with the name or code of the responsible organisation depending on the role of the publishing user:
    ii)   the 'year' is filled with the current year;
    iii)   the next available 'number' is assigned, in case a dedicated number was entered by the NtS editor or an application process in step 2 it is taken over (given that (Organisation/Year/Number/Serial) is unique as explained in chapter 15.1;
    iv)   the 'serial number' 0 is assigned;
  c)   'date _issue' is automatically filled with the actual date/time of publish action.

6.2   Update/withdrawal of an existing FTM

1.   The respective published message has to be selected to be updated in the FTM editor tool, the original FTM has to be copied or altered in the DB (depending on national processes).
  a)   Expired FTM (which passed the validity_date_end) cannot be updated any more, if this is the case NtS editor has to create a new FTM.
  b)   The subject code 'Notice withdrawn' is only used if:
    i)   present date is before the validity_date_start. In case only the content of the field 'additional information in national language' may be altered, the coded content of the message (step 2) has to stay unchanged;
    ii)   the validity period already started and the new end date for all limitations is in the past. The end date of the limitation has to be set to the correct time.
  c)   If a notice is withdrawn the validity period date end always has to be set to date of withdrawal.

2.   The content (e.g. time of validity, limitations) has to be altered by the editor in line with (3) and (4) of the NtS Encoding Guide for editors.

3. When an NtS editor/publisher triggers the publish action:

   a) it is checked if all mandatory content is provided in line with the NtS XSD (if not go back to (2));

   b) the nts_number is generated by the NtS application:

      i) the 'organisation' stays unchanged;

      ii) the 'year' stays unchanged;

      iii) the 'number' stays unchanged;

      iv) the 'serial number' is incremented (increased by 1);

   c) 'date_issue' is automatically filled with the actual date/time of publish action

   d) FTM with subject code 'Notice withdrawn' shall not be considered for voyage planning (any more).

6.3 Waterway and/or object related FTM

A waterway related FTM contains information about one or several stretches of waterway. A waterway stretch is defined in the 'fairway_section' part by its begin and end ISRS Location Codes.

An object related FTM contains information about one or several specific objects on the waterway. An object is defined in the 'object' part by its ISRS Location Code.

One FTM has to refer

- to one or several fairway sections, or
- to one or several objects on one or several fairway sections.

6.4 Automatic ordering of limitation codes

Different limitations have different impact on navigation. In order to allow display of the most severe limitation e.g. in an FTM list overview, the following order shall be considered starting with the most severe limitation having Rank 1:

Rank	Value	Meaning (EN)
1	OBSTRU	blockage
2	PAROBS	partial obstruction
3	NOSERV	no service
4	SERVIC	changed service
5	VESDRA	vessel draught
6	VESBRE	vessel breadth
7	CONBRE	convoy breadth
8	VESLEN	vessel length
9	CONLEN	convoy length
10	CLEHEI	clearance height
11	VESHEI	vessel air draught
12	AVALEN	available length

Rank	Value	Meaning (EN)
13	CLEWID	clearance width
14	AVADEP	available depth
15	LEADEP	least depth sounded
16	DELAY	delay
17	ALTER	alternate traffic direction
18	TURNIN	no turning
19	PASSIN	no passing
20	OVRTAK	no overtaking
21	NOBERT	no berthing
22	NOMOOR	no mooring
23	ANCHOR	no anchoring
24	SPEED	speed limit
25	WAVWAS	no wash of waves
26	NOSHORE	not allowed to go ashore
27	MINPWR	minimum power
28	CAUTIO	special caution
29	NOLIM	no limitation

6.5   Handling of limitation period

- Limitations with the same limitation periods should be grouped/listed together/combined for display to keep it reader-friendly.
- NtS editor tools should provide a function for editors to avoid re-typing of limitation periods.
- All limitations have to include a limitation period with an interval code in order to allow proper calculations within voyage planning applications. To ease the work of NtS editors the following functions may be implemented:
    - The NtS editor tool may provide a function to copy already entered limitations to avoid re-typing of the limitation period by the NtS editor.
    - The NtS editor tools may provide a function to select more than one limitation code for a specific limitation period and automatically create the required limitation sections based on the information entered by the NtS editor.
- 'Monday to Friday except public holidays': The value 'holidays' is very difficult for voyage planning applications. A list of holidays for each country is needed for proper calculation. If no such list is available the respective limitations will be assigned to the public holidays nevertheless.
- 'with the exception of: must not be used; Interrupted intervals have to be given as separate limitation periods within the same limitation, therefore this code shall not be displayed/available to notice editors.

- Logic and display of information applicable in case of interval code 'continuous':

  <date_start>2015-04-01+01</date_start>

  <date_end>2015-06-30+02</date_end>

  <time_start>06:00:00</time_start>

  <time_end>10:00:00</time_end>

  <interval_code>CON</nterval_code>

  If the interval_code is continuous the start_time belongs to the start_date and the end_time belongs to the end_date e.g. from 1 April 06:00 to 30 June 10:00

- Logic and display of information applicable in case of any other interval code than 'continuous':

  <date_start>2015-04-01+01</date_start>

  <date_end>2015-06-30+02</date_end>

  <time_start>06:00:00</time_start>

  <<time_end>10:00:00</time_end>

  <interval_code>WRK</interval_code>

  If the interval_code has another value the start_time and end_time belongs to this interval_code e.g. from 1 April to 30 June Monday to Friday from 06:00 to 10:00

- The limitation time end always has to be filled in the last version of a message.

7.   General implementation rules

      The following is to be considered:

- The table 'GUI_labels' provided in the NtS Reference Tables shall be considered when building NtS applications (search masks, e-mail subscription form, display of messages).
- The date_end cannot be before date_start.
- Codes that have been disabled (are not to be used any more) via NtS change requests (see comments in the NtS XSD) shall not be displayed to NtS editors upon creation of new messages. The codes are still included in the NtS XSD enumerations for backwards compatibility.

7.1   Filling of the 'mmber_section'

      Every number (Organisation/Year/Number/Serial) has to be unique per message type. That means that messages of different types can have the same NtS Number.

      For users the message numbers are only relevant for FTM and ICEM, for all other message types display of the message number can be skipped depending on national requirements.

      To users the message number shall be displayed in the following format 'Message Type/Country/Organisation/Year/ Number/Serial' (it can be shortened depending on applied filters if no information gets lost).

7.2   Filling of elements from', 'originator', 'organisation' and 'source'

      The element 'from' in the identification section is filled with the name of the national system that provides the message (e.g. ELWIS, DoRIS, SLOVRIS, FLARIS).

The element 'originator' is the organisation which enters the messages into the national systems.

The element 'source' is the authority for which the FTM are published.

The element 'organisation' within the nts_number section is the name of the organisation assigning the nts_number (NtS Provider).

7.3   Omission of elements

Elements that would contain only standard or default values shall be omitted if they are conditional, they lead to message overhead with no added value.

Following elements are concerned:
-     Target Group: target_group_code ALL with direction_code ALL (if there are no other specific target groups within the message),
-     position_code: AL,
-     reason code: OTHER.

7.4   Automatic filling of date_issue FTM and ICEM

For FTM and ICEM the value of date_issue element is the actual date and time of publishing. In case of updated messages date_issue is the date and time when the update was published.

WRM and WERM

For WRM and WERM the value of date_issue element is the date and time of the processing request, because there can be several measurements with different issuing time stamps within one W(E)RM message.

7.5   Handling of time zone information in NtS messages

Date and time shall always be provided in local time including time zone information within the NtS XML messages.

The only exceptions from this provision are the 'time_start' and the 'time_end' within the 'limitation_period' section. This is because in the limitation section an interval can be applied. If date start and date end have different time regimes (e.g. CEST and CET) this would result in a change of the time zone information within this interval. This change cannot be expressed via a single limitation period. Instead of creating different limitation periods for each time change only a single limitation period without time zone information is used to reduce overhead in message processing and transmission.

7.6   Handling of Seconds in NtS messages

As a general rule seconds have to be provided in (date)/time fields but shall not be displayed to NtS users. Minutes are sufficient for NtS granularity.

7.7   Format of decimals in NtS messages

Decimals in numeric fields are indicated with a . (period). No thousand separators are used.

The number of decimals used for values shall be limited to a feasible amount to ensure user-friendly display.

7.8   Units to be used in NtS messages

Only cm, m³/s, h, km/h and kW, m/s (wind), mm/h (rain) and degree Celsius are allowed to be used as units within NtS messages, applications may convert the units for user friendliness.
In case the input units differ from the standardised units the entered values have to be converted by the application accordingly.

7.9   Rules for the elements 'name', 'position_code' and 'type_code'

The element 'name' shall be prefilled automatically from the RIS Index reference data 'national object name' (NtS editors might amend the prefilled name if this is a national requirement). Naming conventions for object names are included in the RIS Index Encoding Guide version 2.0 or higher. Examples for proper object names are also given in the NtS Encoding Guide for editors.

The type code is added to the object by the NtS application in front of the object name.

The position of objects is encoded via position code and added to the object by the NtS application out of the RIS Index. Editors may change prefilled type and position codes. An object position code shall not be provided for geo_objects in the fairway_section.

A full object name is composed of its position code, type code and name.

To ease the work of NtS editors the following mapping may be implemented in NtS editor tools supporting editors in finding / selecting the proper objects based on the RIS Index function_code or the NtS type_code:

Table 1

Matching 'RIS Index fUnction_code' — 'NtS type_code'

Function Code	Function Code Meaning	Type Code	Type Code Meaning
—	—		
BUAARE	E.1.1 Built-Up Areas		to be selected by editor
BUISGL	E.1.2 Building of Navigational Significance		to be selected by editor
brgare	G.1.1 - G.1.6 Bridge Area [C_AGGR()]	BRI	bridge
bridge_5	G.1.1 Bascule Bridge	BRO	bridge opening
bridge_1	G.1.2 Bridges with Bridge Arches	BRO	bridge opening
bridge_1	G.1.3 Fixed Bridge	BRO	bridge opening
bridge_4	G.1.4 Lift Bridge	BRO	bridge opening

Function Code	Function Code Meaning	Type Code	Type Code Meaning
bridge_12	G.1.5 Suspension Bridge	BRO	bridge opening
bridge_3	G.1.6 Swing Bridge	BRO	bridge opening
cblohd	G.1.8 Overhead Cable	CAB	cable overhead
pipohd	G.1.9 Overhead Pipe	PPO	pipeline overhead
bridge_7	G.1.12 Drawbridge	BRO	bridge opening
bunsta	G.3.2 Bunker / Fuelling Station	BUS	Bunker / Fuelling Station
cranes	G.3.4 Crane		to be selected by editor
hrbare	G.3.9 Harbour Area	HAR	harbour
hrbbsn	G.3.10 Harbour Basin	HAR	harbour
ponton	G.3.11 Landing Stage, Pontoon		to be selected by editor
morfac	G.3.12 Mooring Facility	MOO	mooring facility
hulkes	G.3.14 Permanently Moored Vessel or Facility		to be selected by editor
prtare	G.3.15 Port Area	HAR	harbour
refdmp	G.3.17 Refuse Dump	REF	refuse dump
termnl	G.3.19 Terminal	TER	terminal
trm01	G.3.19 RORO-terminal	TER	terminal
trm03	G.3.19 Ferry-terminal	TER	terminal
trm07	G.3.19 Tanker-Terminal	TER	terminal
trm08	G.3.19 Passenger Terminal	TER	terminal
trm10	G.3.19 Container Terminal	TER	terminal
trm11	G.3.19 Bulk Terminal	TER	terminal
vehtrf	G.3.20 Vehicle Transfer Location	BER	berth
lokbsn	G.4.3 Lock Basin	LKB	lock basin
lkbspt	G.4.4 Lock Basin Part	LKB	lock basin
lokare	G.4.3 / G.4.4 Lock Area [C_AGGR()]	LCK	lock
excnst	G.4.8 Exceptional Navigational Structure	SLI	ship lift
		TUN	tunnel
		CBR	canal bridge
gatcon	G.4.9 Opening Barrage	BAR	weir
		FLO	flood gate
wtwgag	I.3.4 Waterway Gauge	GAU	tide gauge
FERYRT_2	L.2.1 Cable Ferry	FER	ferry
FERYRT_1	L.2.2. Free Moving Ferry	FER	ferry
feryrt_4	L.2.3. Swinging Wire Ferry	FER	ferry

Function Code	Function Code Meaning	Type Code	Type Code Meaning
dismar	L.3.2 Distance Mark along Waterway Axis	RIV	river
achare	M.1.1 Anchorage Area	ANC	anchoring area
achbrt	M.1.2 Anchorage Berth	BER	berth
berths_3	M.1.3 Berth / Fleeting Areas	BER	berth
berths_1	M.1.4 Transhipment Berth	BER	berth
trnbsn	M.4.5 Turning Basin	TUR	turning basin
		CAN	canal
		FWY	fairway
rdocal	Q.2.1 Radio Calling-In Point (notification point)	REP	reporting point
chkpnt	R.1.1 Check Point	BCO	border control
sistat_8	R.2.1 Traffic Sistat — Bridge Passage	SIG	signal station
sistat_6	R.2.2 Traffic Sistat — Lock	SIG	signal station
sistat_10	R.2.3 Traffic Sistat — Oncoming Traffic Indicator	SIG	signal station
sistat_2	R.2.4 Traffic Sitat — Port Entry and Departure	SIG	signal station
pas	Passage Points		to be selected by editor
riscen	RIS centre	VTC	vessel traffic centre
specon	Special Construction		to be selected by editor
trafp	Traffic Points (first reporting points)	REP	reporting point
junction	Waterway node / end of waterway / Junction		to be selected by editor
waypt	Waypoint		to be selected by editor

Legend

green	Direct match (1:1 relation)
yellow	matching example, other Type Codes possible (1:n relation)
blue	no direct match / to be selected by editor

7.10   Rules for the element fairway_name'

To avoid application logic / necessity of proper reference data at the receiving system (software displaying the notice to the user) the optional element 'fairway_name' shall always be included in the 'geo_object' and automatically filled by the NtS application with the 'Waterway name' from the RIS Index. NtS editors shall not alter the content of the element fairway_name.

7.11 Clarifications for translations in the spreadsheet 'reference_code'

The following definition shall be used for reference_code values provided in the NtS Reference Tables:

- NAP: In the Netherlands the abbreviation NAP is used and understood, NAP is not translated
- KP: 'channel level' shall be translated thus provided in national language
- FZP: only the abbreviation 'FZP' shall be used (nowadays hardly used anymore)
- ADR: 'Adriatic Sea' shall be translated thus provided in national language
- TAW/DNG: 'Tweede algemene waterpassing' (Dutch) — 'Deuxième Nivellement Général' (French) is the reference height used in Belgium to express height measurements. 0 is the average sea water level at low water in Oostende
  - Dutch: TAW
  - French: DNG
  - All other Languages: TAW/DNG
- LDC: 'low navigable water level Danube Commission' shall be translated thus provided in national language
- HDC: 'high navigable water level Danube Commission' shall be translated thus provided in national language
- ETRS: 'European Terrestrial Reference System 1989' the abbreviation 'ETRS89' is used in all languages.

7.12 Recommendation for the element 'coordinate'

Although the element coordinate within the geo object section is conditional, the geo coordinates shall be given in WGS84 in format [d]d mm.mmm[m] N (latitude) and [d][d]d mm.mmm[m] E (longitude). This is to refer the NtS messages geographically.

7.13 Handling of target groups

The target group section consists of target group code and direction code. If both have the value ALL the whole section shall be omitted if there are no other specific target groups within the message. If just one of these two is given the other must be filled with the default value ALL because both elements are mandatory.

Further information concerning target groups can be found in the NtS Encoding Guide for editors.

7.14 Display of valid messages at a given time

The validity_period shall be used by applications to select the messages, which are to be displayed to users for a requested time.

If subject_code is INFSER (Info service) the validity period is used to specify the time the Info service Message is displayed to the users, not for the period of validity of the provided information (e.g. 1 month).

7.15   Optional functions to increase user friendliness of NtS editor tools

The following functions may be offered to NtS editors depending on national requirements:

- NtS applications may offer NtS editors to save draft NtS messages (not all mandatory content has to be provided in order to save draft messages)
- Different user roles may apply to different editors (e.g. editors that are allowed to enter/alter notices, publishers that are allowed to publish notices (in addition to editing)

8.   NtS XML Message Structure

The NtS XML Message Structure and the content and purpose of data elements are defined and further explained inAnnex 17: NtS XML Schema Definition (XSD).

