The e-Navigation strategy of Korean government

SMART-Navigation

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Ministry of Oceans and Fisheries
Republic of Korea
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1. SMART-Navigation
1. SMART-Navigation

* Korea’s Initiative for future e-Navigation

SMART-Nav is ...

Total Maritime Safety Management System utilizing Digital Data Telecom.

SMART-Navigation = IMO e-Nav + e-Nav Services for non-SOLAS ships

Taking into consideration special maritime environment in Korean Coastal Waters
1. SMART-Navigation

Key Elements of SMART-Nav

- **Ship**
  - New generation’s ECDIS
  - Integrated Bridge System
  - Ship Area Network
  - Device for small craft

- **Network**
  - Maritime LTE Network
  - Digital GMDSS Network
  - Maritime Satellite Comm.

- **Shore-based**
  - Single Window Reporting
  - Maritime Cloud service
  - Maritime Big-Data
  - Ship Monitoring Center
1. SMART-NAVIGATION

SMART-Nav Services

Korea’s specially designed service

For safety, economy, security and environmental protection in Korea
- Essentially required service for Korea
- Specialized service for Korea

Additional service not included in the preliminary list of MSPs but necessary for Korea maritime safety management

Remote monitoring of ship’s on-board sys.
e-Navigation services for coastal small ships, fishing vessels and leisure boats

1. VTS Information Service (IS)
2. VTS Navigation Assistance Service (NAS)
3. VTS Traffic Organization Service (TOS)
4. Local Port Service (LPS)
5. Maritime Safety Information (MSI)
6. Pilotage service
7. Tugs service
8. Vessel shore reporting
9. Telemedical Maritime Assistance Service (TMAS)
10. Maritime Assistance Service (MAS)
11. Nautical chart service
12. Nautical publications service
13. Ice navigation service
14. Meteorological information service
15. Real-time hydrographic and environmental information services
16. Search and Rescue (SAR) Service
1. SMART-Navigation

**KOREA’S SPECIALLY DESIGNED SERVICE**

1) Background

- Statistics of marine accidents in Korea

![Graph showing statistics of marine accidents in Korea over years 2010 to 2014. The graph indicates the number of accidents for both Fishing Vessels and Small ships for each year.](image)
1. SMART—Navigation

KOREA’S SPECIALLY DESIGNED SERVICE

1) Background

- Most of the accidents was caused by human errors and the environment

![Image of a boat in the water and a view inside a navigation cockpit.](image-url)
1. SMART-Navigation

**KOREA’S SPECIALLY DESIGNED SERVICE**

## 2) Additional MSPs

<table>
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<tr>
<th>Subject</th>
<th>Contents</th>
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<tr>
<td>(1) Accident Preventing Service for Vulnerable Ships</td>
<td>Service for supporting ship’s safety operation and sending vulnerable ship’s information (be sensed by ship’s system including nav. Equip.) to shore</td>
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<tr>
<td>(2) Real time Context Aware Monitoring Service</td>
<td>Real-time monitoring and notice service from shore to the ship’s status based on vulnerable ship’s location and related risk information</td>
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<td>(3) Customized Service for Fishing vessels</td>
<td>Service providing customized information for fishing vessel (safety fishing route, sea temp. weather info.)</td>
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<td>(4) ENC Streaming Service for Small ships</td>
<td>ENC Streaming service using Maritime LTE for Small ships (Not installed ENC system)</td>
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</table>
1. **SMART-Navigation**

**KOREA’S SPECIALLY DESIGNED SERVICE**

(1) **Accident Preventing Service for the Vulnerable ships**

* Technology for Supporting Optimized Safety Route Vulnerable ships from land, utilizing related information

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**Vulnerable ships ▼**
- Coastal Passanger ship
- Coastal Tanker
- Coastal Cargo ship

