



Physical and virtual AIS AtoN at the Elbe-Weser Corridor

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Safety of Navigation



- Improved by AIS AtoN messages

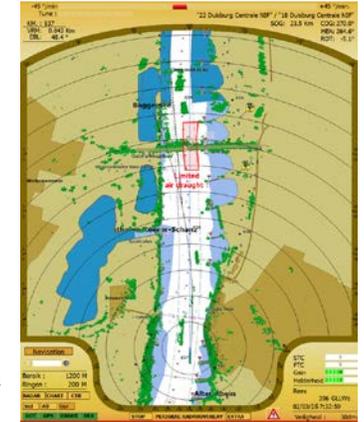


- AIS AtoN and Inland ECDIS are suitable technical standards to improve safety of navigation. All the more when these standards are used in combined applications.
- The aim is to inform the skippers about the current situation via the Inland ECDIS chart on board of the vessels.

Physical AtoN, Ferry
(Reporting)



Onboard Inland
ECDIS Application
(navigational information)



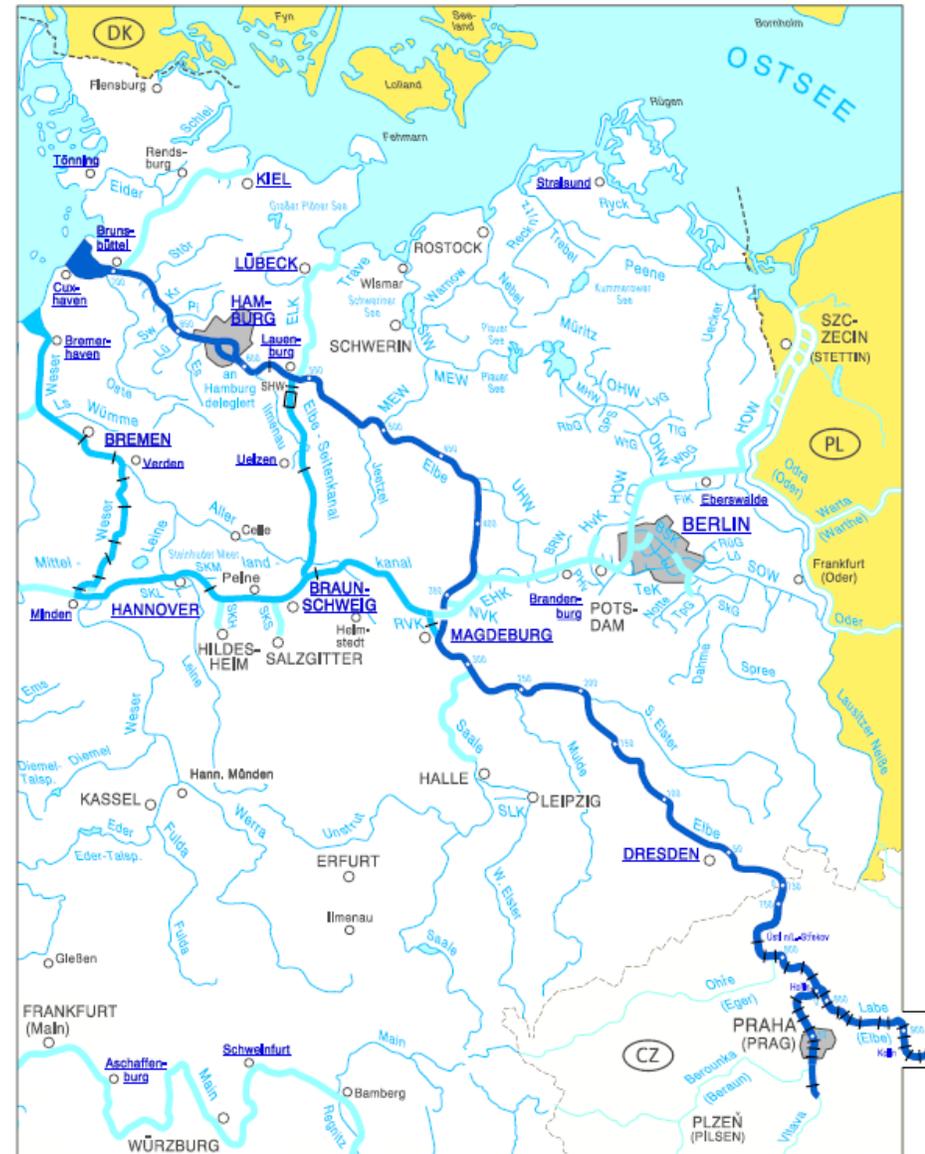
Traffic Control Center
(monitoring, managing)



European Project RIS COMEX

- Sub Activity 5.1: Safety of Navigation

- Within the frame of the European RIS COMEX project are reference applications foreseen.
- The main test field is the “Elbe-Weser” corridor.
- The necessary tech will be installed for the field testing of AIS AtoN.
- Both types of AIS AtoN, the “Physical AIS AtoN” and the “Virtual AIS AtoN” will be applied.
- AIS AtoN messages offer the possibility to inform the skippers immediately about current dangerous situations on the track.



