WASTE MANAGEMENT FOR INLAND NAVIGATION ON THE DANUBE

Report – Feasibility study on the application of RIS

Work Package 5: Developing financing model for oily and greasy ship waste
Activity 5.3: Evaluating RIS for supervision and fee collection
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0 SCOPE OF DOCUMENT

The scope of the documents is to investigate the synergies between RIS and the elaborated financial model.

River Information Services is an electronic system for traffic control and the most important information media for inland navigation on the Danube. The display of the real time position of vessels by means of an Inland Electronic Navigational Chart including nautical and other information is the main function of RIS. Data sets of the applied “Tracking and Tracing Technology” by AIS (Automatic Identification System) Transponder and of the Electronic Reporting module (e.g. for dangerous goods) can support the controlling of the financing model. Therefore, it is essential to analyze possible synergy between a common financing system and RIS.

Due to the potential conjunction of both systems RIS is able to monitor payment flows regarding the bilge water collecting/treatment and disposal service as it is also possible by RIS to identify which vessel, when and where has visited the bilge water/waste oil receiving points or bunker stations. Additionally RIS provides potentially services regarding risk management as it is possible to accomplish an automatic alarm in case of oil accidents or accidents with dangerous goods on the Danube for instance.

1 SUMMARY


Based on the analysis and investigations made during the WANDA project it can be stated that the application of river information services to support waste management (supervision and fee collection) and disposal is feasible and recommended. Systems (hardware and software) are set up or being set up currently for these objectives. RIS should not be considered as an "automatic invoicing tool", but should provide adequate information to authorities for law enforcement and other administrative processes.

The RIS key technologies support the control of the processes both from the administrative and commercial side. The Danube-riparian countries are introducing the carriage and operation requirement for the use of the Inland AIS equipment.

In this current report the basic RIS technologies have been analyzed as described in the relevant EC regulation and practical experiences have been used, also with the involvement of a Hungarian expert company, Rivus Bt. The current state of the art elements have been investigated and proposals for value added services have been raised in this document.

When choosing the proper financing solution of the waste management system the functionalities and potentials of river information services could be used as described in chapter 3.
The mobile service (Bilgenentöler 8) has been analyzed by Rivus Bt. as well and the experiences have been integrated into Annex 2.

The following key features can support to sustain the environmentally friendliness of inland navigation:

- **RIS implementation / AIS carriage requirement in the different Danube countries** → enables support and control

- **Interoperability** between the existing and the planned „Danube system” → RIS can support (e.g. with the help of the European Hull Database – PLATINA)

- **Tracking and tracing** → messages to be sent to the respective authorities when a vessel is entering: fee is paid or not

- **Statistics** → what was disposed, quantity, how much time is necessary to dispose waste etc.
2 WHAT IS RIS?

“River Information Services (RIS) means the harmonised information services to support traffic and transport management in inland navigation, including, wherever technically feasible, interfaces with other transport modes. RIS do not deal with internal commercial activities between one or more of the involved companies, but are open for interfacing with commercial activities. RIS comprise services such as fairway information, traffic information, traffic management, calamity abatement support, information for transport management, statistics and customs services and waterway charges and port dues.” (Article 3 (a) of the 2005/44/EC Directive)


RIS provides several types of services to different types of users.

1. Figure: RIS services
The so called RIS key technologies are considered to be the following:

1. Vessel Tracking & Tracing
2. Notices to Skippers
3. Electronic Reporting
4. Inland ECDIS

2.1 HISTORY

In 1998 the European Union initiated the concept of River Information Services (RIS). This RIS concept has been developed and detailed in research projects like INDRIS\(^1\) and COMPRIS\(^2\). The potential of RIS to bring inland navigation to a better position in the transport chain was also recognised by international organisations like the UN ECE, Several river Commissions like Rhine and Danube Commission and the International Association for Navigation (PIANC). PIANC established a working group that developed in 2002 the Guidelines for River Information Services which are still an important pillar in the implementation phase of River Information Services. In 2004 the first revision of these guidelines were drafted and published.

With the support of several European Member States the European Commission took the initiative for a directive on River Information Services in 2003 which came into force in 2005. The PIANC guidelines, revision 2004, are one of the basic regulations of this directive.

River Information Services were formally recognized as a concept for harmonised information services to support traffic and transport management for inland navigation, including interfaces to other transport modes

The RIS directive put formal requirements to the European Member States to implement several basic services in their parts of the waterway network. These services, as there are electronic navigational charts, notices to skippers and electronic reporting, should be implemented according to defined RIS standards.

In the European context the development and formalisation of River Information Services is seen as an example for other transport modes towards a successful implementation of IT related traffic and transport services.

