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## Economic Commission for Europe

### Inland Transport Committee

#### Working Party on Inland Water Transport

##### Working Party on the Standardization of Technical and Safety Requirements in Inland Navigation

###### Forty-eighth session

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Item 9 (c) of the provisional agenda

##### **Promotion of River Information Services (RIS) as well as other Information and Communication Technologies (ICT) in inland navigation: International Standards for Notices to Skippers and for Electronic Ship Reporting in Inland Navigation (Resolutions Nos. 79 and 80)**

## **River Information Services: Further amendments to UNECE Resolution No. 80**

### **Note by the secretariat**

#### **Revision**

### **I. Mandate**

1. This document is submitted in line with cluster 5: Inland Waterway Transport, paragraph 5.1 of the programme of work 2014–2015 (ECE/TRANS/2014/23) adopted by the Inland Transport Committee on 27 February 2014.

2. The Notices to Skippers (NtS) Expert Group approved revised NtS Standard (version 4.0) at its meeting in Lille, France, on 26 November 2015. In the course of the elaboration of the new NtS standard it was agreed that the revision consisted of six parts (NtS Technical Annex and its four Appendixes):

- Appendix A: NtS Encoding Guide for editors;
- Appendix B: NtS Encoding Guide for application developers;
- Appendix C: NtS XML Schema Definition (XSD);
- Appendix D: NtS Web Service Specification (WSDL).

3. The Working Party on the Standardization of Technical and Safety Requirements in Inland Navigation is invited to consider the updates proposed to Resolution No. 80, International Standard for Notices to Skippers in Inland Navigation, made on the basis of the revision made by the NtS Expert Group to the International Standard for Notices to Skippers in Inland Navigation.

## Annex 1

### **Draft amendments to the International Standard for Notices to Skippers in Inland Navigation (annex to Resolution No. 80)**

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#### ABBREVIATIONS

<b>ENC</b>	<b>Electronic Navigational Chart</b>
<b>ERDMS</b>	<b>European Reference Data Management Service</b>
<b>FIS</b>	<b>Fairway Information Services</b>
<b>FTM</b>	<b>Fairway and Traffic related Message</b>
<b>ICEM</b>	<b>ICE Message</b>
<b>ID</b>	<b>Identification</b>
<b>Inland ECDIS</b>	<b>Inland Electronic Chart Display and Information System</b>
<b>ISRS</b>	<b>International Ship Reporting Standard</b>
<b>NtS</b>	<b>Notices to Skippers</b>
<b>RIS</b>	<b>River Information Services</b>
<b>SOAP</b>	<b>Simple Object Access Protocol</b>

<b>UTF-8</b>	<b>8-bit Unicode Transformation Format</b>
<b>WERM</b>	<b>Weather Related Message</b>
<b>WGS 84</b>	<b>World Geodetic System 1984</b>
<b>WRM</b>	<b>Water Related Message</b>
<b>WSDL</b>	<b>Web Services Description Language</b>
<b>XML</b>	<b>Extended Markup Language</b>
<b>XSD</b>	<b>XML Schema Definition</b>

## 1. Introduction

1.1 In the following, the primary functions and performance requirements of international standards for notices to skippers for inland navigation are described.

1.2 Fairway Information Services (FIS) **mean contain** geographical, hydrological and administrative **information regarding the waterway (fairway) data** that are used by ~~skippers~~ **boatmasters** and fleet managers to plan, execute and monitor a ~~trip~~ **–voyage (the terms “boatmaster” and “skipper” used in the present standard shall be deemed to be equivalent with the term “ship master” used in UNECE Resolution No. 57, Guidelines and Recommendations for River Information Services)**. FIS provide dynamic information (e.g. water levels, water level predictions etc.) as well as static information (e.g. ~~regular~~ operating times of locks and bridges) regarding the use and status of the inland waterway infrastructure, and thereby support tactical and strategic navigation decisions.

1.3 Traditional means to supply FIS are e.g. visual aids to navigation, notices to skippers on paper, broadcast and fixed telephone on locks. The mobile phone ~~using GSM~~ has added new possibilities of voice and data communication, but ~~GSM~~ **a cellular network** is not available in all places and at all times. Tailor-made FIS for the waterways can be supplied by radiotelephone services on inland waterways, Internet services or electronic navigational chart (ENC) services (e.g. Electronic Chart Display and Information System for inland navigation (Inland ECDIS) with ENCs).