Reference application AIS AtoN

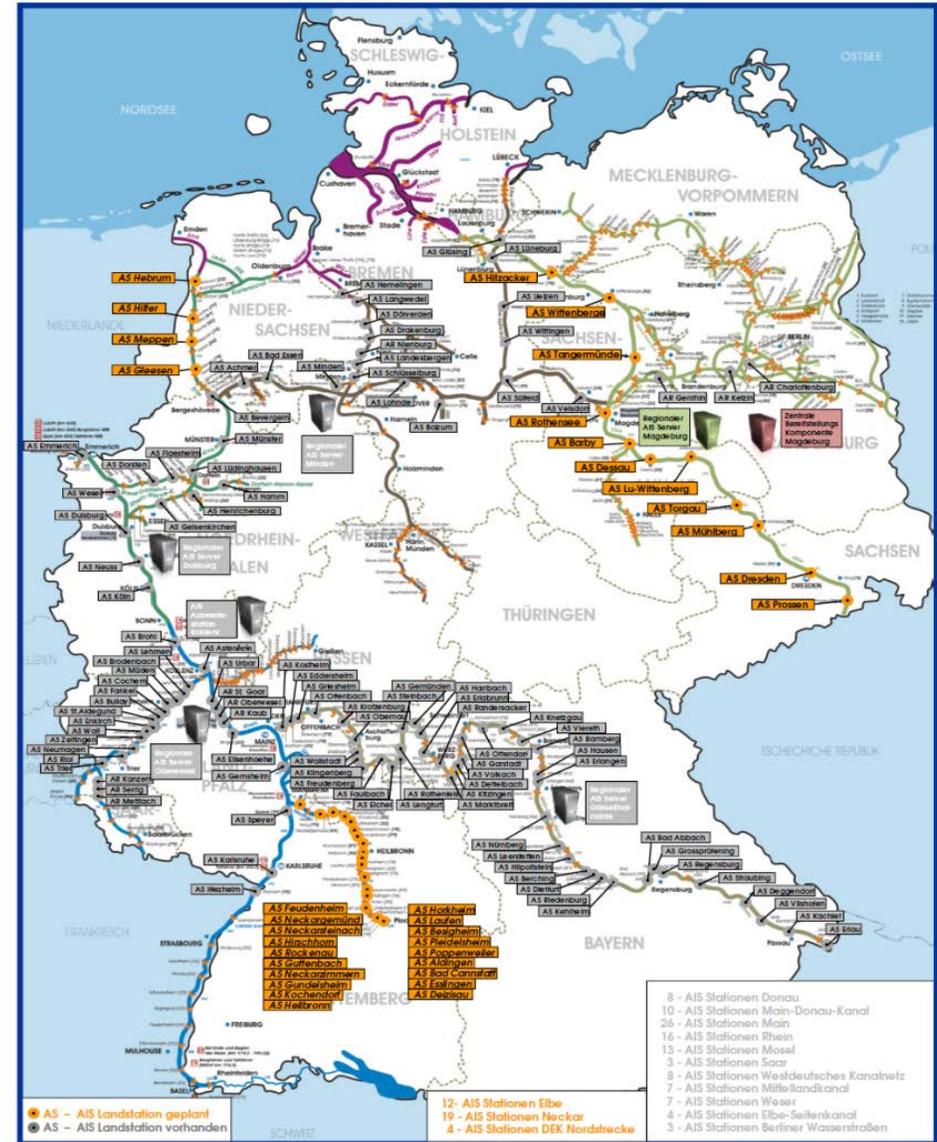
- Preconditions



- Extending the Inland AIS shore infrastructure.
- Amending the existing AIS data management in order to provide the specific AIS AtoN messages.
- Amending the already working environment for managing, providing and monitoring AIS AtoN.
- Amending the Inland ECDIS onboard systems in cooperation with the Inland ECDIS manufacturers to receive the specific AIS AtoN messages and to visualize them in the system on board.

