

Research Study of River Information Services on the US Inland Waterway Network

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FINAL REPORT

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1 PROJECT AT A GLANCE

Project Volume:	USD 155,540.00
Project Start:	July 6, 2010
Project End:	September 27, 2012
Project Report:	No. 5/5 (month 27)
Reporting Period:	March. 1, 2012 – Sep. 27, 2012 (7 months)
Technical Status:	
Financial Status:	
Current Invoice:	USD 46.691,19
Outstanding costs:	USD 237,88
Final Report:	September 28, 2012 month 27

2 PROBLEM STUDIED

The goal of this cooperative research project was to prove the applicability of the River Information Services (RIS) concept on the US inland waterway network and to create a RIS pilot application to support lock management.

RIS were defined by RIS guidelines first published by the World Association for Waterborne Transport Infrastructure (PIANC) in 2004 *“as a concept for harmonized information services to support traffic and transport management in inland navigation, including the interfaces to other transport modes”* [PIANC WG125, 2011]. Until recently RIS have mainly been implemented on the European main inland waterways. In 2007 the US Committee of the Maritime Transportation System (CMTS) considered the implementation of RIS on the US inland waterway network in order to improve the safety and efficiency of waterborne transport by inland barge.

In order to make maximum use of the lessons learned during RIS implementation in Europe this cooperative research agreement has been set up between the US Army Corps of Engineers (USACE) and via donau which is the RIS Provider in Austria and one of the European lead experts in the field of RIS.

3 SUMMARY OF RESULTS

Three main results were achieved within this project.

First a strategy for the introduction of RIS to US waterways has been developed and set in the proper context with related global and national initiatives in the maritime domain.

Second a concrete implementation of RIS, namely the Lock Operations Management Application (LOMA) has been specified, contracted and implemented which supports traffic management on US main inland waterways and which will be the enabler of many of the following RIS initiatives.

Third the lessons learned from LOMA implementation were set in context with the developing international e-Navigation strategy and recommendations for future RIS initiatives were elaborated.

4 SCIENTIFIC PERSONNEL INVOLVED

4.1 USACE personnel

- Brian Tetreault, ERDC-CHL, LOMA program manager and AIS expert
- James E. Clausner, ERDC-CHL, project management support
- Dinah McComas, ERDC-CHL, assisting in project dissemination
- Doug McDonald, IWR, technical director
- Jeremy Hines, ERDC-CHL contractor, RIS Administrator
- Lee Whitlow, ERDC-ITL contractor, IT expert

No advanced degrees were earned during this project.

4.2 via donau personnel

- Juergen Troegl, development of traffic management department, team leader and AIS expert
- Mario Sattler, development of traffic management department, reporting expert
- Christoph Plasil, development of traffic management department, NtS expert
- Lukas Seemann, development of traffic management department, logistics services expert

No advanced degrees were earned during this project.

5 PUBLICATIONS AND TECHNICAL REPORTS

5.1 Publications

During the project period the following presentations have been given by the project team and were mostly published in conference proceedings:

- 14-15 November 2010 – ASCE COPRI Congress. Provided two lectures during workshop on e-Navigation.
- 16-17 November 2010 - eNavigation 2010 conference. Shared e-Navigation information with stakeholders and gathered their input. Participated on panel presenting e-Navigation technologies.
- 31 January - 03 February 2011: EfficienSea e-Navigation Underway conference. Provided presentation on US e-Navigation testbeds, including US e-Navigation Strategy, RIS and LOMA.
- 01-03 March 2011: Inland Waterways Conference, Cincinnati, OH: Coordinated e-Navigation session, including presentations on LOMA, US RIS and e-Navigation efforts by various USACE and USCG presenters.
- 05 May 2011: Inland Ports and Terminals conference, Pittsburgh, PA. Provided conference attendees, mostly industry representatives, overview of eNav, RIS and LOMA projects.
- 16-20 May 2011: Radio Technical Commission for Maritime Services (RTCM) Annual Meeting, St. Pete Beach, FL. Attended annual meeting of US maritime telecommunications standards

organization, participated in several working group meetings and chaired AIS application specific message technical working group meeting.

- 26-27 July 2011: US-European Workshop on Technology Transfer and Promotion for Marine Highways, George Mason University, Fairfax, VA. Provided US e-Nav, RIS and LOMA overview to audience interested in improving marine transportation and increasing use of inland waterways.
- 08 September 2011: Meeting with University of Arkansas and Rutgers National Transportation Safety Center of Excellence (NTSCOE) team, New Brunswick, NJ: Discussed NTSCOE Supporting Secure and Resilient Inland Waterways (SSRIW) project. Meeting explored data collected to date and expanding information available from eNav21 and other CHL projects, including Chanel Portfolio Tool (CPT)
- 12-16 September 2011: SmartRivers 2011 Conference, New Orleans LA: Coordinated a half-day LOMA workshop including LOMA demonstration. Also provided two presentations on e-Navigation and RIS.
- 29-30 November 2011: e-Navigation 2011 Conference, Seattle, WA. Participated in annual conference on e-Navigation and the operations sector of the maritime industry. Provided presentation on USACE e-Nav efforts, including LOMA and RIS.
- 17-20 January 2012: e-Navigation Underway conference, Copenhagen, Denmark. Provided presentation on USACE e-Navigation efforts and testbed projects.
- 06-08 March 2012: Inland Waterways Navigation Conference, St. Louis, MO.
- 05-06 June 2012: Inland Waterways Users Board Meeting, Pittsburgh, PA. Provided IWUB with briefing on status of USACE e-Nav efforts, including LOMA; met with LRP representatives to discuss RIS and LOMA efforts.
- 26-28 June 2012: TRB-CMTS R&D Conference, Washington, DC. Provided presentation on and use of e-Nav and LOMA capabilities in monitoring and improving the Marine Transportation System.