1.4 The following ~~technical specifications~~ **standard** for Notices to Skippers provides rules for the data transmission of fairway information via Internet services.

1.5 The standardization of Notices to Skippers ~~(NtS) shall:~~

~~(a) provide automatic translation of the most important content of notices in all the languages of the participating countries;~~

~~(b) provide a standardised structure of data sets in all the participating countries to facilitate the integration of notices in voyage planning systems;~~

**(ea) provides FIS information consisting of a standard fairway and traffic related information, for water level-related information, ice related information and weather related information;**

**(b) provides automatic translation of the most important content of notices using standard vocabulary in combination with code lists (the NtS Reference Tables);**

**(c) provides a standardised structure of data-sets to facilitate the integration of notices in voyage planning systems;**

**(d) be is** compatible with the data-structure of **the RIS Index and** Inland ECDIS to facilitate integration of ~~Notices to Skippers~~ **NtS** into Inland ECDIS;

(e) facilitates data-exchange ~~between~~**among systems operated in** different countries **and towards applications making use of NtS (e.g. Inland ECDIS) via NtS Web Service.**

1.6 It ~~will~~**is** not ~~be~~ possible to standardize all the information, which is contained in Notices to Skippers. Part of the information ~~will~~**can** be provided as “free text” without automatic translation. The standardized part should 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 (for example: closure of locks, reduction of vertical clearance, etc.).

1.7 Additional information **that is not relevant for safety or voyage planning** (for example: cause of the closure of a lock) can be given as free text.

## 2. Data standard

2.1 Notices to Skippers shall be provided according to Chapter ~~7 “Structure of the messages and coding in XML format”~~ as regarding XML Message Specification **5.6 “XML definition overview”**.

2.2 In order to enable a broad applicability, the XML message definition contains a wide range of elements. The message is structured into entities (tags), such as sections, groups, subgroups and data elements. The use of free text in the data elements should be restricted to a minimum. Wherever **it is** possible, data elements are encoded (standardised). The XML message definition defines the structure of the XML message and the codes. The standardized code values, ~~and their translation are provided in the NtS Reference Tables by the European Reference Data Management Service (ERDMS) at <http://risdatamanagement.ris.eu>.~~ **their explanation and translation into relevant languages are provided in reference tables maintained by the Notices to Skippers Expert Group.**<sup>†</sup>

2.3 **The standardised NtS XML Schema Definition (XSD) containing the standardised code values and possible formats is included in Appendix C.** ~~The XML scheme for Notices to Skippers, which is based on the XML definition and the standardised code values and which contains a complete definition for all the XML elements including possible formats and code values is maintained by the Notices to Skippers Expert Group.~~

~~In order to obtain a machine readable XML message one has to fill out the empty fields in the XML scheme (free text) and to select the code values from the value lists provided in the XML scheme.~~

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## 3. Water level information

3.1 ~~Water level information is very important for voyage planning as well as for the safety of navigation. At the moment there is no common standard of referencing water level information (Germany for example is using the GIW, “gleichwertiger Wasserstand”, the Danube Commission is recommending the RNW, Regulierungs Niederwasser, which is defined slightly different. The vertical clearance is mostly referred to a high water level, but sometimes to low water level. The values of gauges are referring to different sea levels or~~

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<sup>†</sup> Secretariat of the Notices to Skippers Expert group: [nts@ris.eu](mailto:nts@ris.eu)  
[www.ris.eu/expert\\_groups/nts](http://www.ris.eu/expert_groups/nts)

to special reference points). Therefore, it is not possible to integrate water level information in systems for automatic calculation of clearances.

3.2 — Reference data for water level gauges relevant to navigation shall be provided by member States. The water level information in the message can be referred to the zero point of a gauge, as it has been done in the past, and the on board software can calculate the absolute height by use of the reference data.

#### 4. Weather messages

4.1 — In most tidal waters and on many of the other inland waterways, a number of hydro-meteo items are measured continuously and distributed online. The primary addressee of these measurements are the water(-way) authorities. The distribution of these data to users like skippers of inland waterway vessels varies greatly. In order to facilitate the distribution of hydro-meteo information from hydro-meteo networks to skippers, dedicated weather messages shall be distributed as Notices to Skippers in accordance with the Chapter VII, table, XML message definition.

