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Electronic Reporting of Ships in the RIS System

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ABSTRACT: This article presents the principles of data transmission and processing in a module of duplex transmission of messages as required by ship reporting in the RIS (River Information Services) system. Technical specification of messages intended for ship commanders is analyzed. Data standards in harmonized River Information Services on inland waterways are presented. Furthermore, the analysis covers message structures, encrypting in XML format for electronic reporting by ships. Finally, the author evaluates the advantages of introducing the RIS system for the safety of inland vessel traffic and the effect of the system on environmental protection.

1 INTRODUCTION

RIS (*River Information Services)* is a system that aims at the implementation of river traffic information services co-ordinating planning and logistics of transport.

RIS consists of advanced functions and services bringing operational advantages (e.g. immediate navigational decisions) and strategic ones (e.g. resources planning) for its potential users – inland shipping administrations – captains, terminal managers or lock operators.

Modern radio-communications and information technologies are used in inland transport. Ships are equipped with portable computers which have access to the Internet via a mobile telephone network. Besides, satellite positioning systems, electronic charts and inland AIS transponders are being developed and implemented.

Shore installations include radar stations with target tracking functions and ship reporting systems with interconnected databases.

Several technological innovations connected with RIS have been introduced in the sector of inland navigation [1]:

- electronic navigational charts (ENC) for displaying information on fairway situation and ship positions,
- Internet applications and inland ECDIS for messages for captains,
- electronic reporting systems for collecting data on voyage-related information (ship and cargo),
- vessel tracking and locating, such as automatic identification systems (AIS) for automatic reporting of ship's position.

2 BASIC FUNCTIONS AND OBJECTIVES OF ELECTRONIC SHIP REPORTING IN RIS

Functions and objectives of electronic ship reporting in inland navigation have been developed in line with the principles which aim to [4]:

- facilitate electronic data interchange between relevant authorities of the EU member states and inland navigation operators,
- use standardized notifications in communications between a ship and management centre in order to ensure compliance with mandatory rules in the adopted standards,
- use recognized international lists of codes and classifications,
- use unique European ship identification numbers.

The tasks of electronic ship reporting in the RIS system are as follows [3]:

1 Facilitation of data structure transfer in conformity with adopted EDI (Electronic Data Interchange) standards.
2 Exchange of information between inland navigation partners.
3 Sending dynamic information on a voyage at the same time to many participants.
4 Consistent use of the **UN/EDIFAC standard** (Electronic Data Interchange for Administration, Commerce and Transport) within the EU, accord-

ing to its directive on data transmission procedures **UNTDID** (United Nations Trade Data Interchange Directory)
5 Inland traffic management.
6 Transfer of complete information on locks and bridges and calamity situation.
7 Loading / unloading management and container terminal operation monitoring.
8 Border crossing control.
9 Services to passengers of inland ships.

3 PRINCIPLES OF DATA TRANSMISSION AND PROCESSING IN THE RIS SYSTEM.

Technical specifications defining the principles for data transmission of ship reporting in the RIS comply with the relevant EU directive [2].

The directive precisely covers such issues as:

- introduction of Standard Message Types (SMT));
- criteria and principles for data transmission - UN/EDIFACT;
- specifications of the message type directory EDMD (Edition 98.B, recommended by IMO);
- specification of the code list (CL);
- introduction of data standardization elements (Trade Data Elements Directory (TDED)).

3.1 Data transmission standards in the RIS system.

In conformity with the EDIFACT standard, data processing in the RIS system makes use of XML format (Extended Mark-up Language) [6] in which:

- EDIFACT and XML utilize the same data structure and code list.
- presently these versions are being tested: ebXML, eDocs and BICS 2.0.

3.2 Classifications and code lists in the EDIFACT messages.

The following classifications shall be used in inland electronic ship reporting [3,6]:

1 Vessel and convoy type
2 Official ship number (OFS)
3 IMO ship identification number (IMO)
4 ERI (Electronic Reporting International) ship identification number
5 UN Dangerous Goods number (UNDG)
6 International Maritime Dangerous Goods Code (IMDG)
7 United Nations codes for the representation of the names of countries
8 United Nations code for trade and transport locations (UN/LOCODE)
9 Fairway section code
10 Terminal code
11 Freight container size and type code (ISO)
12 Container identification code (ISO)
13 Package type code
14 Nature of cargo

The following table (tabl.1) defines the usage of the messages:

Table 1. RIS function and procedures of the messages

RIS Service and Function	Messages in the procedures Ship-to-authority	Authority-to-ship	Authority-to-authority
Traffic management	**ERINOT (VES)** **ERINOT (CAR)**	**ERIRSP** Notices to skippers	**ERINOT (PAS)**
Calamity abatement	**ERINOT (VES)** **ERINOT (CAR)** PAXLST	**ERIRSP** Notices to skippers	**ERINOT (PAS)** PAXLST
Transport management	**ERINOT (VES)** **ERINOT (CAR)** CUSCAR, CUSDEC	**ERIRSP** Notices to skippers	**ERINOT (PAS)** CUSCAR, CUSDEC
Statistics	**ERINOT (VES)** **ERINOT (CAR)** PAXLST CUSCAR, CUSDEC		
Waterway charges	**ERINOT (VES)** **ERINOT (CAR)**	**ERIRSP**	
Border control	PAXLST	**ERIRSP**	PAXLST
Customs services	CUSCAR, CUSDEC	**ERIRSP**	CUSCAR, CUSDEC

