RISERI
Electronic Reporting International

THE IMPORTANCE OF THE RIS KEY TECHNOLOGY AND THE RIS STANDARDS

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chair of European Expert group Electronic Reporting International

Content Presentation

- **What is RIS and for what is it used**
- Introduction RIS Key technologies
- Introduction RIS standards
- Working on RIS standards
- More about Electronic Reporting
- More about AIS
- Lessons learned

What is RIS??

- River Information Services (RIS) means the harmonized information services to support traffic and transport 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.

  (Source RIS Directive 2005/44/EC)

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  (Source RIS Directive 2005/44/EC)

- **Simply said**
- RIS is the concept for harmonized information services to support traffic and transport management in inland navigation, including interfaces to other transport modes.

River Information Services

- **Objectives:**

  safe, efficient, reliable and environmental friendly

- **Definition:**

A comprehensive set of services for navigation on the inland waterway network, which are agreed internationally

- *RIS key technologies are:*
  - Inland ECDIS
  - Electronic Reporting
  - Inland AIS
  - Notices to Skippers

RIS Services

1. Fairway Information Services
2. Traffic Information Services
3. Traffic management
4. Calamity abatement support
5. Information for transport logistics
6. Information for law enforcement
7. Statistics
8. Waterway charges and harbour dues

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RIS Key technologies

- RIS Key Technologies hold a central position in the services to be provided in the RIS arena.

- The RIS Key Technologies are:
  - Inland ECDIS,
  - Electronic Reporting International (ERI),
  - Inland AIS and
  - Notices to Skippers.

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  - Electronic Reporting International (ERI),
  - Inland AIS and
  - Notices to Skippers.

- But do not forget the so called Basic technologies
  - Radio/VHF
  - Radar

They were, are and will be essential for the good functioning of RIS

Inland Ecdis.1

1) Inland ECDIS stands for ECDIS (Electronic Chart Display and Information System) inland. ECDIS is a navigation information system for displaying selected information from "System Electronic Navigational Chart" (SENC) with positional information from navigation sensors and if necessary, additional (navigation) -related information.

2) Inland ECDIS is a system for displaying electronic navigational charts and additional geographic related information.

3) The aim is to contribute to the safety and efficiency of inland shipping and thus the protection of the environment. At the same time Inland ECDIS should help to reduce the workload when navigating the ship.

4) Inland ECDIS functions as one of the Key Technologies and is also the basis for the use of other systems / services and applications such as Inland AIS.

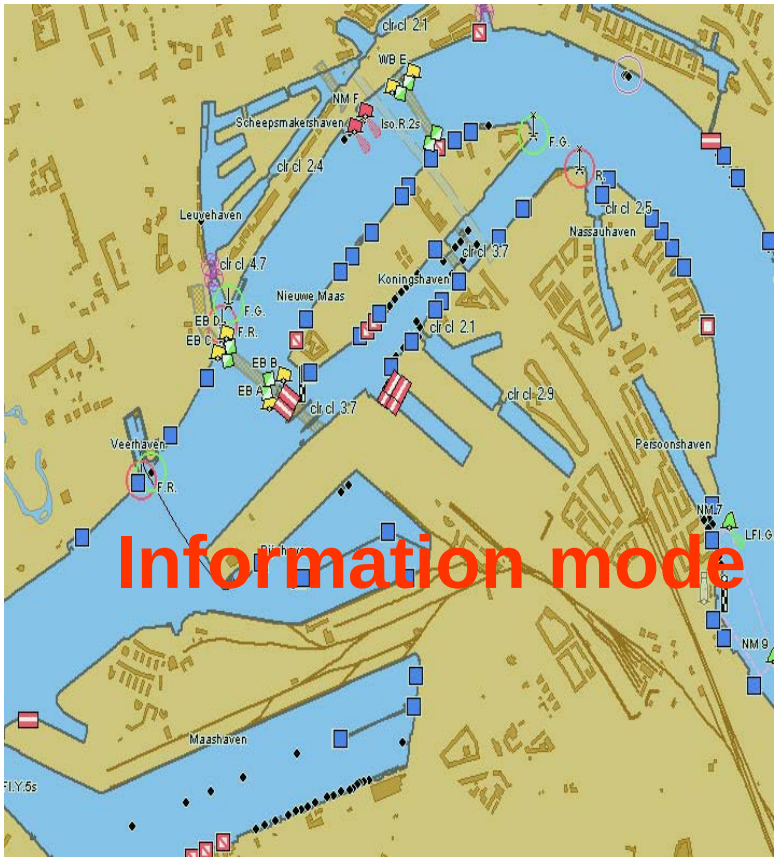
Inland Ecdis.2

1) For (most of) the electronic navigational charts the international "Inland ECDIS" standard is used.
2) The cards that are used in this standard are kinown as "ENC", which stands for Electronic Navigation Chart
3) For the presentation an Inland ECDIS chart viewer or ENC viewer has to be used. (software)
4) Inland ECDIS can be used in two ways.
   - In the Information mode
   - In the Navigation mode

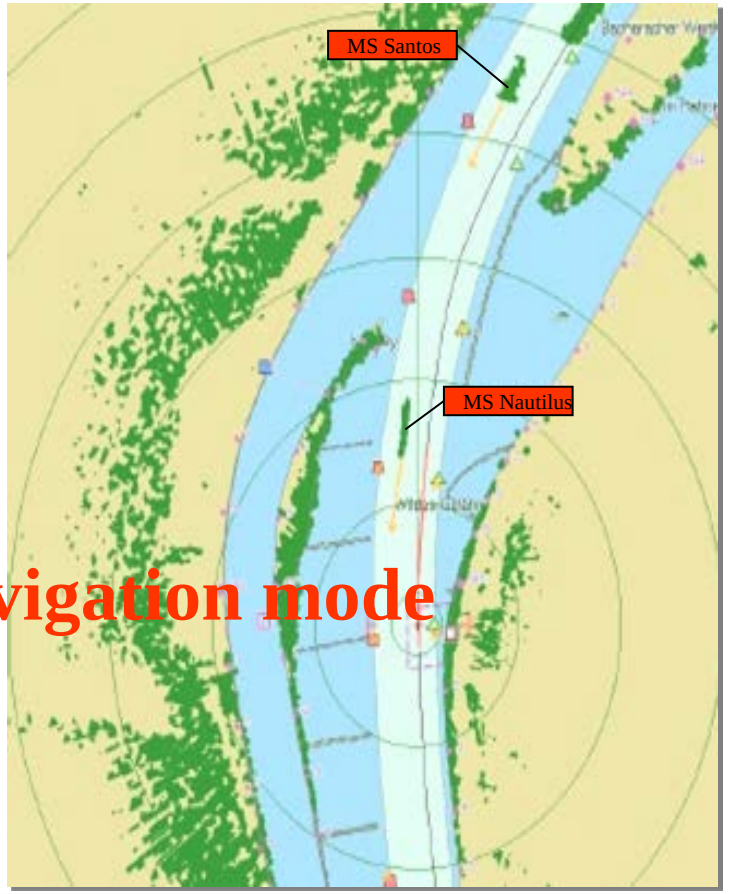
a) In the Information Mode information is given about the waterways and also AIS information can be displayed, but the focus here is really on information and it can certainly not be used for navigation.

b) In the navigation module, the Inland ECDIS information is combined with the radar-information from the own ship's radar and then it can be used for navigation. Next to that, also AIS information can be displayed here in the navigation mode.

Inland ECDIS.3



Information mode



Navigation mode

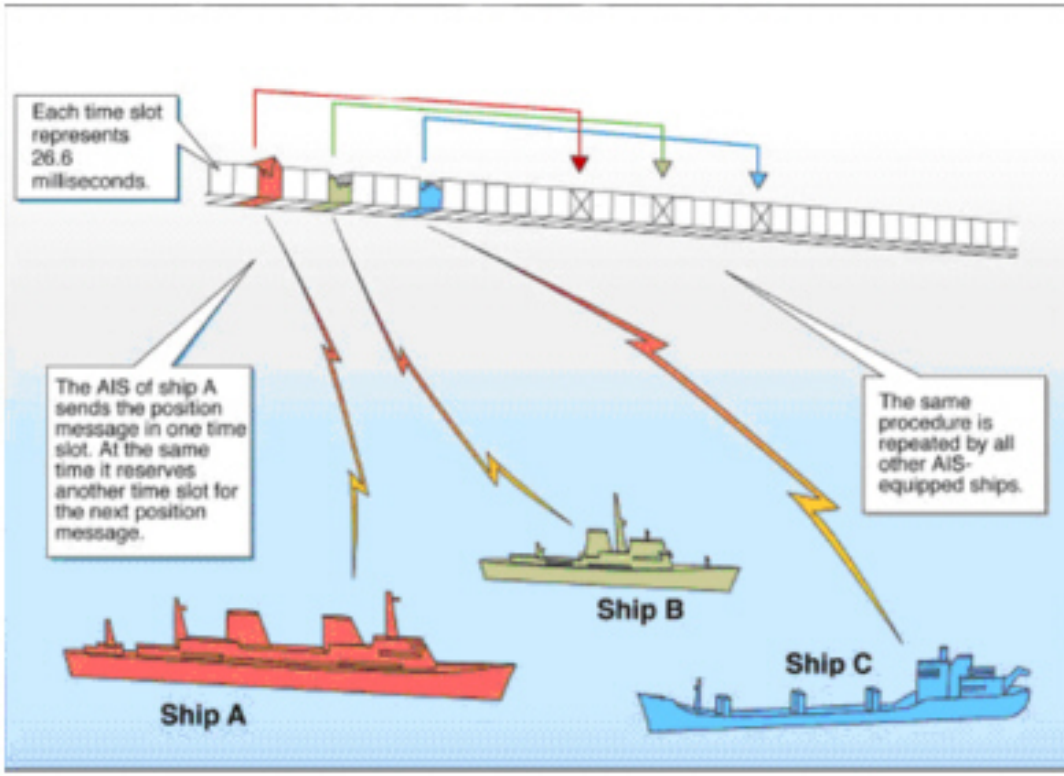
Inland AIS .1

1) Inland AIS (Automatic Identification System) is an important RIS Key technology for the automatic exchange of identification and nautical data between ships and between ships and shore (VTS centres, locks etc.)
2) Inland AIS is a instrument for tracking and tracing in inland navigation with the aim of improving the safety and efficiency of inland navigation.
3) AIS is an interactive system. Therefore all ships that wishes to make use and wishes to participate in the AIS process, should be equipped with an AIS system.
4) A ship equipped with AIS, sends and receives automatically and periodically information from other vessels in the vicinity that are equipped with AIS equipment. This information relates to the vessel and the actual nautical data.
5) AIS is a navigation information system and certainly not a navigation system. AIS **does not** replaces nautical services such as tracking by radar and VTS but only supports these services. AIS and radar are complementary to each other.

