ANNEX 17
NOTICES TO SKIPPERS ENCODING GUIDE FOR EDITORS

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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
XSD	XML Schema Definition

1.   Background and Structure

ES-RIS 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 the NtS XSD and the NtS Web Service WSDL as described in Annex 19 and Annex 20 respectively.

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 corresponds to Annex 17.

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 corresponds to Annex 18.

2.   Applicability of NtS messages

An NtS message may relate to object(s) and/or network part(s). Objects are defined in the Reference Data and may be selected by editors upon creation of a message. In NtS messages objects are defined in the 'geo location' section of the NtS XSD.

A network part is defined by a start- and endpoint within the waterway network. There has to be an unambiguous route between the start- and the endpoint which have to lie on the same waterway (only one waterway name is possible between start- and endpoint). In combination with the fairway_name an unambiguous route can be provided (sidearms and potential shortcuts with different fairway_names would be excluded).

If the network_part spans over more than one waterway the NtS editor application may provide functionality to easily select routes or areas to be included within one message.

3.   Selection of the NtS message type

   a)   FTM

         Choose this type if you want to create a „Fairway and traffic related message" for network parts or objects on the waterway (go to paragraph 4).

   b)   WRM

         Choose this type if you want to create a „Water related message", which enables provision of information on current and forecasted water levels as well as other information. The water related message contains information for an object or a network part (go to paragraph 6).

   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 network part (go to paragraph 7).

   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 network part (go to paragraph 8).

4.   FTM basic considerations, steps towards publication of an FTM

       Detailed information which codes have to be used is given in paragraph 5. The considerations beginning from paragraph 4.4 are not necessarily in the input order of an FTM editor tool.

4.1   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.

4.2   Does a valid FTM already exist related to the current situation (related to the content as well as to the time of validity)?

   a)   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.

   b)   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).

4.3   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. The free text shall be kept as short as possible and only include essential information.

4.4   The geographical range of validity is to be set

4.4.1   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).

In case an FTM applies to several objects they can all be included in one FTM.

4.4.2   In case the FTM is related to a specific network part the start- and end points have to be defined (unambiguous route possible between start- and endpoint). If the content applies to several waterways they can all be listed in one FTM including all affected network parts.

4.4.3   Combination of object- and network part related information is possible within one message as long as the information relates to one specific cause/event (same subject and reason code).

4.4.4   The detailed geographic impact of an NtS may be added to the message. It is used for visualisation in web-applications and Apps, and not for navigational purposes.

In case of a network_part, it is advised to automatically generate the geographic impact based upon the coordinates (stretch based upon geo_location_from and geo_location_to).

The geographic_impact in the NtS message shall be in line with the information (fairway/waterway coordinates/objects) published in Inland ENCs (in case Inland ENCs are available for the area).

4.5   The limitation section is to be entered if applicable

If limitations are applicable they have to be included in the FTM as defined in paragraph 5.3.

If values bound to limitations are known they have to be stated. Values for ship dimensions, speed limit and available space for navigation are obliged to be given.

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).

In case the date end of a limitation is known it has to be included in the FTM.

If known also time start and time end of the limitation have to be provided.

The limitation period of a limitation has to lie within the validity period of an FTM, limitation periods outside the validity period of an FTM are not valid and shall not be taken into account for voyage planning and display to users in applications.

The only exception where it is allowed that a limitation period exceeds the validity period of the message is when a limitation is withdrawn. The limitation is ended by means of the withdrawal date. The limitation periods stay as they were thus may exceed the validity period of the message. Because of the set withdrawal date the limitations are not valid any more. The withdrawn date has to be set to the current time or to the past.

For example maintenance works on a lock are completed earlier as originally announced. In this case the limitation periods stay as originally announced, only the withdrawn date and time is set to the actual end date of the blockage.

4.6   The target group(s) concerning the type of vessels and affected directions is/are to be entered if applicable

4.6.1   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.

4.6.2   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)).

4.6.3   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).

4.6.4   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.

4.7   The validity period of the message is to be set.

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. Editors have the obligation to check published messages periodically to set an end date as soon as known or to withdraw messages or limitations that are not applicable any more to ensure that only actual and valid messages are displayed to the users.

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.
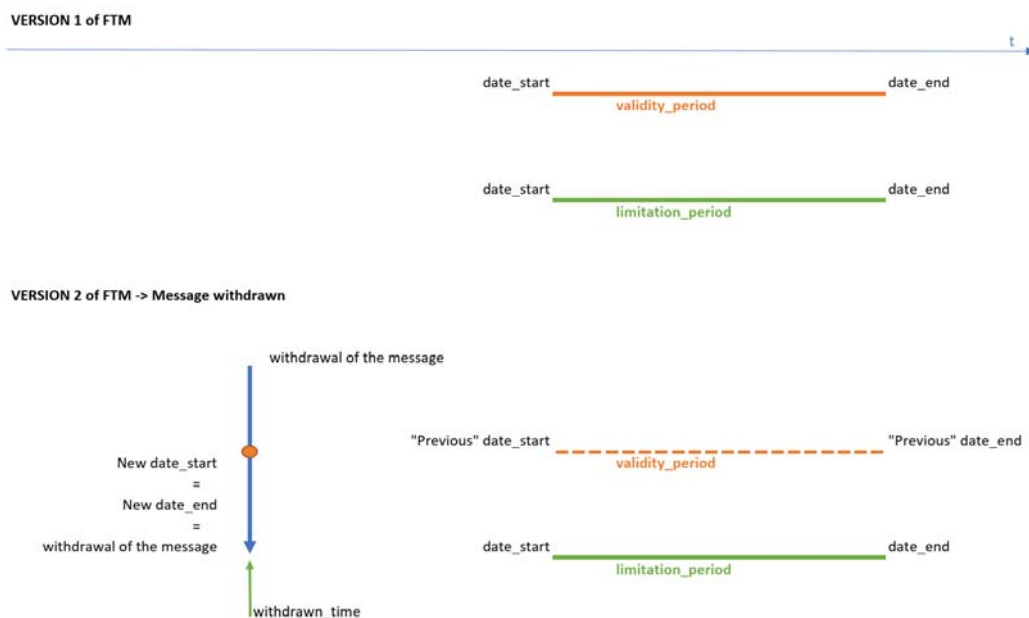
4.8   Notice withdrawn

A notice is withdrawn in case a notice was published but it becomes obsolete because

-     the announced limitations will not become effective (e.g. dredging was planned but cannot be started due to high water level).

-     the announced limitations started but end right away before their original indicated end date (e.g. maintenance works end earlier than originally planned).

In case the entire message is withdrawn before its validity has begun (see Figure 17-1)

-     the notice withdrawn flag is set to true.

-     the content of the message itself must remain the same, with exception of the validity period. The start and end date of the message are set to present date.

-     the withdrawn time has to be filled out for all limitation periods with present date

Figure 17-1
Validity period of FTM not started yet

In case the entire message is withdrawn after its validity has begun (see Figure 17-2)

-     the notice withdrawn flag is set to true.

-     the content of the message itself must remain the same, with exception of the validity end date of the message which is set to present date.

-     the withdrawn time has to be filled out for all limitation periods and must not be in the future

Figure 17-2
Validity period of FTM is started

In case individual limitations are withdrawn but other limitations of the message stay valid

- this is an update of the message but not a withdrawal of the entire message;
- the notice withdrawn flag is not included in the message;
- the withdrawn time has to be filled out for limitations that are withdrawn;
- the withdrawn time must not be in the future;
- limitations that stay valid may be updated if there is a change.

If there is another update of the message all previously withdrawn limitations are not provided in the updated message any more. This is to keep the content of the message as small as possible and to only indicate withdrawn limitations compared to the previous message. A history of all withdrawn limitations is not kept inside of the message. As long as the message stays valid the notice withdrawn flag is not included in the message.

4.9   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.

4.10   The message can be published

5.   FTM explanation of codes

5.1   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). For 'Info service' a validity end date shall always be set.

5.2   Reason_code

The Reason code should be filled to give additional information to the skippers.

Table 17-1
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

5.3   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 (flood) gate,
-    through a specified point on the waterway,
-    on a specified section of the waterway network.

For other individual objects such as berth, terminal the limitation blockage must not be used as it would lead to wrong results of route- and voyage planners (a closed berth does not imply a blockage of the waterway in front of it). In case a berth is closed the limitations 'no mooring', 'no anchoring' or 'no berthing' shall be used.

b) partial obstruction:

The code may be used in case e.g. a lock/bridge is revised and it is not known to the editor which basin of the lock/opening of the bridge is blocked at the given time of the notice so a partial obstruction is valid for the whole lock complex\bridge. In addition the Position_code "variable" can be used. The use of this code shall be reduced to a minimum thus only be used if it is not possible to publish a notice for a specific lock basin or bridge opening.

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) permissible dimension:

Permissible vessel/convoy dimensions (length, breadth, height, draught) are sometimes to be handled as a pair and not separately. To give an example, the following maximum dimensions for formations might be applicable on a waterway:

-   Maximum length: 85 m,
-   Maximum breadth: 10.5 m,

OR

-   Maximum length: 110 m,
-   Maximum breadth: 9.6 m.

This means if a formation has a maximum length of 85 m it may be up to 10.5 m wide, but if the formation is longer (up to 110 m) it may only have a maximum breadth of 9.6 m.

A maximum of the following four limitations may be given in combination with each other:

-   length (maximum length of a vessel/convoy),
-   breadth (maximum breadth of a vessel/convoy),
-   height (maximum height of a vessel/convoy),
-   draught (maximum draught of a vessel/convoy).

For permissible dimensions absolute maximum values have to be provided (together with indication_code 'maximum')

f) 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 codes:

-   vessel draught,
-   vessel breadth,
-   convoy breadth,
-   vessel length,
-   convoy length,
-   vessel air draught.

If available an absolute value shall be provided.

g) If there are limitations related to available size of an object or a network part, the following codes are used:

- clearance height,
- available length,
- clearance width,
- available depth.

If available an absolute value shall be provided.

h) 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) shall be provided.

i) delay:

shall be used in case an obstruction/incident with a limited duration occurs at an object or on a network part 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.

j) If specific manoeuvres or actions are prohibited, the respective limitations are to be encoded. These limitations should only be encoded if they are not already announced via navigational signs or regulations that are encoded in the official Inland ENC unless it helps to provide a complete picture of the overall situation:

- 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.

k) 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 where 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.

l) no limitation:

should only be used in case it shall be explicitly stated that there are no limitations in a certain time period, for example when a lock which is normally used in locking process stands open because the water level at both sides is even.

5.4   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 01.01.2021, 00:00 hrs, until 31.03.2021, 23:59 hrs, but also blockage on 17.09.2021 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 – 07.04.2021 until 11.04.2021, 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. If possible, absolute times shall be provided to allow proper consideration of the limitation times in voyage planning applications.

d) night-time (as it is defined in CEVNI):

The term "night" means the period between sunset and sunrise. If possible, absolute times shall be provided to allow proper consideration of the limitation times in voyage planning applications.

e) Days of the week:

If there are intervals related to different days of the week these have to be selected from the following codes:

- 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) "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.

5.5   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.

5.5.1   If absolute dimensions or references are known they have to be used because relative values can hardly be taken into account in voyage planning applications. Only if it is not possible to refer to an external reference system relative values should be used.

reduced by   →   this is a relative value

maximum   →   this is an absolute value

minimum   →   this is an absolute value

5.5.2   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)

5.5.3   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).