9.   NtS Web Service

9.1   Objective

The NtS Expert Group identified the web service technology as an appropriate means to provide the Notices to Skippers.

(9.1) constitutes the specification of the web service for the provision of the Notices to Skippers, short NtS Web Service. Particular emphasis was placed on the use of well-established international standards.

One goal of the conceptual design was to ensure a good balance between flexibility and robustness of the resulting web service. The filter parameters provided in the requests are essentially the criteria specified in the NtS standard (waterway section with optional river km, time of validity, date of publication of the notice). This seems sufficiently expressive considering the use cases of the web service and at the same time limits the complexity of the implementation.

The core result is a contract for the web service, in which the requests and responses are specified. The consumers of the web service can rely on this contract and the providers have to comply with it. This contract is specified using the international standard WSDL.

Every participating Member State shall implement one or more web services for the different message types of the NtS (FTM, WRM, ICEM, WERM) and provide them via the internet ('NtS Message Service').

The technical details of the implementation of the NtS WS, e.g. choice of appropriate data pools, applications and platforms, are not in the scope of this specification and are in the responsibility of each individual participating Member State.

In order to define a secure communication one has to consider various security aspects and protection objectives. Depending on the circumstances not all of these aspects have to be considered. The priority of the various security aspects and the degree of their fulfilment can vary. Also the feasibility of a certain measure can be limited by the capabilities of the technical implementation. In the context of NtS all information are public. So there is no need to secure the NtS data themselves in terms of data protection. Therefore every provider has to decide on its own in how far this aspect will be implemented in its service.

9.2   Basic Principles and constraints

9.2.1   Web standards

The NtS Web Service has to comply with the WS-I Basic Profile 1.1. This profile 'provides interoperability guidance for a core set of non-proprietary web services specifications, such as SOAP, WSDL and UDDI'[1]. The most relevant standards herein are

- XML Schema Definition (XSD),
- Simple Object Access Protocol (SOAP),
- Web Services Description Language (WSDL), and
- Universal Description, Discovery and Integration (UDDI).

The response message of the NtS WS is an NtS message which is defined in XML Schema Definition (XSD) in Annex 17.

SOAP   is an application protocol for data transmission among IT-Systems and is standardised by the World Wide Web Consortiums (W3C).

The specific elements for the NtS Web Service are defined inline in the corresponding WSDL specifications in Annex 18. The schema of the NtS standard (XSD) is included with an import statement.

UDDI   (Universal Description, Discovery and Integration) is noted here as a central, possibly international registry for web services, where the NtS Web Service could be registered. In this registry potential consumers of the web service could search and find the service. But since the potential providers of the NtS Web Service are limited by the participating Member States and the WSDL specification is an integral part of the standard, the need for an independent registration of the NtS Web Service is not apparent.

9.2.2   Interaction model and encoding method for NtS WS

The encoding method Document-literal wrapped is used for the NtS Web Service, because it allows for validation against an XML schema and the operation names defined in the WSDL specification are used directly as XML tag names in the SOAP messages.

---

[1]   Description cited from the WS-I Website: http://www.ws-i.org

9.3   General specifications and recommendations

9.3.1 Specification: Version information

The version information of the NtS Web Service consists of two sections:
-    version of the web service itself,
-    version of the NtS schema used by the web service.

The section of the web service itself consists of two parts:
-    major version of the web service,
-    minor version of the web service.

The major version is given as a positive integer denoting the major version of the web service.

The minor version is given as a non-negative integer denoting the minor version of the web service within the major version.

The section of the NtS schema contains the version of the NtS schema as defined by the NtS Expert Group.

Hence, the version of the NtS Web Service specified here is 2.0.4.0, where 2.0 is the version of the web service itself and 4.0 is the version of the NtS schema used.

Explicit version information is not necessary in the requests or responses of the NtS Web Service. There are only a few versions of the services expected to be online at the same time. Different versions shall be provided with different URLs. Hence, each instance of an NtS Web Service implementation shall support one specific version of the NtS Web Service.

9.3.2 Specification: Structure of namespaces

The namespaces in the NtS Web Service are based on the web domain of the RIS Expert Groups, http://www.ris.eu/

The namespaces contain a particle indicating the corresponding service and version information. Hence, the service specified here uses the following namespace:

NtS Message Service: http://www.ris.eu/nts.ms/2.0.4.0

9.3.3 Recommendation: Use of namespaces

For higher transparency of XML documents it is recommended to define namespaces in the outmost suitable element in the schemas as well as the instance documents and not to use local namespace definitions in nested elements.

9.3.4 Recommendation: Use of namespace prefixes

Requests and responses in the NtS Web Service shall use XML elements in qualified form, i.e. with an explicit namespace prefix, and XML attributes in unqualified form, i.e. without a namespace prefix.

It is recommended to use intuitive namespace prefixes like 'nts' for better human readability.

9.3.5 Specification: Use of ISRS Location Codes

The ISRS Location Code is explained in (2) of the NtS Encoding Guide for application developers as well as the RIS Index Encoding Guide.

Querying an NtS Web Service, the client can reference various objects, e.g. fairway sections, gauges or locks. If the corresponding parameters, the id elements, are used, they must contain ISRS Location Codes. These parameters are typically given in id elements, each containing one or two ids.

When using these parameters, the following general conventions have to be observed:
- ISRS Location Codes have to be submitted as full-length 20-character codes, i.e. without truncating trailing zeros,
- If two ids are used within an id element, both ISRS Location Codes have to refer to the same waterway. This means, that the codes include some identical digits located in the fairway_section part of the ISRS Location Code. The fairway section code together with the fairway hectometre defines a waterway stretch provided as pair of id elements.

For the provision of waterway stretches (id element pairs within the fairway_section geo_object) in NtS messages, the following has to be considered with respect to the ISRS Location Codes:
- digits 1 to 2 (Country code):
    - have to be identical within the id pair, but
    - different country codes may be defined within one id pair in case neighbouring countries are using the same fairway section code for a specific waterway and the same system for defining the hectometres,
- digits 3 to 5 (UN Location code):
    - are not relevant, may contain different content within the id pair,
- digits 6 to 10 (Fairway section code):
    - have to be identical within the id pair, but
    - [exception]: in case of using the Belgian ISRS codes within NtS WS, one should use only digits 6 to 8 to identify the fairway section, because NtS messages will be published across different sections within one fairway,
- digits 11 to 15 (Object Reference Code).
    - are not relevant, may contain different content within the id pair,

- digits 16 to 20 (Fairway Hectometre):
  - consist of five numerical digits defining the hectometre thus will usually contain different content within the id pair. Example: '00235' for fairway km 23,5; '00001' for fairway km 0,1,
  - [exception]: in case of the Netherlands there is not always a direct connection between the Fairway hectometre and the physical kilometre of the fairway due to the definition of the start of the fairway stretch in the network model and in the real world, in such cases the Object Reference Code for objects of the type 'dismar' starts with Kxxxx (xxxx includes the physical kilometre, e.g. NLSVG00130K000300191 (km 3)). But for other types of objects there is no direct relation to the physical fairway km in the ISRS codes, e.g. the bridge of Sas van Gent on the same fairway at km 2,5 has the ISRS code NLSVG001300521600186. For the Kanaal Gent-Terneuzen the physical km 0,0 starts at the border of Belgium and the Netherlands and the Fairway Hectometre 0,0 starts at the beginning of the canal in Gent.

In case a message touches more than one waterway or fairway sections all fairway sections have to be defined by their begin- and end-point in separate 'fairway_section' XML elements.

For some countries/regions it is required to build filter functionality. For example if ISRS Location Code (1-2) is BE use ISRS Location Code (6-8) as the ID for linear referencing with the fairway hectometre (ISRS Location Code 16-20). Examples for fairway stretches (valid id element pairs within the fairway_section) that include above defined exceptions:

- The two NL ISRS Location Codes are a valid definition of a waterway stretch (showing NL exception with respect to the kilometre of the fairway): NLSVG00130K000300191 (km 3,0 at Sas van Gent on the Kanaal Gent- Terneuzen) — NLWDP00130K000400200 (km 4,0 at Westdorpe on the Kanaal Gent-Terneuzen),
- The two BE ISRS Location Codes are a valid definition of a waterway stretch (showing BE exception with respect to the fairway section code ('020' Albertkanaal)): BEGNK02016L010100414 (lock of Genk located at km 41,4 on the Albert Canal) — BEOSH02033L010500772 (lock of Ham located at km 77,2 on the Albert Canal).

The following figure shows counter-examples of ISRS Location Code usage for each of the general conventions (no exceptions to the general conventions apply to SK waterway stretches):

```
<ns : ids>
        <ns : id>SKXXX00001</ns : id>
<ns : ids />

<ns : ids>
        <ns:id>SKXXX000010000000110</ns : id>
        <ns:id>SKXXX000200000001508</ns : id>
</ns : ids>
```

Invalid ISRS Location Code queries

General remark: A service to query valid ISRS Location Codes is not supported by the NtS Web Service. The ISRS Location Codes are provided within the European Reference Data Management System (ERDMS).

The correct usage of ISRS Location Codes in queries and their interpretation is given in the following five cases.

Case 1: No ids element in request

The ids element is an optional part of the request, i.e. a query without any ids elements is allowed:

```
<ns:get_messages_query>
        <ns: message_type>FTM</ns : message_type>
</ns:get_messages_query>
```

Valid query without ids parameter

If no ids element is given, all messages shall be returned (depending, of course, on other filter criteria like validity_period or dates_issue).

Case 2: One id element in request

Each ids element can contain one or two id elements. The case of one id element is shown in the following figure:

```
<ns : get_messages_query>
        <ns : message_type > FTM</ns : message_type >
        <ns : ids>
                <ns:id>DEXXX007010000002407</ns : id>
        </ns : ids>
</ns : get_messages_query>
```

Valid query with one id parameter

If such a query is received, the server shall return all matching messages with a start hectometre < the given value (240,7 in the example) and an end hectometre > this value. The figure below depicts this selection of messages: The position queried lies between the start and end hectometre values of messages 1, 3 and 4, which would be returned. Messages 2, 5 and 6 do not overlap with the query position, so they would not be returned.

If the given ISRS Location Code denotes a singular object, e.g. a gauge or a lock, the web service should return the messages involving this object.
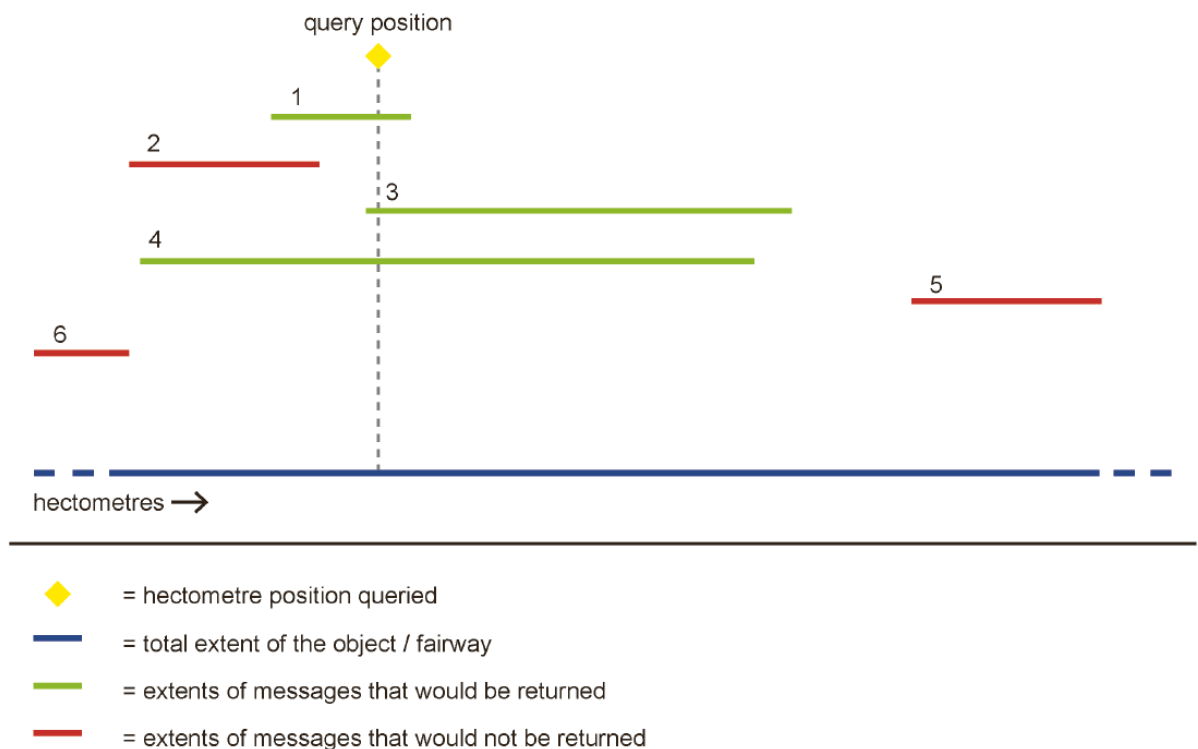
Matching and not matching messages for one id parameter

Case 3: Two id elements in request

Each ids element can contain one or two id elements. The case of two id elements is shown in the following figure:

```
<ns:get_messages_query>
        <ns :message_type>FTM</ns : message_type>
        <ns : ids>
                <ns : id>DEXXX007010000001203</ns : id>
                <ns : id>DEXXX007010000002407</ns : id>
        </ns : ids>
</ns:get_messages_query>
```

Valid query with two id parameters

All hectometre values queried shall be treated as valid, even if the corresponding fairway section has different start or end points. For instance, if the fairway section starts at hectometre 100,0 and ends at hectometre 300,0, a request querying hectometres 20,0 up to 400,0 would be valid. Internally, of course, only the 'real' extent of the fairway section is searched.

Doing so also enables the search for all messages on a fairway without knowing its exact hectometre range (one would send its ISRS Location Code with hectometres set to '00000' or '99999' respectively).

All matching messages intersecting the given hectometre interval shall be returned. The following diagram illustrates this situation:

= hectometre range queried

= total extent of the object / fairway

= extents of messages that would be returned

= extents of messages that would not be returned
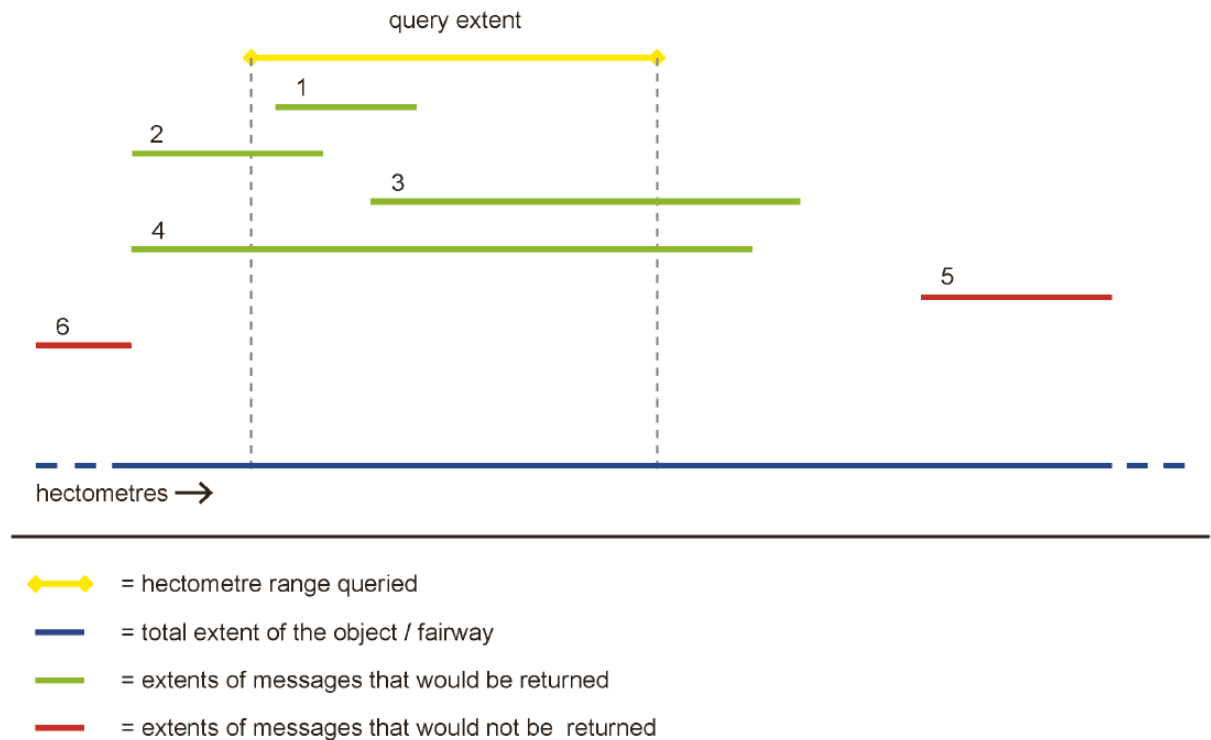
Matching and not matching messages for two id parameters

The figure above shows, how 'intersecting' is defined. While the extents of the messages 1 to 4 overlap with the extent of the queried hectometre range (partially or completely), the extents of messages 5 and 6 do not, therefore messages 1 to 4 will be returned, 5 and 6 will not be returned.