The investment is about 900.000 €

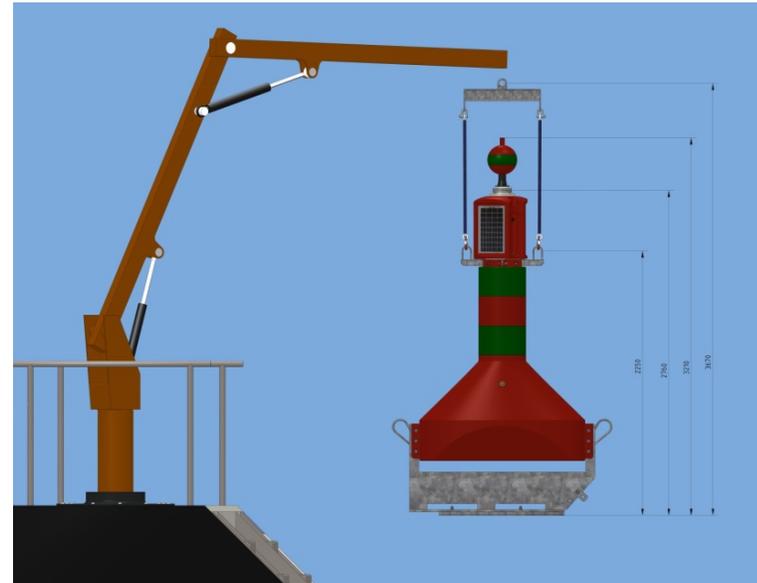
The project is co-financed by the European Union.



Reference application AIS AtoN

- Physical AIS AtoN

- Buoys and beacons:
 - Existing as real objects
 - Equipped with transponders that regularly send condition and position via AIS
- Purpose: marking durable situations
- Inland ECDIS charts: “Physical AIS AtoN” have to be encoded



Reference application AIS AtoN

- Physical AIS AtoN

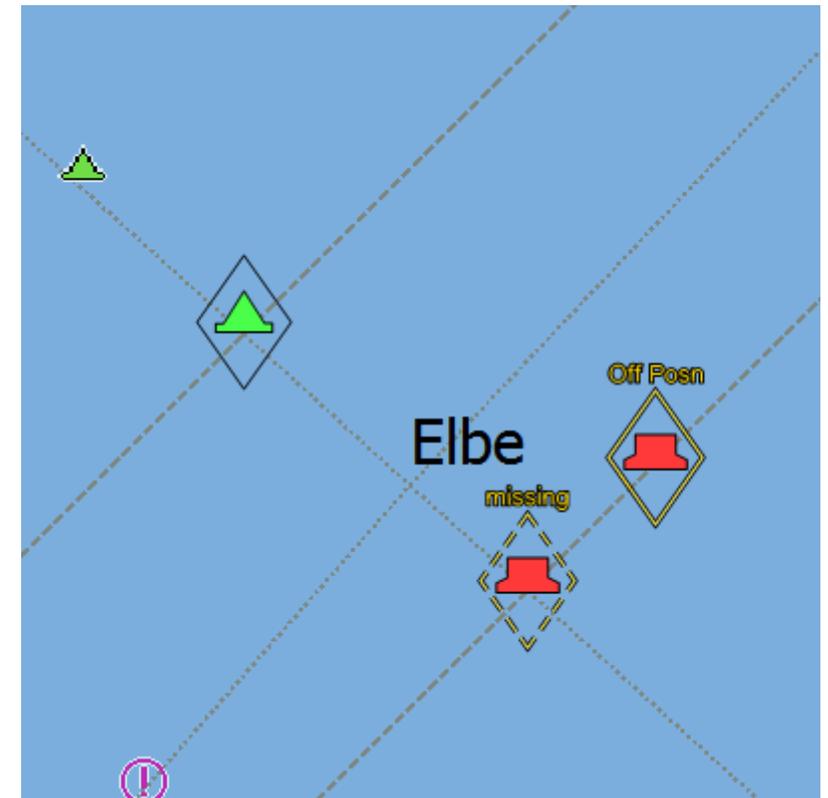
- Visualization in Inland ECDIS:
 - Case „on position“: point object with current position
 - Case „off position“:
 - "missing – symbol" at required position
 - "off position – symbol" at actual position



missing



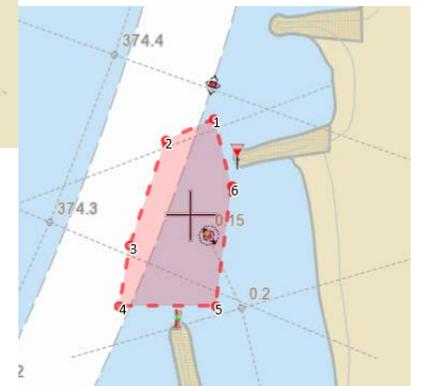
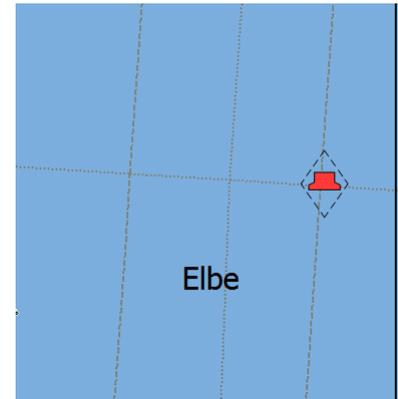
Off Posn



