Economic and Social Council

Economic Commission for Europe

Inland Transport Committee

Working Party on Inland Water Transport

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

Thirty-ninth session
Geneva, 15–17 June 2011
Item 8 (a) of the provisional agenda
**Establishment of common principles and technical
requirements for Pan-European river information services (RIS)**

Resolution No. 57, "Guidelines and Recommendations for River Information Services"

Note by the secretariat

I. Mandate

1.   At its fifty-first session, the Working Party on Inland Water Transport (SC.3) recognized that international expert groups continued their work on further developing technical standards for the river information services (RIS) and that the adoption of the SC.3 resolutions Nos. 48, 57, 60 and 63 was only a first step towards the creation of a harmonized framework for the river information services. To ensure proper maintenance of these recommendations, SC.3 asked the Working Party on the Standardization of Technical and Safety Requirements in Inland Navigation (SC.3/WP.3) to notify it of any developments that would make it necessary to amend the Resolutions in question (ECE/TRANS/SC.3/178, para. 27).

2.   It is recalled that the RIS Guidelines elaborated in 2004 by the World Association for Waterborne Transport Infrastructure (PIANC) constitute the basis for the Working Party on Inland Water Transport (SC.3) Resolution No. 57, "Guidelines and Recommendations for River Information Services" (TRANS/SC.3/165) as well as for relevant EU and River Commissions' instruments. Since then, the PIANC has revised their Guidelines to take into account the progress in developing and implementing RIS related standards and in developing information technologies, in general.

3.   Reproduced below is a comparison between Resolution No. 57 and the draft revised PIANC Guidelines dated March 2011. Due to strict United Nations rules concerning the

volume of working documents submitted for translation and distribution, the secretariat omitted the texts of the PIANC Guidelines that stayed mainly unchanged since 2004. The original numbering in the PIANC Guidelines is included in square brackets.

4.   The Working Party is invited to consider revising Resolution No. 57, based on this information.

II.   Chapter 1, "Introduction"

5.   The text is mainly the same as in Chapter 1.[1]

III.   Chapter 2, "Definitions"

6.   The text is mainly the same as in Chapter 2, except for the following new or amended definitions:

(a)   The definition of RIS area is supplemented with the following sentence:

A RIS area may include a VTS area with VTS center.

(b)   RIS operator: The RIS operator is a person performing one or more tasks contributing to the services of RIS;

(c)   RIS provider: The RIS provider is the organization or organizational unit assigned or contracted to operate the RIS-System and to provide RIS-Services;

(d)   RIS user: The user of the services can be described in a number of different groups: rescue and emergency service provider, law enforcement agency for cargo inspection, law enforcement agency for immigration control, law enforcement agency for traffic rules, accident and incident investigation body, organization in charge of collecting statistical data, fleet manager, competent authority for traffic management, lock operator, bridge operator, terminal operator, port operator, skipper, ship owner, cargo owner, consignee, consignor, berth operator, fire brigade, forwarder, freight broker and shipping agent;

(e)   Explanatory notes on vessels participating in RIS:

(i)   All vessels, commercial inland vessels and sea-going vessels sailing on inland waterways as well as recreational vessels, sailing in a RIS area can make use of River Information Services.

(ii)   Vessels navigating in a RIS area shall make use of mandatory services and are recommended to make use as far as possible of the information provided by RIS.

(iii)   Decisions concerning the actual navigation and the manoeuvring of the vessel remain within the responsibility of the skipper. Any information provided by the RIS cannot replace any decision made by the skipper.

(f)   RIS Key technology: A technology that holds a central position in the services to be provided in the RIS arena. The RIS technologies are Inland ECDIS, Electronic Reporting, Inland AIS and Notices to Skippers.

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[1] Unless otherwise indicated, the references in the text refer to paragraphs of the annex to Resolution No. 57, TRANS/SC.3/165.

IV.   Chapter 3, "Participating vessels" [2]

7.   Chapter 3 is renamed "RIS Stakeholders".

8.   A new section 3.1 "General" is added as follows:

[3.1]   General

The inland navigation sector includes many parties such as national authorities, port authorities, vessel owners, skippers, providers of nautical services, customs, etc. Achieving the objectives of RIS very much depends on interactions between these parties across national and organizational boarders, hence, the RIS Guidelines shall describe generic solutions.

The implementation guidelines will not consider how stakeholders are organized, as this may vary in different regions, countries and organizations. The RIS Guidelines must focus on the core responsibilities that, e.g. due to international agreements and regulations, have to be handled everywhere and consequently the guidelines will combine responsibilities into generic roles that can be played by different stakeholders and organizations.

9.   A new section 3.4 "RIS Stakeholders" is added as follows:

[3.4]   RIS stakeholders

RIS will be realized and kept operational by cooperating stakeholders and the following categories can be differentiated:

[3.4.1]   Policy makers: These want RIS to solve (or diminish) traffic and transport problems. One party of policymakers are the authorities responsible for safety on the waterways. Other policymakers, e.g. organizations of ship owners, want to provide transport/logistical information services to cargo shippers and terminal operators. The different groups of policymakers have their own policy objectives, tasks and requirements on the services to achieve its objectives. Once the services have been selected, the functions and information needs with their restrictions and interactions for providing these services should be determined. The authority stakeholder roles that can be seen as relevant in the context of RIS are presented in Table 1, "Authority stakeholder roles".[3]

[3.4.2]   Managers: These control the RIS applications, e.g. waterway managers of the competent authority, traffic control managers, managers of search and rescue services, ship owners and cargo shippers. They define requirements for applications with more detailed and accurate descriptions of the services and the functions, regarding local interaction or aspects of man/machine interface. The managers that can be seen as relevant in the context of RIS, are presented in Table 2, "Manager stakeholder roles".[3]

[3.4.3]   Service providers: These make and keep RIS operational and therefore they develop, maintain and operate the RIS applications. They control the autonomous applications and, where necessary, they provide the main input into the applications either by themselves or by RIS users. The service providers that can be seen as relevant in the context of RIS, are presented in Table 3, "Service providers stakeholder roles". [3]

[3.4.4]   RIS Users: These can be described in a number of different groups, as presented in Table 4 on "User Stakeholder roles". [3]

[3.4.5]   System engineers: These prepare system specifications and integrate hardware and software components into system components. RIS and VTS suppliers,

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[2] Chapter 3 is replaced by explanatory note presented in paragraph 5 (e) of this document.

system integrators and telecommunication operators will combine the system components into complete systems which enable RIS services.

