Korea’s Strategy for e-Navigation

SMART-Navigation

Presented by
Bu Young, Kim

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Ministry of Oceans and Fisheries
Republic of Korea
CONTENTS

1. SMART-Navigation?
2. Why SMART-Navigation?
4. What to do?
5. Roadmap and Organization
6. What benefits?
Korea’s initiative for the future e-Navigation to improve safety of navigation and efficiency of sea logistics through harmonization of navigation system and supporting shore service.
1. SMART - Navigation?

Key elements of ‘SMART - Navigation’

- New generation ECDIS
- Upgraded ICT platform
- Integrated/Standardized/Automated Bridge Equip.
- Improved Reliable/Resilient onboard PNT sys.
- Navigation assistance device for small crafts

Harmonized

- Single Window Reporting
- Maritime Cloud/Big-Data service
- Ship Monitoring Center

Ship
(On board)

Network
(Communication)

- Maritime Mobile Network
- Digital GMDSS Network
- Maritime Satellite Comm.

Ashore
2. Why SMART- Navigation?

(1) Damages caused by marine accidents are still going on

- **280 persons**
  - Damages for human

- **740 cases**
  - The number of accidents

- **Human errors (89%)**

- **Merchant ships 22%**
- **Fishing vessels 78%**
2. Why SMART-Navigation?

(2) Seamless information exchange at sea

- The low level of maritime radio communication
- Increase of interests in marine leisure activities
- Common utilization of open maritime information
2. Why SMART- Navigation?

(3) Special Consideration on Coastal Ships

- Occupy 89% of accidents by Non-SOLAS ship
- Restricted use of Maritime Safety Information (MSI)

**Vision**

To establish a framework that provides a platform for seamless information exchange between ships and ship and shore

**Goal**

- To enhance the safety and security of navigation
- To improve efficiencies of shipping
- To overcome an information gap at sea

* through harmonization of marine information and breaking communication barrier

Project Plan

- Period: 2015 ~ 2019 (5 years)
- Budget: 220M USD

* Feasibility Study for national R&D projects will be carried out by the Ministry of Strategy (~Sept. 2014)

Contents

- R&D: e-Navigation application and standard
- Infrastructure: e-Navigation platform (Network and Data centre infra)
4. What to do?

**Strategy**

- **S1** Development of core technologies
- **S2** Expansion of national infrastructure
- **S3** International cooperation
- **S4** Partnership with stakeholders

**Implementation**

- Government lead R&D projects
- SMART-Navigation operation center
- Marine mobile and Digital-GMDSS
- Global e-Navigation test-bed projects
- Responses to compelling needs from users
4. What to do?

(S1) R&D Projects for ...

- Technologies for IMO’s e-Navigation services (MSPs)
- Technologies for information exchange
- Technologies for marine information services for non-SOLAS ships
- Maritime network technology based on land infrastructure

(S2) Infrastructure for ...

- SMART-Navigation operation center for marine information services
- Maritime cloud service and big-data
- ENC comply with S-100
- Marine Mobile Network and Digital GMDSS
- Portable device for small crafts
4. What to do?

Architecture of SMART-Navigation

- Total Maritime Safety Management (SAMRT-Navigation)
  - Pilot Assist
  - Medical Assist
  - Emergency Assist
  - VTS Assist
  - Chart & Pub. Update
  - Small ship Assist

Maritime Network (LTE, Digital GMDSS)
- ENC with S-100
- Common Maritime Data Structure
- Maritime Cloud Service and Big-data
- Software Quality Assurance

Services
Platform
(S3) International Cooperation

- Cooperation with international organizations and member states to develop the global standards for e-Navigation
  * MOU between M.O.F and Danish Maritime Authority, Swedish Maritime Administration for the Establishment and Use of a Global e-Navigation Test Bed (‘14.1.28)

- National efforts fulfillment as IMO council member for adoption/amendment to international rules/regulation related e-Navigation

- Organizing global forum to share up-to-date e-Navigation information
  * The Seoul International Maritime Forum(SIMF) (‘14.4.23)
4. What to do?

- The 1st Global e-Navigation Test bed (15~16 April 2014)
4. What to do?

(S4) Partnership with stakeholders

- Strategic development Group
- International Services Group
- National Infrastructure Group
- National Services Group
- International standardization Group

Coordination of the diverse interests of project participants and active involvement of beneficiaries in project
5. Roadmap and Organization

(1) Project Roadmap

- **2014**
  - **R&D**
    - Developing core Technologies, & Services

- **2015**
  - **Infrastructure**

- **2016**
  - **Operation**
    - Applying Systems developed
    - Expending to Non-SOLAS

- **2018 2019 2020**
  - **Preparation of Project**
    - Architecture of SMART-Navigation
    - Organizing Governance

- **2025**

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- **2025**
5. Roadmap and Organization

(2) Project Organization

- Sustainability at the Government level
- Co-work with relevant agencies
- Reflect of compelling needs of Users

MOF (Steering Committee)

Co-work with Related Ministries

SMART-Navigation FORUM (Advisory body)

Project Team

Working Group 1 (On-Board)

Working Group 2 (Shore-Based)

Working Group 3 (Communication)
6. What benefits?

(1) Overcome an information gap at sea

- Port area and approaches: Mobile Network Service
- Coastal waters: Digital communication service (VDE, D-MF/HF)
- Open sea and remote area: Satellite service (VDE-Sat)
Within 100Km = Marine Mobile Network
100~300km = Digital GMDSS
6. What benefits?

(2) Enhancement of Navigation Safety

- Graphical display of static and dynamic information of ship data automatically collected
- e-Navigation devices for Non-SOLAS ships
6. What benefits?

(3) Closer interface between ship and shore-based users

- Real time situational awareness between Mariners-VTS operators
- Proactive prevention of ship accidents and warning
- Comprehensive utilization of maritime traffic information
6. What benefits?

SMART-Navigation can achieve:

**Safety**
- Reduction of 30% maritime accident rate
- Improvement of port productivity and efficiency

**Efficiency**
- Port efficiency: 70%
- Ship fuel consumption: 10%

**Happiness**
- Solution of digital divide for users at sea

**Creative**
- New technology and expertise for international community

- 9.8 kbps to 300 kbps (30x)
- 20 km to 100 km (5x)
- 2020 vs 2012: 30%
Thank you

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