SMART-Navigation

- Introduction of e-Navigation project in Korea -

2017.06.05

HwangSooJin

KMI (Korea Maritime Institute)

Contents

I . Introduction

Introduction

• Definition of e-Navigation (IMO MSC 85/26/Add.1)

"**E-navigation** is the **harmonized collection, integration, exchange, presentation and analysis** of **marine information on board and ashore** by **electronic means** to enhance berth to berth navigation and related services **for safety and security at sea and protection of the marine environment**"

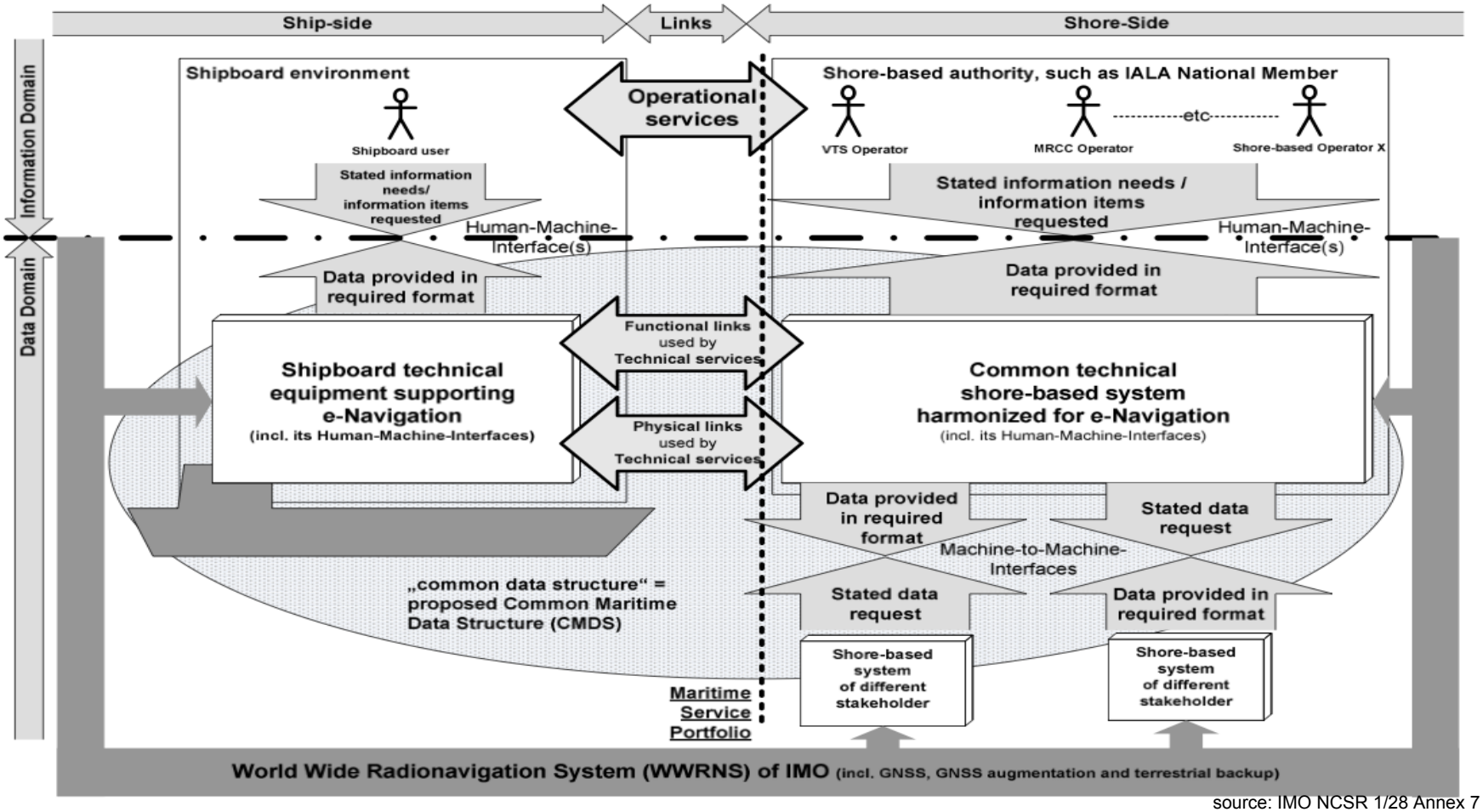
• IIMO Strategy Implementation Plan(SIP)