Reference application AIS AtoN

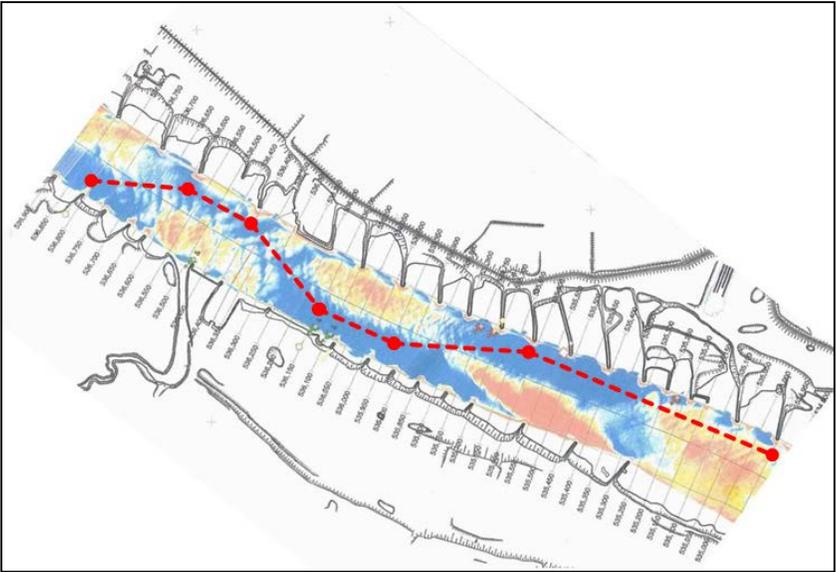
- Virtual AIS AtoN

- Virtual buoys, beacons, line and area objects, provided via AIS land infrastructure:
 - Digital projections, not existing as real objects
- Purpose: marking temporary situations (restrictions) and/or dangerous spots
- Inland ECDIS charts: “Virtual AIS AtoN” are not provided by Inland ECDIS charts, only via AIS messages
- Visualization in Inland ECDIS chart on board:
 - as point, line or area

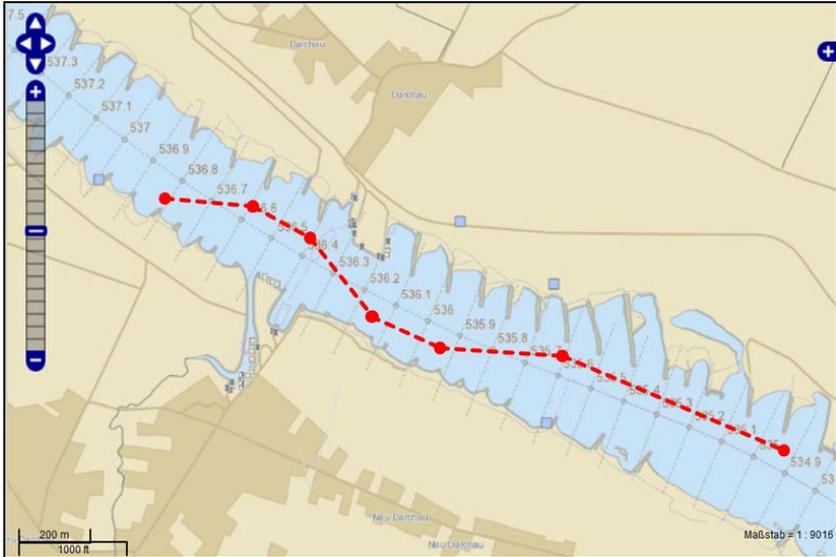


Reference application AIS AtoN, examples

- Recommended tracks in specific shallow sections



Construction of a recommended track



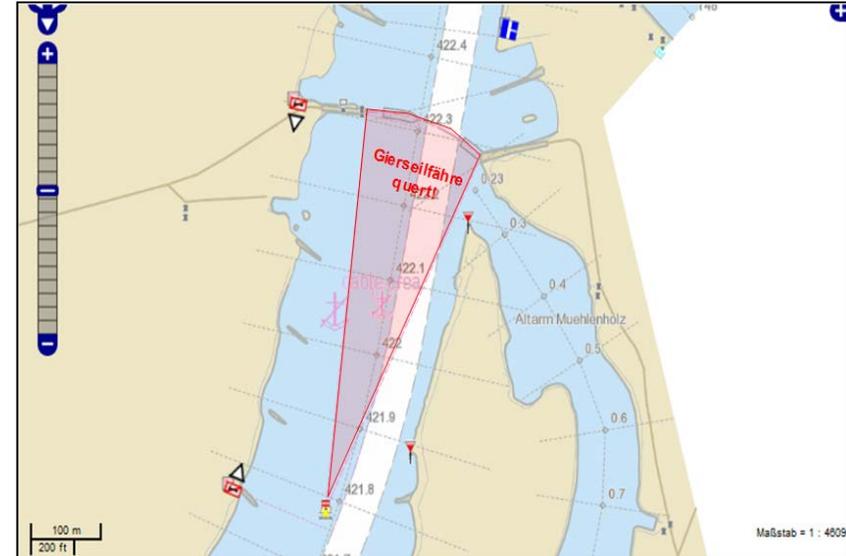
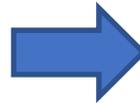
Visualized in Inland ECDIS

