Implementing e-Navigation; a qualified view on the future of eNav
Implementing e-Navigation (S1,S2,S4,S5)

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The approach

• The e-navigation Strategy Implementation Plan (SIP)

• Strategy Implementation Plan for the five prioritized e-navigation solutions
  
  • S1: improved, harmonized and user-friendly bridge design including S-mode;
  • S2: means for standardized and automated reporting;
  • S3: improved reliability, resilience and integrity of bridge equipment and navigation information;
  • S4: integration and presentation of available information in graphical displays received via communication equipment; and
  • S5: improved Communication of VTS Service Portfolio

Here are some examples..............
Key components

Framework, procedures and harmonized data language – the glue

Operational description – the platform

Several solutions exists – and new will become available

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OPENBRIDGE - Harmonized exchange of information shore-ship and interoperability (S1,S4,S5)

Cooperation between industrial competitors

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What is the SESAME Straits project?

SESAME Straits –

Secure, Efficient and Safe maritime traffic Management in the Straits of Malacca and Singapore

Clear synergies between the MEH project and e-Navigation
SESAME Straits - objectives

The primary objective is to develop and validate shared situational awareness and cooperative decision making between ship's bridge team and shore based Vessel Traffic Service (VTS) personnel.

Secondary objectives are:
- Just In Time arrival within a Regional Maritime Service Portfolio
- Use existing systems/equipment as far as possible
Operational Concept

- Shared situational awareness
- Cooperative decision support
- Regional Maritime Service Portfolio (MSP)

Route Advice-JIT:
- Efficient traffic flow
- Reduced navigation risk
- Reduced ship bunkers
- Reduced toxic gas emissions
- Better utilization of port facilities resources
The SESAME Straits e-Navigation test bed project

• Demonstrated that shared situational awareness and cooperative decision making between ship and shore is possible as a means of organizing vessel traffic in a Ship Traffic Management System (STMS).

• Demonstrated this by developing and testing at sea five demonstrators:
  1. Shore-based VTS system with a route monitor web client,
  2. Ship-based ECDIS,
  3. Ship-based planning station,
  4. Shore-based Ship Traffic Simulator, and
  5. VDES transponder
SESAME Straits – existing systems today

Planning station | ARPA/ECDIS

Shipping provided by International Chamber of Shipping (ICS)

VHF voice/AIS

C-Scope VTS with decision support

C-Scope VTS system provided by the Maritime and Port Authority of Singapore (MPA)

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SESAME Straits – New systems

Cooperative decision support and shared situation awareness

Planning station  ARPA/ECDIS

Ship/Shore data communication

VHF voice/AIS

Cooperative decision support and shared situation awareness

C-Scope VTS system provided by the Maritime and Port Authority of Singapore (MPA)

Shipping provided by International Chamber of Shipping (ICS)

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The Success

- The SESAME project demonstrated that predicting possible vessel traffic hot-spots in congested waterways is possible, and that new strategies to avoid such congestions can be used to improve safety and increase efficient traffic flow, enabling "Just-in-time" arrival of vessels, and reducing the environmental footprint.
Guiding principles

- Build upon the existing SESAME test bed
- Use international standards and protocols
- Cooperate with other projects
- Use Human Centered Design principles
- Seek additional regional partners
- Expand the test bed coverage
- Continue under the Norway-Singapore R&D MoU
Automatic Reporting principle

1. **Maintain ship report data**

2. **Release report data**

3. **System report released data**

   - SHORE Single Window

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Automatic Reporting, Singapore

Singapore - February 2017

- 2nd generation HW/SW/concept
- VDES and mobile communication
- Ship²Shore
Results from the trials

Summary of the VDES results

<table>
<thead>
<tr>
<th>Category</th>
<th>Success Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overall success rate for reports in the testbed</td>
<td>83.3 %</td>
</tr>
<tr>
<td>Overall (all reports submitted)</td>
<td>84.3 %</td>
</tr>
<tr>
<td>Manual submitted reports</td>
<td>80.0 %</td>
</tr>
<tr>
<td>Automatic submitted reports</td>
<td>80.0 %</td>
</tr>
</tbody>
</table>
Findings

✓ Results from the testbeds shows that Automatic Reporting is feasible and a part of the future

✓ Single Window central element when it comes to reporting

✓ Solutions such as VDES* will solve communications needs for Automatic Reporting

✓ Technical and operational concepts for reporting needs to be further explored and developed

✓ Focus on standards, harmonisation and security

✓ SESAME 1 is good platform for the development of SESAME 2

*along with other types of technology
Way forward of a SESAME 2 project

- Digitalization, Automation and Single Window
  - Further explore concepts for ship reporting
  - Use experience to further develop Automatic Reporting
  - Harmonisation
  - Integration
  - Test beds (full scale)
Way forward tomorrow could be……

Shore

Today

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Ship

E-Nav S2  E-Nav S5 MS 8
Combination og S5 and S2

please report

what to report?

here’s my reporting requirements (“Forms”)

please report

here’s my report
SafeSeaNet
Norway

Arrival
- Pilot Exemption Certificate
- Border control
- Waste
- Environment
- ISPS/security
- Port
- Cargo
- Logistics
- Pilot order
- Safety
- Customs
- HAZMAT

DIGITALIZATION
- Departure
- Crew and passengers lists
- Statistics

HARMONISATION

COLLABORATION

SINGLE WINDOW
Port/ISPS (International Ship and Port Facilities Security Code) Data Exchange (S2, S5)

SHIP
PORT/ISPS
NCA

Other Stakeholders

Norwegian Single Window (SSN) including a new Port/ISPS module

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e-Nav testbed – STM og SEASAME
Route Exchange (MS 3 TOS) & MSI (MS 5)
Testbed Horten and Kvitsøy VTS, Norway
S5 MS 3 TOS and MS 4 LPS

1 CSOC STM FUNCTIONALITY
Voyage plans that are sent to the VTS through the STM VIS API will, if the voyage plan is valid, be displayed in the C-Scope Operator Client.

1.1 Receive a voyage plan
Once you receive a Voyage plan it will be displayed as an alert in the “Misc. Alerts” panel. When a voyage plan is received a “subscribe to voyage plan” message is automatically sent back to the vessel so that the VTS get the next updates on the plan from the vessel.

- Route Exchange
- TOS and Monitoring «Just In Time arrival»
- STM text message function
- STM polygone in S-124 format
View on the future of e-Nav

“The future depends on what you do today.”
Mahatma Gandhi

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Thank you for your attention!