- period: 2015~2019
- Identified tasks and timelines for the implementation of prioritized e-Navigation solutions, new standards and regulations
- MSP (Maritime Services Portfolio)

KMI

Introduction

- **e-Navigation**

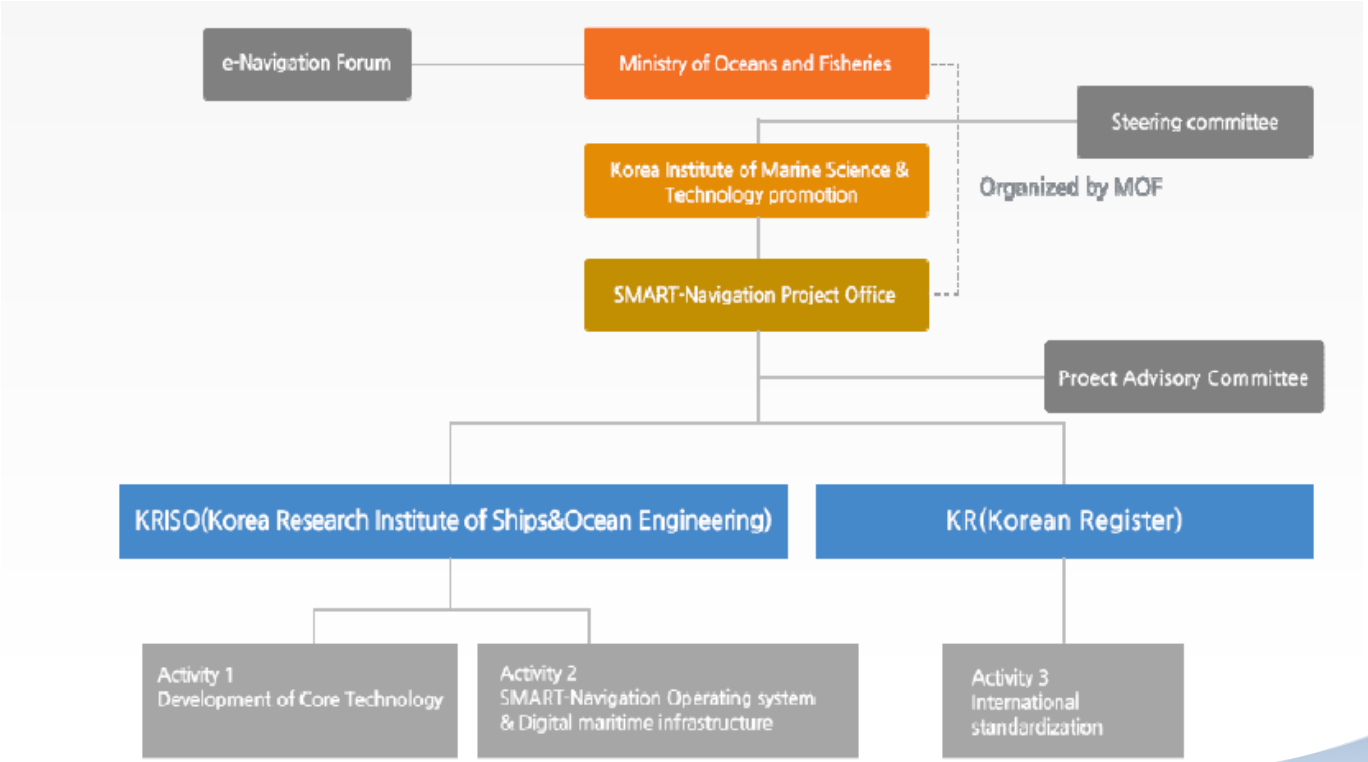


source: IMO NCSR 1/28 Annex 7

II . SMART-Navigation

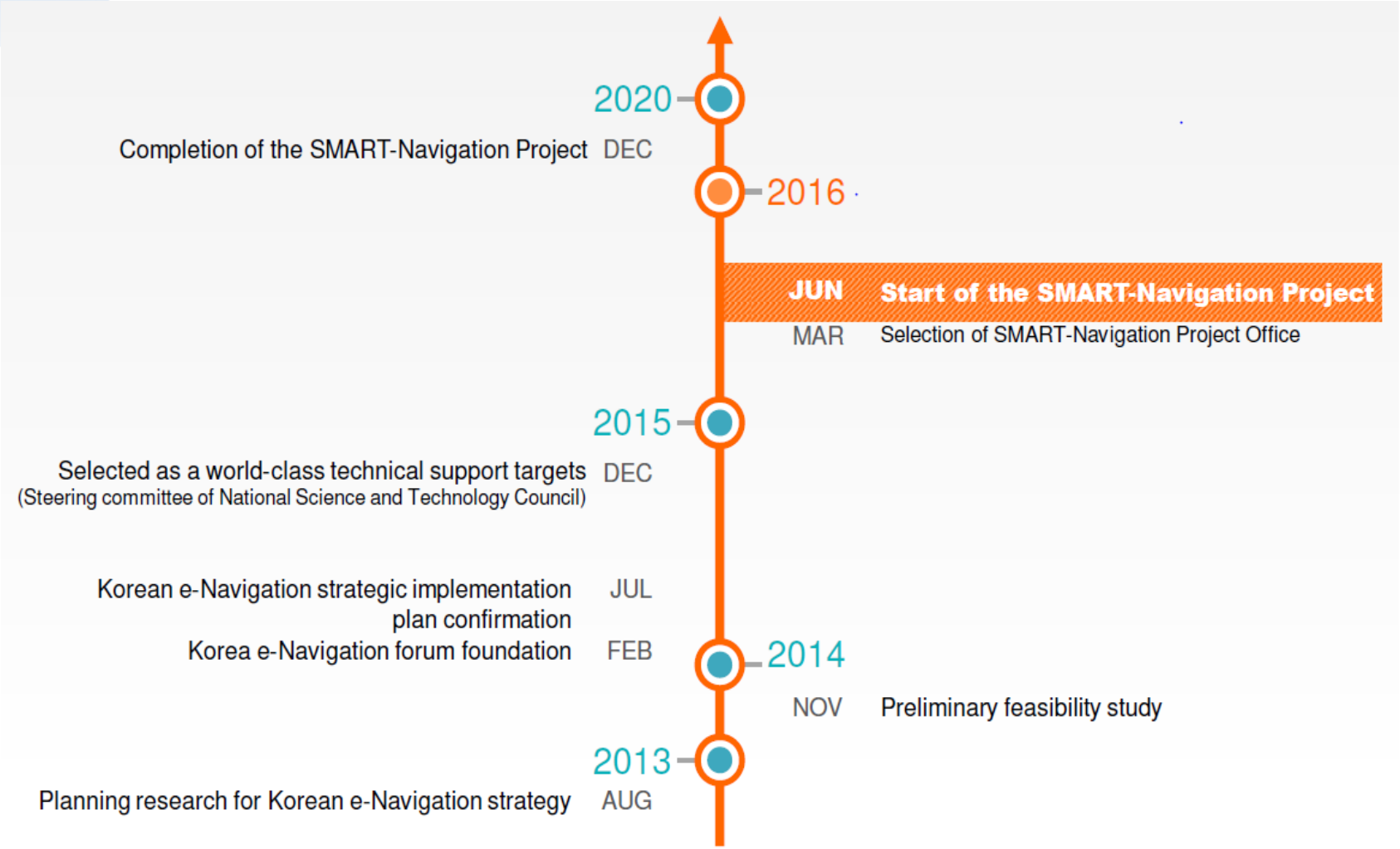
SMART-Navigation

- **Project: SMART-Navigation**
- **Budget: About USD 110 M**
- **Period : March 2016~ December 2020**