\(^1\) INDRIS was a research project on the development of River Information Services in the 4th Framework Programme of DG Energy and Transport of the European Commission (EC)

\(^2\) COMPRIS was a research project in the 5th Framework Programme of DG Energy and Transport of the EC
2.2 LEGAL BACKGROUND

On the general level river information services are regulated in the so called RIS Directive that is defining the task of the Commission to define guidelines and technical specifications for RIS. In summer 2010 the following documents are available:


2.3 VESSEL TRACKING & TRACING

Tracking and tracing of inland navigation vessels is an important part of the “River Information Services” (RIS) for the improvement of safety and efficiency in the sector. It supports onboard navigation, shore-based traffic monitoring as part of Vessel Traffic Services (VTS) and other tasks such as calamity abatement. Inland AIS (Automatic Identification System) is a standardised procedure for the automatic exchange of nautical data between ships and between ships and shore installations.
2. Figure: Basic configuration of the on-shore AIS network

3. Figure: Traffic overview on the Danube stretch rkm 1811-1433 (image from the Hungarian RIS infrastructure)
2.4 NOTICES TO SKIPPERS

National and local fairway authorities have the obligation to inform users about issues regarding the waterway that might influence safety and accessibility. Notices to Skippers communicate for example the status of the inland waterway infrastructure (i.e. bridges and locks), failures of aids to navigation, temporarily blockages of waterway sections or other types of infrastructure, works, water level and water depth information ice information and weather messages. The international standard for Notices to Skippers provides a standardized data format, which can be used both for publishing notices on the internet (pull-services) or for distribution by e-mail (push services).

Notices to Skippers (see also Chapter 3.1.2) messages are being published in several modes such as XML format, codeformat or in a PDF file etc.

4. Figure: NtS message structure
2.5 ELECTRONIC SHIP REPORTING

Electronic reporting and electronic messaging is the way to a paperless environment in inland shipping. All necessary information is available at the right time and in the right place. The messages address the parties concerned ensuring a fast dispatch and transparent procedures with appropriate controls and simplified water transport processes.

Information on vessel and cargo data over a large area are important for all those participating in transport operation: Authorities, lock operators, emergency services, port operators, fleet operators. For that reason, electronic ship reporting systems are set up. The Standard for Electronic Ship Reporting in Inland Navigation describes the messages, data items and codes to be used in electronic ship reporting for the different services of RIS.

6. Figure: BICS application to fill out electronic ship reports
2.6 INLAND ECDIS

Inland ECDIS is a system for the display of electronic inland navigation charts and additional information. Its purpose is to contribute to safety and efficiency of inland navigation and thus also to protection of the environment. Simultaneously Inland ECDIS is to reduce the workload when navigating the ship as compared to traditional navigation and information methods. Inland ECDIS provides also the basis for other River Information Services (RIS), e.g. Inland AIS.

7. Figure: Inland ECDIS screen in navigation mode
3 APPLICATION OF RIS IN WASTE MANAGEMENT

In general it can be stated that the key elements of river information services can for sure be utilized and applied to support the waste management and disposal, thus contributing to environment protection and better water quality. However, RIS shall not be considered as a fee collection tool, but as an information provider for the planned fee collection system(s).

3.1 APPLICATION OF BASIC RIS SERVICES

3.1.1 Vessel Tracking & Tracing

Mobile services are recommended to be equipped with an Inland AIS transponder to support the relevant processes. The list of the certified Inland AIS transponders can be downloaded from [http://www.ccr-zkr.org/Files/ris/ais_apagrees.pdf](http://www.ccr-zkr.org/Files/ris/ais_apagrees.pdf).

During the WP3 Status Meeting held in Budapest on 3rd February 2011 the information was provided to RSOE that the company Bilgenentölungsgesellschaft MBH will be contracted to a defined operation on the Danube. According to the information the vessel of the company (Bilgenentöler 8) is equipped with an Inland AIS transponder. In this case, during the pilot several features of VTT can be used, such as:

- recording the voyage(s) of the vessel,
- drawing and displaying the route of the vessel during the voyage(s),
- provide statistics,
- highlight on a map where the bilge boat was facing the highest demand,
- etc.

A precondition for this task is that the vessel owner company authorizes the Austrian, Slovakian and Hungarian project partners to collect and store the AIS data of the given vessel, and use the data to evaluate the actions during the WANDA pilot.

Based on the information from the service of the bilge boat several diagrams can be drawn on the voyage and the disposal works as displayed below in the screenshots.

In the applications providing vessel tracking and tracing solutions the data that are displayed are broadcasted by the standardized Inland AIS on-board equipment – the transponders. Considering the Danube there is an existing Danube Commission recommendation (Dok. DK/TAG75/20) prescribes the data requirements to be provided from the vessels. These data can be displayed e.g. on web-based VTT applications (see also Fig. 8.):

- User identifier (MMSI)
- Name of ship
- Call sign
- Type of ship and cargo
- Unique European vessel identification number ENI
f. Overall length (decimetre accuracy)
g. Overall beam (decimetre accuracy)
h. Maximum present static draught
i. Type of vessel and convoy
j. Category of dangerous cargo
k. Position (WGS 84)
l. Speed over ground
m. Course over ground
n. Position accuracy (GNSS/DGNSS)
o. Time of el. position fixing device
p. Navigational status
q. Position of the GNSS antenna

8. Figure: Position of the vessel next to the targeted vessel
9. Figure: Route of the vessel

10. Figure: Position next to a disposal place in the Port of Csepel
3.1.1.1 Status of Inland AIS implementation in European Countries

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<th>Inland AIS</th>
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<th>Landbased AIS infrastructure</th>
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<td>No activities planned</td>
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Is going on
Completed
Pilot operation
Fully operational

* Remark from Serbia (18th January 2012, it was proposed to inform the VTT Expert Group leader on the update):
  • dGPS via ais already in pilot operations
  • waterlevel via AIS is implemented and is under testing
  • Equipment program is ongoing
  • Landbased AIS infrastructure in 2011 was newly completed in 2011
  • Landbased AIS infrastructure in 2012 is in pilot operation

Table 1: Status of Inland AIS implementation in European Countries

(Source: CCNR Leaflet Inland AIS 2011)
3.1.1.2 AIS application possibilities based on the Hungarian experiences

The obligatory installation and use of AIS transponder has been preceded by the tendering of the National Transport Authority.