5.2 Technical Reports

The following internal main technical reports have been produced within the project:

- LOMA Statement of Work (SoW)
- LOMA Product Requirement Specification (PRS) and Requirements Traceability Matrix (RTM)
- Eight individual Product Requirement Documents (PRDs) describing the main use cases of the LOMA application
- LOMA Acceptance Test Plan (ATP)
- LOMA equipment installation and maintenance manual
- LOMA Equipment acquisition guide

6 ABSTRACT

At the very beginning of the cooperation development of the US e-Navigation (e-Nav) strategy had been started. The US e-Nav strategy defines the approach to introduce intelligent information services in US coastal and inland waters. It identifies stakeholders, relevant agencies and bodies, related technologies, proposed services as well as the implementation strategy. The document clearly identifies RIS as the vehicle for implementing e-Nav on inland waterways.

As the US inland waterway network comprises 196 lock sites on the main navigable rivers, the safe and efficient management of barge traffic through these locks has been identified as one of the key goals for RIS implementation. Based on the experiences of the US Coast Guard (USCG) Nationwide Automatic Identification System (NAIS) and the lessons learned from AIS implementation on European waterways the concept for the LOMA system was elaborated and contracted to an USACE software supplier. A major portion of this project's resources were invested in elaborating the different parts of the LOMA specifications and to manage the interface with the software supplier. The acceptance of the LOMA system was achieved in September 2012 after an intensive acceptance procure laid down in the Acceptance Test Plan (ATP) comprising over 150 pages of test descriptions.

As a final part of this cooperative research project, recommendations for future development and implementation of RIS have been elaborated and are presented later in this document.

7 FINDINGS AND RECOMMENDATIONS

The findings are clustered in organizational, procedural and functional recommendations.

7.1 Organizational recommendations

The organizational recommendations reflect all findings from how the LOMA project performed at the interfaces between ERDC-CHL as the sponsor of LOMA and other Corps, government and private entities.

7.1.1 Staffing and organization

The LOMA team currently consists of Brian J. Tetreault who is acting as program manager and doing a very large variety of tasks including strategic planning, budget planning, supplier contacts, publication and dissemination work and the time consuming interface to users, other Corps organizational components, the districts, USCG and others. James Clausner supported the project in the beginning but is no longer working on LOMA and Dinah McComas supports the program manager in organizing project workshops, participation in conference and other technology transfer efforts. Jeremy Hines is working as LOMA System Administrator on a purely technical level.

For efficient and effective implementation of LOMA and RIS in the US it is recommended to enlarge the team and to make sure that clear responsibilities and a balanced workload are ensured. Especially the contact with stakeholders is crucial for the success of RIS, which is based on user input and acceptance. So far a lot of contacts to different user groups have been established. In order to involve all of them in the development of RIS more resources will be necessary. Based on the observations so far the following positions are recommended.

Program Manager responsible for:

- strategic planning
- budgeting
- liaisons with other Corps divisions, HQ, USCG and key stake holders
- oversight of RIS/LOMA operations and development

Operations manager responsible for:

- management of the RIS Center
- liaison with private partners of the RIS Center
- contract management with existing hard- and software suppliers and infrastructure providers for routine changes in the current system
- development of service level agreements (SLAs) with RIS/LOMA users / user groups
- ensuring of the operation within the agreed service levels
- planning of operational tasks

RIS Administrators responsible for:

- daily operation of RIS/LOMA
- system monitoring
- network monitoring
- proactive maintenance
- reactive maintenance
- testing of new services and systems
- input to specification of new services and systems