V. Chapter 4, "RIS Architecture"

10.   Chapter 4, is replaced by a new Chapter 4 "RIS Key Technologies", which partly incorporates provisions of former Chapter 8 and annexes 1-4. New Chapter 4 is as follows:

[4.1]   General

[4.1.1]   The RIS Key technologies have a central position in the services to be provided in the RIS arena. The RIS technologies are Inland ECDIS, Electronic Reporting, Inland AIS and Notices to Skippers.

[4.1.2]   The efficient and effective use of RIS key technologies is based upon the specification and coding, formalization and harmonized use of reference data. Special elements of the reference data are "hull data" and the RIS index. Figure 1 presents RIS Key technology and reference data.[3]

[4.2]   Inland ECDIS[4]

[4.2.1]   Inland ECDIS means Electronic Chart Display and Information System for inland navigation. ECDIS is a navigation information system displaying selected information from a System Electronic Navigational Chart (SENC) with positional information from navigation sensors and if required additional navigation-related information.

[4.2.2]   Inland ECDIS is a system for the display of electronic inland navigation charts and additional geographic related information. Its purpose is to contribute to safety and efficiency of inland navigation and thus also to protection of the environment. Simultaneously Inland ECDIS will reduce the workload when navigating the ship as compared to traditional navigation and information methods. Inland ECDIS, provides as one of the key technologies, the basis for other River Information Services (RIS), for the use of systems and applications like Inland AIS.

[4.2.3 – 4.2.13][5]

[4.2.14]   It is recommended to include the water depths to the ENC (depths contours) for shallow river stretches that determine the draught of the vessels. The water depths may be related to a reference water level or to the actual water level.

[4.3]   Inland AIS[6]

[4.3.1]   Inland AIS (AIS stands for "Automatic Identification System") is a RIS key technology for the automatic exchange of identification and nautical data between ships and between ships and shore installations.

[4.3.2]   Inland AIS is an instrument for the tracking and tracing of inland navigation vessels with the goal to improve safety and efficiency of Inland Navigation supporting onboard decisions (TTI and STI), shore-based Traffic Management (TM) including Vessel Traffic Services (VTS, Lock and Bridge Management (LBM) and Traffic Planning (TP),

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[3] Due to the limited space, figures and tables are reproduced in the addendum to this document.
[4] In Resolution No. 57, information on Inland ECDIS is contained in Annex 4.
[5] The text of paras. 3–13 are mainly the same as Annex 1, paras. 2–12.
[6] In Resolution No. 57, information on Inland AIS is contained in Annex 1.

Calamity Abatement Support (CAS), Information for Transport Logistics (ITL) and Information for Law Enforcement (ILE).

[4.3.3]   AIS is a ship borne radio data system, exchanging static, dynamic and voyage related vessel data between equipped vessels and between equipped vessels and shore stations. Ship borne AIS stations broadcast the vessel's identity, position and other data in regular intervals. By receiving these transmissions, ship borne or shore based AIS stations within the radio range can automatically locate, identify and track AIS equipped vessels on an appropriate display like radar or Inland ECDIS.

[4.3.4]   AIS is a cooperative procedure, therefore all those wishing to use and participate in the system must be equipped with an AIS device.

[4.3.5]   AIS is an additional source of navigation-related information. AIS does not replace navigation-related services such as tracking by radar and VTS, but in fact supports them. The strength of AIS lies in the detection and tracking of those craft fitted with it. AIS and radar complement one another due to their different characteristics.

[4.3.6]   The legal basis for Inland AIS is:[7]

• Resolution of the Central Commission for Navigation on the Rhine (CCNR) of 2006: (Protocol 2006–I–21)

• Commission Regulation (EC) No. 415/2007 of 2007 concerning the technical specifications for vessel tracking and tracing systems referred to in Article 5 of Directive 2005/44/EC of the European Parliament and of the Council on harmonized River Information Services (RIS) on inland waterways.

• CCNR Resolutions of 2007: "Vessel Tracking and Tracing Standard for Inland Navigation - Type approval, installation and operation of Inland AIS devices on inland navigation vessels" (Protocol 2007–I–15 and 2007–II–24).

[4.3.7]   The Inland AIS Standard defines:

(a)   Functional requirements for Inland AIS devices,

(b)   Technical requirements for Inland AIS devices,

(c)   Specification of AIS messages for the exchange of messages between Inland AIS devices via radio,

(d)   Specification of AIS data sets for data exchange between Inland AIS devices and connected applications.

[4.3.8]   The information content of Inland AIS basically tallies that of maritime AIS, while providing additional information specific to inland waterways. In view of their shared information content, Inland AIS and maritime AIS are compatible. All data transmitted can be received by both maritime and Inland AIS devices to be visually displayed and analysed. However the specifically Inland AIS information is only transmitted and assessed by Inland AIS devices.

[4.3.9]   For seagoing vessels is a carriage requirement according to the SOLAS convention. In Austria there is a carriage requirement for Inland AIS.