Inland AIS .2

The working of AIS

- For AIS data traffic two dedicated VHF channels are reserved
- AIS is a self-organizing system that works with Time Slots of 26.6 milliseconds.
- Slot based; for each channel 2250
- slots per minute.
- Both channels together 4500 slots per minute = 75 slots per sec.
- An AIS message consists of
- min. 1 and max. 5 slots.
- In a standard of 2250 slots per channel per minute a station can handle up to 375 ships in its reception range.



Inland AIS .3

1. Inland AIS comes from the maritime AIS and is expanded with specific information for inland navigation.

2. With regard to the common information content Inland AIS and maritime AIS are compatible. All information sent can be received, displayed and transmitted by both maritime AIS equipment as by Inland AIS devices.

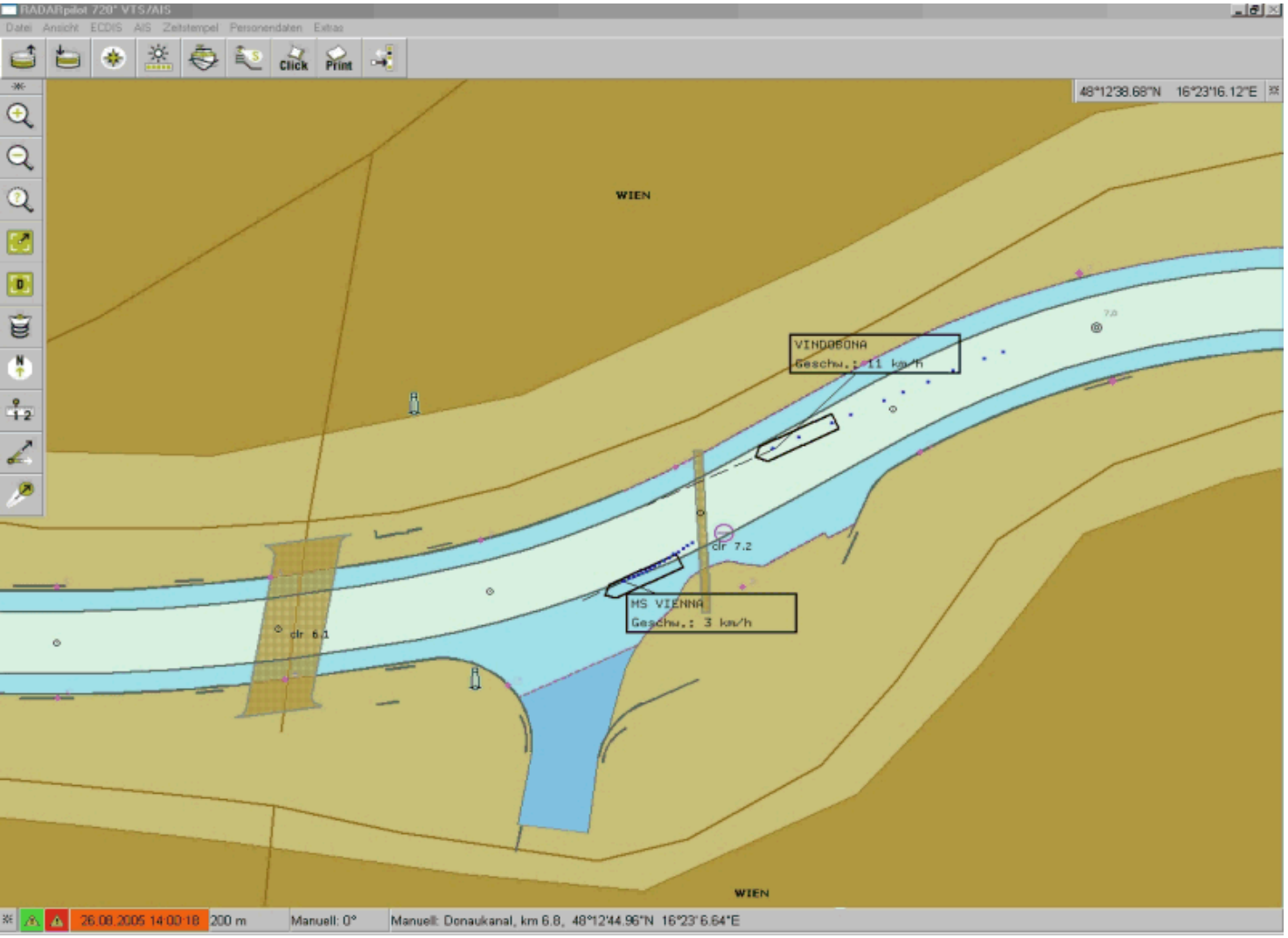
3. On the other hand, the inland specific information can only be received, displayed and transmitted by Inland AIS equipment.

4. An AIS device generally consists of the following components:
   - VHF transmitter/receiver, two VHF channels in the VHF band
   - GNSS receiver, AIS uses GPS as a position determination system including the time signal, making that all AIS are synchronized worldwide.
   - Dataprocessor

Inland AIS .4

1. For the practical use of Inland AIS information by the skipper during navigation, a display of an electronic card is needed.
2. As an Inland AIS device no maps can not display any map a combination of Inland AIS and Inland ECDIS, in the information mode, is recommended. Moreover, also use can be made of a so-called visualization system in order to display the information.
3. In case there is AIS shore based infra available, AIS can be used to exchange messages between shore and vessel(s) also. In principle this is meant for very urgent messages (incidents), but in several countries there is a tendency visible to exchange more regular information messages . (water levels, bridge height etc.)
4. This is fine for regions with a low traffic density and no mobile phone coverage, but very annoying in areas of intensive shipping and nearby the major seaports in Europe.
5. Pragmatically and shortly said this leads to the fact that a ship less/no navigation information will receive of ships which sail further away.

Inland AIS .5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Electronic Reporting Internationaal (ERI) .1

- For the rest of the presentation we will use electronic reporting as we mean this key technology.

1. Electronic reporting facilitates electronic data interchange (Electronic Data Interchange (EDI)) for reporting to and between competent authorities and the electronic exchange of information between parties involved in inland navigation and to parties in the multimodal transport chain, which are involved in inland navigation.
2. Electronic reporting ensures that it is avoided that skippers during a journey have to report several times to the competent authorities and that the same data related to a journey repeatedly has to be provided to different authorities and/or commercial parties.
3. Electronic Reporting provides rules and procedures for the exchange of electronic messages between partners in inland navigation. Public authorities and others should exchange their data in accordance with these standards and rules.

Electronic Reporting .2

1. Electronic Reporting in Inland Navigation is based on internationally accepted standards and classifications for trade and transport and these are further added to the inland navigation. These additions are based mainly on the experience gained in several European research- and development projects and during the implementation of reporting systems in different countries.

2. The Competent Authorities must be able to receive electronic ship reports of the required data from ships, as far as ship reporting is required by national or international law or regulations.

3. In case of cross-border transport, this messages must be sent completely filled in to the Competent Authorities of the neighboring state before the ship crosses the border.

Electronic reporting .3

- Electronic Reporting includes the following procedures for reports:

Ship - authority reports consist mainly of:

a) Transport notification messages on the voyages of loaded or empty ships within the jurisdictional area of the Competent Authority, when the regulations are applicable. (Containers, passengers, cargo ADN, etc.)

b) Communications concerning arrivals, position reports at locks, bridges and reporting points of traffic centers

Messages between authorities

These consists mainly of transport notifications for ships, empty or loaded and sailing from one area to the other.

Message from Authorities to vessels

These mainly consists of acknowledgments and responses related to previously submitted reports

Electronic Reporting .4

- **Important aspect =Privacy**

1. The Competent Authorities should take the necessary measures to ensure pursuant to the confidentiality, integrity and security of these messages sent to them and take into consideration the relevant legal aspects. They may use such information only for certain services, such as calamity abatement, border control and customs matters.

2. A request for information from a ship - authority message to send to another party can only and only if the owner of the information, for example the skipper or shipper has given its explicit consent.

Notice to Skippers (NtS) .1

1. Notices to skippers are among the most common means of information in inland navigation. Traditionally, they were distributed by VHF, in writing, teletext on notice boards or by fax. From the 90s in some countries web services were introduced. But these services provide the information only in the language of the country.
2. Notice to Skippers is an important RIS key technology that provides standardized reports and is language independent.
3. Notice to Skippers provides a standardized data format that can be used for publishing the notices to skippers on the internet (pull services) or for distribution by e-mail (push services).
4. Notice to Skippers provides a automated translation of the important content of notices in all the languages of the participating countries. In addition there is space for free text which will not be translated.
5. Notice to Skippers is compatible with the data structure of Inland ECDIS, making integration into Inland ECDIS possible.

Notice to Skippers .2

In Notice to Skippers the following message types are possible:

- **Fairway and traffic related message**

  This is a message that provides information on a specific section of a waterway or object. (Blocks, obstacles, restrictions, opening hours etc.
- **Water level related message**

  This is a message that provides information on the water level, the least sounded depth, air draught, state of the weir, drainage, the regime, the expected water level, the expectation of the least sounded depth and the expected water discharge.
- **Ice Report**

  This is a report that provides information on the ice and navigability.
- **Weather message**

  This is a message that provides information about the weather.

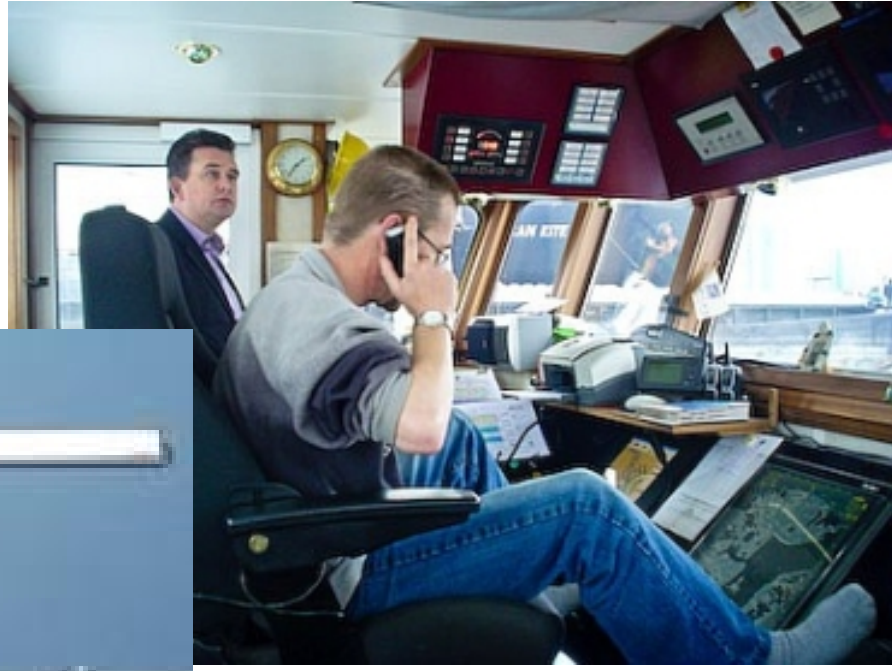
➢ When filling in the kernel content, use is made of standardized concepts and terminology due to the translation.