4.2 — Member States are not obliged to provide weather data. If such data is provided, this shall be done in line with these technical specifications.

### 35. Way of distribution Provision of Notices to Skippers

53.1 If the competent authorities provide Notices to Skippers of their own country in such a way that these notices can be used by speakers of other languages, they shall be **provided accessible online** according to **this standard in these technical specifications XML format downloadable in the Internet, and via the standardised NtS Web Service (WSDL). The standardised NtS WSDL is included in Appendix D.** In order to enable a specific download, Internet sServices should provide a possibility to select **at least**:

- (a) **a s**Specific waterway section (**ID number of a fairway section number of the ISRS Location Code** according to Chapter VII, table); or
- (b) **a s**Specific part of a waterway, defined by the river-km (fairway hectometer of the **ID** according to Chapter VII, table **ISRS Location Code**) of the starting and the end point;
- (c) **a t**Time of validity (starting date and end date **according to Chapter VII, table of validity period**); and
- (d) **a d**Date of publication of the notice (date **and time** of publication **according to Chapter 7, table**).

53.2 Notices according to this standard can additionally be provided for example by:

- (a) **mobile applications (apps)** Wireless Application Protocol (WAP) services;
- (b) E-mail services.

53.3 Data exchange **among the systems operated in different countries** between the authorities is recommended. All the **authorities systems** using this standard can integrate Notices of other **authorities and countries systems** in their own services **provided the content remains unchanged. In order to ensure quality of information service, it is recommended to inform users in case the connection to a source of integrated NtS is not available.** The participating parties (authorities) can agree on the procedure of transmitting the XML messages by push or pull services directly.

## 64. Procedure for changes in the NtS reference tables and XML scheme of notices to skippers Standard

6.1—Proposals for amendments to the NtS standard reference tables or the XML scheme have to be sent together with an explanation, why the amendment is needed to the Chairperson of the Notices to Skippers Expert Group. Each member and/or observer of the NtS Expert Group is entitled to submit proposals and/or change requests in accordance with the change request procedures as described in the Terms of Reference for the NtS Expert Group by means of the agreed change request form.expert group.

The Chairperson shall distribute the proposal change requests to the members of the NtS Expert Group.

As regards the NtS Expert Group, the amendment procedure as defined in the Terms of Reference for the Notices to Skippers Expert Group shall apply. Change requests adopted by the NtS Expert Group are issued on the website of the RIS Expert Groups. Proposals that are adopted by the expert group will be published on the website of the Notices to Skippers expert group.

### 4.21 Amendment of the NtS Encoding Guide, the NtS XSD or the NtS WSDL

Proposals for amendment of the resolutions of the United Nations Economic Commission for Europe (UNECE) relating to the NtS International Standard for Notices to Skippers based on consolidated adopted proposals change requests are forwarded to the UNECE Working Party on Inland Water Transport in consultation with the UNECE secretariat. The UNECE secretariat will proceed with such amendment in accordance with the procedures established by the UNECE. In this context, one shall take due account of the work of the NtS expert group. If a proposal for an amendment of the relevant resolution of the UNECE based on consolidated proposals is adopted, the updated resolution is published by the UNECE secretariat.

### 4.2 Amendment of the NtS Reference Tables

NtS Reference Tables are maintained, amended and updated by the NtS Expert Group at <http://risdatamanagement.ris.eu> in order to ensure availability of the latest NtS Reference Tables at the ERDMS according to the procedure established by the NtS Expert Group. The chairperson of the NtS Expert Group informs regularly the Working Party on Inland Water Transport on the current status of the NtS Tables.

## 75. Structure of the messages NtS and coding in XML format

This chapter describes the structure and formatting of standardised electronic Notices to Skippers.

### 75.1 Structure of the notices to skippers General

75.1.1 Notices to Skippers' RIS messages have consist of the following information sections parts (Fig. 1):

- (a) Identification of the message section;
- (b) Fairway and traffic related message section;
- (c) Water level related messages section;
  - Water level messages;

- ~~▲ Least sounded depth—messages;~~
- ~~▲ Vertical clearance—messages;~~
- ~~▲ Barrage status—messages;~~
- ~~▲ Discharge messages;~~
- ~~▲ Regime messages;~~
- ~~▲ Predicted water level—messages;~~
- ~~▲ Least sounded predicted depth—messages;~~
- ~~▲ Predicted discharge—messages;~~
- (d) Ice ~~message~~**related section**;
- (e) Weather ~~messages~~**related section**.