5.6   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.

5.7   Position_code (limitations):

5.7.1   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.

5.7.2   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.

5.7.3   If necessary, more precise position information should preferably be given by way of maps or sketches (Attachment, see paragraph 4.9)

5.7.4   For network parts 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.

5.8   Target_group_code (see paragraph 4.6)

5.9   Reporting_code

5.9.1   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.

5.9.2   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.

5.9.3   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).

5.10   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: 'https://example.com'
-   Sound signalling: 'long blast / langer Ton'
-   E-mail: 'example@authority.eu'
-   EDI mailbox number: '900012345@edi.bics.nl'
-   Teletext: 'ARD, 992 - 995'

5.11   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
-   distance mark (A distance mark is used to indicate a certain location on the waterway)

- 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)
- harbourigure
- 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).

6.   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.

7.   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. The ice is not necessarily causing a limitation thus also information about ice not hindering navigation may be feasible.

7.1   Is there a need to publish information via NtS ICEM?

The first ice message for a network part shall only be published in case of ice at the waterway or tributaries, also in case there are no limitations.

7.2   Does a valid ICEM already exist for the affected network part?

a)   Yes:

If a message for the affected stretch is (still) valid the already existing message may 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).

b)   No:

In case there is no valid ice message available for the affected stretch, a new message is to be created.

7.3   One ICEM is always valid for one single stretch of the waterway. The geographical range of validity is to be set by defining the network part.

7.4   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).

7.4.1   Ice_condition_code

7.4.2   Ice_accessibility_code

7.4.3   Ice_classification_code

7.4.4   Ice_situation_code (the ice situation code should always be provided to allow presentation of ice situation on a map e.g. using 'traffic light' colours).

7.5   The ICEM can be published. Ice messages will be valid automatically until the next day after publication or until as defined in national procedures.

8.   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).

9.   Rules for certain elements

9.1   Filling of elements "from", "publisher" and "source"

- The element "from" includes the name of the system the message was sent from.
- The element "publisher" includes the name of the organisation which published the message.
- The element "source" includes the organisation/department providing the information published in the message.

9.2   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.

A name of a Distance Mark shall only be given to provide extra information to be displayed to fairway users (for example nautical mile indication). If an object name is given it overrules the general logic that the information displayed to users is a combination of fairway name and fairway hectometre.

- E.g.: At the lower Danube the distance mark at km 1.8 is also the location of the nautical mile 1. The information on the nautical mile may be included in the object name of the distance mark to display it to the users as additional information.

9.3   Rules for the element "name" in the start and end point of a network part

Object names for the start and end point shall only be provided if it provides added value to the users (e.g. name of a bridge where the message applicability starts). For distance marks not object name shall be included unless information on nautical miles (or other relevant information for users) on that specific location shall be given.

9.4   Rules for elements including "object name", "fairway name" and "route name"

If a name is available / relevant in several languages translations may be provided including the language code in the attribute. This shall be done automatically from the reference data.

E.g. DE: "Staatsgrenze AT-SK"; SK: "Statna hranica AT-SK".

9.5   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. Editors applications may offer different units for the entering of the information and then convert it.

ANNEX 18
NOTICES TO SKIPPERS ENCODING GUIDE FOR APPLICATION DEVELOPERS

TABLE OF CONTENTS

Abbreviations

Abbreviation	Meaning
ID	Identification
NtS	Notices to Skippers
RIS	River Information Services
SOAP	Simple Object Access Protocol; network protocol typically used for web services
URL	Uniform Resource Locator; location of a network resource typically used for internet addresses
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

1.   Background & Structure

ES-RIS 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 the NtS XSD and the NtS Web Service WSDL as described in Annex 19 and Annex 20 respectively.

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 corresponds to Annex 17.

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 corresponds to Annex 18.

2.   Applicability of NtS messages

An NtS message may relate to object(s) and/or network part(s). Objects are defined in the Reference Data. An NtS editor application shall provide capabilities for editors to select such objects upon creation of a message. In NtS messages objects are defined in the 'geo_location' section of the NtS XSD.

A network part is defined by a start- and endpoint within the waterway network. There has to be an unambiguous route between the start- and the endpoint and the geo_location_from and geo_location_to have to lie on the same waterway (only one waterway name is possible between the geo_location_from and geo_location_to). In combination with the fairway_name an unambiguous route can be provided (sidearms and potential shortcuts with different fairway_names would be excluded).

If the network_part spans over more than one waterway, a network_part section for each waterway has to be defined within the same message. An NtS editor application may provide capabilities for editors supporting them in selecting routes or areas an NtS message applies to.

Optionally an unambiguous route can also be defined by providing the network_part within the geographic_impact section via coordinates in WKT (well-known-text) format.

3.   NtS messages and sections

An NtS message consists of the following:

a)   the identification section,

b)   one or more of the following sections according to the message type:

-    limitation(s) for the Fairway and traffic related message,

-    limitation(s) for the Water level related message,

-    ice condition(s) for the Ice related message,

-    weather report(s) for the Weather related message.

Figure 18-1
Visualisation of the NtS message structure
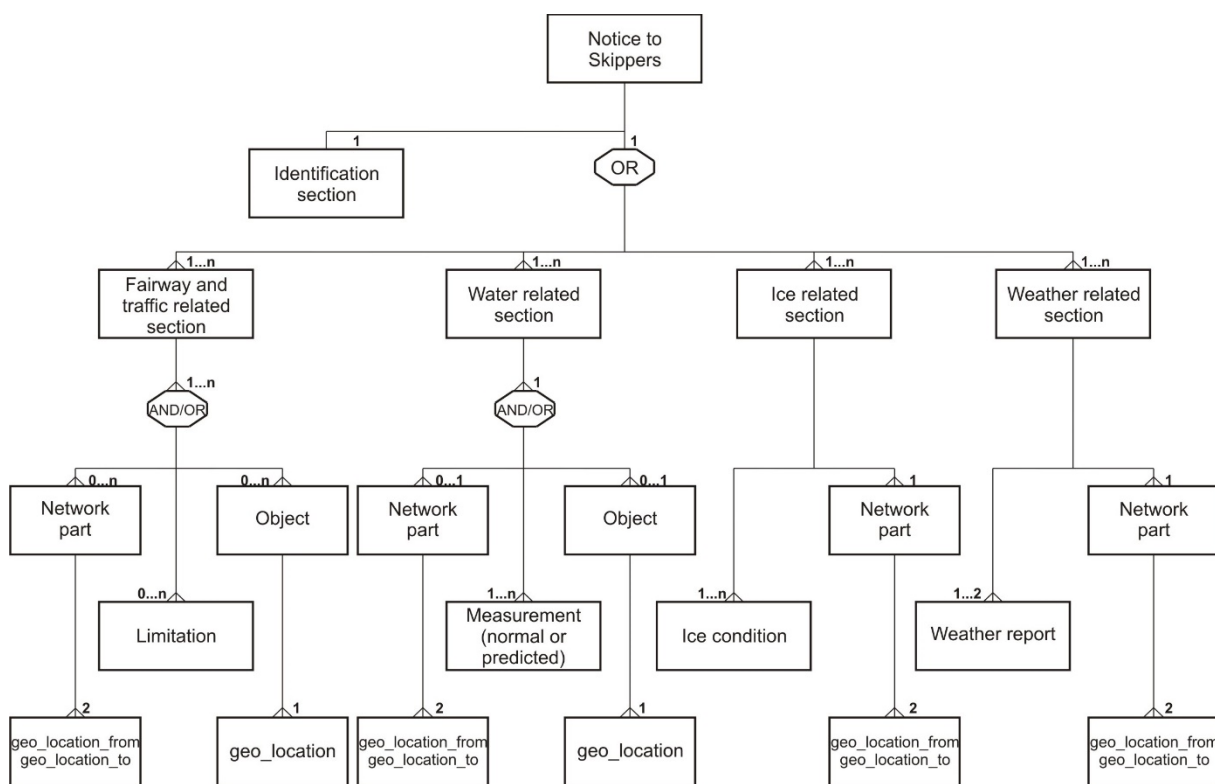
mandatory element (1),
mandatory element that may occur one or two times (1…2),
mandatory element that has to occur two times (2),
mandatory elements that may occur as often as necessary (1-n),
optional element that may occur as often as necessary (0…n).

The identification section 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 network parts and/or objects on the waterway (go to paragraph 7).

- Water level related section: a „Water Related Message" (WRM) facilitates provision of information on current and forecasted 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 network_part (e.g. least sounded depth for a network part, applicable regime at a network part) (go to paragraph 4).

- Ice related section: an „ICE Message" (ICEM) contains information about the ice conditions for a network part (go to paragraph 5).

- Weather related section: a "WEather Related Message" (WERM) enables provision of information on current as well as forecasted weather situations on a network part (go to paragraph 6).

4.   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 forecasts),
- Least sounded depth (including forecasts),
- Vertical clearance (including forecasts),
- Discharge (including forecasts),
- Barrage status,
- Regime.

Clarifications for translations in the spreadsheet "reference_code" are provided in paragraph 8.12.

Usually WRM are created and published automatically based on information received from sensor equipment or information received from infrastructure (e.g. forecasts, barrage status). There may be different triggers for WRM publication, e.g. periodically or when certain values are reached.

4.1   Filling of nts_number section in the WRM

In the NtS XSD described in Annex 19, 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).

4.2   Filling of WRM including forecasts

The date_start of validity_period has to be filled with present date (date_issue). In order to avoid WRM 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.

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 forecasts the "measure_date" is the date/time the forecast is valid for.

Water level forecasts always include a factor of uncertainty. Usually models with different parameters (e.g. weather forecast) are calculated leading to different forecasted water level values. To enable provision of a minimum and maximum forecasted value e.g. visualisation of a water level forecast confidence interval, two additional optional data fields are included in the WRM 'measure' section.

An illustration of water level forecast confidence interval is given in the following figure:

Figure 18-2
Visualisation of water level forecast confidence interval
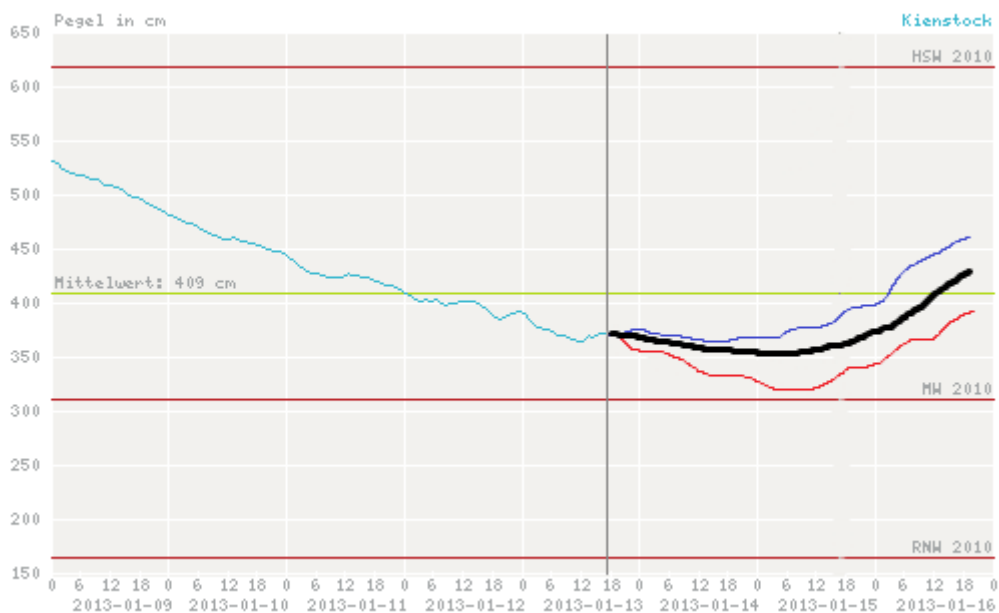
most probable value: black
confidence interval upper boarder: violet
confidence interval lower boarder: red

Two elements are available in the NtS XSD:

<value_min>   lowest value of confidence interval,

<value_max>   highest value of confidence interval.