Basic Technologies

- In addition to the RIS key technologies, there are the basic technologies - like radar and VHF, which are for many decades important supporting technologies for the navigation and certainly they will not be replaced by the RIS key technologies, but on the contrary they are needed to support the use of RIS services .

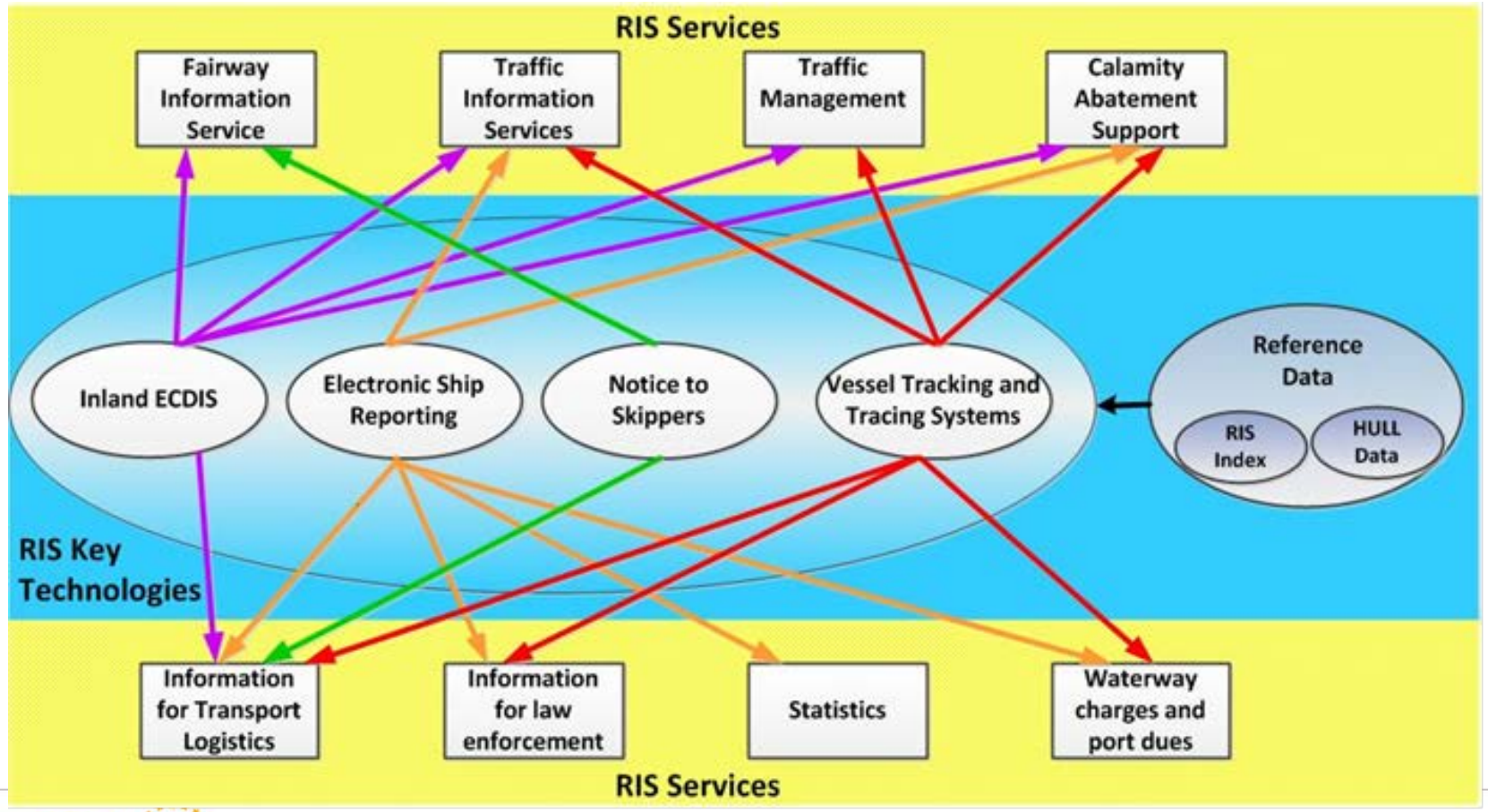
- For RIS the following VHF services of importance
  - Ship-ship
  - Nautical information from posts/centres
  - Ship-authorities

- Radar is to be used as the primary navigational instrument and is the basis for tactical traffic information images on board a vessel.
- Radar gives the true and accurate traffic picture within reach of the ship's radar.



RISERIO

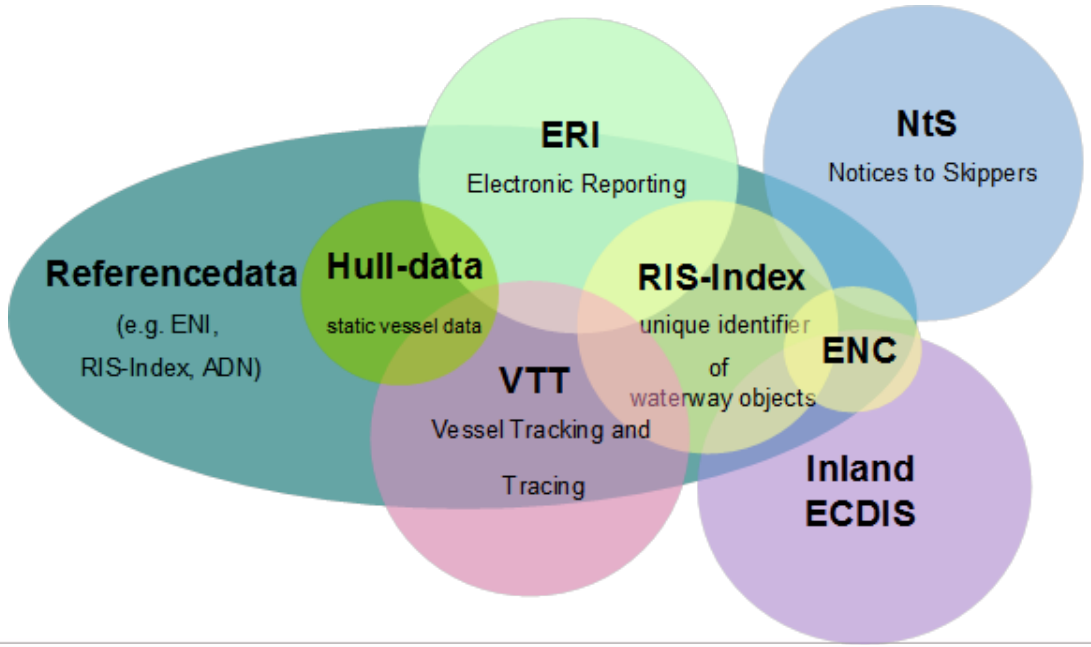
RIS-services versus RIS-technologies



RIS key technologies and referencedata make together the RIS Services

•The efficient en effective use of RIS Key Technologies is based on the description and coding, formalized and harmonized use of reference data.

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



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Why RIS standards

- The first step towards the development of RIS standards has been set in the late 90's, by the European RIS Platform: A platform with as participants representatives from both the EU Member States, as from non-EU countries, with the aim of promoting standardized and harmonized implementation of RIS.
- The international standardization of RIS services and technologies was and is necessary :

  - Because inland shipping does not stop at national borders;
  - Because the different RIS systems only fully come into their own when they are harmonized;
  - Because of the fact that manufactures of RIS equipment only will develop hardware and software, where there are generally applicable and acceptable standards.

- In addition, standardization simplifies the introduction of new IT developments from other modes of transport in inland navigation and makes in particular the integration of the different modes of transport possible (multi-modal transport by road, rail and waterway)

Which RIS standards are there

- The first RIS standards were formally adopted by the CCNR and UNECE between 2000 and 2004. They were more or less recommendations.
- After October 2005, when the RIS Directive was published, the EU also took initiatives to establish the RIS standards and Member States were expected/required to implement the standards.
- With the establishment of the Sava Commission (SC) around 2012 they also started the procedures to accept the RIS Standards.

- At the moment there are the following standards:
  - Inland ECDIS [EU/UNECE/CCR/SC]
  - Notice to Skippers (NtS) [EU/UNECE/CCR/SC]
  - Electronic Reporting (ERI) [EU/UNECE/CCR/SC]
  - Tracking en Tracing (T&T) [EU/UNECE/CCR/SC]
  - Inland VTS [UNECE/CCR]

- The RIS standards impose obligations to the Member States but not to the shipping. Member States or River Commissions shipping may require this by including a requirement in the respective Police Regulations.

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Working on RIS standards .1

1) Around 2000 initiatives were taken from the European RIS platform for the creation of so-called RIS Expert Groups consisting of "technical" experts and representatives from the national authorities. (International technical platforms).
2) Task of the RIS Expert Groups was and is to work on the standardization and harmonization of RIS key technologies.
3) Since then, the RIS Expert Groups have played an important role in the further development of the standards.
4) The RIS Expert Groups ensure the harmonized development and maintenance of RIS standards.
5) The RIS expert groups act as advisory bodies for international institutions such as the European Commission (EU), the Central Commission for Navigation on the Rhine (CCNR), the Danube Commission (DC), the Sava Commission (SC) and the United Nations UNECE) for standardization, but if necessary also for other questions dealing with RIS.
6) The RIS Expert Groups do not establish itself, but on the basis of their work and advice, the standards were and are adopted by the EU, UNECE, CCR, SC.

Working on standards .2

- Standards are further developing by :
  - Technical developments; RIS started with the technique from 2000. We are now 15 years later. Computers, tablets, Cloud, 4G, smart phones lead to new insights;
  - Experiences from the earlier applications;
  - Needs in other countries;
  - Functional additions;
  - Social developments;
  - Developments in inland shipping and in the transport chain.

