«Hermitage» - first e-Navigation testbed in Russia

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About «Kronstadt Technologies» (JSC)

- «Kronstadt Technologies» (Included in the Kronstadt Group) is a national leader in the field of digital technologies for marine and river transport.

- Kronstadt Group (until 2015 - part of Transas Group) has been operating in this market for more than 25 years. Now we are part of the largest Russian financial corporation – «SISTEMA» (SYSTEM) .

- We are the only Russian technology company to become a member in IALA association, which is operation agency for IMO in terms of development and implementation of e-Navigation.

- «Kronstadt Technologies» is a contractor for developing business road map MARINET by the order of National Technology Initiative of Russia. The company takes part in developing of business road map for improvement of regulation of Russian Federation in terms of e-Navigation and USV.

The second stage of development Testbed "Hermitage"

- In 2016 we started creating the first testbed e-Navigation in Russia.

- Now the second stage of the testbed's development is taking place.

- This work is performed by the Kronstadt Group in cooperation with our partners.

- Customers - Ministry of Transport of Russia and MariNet (from National Technological Initiative).

- Research and development (R&D) names: "e-Sea" and "e-NAV".

- Implementation period – 2016-2021.

- The name of testbed - "Hermitage" (in honor of the famous museum in St. Petersburg).
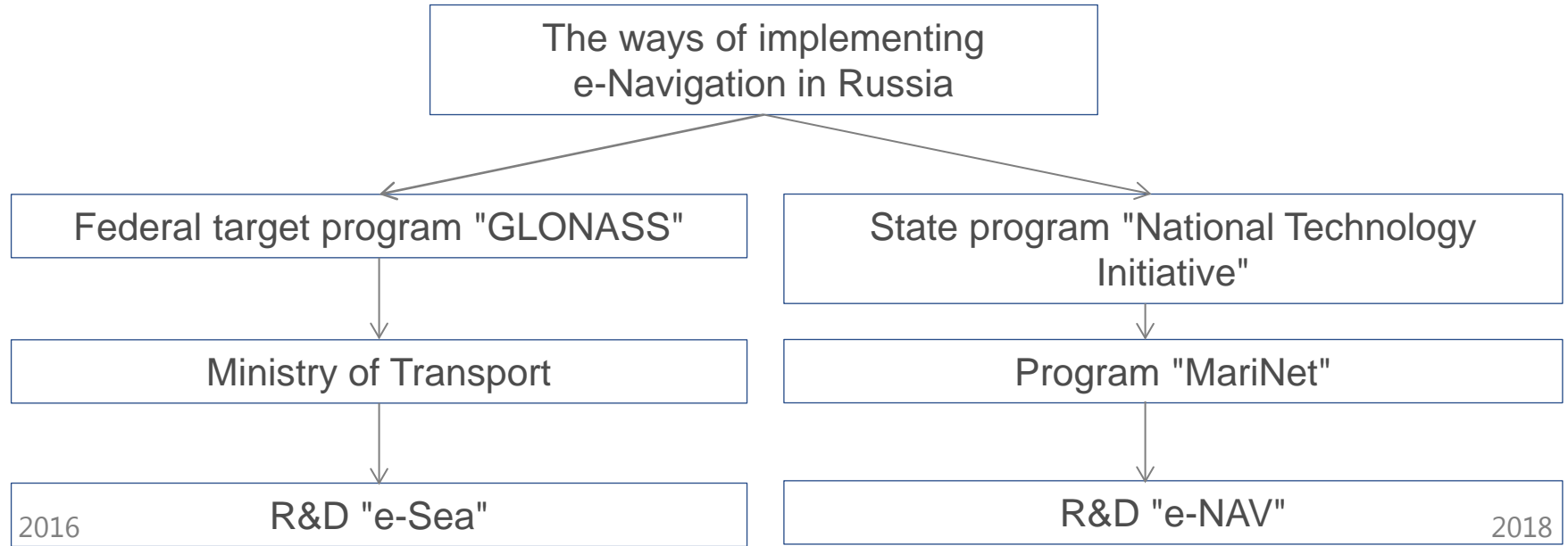
- Testbed includes the sea and the river segments.

The State Hermitage Museum,
Saint Petersburg, Russia

Borders of Testbed "Hermitage" in Russia

Implementing e-Navigation in Russia

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┌─────────────────────────────────┐
│     The ways of implementing     │
│      e-Navigation in Russia      │
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Federal target program "GLONASS"	State program "National Technology Initiative"
Ministry of Transport	Program "MariNet"
R&D "e-Sea"	R&D "e-NAV"

2016

2018

Previous experience of Kronstadt Group in the technology e-Navigation :

- R&D "Approach-T" in 2009,
- R&D "Approach-Nav-T" in 2012.