Besides forecasted 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).

5.   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 network_part 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:

5.1   New ICEM
  a) NtS applications may offer NtS editors
    i)   to use existing notices as draft upon creation of new ICEM (e.g. if ice conditions are similar to the existing notice) and/or
    ii) to use notice templates for certain situations.
  b) The content (e.g. time of measurement or respective ice conditions) has to be entered by the editor in line with paragraph 7 of the NtS Encoding Guide for editors (Annex 17). The date and time of measurement could also be set by the application according to national definitions.
  c) When an NtS editor/publishers triggers the publication action,
    i)   it is checked if all mandatory content is provided in line with the NtS XSD (if no go back to (b)),
    ii) the nts_number is generated by the NtS application,
        -   the 'organisation' is filled with the name or code of the responsible organisation depending on the role of the publishing user,
        -   the 'year' is filled with the current year,
        -   the next available 'number' is assigned,
        -   the 'serial number' 0 is assigned,

iii) 'date_issue' is automatically filled with the actual date/time of publication action,

iv) 'validity_period' – 'date_start' is automatically filled with the actual date of publication,

v) '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).

5.2   Update of an existing ICEM

d)   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.

e)   The content (e.g. time of measurement or respective ice conditions) has to be altered by the editor in line with paragraph 7 of the NtS Encoding Guide for editors (Annex 17). The date and time of measurement could also be altered by the application according to national definitions.

f)   When an NtS editor/publisher triggers the publication action,

i)   it is checked if all mandatory content is provided in line with the NtS XSD (if not, go back to (b));

ii)   the nts_number is generated by the NtS application,

-     the 'organisation' stays unchanged,

-     the 'year' stays unchanged,

-     the 'number' stays unchanged,

-     the 'serial number' is incremented (increased by 1);

iii)   'date_issue' is automatically filled with the actual date/time of publication action;

iv)   'validity_period' – 'date_start' is automatically filled with the actual date of publication;

v)   '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).

6.   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). In order to avoid WERM 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.

A WERM applies to a network part, i.e. area of applicability of the weather station (gauge).

Date and time of measurement/forecast have to be provided.

In case of forecasts the "measure date" is the date/time the forecast is valid for.

6.1   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).

6.2   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 meters	
14, dense fog	below 100 meters	
15, moderate fog	below 200 meters	
16, fog	below 1000 meters	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.

7.   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:

7.1   New FTM

    a)   NtS applications may offer NtS editors to

        i)   use existing notices as draft upon creation of new FTM and/or

        ii)   use notice templates for certain situations.

    b)   The content (e.g. time of validity, limitations) has to be entered by the editor in line with paragraph 4 and 5 of the NtS Encoding Guide for editors (Annex 17).

    c)   When an NtS editor/publisher triggers the publication action,

        i)   it is checked if all mandatory content is provided in line with the NtS XSD (if not go back to (b)),

        ii)   the nts_number is generated by the NtS application,

           -     the 'organisation' is filled with the content of the 'publisher' which is included in the identification section,

           -     the 'year' is filled with the current year,

           -     the next available 'number' is assigned, in case a dedicated number was entered by the NtS editor or an application process in step b) it is taken over (given that (Organisation/Year/Number/Serial) is unique as explained in paragraph 8.1),

           -     the 'serial number' 0 is assigned',

        iii)   date _issue' is automatically filled with the actual date/time of publication action.

7.2   Update/withdrawal of an existing FTM

    a)   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).

        i)   Expired FTM (which passed the validity_date_end) cannot be updated any more, if an update on an incident is nevertheless necessary the NtS editor has to create a new FTM.

        ii)   The "Notice withdrawn" flag is set to "true" when the entire message is withdrawn. The subject code of the previous version must remain the same.

        The content of the message itself must remain the same, with exception of the validity period.

           -     If the message did not become valid yet the validity start_date and validity date_end have to be set to present date (see Figure 18-3).

           -     If the message already became valid the validity date_start remains unchanged and the validity date_end has to be set to present date. (see Figure 18-4).

        Notice_withdrawn is an optional element and must not be included in the message if the notice is not withdrawn.

        The element notice_withdrawn is used instead of the subject code "CANCEL" (used in previous editions of the NtS standard). Even if a message is withdrawn the previous subject code ('announcement', 'warning', 'information service') is kept. This makes it possible to display that e.g. a 'warning' is withdrawn. The subject code "CANCEL" shall therefore no longer be used for new messages and shall be de-activated in NtS applications.

In addition to setting notice_withdrawn to "true" all individual limitations have to be withdrawn (fill in the withdrawn_time). Present date could be pre-set and changed by editors.

iii) FTM with "Notice withdrawn" flag set to "true" must not be considered for voyage planning (any more).

b) The content (e.g. time of validity, limitations) has to be altered by the editor in line with paragraph 4 and 5 of the NtS Encoding Guide for editors (Annex 17).

c) When an NtS editor/publisher triggers the publication action;

i) it is checked if all mandatory content is provided in line with the NtS XSD (if not go back to (b));

ii) the nts_number is generated by the NtS application,

- the 'organisation' stays unchanged,

- the 'year' stays unchanged,

- the 'number' stays unchanged,

- the 'serial number' is incremented (increased by 1);

iii) 'date_issue' is automatically filled with the actual date/time of publication action.

Figure 18-3
Validity period of FTM not started yet
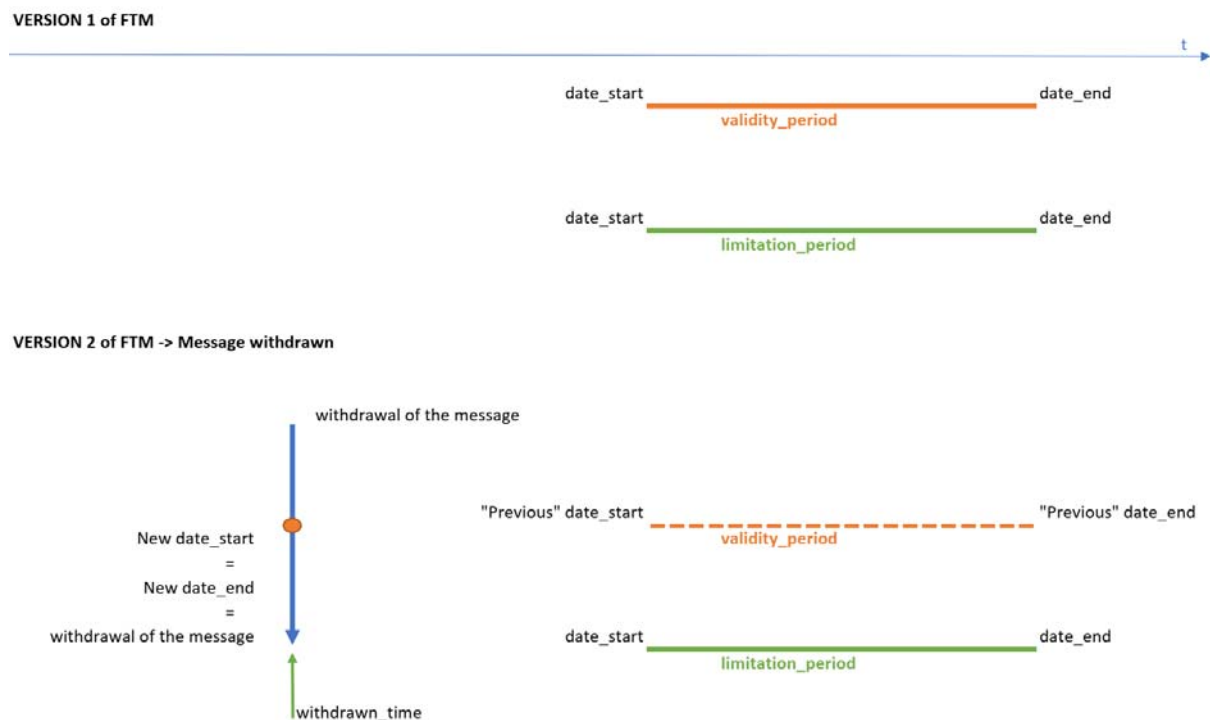
Figure 18-4
Validity period of FTM started
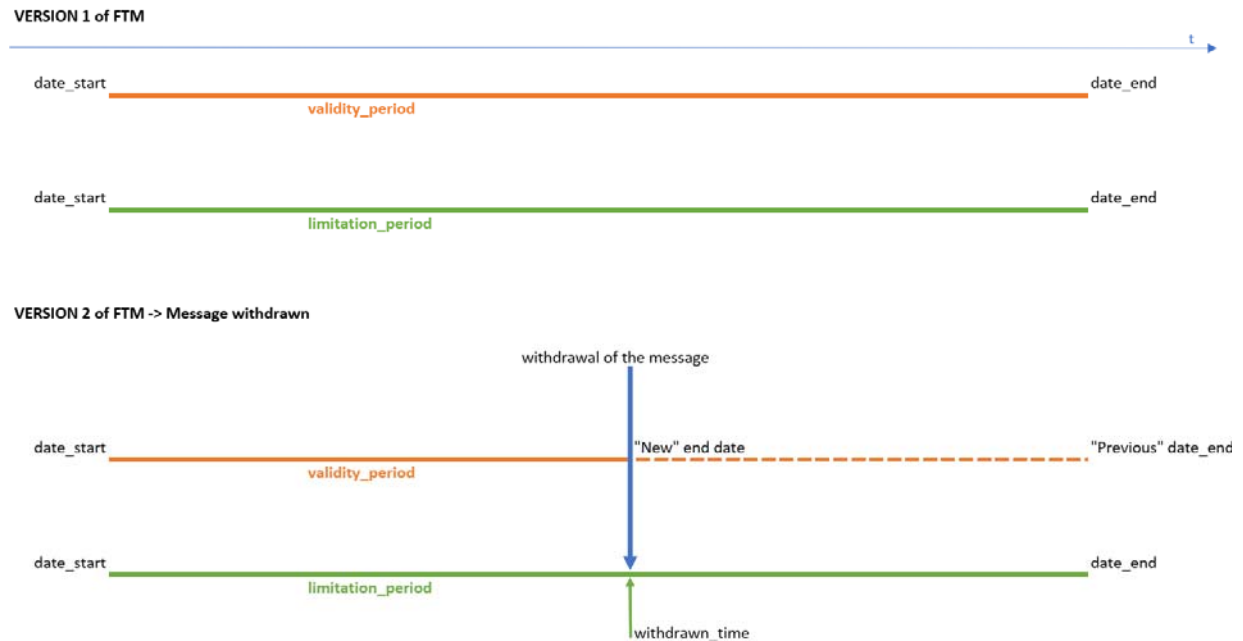
7.3 Handling of FTM limitation groups

a) At least one network part or object has to be included in an FTM_limitation_group

b) Limitation_groups that apply to different network parts and/or objects have to be included in different FTM_limitation_groups together with the respective network parts and/or objects.

c) Limitations that are valid at different limitation periods have to be included in different limitation_groups.

d) Limitations with the same limitation periods should be grouped/listed together in one limitation_group to support reader-friendly display.

e) All limitations have to include a limitation period with an interval code in order to allow proper calculations within voyage planning applications.

f) The NtS editor tools should provide a function to select more than one limitation code for specific limitation period(s) and automatically create the required limitation groups based on the information entered by the NtS editor.

g) "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 as well.

h) "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 message editors.

i) Logic and display of information applicable in case of interval code 'continuous' (default):

<date_start>2022-04-01+01</date_start>,

<date_end>2022-06-30+02</date_end>,

<time_start>06:00:00</time_start>,

<time_end>10:00:00</time_end>,

<interval_code>CON</interval_code>.