The technical condition for a message to intersect with an interval [A, B] is: The start hectometre of the message is < B and its end hectometre is > A.

Combination: Multiple ids elements in request

```
<ns : get_messages_guery>
        <ns:message_type>ICEM</ns : message_type>
        <ns:ids>
                <ns : id>SKXXX000010000000000</ns : id>
        <ns : ids  />
        <ns : ids>
                <ns : id>SKXXX000050000000110</ns: id>
                <ns : id>SKXXX000050000000150</ns:id>
        </ns : ids>
        <ns : ids>
                <ns : id>SKXXX000020000001105</ns:id>
        <ns:ids />
        <ns : ids>
                <ns : id>SKXXX000050000002200</ns:id>
                <ns : id>SKXXX000050000003000</ns:id>
        </ns: ids>
</ns : get messages query>
```

Valid query with multiple ids elements

The combination of several ids elements in the request leads to a union of the corresponding messages. All the ids elements are treated individually and a message will be returned, if it matches at least one of them. Therefore, the following messages would be returned for the given example:

- All messages for the object with the ISRS Location Code SKXXX0000010000***** with start hectometre =0 and end hectometre > 0 (see Case 2)
- All messages for the object with the ISRS Location Code SKXXX0000500000***** which intersect the hectometre interval [11,0, 15,0] (see Case 3)
- All messages for the object with the ISRS Location Code SKXXX0000200000"*" with start hectometre < 110,5 and end hectometre > 110,5 (see Case 2)
- All messages for the object with the ISRS Location Code SKXXX0000500000***** which intersect the hectometre interval [220,0, 300,0] (see Case 3).

9.4   NtS Message Service (implementation specification)

In (9.4) the implementation specification of the NtS message service is given, deduced from the considerations and choices in (9.1) to (9.3).

The NtS message service provides the four types of messages in the NtS:
1. NtS FTM (fairway and traffic related message)
2. NtS WRM (water related message)
3. NtS ICEM (ice message)
4. NtS WERM (weather related message)

An implementation of the NtS message service can support all message types or just a selection. It is allowed that a participating Member State provides more than one service for a specific message type, that complement each other.

9.4.1   Request

In order to achieve a maximum robustness of the service while keeping the complexity on a low level no additional query language is used for the NtS Web Service. Instead the constructs provided by WSDL itself are applied. The specific operations together with their parameters are specified entirely within the WSDL specification. In the case of the NtS Message Service a single operation is defined.

The subject-specific filter criteria are taken from the NtS standard, but extended concerning multiplicity of the parameters:
- type of message (compulsory; one of 'FTM', 'WRM', 'ICEM', 'WERM'),
- specific waterway sections or parts thereof, or specific objects (optional; described by single ISRS Location Codes and/or pairs of ISRS Location Codes),
- time of validity (optional; start date and end date),
- date of publication of the notice (optional; single dates and/or intervals of dates).

Only the messages matching the given criteria are returned by the service.

Paging mechanism

In order to control the amount of data a paging mechanism is supported. The paging parameter is defined with a complex type containing the following elements:

- offset: serial number of the first returned message (integer > 0),

- limit: max. number of messages (integer > 0),

- total count: flag, if total number of messages shall be returned (Boolean value).

The complex paging parameter is optional, but if it is present, all elements within have to be given. Then, the paging mechanism works in the following way:

The total number of messages will not exceed the value of the parameter limit, with the exception that a value of 0 means 'no limit'. The response skips as many messages as defined in the parameter offset. In order to provide this mechanism, the service has to observe a temporarily stable (but otherwise arbitrary) sequence of the messages, e.g. between two updates of message data on the underlying data set of the web service. This means that two consecutive identical calls must return the same messages in the same order. The parameter total count determines whether the response shall provide the total number of messages matching the subject-specific criteria. Usually it should be sufficient to request this information with the first response, but omit it in all consecutive responses. This should result in a better performance of the web service.

The paging mechanism provides a means to request the messages iteratively in 'pages'. In order for the paging mechanism to work properly, the same subject-specific parameters have to be provided in each call.

9.4.2 Response

In case of a successful request the NtS Web Service response contains the NtS messages that match the request parameters. The NtS messages have to comply with the NtS schema and can be validated against that schema. Since the message type is a compulsory request parameter, each response can contain only NtS messages of the same message type, FTM, WRM, ICEM or WERM respectively.

If the service detects errors while processing the request it can return an arbitrary number of error messages, using the error codes listed in the following subparagraphs.

One response of an NtS Web Service can contain NtS messages and error messages at the same time.

Optional paging information is returned if the request contained paging parameters. In this case the offset and number of contained messages are mandatory, the total count needs only be present if it has been requested.

Please note: It is assumed that the communication between the web service and the user is technically established, i.e. the service receives the request and the user receives the corresponding response. Technical errors, e.g. breakdown of the internet connection or inaccessibility of the web service due to maintenance or crash, are not considered here. Only error situations that happen 'behind' the web service layer from the users point of view are considered here.

Error messages

The error codes for the expected error situations are given below, together with an explanation. Only the error code is contained in the response, which is the usual procedure in the XML schema of the NtS.

Error codes for the NtS message service

Code	Description	Explanation
e010	message type not supported	web service does not support the requested message type[e]
e030	paging parameters inconsistent with messages	parameters for paging mechanism do not fit the available messages, e.g. Offset >= Total Count
e100	syntax error in request	request violates the schema for requests; can be specified in more detail by further elxx-Codes
e110	incorrect message type	given message type is not known
e120	incorrect type-specific parameters	type-specific parameters are erroneous
e130	incorrect paging parameters	given parameters for the paging mechanism are erroneous
e200	operation not known	the requested operation is unknown
e300	data source unavailable	data source of the web service for the NtS data is temporarily unavailable (technical problem)
e310	too many results for request,	server is unable to handle number of results

9.5   Generation of services and clients

If the contract-first approach is consequently observed, i.e. one or more contracts with complete descriptions of the interfaces are given in the form of WSDL documents, an implementation of the service(s) as well as an implementation of a corresponding client can be automatically generated using appropriate software tools. In an ideal situation no manual changes have to be made in the generated source code.

However, in most cases several iterations are necessary until the WSDL specification meets the precise requirements of such a tool. Typically the tool makes individual demands on the use of the WSDL standard in order to work smoothly. As a consequence changes to the WSDL specification may be necessary, although the WSDL specification was a valid specification according to the WSDL standard in the first place. If the WSDL specification of the web service is changed after the service or the client have been generated, a new generation process may be necessary, depending on the changes made.

Glossary

Term	Explanation
ID	Identification
ISRS Location Code	'International Ship Reporting Standard' Location Code
NtS	Notices to Skippers
RIS	River Information Services
SOAP	Simple Object Access Protocol; network protocol typically used for web services
UDDI	Universal Description, Discovery and Integration; Standard for registry services in the context of web services
UN	United Nations
URL	Uniform Resource Locator; location of a network resource typically used for internet addresses
WGS 84	World Geodetic System 1984
WS	Web Service; service that provides its interfaces in the internet and is used by internet communication
WSDL	Web Services Description Language; standard for the specification of web services
WS-I	Web Services Interoperability Organisation; industry consortium with the objective to support interoperability of web services
XML	Extensible Markup Language; meta language for the structured and platform independent representation of data
XSD	XML Schema Definition; standard to specify the structure of XML documents

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STANDARDISED NTS EXTENDED MARKUP LANGUAGE (XML) SCHEMA DEFINITION, REFERRED TO AS XSD, STANDARDISED CODE VALUES AND POSSIBLE FORMATS

No	Tag (Group headers and dosers are boldly printed)	Description	Occ.	Rule
	xmlns:nts="http://www.ris.eu/nts/4.0.4.0"			
	<RIS_Message>	Notice to Skippers		
1s	**<identification>**	**Identification section**	M	1
1.1	<internal_id>xs:string (64)</internal_id>	Internal ID	C	
1.2	<from>xs:string (64)</from>	Sender (System) of the message	M	
1.3	<originator>xs:string (64)</originator>	Originator (initiator) of the information in this message	M	
1.4	<country_code>nts:country_code_enum</country_code>	Country where message is valid	M	
1.5	<language_code>nts:language_code_enum</language_code>	Original language used in the textual info, (contents)	M	
1.6	<district>xs:string (64)</district>	District / Region within the specified country where the message is applicable	C	
1.7	<date_issue>xs:dateTime<date_issue>	Date and time of publication including time zone (yyyy-mm-ddThh:mm:ss+hh:mm)	M	
1e	**</identification>**			
2s	**<ftm>**	**Fairway and traffic related section**	C	1
2.1	<internal_id>xs:string (64)</internal_id>	Internal ID	C	
2.2s	**<nts_number>**	NtS Number	M	
2.2.1	<organisation>xs:string (64)</organisation	Name of the publishing organisation (NtS Provider)	M	
2.2.2	<year>xs:gYear (1900-9999)</year>	Year of first issuing of the notice	M	
2.2.3	<number>xs:integer (0-99999999)</number>	Number of the notice (per year, starting with: 1, 0 shall not be used for published notices)	M	

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No	Tag (Group headers and dosers are boldly printed)	Description	Occ.	Rule
2.2.4	<serial_number>xs:integer (0-99)</serial_number>	Serial number of notice (replacements and withdrawals), original notice: 0	M	
2.2e	</nts_number>			
2.3s	<target_group>	Target group information	C	
2.3.1	<target_group_code>nts:target_group_code_enum</target_group_code>	Target group (vessel type) for this message	M	5
2.3.2	<direction_code>nts:direction_code_enum</direction_code>	Upstream or downstream traffic, or both	M	5
2.3e	</target_group>			
2.4	<subject_code>nts:subject_code_enum</subject_code>	Subject code	M	
2.5s	<validity_period>	Overall period of validity	M	
2.5.1	<date_start>xs:date</date_start>	Start date of validity period including time zone (yyyy-mm-dd+hh:mm)	M	
2.5.2	<date_end>xs:date</date_end>	End date of validity period including time zone (yyyy-mm-dd+hh:mm)	C	
2.5e	</validity_period>			
2.6	<contents>xs:string (500)</contents>	Additional information in local language	C	
2.7	<source>xs:string (64)</source>	Notice source (name of authority)	C	
2.8	<reason_code>nts:reason_code_enum</reason_code>	Reason / justification of notice	C	
2.9s	<communication>	Communication channel information	C	
2.9.1	<reporting_code>nts:reporting_code_enum</reporting_code>	Reporting regime (information or duty to report)	M	5
2.9.2	<communication_code>nts:communication_code_enum</communication_code>	Communication code (telephone, VHF etc.)	M	5
2.9.3	<number>xs:string (128)</number>	Telephone, VHF number (including callsign), e-mail address, URF or teletext	C	
2.9.4	<label>xs:string (256)</label>	Name of the attachment or additional information	C	
2.9.5	<remark>xs:string (1024)</remark>	Additional remarks concerning the communication	C	

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No	Tag (Group headers and dosers are boldly printed)	Description	Occ.	Rule
2.9e	</communication>			
2.10s	<fairway_section>	Fairway section, also available for objects (no 2.11)	C	2
2.10.1s	<geo_object>	Geo information of fairway	M	5
2.10.1.1	<id>nts:isrs_code_type</id>	ISRS Focation Code of the fairway section (2x) Pattern=[A-Z]{2}[A-Z]{3}[A-Z0-9]{5}[A-Z0-9]{5}[0-9]{5}	M	7
2.10.1.2	<name>xs:string (256)</name>	Focal name of the fairway section (f.e.: Rhine between bridge A and bridge B)	M	
2.10.1.3	<type_code>nts:type_code_enum</type_code>	Type of geographical object (default=FWY)	M	
2.10.1.4	<position_code>nts:position_code_enum</position_code>	Describes the position related to the fairway	C	
2.10.1.5s	<coordinate>	Fairway section begin and end coordinates (2x)	C	7
2.10.1.5.1	<lat>xs:string (10-12)</lat>	[d]d mm.mmmjm] N	M	5
2.10.1.5.2	<long> xs:string (10-13)</long>	[d][d]d mm.mmmjm] E	M	5
2.10.1.5e	</coordinate>			
2.10.1.6	<fairway_name>xs:string (2 5 6)</fairway_name>	Waterway name (usefull if no RIS Index is available).	C	
2.10.1e	</geo_object>			
2.10.2s	<limitation>	Fairway section limitations	C	
2.10.2.1s	<limitation_period>	Limitation periods / intervals (All limitations have to include a limitation period with an interval code in order to allow proper calculations within voyage planning applications)	C	
2.10.2.1.1	<date_start>xs:date</date_start>	Start date of limitation period (overall) INCLUDING time zone format=yyyy-mm-dd+hh:mm	M	5
2.10.2.1.2	<date_end> xs:date</date_end>	End date of limitation period INCLUDING time zone format=yyyy-mm-dd+hh:mm	C	
2.10.2.1.3	<time_start>xs:time</time_start>	Start time of limitation period WITHOUT time zone format=hh:mm:ss [whereas ss=00]	C	

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No	Tag (Group headers and dosers are boldly printed)	Description	Occ.	Rule
2.10.2.1.4	\<time_end\> xs:time\</time_end\>	End time of limitation period WITHOUT time zone format=hh:mm:ss [whereas ss=00]	C	
2.10.2.1.5	\<interval_code\>nts:interval_code_enum\</interval_code\>	Interval for limitation (mandatory M(5) but is set to C to be compatible with former XSD version)	C	
2.10.2.1e	\</limitation_period\>			
2.10.2.2	\<limitation_code\>nts:limitation_code_enum\</limitation_code\>	Kind of limitation	M	5
2.10.2.3	\<position_code\>nts:position_code_enum\</position_code\>	Describes the position of the limitation related to the fairway	C	
2.10.2.4	\<value\>xs:float\</value\>	Value of limitation (i.e. max draught)	C	
2.10.2.5	\<unit\>nts:unit_enum\</unit\>	Unit of the value of the limitation	C	
2.10.2.6	\<reference_code\>nts:reference_code_enum\</reference_code\>	Value reference	C	
2.10.2.7	\<indication_code\>nts:indication_code_enum\</indication_code\>	Minimum or maximum or reduced by	C	
2.10.2.8s	\<target_group\>	Target group information		
2.10.2.8.1	\<target_group_cod\> nts:target_group_code_enum \</target_group_code\>	Target group (vessel type) for this limitation	M	5
2.10.2.8.2	\<direction_code\> nts:direction_code_enum\</direction_code\>	Upstream or downstream traffic, or both	M	5
2.10.2.8e	\</target_group\>			
2.10.2e	\</limitation\>			
2.10e	\</fairway_section\>			
2.11s	\<object\>	Object section	C	2
2.11.1s	\<geo_object\>	Geo Information of object	M	5
2.11.1.1	\<id\>nts:isrs_code_type\</id\>	ISRS Location Code of the object (lx) Pattern=[A-Z]{2}[A-Z]{3}[A-Z0-9]{5}[A-Z0-9]{5}[0-9]{5}	M	8
2.11.1.2	\<name\>xs:string (256)\</name\>	Local name of the aggregated object	M	
2.11.1.3	\<type_code\>nts:type_code_enum\</type_code\>	Type of geographical object	M	
2.11.1.4	\<position_code\>nts:position_code_enum\</position_code\>	Describes the position related to the object	C	