Reference application AIS AtoN, examples

- Indication of a virtual caution area while a cable ferry is crossing



Cable ferry at the river Elbe



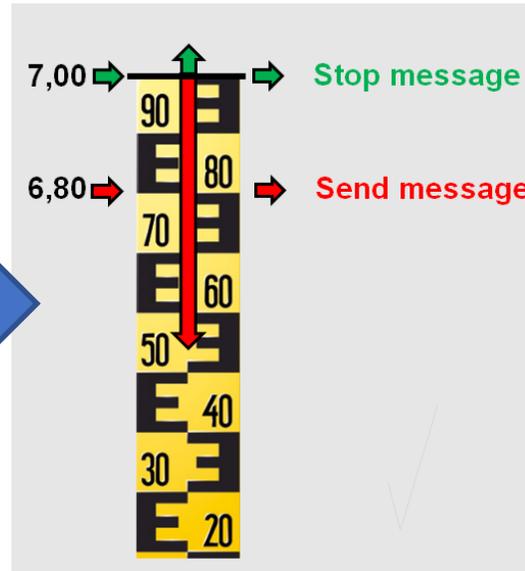
Virtual caution area while the ferry is crossing

Reference application AIS AtoN, examples

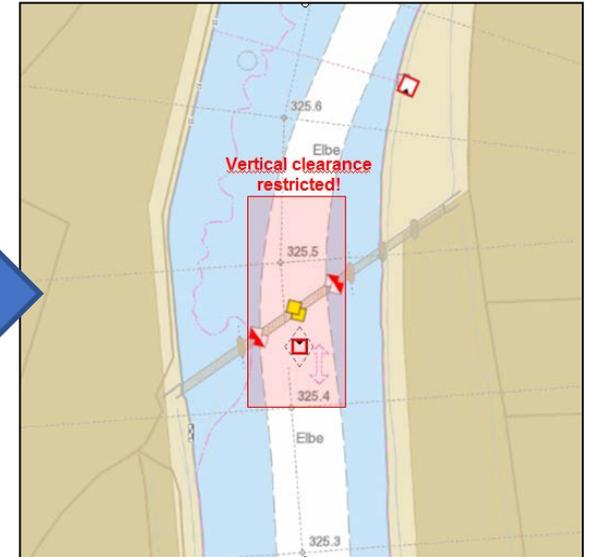
- Indication of currently limited vertical clearance under bridges (pending on water level)



Bridge at the river Elbe



Reference gauge



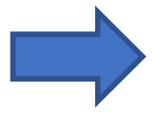
Virtual caution area is indicating low vertical clearance

Reference application AIS AtoN, examples

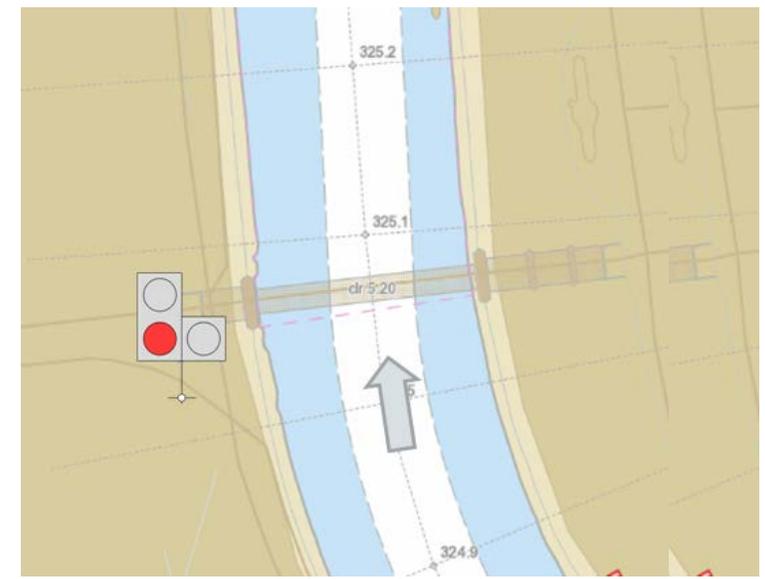
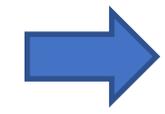
- Indication of the current switching status of signals with the direction of impact