**E-Nav Center**
- Cal. For Optimized Safety Route
- Aware risk of collision, aground
- Monitoring of Traffic

**Rescue Org.**
- Real time route info.
  - Passage plan

**Ships around of Rescue operation**
- Optimized route info.
1. SMART-Navigation

KOREA’S SPECIALLY DESIGNED SERVICE

(2) Real time Context Aware Monitoring Service

* Total maritime traffic management technology for monitoring ship’s status, operation status, etc through information from ships and shore.
1. SMART-Navigation

KOREA’S SPECIALLY DESIGNED SERVICE

(3) Customized service for Fishing vessel

* Providing optimized service for fishing vessel to prevent maritime accidents through
  -- Real-time monitoring of fishing vessel’s position
  -- Providing information of Sea temp, weather, tide, etc

![Diagram showing the total solution for fishing vessel with safety info, position information, onboard information, and risk analysis.]
1. SMART-Navigation

KOREA’S SPECIALLY DESIGNED SERVICE

(4) ENC Streaming Service for Small ships

*Provide Real-time ENC streaming service to Small ships (Fishing vessel, leisure boat)
2. Strategy for SMART–Nav
2. Strategy for SMART-Nav

Decisions of the Government

The Economic Ministers’ Conference decided as a National Strategy
(Nov, 2013)

2014 Work Plan of the President Office
(Feb, 2014)

Feasibility Study for National R&D Projects has been carried out by the Ministry of Planning and Finance
(Nov, 2014)
2. Strategy for SMART-Nav

Vision

Construction of Marine power with Safety & Efficient Sea

Goal

- To reduce marine accidents
- To improve efficiencies of shipping
- To create new market of the Nav. Equipments
2. Strategy for SMART-Nav

1. Arrange promoting Platform
2. Develop Core Technologies
3. Construct Infrastructure
4. Construct Total Governance system
2. Strategy for SMART-Nav

Platform

Construct national system to achieve policy object related to marine accident prevention and efficient port operation, promoting industry

01 Improvement system for marine safety & Port operation

02 Development of maritime safety industrial environment

03 Cultivating customized Specialist with academic-industry-trial collaboration

04 Arrangement of legislative system.
2. Strategy for SMART-Nav

Core Technologies

Core technologies R&D on the service for Korean e-Nav

- R&D Total Maritime Traffic Management Technology
- R&D Leading International Standard
2. Strategy for SMART-Nav

Within 100Km = **Marine LTE**
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100~300km = Digital GMDSS
2. Strategy for SMART-Nav

Construct National Maritime Safety Infrastructure for realization of Korean e-Nav

- Construct total operation system for e-Navigation
- Construct Next Gen. Maritime radio comm. infrastructure
3. Strategy for SMART-Nav

- SMART-Nav operation center for marine information services
- Maritime cloud service and big-data
- ENC comply with S-100
- Marine LTE and Digital GMDSS
- Portable Device for small crafts
2. Strategy for SMART-Nav

- Total Governance System

National Co-operation & Operation System, Public relations, International Co-operation System

01 Inter-ministerial Consultative Organization

02 Public-Private co-operation Partnership

03 Activate National Communication

04 Enhance International Network
2. Strategy for SMART-Nav

Architecture of SMART-Nav

Total Maritime Safety Management (SMART-Nav)

- Pilot Assist
- Med. 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
- Resilient PNT
4. Roadmap
4. Roadmap

Project Roadmap

**2014**  **2015**  **2016**  **2017**  **2018**  **2019**  **2020**

**R&D**
- Developing relevant core Tech. & Services

**Infrastructure**

**Conceptual design**
- Architecture of SMART-Nav
- Organizing Governance

**Implementation**
- Applying Systems developed
- Expending to Non-SOLAS

**Operation**
5. Conclusion
5. Conclusion

- SMART-Nav is a **Korean version of e-Navigation**
- MOF will carry out a **R&D project for SMART-Nav**
- MOF wishes to play a key **role in global implementation** of e-Navigation
Thank you