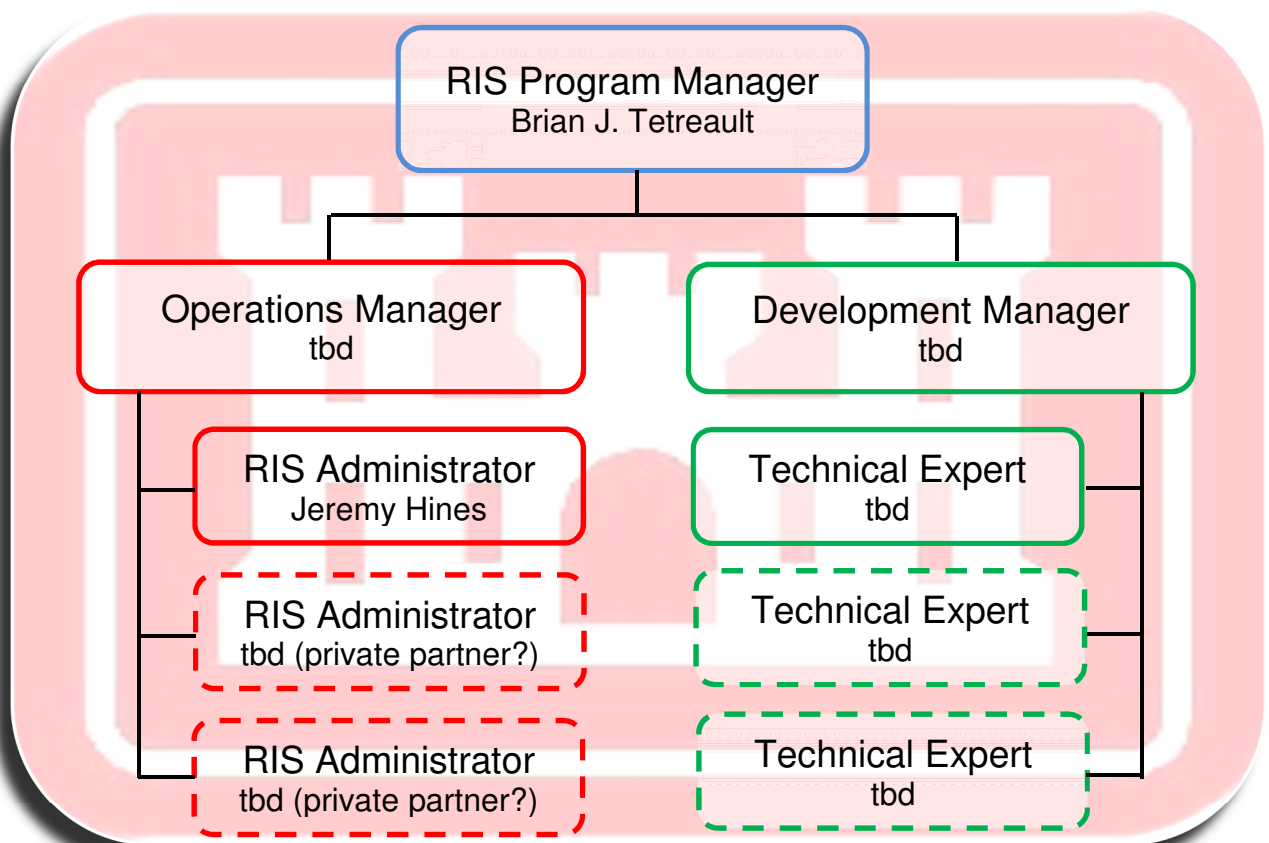
- system security

Development Manager responsible for:

- planning and management of all new features, services and systems
- contract management with new and existing hard- and software suppliers for new developments
- project manager for new developments
- management of the RIS/LOMA experts
- liaison with other Corps organizational components
- strategic oversight of RIS technologies and coordination of R&D efforts
- management and planning of the participation in standardization and expert groups

Technical experts responsible for:

- technical expertise in their specific field(s)
- participation in standardization and expert groups
- development of technical specifications
- technical negotiations with suppliers
- testing and system acceptance
- assistance to RIS Administrator(s) in case of technical problems



It is recommended to set up an organizational structure for operation and development of RIS and to provide the necessary staffing to ensure that the successful efforts of the past can be continued and the contact to the users of RIS can be intensified.

7.1.2 Interface with IWR

Since the very beginning of the project, IWR and their LPMS system have been identified as one of the key interfaces to the LOMA project. During the LOMA kick-off workshop held in Alton, IL in December 2009 representatives of the main LOMA user groups also identified the need for the fusion of traffic and transport data resulting in a close connection of LOMA and LPMS as one of the key success factors for the improvement of lock management. Since then continuous efforts have been made from the LOMA program manager to work with those responsible for LPMS at IWR to implement a close link between the two systems in order to ease the workflow for the lock operators and to enhance the quality of the transport statistics produced by the LPMS system. The level of cooperation has been limited on IWR side, in particular at the beginning of the LOMA project, therefore it was not possible to include a solid description of the envisioned interface between the two systems in the LOMA specification. While LOMA provides an interface for LPMS to read live AIS data the necessary support to establish an interface to read convoy and cargo data from LPMS was lacking.

For the future it is strongly recommended that a clear common understanding with IWR is achieved about the future development and implementation of RIS and to come to an explicit agreement of cooperation supported by higher management.

7.1.3 Interface with ACEIT

During the implementation of LOMA it turned out that the procedures to meet the IT security requirements from ACEIT were difficult to identify and caused far more effort on project management and development than initially estimated. Also the strict IT security policies complicated the cooperation with software suppliers and external parties that might benefit from interface with LOMA.

As RIS, by definition, requires interfaces to various users, many of which are from the private sector, it is recommended to make a clear separation between LOMA as a Corps-internal application and future RIS applications. It is recommended to set up a “RIS Center” which shall act as connection point between governmental and private systems and users. Though not necessarily a physical building or room, the RIS Center is meant to be an instance which coordinates all RIS efforts and these applications which are not exclusively governmental. Those shall have defined interfaces with Corps systems such as LOMA following interface agreements with ACEIT. Even if LOMA is to be hosted in the ACEIT production environment it is further recommended that the RIS Administrator in the RIS Center monitor, configure and operate LOMA. The RIS Center should follow and apply appropriate ACEIT rules to ensure no breach of applicable security and privacy rules occur. Following these rules the RIS Center shall provide a controlled interface to connect LOMA and other relevant RIS related systems with the non-government RIS applications which might be developed in the future.

Therefore it is recommended to set up a dedicated RIS Center which has a clear mission statement and to agree on rules for interconnection with applications hosted on the Corps network by ACEIT. All cooperation with non-governmental entities shall be managed based on these rules.