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Critical remark

- The coverage of the GSM network is far from good along the European waterway network. The Netherlands seem to be a more or less positive exception. Mobile Internet is not yet suitable for large data packets

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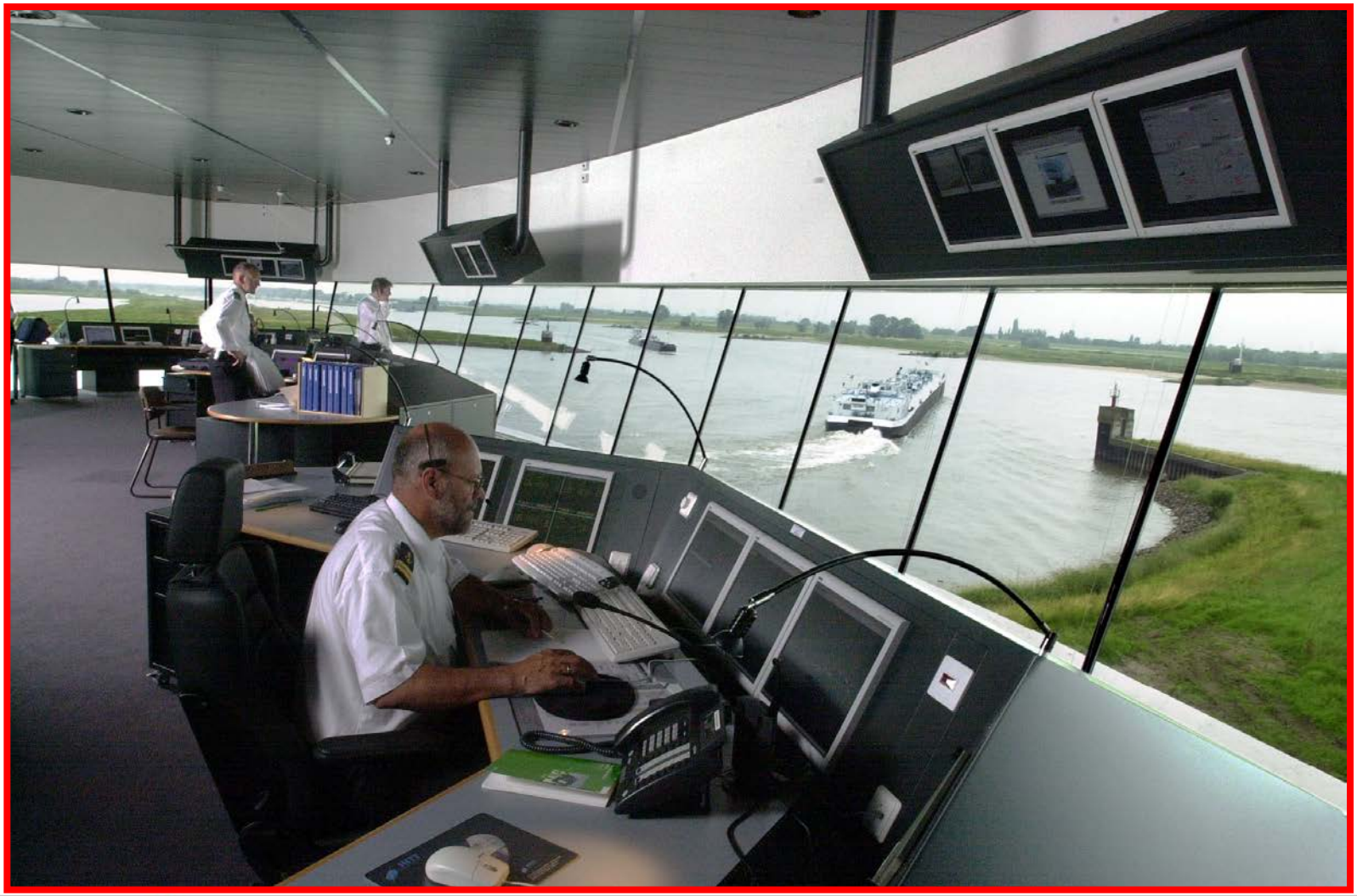
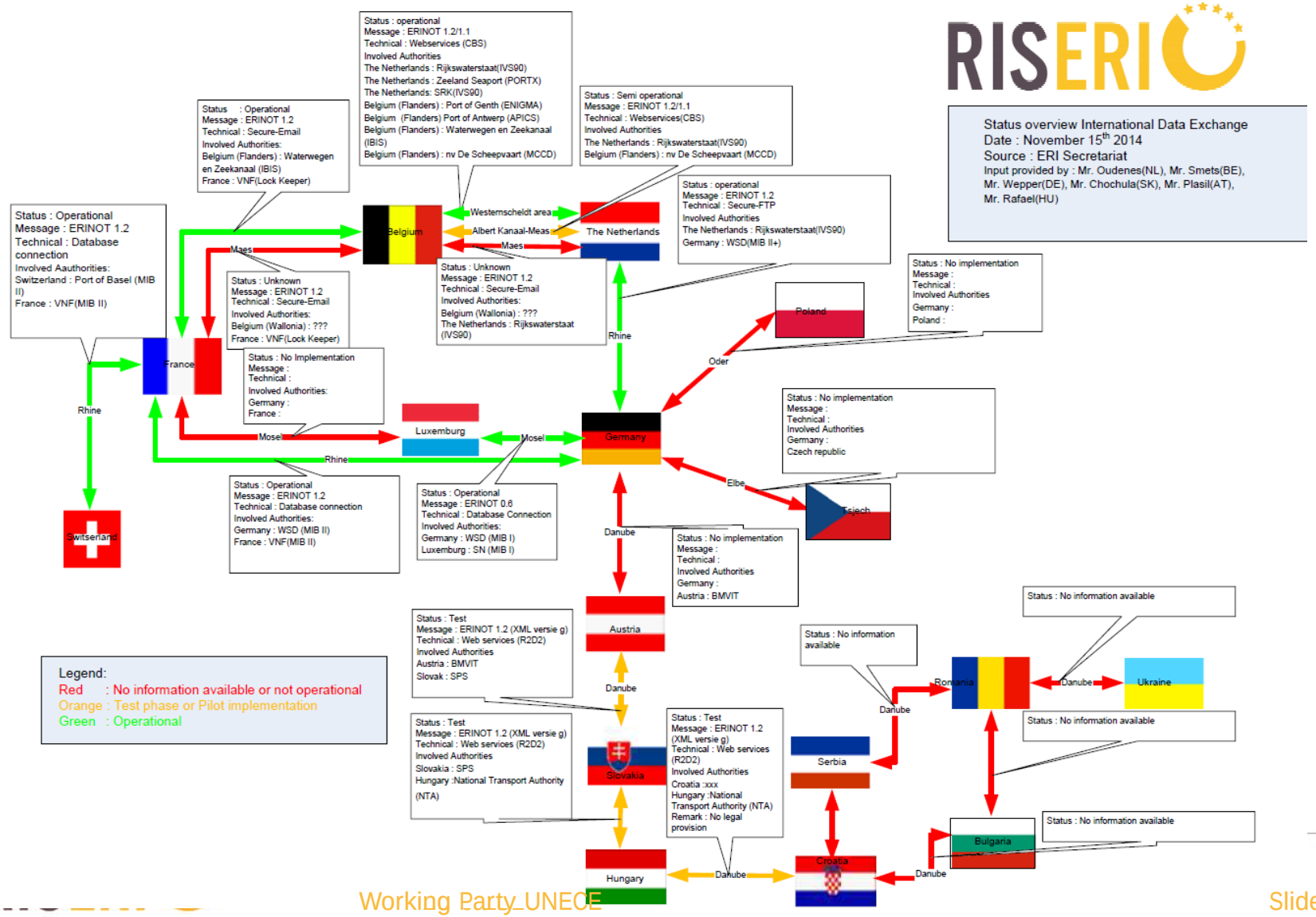
More about Electronic reporting



What is new in the standard under development

- Several editorial Corrections
- Several small errors have been corrected
- Structure of the report has been brought in line (uniform lay-out)
- The possibility for ships using LNG as fuel to report
- The improvement of the technical names for ADN cargo
- New chapter on AIS / Aids to Navigation
- New definitions have been added
- The standard is compliant to the latest international regulations.
- Experiences during the various implementations have been taken into account.

Electronic Reporting in Europe



Elektronic reporting on the Rhine.

- There is a reporting obligation in the Rhine-police-regulation to target ships.
- Reports are at the moment often done by VHF radio or fax, which means a lot of work on both sides, with a probability of errors and uncertainties.
- Gradual introduction obligation to report electronically is for seen.
- 1-1-2010, mandatory for (container)vessels with more than 20 containers.
- 1-12-2015 mandatory for all vessels with one or more containers.

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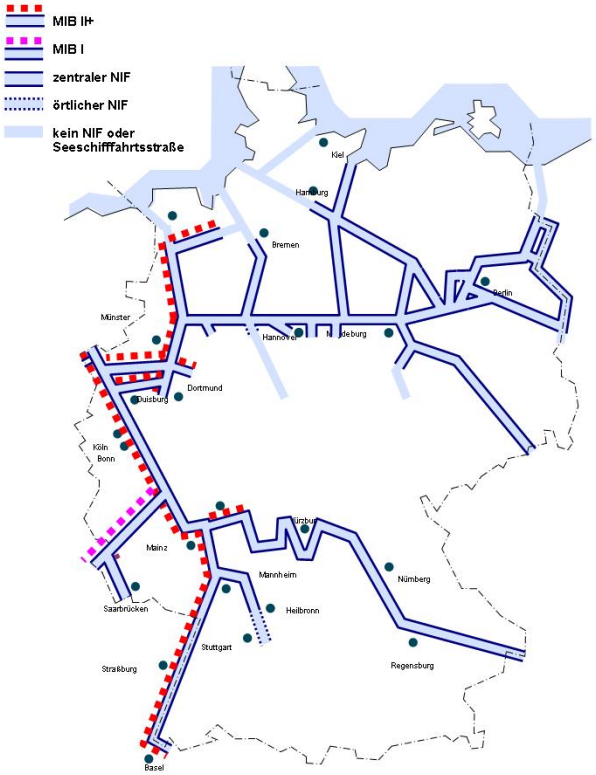
- 1-1-2010, mandatory for (container)vessels with more than 20 containers.
- 1-12-2015 mandatory for all vessels with one or more containers.

- Next step is the obligation of the electronic reporting for all tankers (CCNR working program 2016-2017)

Reporting and Information System Inland Navigation (MIB)

- **Today**



- * System along the federal waterways Rhine, Mosel, Main and West-German canals since 1995.
- * Receiving information of inland navigation about vessels and convoys, cargo and voyage for calamity abatement and lock management.
- * Vessels or convoys can report electronically.
- * Since 2010 container vessels or convoys have to report electronically along the river Rhine.

Reporting and Information System Inland Navigation

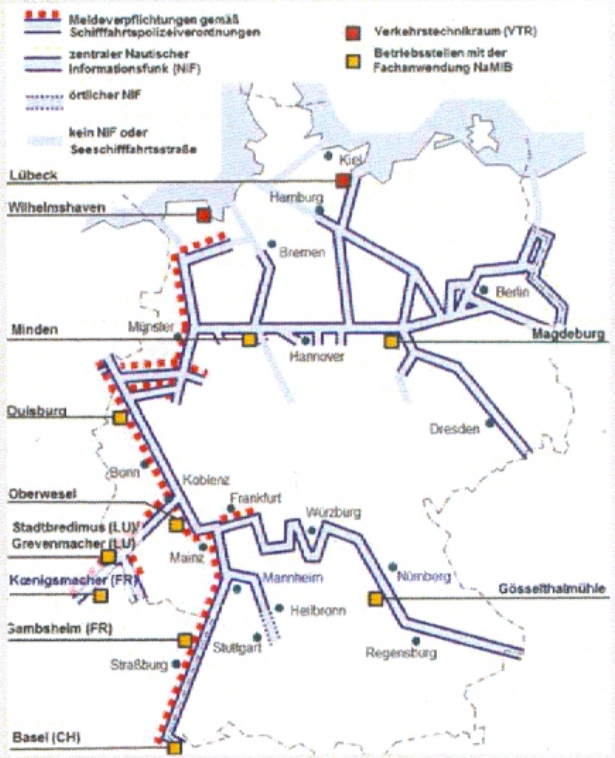
Wir machen Schifffahrt möglich.