~~75.1.2 A standardized message in XML format contains therefore also 4 different sections, in addition to the message identification mentioned in subparagraph (a) below, as shown in Fig. 7.1.2:~~

- ~~—— (a) Message identification;~~
- ~~—— (b) Fairway and traffic related messages;~~
- ~~—— (c) Water level related messages;~~
- ~~—— (d) Ice messages;~~
- ~~—— (e) Weather messages.~~

~~—— Normally i~~**n** one message only two sections will be filled: the ~~message~~ identification section and at least one of the following sections: Fairway and Traffic related ~~messages~~**sections**, Water ~~level~~ related ~~message~~**section**, Ice ~~message~~**related section** or Weather ~~message~~**related section** (mix of sections, **of** different ~~message~~ **message** -types ~~of message information~~ is not allowed).

**Notices to Skippers relate to a fairway (section) or a geographical object (point).**

## **5.2 Fairway and traffic related section**

**5.2.1—**The fairway and traffic related section **should** contains limitations for a ~~f~~**F**airway (link**section**) or an ~~Object~~**object and is used for the following purposes: A Notice to Skippers** relates to a Fairway or a geographical Object (point). ~~If the message is about an Object, the fairway section shall be filled with the related fairway information without the limitation section.~~

- **“Info service”:** not directly relevant for voyage planning or safety

**General Information that must not have direct relation to specific limitations (e.g. local rules of traffic, Inland ECDIS Update) thus not include a limitation.**

- **“Announcement”:** relevant for voyage planning or safety

**The announcement may contain limitations – (sécurité) (e.g. blockage of a lock chamber due to maintenance works, dredging on the fairway).**

- **“Warning”:** relevant for safety

**A warning must contain at least one limitation that results in direct and concrete endangerment of persons, crafts or facilities. – (pan pan) (e.g. welding**

**works on a bridge producing sparks, Inspection cage/workers hanging from a bridge, obstacle in the fairway).**

~~—— If a notice contains different limitations for different target groups or different communication information for different limitations, several fairway and traffic related sections with the same number can be used.~~

### **5.3 Water related section**

**5.3.1** The ~~Water~~**water** level related ~~message~~ section contains ~~measurements~~**values or predictions for:** for an Object usually a tide gauge.

- **water level;**
- **least sounded depth;**
- **vertical clearance;**
- **barrage status;**
- **discharge;**
- **regime.**

**5.3.2** Usually water related information are created and issued automatically based on data received from sensor equipment (e.g. tide gauge), systems (e.g. water level model) or infrastructure (e.g. barrage status). There may be different triggers for publication, e.g. periodically or when certain values are reached.