7.1.4 Setting up Private Public Partnerships (PPPs)

For the time being LOMA as the first dedicated RIS application is – with the exception of certain data distributed to vessel using AIS ASMs – mainly addressing governmental users. In order to make

maximum use of the AIS data collected in LOMA it is suggested to make it accessible also to non-governmental users to develop services such as fleet management applications on top. In order to ensure government agencies do not interfere with the commercial market it is recommended to set up PPPs to regulate the cooperation between USACE as the RIS authority and private players. The before-mentioned RIS Center would be a good facilitator for such cooperation. Private partners should be invited to participate in the RIS center to access government system for using the data for commercial purposes. In return the private partners take over a certain amount of the operating costs for the RIS Center.

A second potential cooperation is the intended set up of a broad band wireless network by private players under the lead of the Port of Pittsburgh Commission (PPC). One possible way to cooperate in this project is that the Corps provides the private consortium access to Corps infrastructure (locks, buildings, masts) to mount the telecommunication equipment and potentially even provides a certain bandwidth in a public subnet of the Corps backbone network to connect certain sites with internet access. In return the private consortium gives all users of the inland waterway network free access to the Corps RIS services in the whole coverage area of the wireless network.

It is recommended to intensify talks with private stakeholders to closely involve them in the future development of RIS in the US. Further a RIS Center shall be set up as platform for cooperation with private players. Interested industry partners shall have the possibility to contribute to this RIS center. Finally it is recommended to enter negotiations with the PPC how efforts to offer a wireless broadband network can be supported by joining forces and sharing of resources.

7.1.5 Budgeting

Based on the suggestion that RIS need to be further developed in the US it is suggested to set up multi-annual funds for RIS in order to allow for development in longer time periods and to set up maintenance and operation contracts for existing applications on a multi-year basis. By doing so money could be saved as payments to contractors could be held back until the finalization of the product rather than being under the time pressure to release payments before the end of the fiscal year which typically results in greater time pressure and less quality of the product. Also the setup of long term maintenance contracts usually results in a significantly lower price than contracts on a one year basis. Finally the administrative overhead for contracting on a one year period is also higher than e.g. for a 5-year contract.

For key suppliers of RIS components it is further recommended to set up framework contracts which allow for the flexible contracting of system extensions or change requests.

It is recommended to apply for multi-annual funds for development and operation of RIS and to set up framework contracts with key suppliers.

7.2 Procedural recommendations

The procedural recommendations reflect the lessons learned mainly from working with the government software contractor in the given contractual framework.

7.2.1 Implementation of future LOMA capabilities

For future extensions of LOMA and other RIS applications is suggested to make use of multiple contractors including Corps internal resources. As a pre-requisite it shall be ensured that all systems and applications implemented in the future have open interfaces to allow third party developers to send and retrieve data. Doing so can significantly help to reduce costs as software providers can stay in their field

of expertise and do not have to implement new applications in fields where they do not have expertise. Also this approach ensures maximum flexibility and makes the systems future proof.

It is recommended to define standard interfaces for RIS. Potential key players to be involved in this standardization are the FILS group, IWR, ACEIT and industry representatives participating in PPPs.

7.2.2 Tendering procedures

The initial price offer for fee based contracts for software development is in average – depending on the topic and supplier – about 10 to 25% less than a lump sum contract. When financial contract extensions and reduced amount of features as well as internal resources on client side are taken into consideration it turn out that fee based contracts usually take longer to implement and have final costs which are up to 25% above lump sum contracts. Those numbers are based on experience in ten years of contracting RIS software in Europe and a matching experience in the LOMA project.

For all developments other than extensions of existing software with well-known suppliers it is therefore highly recommended to use lump sum contracts. The contracts shall be based on tender procedures with very detailed level of functional specifications in the statement of work. This mature level of specification creates more effort during the elaboration of the tender documentation and therefore also prolongs the time needed before a contract can be set, but it allows the contractors to better estimate the time and price for the final product and helps to reduce discussions and misinterpretation of requirements in later stages of the project. Finally water tight requirements in the SoW can be used to make the contractor implementing all functions without the risk of financial extension of the contract.

Also the payment milestones shall reflect the chosen approach and protect the interests of the client while reducing risks for the contractor. A typical payment milestone could look as follows:

- 20% pre-payment
- 15% after signoff of the detailed requirement specification
- 25% after provision of a functional prototype / early beta release
- 15% after release of the acceptance test plan
- 15% after passing the acceptance
- 10% after all documentation and training have been delivered and all remaining defects from acceptance have been fixed

It is recommended to use lump sum contracts for future RIS development, based on a well elaborated list of requirements in the SoW. It is further recommended to introduce a payment plan which allows the client to align payment and progress in a reasonable way.

7.3 Functional recommendations

This section deals with recommendations for future RIS activities in the US and covers both LOMA and other RIS applications.

7.3.1 Enlarging of the AIS network

Currently 65 AIS transceivers (AtoNs) are operational and feeding vessel data into LOMA. In order to improve the coverage both for receiving from vessels and for sending information to them additional stations are required. At least all lock sites shall be equipped with AtoNs. Additionally it should be investigated if additional AIS stations can be installed on other Corps or state owned facilities or on buildings owned by potential private partners of the RIS initiative.

It is recommended to extend the AIS network to all lock sites and to look for additional locations where AIS stations could be installed.

7.3.2 Direct LOMA capabilities

Due to the R&D nature of the initial (fee based) LOMA contract several requirements specified in the SoW were not be able to be accomplished in the final product. Further experience and user feedback have led to additional requirements which came up during the usage of the beta version of LOMA and during the final acceptance procedure.