Successor of Reporting and Information System Inland Navigation (NaMIB)

WSV.de

Aims:

- Ensuring the provision of information about accidents and damaged vessels or convoys at all relevant waterways.
- Establishment of a central application that is easily configurable and scalable nationwide.
- Modular overall architecture for linking with other services (e.g. lock management).
- Cross-border, uniform reference data.
- Definition of interfaces and implementation of electronic data exchange with third parties.



14.06.2016 Federal Waterways and Shipping Agency, Inland Traffic Technologies and River Information Services

IVS-90 in the Netherlands

- IVS90 is intended for all ships using the Dutch main waterways. Through the system a skipper registers his ship- and cargo data. After registration with an IVS-mail the relevant information will remain available along the route/voyage.

- **Throughput**

  The data of a ship need not be transmitted over again.This promotes a rapid process at locks, bridges and traffic posts. It is also used for lock planning and placing the vessel in the lock chamber.

- **Calamities**

  IVS90 also promotes assistance during incidents/calamities on the water. By the system is in fact known more or less the position of a ship, how many people are on board and what the cargo is. Thereby emergency services can directly come targeted in action.

- **Confidential**

  IVS90 is not available to others exclusive aid workers in case of emergency. Aid workers receive the data only in case of emergency.

BICS

- **Elektronic reporting**
- BICS is an application that allows skippers to report electronically their voyage and cargo data to the waterway- and port authorities. They process the data in IVS90 or in another system of the waterway authority. BICS is available in multiple languages (currently English, French, German and Dutch). This enhances the communication with the systems of other European countries.
- Ultimately, it is intended that BICS can be used throughout Europe.

Electronic reporting is mandatory for vessels carrying containers on al the waterways in the Netherlands since 2010

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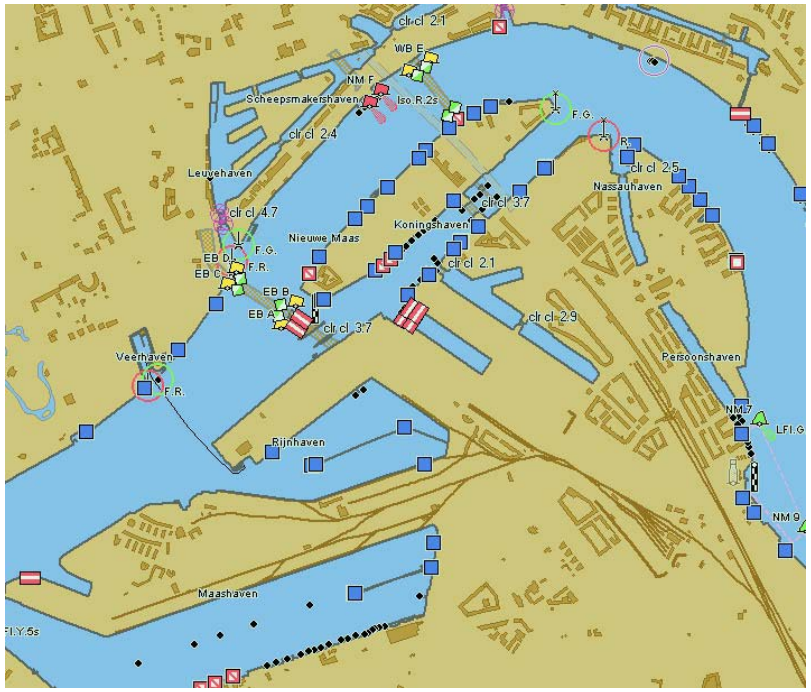
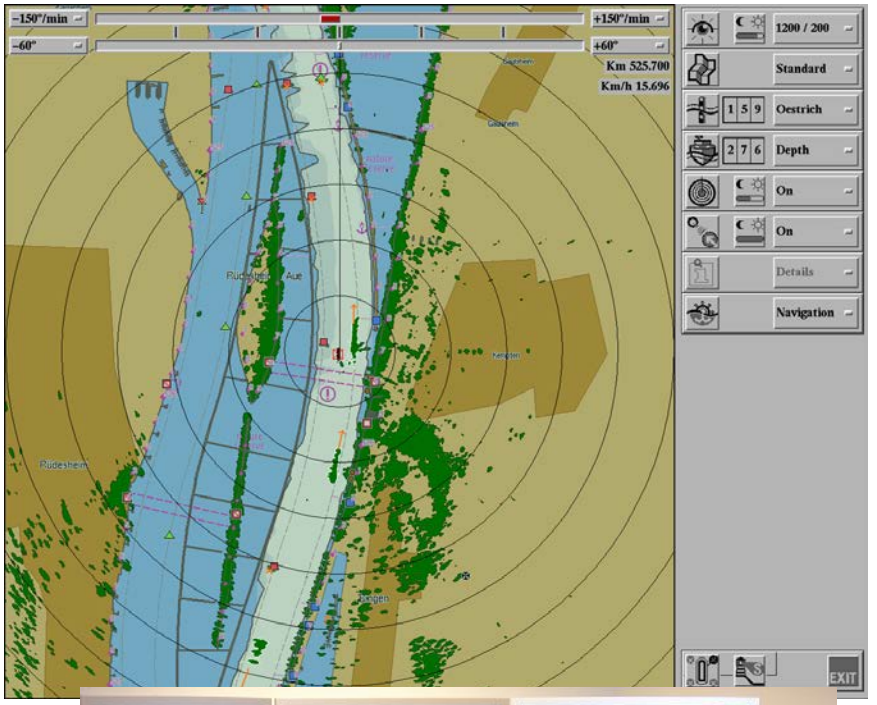
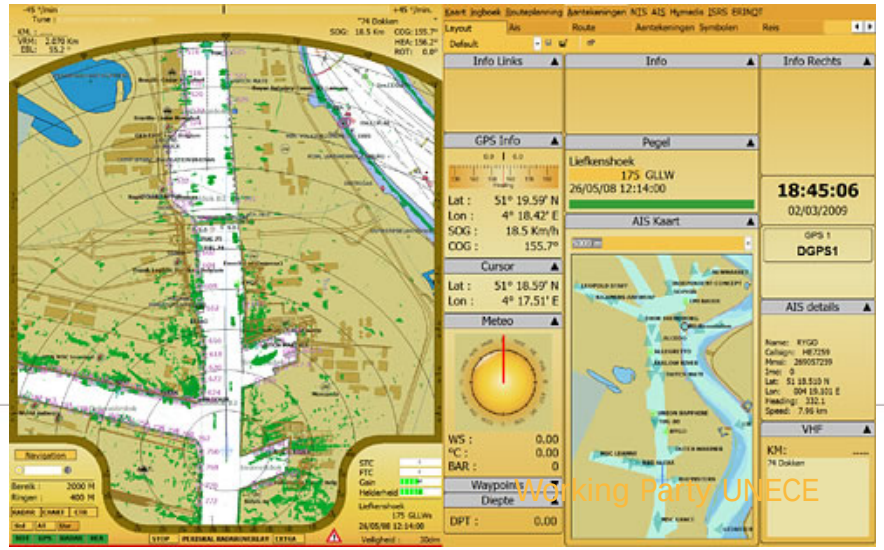
More about AIS

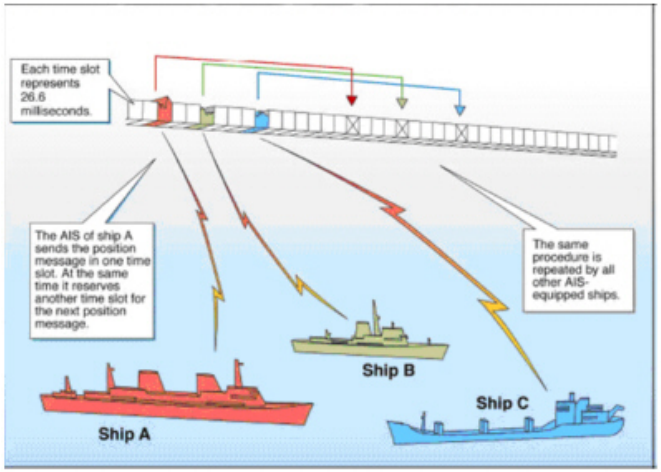






Points of attention with respect to AIS

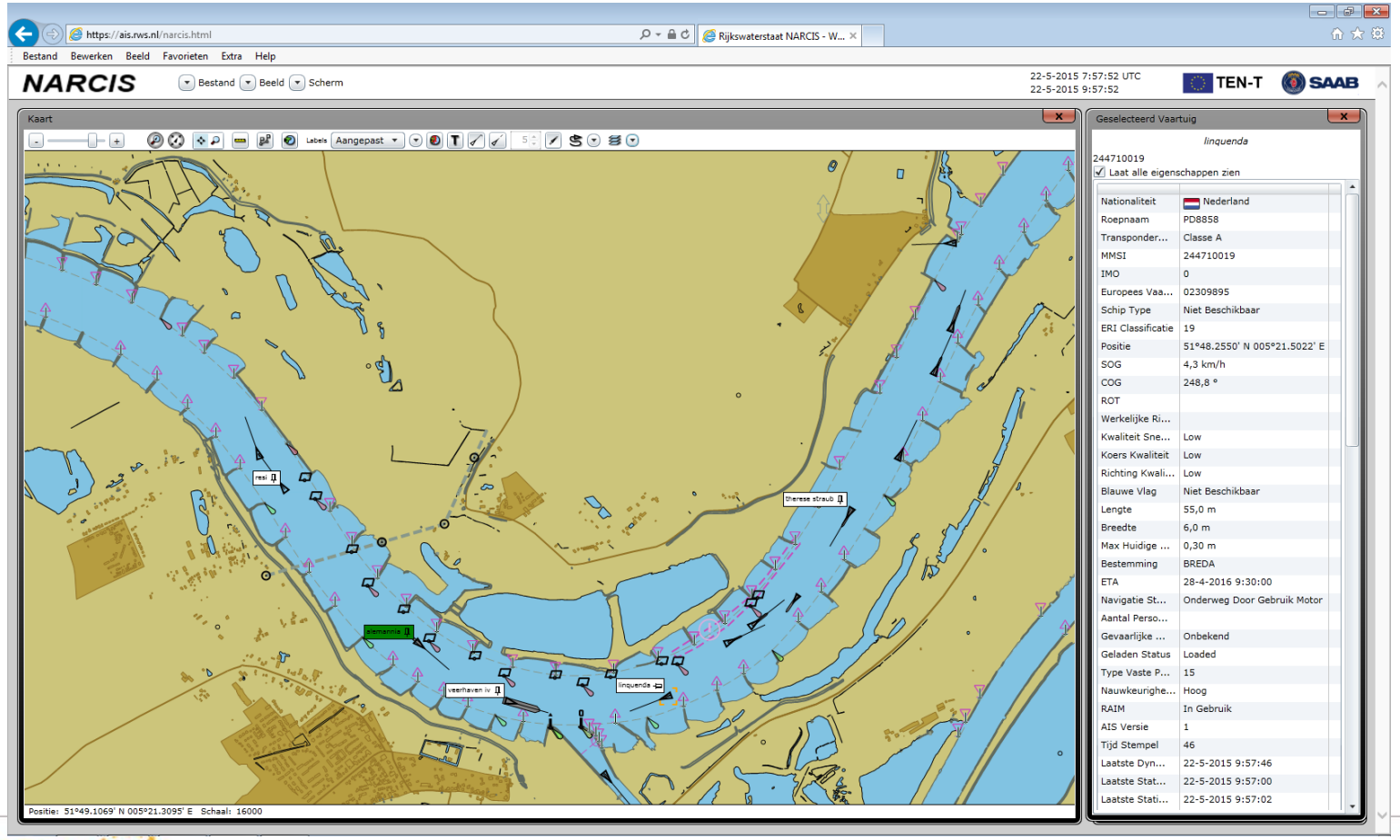
- AIS information can not be used as navigation information.
- AIS is a navigation information system and not a navigation system.
- AIS is in the first place meant to inform the shipper about the other ships in the area/vincinty.
- AIS can also be used to transfer other information, but especially in high-traffic areas that can have an impact on the slot management.