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No	Tag (Group headers and dosers are boldly printed)	Description	Occ.	Rule
2.11.1.5s	<coordinate>	Object coordinates (lx)	C	8
2.11.1.5.1	<lat>xs:string (10-12)</lat>	[d]d mm.mmmjm] N	M	5
2.11.1.5.2	<long>xs:string (10-13)</long>	[d][d]d mm.mmmjm] E	M	5
2.11.1.5e	</coordinate>			
2.11.1.6	<fairway_name>xs:string (2 5 6)</fairway_name>	Waterway name (usefull if no RIS Index is available).	C	
2.11.1e	</geo_object>			
2.11.2s	<limitation>	Object limitation section	C	
2.11.2.1s	<limitation_period>	Limitation periods / intervals (All limitations have to include a limitation period with an interval code in order to allow proper calculations within voyage planning applications)	C	
2.11.2.1.1	<date_start>xs:date</date_start>	Start date of limitation period (overall) INCLUDING time zone format=yyyy-mm-dd+hh:mm	M	5
2.11.2.1.2	<date_end>xs:date :/date_end>	End date of limitation period INCLUDING time zone format=yyyy-mm-dd+hh:mm	C	
2.11.2.1.3	<time_start>xs:time</itime_start>	Start time of limitation period WITHOUT time zone format=hh:mm:ss [whereas ss=00]	C	
2.11.2.1.4	<time_end>xs:time</time_end>	End time of limitation period WITHOUT time zone format=hh:mm:ss [whereas ss=00]	C	
2.11.2.1.5	<interval_code>nts:interval_code_enum</interval_code>	Interval for limitation (mandatory M(5) but is set to C to be compatible with former XSD version)	C	
2.11.2.1e	</limitation_period>			
2.11.2.2	<limitation_code>nts:limitation_code_enum</limitation_code>	Kind of limitation	M	5
2.11.2.3	<position_code>nts:position_code_enum</position_code>	Describes the position of the limitation related to the fairway	C	
2.11.2.4	<value>xs:float</value>	Value of limitation (i.e. max draught)	C	
2.11.2.5	<unit>nts:unit_enum</unit>	Unit of the value of the limitation	C	

No	Tag (Group headers and dosers are boldly printed)	Description	Occ.	Rule
2.11.2.6	\<reference_code\>nts:reference_code_enum\</reference_code\>	Value reference	C	
2.11.2.7	\<indication_code\>nts:indication_code_enum\</indication_code\>	Minimum or maximum or reduced by	C	
2.11.2.8s	\<target_group\>	Target group information	C	
2.11.2.8.1	\<target_group_code\>nts:target_group_code_enum \</target_group_code\>	Target group (vessel type) for this limitation	M	5
2.11.2.8.2	\<direction_code\>nts:direction_code_enum\</direction_code\>	Upstream or downstream traffic, or both	M	5
2.11.2.8e	\</target_group\>			
2.11.2e	\</limitation\>			
2.11e	\</object\>			
2e	\</ftm\>			
3s	\<wrm\>	Water related section	C	1
3.1	\<internal_id\>xs:string (64)\</internal_id\>	Internal ID	C	
3.2s	\<nts_number\>	NtS Number	C	
3.2.1	\<organisation\>xs:string (64)\</organisation\>	Name of the publishing organisation (NtS Provider)	M	5
3.2.2	\<year\>xs:gYear (1900-9999)\</year\>	Current year of the notice	M	5
3.2.3	\<number\>xs:integer (0-99999999)\</number\>	Number of the notice (see Developers Guide for WRM-Message Number generation)	M	5
3.2.4	\<serial_number\>xs:integer (0-99)\</serial_number\>	Serial number of the notice (see Developers Guide for WRM-Message Serial Number generation)	M	5
3.2e	\</nts_number\>			
3.3s	\<validity_period\>	Overall period of validity	M	

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No	Tag (Group headers and dosers are boldly printed)	Description	Occ.	Rule
3.3.1	<date_start>xs:date</date_start>	Start date of validity period including time zone (yyyy-mm-dd+hh:mm)	M	
3.3.2	<date_end>xs:date</date_end>	End date of validity period including time zone (yyyy-mm-dd+hh:mm)	C	
3.3e	</validity_period>			
3.4s	</geo_object>	Geo Information of measurement location	M	5
3.4.1	<id>nts:isrs_code_type</id>	ISRS Location Code of the object/fairway (lx or 2x) Pattern=[A-Z]{2}[A-Z]{3}[A-Z0-9]{5}[A-Z0-9]{5}[0-9]{5}	M	9
3.4.2	<name>xs:string (256)</name>	Local name of the object/fairway	M	
3.4.3	<type_code>nts:type_code_enum</type_code>	Type of geographical object/fairway	M	
3.4.4	<position_code>nts:position_code_enum</position_code>	Describes the position related to the object/fairway	C	
3.4.5s	<coordinate>	Object/Lairway coordinates (lx or 2x)	C	9
3.4.5.1	<lat>xs:string (10-12)</lat>	[d]d mm.mmm[m] N	M	5
3.4.5.2	<long>xs:string (10-13)</long>	[d][d]d mm.mmm[m] E	M	5
3.3.5e	</coordinate>			
3.3.6	<fairway_name>xs:string (256)</fairway_name>	Waterway name (usefull if no RIS Index is available).	C	
3.4e	</geo_object>			
3.5	<reference_code>nts:reference_code_enum</reference_code>	Value reference (measurement reference)	C	6
3.6s	<measure>	Measurements (normal or predicted values)	M	5
3.6.1	<predicted>xs:boolean</predicted>	Predicted measurement (1 or true) or real measurement (0 or false)	M	
3.6.2	<measure_code>nts:measure_code_enum</measure_code>	Kind of water related information	M	
3.6.3	<value >xs :float</value >	Measured or predicted value	C	10
3.6.4	<value_min >xs :float </value_min>	Lowest value of confidence interval	C	

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No	Tag (Group headers and dosers are boldly printed)	Description	Occ.	Rule
3.6.5	<value_max>xs:float</value_max>	Highest value of confidence interval	C	
3.6.6	<unit>nts:unit_enum< /unit>	Unit of the water related value	C	
3.6.7	<barrage_code>nts:barrage_code_enum</barrage_code>	Barrage status	C	11
3.6.8	<regime_code>nts:regime_code_enum</regime_code>	Regime applicable	C	12
3.6.9	<measuredate>xs:dateTime</measuredate>	Date and Time of measurement or predicted value including time zone Format=yyyy-mm-ddThh:mm:ss+hh:mm	M	
3.6.10s	<difference>	Difference with comparative value	C	
3.6.10.1	<value_difference>xs:float</value_difference>	Difference with comparative value	M	5
3.6.10.2	<time_difference>xs:duration</time_difference>	Time difference to measuredate of comparative value	M	5
3.6.10e	</difference>			
3.6e	</measure>			
3e	**</wrm>**			
4s	**<icem>**	Ice related section	C	1
4.1	<internal_id>xs:string (64)</internal_id>	Internal ID	C	
4.2s	<nts_number>	NtS Number	M	
4.2.1	<organisation>xs:string (64)</organisation	Name of the publishing organisation (NtS Provider)	M	
4.2.2	<year>xs:gYear (1900-9999)</year>	Current year of the notice	M	
4.2.3	<number>xs:integer (0-99999999)</number>	Number of the notice (per year, starting with: 1, 0 shall not be used for published notices)	M	
4.2.4	<serial_number>xs:integer (0-99)</serial_number>	Serial number of notice, original notice: 0	M	
4.2e	</nts_number>			
4.3s	<validity_period>	Overall period of validity	M	

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No	Tag (Group headers and dosers are boldly printed)	Description	Occ.	Rule
4.3.1	<date_start>xs:date</date_start>	Start date of validity period including time zone (yyyy-mm-dd+hh:mm)	M	
4.3.2	<date_end>xs:date</date_end>	End date of validity period including time zone (yyyy-mm-dd+hh:mm)	C	
4.3e	</validity_period>			
4.4s	<fairway_section>	Fairway section — the limitation inside the fairway section cannot be used in the ICEM	M	5
4.4.1s	<geo_object>	Geo Information of fairway	M	5
4.4.1.1	<id>nts:isrs_code_type</id>	ISRS Location Code of the fairway section (2x) Pattern=[A-Z]{2}[A-Z]{3}[A-Z0-9]{5}[A-Z0-9]{5}[0-9]{5}	M	
4.4.1.2	<name>xs:string (256)</name>	Local Name of the fairway section (f.e.: Rhine between bridge A and bridge B)	M	
4.4.1.3	<type_code>nts:type_code_enum</type_code>	Type of geographical object (default=FWY)	M	
4.4.1.4	<position_code>nts:position_code_enum</position_code>	Describes the position related to the fairway	C	
4.4.1.5s	<coordinate>	Fairway section begin and end coordinates (2x)	C	7
4.4.1.5.1	<lat>xs:string (10-12)</ lat>	[d]d mm.mmm[m] N	M	5
4.4.1.5.2	<long> xs:string (10-13)</long>	[d][d]d mm.mmm[m] E	M	5
4.4.1.5e	</coordinate>			
4.4.1.6	<fairway_name>xs:string (2 5 6) </fairway_name>	Waterway name (usefull if no RIS Index is available).	C	
4.4.1e	</geo_object>			
4.4e	</fairway_section>			
4.5s	<ice_condition>	Ice conditions	M	
4.5.1	<measuredate>xs:dateTime</measuredate>	Date and Time of measurement or prediction including time zone Format=yyyy-mm-ddThh:mm:ss+hh:mm	M	

No	Tag (Group headers and dosers are boldly printed)	Description	Occ.	Rule
4.5.2	\<ice_condition_code\>nts:ice_condition_code_enum\</ice_condition_code\>	Condition code	C	4
4.5.3	\<ice_accessibility_code\>nts:ice_accessibility_code_enum\</ice_accessibility_code\>	Accessibility code	C	4
4.5.4	\<ice_classification_code\>nts:ice_classification_code_enum\</ice_classification_code\>	Classification code	C	4
4.5.5	\<ice_situation_code\>nts:ice_situation_code_enum\</ice_situation_code\>	Situation code	C	4
4.5e	\</ice_condition\>			
4e	**\</icem\>**			
5s	**\<werm\>**	Weather related section	C	1
5.1	\<internal_id\>xs:string (64)\</internal_id\>	Internal ID	C	
5.2s	\<nts_number\>	NtS Number	C	
5.2.1	\<organisation\>xs:string (64)\</organisation\>	Name of the publishing organisation (NtS Provider)	M	5
5.2.2	\<year\>xs:gYear (1900-9999)\</year\>	Year of issuing of the notice	M	5
5.2.3	\<number\>xs:integer (0-99999999)\</number\>	Number of the notice (per year, starting with: 1, 0 shall not be used for published notices)	M	5
5.2.4	\<serial_number\>xs:integer (0-99)\</serial_number\>	Serial number of notice, original notice: 0	M	5
5.2e	\</nts_number\>			
5.3s	\<validity_period\>	Overall period of validity	M	13
5.3.1	\<date_start\>xs:date\</date_start\>	Start date of validity period including time zone (yyyy-mm-dd+hh:mm)	M	
5.3.2	\<date_end\>xs:date\</date_end\>	End date of validity period including time zone (yyyy-mm-dd+hh:mm)	C	
5.3e	\</validity_period\>			

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Annex 17
Standardised NtS extended markup language (XML) schema definition, referred to as XSD, standardised code values and possible formats

No	Tag (Group headers and dosers are boldly printed)	Description	Occ.	Rule
5.4s	\<fairway_section\>	Fairway section	M	
5.4.1s	‹geo_object\>	Geo Information of fairway	M	
5.4.1.1	\<id\>nts:isrs_code_type\</id\>	ISRS Location Code of the fairway section (2x) Pattern=[A-Z]{2}[A-Z]{3}[A-Z0-9]{5}[A-Z0-9]{5}[0-9]{5}	M	7
5.4.1.2	\<name\>xs:string (256)\</name\>	Local name of the fairway section (f.e.: Rhine between bridge A and bridge B)	M	
5.4.1.3	‹type_code\>nts:type_code_enum\</type_code\>	Type of geographical object (default=FWY)	M	
5.4.1.4	\<position_code\>nts:position_code_enum\</position_code\>	Describes the position related to the fairway	C	
5.4.1.5s	\<coordinate\>	Fairway section begin and end coordinates (2x)	C	7
5.4.1.5.1	\<lat\>xs:string (10-12)\</lat\>	[d]d mm.mmm[m] N	M	5
5.4.1.5.2	\<long\>xs:string (10-13)\</long\>	[d][d]d mm.mmm[m] E	M	5
5.4.1.5e	\</coordinate\>			
5.4.1.6	\<fairway_name\>xs:string (256)\</fairway_name\>	Watenvay name (usefull if no RIS Index is available).	C	
5.4.1e	\</geo_object\>			
5.4e	\</fairway_section\>			
5.5s	\<weather_report\>	Weather Report (lx or 2x)	M	
5.5.1	\<measuredate\>xs:dateTime\</measuredate\>	Date and Time of measurement or predicted value including time zone Format=yyyy-mm-ddThh:mm:ss+hh:mm	C	
5.5.2	\<forecast\>xs:boolean\</forecast\>	Forecast (true or 1) OR Actual report (false or 0)	M	
5.5.3	\<weather_class_code\>nts:weather_class_code_enum\</weather_class_code\>	Classification of weather report (O..Nx)	M	3
5.5.4s	\<weather_item\>	Weather items (O..Nx)	C	
5.5.4.1	\<weather_item_code\>nts:weather_item_code_enum\</weather_item_code\>	Weather item type (Wind, Wave etc)	M	5
5.5.4.2	\< value_min\>xs :float\</value_min \>	Actual or Minimum value	M	5

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Standardised NtS extended markup language (XML) schema definition, referred to as XSD, standardised code values and possible formats

No	Tag (Group headers and dosers are boldly printed)	Description	Occ.	Rule
5.5.4.3	<value_max>xs:float</value_max>	Maximum value	C	
5.5.4.4	<value_gusts >xs :float</value_gusts >	Gusts value (Wind)	C	
5.5.4.5	<unit>nts:unit_enum</unit>	Unit of the value	C	
5.5.4.6	<weather_category_code>nts:weather_category_code_enum</weather_category_code>	Classification of wind report	C	
5.5.47	<direction_code_min>nts:weather_direction_code_enum</direction_code_min>	Direction of wind or wave	C	
5.5.4.8	<direction_code_max>nts:weather_direction_code_enum</direction_code_max>	Direction of wind or wave	C	
5.5.4e	</weather_item>			
5.5e	</weather_report>			
5e	**</werm>**			
	Legend for Occurrence (Oce.): Mandatory (M) Conditional (C)			

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Standardised NtS extended markup language (XML) schema definition, referred to as XSD, standardised code values and possible formats

Rules applicable to table "NtS XSD V.4.0.4.0":