11. Figure: Illustrative photos of Inland AIS installations

**Equipping vessels with transponders**

The National Transport Authority put out to tender on April 5th 2011 within the framework of the IRIS Europe II project, financed by the European Union and the Ministry of National Development to grant use of AIS devices and their accessories. Goal of the tendering is to fit out the floating objects with the compulsory equipment.

The inviting applications applied to the granting use of the distributed AIS devices and their accessories for 5 years with the purpose of realizing the River Information Services (RIS) within the framework of the IRIS Europe II project (2008-EU-70000-S), financed by the European Union. Further use and ownership after the end of the 5 years will be disposed of by the granter of use according to the law of national wealth.

On account of the tendering, applicants suitable for the calling for tender have been granted use of 127 AIS transponders and their accessories. Meanwhile institutions of the authorities and water police have been provided with transponders. Besides the tendering 20 transponders were equipped on private order.

By equipping transponders the compulsory fundamental system of River Information Services (RIS) was realized.

**Announcement of the AIS decree**

In the 53/DU/2011. Notices to Skippers announcement on August 22, 2011 the National Transport Authority published its decree about the introduction of the Automatic Identification System (AIS), announcing that:
The Ministry of National Development introduces duty to operate and use Automatic Identification System (AIS) on the Hungarian section (between 1811-1433 rkm) of the Danube and on its Szentendre branch according to the following:

a) from September 1, 2011 ships, ferries, floating equipment and small motorized vessels that are allowed to carry more than 12 passengers, of which records are kept in the Hungarian register, are involved.

Floating objects that are part of a convoy and ferries navigating non-independently are exempted.

b) from January 1, 2012 besides floating objects determined in a) ships, ferries, floating equipment and those small motorized vessels that are allowed to carry more than 12 passengers, of which records are not kept in the Hungarian register, are involved.

Floating objects that are part of a convoy and ferries navigating non-independently are exempted.

AIS devices in working order and conform to the technical requirements of vessel localization and following systems – with the exception of stranded floating objects at designated stranding places and anchored at a harbour or put into port – are to be kept in working order.

With this announcement the Notices to Skippers 06/TAJ/2011. about the introduction of the Automatic Identification System (AIS) and the tendering regarding the discounted claim of AIS devices is now no longer in effect.

3.1.1.3 Application alternatives of AIS in the WANDA project with the use of RISING3 solutions

In case the vignette system preferred by the „Financing model IWT waste Danube; Wanda Project” study is chosen with the complementary functions of the RISING project the vignette system can be supported using the following exemplary functions:

- localization and following of vessels become possible (Logged in vessels become visible for ports and receiving locations. In case of water pollution, polluting vessels become identifiable by replaying the time and position of pollution. Time and position of pollution become calculateable.)
- the „Geofencing“ function makes it available to determine and document the location of vessels in the given geographical „fence”
- waste disposal can be traceable and documentable (place, quantity for each type)

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3 RISING is a project co-financed by the European Commission (DG MOVE) within the 7th Framework Programme for Research and Technological Development. RISING has the overall objective of identifying, integrating and further developing information services such as River Information Services (RIS) in order to efficiently support Inland Waterway Transport (IWT) and logistics operations. For more details please visit www.rising.eu.
• in case of electronically coded purchase of „vignettes”, vessels can be checked through the RIS system if they have been provided with a valid „vignette”

The realization of the laid down fundamental principles of the RISING and of the above mentioned practical advantages of the vignette system requires further specifications and pilot tests.

3.1.1.4 Other AIS application possibilities

• Flag assignment within VTT systems (black vs. green flag, depending on the status of the waste disposal). As an example, a black flag can be automatically assigned to the vessels according to predefined criteria (no available information about waste disposal, when vessel enters certain country), while a green flag can be assigned on the basis of certain time period that a vessel has spent in a geo-fenced area (e.g. waste disposal facility). Additionally a green flag could be assigned by certified waste disposal facility operator for vessels that have performed waste disposal operations at the proper way. This would enable competent authorities to monitor the vessels (from waste disposal/pollution) involved in operations within their juridical area.

• Usage of AIS is also possible for waste facility operator, in similar manner as any other terminal operator to plan its operations in a proper way, meaning that the operator will be able to receive pre-arrival information, vessel dimension and waste information (type, quantity etc.). Based on these information the operator can among others
  o start organizing the proper berthing place (e.g. next to an automatized waste disposing equipment or a place where a sucking truck can easily drive in),
  o order the necessary equipment and services (e.g. sucking trucks, cleaning equipment, workforce),
  o start to fill in the necessary documentation.
3.1.2 Notices to Skippers

Broadcast and display information for skippers:

- publish the information from Inland ECDIS
- publish the date where and when waste disposal services are available (e.g. the Bilgen-entöler boat)

As an example the voyage announcement of the bilge boat can be formulated in a standardized NtS message:

12. Figure: Illustration of the use of the NtS technology
3.1.3 Electronic ship reporting

The current version of the EU regulation on electronic ship reporting (Commission Regulation (EU) No 164/2010 of 25 January 2010) includes four types of messages:

- ERINOT - (Dangerous) goods reporting,
- ERIRSP - ERINOT response and receipt message,
- PAXLST - Passenger and crew list,
- BERMAN - Berth management port notification.