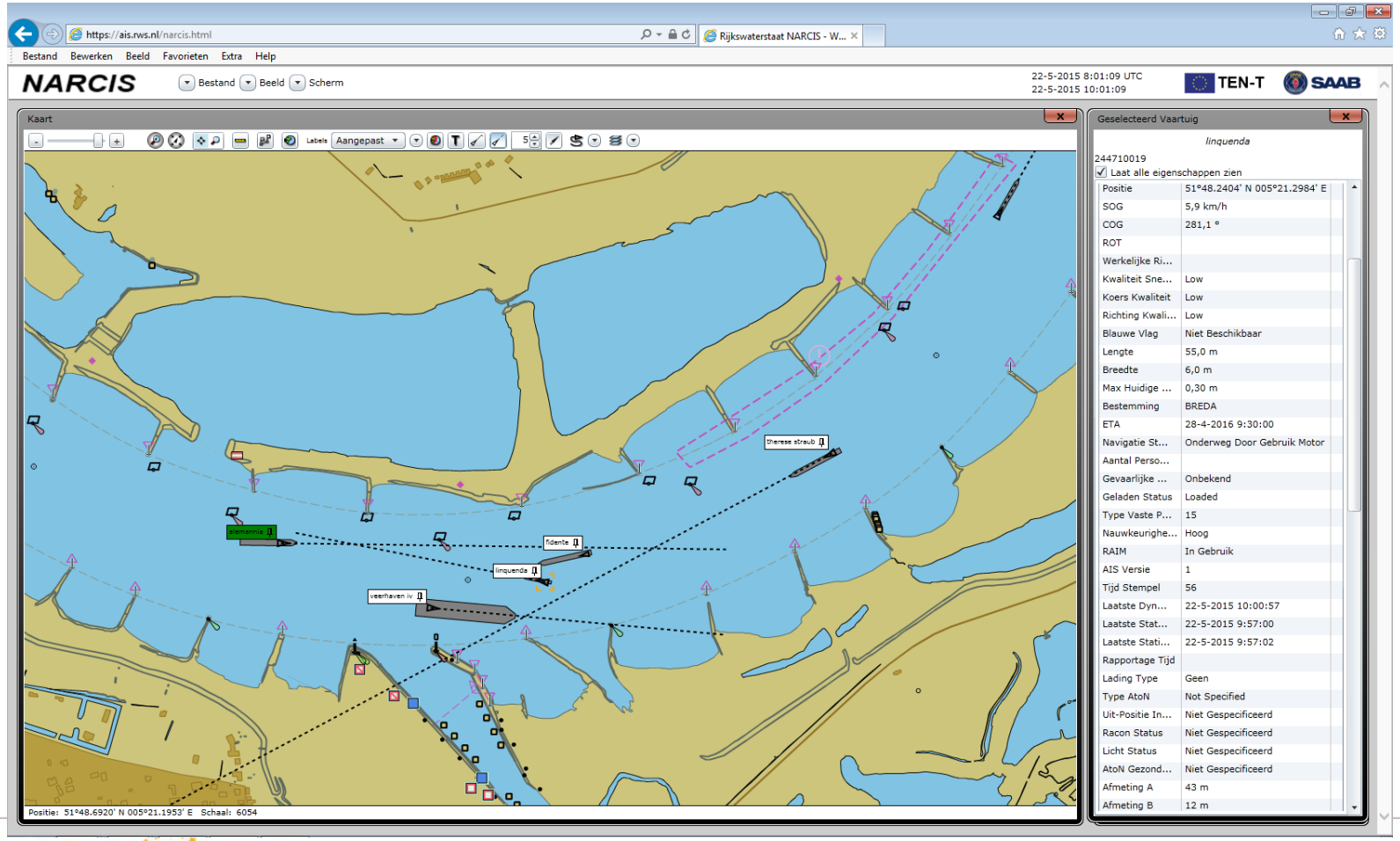
What is new in the standard under development

- Several editorial Corrections
- Several mistakes have been corrected
- Structure report has improved
- New chapter on class B transponder
- Separate chapter AIS specific messages
- New chapter on AIS / Aids to Navigation
- There was a critical look at the definitions
- The standard is brought in line with the international regulations. (ITU etc.)
- Experiences during the various implementations have been taken into account

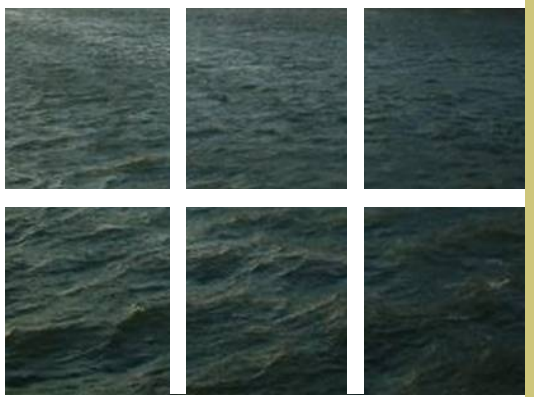
Presentation of AIS information in Inland Ecdis

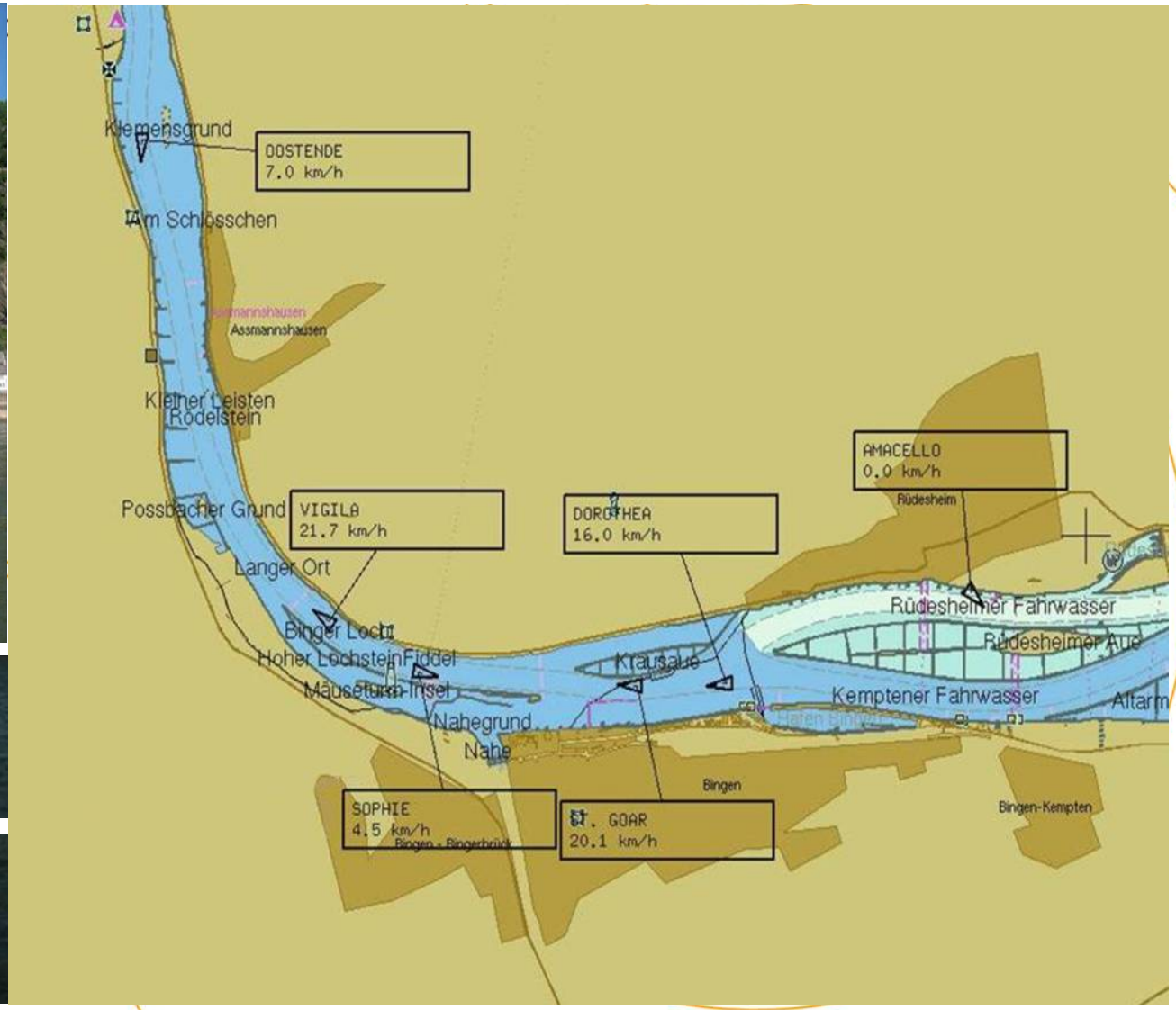


Presentation of AIS information in Inland Ecdis



Implementing Inland AIS into the German RIS





Technical implementation of the AIS shore infrastructure

The Inland AIS network will cover about 2400 km of inland waterways.