* source: IALA-aism, http://www.iala-aism.org/content/uploads/2016/09/1110-Han-Jin-Lee-SMARTnNav-an-e-nav-project-focusing-on-non-SOLAS-vessels-v1.pdf

SMART-Navigation



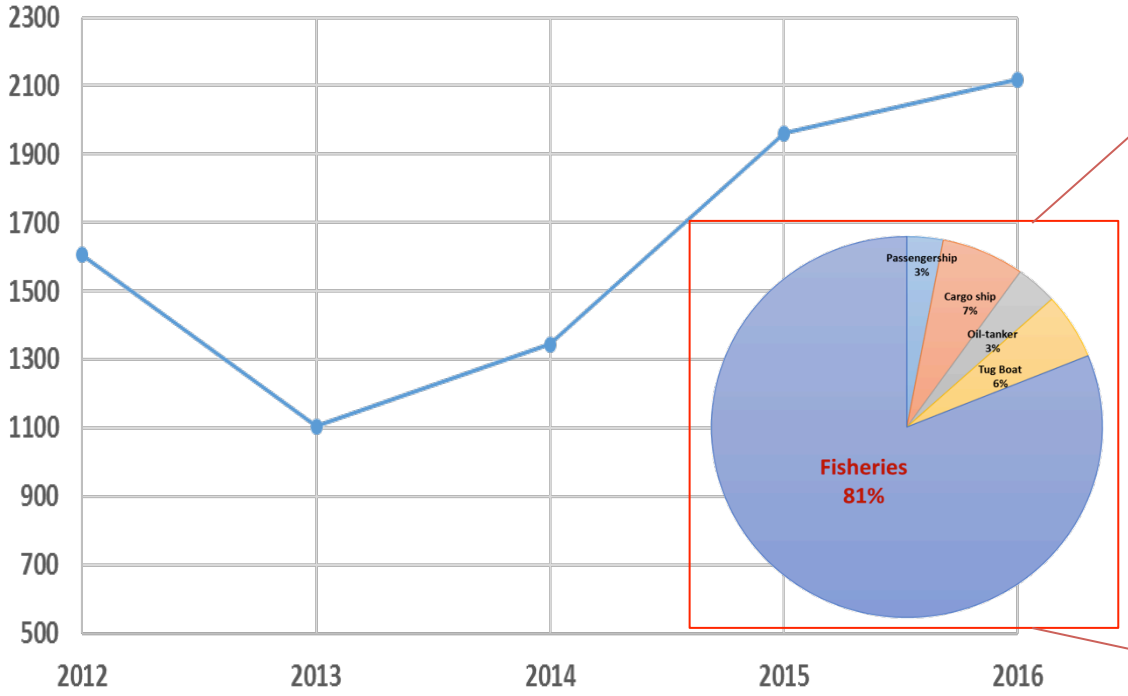
출처: SMART-Navigation, KRISO

KMI

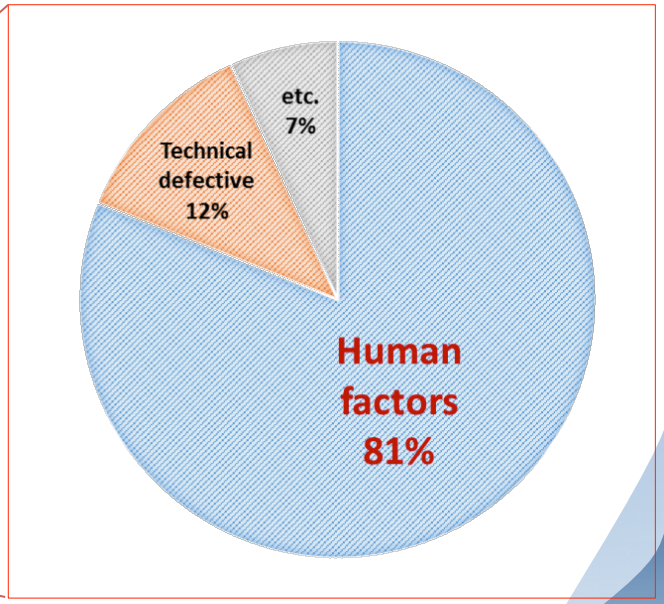
SMART-Navigation

- Marine Accidents in Korea
- Caused by fisheries : 81%
- Due to Human Factors : 81%

- To enhance berth to berth navigation and related services for safety and security at sea
- To Protect marine environment



[Trend of Marine Accidents per year]



[Distribution on Marine Accidents from 2012 to 2016]

* source: Korean Maritime Safety Tribunal statistics, https://www.kmst.go.kr/eng/main/main.jsp

KMI

SMART-Navigation

Korean e-Navigation

"**E-navigation** is the **harmonized collection, integration, exchange, presentation and analysis** of **marine information on board and ashore** by **electronic means** to enhance berth to berth navigation and related services **for safety and security at sea and protection of the marine environment**"

SOLAS

ECIDS

NON-SOLAS

ENC

SMART-Navigation

SMART-Navigation

- **S** Sea traffic coordination & optimization
- **M** Maritime domain awareness
- **A** Active & proactive maritime safety management
- **R** Remote Assistance
- **T** maritime Telematics

Activity 1	Core Technology Development	Enabling comprehensive situational awareness & responding service(S1)	WP1	Monitoring Assistance for high risk ships
		e-Navigation service development covering Korean maritime traffic (S2/S3/S4)	WP2	Remote monitoring on system onboard for high risk ships
			WP3	Optimal routes planning for high risk ships
			WP4	Electronic Navigation Chart streaming for small vessels
		Developing essential services required by IMO e-Navigation(S5)	WP5	Pilots/tugs assistance service
			WP6	Maritime safety information service (information on maritime safety, weather, route)
Activity 2	Developing SMART-Navigation operating system & Digital maritime infrastructure		WP7	Comprehensive operating system for e-Navigation
			WP8	Establishing high speed wireless maritime network(LTE-M)
			WP9	Establishing digital system for maritime wireless communication
Activity 3	Leading Technology Development for global standardization		WP10	Developing Maritime data standards(S-10X)
			WP11	Developing Maritime cloud
			WP12	Developing maritime wireless communication(standard) technology
			WP13	S-mode

