“eNavigation starts with eVoyagePlanning”: Information exchange, dynamic routing and knowledge transfer.

Current status and potential solutions?

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A philosopher AND mariner story?

- Philosopher = Mariner? Plato: “Stargazers”
- Norwegian fjords – SAR Ambulance/Rescue Seaman
- West Africa, North Sea: Cadet, DPO and OOW (1 week as Ch. Officer)…
- “Voyage Plan rig move Jackup Nigeria – Ghana”
  - Paper charts
  - Piracy
  - Wave >4 m, <7 s period….
  - Approx 2 days work…. Could be done in 15 minutes!
  - Great training – BUT TIME FOR QUALITY ASSURANCE?

- Never intended to go ashore (WANTED D1).
- Asked to go ashore; Marine Logistics Coordinator, and then Product Manager.

User Needs – User Wants?
IMO Res A.893 Annex 25
Guidelines for Voyage Planning – process:
IMO Requirements for voyage/passage plans:
What’s the safest (and most cost effective) scheduled route Berth to Berth?
Considering:
- Available NavAids
- Weather/tide/currents
- Under Keel Clearance
- Reporting
- Events
- Pilots
- Charts
- Nautical Publications
- Watch keeping
- Engine mode
- Operations underway
- Contingency plans
The wheel of “eNavigation”
Business interest, marine spatial planning/coordination and vessel operations
Typical ship logistics
“Offshore”
IMO NAV58, annex 4 (5,6?)
Proposed eNavigation solutions

1. Improved, harmonized and user-friendly bridge design
2. Means for standardized and automated reporting for shipboard users
3. Improved reliability, resilience and integrity of bridge equipment and navigation information
4. Integration and presentation of available information in graphical displays on board received via communication equipment
5. Information Management
6. Improved access to relevant information for Search and Rescue (SAR)
7. Improved reliability, resilience and integrity of navigation information provided by shore-based users
8. Improved and harmonized shore-based systems and services
9. Improved communication of VTS service portfolio
10. Improved, harmonized and user-friendly shore-based design
11. Means for standardized and automated reporting for shore-based users
12. Integration and presentation of available information in graphical displays received via communication equipment for shore-based users
13. Information Management for shore-based users
14. Exchange of route segment
15. Exchange of voyage plan

System requirements:
- Harmonized
- User friendly
- Automated
- Graphical Integration

Functional requirements:
- Information Management
- Reporting Management
- VTS Service Portfolio
- Search and Rescue
- Route and Voyage Plan Exchange

For who?
Ship AND Shore side users!
Data or Information?

PILOTAGE PASSAGE PLAN TO VIÅN DOCK

Your Pilot will advise you of any variation to this standard plan.

This plan is valid until: 1200

Minimum WP: 2 m

PILOT BOARDING POSITION:
1.5 mi SW from outer breakwater.
On departure, Pilot will disembark at port of the ferryway buoy (N°2).

All vessels within port area must keep VHF watch on ch 14 and 16.

Expected current from Iona stream:
Ingoing 4 kts.
Outgoing 2 kts.

Maximum speed inside the harbour: 9 knots

Tugboats available:

- Vanessa
- Monte Xhìba
- Marine

Recommended mooring lines:
PMW: 34 k of 2.5 pl.
AF: 5 k of 2.2 pl.

Allocated berth: 5/12

Available space: 200 m

This chart is not to be used for navigation.

The Captain is kindly requested to sign this passage plan and return it to the Pilot.

Pilot’s signature: 
Master’s signature: 

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IMO/MEH/NCA "S100" testbed, Singapore 2012
Jeppesen and Kongsberg Norcontrol providing the "future" of situational awareness in navigation?
Singapore MEH test bed case 1: Situation awareness based on current and new infrastructure (VTS, AIS, S100, Jeppesen SENC/DC).
Singapore MEH test bed case 2: Sharing of METHYD information through AIS/Jeppesen DC based on the “S100” format.

Above: Combination of Jep. Weather forecast, and AIS METHY
How do we achieve the vision of eNavigation when starting with eVoyagePlanning?
Ease of updating and synchronization: Information to be available where and when it is needed.
Tools for Nautical Management:
Automatic Routing based on industrial routes, wizard “chart picking”, object inspection, updating, ordering, quoting and PDF reporting.
On chart information:
Information linked from hydrographic, AND dynamical data with clear Voyage Plan events ("Mariner Notes", MSI, METHYD etc).

Ferry cross

Pilot aboard.