If the interval_code is continuous, the start_time refers to the start_date only and the end_time refers to the end_date only, e.g. from 1 April 06:00 to 30 June 10:00.

j) Logic and display of information applicable in case of any other interval code than 'continuous':

<date_start>2022-04-01+01</date_start>,

<date_end>2022-06-30+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 refer to the respective interval_code, e.g. from 1 April to 30 June Monday to Friday from 06:00 to 10:00.

k) The limitation time end always has to be filled in the last version of a message unless the respective limitation is withdrawn and therefore the withdrawn_time is set instead.

l) If a limitation "time_start" is not filled out by the editor the value "00:00" is automatically included in the message.

m) If a limitation "time_end" is not filled out by the editor the value "23:59" is automatically included in the message.

n) The limitation period of a limitation has to lie within the validity period of an FTM, limitation periods outside the validity period of an FTM are not valid and shall not be taken into account for voyage planning and display to users in applications. In case a limitation is withdrawn the withdrawn_time has to be within the validity period of the message. In this case the limitation date_end and time_end are not considered any more thus may exceed the validity date_end of the message.

o) When withdrawing a limitation_period, the withdrawn_time must be provided with a timestamp which is ether equal to the date of publication of the NtS message or a timestamp which is in the past. It is not allowed to enter a timestamp in the future.

p) In case several limitations are present in the message but only one of them is withdrawn the content of the limitation_group is to be split in two limitation_groups. One limitation_group ends (and has the withdrawn_time set) and the other one stays valid (no withdrawn_time set).

q) In case a message is updated and one or more limitations are withdrawn, the withdrawn_time is provided for these limitations. If there is another update of the message all previously withdrawn limitations are not provided in the updated message any more. This is to keep the content of the message as small as possible and to only indicate withdrawn limitations compared to the previous message. A history of all withdrawn limitations is not kept inside of the message.

r) Depending on the limitation usually no value or exactly one value is provided. The limitation code 'PERDIM' (permissible dimension) is an exception. For 'PERDIM' a minimum of two and a maximum of four values shall be provided together with the dimension_type:

- LEN: length (maximum length of a vessel/convoy),
- BRE: breadth (maximum breadth of a vessel/convoy),
- HEI: height (maximum height of a vessel/convoy),
- DRA: draught (maximum draught of a vessel/convoy).

The indication_code 'MAX' (maximum) has to be used together with the limitation_code 'PERDIM'.

The unit (cm) has to be provided together with the limitation_code 'PERDIM'.

s) All provisions set in this paragraph have to be considered by NtS applications automatically reducing manual editor interactions as much as possible.

7.4 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:

Table 18-1
Order of limitations according to severity

Rank	Value	Meaning (EN)
1	OBSTRU	blockage
2	PAROBS	partial obstruction
3	NOSERV	no service
4	SERVIC	changed service
5	PERDIM	permissible dimension
6	VESDRA	vessel draught
7	VESBRE	vessel breadth
8	CONBRE	convoy breadth
9	VESLEN	vessel length
10	CONLEN	convoy length
11	CLEHEI	clearance height
12	VESHEI	vessel air draught
13	AVALEN	available length
14	CLEWID	clearance width
15	AVADEP	available depth
16	LEADEP	least depth sounded
17	DELAY	delay
18	ALTER	alternate traffic direction

Rank	Value	Meaning (EN)
19	TURNIN	no turning
20	PASSIN	no passing
21	OVRTAK	no overtaking
22	NOBERT	no berthing
23	NOMOOR	no mooring
24	ANCHOR	no anchoring
25	SPEED	speed limit
26	WAVWAS	no wash of waves
27	NOSHORE	not allowed to go ashore
28	MINPWR	minimum power
29	CAUTIO	special caution

8.   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.

8.1   Filling of the "number_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).

8.2   Filling of elements "from", "publisher", "organisation" and "source"

The element "from" includes the name of the system the message was sent from (e.g. ELWIS, DoRIS, SLOVRIS, VisuRIS).

The element "publisher" includes the name of the organisation which published the message.

The element "source" includes the organisation/department providing the information published in the message.

The element "organisation" within the nts_number section is the name of the "publisher".

8.3 Omission of elements

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.

This concerns the following elements:
- Target Group: target_group_code ALL with direction_code ALL (if there are no other specific target groups within the message),
- position_code: AL.

8.4 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.

8.5 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.

8.6 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.

8.7 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.

8.8   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.

8.9   Rules for the element "waterway_hectometre"

The element "waterway_hectometre" includes the position of a location on a waterway. In general this position is deemed to be meaningful to the users thus displayed together with the "type_code" and "object_name" to the users.

For objects of the type "dismar" (distance mark) an object name shall only be given to provide extra information to be displayed to fairway users (for example nautical mile indication). If an object name is given it overrules the general logic that the information displayed to users is a combination of fairway name and fairway hectometre.

8.10   Rules for the elements "localisation_name", "location", "position_code" and "type_code"

The element localisation_name is mandatory for objects and optional for network parts. The "object_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 3.0 or higher. Examples for proper object names are also given in the NtS Encoding Guide for editors.

With more detailed information on each RIS Index object the NtS message contains more information to create a comprehensive visualisation to the end-user, which will look the same for all NtS messages of all authorities.

For RIS Index objects the following attributes are considered and shall be automatically filled from the RIS Index:
-    ISRS Location Code;
-    Main RIS Index key-attributes in separate fields:
    •   Country Code & UN Location Code,
    •   Fairway Section Code,
    •   Object Reference Code,
    •   Fairway Hectometre;
-    Object name of the impacted object(s) in one or more languages;
-    Location name of the impacted object(s) in one or more languages;
-    Object type of the impacted object(s).

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.

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 applications supporting editors in finding / selecting the proper objects based on the RIS Index function_code or the NtS type_code:

Table 18-2
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
bridge_12	G.1.5 Suspension Bridge	BRO	bridge opening
bridge_3	G.1.6 Swing Bridge	BRO	bridge opening
TUNNEL	G.1.7 Tunnel	TUN	tunnel
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
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
prtare	G.3.15 Port Area	HAR	harbour
refdmp	G.3.17 Refuse Dump	REF	refuse dump
termnl	G.3.19 Terminal	TER	terminal

Function Code	Function Code Meaning	Type Code	Type Code Meaning
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
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	CBR	canal bridge
gatcon_4	G.4.9 Lock Gate	BAR	weir
gatcon_2	G.4.9 Flood Barrage Gate	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
dismar	L.3.2 Distance Mark along Waterway Axis	DMR	distance mark
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

Function Code	Function Code Meaning	Type Code	Type Code Meaning
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
riscen	RIS centre	VTC	vessel traffic centre
trafp	Traffic Points (first reporting points)	REP	reporting point
junction	Waterway node / end of waterway / Junction		to be selected by editor

Legend:

green	Direct match (1:1 relation)
yellow	matching example, other TypeCodes possible (1:n relation)
blue	no direct match / to be selected by editor

8.11   Rules for the element "fairway_name" and "route_name"

To avoid application logic / necessity of proper reference data at the receiving system (software displaying the notice to the user) the element 'fairway_name' shall always be included in the network_part or 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.

If the "route_name" is included in the network_part or object it shall be filled automatically from the RIS Index.

8.12   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.

8.13   Recommendations for the element "geographic_impact"

A polygon consisting of an array of coordinates in WKT (Well-known-text) format may be defined to specify a geographic area for which messages apply.

The geographic impact of an NtS may be added to the message. It is used for visualisation in web-applications and Apps, and not for navigational purposes.

The following coordinate system must be used: WGS84 latitude/longitude (EPSG:4326).

The geographic impact shall be filled automatically from the reference data and correspond to the area of validity of the FTM message: In case of a network_part, it is advised to automatically generate the geographic impact based upon the coordinates (stretch based upon geo_location_from and geo_location_to).

The geographic_impact in the NtS message shall be in line with the information (fairway/waterway coordinates/objects) published in Inland ENCs (in case Inland ENCs are available for the area).

8.14   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.

8.15   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).

8.16   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)).

9.   NtS XML Message Structure

The NtS XML Message Structure and the content and purpose of data elements are defined and further explained in Annex 17: NtS XML Schema Definition (XSD).

10.   NtS Web Service

10.1   Objective

The NtS Expert Group identified the web service technology as an appropriate means to provide the Notices to Skippers.

This paragraph constitutes the specification of the web service for the provision of the Notices to Skippers, short NtS Web Service.

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, but focused on machine-to-machine interfacing. 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 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.

10.2   Basic Principles and constraints

10.2.1   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 and WSDL. The most relevant standards herein are

-    XML Schema Definition (XSD),

-    Simple Object Access Protocol (SOAP) and

-    Web Services Description Language (WSDL).

The response message of the NtS WS is an NtS message which is defined in XML Schema Definition (XSD) in Annex 19.

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 20. The schema of the NtS standard (XSD) is included with an import statement.

10.3   General specifications and recommendations

10.3.1   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 Temporary Working Group of CESNI/TI.

Hence, the version of the NtS Web Service specified here is 3.0.5.0, where 3.0 is the version of the web service itself and 5.0 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.

10.3.2   Specification: Structure of namespaces

The namespaces in the NtS Web Service are based on the web domain of CESNI/TI: https://ris.cesni.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:

https://ris.cesni.eu/_assets/NtS_MS/5.0.5.0/NtS_XSD_V.5.0.5.0.html

10.3.3   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.

10.3.4   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.

10.3.5   Definition of the ISRS Location Code

The ISRS Location Code is defined in Part III, Chapter 4, Article 4.03.

10.3.6   Definition of location attributes

Meaningful information with respect to the location of objects shall be extracted from the elements:
-    un_locode,
-    fairway_section_code,
-    object_reference_code,
-    fairway_hectometre.

These elements shall be filled automatically by the editor application with information from the RIS Index.

10.4   NtS Message Service (implementation specification)

In this paragraph the implementation specification of the NtS message service is given, deduced from the considerations and choices in the preceding paragraphs.

The NtS message service provides the four types of messages in the NtS:
-    NtS FTM (fairway and traffic related message),
-    NtS WRM (water related message),
-    NtS ICEM (ice message),
-    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.