However, in the UN/EDIFACT standards there are several more types of messages that can be used in (inland) navigation. Out of these UN/EDIFACT messages the so called WASDIS messages is of relevance for the framework of the WANDA project.

Therefore it is recommended to investigate the potential use of the ERINOT, BERMAN and WASDIS messages in the waste management procedures out of the electronic ship reporting features.

**Short explanation of the ERINOT message**:  

The ERI notification message (ERINOT) shall be used for the reporting of voyage related information and of information on dangerous and non-dangerous cargo carried on-board vessels sailing on inland waterways. The ERINOT message is a specific use of the UN/EDIFACT "International Forwarding and Transport Dangerous Goods Notification (IFTDGN)" message as it has been developed within the PROTECT organisation. The ERINOT message is based on the EDIFACT directory 98.B and the PROTECT implementation version 1.0.

For the data and codes contained in the message applications based on these message specifications, use has been made of the UN Directory D98B.

The ERINOT message encompasses the following types:

- transport notification from vessel to authority (identifier "VES"), from ship to shore;
- transport notification from carrier to authority (identifier "CAR"), from shore to shore;
- passage notification (identifier "PAS"), from authority to authority.

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4 based on Commission Regulation (EU) No 164/2010
Short explanation of the BERMAN message:

The Berth Management (BERMAN) message combines the pre-arrival notification respectively general declaration into one single notification which is based on the EDIFACT message BERM from the UN/EDIFACT D04B directory. The implementation manual is based on the guidelines as defined by the PROTECT group.

The BERMAN message shall be sent by vessels sailing on inland waterways before arriving at or departing from a berth or a port and provides information about the time of arrival and the services required to ensure a prompt handling, to support procedures and to facilitate controls.

The message incorporates the legal requirements regarding the notification of a ship to a port. It supports one request for the ship — be it for entering the port, berthing on arrival of the ship, leaving the berth on departure of the ship or shifting of berths for the ship within the port or for transiting only through the port area. The arrival and transit notification contains all details regarding the movement of the ship from outside the port area to the first berth in the port area or in case of transit to the point where the vessel is leaving.

Required additional services to be arranged for arrival at a berth can be specified. The estimated time of arrival (ETA) at the entry point and where required leaving point and previous place of call of the ship are required information elements.

The exchange of ERINOT information is already included in the pilot implementation phase in the framework of the international RIS data exchange (for more information please visit [http://www.iris-europe.net/](http://www.iris-europe.net/) website of the IRIS Europe I and II projects). The BERMAN message was officially introduced in the regulation on electronic ship reporting as listed in chapter 2.2. Some countries will start the pilot implementation of the BERMAN message in the IRIS Europe 3 project.

During the discussions w.r.t. the evaluation of RIS in the waste management RSOE has proposed to investigate the utilization of the WASDIS message on the Danube. Therefore the next separate chapter is dedicated for the WASDIS-related inventory.

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5 based on Commission Regulation (EU) No 164/2010
3.1.3.1 WASDIS message

The United Nations Directories for Electronic Data Interchange for Administration, Commerce and Transport has published the WASDIS message specification on 10th June 2003, revision 2. WASDIS is standing for Waste disposal information message.

The scope of the message is to convey information on last inspection and/or on waste and cargo residues on board of a means of transport (e.g. vessel) and/or equipment related to a means of transport – and still to be disposed in the next place or port of call of the means of transport.

The Waste disposal information message may be used for both national and international applications. It is based on universal practice related to administration, commerce and transport, and is not dependent on the type of business or industry.

The message has been designed to enable control of pollution caused by an activity of transport, e.g. in the maritime and port environment.

- The message relates to one means of transport and/or equipment related to a means of transport.
- The message can be sent by a shipping agent to an authority (e.g. a port) or a centralized database of authorities
- The message can be sent by an authority (e.g. a port) to an authority in the next place or port of call of the means of transport (e.g. a vessel) or to a search or rescue organization

Business area: control of pollution by a means of transport (e.g. maritime pollution)⁶

Requirements towards an electronic message on waste disposal:

- availability of XSD (XML messages are used in the context of RIS on the Danube)

3.1.4 Inland ECDIS

Since the Inland ECDIS technology and service can be considered as a standardized complex tool (including chart, hydrological, AIS, radar, logistics etc. information) it can also serve as additional support for both on-board and on-shore users, practically for example with the following options:

- Indication of waste disposal facilities on ENCs (such as the Green Terminal in the Port of Baja)
- Indication of quantity of waste that can be disposed
- Mark the ports, where it is possible to dispose the ship-generated waste

⁶ based on: http://www.unece.org/trade/untdid/d03a/trmd/wasdis_c.htm#0120_X
Mark the ports, where it is possible to dispose the ship-generated hazardous waste

All these can be visualized in the Inland ECDIS charts:

13. Figure: Illustration of the use of the Inland ECDIS technology

### 3.2 APPLICATION OF ADDITIONAL RIS SERVICES

Based on the basic RIS services (meaning that the information is deriving from the four RIS key technologies) several value added services can be foreseen that can further support waste management functions and processes, such as:

- Marking the port facilities where it is possible to dispose the ship-generated waste
- Implementation of new payment system in the ports
- Vessel Tracking and Tracing (displays the registered vessels in the ports’ database, in case of water pollution from the time and position data it is possible to identify the related vessel)
- Implementation of the “geofencing” function (it is possible to document and determine the payment the country) – see chapter 3.1.1.2.
- RIS makes it possible to transmit the ship-generated waste documentation and tracking (place, waste of type quantity)

These functions can be piloted and tested in the course of next actions.
4 HOW CAN RIS SUPPORT THE PARALLEL OPERATION OF THE CDNI AND THE VIGNETTE SYSTEMS?

In other tasks of the current WANDA project potential financing models have been analysed and ranked in the field of waste management. It is well-known that in the Rhine-region the so called CDNI system is in force, although some revision activities have already been started.

For the Danube-region a so called vignette system is proposed. This means that there will be vessels navigating under both systems, thus a dedicated administration system should be elaborated. RIS can be of support in this field as well.

The two systems are completely different and will hardly be compatible unless some of the existing problems will be solved. Theoretically the parallel operation of the systems could be imagined as following:

1. the border points between the systems shall be clearly defined (it is practical to define such geographical locations that make the automatic data recording feasible by using RIS „Geofencing”)

2. the AIS data are appropriate for vessel identification, however in order to follow the transition between the systems further data shall be recorded:
   - ECO Card number (proof of payment in the Rhine Region – CDNI system)
   - Vignette identification number (proof of payment in Danube System)
   - Date of issue and validity of the vignette
   - amount of gas oil at border crossing

3. The parallel operation of the systems involves the possibility of double invoicing. The only way to avoid this situation is to make those vessels entitled to use the waste disposal facilities available for „vignetted” vessels that have already paid tax when bunkering gas oil in the ECO Card system and vice versa.

The comparison of the systems as you can see above is considerably difficult. Unless a standardized European system is applied no matter if it is the „vignette” or „ECO Card” system, a supporting tool and/or system has to be set up. This function can be supported by river information services, by means of data provision from RIS systems towards governmental and commercial users. Among other the Danube FIS Portal – developed in the NEWADA project (www.newada.eu) – can be one of the information sources for the stakeholders.
5 ACTIVITIES DONE IN THE TASK

RSOE as subworkpackage leader for 5.3 gave a presentation of RIS (introduction of the system, technical possibilities) at the WP5 meeting of the project in Vienna on 18th May 2010. The next presentation was sent to be used on the WP5 meeting on 16th November 2010. RSOE took part and presented the proceedings of 5.3 in the WP3 status meeting on 3rd February 2011 at the premises of KTI and on 8th June 2011.

RSOE has also held a short presentation of the project at the Electronic Reporting International Expert Group in Budapest on 10th June 2010. At this meeting the initiative of applying the WASDIS message for the Danube was raised. The meeting has decided to put this question on the agenda of the ERI Message Development Group.

RSOE updated the Electronic Reporting International Expert Group on the status of the WANDA project w.r.t. ERI on 17th November 2010, on 14th June 2011 and on 17th November 2011.

6 COST-BENEFIT ANALYSIS AND CONCLUSIONS

When elaborating on the costs and benefits of introducing RIS into the waste management processes it is necessary to divide the arising topics:

- costs and benefits for law enforcement bodies,
- costs and benefits for users,
- costs and benefits for service providers.

In the following tables an assumption is provided for the costs and benefits. At several aspects it is hard to measure the costs and/or the benefits in euros, therefore it was chosen to provide list of costs and benefits.

<table>
<thead>
<tr>
<th>COSTS</th>
</tr>
</thead>
</table>
| for law enforcement bodies | • system specifications and implementations  
  o to integrate e.g. vignette information and waste disposal information into existing systems  
  o to check waste disposal activities against the requirements for the given type of vessel  
  • databases to register the validity of the vignette |
<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>for users</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• well-trained staff</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• proper RIS equipment are needed on board</td>
</tr>
<tr>
<td></td>
<td>o it can be assumed that most of the related vessels are equipped with an Inland AIS transponder (if not, a proper unit costs appr. 1.500 EUR + 300 EUR installation cost)</td>
</tr>
<tr>
<td></td>
<td>o PC or laptop on-board (appr. 600-1.000 EUR)</td>
</tr>
<tr>
<td></td>
<td>o Inland ECDIS Viewer (appr. 1.000 EUR)</td>
</tr>
<tr>
<td></td>
<td>o internet connection</td>
</tr>
<tr>
<td></td>
<td>• well-trained staff</td>
</tr>
<tr>
<td>for the service providers</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• proper infrastructure to receive and provide data:</td>
</tr>
<tr>
<td></td>
<td>o PC or laptop (appr. 600-1.000 EUR / operating place)</td>
</tr>
<tr>
<td></td>
<td>o internet connection</td>
</tr>
<tr>
<td></td>
<td>• well-trained staff</td>
</tr>
</tbody>
</table>