1.	In one <RIS Message> at least two sections have to be filled in: the <identification> section (1), one of the following sections: <ftm> (fairway and traffic related messages) (2), <wrm> (water related message) (3), <icem> (ice message) (4), <werm> (weather related message) (5).
2.	At least one of the Group 2.10 (<fairway section>) or Group 2.11 (<object>) has to be given within <ftm>.
3.	A combinations of <weather_class_code> tags (5.5.3) in section <weather_report> can be given.
4.	In group 4.5 (<ice condition>) at least one of the conditional elements 4.5.2 to 4.5.5 have to be given.
5.	If a conditional group contains mandatory subgroups or elements these will only be mandatory if the group on the higher level is applied.
6.	Element <reference_code> is only mandatory for "WAL" (water level) in <wrm> (3.5).
7.	A <geo_object> in <fairway section> (<ftm> 2.10.1 , <icem> 4.4.1, <werm> 5.4.1) is defined by the begin and end ISRS Location Codes and coordinates (2 ISRS Location Codes and 2 sets of coordinates).
8.	A <geo_object> in <object> section (<ftm> 2.11.1) is defined by the ISRS Location Code and coordinates of its center point (1 ISRS Location Code 1 set of coordinates).
9.	A <geo_object> in <wrm> has 2 ISRS Location Codes and 2 sets of coordinates in case the <type_code> (3.4.3) is "FWY", "RIV" or "CAN", otherwise only 1 ISRS Location Code and 1 set of coordinates has to be given.
10.	If there is a measurement the elements <value> (3.6.3) or <value_min> (3.6.4) and <value_max> (3.6.5) is/are mandatory if <measure_code> (3.6.2) is either "DIS", "VER", "LSD" or "WAL". In case there is no measurement (and a message should be sent anyhow) the value elements shall be omitted.
11.	Element <barrage_code> (3.6.7) is mandatory if <measure code> (3.6.2) is "BAR".
12.	Element <regime_code> (3.6.8) is mandatory if <measure code> (3.6.2) is "REG".
13.	Predictions for more than one <validity_period> (5.3) require individual <werm> messages.
14.	In case of <icem> (4.4.2) and <werm> a <limitation> section is not applicable. Limitations shall be provided via FTM notices.

```xml
<?xml version="1.0" encoding="UTF-8"?>
<xs:schema xmlns:nts="http://www.ris.eu/nts/4.0.4.0"
xmlns:xs="http://www.w3.org/2001/XMLSchema"
targetNamespace=">http://www.ris.eu/nts/4.0.4.0" elementFormDefault="qualified"
attributeFormDefault="unqualified" version="4.0.4.0">
<!--

============================================

 = definition of main element RIS_Message =

= and corresponding type RIS_Message_Type =

============================================

-->
<xs:element name="RIS_Message" type="nts:RIS_Message_Type">
    <xs:annotation>
        <xs:documentation>River Information Service
    Message</xs:documentation> </xs:annotation>
</xs:element>
<xs:complexType name="RIS_Message_Type">
    <xs:sequence>
        <xs:element name="identification" type="nts:identification_type">
            <xs:annotation>
                <xs:documentation>Identification section</xs:documentation>
            </xs:annotation>
        </xs:element>
        <xs:choice>
            <xs:annotation>
                <xs:documentation>One msg contains one of these
            sections</xs:documentation> </xs:annotation>
            <xs:element name="ftm" type="nts:ftm_type" maxOccurs="unbounded">
                <xs:annotation>
                    <xs:documentation>Fairway and traffic related
                section</xs:documentation> </xs:annotation>
            </xs:element>
            <xs:element name="wrm" type="nts:wrm_type"
                maxOccurs="unbounded"> <xs:annotation>
                    <xs:documentation>Water related section</xs:documentation>
                </xs:annotation>
            </xs:element>
            <xs:element name="icem" type="nts:icem_type"
                maxOccurs="unbounded"> <xs:annotation>
                    <xs:documentation>Ice related section</xs:documentation>
                </xs:annotation>
            </xs:element>
            <xs:element name="werm" type="nts:werm_type"
                maxOccurs="unbounded"> <xs:annotation>
                    <xs:documentation>Weather related section</xs:documentation>
                </xs:annotation>
```

```
                </xs:element>
            </xs:choice>
        </xs:sequence>
    </xs:complexType>

 <!--
   ===============================================
   = definition of identification_type, =
   = used in definition of RIS_Message_Type =
   ===============================================
   -->
   <xs:complexType name="identification_type">
      <xs:sequence>
          <xs:element name="internal_id" type="nts:internal_id_type" minOccurs="0">
              <xs:annotation>
                  <xs:documentation>Internal ID</xs:documentation>
              </xs:annotation>
          </xs:element>
          <xs:element name="from">
              <xs:annotation>
                  <xs:documentation>Sender (System) of the message</xs:documentation>
              </xs:annotation>
              <xs:simpleType>
                  <xs:restriction base="xs:string">
                      <xs:maxLength value="64"/>
                  </xs:restriction>
              </xs:simpleType>
          </xs:element>
          <xs:element name="originator">
              <xs:annotation>
                  <xs:documentation>Originator (initiator) of the information in this
              message</xs:documentation> </xs:annotation>
              <xs:simpleType>
                  <xs:restriction base="xs:string">
                      <xs:maxLength value="64"/>
                  </xs:restriction>
              </xs:simpleType>
          </xs:element>
          <xs:element name="country_code" type="nts:country_code_enum">
              <xs:annotation>
                  <xs:documentation>Country where message is valid</xs:documentation>
              </xs:annotation>
          </xs:element>
          <xs:element name="language_code" type="nts:language_code_enum">
              <xs:annotation>
                  <xs:documentation>Original language used in the textual info.
              (contents)</xs:documentation> </xs:annotation>
          </xs:element>
          <xs:element name="district" minOccurs="0">
              <xs:annotation>
                  <xs:documentation>District / Region within the specified country, where the message is
                      applicable </xs:documentation>
```

```
            </xs:annotation>
            <xs:simpleType>
                <xs:restriction base="xs:string">
                    <xs:maxLength value="64"/>
                </xs:restriction>
            </xs:simpleType>
        </xs:element> <xs:element name="date_issue" type="xs:dateTime">
            <xs:annotation>
                <xs:documentation>Date and time of publication including time
            zone</xs:documentation> </xs:annotation>
        </xs:element>
    </xs:sequence>
</xs:complexType>
<!--
============================================
= types used in definition of identification_type =
============================================
-->
<xs:simpleType name="country_code_enum">
    <xs:restriction base="xs:string">
        <xs:maxLength value="2"/>
        <xs:enumeration value="AT"/>
        <xs:enumeration value="BE"/>
        <xs:enumeration value="BG"/>
        <xs:enumeration value="CH"/>
        <xs:enumeration value="CY"/>
        <xs:enumeration value="CZ"/>
        <xs:enumeration value="DE"/>
        <xs:enumeration value="DK"/>
        <xs:enumeration value="EE"/>
        <xs:enumeration value="ES"/>
        <xs:enumeration value="FI"/>
        <xs:enumeration value="FR"/>
        <xs:enumeration value="GB"/>
        <xs:enumeration value="GR"/>
        <xs:enumeration value="HR"/>
        <xs:enumeration value="HU"/>
        <xs:enumeration value="IE"/>
        <xs:enumeration value="IT"/>
        <xs:enumeration value="LT"/>
        <xs:enumeration value="LU"/>
        <xs:enumeration value="LV"/>
        <xs:enumeration value="MD"/>
        <xs:enumeration value="ME"/>
        <xs:enumeration value="MT"/>
        <xs:enumeration value="NL"/>
        <xs:enumeration value="PL"/>
        <xs:enumeration value="PT"/>
        <xs:enumeration value="RO"/>
        <xs:enumeration value="RS"/>
```

```
            <xs:enumeration value="SE"/>
            <xs:enumeration value="SI"/>
            <xs:enumeration value="SK"/>
            <xs:enumeration value="RU"/>
            <xs:enumeration value="UA"/>
        </xs:restriction>
    </xs:simpleType>

    <xs:simpleType name="language_code_enum">
        <xs:restriction base="xs:string">
            <xs:maxLength value="2"/>
            <xs:enumeration value="DE"/>
            <xs:enumeration value="EN"/>
            <xs:enumeration value="FR"/>
            <xs:enumeration value="NL"/>
            <xs:enumeration value="SK"/>
            <xs:enumeration value="HU"/>
            <xs:enumeration value="HR"/>
            <xs:enumeration value="SR"/>
            <xs:enumeration value="BG"/>
            <xs:enumeration value="RO"/>
            <xs:enumeration value="RU"/>
            <xs:enumeration value="CS"/>
            <xs:enumeration value="PL"/>
            <xs:enumeration value="PT"/>
            <xs:enumeration value="ES"/>
            <xs:enumeration value="SV"/>
            <xs:enumeration value="FI"/>
            <xs:enumeration value="DA"/>
            <xs:enumeration value="ET"/>
            <xs:enumeration value="LV"/>
            <xs:enumeration value="LT"/>
            <xs:enumeration value="IT"/>
            <xs:enumeration value="MT"/>
            <xs:enumeration value="EL"/>
            <xs:enumeration value="SL"/>
        </xs:restriction>
    </xs:simpleType>
<!--
===========================================
= definition of ftm_type, =

= used in definition of RIS_Message_Type =
===========================================
-->
<xs:complexType name="ftm_type">
    <xs:sequence>
        <xs:element name="internal_id" type="nts:internal_id_type" minOccurs="0">
            <xs:annotation>
                <xs:documentation>Internal ID</xs:documentation>
```

```
        </xs:annotation>
    </xs:element>
    <xs:element name="nts_number" type="nts:nts_number_type">
        <xs:annotation>
            <xs:documentation>NtS Number</xs:documentation>
        </xs:annotation>
    </xs:element>
    <xs:element name="target_group" type="nts:target_group_type" minOccurs="0"
        maxOccurs="unbounded"> <xs:annotation>
            <xs:documentation>Target group information</xs:documentation>
        </xs:annotation>
    </xs:element>
    <xs:element name="subject_code" type="nts:subject_code_enum">
        <xs:annotation>
            <xs:documentation>Subject code must contain one of the following: Announcement
                (ANNOUN), Warning (WARNIN), Notice withdrawn (CANCEL) or Information service
                (INFSER). More information on the use of codes can be found in the NtS Encoding
                Guide.</xs:documentation>
        </xs:annotation>
    </xs:element>
    <xs:element name="validity_period" type="nts:validity_period_type">
        <xs:annotation>
            <xs:documentation>Overall period of validity</xs:documentation>
        </xs:annotation>
    </xs:element>
    <xs:element name="contents" minOccurs="0">
        <xs:annotation>
            <xs:documentation>Additional information in local language</xs:documentation>
        </xs:annotation>
        <xs:simpleType>
            <xs:restriction base="xs:string">
                <xs:maxLength value="500"/>
            </xs:restriction>
        </xs:simpleType>
    </xs:element>
    <xs:element name="source" minOccurs="0">
        <xs:annotation>
            <xs:documentation>Notice source (name of authority)</xs:documentation>
        </xs:annotation>
        <xs:simpleType>
            <xs:restriction base="xs:string">
                <xs:maxLength value="64"/>
            </xs:restriction>
        </xs:simpleType>
    </xs:element>
    <xs:element name="reason_code" type="nts:reason_code_enum" minOccurs="0">
        <xs:annotation>
            <xs:documentation>Reason / justification of the notice</xs:documentation>
        </xs:annotation>
    </xs:element>
    <xs:element name="communication" type="nts:communication_type" minOccurs="0"
    maxOccurs="unbounded">
        <xs:annotation>
            <xs:documentation>Communication channel information</xs:documentation>
        </xs:annotation>
```

```
                  </xs:element>
                  <xs:choice maxOccurs="unbounded">
                      <xs:element name="fairway_section" type="nts:fairway_section_type">
                          <xs:annotation>
                              <xs:documentation>Fairway section</xs:documentation>
                          </xs:annotation>
                      </xs:element>
                      <xs:element name="object" type="nts:object_type">
                          <xs:annotation>
                              <xs:documentation>Object section</xs:documentation>
                          </xs:annotation>
                      </xs:element>
                  </xs:choice>
              </xs:sequence>
          </xs:complexType>
          <!--
          ==========================================
          <!-- = types used in definition of ftm_type =
          ==========================================
          -->
          <xs:simpleType name="subject_code_enum">
              <xs:restriction base="xs:string">
                  <xs:minLength value="3"/>
                  <xs:maxLength value="6"/>
                  <xs:enumeration value="ANNOUN"/>
                  <xs:enumeration value="WARNIN"/>
                  <xs:enumerahon value="CANCEI"/>
                  <!-- the following values are added due to CR 128 -->
                  <xs:enumeration value-'INFSER"/>
                  <!-- obsolete values due to CR 128 but still valid for backwards
                  compatibility <xs:enumeration value="OBSTRU"/>
                  <xs:enumeration value="PAROBS"/>
                  <xs:enumeration value="DELAY"/>
                  <xs:enumeration value="VESLEN"/>
                  <xs:enumeration value="VESHEI"/>
                  <xs:enumeration value-'VESBRE"/>
                  <xs:enumeration value="VESDRA"/>
                  <xs:enumeration value="AVALEN"/>
                  <xs:enumeration value="CLEHEI"/>
                  <xs:enumeration value="CLEWID"/>
                  <xs:enumeration value="AVADEP"/>
                  <xs:enumeration value="NOMOOR"/>
                  <xs:enumeration value="SERVIC"/>
                  <xs:enumeration value="NOSERV"/>
                  <xs:enumeration value="SPEED"/>
                  <xs:enumeration value="WAVWAS"/>
                  <xs:enumeration value="PASSIN"/>
                  <xs:enumeration value="ANCHOR"/>
                  <xs:enumeration value="OVRTAK"/>
                  <xs:enumeration value="MINPWR"/>
                  <xs:enumeration value="DREDGE"/>
                  <xs:enumeration value="WORK"/>
                  <x.s:emnmTation value="EVENT"/>
                  <xs:enumeration value="CHGMAR"/>
                  <xs:enumeration value="CHGSER"/>
```

```
            <xs:enumeration value="SPCMAR"/>
            <xs:enumeration value-'EXERC"/>
            <xs:enumeration value="LEADEP"/>
            <x.s:enumeration value="IEVDEC"/>
            <xs:enumeration value="LEVRIS"/>
            <xs:enumeration value="LIMITA"/>
            <xs:enumeration value="MISECH"/>
            <xs:enumeration value="ECDISU"/>
            <xs:enumeration value="NEWOBJ"/>
            <xs:enumeration value="CHWWY"/>
            <xs:enumeration value="CONWWY"/>
            <xs:enumeration value="DIVER"/>
            <xs:enumeration value="SPECTR"/>
            <xs:enumeration value="LOCRUL"/>
            <xs:enumeration value="VHFCOV"/>
            <xs:enumeration value="HIGVOL"/>
            <xs:enumeration value="TURNIN"/>
            <xs:enumeration value="CONBRE"/>
            <xs:enumeration value="CONLEN"/>
            <xs:enumeration value="REMOBJ"/>
        </xs:restriction>
</xs:simpleType>
<xs:simpleType name=''reason_code_enum">
        <xs:restriction base="xs:string">
            <xs:minLength value="3"/>
            <xs:maxLength value="6"/>
            <xs:enumeration value-'EVENT''/>
            <xs:enumeration value="WORK"/>
            <xs:enumeration value="DREDGE"/>
            <xs:enumeration value-'EXERC"/>
            <xs:enumeration value-'HIGWAT"/>
            <xs:enumeration value="HIWAI"/>
            <xs:enumeration yalue="HIWAII"/>
            <xs:enumeration value="LOWWAT"/>
            <xs:enumeration value-'SHALLO"/>
            <xs:enumeration value="CALAMI"/>
            <xs:enumeration value="LAUNCH"/>
            <xs:enumeration value="DECLEV"/>
            <xs:enumeration value="FLOMEA"/>
            <xs:enumeration value="BLDWRK"/>
            <xs:enumeration value="REPAIR"/>
            <xs:enumeration value="INSPEC"/>
            <xs:enumeration value="FIRWRK"/>
            <xs:enumeration value="LIMITA"/>
            <xs:enumeration value-'CHGFWY''/>
            <xs:enumeration value="CONSTR"/>
            <xs:enumeration value="DIVING"/>
            <xs:enumeration value="SPECTR"/>
            <xs:enumeration value="EXT"/>
            <xs:enumeration value-'MIN"/>
            <xs:enumeration value=''SOUND"/>
            <xs:enumeration value="OTHER"/>
            <xs:enumeration value="STRIKE"/>
            <xs:enumeration value-'FLOMAT"/>
```

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```
        <xs:enumeration value="EXPLOS"/>
        <xs:enumeration value="ICE"/>
        <xs:enumeration value="OBSTAC"/>
        <!--the following values are added due to CR 128-->
        <xs:enumeration value="CHGMAR"/>
        <xs:enumeration value-'DAMMAR"/>
        <xs:enumeration value="FALMAT"/>
        <xs:enumeration value="MISECH"/>
        <xs:enumeration value="HEARIS"/>
        <xs:enumeration value="HIGVOL"/>
        <xs:enumeration value="ECDISU"/>
        <xs:enumeration value="LOCRUL"/>
        <xs:enumeration value="NEWOBJ"/>
        <xs:enumeration value="OBUNWA"/>
        <xs:enumeration value="VHFCOV"/>
        <xs:enumeration value="REMOBJ"/>
        <xs:enumeration value="LEVRIS"/>
        <xs:enumeration value="SPCMAR"/>
        <!--the following value is added due to CR 155—>
        <xs:enumeration value="WERMCO"/>
        <!--obsolete values due to CR 128 but still valid for backwards compatibility -->
        <xs:enumeration value="INFSER"/>
      </xs:restriction>
    </xs:simpleType>
  <xs:complexType name="communication_type">
    <xs:sequence>
      <xs:element name="reporting_code" type="nts:reporting_code_enum">
        <xs:annotation>
          <xs:documentation>Reporting regime (information, or duty to
          report)</xs:documentation>
        </xs:annotation>
      </xs:element>
      <xs:element name="communication_code" type="nts:communication_code_enum">
        <xs:annotation>
          <xs:documentation>Communication code (telephone, VHF etc.)</xs:documentation>
        </xs:annotation>
      </xs:element>
      <xs:element name="number" minOccurs="0">
        <xs:annotation>
          <xs:documentation>Telephone, VHF number (including callsign), e-mail address, URL
          or teletext</xs:documentation>
        </xs:annotation>
        <xs:simpleType>
          <xs:restriction base="xs:string">
            <xs:maxLength value="128"/>
          </xs:restriction>
        </xs:simpleType>
      </xs:element>
      <xs:element name="label" minOccurs="0">
        <xs:annotation>
          <xs:documentation>Name of the attachment or additional
          information</xs:documentation>
```