The following features should potentially be included in a future upgrade of LOMA (LOMA 3.0):

- User authorization using CAC and automatic population of USACE user accounts using UPass
- Interconnection to LPMS to display LPMS data in LOMA (both in vessel report and as a gadget) and to allow to automatically populate cargo information entered by lock operators in LOMA to LPMS
- Upgrade of the current draft versions of the AIS Application Specific Messages (ASMs) for lock status and dam status based on feedback to the current implementation from users like:
 - introduce individual lock chambers
 - automatic setting of the dam status based on input from other sources
- Purchase a limited number of onboard IENC viewer applications which support the newly created ASMs
- Specify and implement additional ASMs like lock queue or convoy information
- Implement an interface to automatically feed the Smart Gate system with AIS data and to receive and display Smart Gate data in LOMA
- Implement an interface to the Corps IENC web service to allow for automatic update of IENCs in the LOMA Plotter
- Implement additional capabilities to support operation of LOMA like:
 - web service which checks of AIS targets are received and automatically sends alarm messages via e-mail in case no targets are detected
 - automatic notifications in case the database system or the file system (e.g. log files) exceed certain size limits
 - allow sharing of local alarm zones
 - automatic calculation of river distance of vessel to the selected lock
- Improve the web interface for sending AIS messages from external systems
- Make the user rights management more flexible than today like

- remove dependency on lock
- implement restrictions on AtoN level to allow more detailed geographic restriction of access to AIS data and to enable more precise routing of broadcasted ASMs
- Make further features of the LOMA plotter configurable like e.g.:
 - zoom level for vessel outline
- Improve the usability of LOMA like:
 - Introduce small icons in one of the top corners of the plotter to quickly change between map manipulation, selection of AIS targets, turning on/off vessel tag, turning on/off past tracks, ENC query

It is recommended to extend the current capabilities of LOMA with the described features. The contracting shall be based on a detailed functional design description which shall build an integral part of the contract. It is recommended to implement the features using a lump sum contract.

7.3.3 Harmonization of navigation notices

Currently navigation notices are published by the districts in a decentralized manner on the district's web site. Each of the districts web sites looks a little bit different and partly also uses deviating terminology.

Number	Date	Summary
198-1009-24	06/16/2009	The DREDGE INTEGRITY, owned by ISLAND DREDGING, commenced dredging operations in Lake Providence Harbor (Miles 483.9-R) on 17 June 2009. Full Bulletin
198-2009-35	06/18/2009	The Corps of Engineers' DREDGE JADWIN will commence dredging operations at Victoria Bend (Miles 594.9-595.8) on Saturday, June 20, 2009. Full Bulletin

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Page last updated: Friday, June 19, 2009

Figure 1: Vicksburg District – Navigation Bulletins

Navigation Information
US Army Corps of Engineers
Louisville District

Navigation Information
Hydrographic Survey Data
Lower Ohio River
Lock Outage Schedules
Notices to Navigation Interests
Ohio River and Green River
Navigation Charts
Reports
Sites of Interest
USACE/USACE DGPS
Have A Question?
Division Home

NOTICES TO NAVIGATION INTERESTS

2012-037 (June 20, 2012)
Notice to Navigation Interests 2012-037, Markland 1200 Lock Closure

2012-036 (July 19, 2012)
Notice to Navigation Interests 2012-036, Dredging Mount City, Illinois

2012-035 (July 16, 2012)
Notice to Navigation Interests 2012-035, Dredging Obstructed Locks & Dam

2012-034 (July 9, 2012)
Notice to Navigation Interests 2012-034, Dredging Huntsburg Island & Smithland

2012-033 (July 9, 2012)
Notice to Navigation Interests 2012-033, Obstructed Dam Shell Setting

2012-032 (July 2, 2012)

Figure 2: Louisville District – Notices to Navigation Interests

US Army Corps of Engineers
Mobile District

Navigation Notices

Notice to Navigation Interests
In Reply Refer to:
OP-TN, P.O. Box 2288, Mobile, AL 36628
251-694-3710

Date Bulletin Issued	Bulletin	System/Location
6/29/2012	Navigation Bulletin No. 12-17	BLACK WARRIOR & TOMBIGBEE RIVERS, ALABAMA
6/28/2012	Navigation Bulletin No. 12-16	TENNESSEE TOMBIGBEE WATERWAY, MISSISSIPPI
6/5/2012	Navigation Bulletin No. 12-15	TENNESSEE-TOMBIGBEE WATERWAY, MISSISSIPPI
6/5/2012	Navigation Bulletin No. 12-14	MOBILE SHIP CHANNEL, MOBILE CO., ALABAMA
6/5/2012	Navigation Bulletin No. 12-13	BLACK WARRIOR & TOMBIGBEE RIVERS, ALABAMA
6/4/2012	Navigation Bulletin No. 12-12	TENNESSEE-TOMBIGBEE WATERWAY, MISSISSIPPI
5/25/2012	Navigation Bulletin No. 12-11	TENNESSEE-TOMBIGBEE WATERWAY, MISSISSIPPI
5/9/2012	Navigation Bulletin No. 12-10	TENNESSEE TOMBIGBEE, WATERWAY, MISSISSIPPI
5/4/2012	Navigation Bulletin No. 12-09	BLACKWARRIOR & TOMBIGBEE RIVERS, ALABAMA

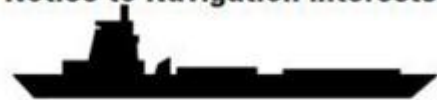
Figure 3: Mobile District – Navigation Notices

The notices are mainly published as .pdf files while the layout and content of the navigation notices themselves differ from district to district. All currently published notices have in common that they are non-standardized free text format which does not allow for any automatic processing.