**Table 2: Cost-benefit analysis aspects**

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>for law enforcement bodies</td>
<td>• up-to-date real time data on waste disposal</td>
</tr>
<tr>
<td></td>
<td>• one integrated data source available</td>
</tr>
<tr>
<td></td>
<td>• less amount of failures</td>
</tr>
<tr>
<td>for users</td>
<td>• less administration costs</td>
</tr>
<tr>
<td></td>
<td>• higher predictability</td>
</tr>
<tr>
<td></td>
<td>• flexible voyage planning</td>
</tr>
<tr>
<td>for the service providers</td>
<td>• less administration costs</td>
</tr>
<tr>
<td></td>
<td>• higher predictability</td>
</tr>
<tr>
<td></td>
<td>• implement ‘just in time’ services</td>
</tr>
</tbody>
</table>
Concerning the potential use cases of usage listed in 3.1.1 one of the most tangible results of the surveys done in this activity was using and elaborating statistics-related conclusions. RSOE was provided with the data of the two trips of the bilge boat on the Hungarian Danube-stretch. A useful result for the future aspects is that the bilge boat was mostly used around the Budapest area and also on the way between Esztergom and Budapest. This could be of support for the planning of further pilot actions and / or waste disposal facilities. More data analysis is included in Annex 2.

14. Figure: Territorial distribution of the bilge boat during the two pilot runs in Hungary

In this current report the basic RIS technologies have been analysed as described in the relevant EC regulation and practical experiences have been used, also with the involvement of a Hungarian expert company, Rivus Bt. The current state of the art elements have been investigated and proposals for value added services have been raised in this document.

Based on the analysis and investigations made during the WANDA project it can be stated that the application of river information services to support waste management (supervision and fee collection) and disposal is feasible and recommended. Systems (hardware and software) are set up or being set up currently for these objectives. RIS should not be considered as an "automatic invoicing tool", but should provide adequate information to authorities for law enforcement and other administrative processes.
7 LIST OF ABBREVIATIONS

<table>
<thead>
<tr>
<th>Abbr.</th>
<th>Abbreviation</th>
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</thead>
<tbody>
<tr>
<td>EC</td>
<td>European Commission</td>
</tr>
<tr>
<td>ENC</td>
<td>Electronic navigational charts</td>
</tr>
<tr>
<td>ERI</td>
<td>Electronic Reporting International</td>
</tr>
<tr>
<td>Inland ECDIS</td>
<td>Electronic chart display and information system for inland navigation</td>
</tr>
<tr>
<td>NTS</td>
<td>Notices to Skippers</td>
</tr>
<tr>
<td>RIS</td>
<td>River Information Services</td>
</tr>
<tr>
<td>VTT</td>
<td>Vessel Tracking and Tracing</td>
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</tbody>
</table>

8 REFERENCES


END OF DOCUMENT
9  ANNEX 1 – WASDIS MESSAGE DEFINITION
United Nations Directories
for Electronic Data Interchange for
Administration, Commerce and Transport

UN/EDIFACT

Message Type : WASDIS

Version : D

Release : 03A

Contr. Agency: UN

Revision : 2

Date : 2003-06-10
CONTENTS

Waste disposal information message

0. INTRODUCTION

1. SCOPE
   1.1 Functional definition
   1.2 Field of application
   1.3 Principles

2. REFERENCES

3. TERMS AND DEFINITIONS
   3.1 Standard terms and definitions

4. MESSAGE DEFINITION
   4.1 Segment clarification
   4.2 Segment index (alphabetical sequence by tag)
   4.3 Message structure
      4.3.1 Segment table

For general information on UN standard message types see UN Trade Data Interchange Directory, UNTDID, Part 4, Section 2.3, UN/ECE UNSM General Introduction
0. INTRODUCTION

This specification provides the definition of the Waste disposal information message (WASDIS) to be used in Electronic Data Interchange (EDI) between trading partners involved in administration, commerce and transport.

1. SCOPE

1.1 Functional definition

A message to convey information on last inspection and/or on waste and cargo residues on board of a means of transport (e.g. vessel) and/or equipment related to a means of transport - and still to be disposed in the next place or port of call of the means of transport.

1.2 Field of application

The Waste disposal information message may be used for both national and international applications. It is based on universal practice related to administration, commerce and transport, and is not dependent on the type of business or industry.

1.3 Principles

The message has been designed to enable control of pollution caused by a means of transport, e.g. in the maritime and port environment.
* The message relates to one means of transport and/or equipment related to a means of transport.
* The message can be sent by a shipping agent to an authority (e.g. a port) or a centralized database of authorities
* The message can be sent by an authority (e.g. a port) to an authority in the next place or port of call of the means of transport (e.g. a vessel) or to a search or rescue organization

Business area: control of pollution by a means of transport (e.g. maritime pollution)

2. REFERENCES

See UNTDID, Part 4, Chapter 2.3 UN/ECE UNSM - General Introduction, Section 1.

3. TERMS AND DEFINITIONS

3.1 Standard terms and definitions

See UNTDID, Part 4, Chapter 2.3 UN/ECE UNSM - General
Introduction, Section 2.

4. MESSAGE DEFINITION

4.1 Segment clarification

This section should be read in conjunction with the segment table which indicates mandatory, conditional and repeating requirements.

**0010 UNH**, Message header
A service segment starting and uniquely identifying a message. The message type code for the Waste disposal information message is WASDIS.