[4.3.10]   In many RIS related processes the implementation and use of Inland AIS on board as well as on shore is a pre-condition. The full scale benefit of Inland AIS for RIS services requires a carriage requirement for Inland AIS.

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[7] No reference is made to the existing UNECE and Danube Commission (DC) resolutions.

[4.3.11][8]

[4.3.12]   The following operating modes can be distinguished for AIS:

       (a)   Ship to ship: All vessels fitted with AIS are able to receive static and dynamic information from all other vessels equipped with AIS within the area of coverage. Inland AIS may be used in combination with Inland ECDIS or radar to enhance a TTI and STI.

       (b)   Ship to shore: Data from vessels equipped with AIS can also be picked up by AIS base stations and relayed to an RIS Centre where it can be used to display Tactical Traffic Information (TTI) and Strategic Traffic Information (STI).

       (c)   Shore to ship: Safety-related data can be transmitted to vessels by shore installations.

[4.3.13]   Various kinds of AIS device types or AIS stations may be distinguished:

       (a)   AIS mobile stations of Class A on all seagoing vessels subject to the requirements of the International Maritime Organisation (IMO) SOLAS Chapter V.

       (b)   AIS mobile stations of Class B CS/SO with restricted functionality, i.e. on seagoing leisure craft.

       (c)   Inland AIS mobile stations, derivatives of AIS mobile stations of Class A with full Class A functionality at VDL level plus additional inland navigation functions.

       (d)   AIS base stations, including shore-based Simplex repeater stations.

       (e)   AIS nautical signal stations for use on signalling devices such as beacons and buoys. ("Aids to Navigation" AtoN).

[4.3.14]   AIS operates on the internationally defined VHF frequencies AIS 1 (161,975 MHz) and AIS 2 (162,025 MHz) and may be switched to other channels in the VHF maritime band.

[4.3.15]   The information transmitted by Inland AIS can be divided into the following categories:

       (a)   Static information, such as vessel number, call-sign, vessel name, vessel type.

       (b)   Dynamic information, such as position of the ship with data on accuracy and integrity status.

       (c)   Voyage-related information, such as length and beam of combinations, dangerous cargo.

       (d)   Information specific to inland navigation such as Standard European Vessel Number, type of combination, number of blue cones/lights as per ADN/ADNR,[9] estimated time of arrival (ETA) at locks, bridges, terminals, borders and presence of "blue signs".

[4.3.16]   For transmitting messages Inland AIS uses the same parameters and the same structure as AIS mobile stations of Class A, which the IMO prescribes for maritime navigation (IMO-AIS). Fields with unused parameters are defined as "not available". Elements marked with '*' must be dealt with differently from seagoing vessels.

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[8] The text of para. [4.3.11] is mainly the same as in Annex 4, para. 5.
[9] The secretariat suggests deleting the reference to ADNR.

[4.3.17]   The Inland AIS (mobile) device shall be in permanent operation whenever the ship is at anchor or en route. When in port, operation will take place in accordance with the local port regulations.

[4.3.18]   The shipmaster shall manually input the following data at the start of the voyage and whenever the data is amended:

    (a)   Correct navigation status;

    (b)   Type of combination;

    (c)   Length/beam of combination;

    (d)   Category of dangerous cargo;

    (e)   Draught of the ship;

    (f)   Loaded/unloaded;

    (g)   Port of destination and ETA.

The conning skipper must check data to ensure that the static ship data is correct and reflect the latest situation. This must be done at least once a month but preferably at the start of every voyage. At certain intervals the shipmaster must also check the dynamic data of his or her own AIS device.

[4.3.19]   A so called minimum keyboard and display (MKD) for Inland AIS devices serves to input voyage-related ship data and other vessel-specific data such as status indication and alarm messages. The MKD may also show AIS messages received, such as ship name, distance and heading of the reporting ship, alphanumerically. Other ship data can be displayed by selecting a given ship. This form of displaying AIS data is not suited for navigational support. When using AIS data for navigation a graphical display similar to Inland ECDIS is essential.

[4.3.20]   A peculiar trait of AIS is the autonomous mode which uses the SOTDMA (Self-Organised Time Division Multiple Access) procedure, thus dispensing with the need for a coordinating base station.

[4.4]   Electronic reporting[10]

[4.4.1]   Electronic (Ship) reporting (ERI) is a RIS key technology that facilitates the RIS services Strategic Traffic Information (STI), Traffic Management (TM), Calamity Abatement Support (CAS), Statistics (ST), Law enforcement (ILE), Waterway charges and harbour dues (CHD) as well as Transport Logistics (TL).

[4.4.2]   Electronic Reporting in Inland Navigation facilitates electronic data interchange (EDI) between partners in inland navigation as well as partners in the multimodal transport chain involving inland navigation and avoids the reporting of the same information related to a voyage several times to different authorities and/or commercial parties.

[4.4.3]   The legal basis for electronic reporting is:[11]

    (a)   Commission Regulation (EU) No. 164/2010 of 2010 on the technical specifications for electronic ship reporting in inland navigation referred to in article 5 of Directive 2005/44/EC of The European Parliament and of the Council of 2005 on harmonized River Information Services (RIS).

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[10] In Resolution No. 57, information on electronic reporting is contained in Annex 2.

[11] No reference is made to the existing UNECE and DC resolutions on electronic ship reporting.

(b)   CCNR Resolution of 2003: (Resolution 2003–I–23).

(c)   United Nations recommendations regarding the interchange of trade data (UN CEFACT recommendation 25, 31 and 32, EDI and E-Commerce agreements).

[4.4.4]   Electronic reporting supports safety and calamity abatement services and as such electronic reporting should be made mandatory.

[4.4.5]   Electronic reporting includes the following messaging procedures

(a)   Ship-to-authority messaging dealing with:

(i)   Transport notification messages on the voyages of loaded or empty ships within the jurisdictional area of the authority where such is applicable.