U.S. ARMY CORPS OF ENGINEERS

Notice to Navigation interests



BUILDING STRONG.

June 28, 2012

TECHNICAL SUPPORT BRANCH

NAVIGATION BULLETIN NO. 12-16

NOTICE TO NAVIGATION INTERESTS:

TENNESSE TOMBIGBEE WATERWAY, MISSISSIPPI

Notice is given to mariners that Inland Dredging Company's pipeline dredge "KELLY L" will begin dredging on or around June 29, 2012 on the Tennessee Tombigbee Waterway at mile 320.5, Aliceville Lake. Dredging operations are expected to continue at this location for approximately two weeks. The dredge will be working 24 hours per day, 7 days per week and may be reached on VHF-FM Channels 14 and 16.

Mariners should exercise extreme caution when transiting this area.

For further information please contact Mr. Allan Brewer at the Tennessee-Tombigbee Waterway Project Office at (662) 327-2142, or inquire at the locks along the waterway for the current location of the dredge and attendant plant.

Figure 4: Navigation Notice – Dredging (important information underlined)

Feedback from users has shown that the navigation notices are of utmost importance for them.

For maximum usage of the navigation notices in RIS it is a pre-requisite to have the data accessible in electronic way following an agreed standard used by all districts. This allowed for electronic processing of the information e.g. in voyage planning tools and also for the display of related information e.g. in an Inland Electronic Chart (IENC).

In principal the standard used for the navigation notices does not matter too much as long as it capable of transporting the necessary type of notice data:

- Issuer
- Number
- Type
- Validity in time
 - From date
 - To date
 - Limitation to
- Geographic validity

- River
- Start river mile
- End river mile
- Type of limitation
- Additional free text

In Europe where another aspect for electronic publication of navigation notices is the fact that such a standard allows for translation in the numerous different languages spoken, the so called Notices to Skippers (NtS) standard has been developed and is used by all national authorities.

An example of the implementation of the NtS System in Austria shows a dredging notice comparable to the one in Figure 4 with the similar elements underlined.

DORIS Nachrichten für die Binnenschifffahrt

Email

Password

Login ↗

Registration e-mail service ↗

Forgotten password ↗

English (en) ▼

Full text

Baggerung Krems-Stein
 A new notice for skippers is available for Krems-Stein in Austria in the original language German from via donau, which has been compiled by BMVIT on 17. January 2012 at 15:17 o'clock:

The fairway and traffic related message No. 10/00 in the year 2012.

Subject: Dredging
 Published by the Schiffahrtsaufsicht Krems.
 This message is valid in the period from 6. February 2012 to 31. October 2012.

For the river Danube, river km 1999.0 to 2003.0 is valid in the period from 6. February 2012 to 31. October 2012 from Monday to Friday from 06:00 o'clock to 20:00 o'clock
on Saturdays from 06:00 o'clock to 13:00 o'clock.
the following limitation: do not create wash in the whole area.

Additional text in national language: Baggerung Krems-Stein. Die Schifffahrt ist grundsätzlich nicht behindert. Arbeitsbereich und -geräte sind entsprechend WVO mit Schifffahrtszeichen (Tag- und Nachtbezeichnung) gekennzeichnet.

Figure 5: Navigation Notice in NtS format – Dredging (important information underlined)

In order to use the NtS messages also in other applications also the machine readable code or XML format options are available:

- RIS message
 - Identification section
 - Sender of the message: via donau
 - Originator of the information: BMVIT
 - Country where message is valid: Austria
 - Original language: German
 - District/region within country: Krems-Stein
 - Date of issue: 17. January 2012
 - Time of issue: 15:17
 - Fairway and traffic related message
 - Year: 2012
 - Number (of the notice): 10
 - Serialnumber: 00
 - Subject: Dredging
 - Period of validity
 - From (yyyymmdd): 6. February 2012
 - Until (yyyymmdd): 31. October 2012
 - Contents: Baggerung Krems-Stein. Die Schifffahrt ist grundsätzlich nicht behindert. Arbeitsbereich und -geräte sind entsprechend WVO mit Schifffahrtszeichen (Tag- und Nachtbezeichnung) gekennzeichnet.
 - Notice source (authority): Schifffahrtsaufsicht Krems
 - Waterway or waterway section
 - Geo information of waterway or object
 - Identification: ATXXX000010000019990
 - Identification: ATXXX000010000020030
 - Name of geo object: Danube
 - Type of object: river
 - Fairway begin and end coordinates
 - Latitude (decimal): 48 24.1657812 N
 - Longitude (decimal): 15 38.1305388 E
 - Fairway begin and end coordinates
 - Latitude (decimal): 48 23.999157 N
 - Longitude (decimal): 15 34.8904722 E
 - Limitation section
 - (Limitation) periods/intervals
 - From (yyyymmdd): 6. February 2012
 - Until (yyyymmdd): 31. October 2012
 - From (hhmm): 06:00
 - Until (hhmm): 20:00
 - Interval: Monday to Friday
 - (Limitation) periods/intervals
 - From (yyyymmdd): 6. February 2012
 - Until (yyyymmdd): 31. October 2012
 - From (hhmm): 06:00
 - Until (hhmm): 13:00
 - Interval: Saturday
 - Kind of limitation: do not create wash
 - Position (of limitation): all

Figure 6: Navigation Notice in NtS code format – Dredging

It is recommended to introduce standardized code format for the publication of navigation notices. This allows the districts to still keep their decentralized systems but ensures that the published content is everywhere following the same structure and wording. Further the navigation notices for the total inland waterway network can be easily published on a central web site where queries for a route on several rivers (e.g. from Pittsburgh down to New Orleans) could be made. Also the publication in code format allows that the information is used by external route planning software applications or allows for the creation of automatic performance indicators or statistics.