```
            </xs:annotation>
            <xs:simpleType>
                <xs:restriction base="xs:string">
                    <xs:maxLength value="256"/>
                </xs:restriction>
            </xs:simpleType>
        </xs:element>
        <xs:element name="remark" minOccurs="0">
            <xs:annotation>
                <xs:documentation>Additional remarks concerning the
                communication</xs:documentation>
            </xs:annotation>
            <xs:simpleType>
                <xs:restriction base="xs:string">
                    <xs:maxLength value="1024"/>
                </xs:restriction>
            </xs:simpleType>
        </xs:element>
    </xs:sequence>
</xs:complexType> <xs:simpleType name="reporting_code_enum">
    <xs:restriction base="xs:string">
        <xs:maxLength value="3"/>
        <xs:enumeration value="INF"/>
        <xs:enumeration value="ADD"/>
        <xs:enumeration value="REG"/>
    </xs:restriction>
</xs:simpleType>
<xs:simpleType name="communication_code_enum">
    <xs:restriction base="xs:string">
        <xs:maxLength value="3"/>
        <xs:enumeration value="TE"/>
        <xs:enumeration value="AP"/>
        <xs:enumeration value="EM"/>
        <xs:enumeration value="AH"/>
        <xs:enumeration value="TT"/>
        <xs:enumeration value="FX"/>
        <xs:enumeration value="LS"/>
        <xs:enumeration value="FS"/>
        <xs:enumeration value="SO"/>
        <xs:enumeration value="EI"/>
    </xs:restriction>
</xs:simpleType>
<xs:complexType name="object_type">
    <xs:sequence>
        <xs:element name="geo_object" type="nts:geo_object_type">
            <xs:annotation>
                <xs:documentation>Geo Information of object</xs:documentation>
            </xs:annotation>
        </xs:element>
        <xs:element name="limitation" type="nts:limitation_type" minOccurs="0"
        maxOccurs="unbounded"> <xs:annotation>
```

```
            <xs:documentation>Object limitation section</xs:documentation>
        </xs:annotation>
      </xs:element>
    </xs:sequence>
  </xs:complexType>
  <!--
  ===========================================
    = definition of wrm_type, =
    = used in definition of RIS_Message_Type =
  ===========================================
  -->
  <xs:complexType name="wrm_type">
    <xs:sequence>
      <xs:element name="internal_id" type="nts:internal_id_type" minOccurs="0">
        <xs:annotation>
          <xs:documentation>Internal ID</xs:documentation>
        </xs:annotation>
      </xs:element>
      <xs:element name="nts_number" type="nts:nts_number_type" minOccurs="0">
        <xs:annotation>
          <xs:documentation>NtS Number</xs:documentation>
        </xs:annotation>
      </xs:element>
      <xs:element name="validity_period" type="nts:validity_period_type">
        <xs:annotation>
          <xs:documentation>Overall period of validity</xs:documentation>
        </xs:annotation>
      </xs:element>
      <xs:element name="geo_object" type="nts:geo_object_type">
        <xs:annotation>
          <xs:documentation>Object section</xs:documentation>
        </xs:annotation>
      </xs:element>
      <xs:element name="reference_code" type="nts:reference_code_enum"
      minOccurs="0">
        <xs:annotation>
          <xs:documentation>Value reference (measurement reference)</xs:documentation>
        </xs:annotation>
      </xs:element>
      <xs:element name="measure" type="nts:measure_type"
        maxOccurs="unbounded">
        <xs:annotation>
          <xs:documentation>Measurements (normal or predicted values)</xs:documentation>
        </xs:annotation>
      </xs:element>
    </xs:sequence>
  </xs:complexType>
  <!--
  ===========================================
  = types used in definition of wrm_type =
  ===========================================
  -->
  <xs:complexType name="measure_type">
    <xs:sequence>
```

```xml
<xs:element name="predicted" type="xs:boolean">
    <xs:annotation>
        <xs:documentation>Predicted measurement (1 or true) or real measurement (0 or
        false)</xs:documentation>
    </xs:annotation>
</xs:element>
<xs:element name="measure_code" type="nts:measure_code_enum">
    <xs:annotation>
        <xs:documentation>Kind of water related information</xs:documentation>
    </xs:annotation>
</xs:element>
<xs:element name="value" type="xs:float" minOccurs="0">
    <xs:annotation>
        <xs:documentation>Measured or predicted value</xs:documentation>
    </xs:annotation>
</xs:element>
<xs:element name="value_min" type="xs:float" minOccurs="0">
    <xs:annotation>
        <xs:documentation>Lowest value of confidence interval</xs:documentation>
    </xs:annotation>
</xs:element>
<xs:element name="value_max" type="xs:float" minOccurs="0">
    <xs:annotation>
        <xs:documentation>Highest value of confidence interval</xs:documentation>
    </xs:annotation>
</xs:element>
<xs:element name="unit" type="nts:unit_enum" minOccurs="0">
    <xs:annotation>
        <xs:documentation>Unit of the water related value</xs:documentation>
    </xs:annotation>
</xs:element>
<xs:element name="barrage_code" type="nts:barrage_code_enum" minOccurs="0">
    <xs:annotation>
        <xs:documentation>Barrage status</xs:documentation>
    </xs:annotation>
</xs:element>
<xs:element name="regime_code" type="nts:regime_code_enum" minOccurs="0">
    <xs:annotation>
        <xs:documentation>Regime applicable</xs:documentation>
    </xs:annotation>
</xs:element>
<xs:element name="measuredate" type="xs:dateTime">
    <xs:annotation>
        <xs:documentation>Date and Time of measurement or predicted value including time
        zone</xs:documentation>
    </xs:annotation>
</xs:element>
<xs:element name="difference" type="nts:difference_type" minOccurs="0">
    <xs:annotation>
        <xs:documentation>Difference with comparative value</xs:documentation>
    </xs:annotation>
</xs:element>
```

```
      </xs:sequence>
    </xs:complexType>
    <xs:simpleType name="measure_code_enum">
      <xs:restriction base="xs:string">
        <xs:maxLength value="3"/>
        <xs:enumeration value="DIS"/>
        <xs:enumeration value="REG"/>
        <xs:enumeration value="BAR"/>
        <xs:enumeration value="VER"/>
        <xs:enumeration value="LSD"/>
        <xs:enumeration value="WAL"/>
        <!-- obsolete values due to CR 151 but still valid for backwards
        compatibility --> <xs:enumeration value="NOM"/>
      </xs:restriction>
    </xs:simpleType>
    <xs:simpleType name="barrage_code_enum">
      <xs:restriction base="xs:string">
        <xs:maxLength value="3"/>
        <xs:enumeration value="CLD"/>
        <xs:enumeration value="OPG"/>
        <xs:enumeration value="CLG"/>
        <xs:enumeration value="OPD"/>
        <xs:enumeration value="OPN"/>
      </xs:restriction>
    </xs:simpleType>
    <xs:simpleType name="regime_code_enum">
      <xs:restriction base="xs:string">
        <xs:maxLength value="2"/>
        <xs:enumeration value="NO"/>
        <xs:enumeration value="HI"/>
        <xs:enumeration value="II"/>
        <xs:enumeration value="I"/>
        <xs:enumeration value="NN"/>
        <xs:enumeration value="LO"/>
      </xs:restriction>
    </xs:simpleType>
    <xs:complexType name="difference_type">
      <xs:sequence>
        <xs:element name="value_difference" type="xs:float">
          <xs:annotation>
            <xs:documentation>Difference with comparative value</xs:documentation>
          </xs:annotation>
        </xs:element>
        <xs:element name="time_difference" type="xs:duration">
          <xs:annotation>
            <xs:documentation>Time difference with measuredata of comparative
            measurement</xs:documentation>
          </xs:annotation>
        </xs:element>
      </xs:sequence>
    </xs:complexType>
```

```
<!--
===========================================
= definition of icem_type, =
= used in definition of RIS_Message_Type =
===========================================
-->
<xs:complexType name="icem_type">
  <xs:sequence>
    <xs:element name="internal_id" type="nts:internal_id_type" minOccurs="0">
      <xs:annotation>
        <xs:documentation>Internal ID</xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="nts_number" type="nts:nts_number_type">
      <xs:annotation>
        <xs:documentation>NtS Number</xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="validity_period" type="nts:validity_period_type">
      <xs:annotation>
        <xs:documentation>Overall period of validity</xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="fairway_section" type="nts:fairway_section_type">
      <xs:annotation>
        <xs:documentation>Fairway section — the limitation inside the fairway section cannot be
        used in the ICEM</xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="ice_condition" type="nts:ice_condition_type"
        maxOccurs="unbounded"> <xs:annotation>
        <xs:documentation>Ice conditions</xs:documentation>
      </xs:annotation>
    </xs:element>
  </xs:sequence>
</xs:complexType>
<!--
===========================================
= types used in definition of icem_type =
===========================================
-->
<xs:complexType name="ice_condition_type">
  <xs:sequence>
    <xs:element name="measuredate" type="xs:dateTime">
      <xs:annotation>
        <xs:documentation>Date and Time of measurement or prediction including time
        zone</xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="ice_condition_code" type="nts:ice_condition_code_enum" minOccurs="0">
      <xs:annotation>
        <xs:documentation>Condition code</xs:documentation>
      </xs:annotation>
    </xs:element>
```

```
<xs:element name="ice_accessibility_code" type="nts:ice_accessibility_code_enum"
    minOccurs="0">
    <xs:annotation>
        <xs:documentation>Accessibility code </xs:documentation>
    </xs:annotation>
</xs:element>
<xs:element name="ice_classification_code" type="nts:ice_classification_code_enum"
    minOccurs="0">
    <xs:annotation>
        <xs:documentation>Classification code </xs:documentation>
    </xs:annotation>
</xs:element>
<xs:element name="ice_situation_code" type="nts:ice_situation_code_enum" minOccurs="0">
    <xs:annotation>
        <xs:documentation>Situation code </xs:documentation>
    </xs:annotation>
</xs:element>
    </xs:sequence>
  </xs:complexType>
  <xs:simpleType name="ice_condition_code_enum">
    <xs:restriction base="xs:string">
      <xs:maxLength value="1"/>
      <xs:enumeration value="A"/>
      <xs:enumeration value="B"/>
      <xs:enumeration value="C"/>
      <xs:enumeration value="D"/>
      <xs:enumeration value="E"/>
      <xs:enumeration value="F"/>
      <xs:enumeration value="G"/>
      <xs:enumeration value="H"/>
      <xs:enumeration value="K"/>
      <xs:enumeration value="L"/>
      <xs:enumeration value="M"/>
      <xs:enumeration value="P"/>
      <xs:enumeration value='R"/>
      <xs:enumeration value="S"/>
      <xs:enumeration value="U"/>
      <xs:enumeration value="O"/>
      <xs:enumeration value="V"/>
    </xs:restriction>
</xs:simpleType>
<xs:simpleType name="ice_accessibility_code_enum">
    <xs:restriction base="xs:string">
      <xs:maxLength value="1"/>
      <xs:enumeration value='A"/>
      <xs:enumeration value="B"/>
      <xs:enumeration value="F"/>
      <xs:enumeration value="L"/>
      <xs:enumeration value='C'/>
      <xs:enumeration value="D"/>
      <xs:enumeration value="E"/>
      <xs:enumeration value="G"/>
      <xs:enumeration value='H"/>
      <xs:enumeration value="M"/>
      <xs:enumeration value="K"/>
```

```
                <xs:enumeration value="T"/>
                <xs:enumeration value-T"/>
                <xs:enumeration value="V"/>
                <xs:enumeration value="X"/>
            </xs:restriction>
    </xs:simpleType>
    <xs:simpleType
        name="ice_classification_code_enum">
        <xs:restriction base="xs:string">
            <xs:maxLength value="1"/>
            <xs:enumeration value-'A"/>
            <xs:enumeration value="B"/>
            <xs:enumeration value="C"/>
            <xs:enumeration value-'D"/>
            <xs:enumeration value="E"/>
        </xs:restriction>
    </xs:simpleType>
    <xs:simpleType name="ice_situation_code_enum">
        <xs:restriction base="xs:string">
            <xs:maxLength value="3"/>
            <xs:enumeration value="NOL"/>
            <xs:enumeration value-'LIM"/>
            <xs:enumeration value="NON"/>
        </xs:restriction>
    </xs:simpleType>
    <!--
    ============================================
    = definition of werm_type, =
    = used in definition of RIS_Message_Type =
    ============================================
    -->
    <xs:complexType name="werm_type">
        <xs:sequence>
            <xs:element name="internal_id" type="nts:internal_id_type" minOccurs="0">
                <xs:annotation>
                    <xs:documentation>Internal ID</xs:documentation>
                </xs:annotation>
            </xs:element>
            <xs:element name="nts_number" type="nts:nts_number_type" minOccurs="0">
                <xs:annotation>
                    <xs:documentation>NtS Number</xs:documentation>
                </xs:annotation>
            </xs:element>
            <xs:element name="validity_period" type="nts:validity_period_type">
                <xs:annotation>
                    <xs:documentation>Overall period of validity</xs:documentation>
                </xs:annotation>
            </xs:element>
            <xs:element name="fairway_section" type="nts:fairway_section_werm_type">
                <xs:annotation>
                    <xs:documentation>Fairway section</xs:documentation>
                </xs:annotation>
            </xs:element>
```

```
    <xs:element name="weather_report" type="nts:weather_report_type" maxOccurs="2">
        <xs:annotation>
            <xs:documentation>Actual or Forecast report sections</xs:documentation>
        </xs:annotation>
    </xs:element>
   </xs:sequence>
    </xs:complexType>
<!--
==========================================
= types used in definition of werm_type =
==========================================
-->
<xs:complexType name="fairway_section_werm_type">
    <xs:sequence>
        <xs:element name="geo_object" type="nts:geo_object_type">
            <xs:annotation>
                <xs:documentation>Geo Information of fairway</xs:documentation>
            </xs:annotation>
        </xs:element>
    </xs:sequence>
</xs:complexType>
<xs:complexType name="weather_report_type">
    <xs:sequence>
        <xs:element name="measuredate" type="xs:dateTime" minOccurs="0">
            <xs:annotation>
                <xs:documentation>Date and time of measurement or predicted value including time
                    zone</xs:documentation>
            </xs:annotation>
        </xs:element>
        <xs:element name="forecast" type="xs:boolean">
            <xs:annotation>
                <xs:documentation>Forecast (true or 1) OR Actual report (false or
                    0)</xs:documentation>
            </xs:annotation>
        </xs:element>
        <xs:element name="weather_class_code" type="nts:weather_class_code_enum"
            maxOccurs="unbounded">
            <xs:annotation>
                <xs:documentation>Classification of weather report</xs:documentation>
            </xs:annotation>
        </xs:element>
        <xs:element name="weather_item" type="nts:weather_item_type" minOccurs="0"
        maxOccurs="unbounded">
            <xs:annotation>
                <xs:documentation>Weather items</xs:documentation>
            </xs:annotation>
        </xs:element>
    </xs:sequence>
    </xs:complexType>
```