Note: Waste disposal information messages conforming to this document must contain the following data in segment UNH, composite S009:

Data element 0065 WASDIS
  0052 D
  0054 03A
  0051 UN

**0020 BGM**, Beginning of message
A segment to indicate the beginning of a message and to transmit the identifying number.

**0030 DTM**, Date/time/period
A segment to provide the date and time of the message.

**0040** Segment group 1: RFF-DTM
A group of segments to specify a reference applying to the whole message.

**0050 RFF**, Reference
A segment to specify a reference, e.g. reference to previous message.

**0060 DTM**, Date/time/period
A segment to indicate a date and time related to the reference.

**0070** Segment group 2: LOC-DTM-GOR
A group of segments to give information about the inspection of the means of transport and the associated results.

**0080 LOC**, Place/location identification
A segment to specify the place where the means of transport has been inspected.
DTM, Date/time/period
A segment to indicate the date and time of the inspection.

GOR, Governmental requirements
A segment to indicate the government agency involved (e.g. Maritime pollution inspection agency), the government involvement (e.g. an indication that a certain procedure is completed or required) and the government procedure (e.g. to indicate that charge of waste is required).

Segment group 3: TDT-DTM-LOC-RFF-MEA-FTX-QTY
A group of segments to indicate the details of the means of transport, with related quantities, locations, dates and times, measurement, etc..

TDT, Transport information
A segment to identify the means of transport (e.g. by Lloyd’s Register number of a vessel, or by the license plate number of a truck) and the type of the means of transport.

DTM, Date/time/period
A segment to indicate the date and time of departure in the place or port of call.

LOC, Place/location identification
A segment to indicate a location relating to the means of transport, such as: place or port of departure - next place or port of call.

RFF, Reference
A segment to specify a reference as an additional identification of the means of transport, e.g. radio call sign of a vessel.

MEA, Measurements
A segment to specify a measurement of the means of transport, e.g. gross tonnage (of a vessel).

FTX, Free text
A segment used for free text information, in coded or clear form.

QTY, Quantity
A segment to indicate quantities related to the means of transport.

Segment group 4: NAD-SG5
A group of segments to identify a party which could give further information on the conveyance of the means of transport.
0200  **NAD**, Name and address
A segment to identify a party's name, address and function from which further information can be obtained (e.g. port authority, harbour master).

0210  Segment group 5:  CTA-COM
A group of segments to indicate a contact within the party.

0220  **CTA**, Contact information
A segment to identify a person or department within the party.

0230  **COM**, Communication contact
A segment to identify a communication number of the contact to whom communication should be directed.

0240  Segment group 6:  DGS-MEA-SGP-FTX-LOC-DTM
A group of segments to specify the details regarding waste and cargo residues.

0250  **DGS**, Dangerous goods
A segment to specify the type of marine pollutant and its subdivision according to the MARPOL regulation (i.e. Maritime Pollution Regulation).

0260  **MEA**, Measurements
A segment to specify the net weight of waste to be discharged, for the MARPOL type and subdivision of goods as indicated in DGS.

0270  **SGP**, Split goods placement
A segment to indicate the equipment in which the dangerous goods are loaded.

0280  **FTX**, Free text
A segment used for free text information, in coded or clear form related to the waste and cargo residues.

0290  **LOC**, Place/location identification
A segment to indicate locations relating to the waste and cargo residues.

0300  **DTM**, Date/time/period
A segment to indicate dates relating to the waste and cargo residues.

0310  **UNT**, Message trailer
A service segment ending a message, giving the total number of segments in the message (including the UNH & UNT) and the
control reference number of the message.

4.2 Segment index (alphabetical sequence by tag)

- **BGM** Beginning of message
- **COM** Communication contact
- **CTA** Contact information
- **DGS** Dangerous goods
- **DTM** Date/time/period
- **FTX** Free text
- **GOR** Governmental requirements
- **LOC** Place/location identification
- **MEA** Measurements
- **NAD** Name and address
- **QTY** Quantity
- **RFF** Reference
- **SGP** Split goods placement
- **TDT** Transport information
- **UNH** Message header
- **UNT** Message trailer