7.3.4 Introduction of electronic cargo reporting

Cargo information is important for most inland waterway users. On the one side, Authorities are interested in cargo information in order to compile the transport statistics and to collect information about dangerous cargo transported by barge. On the other side the industry partners in the transport chain are interested in receiving accurate and up to date information about the whereabouts of cargo for planning of transshipments.

Currently the cargo information is filed by paper reports, reported orally and entered into LPMS or sent electronically using non-standardized e-mail formats or proprietary commercial reporting systems.

The RIS concept foresees that all voyage and cargo information is collected electronically and automatically forwarded to all users of the transport chain. Following the international EDIFACT standard it is ensured that the format in which the cargo information is exchanged can be understood both by private and governmental users and can be exchanged also with other transport modes.

It is recommended to set up a governmental electronic reporting system covering voyage and cargo reports. The system shall ideally be operated by the government with user based access for non-governmental parties. It is important to follow clearly defined role based access rights in order to protect business sensitive data. Nevertheless the system shall be designed in a way that it allows industry users to solely base their cargo data exchange on this system and to not feed multiple systems.

7.3.5 Introduction of a RIS Index

Most RIS services have a clear need for unambiguous identification of geographic objects like mile markers, gauge stations, locks, ports and terminals. Currently many of these objects are collected in the so called "Master Docks" database run by IWR. The current navigation objects in this database are coded using a six character base 16 code. Therefore it is not possible to introduce a systematic structure in the code which allows for encoding of river, river mile or object type within the code.

Further the master docks database is currently not accessible to the public which hinders commercial application developers to use these codes in their applications (e.g. IENC viewer applications).

The overall goal in the RIS concept is to have one single geo object database – the so called RIS Index – which allows to use the same object codes in different RIS applications. By doing so it is e.g. easy to transmit information about lock status both over AIS and the notices to skippers and display the information in the IENC viewer. Also terminal codes can be used for voyage planning in the electronic reporting system, forwarded to a voyage planning software which links it with current water level and NtS information.

Example for a location code within the Austrian RIS Index following the European RIS Index encoding guide:

ATKBG00001G000619415

AT = Austria (UNECE country code)

KBG = object name (UNECE location code)

00001 = river identifier (Danube)

G = geo object (Gauge station)

0006 = object number (gauge station number 6)

19415 = river mile (1945,5)

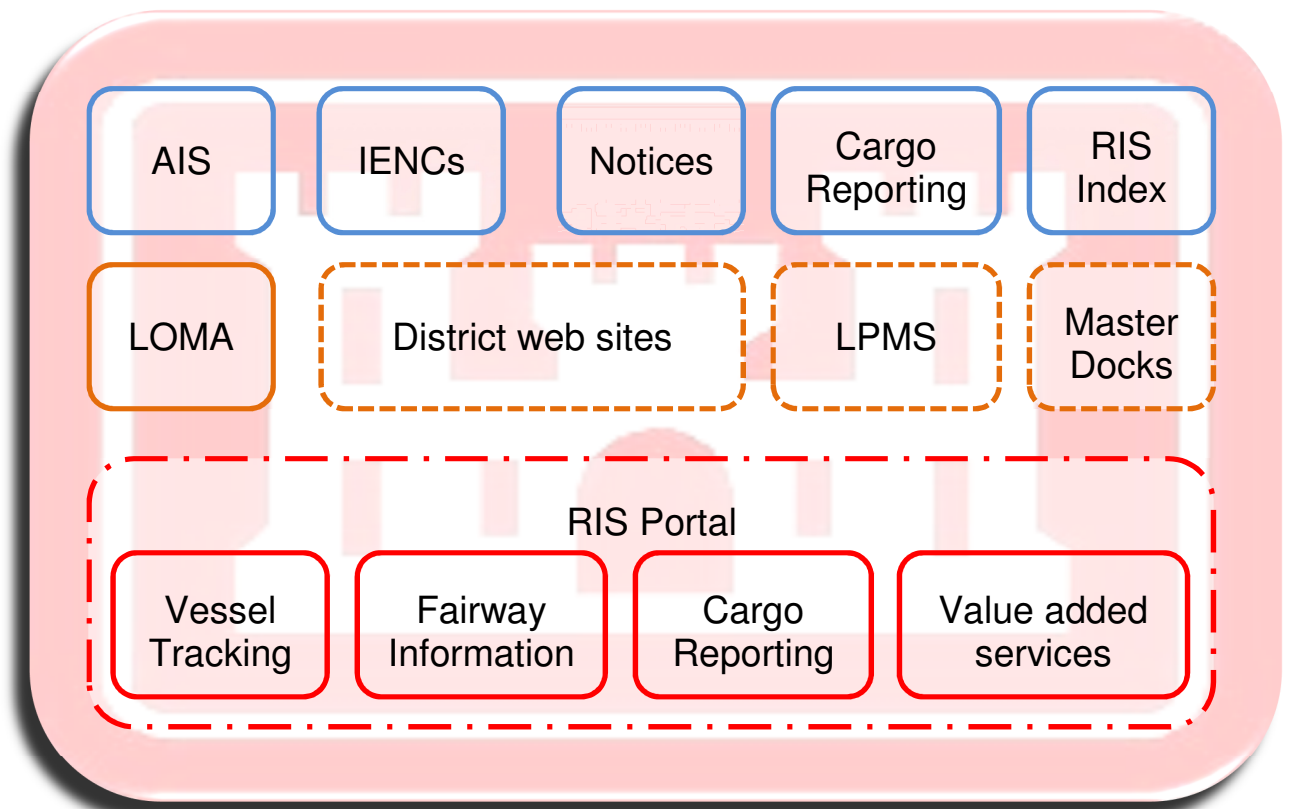
It is recommended to set up an official RIS Index following an agreed encoding guide using ideally UNECE country and location identifiers. The code itself shall have a certain level of complexity in order to allow intelligent encoding of information. The RIS Index shall be maintained by one central governmental body and be published for free ideally also as a web service.