(ii)   Arrival notification and position reports at locks, bridges, reporting points of traffic centres.

(b)   Authority-to-authority messaging dealing with transport notifications for ships, carrying cargo or being empty, travelling from one jurisdictional area to the other.

(c)   Authority-to-ship messaging mainly consists of acknowledgements and responses to previously submitted notification messages and may also include the sending of fairway information, such as Notices to Skippers.

[4.4.6]   Transport notification are to inform the competent authorities of the intention to make specified voyage with a specified ship, either carrying a specified cargo or being empty. The transport notification can either originate from the skipper of the ship or from the shipper of the cargo on behalf of the skipper.

[4.4.7]   Transport notifications shall be sent before the start of a voyage respectively before entering the jurisdictional area of a competent authority and subsequently after every significant change of the voyage data, e.g. number of crew on board or number of barges in the convoy.

[4.4.8]   When a ship requires a permit for the voyage or part thereof, the competent waterway authority shall acknowledge the message after processing the contents of the notification. The acknowledgement will include the permission together with a reference or where applicable a refusal for such a permit together with further details upon the action to be taken.

[4.4.9]   Arrival notification and position reports are to inform the local waterway operators - such as lock masters, bridge operators, traffic centre operators, ports and docking crew - of the impending arrival of a ship. Position reports shall be sent at certain reporting points at the waterway. Arrival notifications and position reports can be obtained by several means, either active or passive:

(a)   Visual / manual;

(b)   By VHF radio;

(c)   By mobile Inland AIS station.

[4.4.10]   The competent authorities shall be able, as far as ship reporting is required by national or international regulations, to receive electronic ship reports of the required data from ships.

[4.4.11]   In cross-border transport, electronic reports shall be transmitted to the competent authorities of the neighbouring jurisdictional area and any such transmission shall be completed before arrival of the vessels at the border.

[4.4.12] The competent authorities shall take the necessary measures to ensure the confidentiality, integrity and security of information sent to them pursuant this standard. They must use such information only for the purposes of the intended services, for example calamity abatement, border control, customs.

[4.4.13] A request to forward information contained in a ship-to-authority-message to any other involved party will not be executed without explicit approval from the owner of the information being the skipper of the vessel or the shipper of the cargo.

[4.4.14] An agreement on the protection of privacy between all involved public and private parties shall be concluded for new applications, based on UNECE Recommendation 26 that contains a "Model Interchange Agreement".

[4.5] Notices to Skippers[12]

[4.5.1] Notices to Skippers is a RIS key technology which provides in a standardized way and language independent:

(a) fairway and traffic related information, as well as

(b) hydrographical information as there are weather information, water level information and ice information.

Notices to Skippers is supporting Fairway Information Services (FIS) and transport planning as part of the Information for Transport Logistic (ITL).

[4.5.2] The legal basis for Notices to Skippers is:[13]

(a) Commission Regulation 416/2007 concerning the technical specifications for Notices to Skippers as referred to in Article 5 of Directive 2005/44/EC of the European Parliament and of the Council on harmonised river information services (RIS).

(b) CCNR Resolution of 2004: (Resolution 2004–I–17).

[4.5.3] A standardized Notices to Skippers in XML-format contains therefore 5 different sections:

(a) Identification;

(b) Fairway and traffic related messages;

(c) Water level related messages;

(d) Ice messages;

(e) Weather related messages.

[4.5.4] The content of the messages is encoded in a machine readable XML-file. This file can be used by software applications like voyage planning or Inland ECDIS on board of a vessel or by internet sites. The encoded information can be used directly for calculations, as for example in voyage planning, or be translated to the language of the user and displayed. The reference tables of the standard contain 21 languages of the member countries of the European Union and additional 3 languages, namely Croatian, Serbian and Russian language.

[4.5.5] The standard for Notices to Skippers provides a standardized data format, which can be used for publishing notices to skippers on the internet (pull-services) or for distribution by e-mail (push services).

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[12] In Resolution No. 57, information on notices to skippers is contained in Annex 3.

[13] No reference is made to the existing UNECE and Danube Commission's resolutions.

[4.5.6]   The standardization of Notices to Skippers is compatible with the data structure of Inland ECDIS to facilitate integration of Notices to Skippers in Inland ECDIS.

[4.5.7]   Fairway information should be provided at a national level or preferably on an (International) fairway network level by implementing one single dissemination point of contact.

[4.5.8]   A standardized method for exchanging Notices to Skippers by means of Web Service (WS) technology is currently in a trial phase. WS will enable an easier and more secure method for exchanging Notices to Skippers between authorities as well as private companies and/or operators.

[4.6]   Reference data needed for RIS Key technologies

RIS references and code tables are key elements in the RIS-standards and are an important link between the various RIS-services. The exchange of computerized data without direct human interference between the RIS users and the RIS services is facilitated by the use of codes and references.

To ensure proper exchange of data there are a number of pre-conditions:

(a)   Reference and code tables are not static, they may change by international and or local rules and regulations. The need for harmonization and standardization however requires that the reference and codes tables are stable and consistent.

(b)   In order to ensure interoperability, throughout the whole transport and logistics chain, there is the general principle that the components of the RIS reference data shall be kept in line with international standards such as the ISO, UNECE recommendations and other relevant standards.

In order to guarantee a solid basis for the use of reference data and code tables, special attention is required for data maintenance, maintenance procedures and distribution of the reference data and code tables.

[4.6.1]   Hull data

(a)   To receive RIS services, the hull data of the vessels sailing through a RIS area shall be available.

(b)   Data of the ship's hull is an important basic input parameter for mainly traffic-related RIS services (e.g. the dimensions of the vessels will be required for the planning of the locking processes).