10.4.1 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 WSDL allows for a number of filtering parameters, which resemble items of the message. With the filtering parameters it is possible for developers to accurately specify the information they want to provide to the user. There is no need to set up different Web Services for different subjects handled in NtS. A combination of multiple filtering parameters can be defined in the same request. The available filtering parameters are:

- Message Type: The NtS message type allows for filtering between FTM, WRM, ICEM or WERM. The Message Type is a mandatory request parameter, only one Message Type can be given in one request.
- Country Code: The two-digit country code allows for filtering of messages concerning a specific country.
- Date Issue: Either a single timestamp or a time span defined by two timestamps (from – to) can be specified for filtering messages, which have been published at a certain date and time (accuracy minutes, no seconds).
  - Provide only one timestamp: request all messages which are published since the given timestamp.
  - Provide two timestamps: request all messages which are published between both timestamps or on the start timestamp.
- Validity Period: Either a single date or a time span defined by two dates (from – to) can be specified for filtering messages, which are valid at a certain date.

10.4.2 Paging mechanism

In order to control the amount of data a paging mechanism must be 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.

The number of messages is the maximum number of NtS messages (the container) in the response of the message service. Inside an NtS message, which is the container – the envelope, an FTM, ICEM, WERM of WRM is present. To have a good control over the paging mechanism, one ICEM, WERM or WRM shall be provided inside the NtS envelop (according to the standard, it's prohibited to add more than one FTM in an NtS envelope).

If f.e. 100 WRM messages are inside one envelop, the sending and receiving system, do not have control over the paging and the size of the response message. And if the sending system want to control the size of the response, it would have to cut NtS messages in different parts (according to the amount of the "limit") and this way edit official send out messages, which could cause operational and possibly legal problems.

10.4.3   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.

The result is ordered ascending on the date_issue.

10.4.4   Error Handling

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 subparagraph.

One response of an NtS Web Service can contain NtS messages and error messages at the same time.

In the paging information 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.

10.4.5   Error messages

The error codes for the expected error situations are given below, together with an explanation. The error code together with the description is contained in the response.

Table 18-3
Error codes for the NtS message service

Code	Description	Explanation
e010	message type not supported	web service does not support the requested message type
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 e1xx-Codes
e110	incorrect message type	given message type is not known
e130	incorrect paging parameters	given parameters for the paging mechanism are erroneous
e140	country not supported	web service does not provide messages for the requested country
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

ES-RIS

Annex 19
Standardised NtS extended markup language (XML) schema definition, referred to as XSD,
standardised code values and possible formats

ANNEX 19
STANDARDISED NTS EXTENDED MARKUP LANGUAGE (XML) SCHEMA DEFINITION, REFERRED TO AS XSD,
STANDARDISED CODE VALUES AND POSSIBLE FORMATS

1.   Description of the XML tags

Nr.	Tag	Description	Remarks	Occurence M (mandatory) C (conditional)	Rule
	xmlns:nts="https://ris.cesni.eu/_assets/NtS_XSD/5.0.5.0"				
	<RIS_Message>	Notice to Skippers			
1s	<identification>	Identification section		M (1x)	1
1.1	<internal_id>xs:string (64)</internal_id>	Internal ID		C (0..1x)	
1.2	<from>xs:string (64)</from>	Sender (System) of the message		M (1x)	
1.3	<publisher>xs:string (64)</publisher>	Publisher (organisation) of the message		M (1x)	
1.4	<source>xs:string (64)</source>	The organisation/department providing the information published in the message		C (0..1x)	
1.5	<country_code>nts:country_code_enum</country_code>	Country where message is valid		M (1x)	
1.6	<language_code>nts:language_code_enum</language_code>	Original language used in the textual info (contents)		M (1x)	
1.7	<district>xs:string (64)</district>	District / Region within the specified country, where the message is applicable		C (0..1x)	
1.8	<date_issue>xs:dateTime<date_issue>	Date and time of publication including time zone		M (1x)	
1e	</identification>				

Nr.	Tag	Description	Remarks	Occurence	Rule
2s	<ftm>	Fairway and traffic related section		C (1..Nx)	1
2.1	<internal_id>xs:string (64)</internal_id>	Internal ID		C (0..1x)	
2.2s	<nts_number>	NtS number		M (1x)	
2.2.1	<organisation>xs:string (64)</organisation>	Name of the publishing organisation (NtS Provider)		M (1x)	
2.2.2	<year>xs:gYear (1900-9999)</year>	Year of first issuing of the notice		M (1x)	

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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)	Starting by 1, number is incremented for each published new message within the same year.	M (1x)	
2.2.4	`<serial_number>xs:integer (0-99)</serial_number>`	Serial number of notice (replacements and withdrawals), original notice: 0	Starting by 0 for initial version, serial number is incremented for each published change of this message.	M (1x)	
2.2e	`</nts_number>`				
2.3s	`<target_group>`	Target group information		C (1..Nx)	
2.3.1	`<target_group_code>nts:target_group_code_enum</target_group_code>`	Target group (vessel type)		M (1x)	5
2.3.2	`<direction_code>nts:direction_code_enum</direction_code>`	Upstream or downstream traffic, or both		M (1x)	5
2.3e	`</target_group>`				
2.4	`<subject_code>nts:subject_code_enum</subject_code>`	Subject code must contain one of the following: Announcement (ANNOUN), Warning (WARNIN) or Information service (INFSER). More information on the use of codes can be found in the NtS Encoding Guide.		M (1x)	
2.5	`<notice_withdrawn>xs:boolean</notice_withdrawn>`	Indication that the entire message is withdrawn. Notice Withdrawn flag set to "true" when the entire message is withdrawn, otherwise it should be ommited (value "false" should not be used). The subject code of previous version must remain the same.		C (0..1x)	
2.6s	`<validity_period>`	Overall period of validity		M (1x)	
2.6.1	`<date_start>xs:date</date_start>`	Start date of validity period including time zone		M (1x)	
2.6.2	`<date_end>xs:date</date_end>`	End date of validity period including time zone		C (0..1x)	
2.6e	`</validity_period>`				
2.7	`<contents>xs:string (500)</contents>`	Additional information in local language		C (0..1x)	
2.8	`<reason_code>nts:reason_code_enum</reason_code>`	Reason / justification of the notice		C (0..1x)	
2.9s	`<communication>`	Communication channel information		C (0..Nx)	
2.9.1	`<reporting_code>nts:reporting_code_enum</reporting_code>`	Reporting regime (information, or duty to report)		M (1x)	5
2.9.2	`<communication_code>nts:communication_code_enum</communication_code>`	Communication code (telephone, VHF etc.)		M (1x)	5

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Standardised NtS extended markup language (XML) schema definition, referred to as XSD,
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2.9.3	<number>xs:string (128)</number>	Telephone, VHF number (including callsign), e-mail address, URL or teletext		C (0..1x)	
2.9.4	<label>xs:string (256)</label>	Name of the attachment or additional information		C (0..1x)	
2.9.5	<remark>xs:string (1024)</remark>	Additional remarks concerning the communication		C (0..1x)	
2.9e	</communication>				
2.10s	<ftm_limitation_group>	FTM limitation group must contain at least one network_part or object		M (1..Nx)	
2.10.1s	<network_part>	An unambiguous part on the network delimited by two points		C (0..Nx)	2
2.10.1.1s	<geo_location_from>	Type of geographical object - start of network part		M (1x)	5, 7
2.10.1.1.1s	<location>	Detailed information of geographical object - extracted from RIS Index		M (1x)	
2.10.1.1.1.1	<isrs_code>xs:string (20)</isrs_code>	ISRS Location Code of the start of network part. Unique identification of the geo object as defined in RIS Index encoding guide.		M (1x)	
2.10.1.1.1.2	<type_code>nts:type_code_enum</type_code>	Type of geographical object		M (1x)	
2.10.1.1.1.3	<un_locode>xs:string (5)</un_locode>	UN Locode of geographical object - extracted from RIS Index		M (1x)	
2.10.1.1.1.4	<fairway_section_code>xs:string (5)</fairway_section_code>	Fairway section of geographical object - extracted from RIS Index		M (1x)	
2.10.1.1.1.5	<object_reference_code>xs:string (5)</object_reference_code>	Object Reference Code of geographical object - extracted from RIS Index		M (1x)	
2.10.1.1.1.6	<fairway_hectometre>xs:string (5)</fairway_hectometre>	Fairway hectometre of geographical object - extracted from RIS Index		M (1x)	
2.10.1.1.1.7s	<coordinate>	Coordinate		M (1x)	
2.10.1.1.1.7.1	<lat>xs:float</lat>	Latitude, encoded according to WGS 1984 (EPSG:4326) and presented in degrees with six decimals [d]d.dddddd (latitude)		M (1x)	
2.10.1.1.1.7.2	<long>xs:float</long>	Longitude, encoded according to WGS 1984 (EPSG:4326) and presented in degrees with six decimals [d][d]d.dddddd (longitude)		M (1x)	
2.10.1.1.1.7s	</coordinate>				
2.10.1.1.1e	</location>				
2.10.1.1.2s	<localisation_name>	Local and translated localisation names of the geographical object		C (0..1x)	

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2.10.1.1.2.1	<un_location_name language=nts:language_code_enum>xs:string (256)</un_location_name>	UN Location name of geographical object	Optional attribute - language	C (0..Nx)	
2.10.1.1.2.2	<object_name language=nts:language_code_enum>xs:string (256)</object_name>	Object name of geographical object	Optional attribute - language	M (1..Nx)	5
2.10.1.1.2e	</localisation_name>				
2.10.1.1e	</geo_location_from>				
2.10.1.2s	<geo_location_to>	Type of geographical object - end of network part		M (1x)	5, 7
2.10.1.2.1s	<location>	Detailed information of geographical object - extracted from RIS Index		M (1x)	
2.10.1.2.1.1	<isrs_code>xs:string (20)</isrs_code>	ISRS Location Code of the end of network part. Unique identification of the geo object as defined in RIS Index encoding guide.		M (1x)	
2.10.1.2.1.2	<type_code>nts:type_code_enum</type_code>	Type of geographical object		M (1x)	
2.10.1.2.1.3	<un_locode>xs:string (5)</un_locode>	UN Locode of geographical object - extracted from RIS Index		M (1x)	
2.10.1.2.1.4	<fairway_section_code>xs:string (5)</fairway_section_code>	Fairway section of geographical object - extracted from RIS Index		M (1x)	
2.10.1.2.1.5	<object_reference_code>xs:string (5)</object_reference_code>	Object Reference Code of geographical object - extracted from RIS Index		M (1x)	
2.10.1.2.1.6	<fairway_hectometre>xs:string (5)</fairway_hectometre>	Fairway hectometre of geographical object - extracted from RIS Index		M (1x)	
2.10.1.2.1.7s	<coordinate>	Coordinate		M (1x)	
2.10.1.2.1.7.1	<lat>xs:float</lat>	Latitude, encoded according to WGS 1984 (EPSG:4326) and presented in degrees with six decimals [d]d.dddddd (latitude)		M (1x)	
2.10.1.2.1.7.2	<long>xs:float</long>	Longitude, encoded according to WGS 1984 (EPSG:4326) and presented in degrees with six decimals [d][d]d.dddddd (longitude)		M (1x)	
2.10.1.2.1.7e	</coordinate>				
2.10.1.2.1e	</location>				
2.10.1.2.2s	<localisation_name>	Local and translated localisation names of the geographical object		C (0..1x)	
2.10.1.2.2.1	<un_location_name language=nts:language_code_enum> xs:string (256)</un_location_name>	UN Location name of geographical object	Optional attribute - language	C (0..Nx)	
2.10.1.2.2.2	<object_name language=nts:language_code_enum>xs:string (256)</object_name>	Object name of geographical object	Optional attribute - language	M (1..Nx)	5