Infrastructure of Sea segment

Sea segment of the testbed
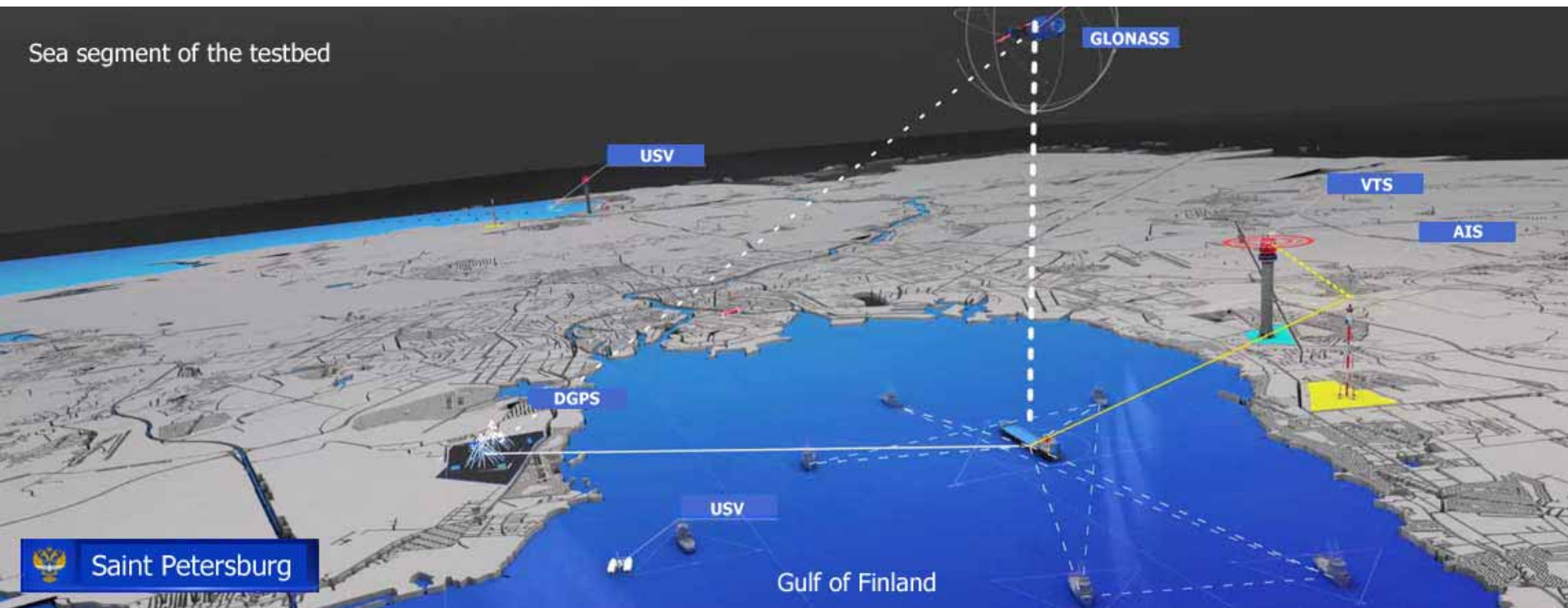
VTS - vessel traffic service
AIS - automatic identification system
DGPS - differential global positioning system

ECDIS - electronic chart display and information system
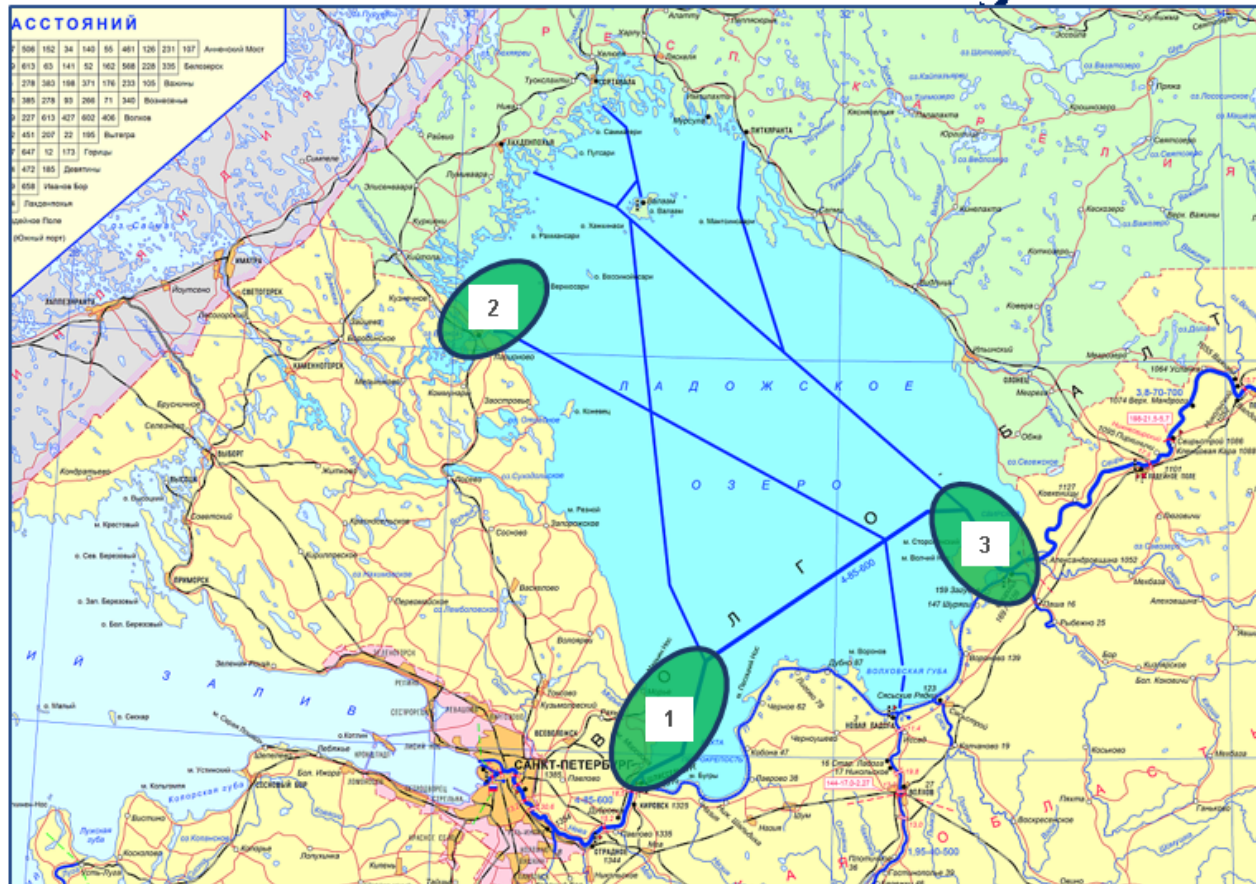USV - unmanned surface vehicles