```
<xs:simpleType name="weather_class_code_enum">
<xs:restriction base="xs:string">
        <xs:maxLength value="6"/>
        <xs:enumeration value="CLR"/>
        <xs:enumeration value="CLDY"/>
        <xs:enumeration value="OCST"/>
        <xs:enumeration value="DZZL"/>
        <xs:enumeration value="RAIN"/>
        <xs:enumeration value="LRAIN"/>
        <xs:enumeration value="ORAIN"/>
        <xs:enumeration value="HRAIN"/>
        <xs:enumeration value="SLEET"/>
        <xs:enumeration value="SNOW"/>
        <xs:enumeration value="SNFALL"/>
        <xs:enumeration value="HAIL"/>
        <xs:enumeration value="SHWRS"/>
        <xs:enumeration value="THSTRM"/>
        <xs:enumeration value="HAZY"/>
        <xs:enumeration value="FOG"/>
        <xs:enumeration value="FOGPAT"/>
        <xs:enumeration value="GALE"/>
        <xs:enumeration value="STRM"/>
        <xs:enumeration value="HURRC"/>
        <xs:enumeration value="FZRA"/>
    </xs:restriction>
</xs:simpleType> <xs:complexType name="weather_item_type">
    <xs:sequence>
        <xs:element name="weather_item_code" type="nts:weather_item_code_enum">
            <xs:annotation>
                <xs:documentation>Weather item type (Wind, Wave etc)</xs:documentation>
            </xs:annotation>
        </xs:element>
        <xs:element name="value_min" type="xs:float">
            <xs:annotation>
                <xs:documentation>Actual or Minimum value</xs:documentation>
            </xs:annotation>
        </xs:element>
        <xs:element name="value_max" type="xs:float" minOccurs="0">
            <xs:annotation>
                <xs:documentation>Maximum value</xs:documentation>
            </xs:annotation>
        </xs:element>
        <xs:element name="value_gusts" type="xs:float" minOccurs="0">
            <xs:annotation>
                <xs:documentation>Gusts value (Wind)</xs:documentation>
            </xs:annotation>
        </xs:element>
        <xs:element name="unit" type="nts:unit_enum" minOccurs="0">
            <xs:annotation>
                <xs:documentation>Unit of the value</xs:documentation>
            </xs:annotation>
        </xs:element>
```

```
<xs:element name="weather_category_code" type="nts:weather_category_code_enum"
    minOccurs="0">
    <xs:annotation>
        <xs:documentation>Classification of wind report</xs:documentation>
    </xs:annotation>
</xs:element>
<xs:element name="direction_code_min" type="nts:weather_direction_code_enum"
minOccurs="0">
    <xs:annotation>
        <xs:documentation>Direction of wind or wave</xs:documentation>
    </xs:annotation>
</xs:element>
<xs:element name="direction_code_max" type="nts:weather_direction_code_enum"
minOccurs="0"> <xs:annotation>
        <xs:documentation>Direction of wind or wave</xs:documentation>
    </xs:annotation>
</xs:element>
</xs:sequence>
</xs:complexType>
<xs:simpleType name="weather_item_code_enum">
    <xs:restriction base="xs:string">
        <xs:maxLength value="2"/>
        <xs:enumeration value="WI"/>
        <xs:enumeration value="WA"/>
        <xs:enumeration value="FG"/>
        <xs:enumeration value="RN"/>
        <xs:enumeration value="SN"/>
        <xs:enumeration value="AT"/>
        <xs:enumeration value="WT"/>
    </xs:restriction>
</xs:simpleType>
<xs:simpleType name="weather_category_code_enum">
    <xs:restriction base="xs:string">
        <xs:maxLength value="2"/>
        <xs:enumeration value="0"/>
        <xs:enumeration value="1"/>
        <xs:enumeration value="2"/>
        <xs:enumeration value="3"/>
        <xs:enumeration value="4"/>
        <xs:enumeration value="5"/>
        <xs:enumeration value="6"/>
        <xs:enumeration value="7"/>
        <xs:enumeration value="8"/>
        <xs:enumeration value="9"/>
        <xs:enumeration value="10"/>
        <xs:enumeration value="11"/>
        <xs:enumeration value="12"/>
        <xs:enumeration value="13"/>
        <xs:enumeration value="14"/>
        <xs:enumeration value="15"/>
        <xs:enumeration value="16"/>
        <xs:enumeration value="17"/>
        <xs:enumeration value="18"/>
        <xs:enumeration value="19"/>
```

```
            <xs:enumeration value="20"/>
            <xs:enumeration value="21"/>
            <xs:enumeration value="22"/>
        </xs:restriction>
</xs:simpleType>
<xs:simpleType name="weather_direction_code_enum"> <xs:restriction base="xs:string">
        <xs:maxlength value="3"/>
        <xs:enumeration value="N"/>
        <xs:enumeration value="NE"/>
        <xs:enumeration value="E"/>
        <xs:enumeration value="SE"/>
        <xs:enumeration value="S"/>
        <xs:enumeration value="SW"/>
        <xs:enumeration value="W"/>
        <xs:enumeration value="NW"/>
        <xs:enumeration value="WRB"/> </xs:restriction>
</xs:simpleType>
<!--
========================================
= types used in several definitions =
========================================
-->
<xs:simpleType name="internal_id_type">
    <xs:annotation>
        <xs:documentation>Internal ID — best practice: global unique identifier</xs:documentation>
    </xs:annotation>
    <xs:restriction base="xs:string">
        <xs:maxLength value="64"/>
    </xs:restriction>
</xs:simpleType>
<xs:complexType name="nts_number_type">
    <xs:sequence>
        <xs:element name="organisation">
            <xs:annotation>
                <xs:documentation>Name of the publishing organisation (NtS
                Provider)</xs:documentation>
            </xs:annotation>
            <xs:simpleType>
                <xs:restriction base="xs:string">
                    <xs:maxLength value="64"/>
                </xs:restriction>
            </xs:simpleType>
        </xs:element>
        <xs:element name="year">
            <xs:annotation>
                <xs:documentation>Year of first issuing of the notice</xs:documentation>
            </xs:annotation>
            <xs:simpleType>
                <xs:restriction base="xs:gYear">
                    <xs:minIndusive value="1900"/>
                    <xs:maxInclusive value="9999"/>
```

```xml
                  </xs:restriction>
               </xs:simpleType>
            </xs:element>
            <xs:element name="number">
               <xs:annotation>
                  <xs:documentation>Number of the notice (per year, starting with: 1, 0 shall not be used
                  for published notices)</xs:documentation>
               </xs:annotation>
               <xs:simpleType>
                  <xs:restriction base="xs:integer">
                     <xs:minIndusive value="00000000"/>
                     <xs:maxInclusive value-'99999999"/>
                  </xs:restriction>
               </xs:simpleType>
            </xs:element>
            <xs:element name="serial_number">
               <xs:annotation>
                  <xs:documentation>Serial number of notice (replacements and withdrawals), original
                  notice: 0</xs:documentation>
               </xs:annotation>
               <xs:simpleType>
                  <xs:restriction base-"xs:integer">
                     <xs:minInclusive value-"00"/>
                     <xs:maxInclusive value="99"/>
                  </xs:restriction>
               </xs:simpleType>
            </xs:element>
         </xs:sequence>
      </xs:complexType>
      <xs:complexType name="validity_period_type">
         <xs:sequence>
            <xs:element name="date_start" type="xs:date">
               <xs:annotation>
                  <xs:documentation>Start date of validity period including time zone</xs:documentation>
               </xs:annotation>
            </xs:element>
            <xs:element name="date_end" type="xs:date" minOccurs="0">
               <xs:annotation>
                  <xs:documentation>End date of validity period including time zone</xs:documentation>
               </xs:annotation>
            </xs:element>
         </xs:sequence>
      </xs:complexType>
      <xs:complexType name="fairway_section_type">
         <xs:sequence>
            <xs:element name="geo_object" type="nts:geo_object_type">
               <xs:annotation>
                  <xs:documentation>Geo information of fairway</xs:documentation>
               </xs:annotation>
            </xs:element>
```

```
        <xs:element name="limitation" type="nts:limitation_type" minOccurs="0"
        maxOccurs="unbounded"> <xs:annotation>
                <xs:documentation>Fairway section limitations</xs:documentation>
            </xs:annotation>
        </xs:element>
    </xs:sequence>
</xs:complexType>
<xs:complexType name="geo_object_type">
    <xs:sequence>
        <xs:element name="id" type="nts:isrs_code_type" maxOccurs="2">
            <xs:annotation>
                <xs:documentation>ISRS Location Code of the fairway/object</xs:documentation>
            </xs:annotation>
        </xs:element>
        <xs:element name="name">
            <xs:annotation>
                <xs:documentation>Local name of the fairway section</xs:documentation>
            </xs:annotation>
            <xs:simpleType>
                <xs:restriction base="xs:string">
                    <xs:maxLength value="256"/>
                </xs:restriction>
            </xs:simpleType>
        </xs:element>
        <xs:element name="type_code" type="nts:type_code_enum" default="FWY">
            <xs:annotation>
                <xs:documentation>Type of geographical object</xs:documentation>
            </xs:annotation>
        </xs:element>
        <xs:element name="position_code" type="nts:position_code_enum" minOccurs="0">
            <xs:annotation>
                <xs:documentation>Describes the position related to the fairway</xs:documentation>
            </xs:annotation>
        </xs:element>
        <xs:element name="coordinate" type="nts:coordinate_type" minOccurs="0" maxOccurs="2">
            <xs:annotation>
                <xs:documentation>Fairway section begin and end coordinates</xs:documentation>
            </xs:annotation>
        </xs:element>
        <xs:element name="fairway_name" minOccurs="0">
            <xs:annotation>
                <xs:documentation>Waterway name (usefull if no RIS Index is
                available)</xs:documentation>
            </xs:annotation>
            <xs:simpleType>
                <xs:restriction base="xs:string">
                    <xs:maxLength value="256"/>
                </xs:restriction>
            </xs:simpleType>
        </xs:element>
    </xs:sequence>
</xs:complexType>
<xs:simpleType name="isrs_code_type">
```

ES-RIS
Standardised NtS extended markup language (XML) schema definition, referred to as XSD, standardised code values and
possible formats

Annex 17

```
    <xs:annotation>
        <xs:documentation>ISRS location code, unique identification of the geo object as defined in
        RIS Index encoding guide</xs:documentation>
    </xs:annotation>
    <xs:restriction base="xs:string">
        <xs:length value="20"/>
        <xs:pattern value="[A-Z]{2}[A-Z]{3}[A-Z0-9]{5}[A-Z0-9]{5}[0-9]{5}" />
    </xs:restriction>
</xs:simpleType>
<xs:simpleType name="type_code_enum">
    <xs:restriction base="xs:string">
        <xs:maxLength value="3"/>
        <xs:enumeration value="RIV"/>
        <xs:enumeration value="CAN"/>
        <xs:enumeration value="LAK"/>
        <xs:enumeration value="FWY"/>
        <xs:enumeration value="LCK"/>
        <xs:enumeration value="BRI"/>
        <xs:enumeration value="RMP"/>
        <xs:enumeration value="BAR"/>
        <xs:enumeration value="BNK"/>
        <xs:enumeration value="GAU"/>
        <xs:enumeration value="BUO"/>
        <xs:enumeration value="BEA"/>
        <xs:enumeration value="ANC"/>
        <xs:enumeration value="BER"/>
        <xs:enumeration value="MOO"/>
        <xs:enumeration value="TER"/>
        <xs:enumeration value="HAR"/>
        <xs:enumeration value="FDO"/>
        <xs:enumeration value="CAB"/>
        <xs:enumeration value="FER"/>
        <xs:enumeration value="PIP"/>
        <xs:enumeration value="PPO"/>
        <xs:enumeration value="HFA"/>
        <xs:enumeration value="HMO"/>
        <xs:enumeration value="SHY"/>
        <xs:enumeration value="REF"/>
        <xs:enumeration value="MAR"/>
        <xs:enumeration value="LIG"/>

        <xs:enumeration value="SIG"/>
        <xs:enumeration value="TUR"/>
        <xs:enumeration value="CBR"/>
        <xs:enumeration value="TUN"/>
        <xs:enumeration value="BCO"/>
        <xs:enumeration value="REP"/>
        <xs:enumeration value="FLO"/>
        <xs:enumeration value="SLI"/>
        <xs:enumeration value="DUK"/>
        <xs:enumeration value="VTC"/>
        <xs:enumeration value="RES"/>
        <xs:enumeration value="LKB"/>
        <xs:enumeration value="BRO"/>
```

```
            <!--the following value is added due to CR 157—>
            <xs:enumeration value="BNS"/>
        </xs:resiriction>
    </xs:simpleType>
    <xs:complexType name="coordinate_type">
        <xs:sequence>
            <xs:element name="lat">
                <xs:simpleType>
                    <xs:restriction base="xs:string">
                        <xs:minLength value="10"/>
                        <xs:maxLength value="12"/>
                    </xs:restriction>
                </xs:simpleTypc>
            </xs:element>
            <xs:element name="long">
                <xs:simpleType>
                    <xs:restriction base="xs:string">
                        <xs:minLength value="10"/>
                        <xs:maxLength value="13"/>
                    </xs:restriction>
                </xs:simpleTvpe>
            </xs:element>
        </xs:sequence>
    </xs:complexType>
    <xs:complexType name="limitation_type">
        <xs:sequence>
            <xs:element name="limitation_period" type="nts:limitation_period_type" minOccurs="0"
            maxOccurs="unbounded">
                <xs:annotation>
                    <xs:documentation>limitation periods / intervals</xs:documentation>
                </xs:annotation>
            </xs:element>
            <xs:element name="limitation_code" type="nts:limitation_code_enum">
                <xs:annotation>
                    <xs:documentation>Kind of limitation</xs:documentation>
                </xs:annotation>
            </xs:element>
            <xs:element name="position_code" type="nts:position_code_enum" minOccurs="0">
                <xs:annotation>
                    <xs:documentation>Describes the position of the limitation related to the
                    fairway</xs:documentation>
                </xs:annotation>
            </xs:element>
            <xs:element name="value" type="xs:float" minOccurs="0">
                <xs:annotation>
                    <xs:documentation>Value of limitation (i.e. max draught)</xs:documentation>
                </xs:annotation>
            </xs:element>
            <xs:element name="unit" type="nts:unit_enum" minOccurs="0">
                <xs:annotation>
```

```
                <xs:documentation>Unit of the value of the limitation</xs:documentation>
            </xs:annotation>
        </xs:element>
        <xs:element name="reference_code" type="nts:reference_code_enum" minOccurs="0">
            <xs:annotation>
                <xs:documentation>Value reference</xs:documentation>
            </xs:annotation>
        </xs:element>
        <xs:element name="indication_code" type="nts:indication_code_enum" minOccurs="0">
            <xs:annotation>
                <xs:documentation>Minimum or maximum or reduced by</xs:documentation>
            </xs:annotation>
        </xs:element>
        <xs:element name="target_group" type="nts:target_group_type" minOccurs="0"
        maxOccurs="unbounded">
            <xs:annotation>
                <xs:documentation>Target group information</xs:documentation>
            </xs:annotation>
        </xs:element>
    </xs:sequence>
 </xs:complexType>
 <xs:complexType name="limitation_period_type">
    <xs:sequence>
        <xs:element name="date_start" type="xs:date">
            <xs:annotation>
                <xs:documentation>Start date of limitation period including time
                zone</xs:documentation>
            </xs:annotation>
        </xs:element>
        <xs:element name="date_end" type="xs:date" minOccurs="0">
            <xs:annotation>
              <xs:documentation>End date of limitation period including time zone</xs:documentation>
            </xs:annotation>
        </xs:element>
        <xs:element name="time_start" type="xs:time" minOccurs="0">
            <xs:annotation>
                <xs:documentation>Start time of limitation period without time zone</xs:documentation>
            </xs:annotation>
        </xs:element>
        <xs:element name="time_end" type="xs:time" minOccurs="0">
            <xs:annotation>
                <xs:documentation>End time of limitation period without time zone</xs:documentation>
            </xs:annotation>
        </xs:element>
        <xs:element name="interval_code" type="nts:interval_code_enum" minOccurs="0">
            <xs:annolation>
                 <xs:documentation>Interval for limitation if applicable</xs:documentation>
            </xs:annotation>
        </xs:element>
    </xs:sequence>
 </xs:complexType>
 <xs:simpleType name="interval_code_enum">
```