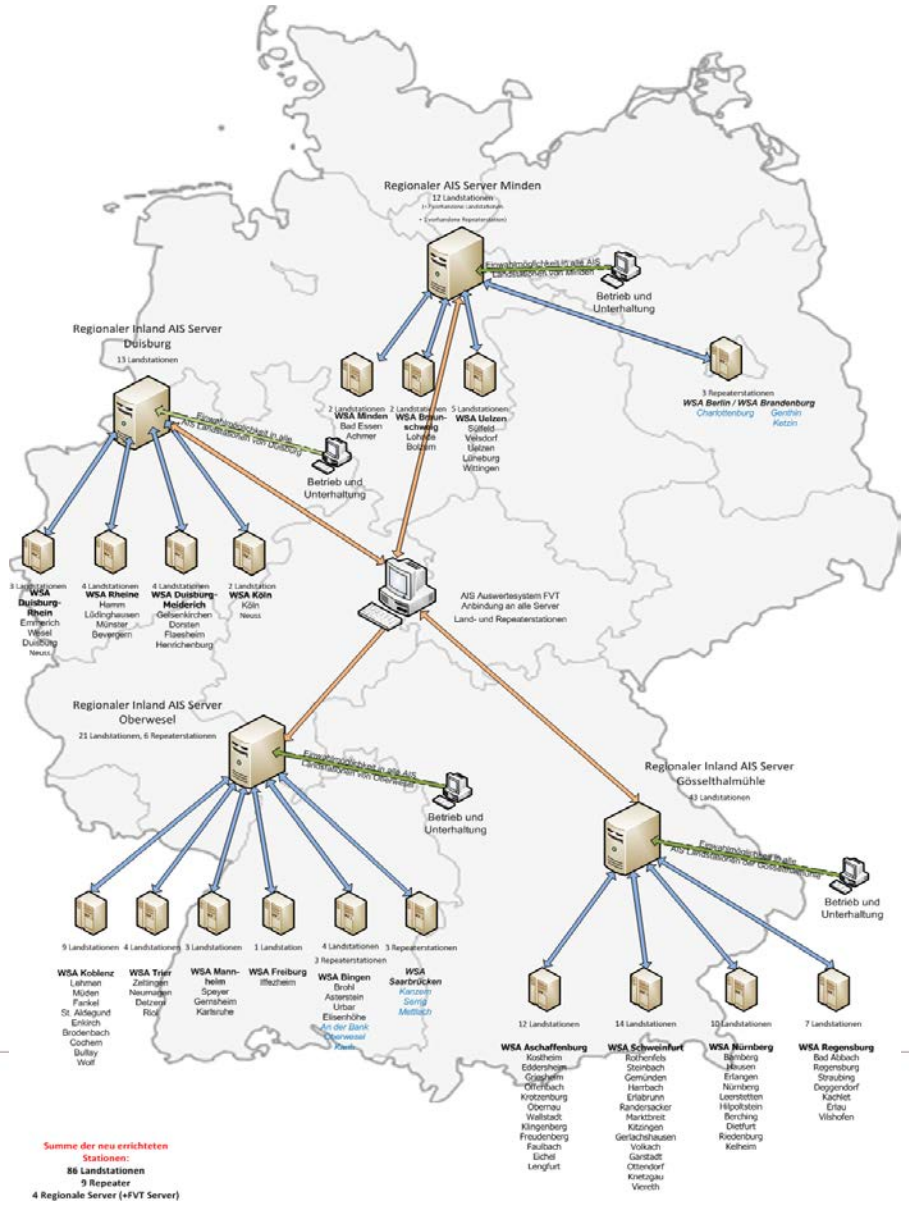
It consists of:

- 86 physical Inland AIS shore stations along the rivers and canals,
- 9 AIS Repeater Stations
- 4 Regional AIS servers.

- The Regional AIS Servers provide the Logical AIS shore station which is the functional interface to other RIS services.
- The German Inland AIS network is now more or less fully operational.

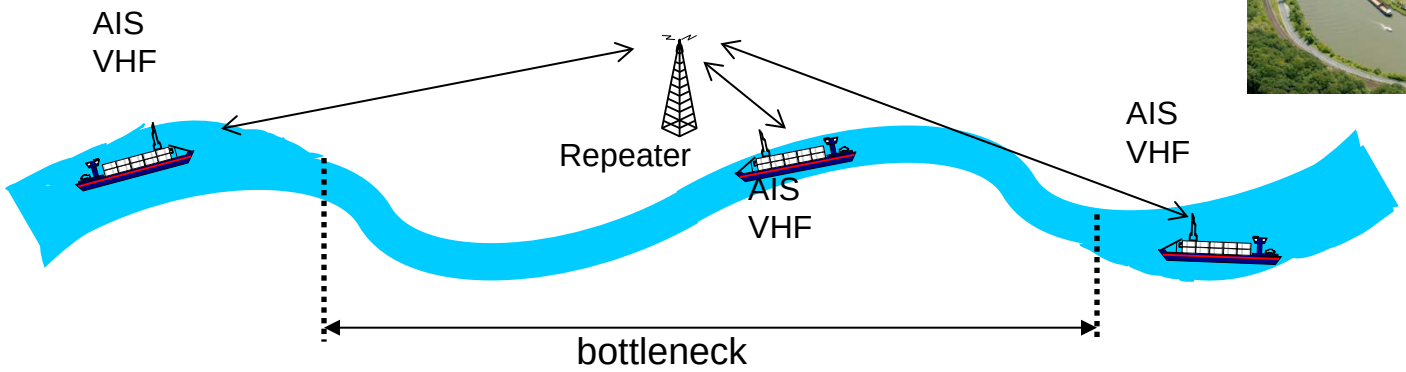
Inland AIS shore infrastructure

- Full AIS coverage of relevant inland waterways .
- Use of existing VHF voice radio telephony infrastructure (NIF) antenna mast, shelter, energy supply, land line for data transfer.
- 4 regional Inland AIS centers
  - **Middle** (Minden): Weser, MLK, ESK,
  - **West** (Duisburg): Rhine, Western Channels
  - **South-West** (Oberwesel): Rhine, Mosel, Saar
  - **South** (Gösseltalmühle): Main, MDK, Danube
- Central technical evaluation center
- Interface to other RIS services
- Standardized interface for providing data to other services and for receiving data from other services to be transmitted to all vessels in a region or addressed to single vessels



AIS Repeater

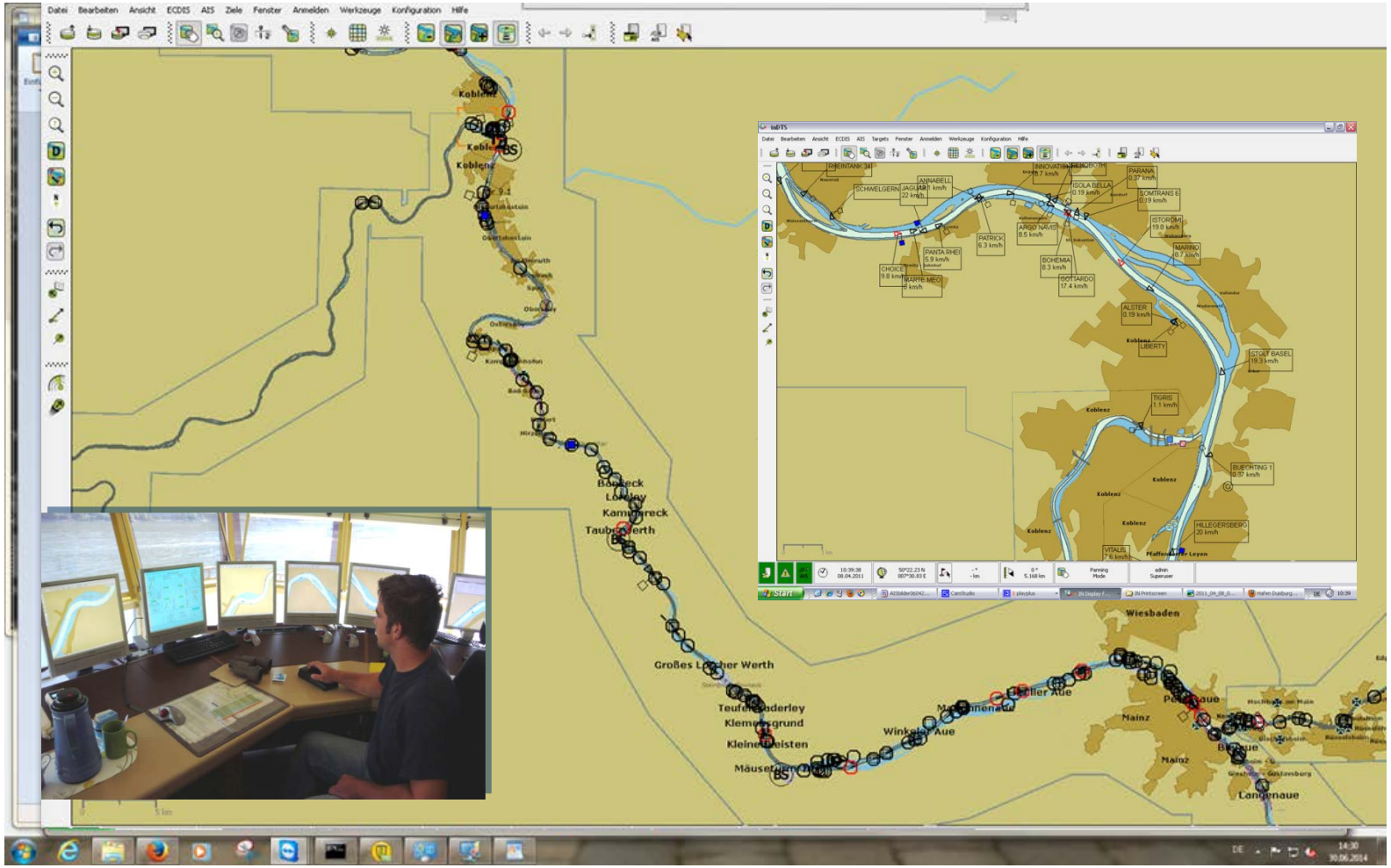
- AIS Repeater station can help to enable ship to ship data exchange in areas with difficult radio propagation like mountains .
- However a repeater reduces the capacity of the VHF-datalink (VDL)with 50%.