(c)   The unique identification (number) of a vessel should be treated as a unique identifier in RIS services.

(d)   Data of the ship's hull will includes the following elements:

(i)   Unique identification of the ship;

(ii)   Name of the ship;

(iii)   Type of ship;

(iv)   Length of the vessel;

(v)   Breadth of the vessel;

(vi)   Maximum draught of the vessel;

(vii)   Operator of the vessel.

(e)   The hull data should be related to technical inspections as the inspection authorities also generate the data of the hull.

[4.6.2]   RIS Index

(a)   A special group of reference data is covered by the RIS index. Inland ECDIS and Notices to Skippers require unambiguous coding of locations of geographic objects. This is however also relevant for Electronic reporting and tracking and tracing activities.

(b)   A location code is the only machine readable link between Electronic Reporting, Inland ECDIS and Notices to Skippers. The location code is a unique ID for each piece of infrastructure, which is of importance for RIS.

(c)   The location code used in the RIS environment is a 20 digit alphanumerical code - the ISRS code - which consists of the following data elements:

(i)   UN Country code (2 letters) ;

(ii)   UN Location code (3 letters) ;

(iii)   Fairway section code (5 digits, alphanumerical);

(iv)   Terminal code or passage point code (5 digits, alphanumerical);

(v)   Fairway section hectometre (5 digits, numerical).

(d)   The RIS Index is a list of location codes with additional information on the objects like their characteristics (name, fairway….), restrictions (available depth, clearance….), operating times, etc.

(e)   In an international fairway network the introduction of a harmonized fairway ID is seen as a positive contribution to the need for linking the RIS index of different countries.

(f)   Each object in the RIS index shall have only one ISRS code, even when those objects are located on common stretches of a waterway for two or more countries.

[4.7]   Basic technologies related to RIS

Apart from the RIS Key technologies, the basic technologies – like radar and radiotelephone services via VHF, which for many decades have been important navigation supporting technologies will not be replaced by RIS key technologies but are supporting the use of RIS services.

[4.7.1]   Radiotelephone service on inland waterways

(a)   The radiotelephone service on inland waterways enables the establishment of radio communication for specific purposes by using agreed upon channels and an agreed operational procedure (service categories). The radiotelephone service comprises five service categories:

(i)   Ship-to-ship;

(ii)   Nautical information;

(iii)   Ship-to-port authorities;

(iv)   On-board communications;

(v)   Public correspondence (service on a non-mandatory basis).

Of these five categories, only the first three are important for RIS. The radiotelephone service enables direct and fast communication between skippers, waterway authorities and port authorities. It is best suited for urgently needed information on a real time basis.

(b)   The radiotelephone service is based on the following rules and regulations:

(i)   Radio Regulations of the International Telecommunication Union ITU (world wide).

(ii)   Regional Arrangement Concerning the Radiotelephone Service on Inland Waterways (Europe, 06.04.2000).

(iii)   Standardized UNECE Vocabulary for Radio Connections in Inland Navigation (UN Economic Commission for Europe No. 35, 1997).

(iv)   National inland waterway rules for navigation.

(c)   In the service categories ship-to-ship, nautical information and ship-to-port-authorities, the transmission of messages should deal exclusively with the safety of human life and with the movement and the safety of vessels.

(d)   Fairway information provision by voice in the nautical information (shore/ship) service category is recommended to be implemented:

(i)   For urgent information needing to be updated frequently and having to be communicated on a real time basis;

(ii)   For dynamic information having to be communicated on a daily basis.

(e)   The urgent and dynamic information to be communicated by VHF radio concerns for example:

(i)   Incidents and calamities;

(ii)   Temporary obstructions in the fairway, malfunctions of aids to navigation;

(iii)   Short-term changes of lock and bridge operating times;

(iv)   Restrictions in navigation caused by weather conditions, flood and ice.

(f)   The RIS area shall be fully covered by the range of the VHF base stations for nautical information.

(g)   In the nautical information service category, Notices to Skippers may be transmitted "to all users" as:

(i)   Scheduled reports on the state of the waterways including water level reports at the gauges at fixed times of the day;

(ii)   Urgent reports at special events (e.g. traffic regulations after accidents).

(h)   It shall be possible for the operator in a RIS centre to answer specific questions of skippers on demand and to receive reports from skippers.

[4.7.2]   Radar

(a)   Radar should be used as the primary navigation tool and is the basis for tactical traffic images on board of a vessel.

(b)   The use of ECDIS in Navigation Mode the traffic image shall be overlaid with radar and preferable Inland AIS.

(c)   In Navigation Mode the radar image shall have the highest display priority.

(d)   Shore based radar should be the primary information for a tactical traffic image in a VTS.

[4.8]   Open Standards

[4.8.1]   The implementation of RIS will depend on the functionalities that are already available in (an) organization(s). The approach will be very different if it can be started

with a green field situation on one hand or for example when it RIS has to be integrated into an existing VTS environment.

[4.8.2] RIS can be implemented by (a) RIS organization(s) or another organization that is responsible for the provision of the RIS services. Nevertheless communication and data exchange with different organizations will be necessary.

[4.8.3] As mentioned in chapter 6.1 RIS services can be seen as a stack of services that can be implemented via different projects in time depending on the needs of an organization. Many partners can be involved in this process.

[4.8.4] It is, therefore, very important that the applications that are developed for the implementation of RIS are built on open standards to make them compatible with applications of other RIS organizations, e.g. machine to machine data exchange should be based on webservices. New technologies like Service Oriented Architecture (SOA), which are specially developed for environments where the business rules continuously can and shall change, should be taken into account for the implementation. The use of open standards, at least for data exchange with other parties, should be recommended. Annex 1 gives an example of how a SOA application could be build on the basis of SOA where technologies like BPMN (Business Process Modeling Notation) are used.