4.3 Message structure

4.3.1 Segment table

<table>
<thead>
<tr>
<th>Pos</th>
<th>Tag Name</th>
<th>S</th>
<th>R</th>
</tr>
</thead>
<tbody>
<tr>
<td>0010</td>
<td>UNH Message header</td>
<td>M</td>
<td>1</td>
</tr>
<tr>
<td>0020</td>
<td>BGM Beginning of message</td>
<td>M</td>
<td>1</td>
</tr>
<tr>
<td>0030</td>
<td>DTM Date/time/period</td>
<td>C</td>
<td>9</td>
</tr>
<tr>
<td>0040</td>
<td>----- Segment group 1</td>
<td>C</td>
<td>9</td>
</tr>
<tr>
<td>0050</td>
<td>RFF Reference</td>
<td>M</td>
<td>1</td>
</tr>
<tr>
<td>0060</td>
<td>DTM Date/time/period</td>
<td>C</td>
<td>9</td>
</tr>
<tr>
<td>0070</td>
<td>----- Segment group 2</td>
<td>C</td>
<td>1</td>
</tr>
<tr>
<td>0080</td>
<td>LOC Place/location identification</td>
<td>M</td>
<td>1</td>
</tr>
<tr>
<td>0090</td>
<td>DTM Date/time/period</td>
<td>C</td>
<td>9</td>
</tr>
<tr>
<td>0100</td>
<td>GOR Governmental requirements</td>
<td>C</td>
<td>1</td>
</tr>
<tr>
<td>0110</td>
<td>----- Segment group 3</td>
<td>M</td>
<td>1</td>
</tr>
<tr>
<td>0120</td>
<td>TDT Transport information</td>
<td>M</td>
<td>1</td>
</tr>
<tr>
<td>0130</td>
<td>DTM Date/time/period</td>
<td>C</td>
<td>9</td>
</tr>
<tr>
<td>0140</td>
<td>LOC Place/location identification</td>
<td>C</td>
<td>9</td>
</tr>
<tr>
<td>0150</td>
<td>RFF Reference</td>
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<td>2</td>
</tr>
<tr>
<td>0160</td>
<td>MEA Measurements</td>
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<td>1</td>
</tr>
<tr>
<td>0170</td>
<td>FTX Free text</td>
<td>C</td>
<td>9</td>
</tr>
<tr>
<td>0180</td>
<td>QTY Quantity</td>
<td>C</td>
<td>9</td>
</tr>
<tr>
<td>0190</td>
<td>----- Segment group 4</td>
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<td>1</td>
</tr>
<tr>
<td>0200</td>
<td>NAD Name and address</td>
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<td>1</td>
</tr>
<tr>
<td></td>
<td>Segment group 5</td>
<td>C</td>
<td>1-------+</td>
</tr>
<tr>
<td>0210</td>
<td>CTA Contact information</td>
<td>M</td>
<td>1</td>
</tr>
<tr>
<td>0220</td>
<td>COM Communication contact</td>
<td>C</td>
<td>3--------++</td>
</tr>
</tbody>
</table>

|   | Segment group 6 | C   | 99--------+ |   |
| 0240 | DGS Dangerous goods | M   | 1       |   |
| 0250 | MEA Measurements | C   | 9       |   |
| 0260 | SGP Split goods placement | C   | 999     |   |
| 0270 | FTX Free text | C   | 9       |   |
| 0280 | LOC Place/location identification | C   | 9       |   |
| 0290 | DTM Date/time/period | C   | 9--------+ |
| 0300 | UNT Message trailer | M   | 1       |   |

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10 ANNEX 2 – ANALYSIS OF THE MOBILE BILGE WATER COLLECTION SERVICE PROVIDED BY BILGENENTÖLER 8 IN HUNGARY

The service of a mobile bilge water collection vessel was available in Hungary for a period of 16 days in 2011, which is 4.3% of the whole year. This fact has to be kept in mind when elaborating and analysing statistics on the runs of the bilge boat.

Concerning the type of vessels there is a huge diversity of generated waste. The passenger vessels and cargo vessels handed over significantly less waste than it was assumed. However, the passenger vessels in Budapest and push boats navigating in Hungary at that time have passed over more than expected. The amount of waste effectively receipt has been 40% of the value predicted.

The service was used only for oily and greasy ship waste. In this category the factual data exceeded significantly the ones estimated in the study, i.e. five times more oily bilge water and twice more waste oil has been consigned by the users of the service. This result could be attributed to the cost-free system and proper communication of the pilot activity. Thus, many vessels took the opportunity to use the service, even the ones that had no binding requirement at that certain point of time to dispose waste. As for the residual wastes unfortunately the opportunity was not taken at all, since the Bilgenentöler could not take over residual waste.

Concerning the territorial data, the performance of some ports (Budapest, Dunaújváros and Baja) did not meet the expectations due to the lack of interest from passenger vessels. However, some parts (Mohács and Esztergom-Budapest stretch) were more popular than expected.

As a conclusion the factual data lag behind the prognosticated values described in the Rivus study. In the expert judgement it originates from the fact that the service was not available continually and it was not well-known. As long as the passenger vessels and self-propelled vessels can also count on the service regularly, the amount of waste handed over will reach the one prognosticated in the study.

The data provided in this annex are received from via donau. Due to data protection reasons the IDs and names of the vessels are deleted.
**First run (June 2011)**

<table>
<thead>
<tr>
<th>Reseption Facility</th>
<th>Date</th>
<th>Nationality</th>
<th>Name of vessel</th>
<th>Type of vessel</th>
<th>Location</th>
<th>Section</th>
<th>Bilge water</th>
<th>Separated bilge oil (excl. waste oils)</th>
<th>Waste oils</th>
<th>Rags</th>
<th>Grease</th>
<th>Fillers</th>
<th>kg</th>
<th>Pieces</th>
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</thead>
<tbody>
<tr>
<td>SCHUBBOOT</td>
<td>2011.06.06</td>
<td>NIEDERLANDE</td>
<td>FGS Tag</td>
<td>Budapest</td>
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<td>2011.06.06</td>
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**Second run (September 2011)**

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<th>nation</th>
<th>name of vessel</th>
<th>Type of vessel</th>
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<th>used oil</th>
<th>bins</th>
<th>rags</th>
<th>grease</th>
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**Table 3 and 4: Extracts from the reports of the Bilgenentüber**

**WANDA — Feasibility study on the application of RIS**

**Jointly for our common future**