AIS : ship - ship (data)
VHF : ship - ship (voice)

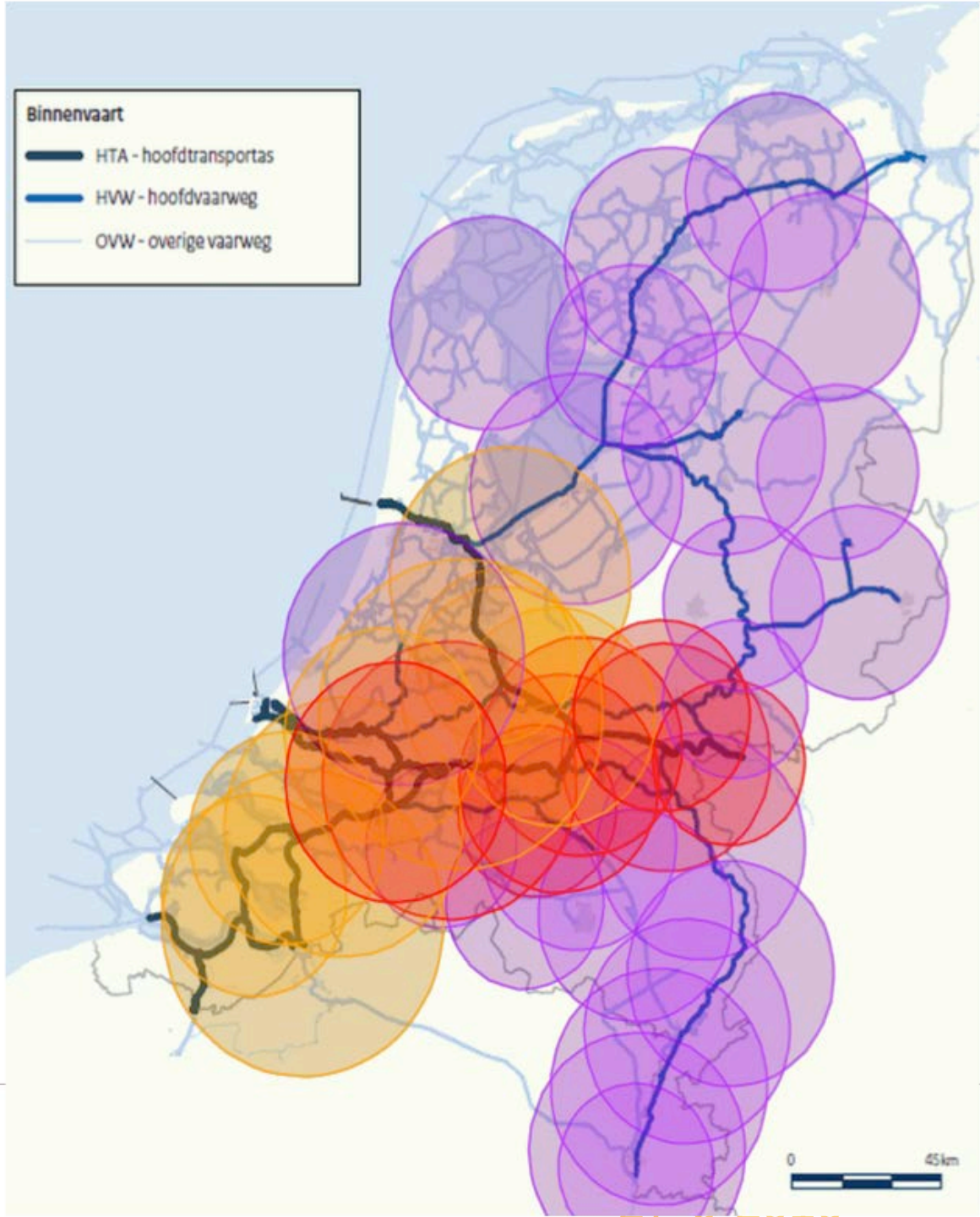
- AIS Repeater ashore enable data exchange ship-ship also in case of difficult radio propagation. Extended Radio Coverage by re-transmission of the AIS VDL Messages received.
- Inland AIS for communication „ship ↔ ship“ for navigation in bottlenecks („Datenfunk-Selbstwahrschau“)

Data provided by Inland AIS shore infrastructure



Example of use in Germany Selbstwahrschau

AIS shore bases infra structure on the inland waterways in the Netherlands



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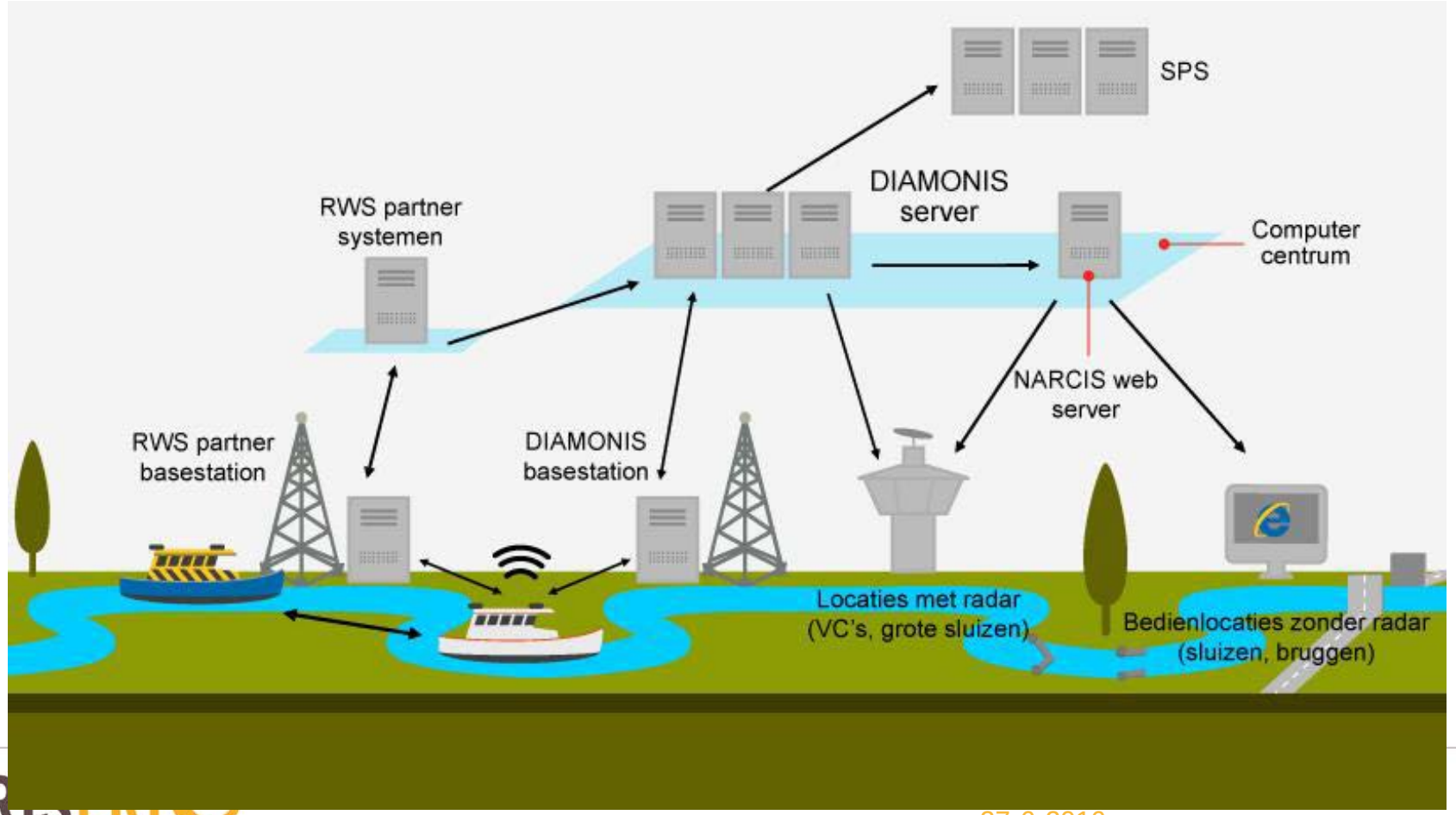
The idea behind AIS shore based infrastructure



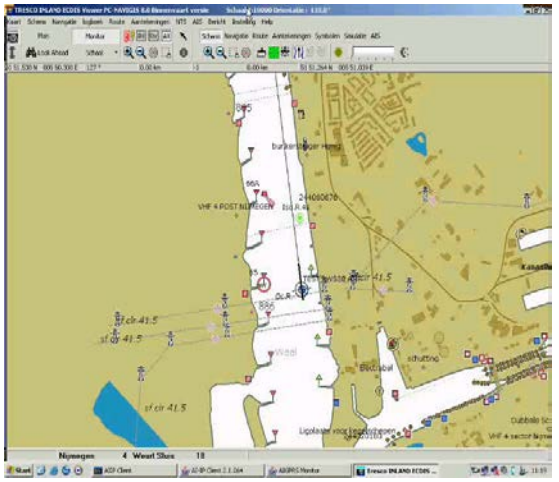
AIS means for the Netherlands waterways

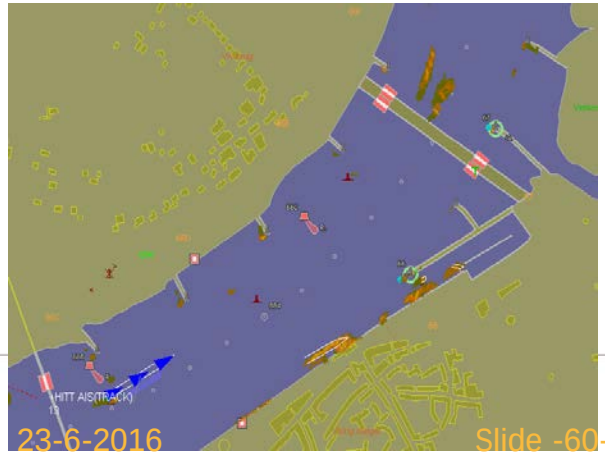
- Additional information to the radarpictures in VTS centres
- Monitoring all over in the Netherlands, so support incident management on the entire waterway
- Opportunity for better planning and control of locks and bridges so better exploitation.
- Possibilities for voyage planning.
- Ultimately a better use of waterways and infrastructure, but also better information for the skipper.
- The skipper can adjust his sailing plan to the availability of a lock or bridge opening and for example also save fuel.

Use of AIS on traffic centres and objects

- AIS provides information further away than the radar coverage of the own vessel

- AIS is mainly used for:
  - Strategic traffic image on a route
  - VTS services such as information service, navigation service and traffic management (pro active acting instead of reactive acting)
  - Lock management
  - Lock planning short- and long term
  - Bridge management
  - Bridge planning, short- and long term





Content Presentation

- What is RIS and for what is it used
- Introduction RIS Key technologies
- Introduction RIS standards
- Working on RIS standards
- More about Electronic Reporting
- More about AIS
- **Lessons learned**

Lessons learned.1

- By introducing technical systems such as Electronic Reporting or AIS it is not enough to change the (police)regulations.
- Between countries, the systems must be aligned and there must be an agreement on the maintenance but also about enforcement.
- Based on the assessment of the introduction of the Electronic Reporting obligation for containervessels, the CCNR decided to work during the introduction of the AIS requirement with a Coordination Group. This has proven to be very successful.
- Communication is also very important during the implementation of such obligations.
  - be open to the shippers and branch organizations
  - organize meetings with users (round table)
  - organize a workshop where all stakeholders can take part as speaker or in the discussion.
  - take care for a brochure, Q&A documents and make use of the digital world (websites, etc.)

Lessons learned.2

- But most important is take your time and find out what needs to be done and how much time is needed, what are the relations between the several actions and take on the basis of that a decision when the obligation/regulation should be implemented. Set up a time line.
- Often you see a date of implementation is set and then problems occur because the schedule is too tight and then you are in problems.

Where do we do it for?

Ultimate goal: reliable waterways and a smooth traffic flow


questions.....?