```xml
        <xs:restriction base="xs:string">
            <xs:maxLength value="3"/>
            <xs:enumeration value="CON"/>
            <xs:enumeration value="DAY"/>
            <xs:enumeration value="WRK"/>
            <xs:enumeration value="WKN"/>
            <xs:enumeration value="SUN"/>
            <xs:enumeration value="MON"/>
            <xs:enumeration value="TUE"/>
            <xs:enumeration value="WED"/>
            <xs:enumeration value="THU"/>
            <xs:enumeration value="FRI"/>
            <xs:enumeration value="SAT"/>
            <xs:enumeration value="DTI"/>
            <xs:enumeration value="NTI"/>
            <xs:enumeration value="RVI"/>
            <xs:enumeration value="EXC"/>
            <xs:enumeration value="WRD"/>
        </xs:restriction>
    </xs:simpleType>
    <xs:simpleType name="limitation_code_enum">
        <xs:restriction base="xs:string">
            <xs:maxLength value="6"/>
            <xs:enumeration value="OBSTRU"/>
            ^smumerahon value="PAROBS"/>
            <xs:enumeration value="DELAY"/>
            <xs:enumeration value="VESLEN"/>
            <xs:enumeration value="VESHEI"/>
            <xs:enumeration value="VESBRE"/>
            <xs:enumeration value="VESDRA"/>
            <xs:enumeration value="AVALEN"/>
            <xs:enumeration value="CLEHEI"/>
            <xs:enumeration value="CLEWID"/>
            <xs:enumeration value="AVADEP"/>
            <xs:enumeration value="NOMOOR"/>
            <xs:enumeration value="SERVIC"/>
            <xs:enumeration value="NOSERV"/>
            <xs:enumeration value="SPEED"/>
            <xs:enumeration value="WAVWAS"/>
            <xs:enumeration value="PASSIN"/>
            <xs:enumeration value="ANCHOR"/>
            <xs:enumeration value="OVRTAK"/>
            <xs:enumeration value="MINPWR"/>
            <xs:enumeration value="ALTER"/>
            <xs:enumeration value="CAUTIO"/>
            <xs:enumeration value="NOLIM"/>
            <xs:enumeration value="TURNIN"/>
            <xs:enumeration value="NOSHORE"/>
            <xs:enumeration value="CONBRE"/>
            <xs:enumeration value="CONLEN"/>
            <!-- the following value is added due lo CR 128
            <xs:enumeration value="LEADEP"/>
            <!-- the following value is added due to CR 148
            <xs:enumeration value="NOBERT"/>
        </xs:restriction>
```

```
</xs:simpleType>
<xs:simpleType name="position_code_enum">
    <xs:restriction base="xs:string">
        <xs:maxLength value="2"/>
        <xs:enumeration value="AL"/>
        <xs:enumeration value="LE"/>
        <xs:enumeration value="MI"/>
        <xs:enumeration value="RI"/>
        <xs:enumeration value="LB"/>
        <xs:enumeration value="RB"/>
        <xs:enumeration value="N"/>
        <xs:enumeration value="NE"/>
        <xs:enumeration value="E"/>
        <xs:enumeration value="SE"/>
        <xs:enumeration value="S"/>
        <xs:enumeration value="SW"/>
        <xs:enumeration value="W"/>
        <xs:enumeration value="NW"/>
        <xs:enumeration value="BI"/>
        <xs:enumeration value="SM"/>
        <xs:enumeration value="OL"/>
        <xs:enumeration value="EW"/>
        <xs:enumeration value="MP"/>
        <xs:enumeration value="FP"/>
        <xs:enumeration value="VA"/>
        <xs:enumeration value="RY"/>
        <xs:enumeration value="GY"/>
    </xs:restriction>
</xs:simpleType>
<xs:simpleType name="reference_code_enum">
    <xs:restriction base="xs:string">
        <xs:maxLength value="4"/>
        <xs:enumeration value="NAP"/>
        <xs:enumeration value="KP"/>
        <xs:enumeration value="FZP"/>
        <xs:enumeration value="ADR"/>
        <xs:enumeration value="TAW"/>
        <xs:enumeration value="PUL"/>
        <xs:enumeration value="NGM"/>
        <xs:enumeration value="ETRS"/>
        <xs:enumeration value="POT"/>
        <xs:enumeration value="LDC"/>
        <xs:enumeration value="HDC"/>
        <xs:enumeration value="ZPG"/>
        <xs:enumeration value="GLW"/>
        <xs:enumeration value="HSW"/>
        <xs:enumeration value="LNW"/>
        <xs:enumeration value="HNW"/>
        <xs:enumeration value="IGN"/>
        <xs:enumeration value="WGS"/>
        <xs:enumeration value="RN"/>
        <xs:enumeration value="HBO"/>
    </x.s:restriction>
</xs:simpleType>
```

```
<xs:simpleType name="indication_code_enum">
    <xs:restriction base="xs:string">
        <xs:maxLength value="3"/>
        <xs:enumeration value="MAX"/>
        <xs:enumeration value="MIN"/>
        <xs:enumeration value="RED"/>
    </xs:restriction>
</xs:simpleType>
<xs:complexType name="target_group_type">
    </xs:sequence>
        <xs:element name="target_group_code" type="nts:target_group_code_enum" default="ALL">
            <xs:annotation>
                <xs:documentation>Target group (vessel type)</xs:documentation>
            </xs:annotation>
        </xs:element>
        <xs:element name="direction_code" type="nts:direction_code_enum" default="ALL">
            <xs:annotation>
                <xs:documentation>Upstream or downstream traffic, or both</xs:documentation>
            </xs:annotation>
        </xs:element>
    </xs:sequence>
</xs:complexType>
<xs:simpleType name="target_group_code_enum">
    <xs:restriction base="xs:string">
        <xs:maxLength value="3"/>
        <xs:enumeration value="ALL"/>
        <xs:enumeration value="CDG"/>
        <xs:enumeration value="COM"/>
        <xs:enumeration value="PAX"/>
        <xs:enumeration value="PLE"/>
        <xs:enumeration value="CNV"/>
        <xs:enumeration value="PUS"/>
        <xs:enumeration value="NNU"/>
        <xs:enumeration value="LOA"/>
        <xs:enumeration value="SMA"/>
        <xs:enumeration value="CND"/>
        <xs:enumeration value="WOC"/>
        <xs:enumeration value="MOV"/>
        <xs:enumeration value="NMV"/>
    </xs:restriction>
</xs:simpleType>
<xs:simpleType name="direction_code_enum">
    <xs:restriction base="xs:string">
        <xs:maxLength value="3"/>
        <xs:enumeration value="ALL"/>
        <xs:enumeration value="UPS"/>
        <xs:enumeration value="DWN"/>
    </xs:restriction>
</xs:simpleType>
<xs:simpleType name="unit_enum">
    <xs:restriction base="xs:string">
        <xs:maxLength value="4"/>
        <xs:enumeration value="cm"/>
        <xs:enumeration value="m3/s"/>
        <xs:enumeration value="h"/>
```

```
        <xs:enumeration value="km/h"/>
        <xs:enumeration value="kW"/>
        <xs:enumeration value="m/s"/>
        <xs:enumeration value="mm/h"/>
        <xs:enumeration value="°C"/>
    </xs:restriction>
  </xs:simpleType>
</xs:schema>
```

ES-RIS

Annex 17
Standardised NtS extended markup language (XML) schema definition, referred to as XSD, standardised code values and
possible formats

ANNEX 18
NOTICES TO SKIPPERS WEB SERVICE SPECIFICATION (WSDL)

```xml
<?xml version="1.0" encoding="UTF-8"?>
<wsdl:definitions
    xmlns:wsdl="http://schemas.xmlsoap.org/wsdl/"
    xmlns:soap="http://schemas.xmlsoap.org/wsdl/soap/"
    xmlns:http="http://schemas.xmlsoap.org/wsdl/http/"
    xmlns:xs="http://www.w3.org/2001/XMLSchema"
    xmlns:soapenc="http://schemas.xmlsoap.org/soap/encoding/"
    xmlns:mime="http://schemas.xmlsoap.org/wsdl/mime/"
    xmlns:nts="http://www.ris.eu/nts/4.0.4.0"
    xmlns:tns="http://www.ris.eu/nts.ms/2.0.4.0"
    targetNamespace="http://www.ris.eu/nts.ms/2.0.4.0"
    name="NtS-Message-Service">
<!--
    = specification of types =
-->
<wsdl:types>
<!--
    = xml-schema for types =
-->
    <xs:schema
        targetNamespace="http://www.ris.eu/nts.ms/2.0.4.0"
        xmlns:xs="http://www.w3.org/2001/XMLSchema"
        xmlns:nts="http://www.ris.eu/nts/4.0.4.0"
        xmlns:nts-ms="http://www.ris.eu/nts.ms/2.0.4.0"
        elementFormDefault="qualified"
        attributeFormDefault="unqualified"
        version="2.0.4.0">
        <!-- import NtS schema -->
        <xs:import
            namespace="http://www.ris.eu/nts/4.0.4.0"
            schemaLocation="http://www.ris.eu/nts/4.0/NtS_XSD_V.4.0.4.0.xsd"/>
        <!-- query with filters, parameters according to the NtS standard -->
        <xs:element name= "get_messages_query" >
            <xs:complexType>
                <xs:sequence>
                    <!- - type of message (FTM, WRM, ICEM, WERM) -->
                    <xs:element name="message_type" type="nts-ms:message_type_type"/>
                    <!-- ISRS codes for fairway sections or objects - ->
                    <xs:element name="ids" type="nts-ms:id_pair" minOccurs="0"
                    maxOccurs="unbounded"/>
                    <!-- time of validity -->
                    <xs:element name="validity_period" type="nts:validity period type"
                    minOccurs="0"/>
                    <!-- date of publication of the notice -->
                    <xs:element name="dates_issue" type="nts-ms:date_pair"
                    minOccurs= "0" maxOccurs= "unbounded"/>
                    <!-- optional parameter for paging mechanism -->
                    <xs:element name= "paging_request"
                    type="nts-ms:paging_request_type" minOccurs="0"/>
```

```
              </xs:sequence>
           </xs:complexType>
        </xs:element>
        <!-- result to query — can contain
           − "nts:RIS_MessageType", arbitrary number, defined in the NtS-xsd (see www.ris.eu)
           − "nts-ms:error_code_type", arbitrary number, defined in this schema
           − "nts-ms:paging_result_type", optional, defined in this schema -->
        <xs:element name= "get_messages_result" >
           <xs:complexType>
              <xs:sequence>
                 <xs:element name="result_message" type="nts:RIS_Message_Type"
                 minOccurs= "0" maxOccurs="unbounded"/>
                 <xs:element name="result_error" type="nts-ms:error_code_type"
                 minOccurs= "0" maxOccurs="unbounded"/>
                 <xs:element name= "paging_result" type= "nts-ms:paging_result_type"
                 minOccurs="0"/>
              </xs:sequence>
           </xs:complexType>
        </xs:element>
        <!-- type definitions used in request -->
        <xs:simpleType name= "message_type_type" >
           <xs:restriction base="xs:string" >
              <xs:enumeration value= "FTM" />
              <xs:enumeration value= "WRM" />
              <xs:enumeration value="ICEM"/>
              <xs:enumeration value= "WERM" />
           </xs:restriction>
        </xs:simpleType>
        <xs:complexType name= "id_pair" >
           <xs:sequence>
              <xs:element name="id" type="nts:isrs_code_type" minOccurs="1"
              maxOccurs="2" />
           </xs:sequence>
        </xs:complexType>
        <xs:complexType name= "date_pair" >
           <xs:sequence>
              <xs:element name= "date_start" type= "xs:date"/>
              <xs:element name= "date_end" type= "xs:date" minOccurs="0"/>
           </xs:sequence>
        </xs:complexType>
        <xs:complexType name= "paging_request_type" >
           <xs:sequence>
              <xs:element name="offset" type="xs:nonNegativeInteger"/>
              <xs:element name="limit" type="xs:nonNegativeInteger"/>
              <xs:element name="total_count" type="xs:boolean"/>
           </xs:sequence>
        </xs:complexType>
        <!-- type definitions used in response -->
        <xs:simpleType name= "error_code_type" >
           <xs:restriction base="xs:string" >
              <xs:enumeration value= "e010" >
                 <xs:annotation>
                    <xs:documentation>Description: message type not supported,
                 Explanation: web service does not support the requested message
```

```xml
                    type</xs:documentation>
                </xs:annotation>
            </xs:enumeration>
        <xs:enumeration value= "e030" >
            <xs:annotation>
                <xs:documentation>Description: paging parameters inconsistent with
                messages, Explanation: parameters for paging mechanism do not fit the
                available messages, e.g. Offset >= Total Count </xs:documentation>
            </xs:annotation>
        </xs:enumeration>
        <xs:enumeration value="e100">
            <xs:annotation>
                <xs:documentation>Description: syntax error in request, Explanation: request
                violates the schema for requests
                </xs:documentation>
            </xs:annotation>
        </xs:enumeration>
        <xs:enumeration value="e110">
            <xs:annotation>
                <xs:documentation>Description: incorrect message type, Explanation: given
                message type is not known</xs:documentation> </xs:annotation>
        </xs:enumeration>
        <xs:enumeration value= "e120" >
            <xs:annotation>
                <xs:documentation>Description: incorrect type-specific parameters,
                Explanation: type-specific parameters are erroneous
                </xs:documentation>
            </xs:annotation>
        </xs:enumeration>
        <xs:enumeration value= "e130" >
            <xs:annotation>
                <xs:documentation>Description: incorrect paging parameters, Explanation:
                given parameters for the paging mechanism are
                erroneous</xs:documentation>
            </xs:annotation>
        </xs:enumeration>
        <xs:enumeration value="e200">
            <xs:annotation>
                <xs:documentation>Description: operation not known, Explanation: the
                requested operation is unknown</xs:documentation> </xs:annotation>
        </xs:enumeration>
        <xs:enumeration value="e300">
            <xs:annotation>
                <xs:documentation>Description: data source unavailable, Explanation: data
                source of the web service for the NtS data is temporarily
                unavailable</xs:documentation>
            </xs:annotation>
        </xs:enumeration>
        <xs:enumeration value="e310">
            <xs:annotation>
                <xs:documentation>Description: too many results for request, Explanation:
                server is unable to handle number of results
                </xs:documentation>
            </xs:annotation>
        </xs:enumeration>
    </xs:restriction>
</xs:simpleType>
<xs:complexType name= "paging_result_type" >
    <xs:sequence>
```

```xml
            <xs:element name="offset" type="xs:nonNegativeInteger"/>
            <xs:element name="count" type="xs:nonNegativeInteger"/>
            <xs:element name="total_count" type="xs:nonNegativeInteger"
            minOccurs="0"/>
          </xs:sequence>
        </xs:complexType>
      </xs:schema>
  </wsdl:types>
  <!--
      = specification of messages =
  -->
  <wsdl:message name= "get_messages_request" >
      <wsdl:part name= "parameters" element= "tns:get_messages_query"/>
  </wsdl:message>
  <wsdl:message name= "get_messages_response" >
      <wsdl:part name= "parameters" element= "tns:get_messages_result"/>
  </wsdl:message>
  <!--
      = specification of port type =
  -->
  <wsdl:portType name= "NtS_message_service" >
      <wsdl:operation name="get_messages">
          <wsdl:input message="tns:get_messages_request"/>
          <wsdl:output message= "tns:get_messages_response"/>
      </wsdl:operation>
  </wsdl:portType>
  <!--
      = specification of binding =
  -->
  <wsdl:binding name= "NtS_message_service_soap_binding" type= "tns:
NtS_message_service">
      <soap:binding style="document"
      transport="http://schemas.xmlsoap.org/soap/http"/>
      <wsdl:operation name="get_messages">
          <soap:operation soapAction= "http://www.ris.eu/nts.ms/get_messages"/>
          <wsdl:input>
              <soap:body use= "literal" />
          </wsdl:input>
          <wsdl:output>
              <soap:body use= "literal" />
          </wsdl:output>
      </wsdl:operation>
  </wsdl:binding>
  <!--
      = specification of service =
  -->
  <wsdl:service name= "NtS_message_service_service" >
      <wsdl:port name= "NtS_message_service"
      binding="tns:NtS_message_service_soap_binding">
          <soap: address location="http://nts-ms.example.org/NtS_message_service"/>
      </wsdl:port>
  </wsdl:service>
</wsdl:definitions>
```

ANNEX 19
NOTICES TO SKIPPERS REFERENCE TABLES (TAGS)

(Distributed separately)