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2.10.1.2.2e	</localisation_name>				
2.10.1.2e	</geo_location_to>				
2.10.1.3	<fairway_name language=nts:language_code_enum>xs:string (256)</fairway_name>	Waterway name	Optional attribute - language	M (1..Nx)	
2.10.1.4	<route_name language=nts:language_code_enum>xs:string (256)</route_name>	Route name	Optional attribute - language	C (0..Nx)	
2.10.1.5	<type_code>nts:type_code_enum</type_code>	Type of geographical object		M (1x)	
2.10.1.6	<geographic_impact>xs:string</geographic_impact>	Geographical impact via coordinates in WKT (Well-Known-Text) format		C (0..1x)	
2.10.1e	</network_part>				
2.10.2s	<object>	Object section		C (0..Nx)	2
2.10.2.1s	<geo_location>	Type of geographical object		M (1x)	5
2.10.2.1.1s	<location>	Detailed information of geographical object - extracted from RIS Index		M (1x)	
2.10.2.1.1.1	<isrs_code>xs:string (20)</isrs_code>	ISRS Location Code of the object. Unique identification of the geo object as defined in RIS Index encoding guide.		M (1x)	
2.10.2.1.1.2	<type_code>nts:type_code_enum</type_code>	Type of geographical object		M (1x)	
2.10.2.1.1.3	<un_locode>xs:string (5)</un_locode>	UN Locode of geographical object - extracted from RIS Index		M (1x)	
2.10.2.1.1.4	<fairway_section_code>xs:string (5)</fairway_section_code>	Fairway section of geographical object - extracted from RIS Index		M (1x)	
2.10.2.1.1.5	<object_reference_code>xs:string (5)</object_reference_code>	Object Reference Code of geographical object - extracted from RIS Index		M (1x)	
2.10.2.1.1.6	<fairway_hectometre>xs:string (5)</fairway_hectometre>	Fairway hectometre of geographical object - extracted from RIS Index		M (1x)	
2.10.2.1.1.7s	<coordinate>	Coordinate		M (1x)	
2.10.2.1.1.7.1	<lat>xs:float</lat>	Latitude, encoded according to WGS 1984 (EPSG:4326) and presented in degrees with six decimals [d]d.dddddd (latitude)		M (1x)	
2.10.2.1.1.7.2	<long>xs:float</long>	Longitude, encoded according to WGS 1984 (EPSG:4326) and presented in degrees with six decimals [d][d]d.dddddd (longitude)		M (1x)	
2.10.2.1.1.7e	</coordinate>				
2.10.2.1.1e	</location>				
2.10.2.1.2s	<localisation_name>	Local and translated localisation names of the geographical object		C (0..1x)	

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2.10.2.1.2.1	`<un_location_name language=nts:language_code_enum>xs:string (256)</un_location_name>`	UN Location name of geographical object	Optional attribute - language	C (0..Nx)	
2.10.2.1.2.2	`<object_name language=nts:language_code_enum>xs:string (256)</object_name>`	Object name of geographical object	Optional attribute - language	M (1..Nx)	5
2.10.2.1.2e	`</localisation_name>`				
2.10.2.1e	`</geo_location>`				
2.10.2.2	`<position_code>nts:position_code_enum</position_code>`	Position of the object related to the fairway		C (0..1x)	
2.10.2.3	`<fairway_name language=nts:language_code_enum>xs:string (256)</fairway_name>`	Waterway name	Optional attribute - language	M (1..Nx)	
2.10.2.4	`<route_name language=nts:language_code_enum>xs:string (256)</route_name>`	Route name	Optional attribute - language	C (0..Nx)	
2.10.2.5	`<geographic_impact>xs:string</geographic_impact>`	Geographical impact via coordinates in WKT (Well-Known-Text) format		C (0..1x)	
2.10.2e	`</object>`				
2.10.3s	`<limitation_group>`	Group of limitations and periods for Fairways and Objects		C (0..Nx)	
2.10.3.1s	`<limitation>`	Fairway section or object limitations		M (1..Nx)	5
2.10.3.1.1	`<limitation_code>nts:limitation_code_enum</limitation_code>`	Kind of limitation		M (1x)	
2.10.3.1.2	`<position_code>nts:position_code_enum</position_code>`	Describes the position of the limitation related to the fairway		C (0..1x)	
2.10.3.1.3	`<value dimension_type=nts:dimension_type_code_enum>xs:float</value>`	Value of limitation (i.e. max draught)	Optional attribute - dimension_type for the limitation 'Permissible dimension'	C (0..4x)	
2.10.3.1.4	`<unit>nts:unit_enum</unit>`	Unit of the value of the limitation (cm, m³/s, h, km/h, kW, m/s, mm/h, °C)	Unit has to be provided when a value is provided.	C (0..1x)	
2.10.3.1.5	`<reference_code>nts:reference_code_enum</reference_code>`	Value reference		C (0..1x)	
2.10.3.1.6	`<indication_code>nts:indication_code_enum</indication_code>`	Minimum or maximum or reduced by		C (0..1x)	
2.10.3.1.7s	`<target_group>`	Target group information		C (0..Nx)	
2.10.3.1.7.1	`<target_group_code>nts:target_group_code_enum</target_group_code>`	Target group (vessel type)		M (1x)	5
2.10.3.1.7.2	`<direction_code>nts:direction_code_enum</direction_code>`	Upstream or downstream traffic, or both		M (1x)	5
2.10.3.1.7e	`</target_group>`				
2.10.3.1e	`</limitation>`				
2.10.3.2s	`<limitation_period>`	Limitation periods / intervals		C (0..Nx)	

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2.10.3.2.1	<date_start>xs:date</date_start>	Start date of limitation period including time zone		M (1x)	5
2.10.3.2.2	<date_end>xs:date</date_end>	End date of limitation period including time zone		C (0..1x)	
2.10.3.2.3	<time_start>xs:time</time_start>	Start time of limitation period without time zone		C (0..1x)	
2.10.3.2.4	<time_end>xs:time</time_end>	End time of limitation period without time zone		C (0..1x)	
2.10.3.2.5	<interval_code>nts:interval_code_enum</interval_code>	Interval for limitation		M (1x)	
2.10.3.2.6	<withdrawn_time>xs:dateTime</withdrawn_time>	Date and time of withdrawal including time zone		C (0..1x)	
2.10.3.2e	</limitation_period>				
2.10.3e	</limitation_group>				
2.10e	</ftm_limitation_group>				
2e	</ftm>				

3s	<wrm>	Water related section		C (1..Nx)	1
3.1	<internal_id>xs:string (64)</internal_id>	Internal ID		C (0..1x)	
3.2s	<nts_number>	NtS number; optional for WRM		C (0..1x)	
3.2.1	<organisation>xs:string (64)</organisation>	Name of the publishing organisation (NtS Provider)		M (1x)	5
3.2.2	<year>xs:gYear (1900-9999)</year>	Year of first issuing of the notice		M (1x)	5
3.2.3	<number>xs:integer (0-99999999)</number>	Number of the notice (per year, starting with: 1, 0 shall not be used for published notices)		M (1x)	5
3.2.4	<serial_number>xs:integer (0-99)</serial_number>	Serial number of notice (replacements and withdrawals), original notice: 0		M (1x)	5
3.2e	</nts_number>				
3.3s	<validity_period>	Overall period of validity		M (1x)	
3.3.1	<date_start>xs:date</date_start>	Start date of validity period including time zone; has to be filled with present date (of publication) for WRM		M (1x)	
3.3.2	<date_end>xs:date</date_end>	End date of validity period including time zone; has to be filled with the day after publication for WRM		C (0..1x)	
3.3e	</validity_period>				
3.4s	<network_part>	An unambiguous part on the network delimited by two points	Network parts are applicable for least sounded depth and regime information in the WRM	C (0..1x)	2
3.4.1s	<geo_location_from>	Type of geographical object - start of network part		M (1x)	5, 7

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3.4.1.1s	\<location\>	Detailed information of geographical object - extracted from RIS Index		M (1x)
3.4.1.1.1	\<isrs_code\>xs:string (20)\</isrs_code\>	ISRS Location Code of the start of network part. Unique identification of the geo object as defined in RIS Index encoding guide.		M (1x)
3.4.1.1.2	\<type_code\>nts:type_code_enum \</type_code\>	Type of geographical object		M (1x)
3.4.1.1.3	\<un_locode\>xs:string (5) \</un_locode\>	UN Locode of geographical object - extracted from RIS Index		M (1x)
3.4.1.1.4	\<fairway_section_code\>xs:string (5) \</fairway_section_code\>	Fairway section of geographical object - extracted from RIS Index		M (1x)
3.4.1.1.5	\<object_reference_code\>xs:string (5) \</object_reference_code\>	Object Reference Code of geographical object - extracted from RIS Index		M (1x)
3.4.1.1.6	\<fairway_hectometre\>xs:string (5)\</fairway_hectometre\>	Fairway hectometre of geographical object - extracted from RIS Index		M (1x)
3.4.1.1.7s	\<coordinate\>	Coordinate		M (1x)
3.4.1.1.7.1	\<lat\>xs:float\</lat\>	Latitude, encoded according to WGS 1984 (EPSG:4326) and presented in degrees with six decimals [d]d.dddddd (latitude)		M (1x)
3.4.1.1.7.2	\<long\>xs:float\</long\>	Longitude, encoded according to WGS 1984 (EPSG:4326) and presented in degrees with six decimals [d][d]d.dddddd (longitude)		M (1x)
3.4.1.1.7e	\</coordinate\>			
3.4.1.1e	\</location\>			
3.4.1.2s	\<localisation_name\>	Local and translated localisation names of the geographical object		C (0..1x)
3.4.1.2.1	\<un_location_name language=nts:language_code_enum\>xs:string (256)\</un_location_name\>	UN Location name of geographical object	Optional attribute - language	C (0..Nx)
3.4.1.2.2	\<object_name language=nts:language_code_enum\>xs:string (256)\</object_name\>	Object name of geographical object	Optional attribute - language	M (1..Nx)	5
3.4.1.2e	\</localisation_name\>			
3.4.1e	\</geo_location_from\>			
3.4.2s	\<geo_location_to\>	Type of geographical object - end of network part		M (1x)	5, 7
3.4.2.1s	\<location\>	Detailed information of geographical object - extracted from RIS Index		M (1x)