### **5.4 Ice related section**

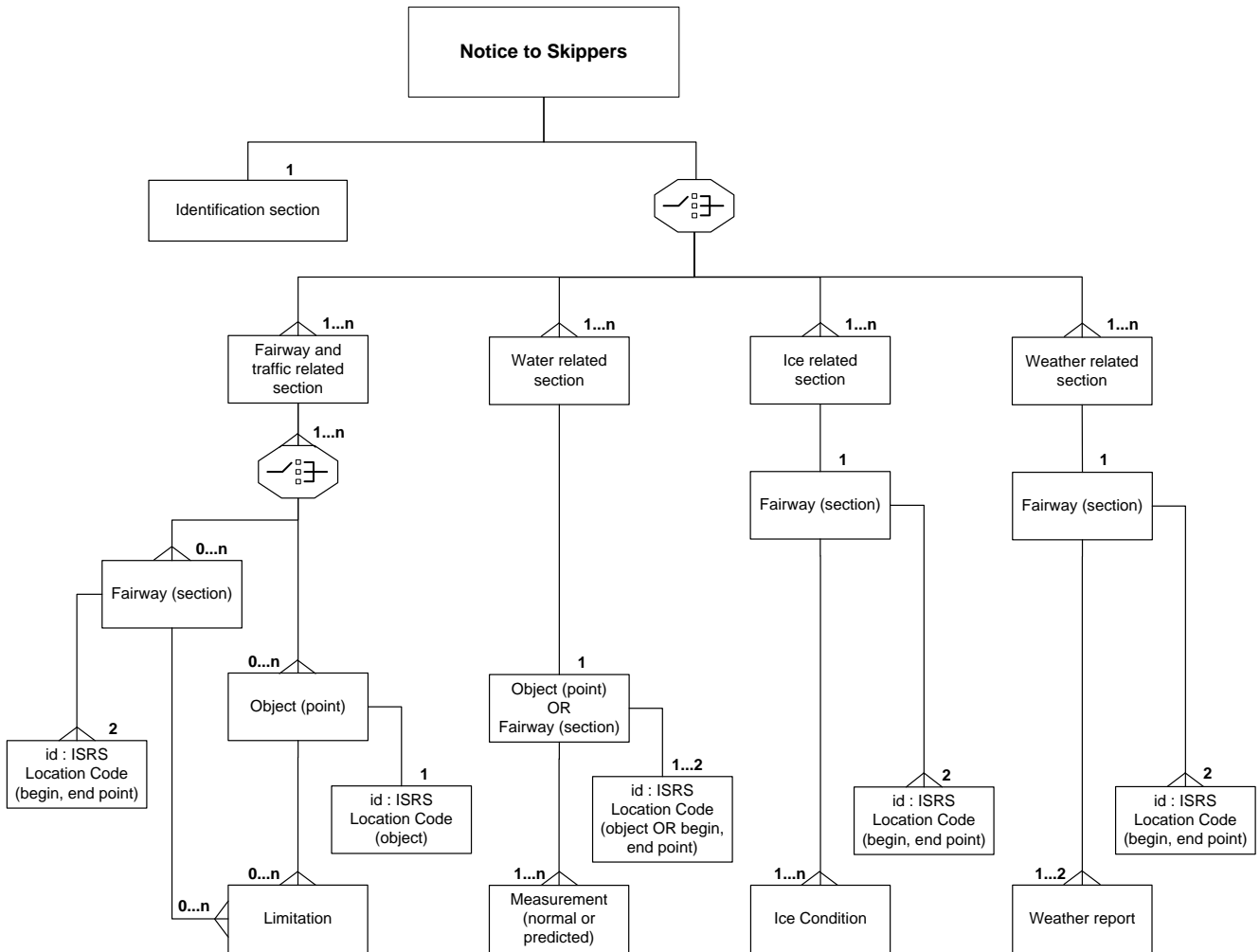
**5.4.1** The ~~Ice~~**ice** ~~message~~**related** section contains information about the **actual or predicted** ice conditions for a fairway (~~link~~**section**). **Ice related information –depend on local observation and assessment and will usually be edited by competent personnel.**

### **5.5 Weather related section**

**5.5.1** The ~~Weather~~**weather** message contains information about ~~the~~**(dangerous)** weather conditions for **inland navigation. In order to facilitate the distribution of hydro-meteo information from hydro-meteo networks to skippers, dedicated weather messages may be distributed as Notices to Skippers. a fairway (link).**



Figure 7.1.2  
**Notice to Skippers** NtS Message structure



**7.2.5.6 XML message-definition overview**

~~7.2.5.6.1 This section gives an overview of the definition of the message coded in XML. The XML XSD scheme for Notices to Skippers (see Table 7.2.1) containing a complete definition for all the XML elements including the possible formats, is included in Appendix C, maintained by the Notices to Skippers Expert Group.~~

Table 7.2.1  
**XML message definition (is deleted)**

- ~~— The following rules apply to the table:~~
- ~~(a) In one message at least 2 sections have to be filled in:~~
  - ~~• the identification section (1);~~
  - ~~• one of the sections:~~
    - ~~• Fairway and traffic related messages (2);~~
    - ~~• Water level related message (3);~~
    - ~~• Ice message (4);~~