The following messages shall be used in electronic ship reporting on inland waterways [6]:

1 **ERINOT**, means "ERI Notification Message", message with the following types:
   - Transport notification from vessel to authority (identifier "VES"), from ship to shore
   - Transport notification from carrier to authority ("CAR"), from shore to shore
   - Passage notification ("PAS"), from authority to authority and the following functions to show what can be expected:
2 **ERIRSP**, means "ERI Response Message",
   - **PAXLST**, means the "Passenger List Message" , including passengers, crew and service personnel.
   - **CUSCAR**, means the "Customs Cargo Report Message",
   - **CUSDEC**, means the "Customs Declaration Message".

The reporting procedure shall always start with the **ERINOT** message and send additional data by the PAXLST, CUSCAR and CUSDEC messages.

3.3 Methods of remote data transmission in electronic ship reporting

The following communications means have been proposed for use in message transmission within electronic ship reporting [5] :

1 VFH radio station.
2 ATIS (Automatic Transmitter Identification System) identifying ship's calling, e.g. while approaching a lock, in a computer-based system of traffic management.
3 inland AIS transponder (Automatic Identification System).

4 DATA STANDARDS IN MESSAGES FOR SHIP SKIPPERS

Navigation messages, with navigation information for inland skippers (fig.1) about a geographical object, have the following information sections [4]:

1 Identification of the message.
2 Fairway and traffic related message.
3 Water level related messages as:
   - Water level messages;
   - Least sounded depth - messages;
   - Vertical clearance - messages;
   - Barrage status - messages;
   - Discharge messages;
   - Regime messages;
   - Predicted water level - messages;
   - Least sounded predicted depth - messages;
   - Predicted discharge - messages.
4 Ice messages.

5 SUMMARY

Electronic ship reporting in the transmission of message for ship skippers and inland navigation management centre enables the RIS system achieve three basic goals:

1 to enhance the safety of transport - minimize the number of:
   - injured persons,
   - fatal casualties,
   - untypical situations in a voyage;
2 to make transport efficient:
   - maximize the capacity of waterways,
   - maximize the use of ship cargo capacity,
   - minimize voyage time,
   - reduce work effort of RIS users,
   - reduce transport costs,
   - reduce fuel consumption,
   - ensure efficient and cost-effective connections for intermodal transport,
   - make efficiently operating harbours and terminals accessible;
3 to make transport environment-friendly:
   - reduce threats to the environment,
   - reduce pollution.

The development of standardized RIS interfaces will make it possible to generate wide-range transparent information processes and smooth data exchange between all participants of inland navigation.

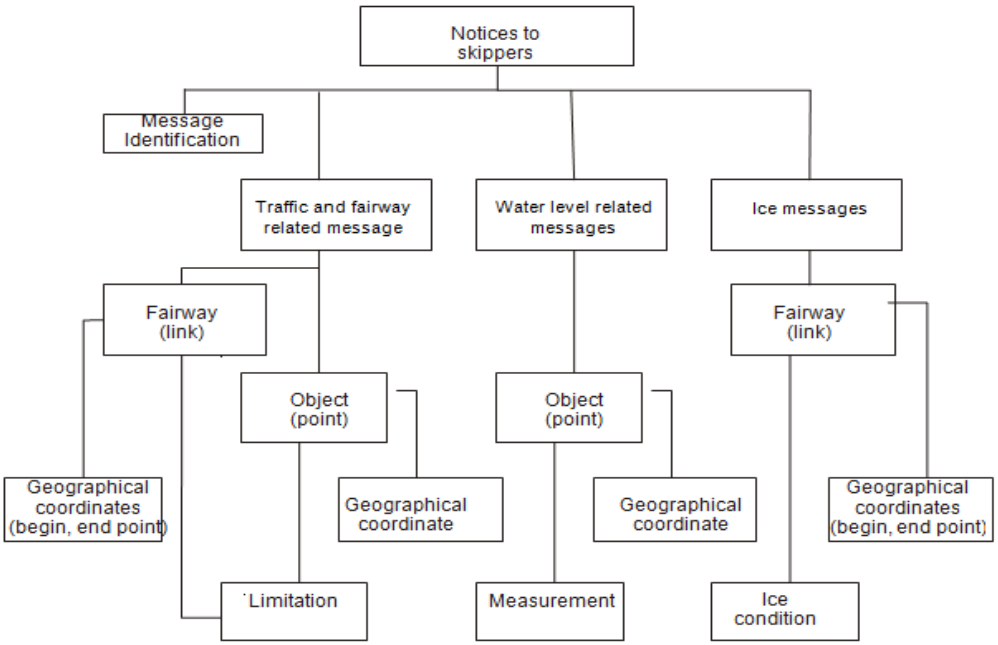

Fig.1 Structure of the Notices to Skippers

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