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3.4.2.1.1	`<isrs_code>xs:string (20)</isrs_code>`	ISRS Location Code of the end of network part. Unique identification of the geo object as defined in RIS Index encoding guide.		M (1x)	
3.4.2.1.2	`<type_code>nts:type_code_enum</type_code>`	Type of geographical object		M (1x)	
3.4.2.1.3	`<un_locode>xs:string (5)</un_locode>`	UN Locode of geographical object - extracted from RIS Index		M (1x)	
3.4.2.1.4	`<fairway_section_code>xs:string (5)</fairway_section_code>`	Fairway section of geographical object - extracted from RIS Index		M (1x)	
3.4.2.1.5	`<object_reference_code>xs:string (5)</object_reference_code>`	Object Reference Code of geographical object - extracted from RIS Index		M (1x)	
3.4.2.1.6	`<fairway_hectometre>xs:string (5)</fairway_hectometre>`	Fairway hectometre of geographical object - extracted from RIS Index		M (1x)	
3.4.2.1.7s	`<coordinate>`	Coordinate		M (1x)	
3.4.2.1.7.1	`<lat>xs:float</lat>`	Latitude, encoded according to WGS 1984 (EPSG:4326) and presented in degrees with six decimals [d]d.dddddd (latitude)		M (1x)	
3.4.2.1.7.2	`<long>xs:float</long>`	Longitude, encoded according to WGS 1984 (EPSG:4326) and presented in degrees with six decimals [d][d]d.dddddd (longitude)		M (1x)	
3.4.2.1.7e	`</coordinate>`				
3.4.2.1e	`</location>`				
3.4.2.2s	`<localisation_name>`	Local and translated localisation names of the geographical object		C (0..1x)	
3.4.2.2.1	`<un_location_name language=nts:language_code_enum>xs:string (256)</un_location_name>`	UN Location name of geographical object	Optional attribute - language	C (0..Nx)	
3.4.2.2.2	`<object_name language=nts:language_code_enum>xs:string (256)</object_name>`	Object name of geographical object	Optional attribute - language	M (1..Nx)	5
3.4.2.2e	`</localisation_name>`				
3.4.2e	`</geo_location_to>`				
3.4.3	`<fairway_name language=nts:language_code_enum>xs:string (256)</fairway_name>`	Waterway name	Optional attribute - language	M (1..Nx)	
3.4.4	`<route_name language=nts:language_code_enum>xs:string (256)</route_name>`	Route name	Optional attribute - language	C (0..Nx)	
3.4.5	`<type_code>nts:type_code_enum</type_code>`	Type of geographical object		M (1x)	
3.4.6	`<geographic_impact>xs:string</geographic_impact>`	Geographical impact via coordinates in WKT (Well-Known-Text) format		C (0..1x)	

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3.4e	</network_part>				
3.5s	<object>	Object section	e.g. gauge station (for provision of water levels)	C (0..1x)	2
3.5.1s	<geo_location>	Type of geographical object		M (1x)	5
3.5.1.1s	<location>	Detailed information of geographical object - extracted from RIS Index		M (1x)	
3.5.1.1.1	<isrs_code>xs:string (20)</isrs_code>	ISRS Location Code of the object. Unique identification of the geo object as defined in RIS Index encoding guide.		M (1x)	
3.5.1.1.2	<type_code>nts:type_code_enum</type_code>	Type of geographical object		M (1x)	
3.5.1.1.3	<un_locode>xs:string (5)</un_locode>	UN Locode of geographical object - extracted from RIS Index		M (1x)	
3.5.1.1.4	<fairway_section_code>xs:string (5)</fairway_section_code>	Fairway section of geographical object - extracted from RIS Index		M (1x)	
3.5.1.1.5	<object_reference_code>xs:string (5)</object_reference_code>	Object Reference Code of geographical object - extracted from RIS Index		M (1x)	
3.5.1.1.6	<fairway_hectometre>xs:string (5)</fairway_hectometre>	Fairway hectometre of geographical object - extracted from RIS Index		M (1x)	
3.5.1.1.7s	<coordinate>	Coordinate		M (1x)	
3.5.1.1.7.1	<lat>xs:float</lat>	Latitude, encoded according to WGS 1984 (EPSG:4326) and presented in degrees with six decimals [d]d.dddddd (latitude)		M (1x)	
3.5.1.1.7.2	<long>xs:float</long>	Longitude, encoded according to WGS 1984 (EPSG:4326) and presented in degrees with six decimals [d][d]d.dddddd (longitude)		M (1x)	
3.5.1.1.7e	</coordinate>				
3.5.1.1e	</location>				
3.5.1.2s	<localisation_name>	Local and translated localisation names of the geographical object		M (1x)	
3.5.1.2.1	<un_location_name language=nts:language_code_enum>xs:string (256)</un_location_name>	UN Location name of geographical object	Optional attribute - language	C (0..Nx)	
3.5.1.2.2	<object_name language=nts:language_code_enum>xs:string (256)</object_name>	Object name of geographical object	Optional attribute - language	M (1..Nx)	
3.5.1.2e	</localisation_name>				
3.5.1e	</geo_location>				
3.5.2	<position_code>nts:position_code_enum</position_code>	Position of the object related to the fairway		C (0..1x)	

3.5.3	<fairway_name language=nts:language_code_enum>xs:string (256)</fairway_name>	Waterway name	Optional attribute - language	M (1..Nx)	
3.5.4	<route_name language=nts:language_code_enum>xs:string (256)</route_name>	Route name	Optional attribute - language	C (0..Nx)	
3.5.5	<geographic_impact>xs:string</geographic_impact>	Geographical impact via coordinates in WKT (Well-Known-Text) format		C (0..1x)	
3.5e	</object>				
3.6	<reference_code>nts:reference_code_enum</reference_code>	Value reference (measurement reference)		C (0..1x)	6
3.7s	<measure>	Measurements (real measurements or forecasts)		M (1..Nx)	
3.7.1	<forecast>xs:boolean</forecast>	Forecast (true) or real measurement (false)		M (1x)	
3.7.2	<measure_code>nts:measure_code_enum</measure_code>	Kind of water related information		M (1x)	
3.7.3	<value>xs:float</value>	Forecast or real measured value		C (0..1x)	8
3.7.4	<value_min>xs:float</value_min>	Lowest value of confidence interval		C (0..1x)	
3.7.5	<value_min>xs:float</value_min>	Highest value of confidence interval		C (0..1x)	
3.7.6	<unit>nts:unit_enum</unit>	Unit of the water related value (cm, m^3/s)	Unit has to be provided when a value is provided.	C (0..1x)	
3.7.7	<barrage_code>nts:barrage_code_enum</barrage_code>	Barrage status		C (0..1x)	9
3.7.8	<regime_code>nts:regime_code_enum</regime_code>	Regime applicable		C (0..1x)	10
3.7.9	<measuredate>xs:dateTime</measuredate>	Date and Time of forecast or measurement value including time zone Format=yyyy-mm-ddThh:mm:ss+hh:mm		M (1x)	
3.7.10s	<difference>	Difference with comparative value		C (0..1x)	
3.7.10.1	<value_difference>xs:float</value_difference>	Difference with comparative value		M (1x)	5
3.7.10.2	<time_difference>xs:duration</time_difference>	Time difference to measuredate of comparative value		M (1x)	5
3.7.10e	</difference>				
3.7e	</measure>				
3e	</wrm>				

4s	<icem>	Ice related section		C (1..Nx)	1
4.1	<internal_id>xs:string (64)</internal_id>	Internal ID		C (0..1x)	
4.2s	<nts_number>	NtS number		M (1x)	
4.2.1	<organisation>xs:string (64)</organisation>	Name of the publishing organisation (NtS Provider)		M (1x)	

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4.2.2	`<year>xs:gYear (1900-9999)</year>`	Year of first issuing of the notice		M (1x)	
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 (1x)	
4.2.4	`<serial_number>xs:integer (0-99)</serial_number>`	Serial number of notice (replacements and withdrawals), original notice: 0		M (1x)	
4.2e	`</nts_number>`				
4.3s	`<validity_period>`	Overall period of validity		M (1x)	
4.3.1	`<date_start>xs:date</date_start>`	Start date of validity period including time zone	To be filled with present date (date_issue)	M (1x)	
4.3.2	`<date_end>xs:date</date_end>`	End date of validity period including time zone	To be pre-filled with the day after publication	C (0..1x)	
4.3e	`</validity_period>`				
4.4s	`<network_part>`	An unambiguous part on the network delimited by two points		M (1x)	
4.4.1s	`<geo_location_from>`	Type of geographical object - start of network part		M (1x)	5, 7
4.4.1.1s	`<location>`	Detailed information of geographical object - extracted from RIS Index		M (1x)	
4.4.1.1.1	`<isrs_code>xs:string (20)</isrs_code>`	ISRS Location Code of the start of network part. Unique identification of the geo object as defined in RIS Index encoding guide.		M (1x)	
4.4.1.1.2	`<type_code>nts:type_code_enum</type_code>`	Type of geographical object		M (1x)	
4.4.1.1.3	`<un_locode>xs:string (5)</un_locode>`	UN Locode of geographical object - extracted from RIS Index		M (1x)	
4.4.1.1.4	`<fairway_section_code>xs:string (5)</fairway_section_code>`	Fairway section of geographical object - extracted from RIS Index		M (1x)	
4.4.1.1.5	`<object_reference_code>xs:string (5)</object_reference_code>`	Object Reference Code of geographical object - extracted from RIS Index		M (1x)	
4.4.1.1.6	`<fairway_hectometre>xs:string (5)</fairway_hectometre>`	Fairway hectometre of geographical object - extracted from RIS Index		M (1x)	
4.4.1.1.7s	`<coordinate>`	Coordinate		M (1x)	
4.4.1.1.7.1	`<lat>xs:float</lat>`	Latitude, encoded according to WGS 1984 (EPSG:4326) and presented in degrees with six decimals [d]d.dddddd (latitude)		M (1x)	
4.4.1.1.7.2	`<long>xs:float</long>`	Longitude, encoded according to WGS 1984 (EPSG:4326) and presented in degrees with six decimals [d][d]d.dddddd (longitude)		M (1x)	
4.4.1.1.7e	`</coordinate>`				

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4.4.1.1e	</location>				
4.4.1.2s	<localisation_name>	Local and translated localisation names of the geographical object		C (0..1x)	
4.4.1.2.1	<un_location_name language=nts:language_code_enum>xs:string (256)</un_location_name>	UN Location name of geographical object	Optional attribute - language	C (0..Nx)	
4.4.1.2.2	<object_name language=nts:language_code_enum>xs:string (256)</object_name>	Object name of geographical object	Optional attribute - language	M (1..Nx)	5
4.4.1.2e	</localisation_name>				
4.4.1e	</geo_location_from>				
4.4.2s	<geo_location_to>	Type of geographical object - end of network part		M (1x)	5, 7
4.4.2.1s	<location>	Detailed information of geographical object - extracted from RIS Index		M (1x)	
4.4.2.1.1	<isrs_code>xs:string (20)</isrs_code>	ISRS Location Code of the end of network part. Unique identification of the geo object as defined in RIS Index encoding guide.		M (1x)	
4.4.2.1.2	<type_code>nts:type_code_enum</type_code>	Type of geographical object		M (1x)	
4.4.2.1.3	<un_locode>xs:string (5)</un_locode>	UN Locode of geographical object - extracted from RIS Index		M (1x)	
4.4.2.1.4	<fairway_section_code>xs:string (5) </fairway_section_code>	Fairway section of geographical object - extracted from RIS Index		M (1x)	
4.4.2.1.5	<object_reference_code>xs:string (5) </object_reference_code>	Object Reference Code of geographical object - extracted from RIS Index		M (1x)	
4.4.2.1.6	<fairway_hectometre>xs:string (5)</fairway_hectometre>	Fairway hectometre of geographical object - extracted from RIS Index		M (1x)	
4.4.2.1.7s	<coordinate>	Coordinate		M (1x)	
4.4.2.1.7.1	<lat>xs:float</lat>	Latitude, encoded according to WGS 1984 (EPSG:4326) and presented in degrees with six decimals [d]d.dddddd (latitude)		M (1x)	
4.4.2.1.7.2	<long>xs:float</long>	Longitude, encoded according to WGS 1984 (EPSG:4326) and presented in degrees with six decimals [d][d]d.dddddd (longitude)		M (1x)	
4.4.2.1.7e	</coordinate>				
4.4.2.1e	</location>				
4.4.2.2s	<localisation_name>	Local and translated localisation names of the geographical object		C (0..1x)	