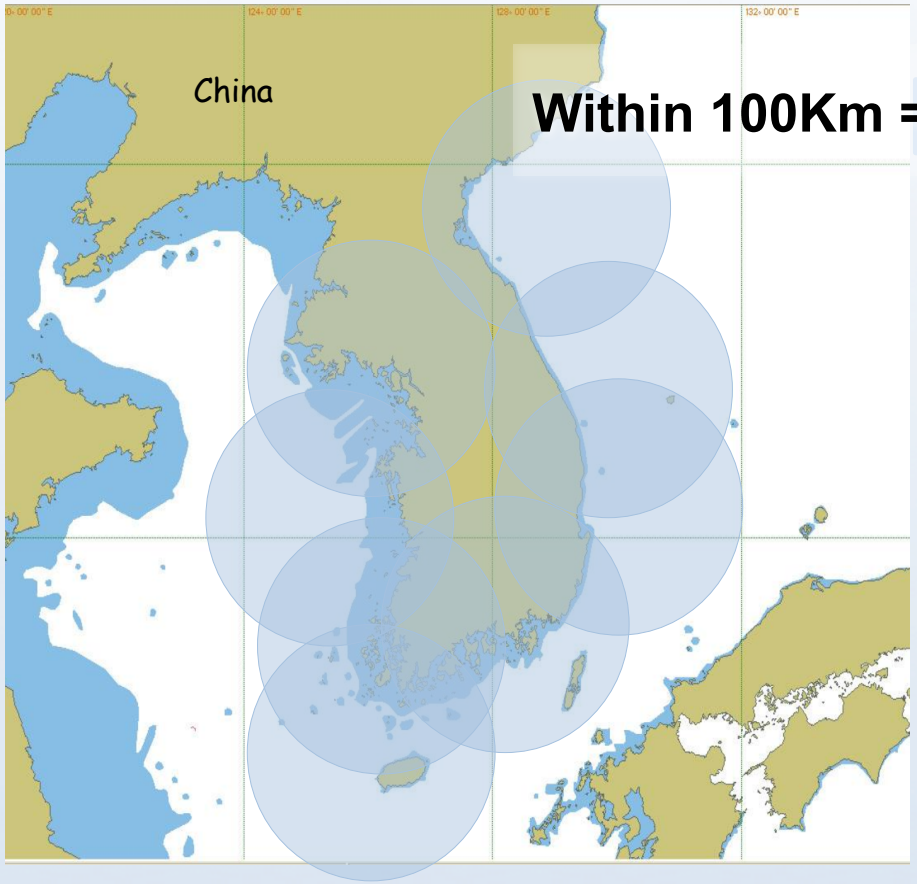
출처: SMART-Navigation, KRISO

KMI

Ⅲ. LTE-Maritime

LTE-Maritime

- **LTE-Maritime**



Within 100Km = LTE-Maritime

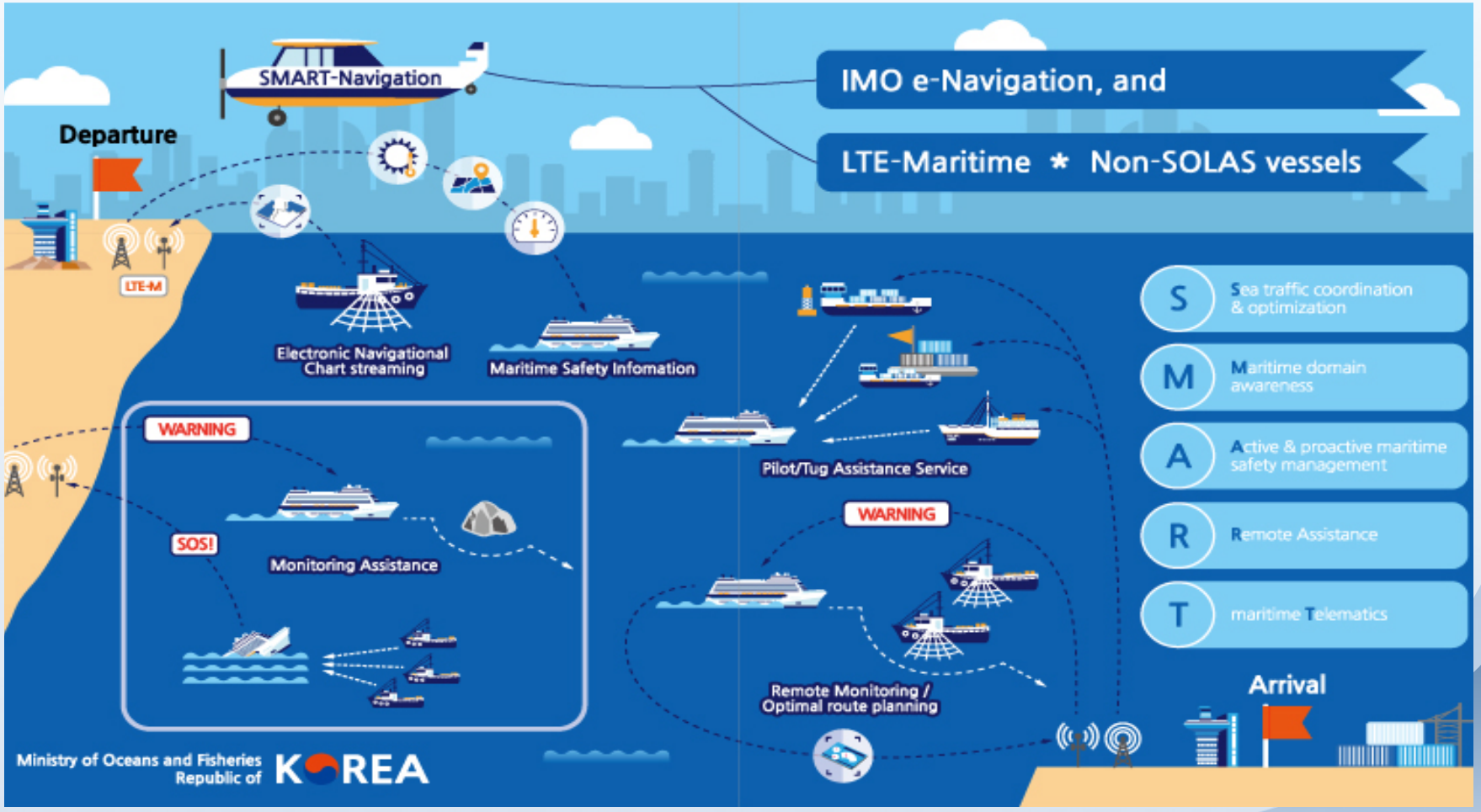
ECIDS

ENC

출처: SMART-Navigation, KRISO

LTE-Maritime

SMART Navigation



Ⅳ. Services

Services

ID	Service	Dedicated user/ship	Physical Link
Svc.1	Monitoring assistance for high risk ships	• High risk ships	LTE-M VDES
Svc.2	Remote monitoring on system onboard for high risk ships	• Passenger ships with Korean Flag (International/Domestic) • Ships requiring the service	LTE-M VDES, etc
Svc.3	Optimal routes planning for high risk ships	• Passenger ships with Korean Flag (International/Domestic) • Ships requiring the service	LTE-M VDES, etc
Svc.4	Electronic Navigation Chart streaming for small vessels	• Non-SOLAS Ships	LTE-M
Svc.5-1	Pilots/tugs assistance service	• Pilot	LTE-M
Svc.5-2	Maritime safety information service (information on maritime safety, weather, route)	• Ships requiring the service	LTE-M VDES, etc