VI. Chapter 5, "Recommendations for individual services"

11. Chapter 5, is replaced by a new Chapter 5 on "RIS services and recommendations on the implementation of RIS services" as follows:

[5.1] Relation between RIS Key technologies and RIS services

The relation between the RIS services and RIS Key technologies as depicted in Chapter 4 and based on experience in previous research and implementation experience is reflected in figure 2.[3]

[5.2] Information categories and RIS services

The functional decomposition of River Information Services (RIS) allows the allocation of information provision to user demands. Table 5 shows connections between information categories, the RIS services and the RIS reference data. The reference data is seen as essential for different information categories and as such separately depicted in the underneath table. Table below gives an example as a guide to the user of the guidelines and may assist the user in making his/her own list. In paragraph 5.3 and further, the different services are specified in detail. In annex 3 a second level of information details is added to the table as additional information to table 5.

[5.3] Fairway information service (FIS)

[5.3.1] Fairway information contains static and dynamic as well as urgent information regarding the fairway. Static and dynamic information should be communicated on a scheduled basis.

[5.3.2] Fairway information should be provided on national level or preferably on (International) fairway network level by creating and implementing one single dissemination point of contact.

[5.3.3] Safety related data as provided should be certified by the competent authority.

[5.3.4] Fairway Information Services should be given with an indication of the quality of the information. Depending on the type of data, this quality can expressed in

terms of accuracy, reliability, age, completeness, conformity to standards, etc. The user should be informed at least on:

(a) Reliability of the information;

(b) Accuracy and age of the information;

(c) Completeness of the information.

[5.3.4]   The urgent information needs to be updated very frequently and/or should be communicated on a real time basis by VHF radio or Inland AIS.

[5.4]   Traffic information service

[5.4.1]   General[14]

[5.4.2]   Tactical traffic information (TTI) Service[15]

[5.4.3]   Strategic traffic information (STI)

[5.4.3.1][16]

[5.4.3.2][17]

[5.4.3.3]   For strategic traffic and transport management supporting services a ship reporting system should be established by the competent authority. The system has the task of collecting, processing and verifying and disseminating the reported information on vessel position, voyage and cargo.

[5.4.3.4]   Special attention is needed for privacy regulation when strategic traffic and transport services are implemented.

[5.4.3.5]   For transport management services data exchange with private parties should be supported but requires strict authorisation rules and a legal basis for the exchange of this information. A single point of contact on the (inter-)national network level for the provision of this strategic information is recommended.

[5.4.3.6]   Data interchange should be established between authorities within the waterway network. For this data exchange standards are to be developed.

[5.5]   Traffic management

[5.5.1]   Vessel traffic services, (VTS)

[5.5.1.1]   Reference is made to the Inland VTS Guidelines of IALA and the CCNR guidelines on inland VTS (Chapter 1, No. 4.).

[5.5.1.2]   Vessel Traffic Services by means of a tactical traffic image on shore should be established for the safety of navigation in critical local situations, the efficiency of traffic and the protection of the environment from potential dangers of shipping. It emphasizes traffic monitoring. The difficult local situations may be:

(a) Complex traffic patterns;

(b) High amount of accidents;

(c) High traffic density;

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[14] The text is mainly the same is in para. 5.2.1.
[15] The text is mainly the same is in para. 5.2.2.
[16] The text is mainly the same is in para. 5.2.3.1.
[17] The text is mainly the same is in para. 5.2.3.2.

(d)   Narrow fairway and/or shoals;

(e)   Narrow bends;

(f)   Narrow and/or many bridges;

(g)   Fast water currents and/or cross currents;

(h)   Fairway with traffic regulations, e.g. one-way-traffic;

(i)   Conjunction of waterways.

[5.5.1.3]   The Tactical Traffic Image (TTI) is produced by collecting shore based radar and vessel tracking and tracing information and displaying the vessel information on an Inland ECDIS. The standards for Inland ECDIS and inland vessel tracking and tracing should be used. For a long river stretch and heavy traffic, the TTI may be enhanced by target tracking.

[5.5.2]   Lock and bridge management[18]

[5.5.3]   Traffic Planning

[5.5.3.1]   Traffic planning should improve the passage time on a fairway or transport corridor by providing information on the state of the fairway and passing times at locks and bridges on a fairway or corridor in an integral approach.

[5.5.3.2]   Through electronic reporting and availability of tactical and strategic traffic information RIS authorities can better anticipate the demand for use of facilities in the RIS area and provide enhanced Traffic Management Services.

[5.5.3.3]   Based on an ETA at the final destination, the RIS authority can advice a ship to adapt its ETA and so optimize not only the resources but also the arrival of the ship. This allows for better use of infrastructure and reduced waiting times leading to improved efficiency.

[5.5.3.4]   RIS traffic planning (TP) optimizes the voyage planning of vessels.

[5.6]   Calamity abatement support

[5.6.1]   Calamity Abatement Support means the supporting actions necessary to limit the consequences of a calamity.

[5.6.2]   Calamity Abatement support is facilitated by reporting of the vessels position, voyage and transport data at the beginning of a voyage. This information should be continuously updated during the voyage. In case of an accident, the RIS centre delivers the data without delay to the emergency services.

[5.6.3]   It is the responsibility of the skipper to report the required data.

[5.6.4]   A ship reporting system with a database and appropriate means of communication should be established.

[5.6.5]   Position and sailing direction of the vessel should be reported by VHF or automatically via Inland AIS:

(a)   When entering or leaving a RIS area;

(b)   At specified reporting points within the RIS area;

(c)   When the data has been changed;

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[18]   The text is mainly the same as in para. 5.3.3.