Current switching the signal



Signal outside



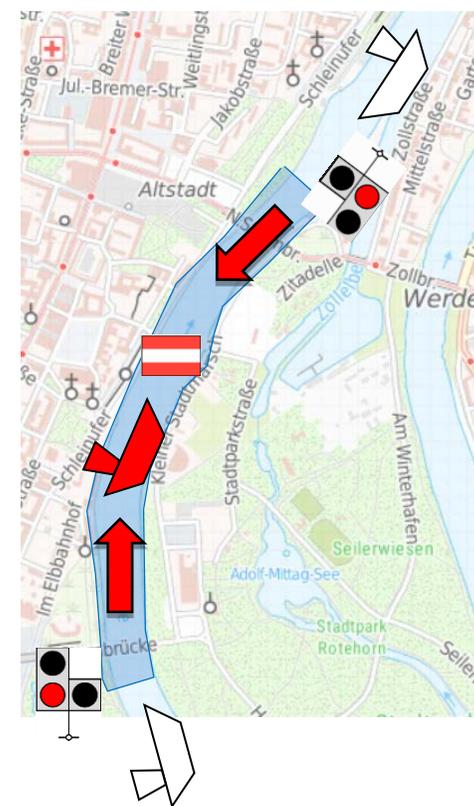
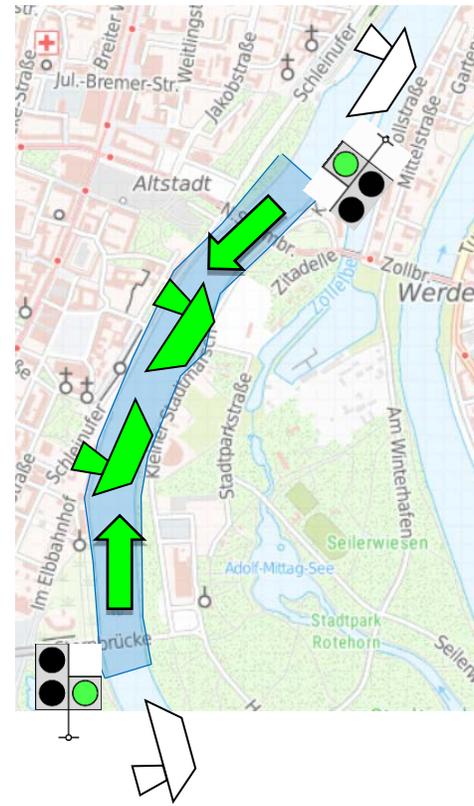
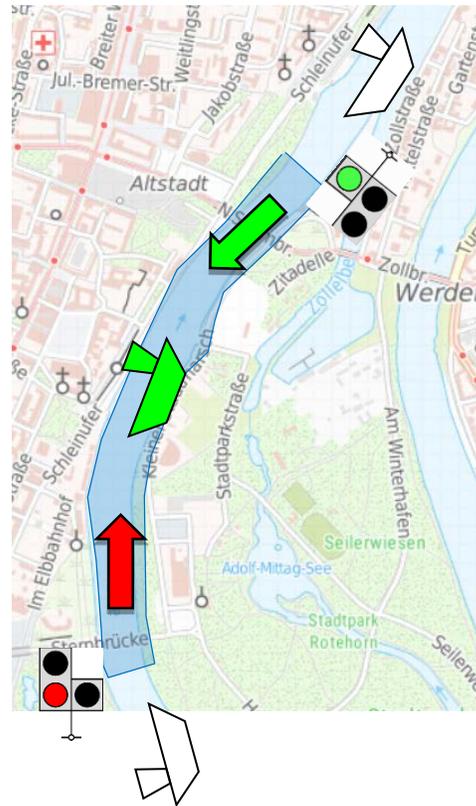
Status visualized in Inland ECDIS

Open Problem: Direction of impact of a signal station

- The status of a signal can be provided by an AIS ASM message



Case 2: some ships request to enter, some ships already checked in, no signal change