~~▲ Weather message (5):~~

- ~~—— (b) Group 2.11 (fairway section) is also available for object related messages (no. 2.12);~~
  - ~~—— (c) Group 2.12 (objects) is not available for fairway related messages (no. 2.11);~~
  - ~~—— (d) In group 4.3, at least one of the conditional elements 4.3.3 to 4.3.6 have to be filled in;~~
  - ~~—— (e) If a conditional group contains mandatory subgroups or elements, these are only mandatory if the group on the higher level is applied;~~
  - ~~—— (f) Only mandatory for water levels and vertical clearances;~~
  - ~~—— (g) A fairway section is defined by the begin and end coordinates (2 sets of coordinates);~~
  - ~~—— (h) An object is defined by the coordinates of its center point (1 set of coordinates);~~
  - ~~—— (i) A wrm\_geo\_object has 2 sets of coordinates in case the type\_code is FWY, otherwise only 1 set of coordinates is to be used;~~
  - ~~—— (j) Mandatory if measure\_code is either "DIS", "VER", "LSD" or "WAL";~~
  - ~~—— (k) Mandatory if measure code is "BAR";~~
  - ~~—— (l) Mandatory if measure code = "REG";~~
  - ~~—— (m) Predictions for different periods require individual weather messages;~~
  - ~~—— (n) May contain combinations of weather\_class\_code tags.~~
- ~~—— The meaning of the different tags used in the XML definition is described on the page "Tags" of the reference table for Notices to Skippers.~~
- ~~7.2.2 The meaning of the different codes used in the XML definition is described in the reference tables for Notices to Skippers. The formats and possible values of all XML elements are described in the XML Scheme for Notices to Skippers.~~
- ~~—— (a) Notices to Skippers can be divided into two categories, namely URGENT and NOT URGENT. Urgent notices always contain a limitation for shipping traffic. There must therefore be one or more records in the limitations section. If there is no limitation section, the message is not urgent;~~
  - ~~—— (b) Latitude (Lat) and Longitude (Long) coordinates are referred to WGS 84 and presented in degrees and minutes with at least three, but preferable four decimals (dd mm.mmmm N, ddd mm.mmmm E);~~
  - ~~—— (c) Decimals in numeric fields are indicated with a decimal point ("."). No thousand separators are used;~~
  - ~~—— (d) Only cm, m<sup>3</sup>/s, h, km/h, kW, Bft (wind), mm/h (rain) and degree Celsius are allowed to be used as units;~~
  - ~~—— (e) For Waterways there is no Objects section. For Objects (bridges, etc.) the waterway section shall be included;~~
  - ~~—— (f) The location code according to the technical specification for electronic ship reporting has to be used as unique ID.~~

## 5.7 Explanation of elements

### ~~7.2.3 Subject codes assigned to the notices to skippers~~

**5.7.1** The meaning of the different elements used in the XML definition is described in the NtS Reference Tables provided via the ERDMS at <http://risdatamanagement.ris.eu>. The formats and possible values of all XML elements are described in the NtS XSD in Appendix C.

Latitude and longitude coordinates are referred to WGS 84 and 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).

Decimals in numeric fields are indicated with a decimal point (“.”). No thousand separators are used.

Only cm, m<sup>3</sup>/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.

**5.7.2** [The ISRS Location Code according to chapter 2.7 of the standard for electronic ship reporting]<sup>2</sup> has to be used in the Geo object section to uniquely identify objects and fairway sections and to ensure interoperable RIS Systems and Services (e.g. to combine information about infrastructure from the RIS Index, Inland ECDIS and NtS for voyage planning). The RIS Indexes, the ISRS Location Codes (and the reference data of objects) are maintained by the competent authorities and submitted to the ERDMS at <http://risdatamanagement.ris.eu>.

## 5.8 NtS Encoding

**5.8.1** NtS shall be published in line with the NtS Encoding Guide for editors (Appendix A) and in line with the NtS Encoding Guide for application developers (Appendix B). Examples for the encoding of common situations are also published on the website of the RIS Expert Groups at <http://www.ris.eu/>.

## Annex 2

### **Draft appendices to the International Standard for Notices to Skippers in Inland Navigation (annex to Resolution No. 80)**

The following appendices were approved by NtS Expert Group and are referred to in Annex 1 to the present document:

- Appendix A: NtS Encoding Guide for editors;
- Appendix B: NtS Encoding Guide for application developers;
- Appendix C: NtS XML Schema Definition (XSD);
- Appendix D: NtS Web Service Specification (WSDL).

At the present time they are available in English only and can be found at [www.unece.org/trans/main/sc3/wp3/wp3doc\\_2016.html](http://www.unece.org/trans/main/sc3/wp3/wp3doc_2016.html).

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<sup>2</sup> Resolution No. 79; if the proposed change is approved by SC.3/WP.3, then it needs to be updated (note of the secretariat).