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4.4.2.2.1	`<un_location_name language=nts:language_code_enum>xs:string (256)</un_location_name>`	UN Location name of geographical object	Optional attribute - language	C (0..Nx)	
4.4.2.2.2	`<object_name language=nts:language_code_enum> xs:string (256)</object_name>`	Object name of geographical object	Optional attribute - language	M (1..Nx)	5
4.4.2.2e	`</localisation_name>`				
4.4.2e	`</geo_location_to>`				
4.4.3	`<fairway_name language=nts:language_code_enum>xs:string (256)</fairway_name>`	Waterway name	Optional attribute - language	M (1..Nx)	
4.4.4	`<route_name language=nts:language_code_enum>xs:string (256)</route_name>`	Route name	Optional attribute - language	C (0..Nx)	
4.4.5	`<type_code> nts:type_code_enum </type_code>`	Type of geographical object		M (1x)	
4.4.6	`<geographic_impact> xs:string </geographic_impact>`	Geographical impact via coordinates in WKT (Well-Known-Text) format		C (0..1x)	
4.4e	`</network_part>`				
4.5s	`<ice_condition>`	Ice conditions	At least one of the following code lists needs to be provided	M (1..Nx)	
4.5.1	`<measuredate>xs:dateTime</measuredate>`	Date and Time of forecast or measurement including time zone Format=yyyy-mm-ddThh:mm:ss+hh:mm		M (1x)	
4.5.2	`<ice_condition_code> nts:ice_condition_code_enum </ice_condition_code>`	Condition code		C (0..1x)	4
4.5.3	`<ice_accessibility_code> nts:ice_accessibility_code_enum </ice_accessibility_code>`	Accessibility code		C (0..1x)	4
4.5.4	`<ice_classification_code> nts:ice_classification_code_enum </ice_classification_code>`	Classification code		C (0..1x)	4
4.5.5	`<ice_situation_code> nts:ice_situation_code_enum </ice_situation_code>`	Situation code	Should always be provided	C (0..1x)	4
4.5e	`</ice_condition>`				
4e	`</icem>`				

5s	`<werm>`	Weather related section		C (1..Nx)	1
5.1	`<internal_id>xs:string (64)</internal_id>`	Internal ID		C (0..1x)	
5.2s	`<nts_number>`	NtS number		C (0..1x)	
5.2.1	`<organisation>xs:string (64)</organisation>`	Name of the publishing organisation (NtS Provider)		M (1x)	5

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5.2.2	`<year>xs:gYear (1900-9999)</year>`	Year of first issuing of the notice		M (1x)	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 (1x)	5
5.2.4	`<serial_number>xs:integer (0-99)</serial_number>`	Serial number of notice (replacements and withdrawals), original notice: 0		M (1x)	5
5.2e	`</nts_number>`				
5.3s	`<validity_period>`	Overall period of validity		M (1x)	11
5.3.1	`<date_start>xs:date</date_start>`	Start date of validity period including time zone	To be filled with present date (date_issue)	M (1x)	
5.3.2	`<date_end>xs:date</date_end>`	End date of validity period including time zone	To be filled with the day after publication	C (0..1x)	
5.3e	`</validity_period>`				
5.4s	`<network_part>`	An unambiguous part on the network delimited by two points		M (1x)	
5.4.1s	`<geo_location_from>`	Type of geographical object - start of network part		M (1x)	5, 7
5.4.1.1s	`<location>`	Detailed information of geographical object - extracted from RIS Index		M (1x)	
5.4.1.1.1	`<isrs_code>xs:string (20)</isrs_code>`	ISRS Location Code of the start of network part. Unique identification of the geo object as defined in RIS Index encoding guide.		M (1x)	
5.4.1.1.2	`<type_code>nts:type_code_enum</type_code>`	Type of geographical object		M (1x)	
5.4.1.1.3	`<un_locode>xs:string (5)</un_locode>`	UN Locode of geographical object - extracted from RIS Index		M (1x)	
5.4.1.1.4	`<fairway_section_code>xs:string (5)</fairway_section_code>`	Fairway section of geographical object - extracted from RIS Index		M (1x)	
5.4.1.1.5	`<object_reference_code>xs:string (5)</object_reference_code>`	Object Reference Code of geographical object - extracted from RIS Index		M (1x)	
5.4.1.1.6	`<fairway_hectometre>xs:string (5)</fairway_hectometre>`	Fairway hectometre of geographical object - extracted from RIS Index		M (1x)	
5.4.1.1.7s	`<coordinate>`	Coordinate		M (1x)	
5.4.1.1.7.1	`<lat>xs:float</lat>`	Latitude, encoded according to WGS 1984 (EPSG:4326) and presented in degrees with six decimals [d]d.dddddd (latitude)		M (1x)	
5.4.1.1.7.2	`<long>xs:float</long>`	Longitude, encoded according to WGS 1984 (EPSG:4326) and presented in degrees with six decimals [d][d]d.dddddd (longitude)		M (1x)	
5.4.1.1.7e	`</coordinate>`				

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5.4.1.1e	</location>				
5.4.1.2s	<localisation_name>	Local and translated localisation names of the geographical object		C (0..1x)	
5.4.1.2.1	<un_location_name language=nts:language_code_enum> xs:string (256) </un_location_name>	UN Location name of geographical object	Optional attribute - language	C (0..Nx)	
5.4.1.2.2	<object_name language=nts:language_code_enum>xs:string (256)</object_name>	Object name of geographical object	Optional attribute - language	M (1..Nx)	5
5.4.1.2e	</localisation_name>				
5.4.1e	</geo_location_from>				
5.4.2s	<geo_location_to>	Type of geographical object - end of network part		M (1x)	5, 7
5.4.2.1s	<location>	Detailed information of geographical object - extracted from RIS Index		M (1x)	
5.4.2.1.1	<isrs_code>xs:string (20)</isrs_code>	ISRS Location Code of the end of network part. Unique identification of the geo object as defined in RIS Index encoding guide.		M (1x)	
5.4.2.1.2	<type_code>nts:type_code_enum</type_code>	Type of geographical object		M (1x)	
5.4.2.1.3	<un_locode>xs:string (5)</un_locode>	UN Locode of geographical object - extracted from RIS Index		M (1x)	
5.4.2.1.4	<fairway_section_code>xs:string (5)</fairway_section_code>	Fairway section of geographical object - extracted from RIS Index		M (1x)	
5.4.2.1.5	<object_reference_code>xs:string (5)</object_reference_code>	Object Reference Code of geographical object - extracted from RIS Index		M (1x)	
5.4.2.1.6	<fairway_hectometre>xs:string (5)</fairway_hectometre>	Fairway hectometre of geographical object - extracted from RIS Index		M (1x)	
5.4.2.1.7s	<coordinate>	Coordinate		M (1x)	
5.4.2.1.7.1	<lat>xs:float</lat>	Latitude, encoded according to WGS 1984 (EPSG:4326) and presented in degrees with six decimals [d]d.dddddd (latitude)		M (1x)	
5.4.2.1.7.2	<long>xs:float</long>	Longitude, encoded according to WGS 1984 (EPSG:4326) and presented in degrees with six decimals [d][d]d.dddddd (longitude)		M (1x)	
5.4.2.1.7e	</coordinate>				
5.4.2.1e	</location>				
5.4.2.2s	<localisation_name>	Local and translated localisation names of the geographical object		C (0..1x)	

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5.4.2.2.1	<un_location_name language=nts:language_code_enum>xs:string (256)</un_location_name>	UN Location name of geographical object	Optional attribute - language	C (0..Nx)	
5.4.2.2.2	<object_name language=nts:language_code_enum>xs:string (256)</object_name>	Object name of geographical object	Optional attribute - language	M (1..Nx)	5
5.4.2.2e	</localisation_name>				
5.4.2e	</geo_location_to>				
5.4.3	<fairway_name language=nts:language_code_enum>xs:string (256)</fairway_name>	Waterway name	Optional attribute - language	M (1..Nx)	
5.4.4	<route_name language=nts:language_code_enum> xs:string (256) </route_name>	Route name	Optional attribute - language	C (0..Nx)	
5.4.5	<type_code>nts:type_code_enum</type_code>	Type of geographical object		M (1x)	
5.4.6	<geographic_impact>xs:string</geographic_impact>	Geographical impact via coordinates in WKT (Well-Known-Text) format		C (0..1x)	
5.4e	</network_part>				
5.5s	<weather_report>	Weather Report (1x or 2x)		M (1..2x)	
5.5.1	<measuredate>xs:dateTime</measuredate>	Date and time of forecast or measurement value including timezone Format=yyyy-mm-ddThh:mm:ss+hh:mm		M (1x)	
5.5.2	<forecast>xs:boolean</forecast>	Forecast (true) OR Actual report (false)		M (1x)	
5.5.3	<weather_class_code> nts:weather_class_code_enum </weather_class_code>	Classification of weather report		C (0..Nx)	3
5.5.4s	<weather_item/>	Weather items		C (0..Nx)	
5.5.4.1	<weather_item_code> nts:weather_item_code_enum </weather_item_code>	Weather item type (Wind, Wave etc)		M (1x)	5
5.5.4.2	<value_min>xs:float</value_min>	Actual or Minimum value		M (1x)	5
5.5.4.3	<value_max>xs:float</value_max>	Maximum value		C (0..1x)	
5.5.4.4	<value_gusts>xs:float</value_gusts>	Gusts value (Wind)		C (0..1x)	
5.5.4.5	<unit>nts:unit_enum</unit>	Unit of the value (cm, m^3/s, km/h, m/s, mm/h, °C)	Unit has to be provided when a value is provided.	C (0..1x)	
5.5.4.6	<weather_category_code>nts:weather_category_code_enum </weather_category_code>	Classification of wind report		C (0..1x)	
5.5.4.7	<direction_code_min>nts:weather_direction_code_enum </direction_code_min>	Direction of wind or wave		C (0..1x)	

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5.5.4.8	<direction_code_max>nts:weather_direction_code_enum </direction_code_max>	Direction of wind or wave		C (0..1x)	
5.5.4e	</weather_item/>				
5.5e	</weather_report>				
5e	</werm>				
	</RIS_Message>				

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2.   Applicable Rules

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 <network_part> or <object> has to be given in the <ftm_limitation_group> and in <wrm>.
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> (3.6).
7.	A <network_part> is defined by the begin (<geo_location_from>) and end (<geo_location_from>) ISRS Location Codes and coordinates (2 ISRS Location Codes and 2 sets of coordinates).
8.	If there is a measurement the elements <value> (3.7.3) or <value_min> (3.7.4) and <value_max> (3.7.5) is/are mandatory if <measure_code> (3.7.2) 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.
9.	Element <barrage_code> (3.7.7) is mandatory if <measure code> (3.7.2) is "BAR".
10.	Element <regime_code> (3.7.8) is mandatory if <measure code> (3.7.2) is "REG".
11.	Forecasts for more than one <validity_period> (5.3) require individual <werm> messages.

3.   XSD file (source code)

Appendix 1   Nts, XSD file (source code) (Distributed separately)

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ANNEX 20
NOTICES TO SKIPPERS WEB SERVICE SPECIFICATION (WSDL)

Appendix 1   Nts, WSDL (Distributed separately)

ANNEX 21
NOTICES TO SKIPPERS REFERENCE TABLES (TAGS)

Appendix 1   Notices to Skippers reference tables (Tags) (Distributed separately)