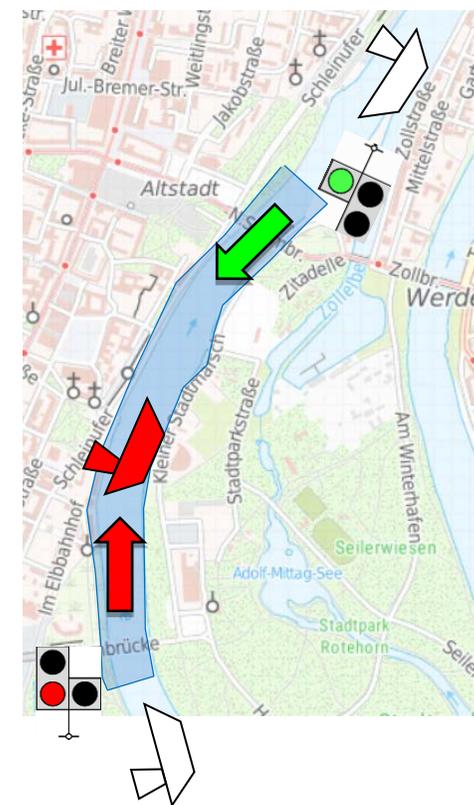
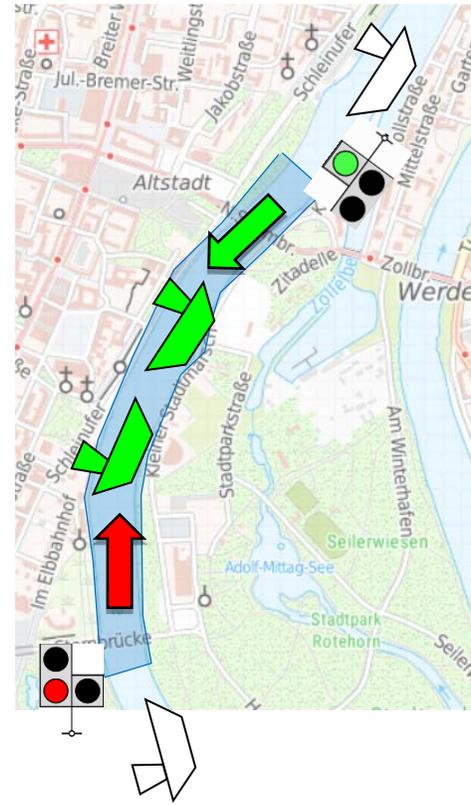
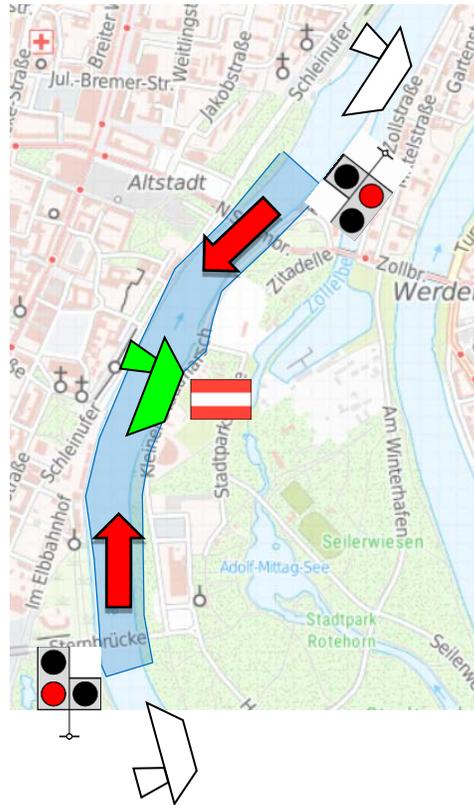


Open Problem: Direction of impact of a signal station

- The status of a signal can be provided by an AIS ASM message



Case 3: some ships request to enter, some ships already checked in, no signal change