KvitsøyVTSch.14

V

MSI:
Ulstein light unlit

METOC:
Wind: 15 kn/220°
Current: 2.2 kn/050°

Tjuvholmen Oc(2)WRG 8s

Pilot aboard
KvitsøyVTSch.14
Weather and optimization “on request”
For screen only, or for route
Route exchange and monitor Direct or through Jeppesen ShipRoutes.
SAR Automated routing:
From IAMSAR, AIS, POS, and route exchange availability:
Weather and Piracy: Combine weather alarm area and piracy incident to find “more secure” route:

Setting Environmental threshold:

>2m Wave Hs: “Limit” for Piracy boarding operations – “Securer” corridor.
More dynamic information exchange = safer navigation and situational awareness.

Above: Example of Singapore MEH METHYD AIS
Right: Example of Polar Navigation tools
(dKart IceNavigator)
Dynamical Passage Plan tables, information where and when it is needed.
Printed report, or in “S10x”
Available in paper form, and in “S10x”; harmonized and exchanged with relevant stakeholders via an international VoyagePlan DB.

(Automated passage plan from OceanView, with some added columns. Chart overview from Nautical Manager.)
Ship reporting: SEEMP, Just in Time Arrival, Optimization and Performance

E-Navigation/eVoyagePlanning also to comply with ALL reporting schemes: Need for tools to comply and document operations.
Ship tracking and performance reporting; onboard and shore side solutions?

“Pay as you sail” tracking: DNV approved for ENC licensing (Independent standalone tracker)

“FleetManager”: combining different tracking solutions (Jeppesen and 3rd party) with performance and ship reporting.
eVoyagePlanning and the Marine Service Portfolio (MSP):

Data from the “MSP Cloud” support eVoyagePlanning and “eNavigation” industry to provide most efficient transfer and information management.

Shipboard:
Nautical Management
Voyage planning, Optimization, Reporting and Contingency
ECDIS/INS – Safe execution of Navigation

Fleet Management:
Operational and Contingency support
Resource Management
Tracking and performance

Authorities and Ports:
Marine Safety and Security,
Resource management,
Marine Coordination
Marine Spatial Planning
Some risks and possible mitigation?

- **Adoption of Voyage/Passage Plan exchange and Collaboration:**
  - Focus on traffic coordination rather than traffic management.
  - ROI as a result of improved safety in reduced collision/weather damage/grounding risks.
  - ROI as a result of better efficiency (improved weather routing, less waiting time in harbor).

- **ENC coverage and availability in critical areas (Gap closing)**
  - World coverage ENC’s are made available to ALL distributors (not exclusively).
  - Distribution through RENC’s or direct agreements.
  - Very good collaboration with i.e. Far east Asian HO’s to ensure this vision. (Gap closing with Malaysian ENC now available through SENC).
  - Jeppesen has extensive experience in supporting HO’s ENC production.

- **Obtaining and updating maritime information (charts, weather etc).**
  - (Charts in raw “S57” are normally 9 DVD’s and takes hours to days to load).
  - SENC distribution can reduce compilation in ratio 1:5-9, also more secure.

  A multiplatform “NextGen” S100 standard may further mitigate the risk.
Some risks and possible solutions continue

- **Overflow and overload of critical navigational system (i.e. ECDIS)**
  - Own system (INS) to handle additional data; open for innovation and integration.
  - System for eVoyagePlanning; get information where and when it is needed already in the planning phase.

- **Human factors: work overload, fatigue, increased traffic.**
  - Systems should provide common workflow for voyage planning/optimization and nautical management.
  - As many automatic algorithms as possible, giving the ship navigational officers more time to verify and quality assurance the output before reaching a decision.
Proposed action points for “eVoyagePlanning”:

1) Investigate current systems and architecture for routing and exchange:
   • Automatic routing based on industrial recommended routes. Weekly updates.
   • Route exchange solutions pr today (formats and application?)
   • Automatic SAR routing and exchange (between OSC and SAR vessels).
   • “Best practices” for data compilation and exchange.

2) Gap analyze and closing:
   • Infrastructure for route exchange (Jeppesen supports 18+ formats)
   • Need for highlight Voyageplan exchange: ROI in increased safety and efficiency (can be made available only for “approved parties” like “LRIT”).
   • “NextGen” VTS should support route exchange and collaboration on voyage plans (Putting the “S” into “Vessel Traffic Service”).

3) Moving ahead:
   • Define “S10x” formats for route and voyage plan exchange (ongoing)
   • Define minimum common architecture, User Interface and implementation strategy
     (Does the industry already have options available?)
     (Jeppesen Navigational kernel (SDK) and Datacenter: approx 90 % OEM penetration).
eNavigation starts with eVoyageplanning;

Going from reactive (navigation) to proactive (planning and preparation).
Thank you!

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