Infrastructure of River segment

VTS - vessel traffic services on inland waterways

AIS - automatic identification system

Synthetic AIS AtoN (Aids to Navigation)

ECDIS - electronic chart display and information system

USV - unmanned surface vehicles

Water level gage

Virtual AtoN test areas on Ladoga Lake

1 — 1st Virtual AtoN test area : 25 virtual AtoNs

2 — 2nd Virtual AtoN test area : 16 virtual AtoNs

3 — 3d Virtual AtoN test area: 14 virtual AtoNs

Onshore marine and river segments (VTS)

The equipment is installed in Coastal Vessel Traffic Services - VTS (Petrodvorets) and in river segment – VTS on inland waterways (Shlisselburg).

Shlisselburg and Oreshek Fortress

In 2018, another 3 VTS will be deployed: one in the sea segment and two in the river segment.

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The ship sea and the river Segments (ECDIS)

ECDIS with e-Navigation functions is elaborated to 7* marine and 5** river vessels

* North-Western Basin Branch FSUE "Rosmorport"

** Basin administration "Volgo-Balt"

Examples of marine vessels bridges

Sea icebreaker "Captain Zarubin"

Examples of river vessels bridges

River Tugboat "MB-1219"

Additional Equipment of the Testbed

Personal pilot kit with e-Navigation functions - navigation application for pilot organizations

Water level meter - provides information about the water level by GSM communication in VTS

Synthetic AIS AtoN - sends information about your location by GSM communication or Iridium SBD in VTS

The ENC Remote Transmission System: access to the Internet, ENC database, etc. via Wi-Fi for a range of up to 3 km. Invention patent

# Perspective projects within the e-Navigation testbed

Within R&D "e-Sea" project developed and tested a model of the VDES coastal and shipborne equipment. In 2020-2021, within the framework of MARINET, it is planned to develop serial equipment of VDES.
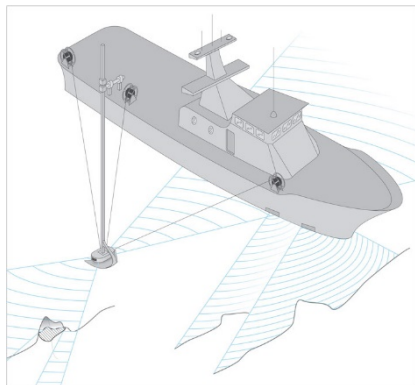
Automated Hydrographic Trawling System - for high-precision and reliable detection of obstacles lying on the seabed.

Invention application

Within the framework of MARINET, a new version of our ECDIS on Linux with e-Navigation functions is being developed. It includes ECDIS, Radar, Conning, Video and etc.
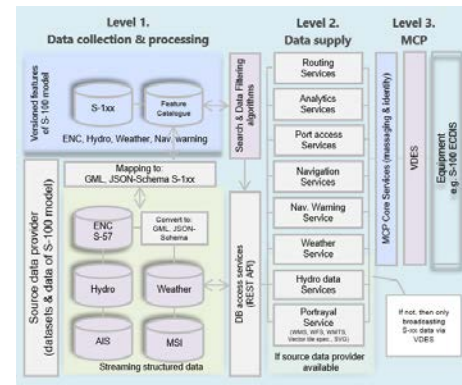
Russian Segment of the Maritime Connectivity Platform - Developing of the e-Nav architecture,

Core Technologies and

Implementation of e-Nav services

Thank you for your attention

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