(d)   Before and after stops of longer than a specific period.

[5.6.7]   In case of accidents responsible RIS authorities of a neighbouring RIS area should be informed on the type, status and possible consequences of an accident.

[5.7]   Information for transport logistics [19]

[5.8]   Information for law enforcement [20]

[5.9]   Information for statistics

[5.9.1]   The RIS Services for Statistics is mainly based up the other RIS services, in particular on Fairway Information Services, Traffic Information and Traffic Management. By means of storing this data over a defined period of time, statistical analysis can be made.

[5.9.2]   The type of analysis and the storage time of the data will also be determined by privacy regulations.

[5.9.3]   Statistical analysis might include the following:

(a)   Number of days per year, during which a waterway is not available due to flood or low water periods;

(b)   Number of vessels on a specific stretch of the fairway;

(c)   Traffic volume;

(d)   Cargo transported;

(e)   Number of lock operations.

[5.10]   Information for waterway charges and port dues

[5.10.1]   The RIS Services for waterway charges and port dues is mainly based on the RIS key technologies like Electronic Reporting and Tracking and Tracing systems.

[5.10.2]   Privacy regulations are essential pre-conditions to this service.

VII.   Chapters 6-7, "Planning of RIS" and "Stepwise development of RIS"

12.   Chapters 6–7 are revised in the light of the practical experience in the implementation of RIS and replaced by Chapter 6 on "Structured approach of the implementation of RIS services" as follows:

[6]   Structured approach of the implementation of RIS services

[6.1]   General

[6.1.1]   The need for RIS should be carefully assessed, based on a cost-benefit analysis and a consultation of the user groups.

[6.1.2]   In those cases where RIS are deemed to be necessary for the safety of traffic flow, the protection of the environment, the efficiency of transport and to augment the traffic on the waterways while keeping the safety at least on the same level, the competent authority should provide the necessary expertize and arrange funding to provide the desired levels of technology and expertize to meet the objectives.

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[19] Same as in section 5.5.
[20] Same as in section 5.8.

[6.1.3]   The RIS services, as defined in Chapter 5 and their relation with the RIS Key Technologies (see Figure 2), can be seen as a layered model similar to that presented in Figure 3.[3] The implementation of RIS should contain a least Fairway Information Services and in the next step it can be extended with traffic information, then with traffic management as the primary services. Based on these three primary services the other services can be implemented.

[6.2]   Mission Statement

[6.2.1]   The first step in the approach for a structured approach for the implementation of RIS is the definition of a mission statement.

[6.2.2]   A mission statement is a formal, written statement of the organization or RIS authority on objectives that should be achieved by the implementation of River Information Services. The mission statement should guide the actions of the organization, spell out its overall goal, provide a sense of direction and guide decision-making. It provides "the framework or context within which the company's strategies are formulated".

[6.3]   Steps of a structured approach for the implementation of RIS

The mission statement has to be translated into a vision statement, i.e. define what the organization wants to realise without specifying how it will be done. Before the vision statement can be defined training is necessary for the involved partners in existing directives and the technical specifications on RIS and other relevant documents.

[6.3.1]   Vision Statement

A structured approach for the content of the vision statement contains at least the following items:

(a)   Definition of the Primary Stakeholders: They have the capabilities, funding and authority (legal basis) to make decisions for realising RIS. They contain at least the authorities that will be responsible for the RIS centre(s) and its organization. To get a clear view on this it is important to define the working area for which RIS services will provided.

(b)   Definition of Secondary Stakeholders: These stakeholders are involved in the realization for RIS but do not have the authority to take decisions, e.g. the skippers, providers of hydrographical, hydrological and meteorological data.

(c)   RIS Key actors: The primary and secondary stakeholders should form the RIS Key Actors.

(d)   Definition of the RIS Services: Figure 4 gives an overview of the stack of the RIS services which are described in more detail in Chapter 5. Chapter 4 gives an overview of the four RIS Key technologies and Figure 2 gives an overview of the relation between RIS Key technologies - RIS Services and Reference data (RIS Index and Hull data). The Primary Stakeholders will have to decide which RIS services they need and to what level of detail each service will be provided. It is recommended to implement at least FIS, TI and TM. The Primary Stakeholders should also decide which organization will implement a certain service.

(e)   The RIS Key technologies: The type of RIS services define which RIS Key technologies are necessary to be implemented as can been seen from table 5.2.

(f)   Definition of the RIS Index: The four RIS Key technologies heavily depend upon the RIS Index. The realization of the RIS Index is necessary and experience shows that this is not an easy task to create and to keep it updated. Special attention should be given to objects in a cross border situation where the entries in the RIS Index should be aligned with the neighbouring countries.

(g)   Evaluation existing systems: The primary stakeholders should decide if they want to realize RIS on the basis of new systems or existing systems. The decision to use new systems or existing systems should be evaluated on basis of cost, availability, reliability and training of personnel.

(h)   Demands on the level of availability and reliability (down time) and other requirements with respect to the Quality of Information Services: The availability of each RIS service has to be defined, will it be available between office hours or does it need to be 24/7/365 availability. The reliability (redundancy) of the used system for the implementation of the RIS services has to be defined. Does it have to be a reliability of e.g. 99.5 % or 99.9 %?

(i)   Definition of data exchange: The definition of data exchange can be defined on two levels:

(i)   Internal: This contains the data exchange with organizations that feed the different systems used for the implementation of RIS, e.g. hydro meteo organizations that provide water levels for NtS.

(ii)   External: Which information and how will be exchanged with neighbouring RIS organizations. A lot of effort on this level has already been done and defined by the IRIS Europe I and II project. There can be also other organizations that need information e.g. the government in case of CAS.

