E-Navigation Underway 2013

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Transas Technologies Ltd.

e-Navigation Development in Russia, industry View
Major government funded developments going in Russian might be classified rather as navigation than e-Navigation yet, these are:

- Regular VTS upgrades and VTS areas expansion;
- Extension of AIS Network coverage;
- Integration of separate AIS networks into national network;
- Implementation of AIS networks along largest rivers;
- Implementation of large RIS implementation program;
- Shore GMDSS systems regular upgrade;
- Running of national LRIT data centre and vessel monitoring centre;

Unfortunately there is no official entity assigned to manage or coordinate development of national e-Navigation concept;

At the same time some related to navigation developments are happening. These are: number of GLONASS satellites increases, preparation for satellite AIS launching is going on, weather and ice services are improving.
2. e-Navigation research

As for e-Navigation:

- 2009 year Russian government launched research work “Approach” aimed at the development of a national program for implementing e-Navigation principles in Russia;
- Till now that was only work directly addressed to e-Navigation in Russia;
- Transas was one of two companies who did this e-Navigation research for national authorities;
- Despite this research was done two years ago I think some of considerations might be still valid and interesting for e-Navigation society.
3. Sea areas specific
4. River waterways

There are many inland waterways capable of letting sea ships pass up to about thousand kilometers upstream, so many of rivers are used by both, sea and river ships.

Russia even has specific See-River ship class and many ships of such type are operating;

All river waterways are managed and maintained by 16 state basins departments;

At what degree river waterways are part of e-Navigation???
5. e- Navigation stakeholders of Russia

National e- Navigation Centre

- Black and Azov sea area authorities
- North-West area authorities
- North Passage area authorities
- Far East area authorities

Common information environment

- State river Basin 1
- State river Basin 16
- Shore User 1
- Shore User N

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6. Russian e-Navigation Shore Architecture
7. e-Nav Shore Services Layout

- National Services
- Area Services
- Local Services

Gateway to access eNav services via shore communication infrastructure

VTS

- AIS Network
- SAR centre
- etc.

Ship connection to eNav services via the shore communication infrastructure
8. Local e-Nav Level and VTS integration into e-Navigation

- Local eNav server
  - Services metadata exchange
  - eNav ship-shore-ship gateway
  - Targets export
  - Radar image export
  - AIS data export
  - RDF data export
  - Meteo data export
  - CCTV stream export
  - VTS DB standard interface
  - Other VTS sensors data import

- VTS Server
- VTS Database

VTS sensors
- Radars
- AIS
- RDF
- Meteo
- CCTV

E-Nav catalogue

Graphical representation of the integration process.
9. Area e-NAV service level

- E-Nav catalogue
  - Services metadata exchange
  - Area operational picture service
  - Area AIS data service
  - Meteo data service
  - Area eNAV Data Service

Area eNav server

- Local eNav Server
- Area Data Provider
- Local eNav Server

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10. National e-Nav service level

- E-Nav catalogue
- Services metadata exchange
- National operational picture service
- National AIS data service
- National document forms service
- National eNav server
- Regional eNav Server
- National Data Provider
- Regional eNav Server

(Refer to image for detailed diagram)
11. E-Nav catalogue

In world of official services each service to be verified and registered. It should be searchable, as information on this service might be requested by any stakeholder according to his particular needs. That is why E-Navigation services catalogue to be part of national e-Navigation environment.

E-NAV service catalogue is sort of registry, which has to provide:
- services specification registry;
- and services instances registry, while each instance is operating in particular area and is provided by particular provider;
- verification of service instances before putting them into the service registry;
- search of services in respond to a stakeholder request, containing needed functionality and related geographical area.

E-Navigation service catalogue itself supposed to be service of national or even international level;

e-Navigation service service instances to be registered by initiative of a service provider.
12. E-Navigation Mockup

To demonstrate some practical examples on how to use services to extract a new added value from information, which is actually available onboard and ashore today, e-Navigation mockup was created and tested.

Basing on available Transas onboard, shore and simulation products 14 scenarios including activity of ships and various shore services were modelled, among them:

- Ship automatically requests and receives chart collection to suit the selected route;
- VTS assigns port approach route to the ship;
- Ship’s master retrieves valid Port Forms, related to next port of call, fills in a few fields to be managed manually and sends forms to the relevant shore organization in electronic form;
- Ship generates a Noon Report, the ship master updates necessary fields and sends the report to the shipowner office electronically.
13 Actual e-Nav Interactions
14. e-Nav Mockup Interactions

Common navigational scenario provided by navigational simulator

- Simulated Integrated Bridge
- Simulated Communications
- VTS 1
- VTS 2
- eNav Index Server
- eNav Services Provider
- eNav Shore User
15. Mockup’s services layout

- Port Forms Service
- Electronic Chart Service
- Ships Route Service
- Weather Service

Internet

FIREWALL

Port Forms Module
Chart Module
Route Module
Weather Module

Berth-to-berth Planning Module

Planning part of Integrated Bridge

Navigator
16. Ship side Automatic Chart Selection by Route
17. Ordering and Receiving Non-Installed Charts
## 18. Checking Charts for the Last Update

![Chart Collection Status Report](image)

### Chart Collection Status Report

#### Selected charts

#### Correction service

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<th>Expires</th>
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### Information on SENC installed in product

#### General Chart collection Info

- Total: 7753 charts
- Selected: 42 charts

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**Note:** The images and diagrams are placeholders and should be replaced with actual content. The text is a natural representation of the document's content.
19. VTS assigns port entry route to arriving ship
20. Port entry route to be assigned, VTS view
21. Deep sea route, ship view
22. Port entry route is received
23. Two routes merged into one, ship view
Some of recommendations on technical and administrative measures necessary to move country toward e-Navigation were well accepted and were progressing toward real projects, namely:

- Start of e-Navigation testbed in Finish Gulf is included into governmental program for 2014 year;
- National Satellite AIS apparatus are planned to be launched one in 2013 year and next in 2014 year.

Technical development was continuing by industry, e.g. many of scenarios demonstrated by research work mockup two years ago were matured and achieved status of regular products features, namely:

- Automatic electronic chart delivery service;
- Electronic chart service “Pay as you sail”; 
- Automatic regular reporting from ship to shipping company office;
- Automatic route exchange and fuel saving related data exchange between ship and shipping company office.
Thank you!
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