7.3.6 RIS Portal

Feedback from lock users has shown that they find the AIS information displayed in the LOMA system very relevant to their work and also reliable. Also industry users would be very interested in having access to the position of their vessels which is currently not foreseen as LOMA is an application within the Corps network following high security standards. Also fairway information like the navigation notices, river gauges, lock status and the IENCs are very relevant for towboat captains. Further all parties involved in transport are interested in accurate cargo information and position.

Ideally the governmental systems for provision of navigation notices, cargo reporting and the RIS Index should be upgraded to follow the RIS standards.

In the next stage these Corps applications shall be connected through well specified interfaces to a "RIS Portal" ideally hosted in the RIS Center. Here the link between highly secure Corps applications and private users is being made. The RIS Center shall take the information from the Corps systems and feed it to the RIS Portal where all information is being presented centrally. The main three service areas shall cover tracking of vessels, provision of accurate fairway information and the electronic cargo reporting system. On top and ideally out of public private partnerships industry users shall further be invited to implement value added services like electronic billing, cargo brokerage platforms or fleet management applications.



— RIS key technology

— Current governmental implementation (dotted lines mean only partly compliant)

— Suggested future Service Portfolio for USRIS

It is recommended to implement a RIS Portal to provide aggregated and controlled access to RIS application to private users. The RIS Portal shall also be open to future extensions created within PPPs.

7.4 Prioritization

In order to match efforts with resources it is suggested to prioritize activities. Given the fact that not all activities have to be carried out sequentially and several could run in parallel the following list is just an indication of priorities and logical dependencies.

1. Ensure the necessary multi-annual funds for RIS operation and development
2. Set up of the organizational structure for RIS operation and development
3. Ensure proper interfaces with other Corps organizational components
4. Set up public-private partnerships and decide priorities and shared resources
5. Provision of the necessary staffing
6. Set up the necessary contracting framework for tendering and procuring additional systems and services
7. Roll out additional AIS stations
8. Implementation of a harmonized RIS index
9. Provision of a RIS Portal for the industry
10. Implementation of additional LOMA capabilities
11. Implementation of an electronic voyage and cargo reporting system
12. Implementation of harmonized navigation notices / notices to skippers

8 REFERENCES

[PIANC WG125, 2011], Report no. 125-2011, InCom WG 125

9 BUSINESS STATUS

The following tables provide an overview of the resources spent to date in comparison to the numbers given in the Agreement.

Phase	Project Month	Amount spent	Amount planned	Deviation
1st Interim Report	4	19.210,54	30.677,00	-11.466,46
2nd Interim Report	7	23.682,15	46.954,00	-23.271,85
3rd Interim Report	10	6.360,99	22.677,00	-16.316,01
4th Interim Report	20	59.357,25	47.232,00	12.125,25
Final Report	27	46.691,19	8.000,00	38.691,19
Total		155.302,12	155.540,00	-237,88

current reporting period

Table 9-1: Resource overview

Phase	Project Month	Labor Costs	International Travel	Domestic Travel	Indirect Costs	Amount spent	Amount planned	Deviation
1st Interim Report	4	7.890,23	5.129,80	1.866,42	4.324,09	19.210,54	30.677,00	-
2nd Interim Report	7	9.737,61	5.977,76	2.837,52	5.129,26	23.682,15	46.954,00	-
3rd Interim Report	10	4.119,30	0,00	0,00	2.241,70	6.360,99	22.677,00	-
4th Interim Report	20	28.206,80	11.017,72	5.150,05	14.982,68	59.357,25	47.232,00	12.125,25
Final Report	27	24.432,33	6.075,21	2.256,34	13.927,30	46.691,19	8.000,00	38.691,19
Total		74.386,27	28.200,49	12.110,33	40.605,03	155.302,12	155.540,00	-237,88

current reporting period

Table 9-2: Detailed resource overview

GENERAL COST CATEGORY DESCRIPTION	TOTAL PROJECT COST PLANNED	TOTAL PROJECT COST SPENT	PER CENT SPENT	PER CENT PROJECT TIME
Direct Costs				
Labor Costs	70.176,00	74.386,27	106,00	100,00
International Travel Costs	26.950,00	28.200,49	104,64	100,00
Domestic Travel Costs	19.790,00	12.110,33	61,19	100,00
Indirect Costs	38.624,00	40.605,03	105,13	100,00
Total Costs	155.540,00	155.302,12	99,85	100,00

Table 9-3: Deviation of resources

At the end of the project 155.302,12 USD have been spent which is 237,88 USD below the estimated budget.