(j)   Training of the personnel: The selection of RIS services that will be implemented procedures has to be defined by how these RIS services will be used and maintained. A function of these procedures is the knowledge (capacity) of the RIS operators that has to be defined together with the necessary training.

(k)   General Planning: For the implementation of the RIS services a time schedule should be made on the basis of the services that will be implemented taking into account the layered structure, as shown in Figure 6.1. It is important to take into account that different partners, organizations and international regulations can be involved in the realization of RIS. This can be a very important factor for the definition of the critical path of within any planning framework.

(l)   Estimation of Cost: The estimation of the cost should contain different items:

(i)   A calculating of the total cost for the implementation of the RIS services;

(ii)   The cost for the management and maintenance of the systems and infrastructure e.g. FIS portal, Inland AIS network;

(iii)   Estimation of costs for updates like Inland ENC's;

(iv)   Estimation of costs due to updates and amendments of regulations;

(v)   Costs for initial training of the personnel and update of the training depending on the adjustments in the procedures of how to use the RIS services.

[6.3.2]   Implementation of the mission statement

[6.3.2.1]   The vision statement forms the basis for implementing RIS. It forms the blue print of the project which should contain at least the following steps:

(a)   Definition of the functional and operational requirements (FOR). This is the translation of the objectives, defined in the vision statement, into requirements that can be implemented. This should be user driven. It defines what should be realized without being concerned on how the solution should be made. An important task in this phase is also the definition of the non-functional requirements like for example availability of the solution, does it need for example 24/7/365 availability, scalability of the solution, etc.;

(b)   Prototyping: a prototype should be developed and evaluated by the users. This will result in an update/change of the FOR. It is very important that the users get a feeling of the functionality that will be provided before the developments starts;

(c)   Technical design: This will translate the FOR in the description on how the system has to be developed. The FOR will be extended with a number of technical issues and an important driving force will be the non-functional requirements;

(d)   Implementation: on the basis of the FOR and technical design the solution will be developed;

(e)   FAT: factory acceptance test, the implementer proves in a simulated environment that the implementation fulfils the FOR;

(f)   SAT: site acceptance test - the implementer shows that the implementation fulfils the FOR and non-FOR in the real environment;

(g)   Training: the users get a training in the use of the implemented systems;

(h)   System test: the implementer proofs that the implementation works without any problems during a number of days when it is used in a real time situation;

(i)   Documentation: is provided on how the implementation is built. A user guide is provided. The necessary information to maintain the installed equipment and systems is set out and planned.

[6.3.2.2]   The items mentioned above are a minimum list of the necessary steps for planning and realizing the implementation of a RIS project. There are different methods to define the execution of the project, for example the waterfall or Agile methodology. The chosen methodology will depend on the implementer, the type of the project, the way an organization works, etc. But it should be taken into account that the FOR and prototyping can take an essential and significant part of the total time foreseen for the project and experience shows that these are the basis for a successful project.

[6.4]   Legal considerations

[6.4.1]   The liability element of compliance with RIS guidance is an important consideration which can only be decided on a case-by-case basis in accordance with national law. Consequently, a RIS authority should take into account the legal implications in the event of a shipping accident, where RIS operators may have failed to carry out their duty competently.

[6.4.2]   Other legal considerations should include at least the following aspects:

(a)   Definition of the tasks and the responsibilities of the responsible RIS authority.

(b)   Provisions for regulating data exchange at national and (if applicable) at international level.

(c)   Rules and regulation for the data storage, especially taking into account data privacy regulations.

[6.4.3]   The legal considerations should be outlined upfront to be able to identify the relevant actions (e.g. amendment of the inland shipping legislation, preparation and conclusion of administrative agreements).

[6.5]   Training

[6.5.1]   The successful delivery of RIS depends upon competent and experienced personnel to fulfil the responsibilities of a RIS authority. The recruitment, selection and training of suitable personnel are a prerequisite to the provision of professionally qualified

personnel capable of contributing to safe and efficient vessel operations. Such personnel will help to ensure that full regard is given to the diverse tasks inherent in RIS activities.

[6.5.2]   Training will depend on the RIS services that the organization wants to implement, the existing organization (Is it starting with a green field situation or will RIS be integrated in already existing situation like a VTS centre? Are there trained VTS personnel? Are there operational procedures in the organization?).

[6.5.3]   The following recommendations on training can be defined:

(a)   First the organization, responsible for the implementation of RIS, has to define the capabilities that are needed from the personnel, depending on the RIS services that shall be implemented. This should answer the question "What to train";

(b)   Then the organization should make a matrix based on the needed capabilities and the capabilities of the available personnel that could be taken into account to fulfil the required needs after the necessary training. This should answer the question "Who to train", i.e. if the organization can fulfil the implementation of RIS with the existing personnel or if there is a need for new personnel;

(c)   The result of the above steps result in a schema that defines "Who has to be trained in what" has to be trained;

(d)   Training means that there is a training environment. This is a very important element during the definition of the functional and operational requirements. The implementation of RIS should make it possible that the provided solution can work in a simulated mode and that previously situations can be replayed for purpose of training;

(e)   The above steps define the need of a separate environment for training. This solves the answer to the question "Where to train";

(f)   Due to the evolution in the RIS environment a continuously update program of training has to be foreseen.

VIII.   Chapter 8, "RIS Standardisation procedures"

13.   Chapter 8 and its annexes are deleted as their content is now contained in the new Chapter 4.

14.   A new annex 1 "Open Standards - Service Oriented Architecture stack" is added.[21]

15.   A new annex 1 "RIS information categories" is added.[22]

16.   Annex 6 "Relevant internet sites" is updated and renumbered as Annex 3.

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[21] Due to the limited space, the text of Annex 1 is reproduced in the addendum to the document.

[22] Due to the limited space, the text of Annex 2 is reproduced in the addendum to the document.