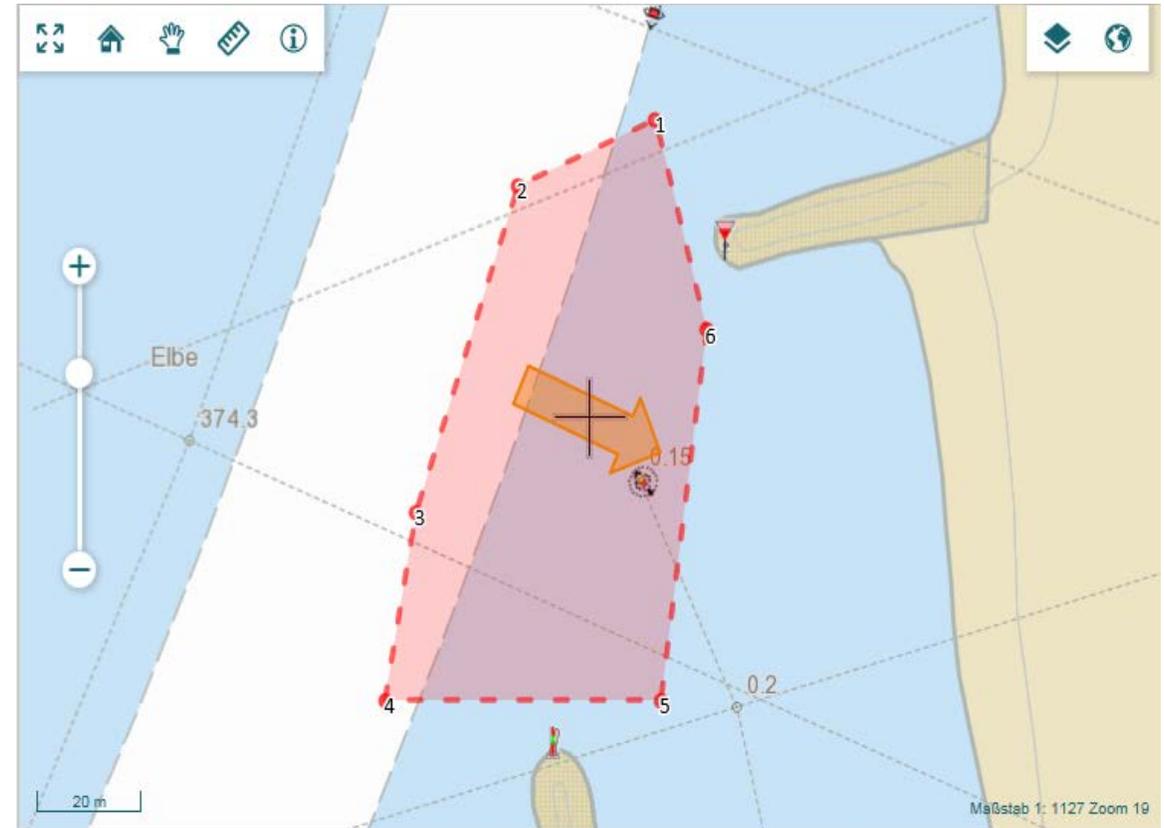


Safety of Navigation

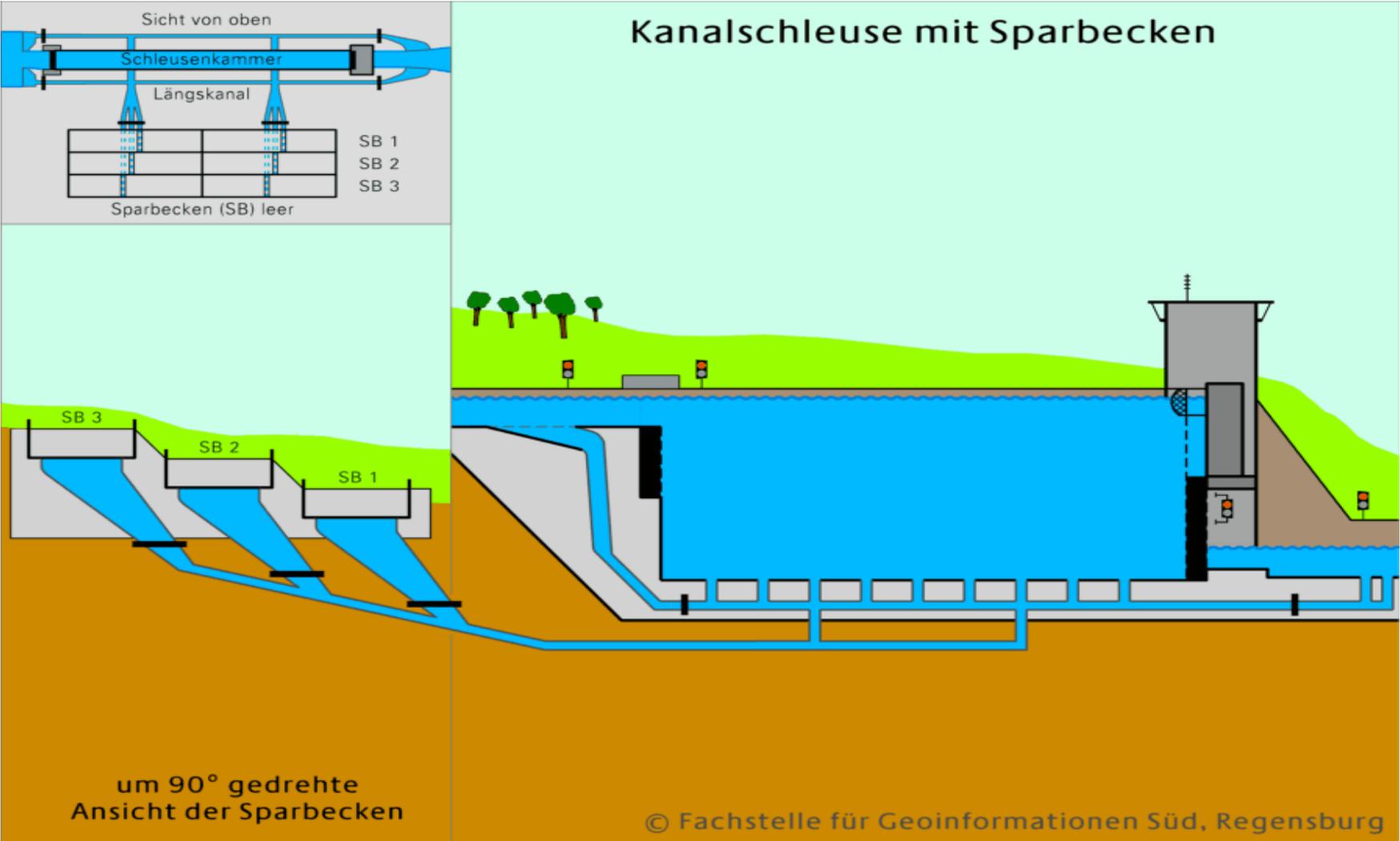
- Conclusion



- For the navigation at inland waterways the availability of reliable and complete information about the current navigational conditions and restrictions are essential.
- This information need affects several aspects and aims:
 - To improve the safety of navigation
 - To ease voyage planning and to support traffic execution, e.g. to avoid waiting times at locks and harbours



THANK YOU FOR YOUR KIND ATTENTION!



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