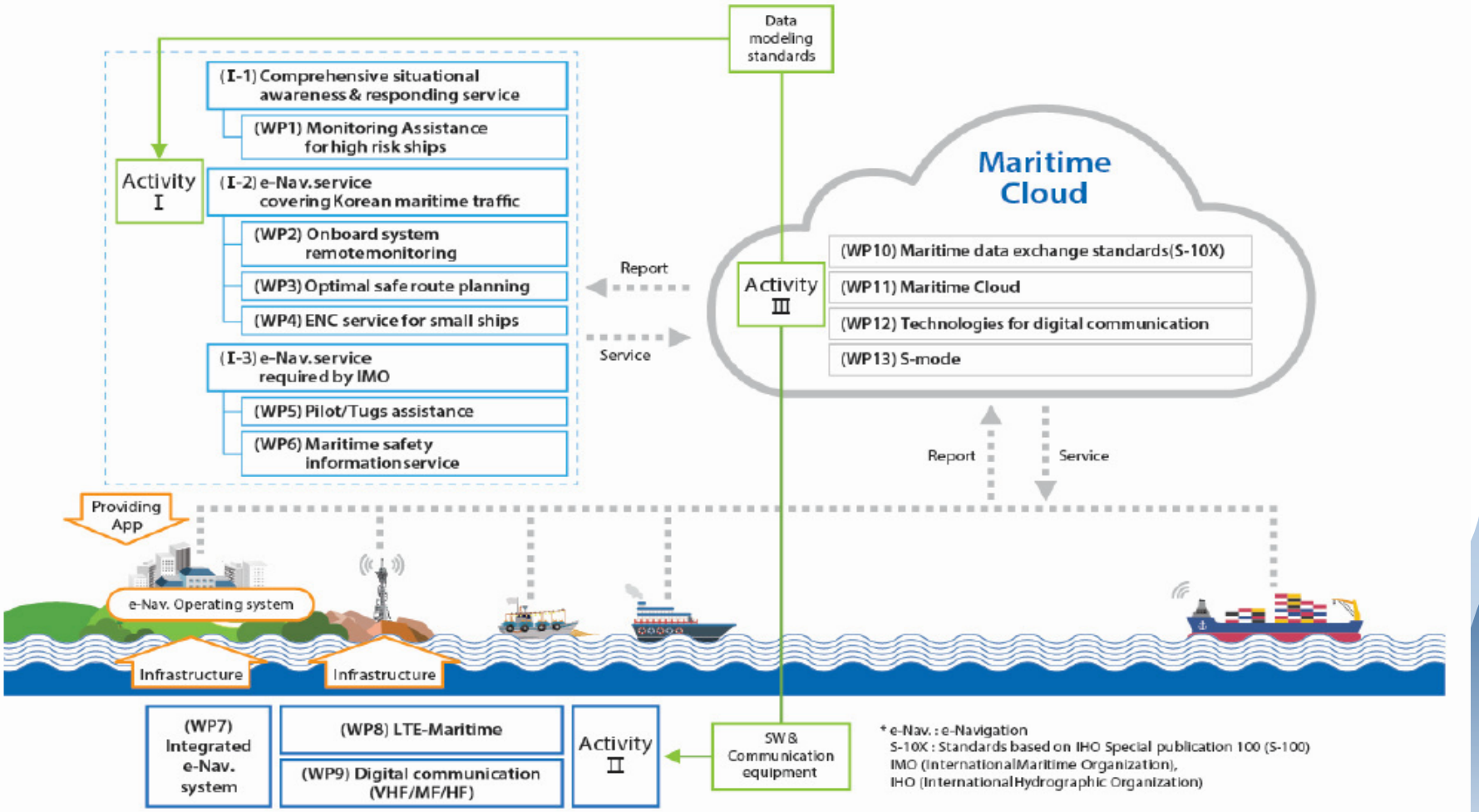
KMI

Services

No	Identified Services	SMART
MSP 1	VTS Information Service (IS)	Svc.1/ Svc.2/ Svc.3
MSP 2	Navigational Assistance Service (NAS)	
MSP 3	Traffic Organization Service (TOS)	
MSP 4	Local Port Service (LPS)	
MSP 5	Maritime Safety Information Service (MSI)	Svc.5-2
MSP 6	Pilotage service	Svc.5-1
MSP 7	Tugs Service	
MSP 8	Vessel Shore Reporting	-
MSP 9	Telemedical Assistance Service (TMAS)	-
MSP 10	Maritime Assistance Service (MAS)	Svc.1/Svc.2
MSP 11	Nautical Chart Service	Svc.4
MSP 12	Nautical Publications Service	Svc.4/Svc.5-2
MSP 13	Ice Navigation Service	-
MSP 14	Meteorological Information Service	Svc.5-2
MSP 15	Real-time Hydrographic and Environmental Information Service	
MSP 16	Search and Rescue Service	-

SMART-Navigation

SMART Navigation

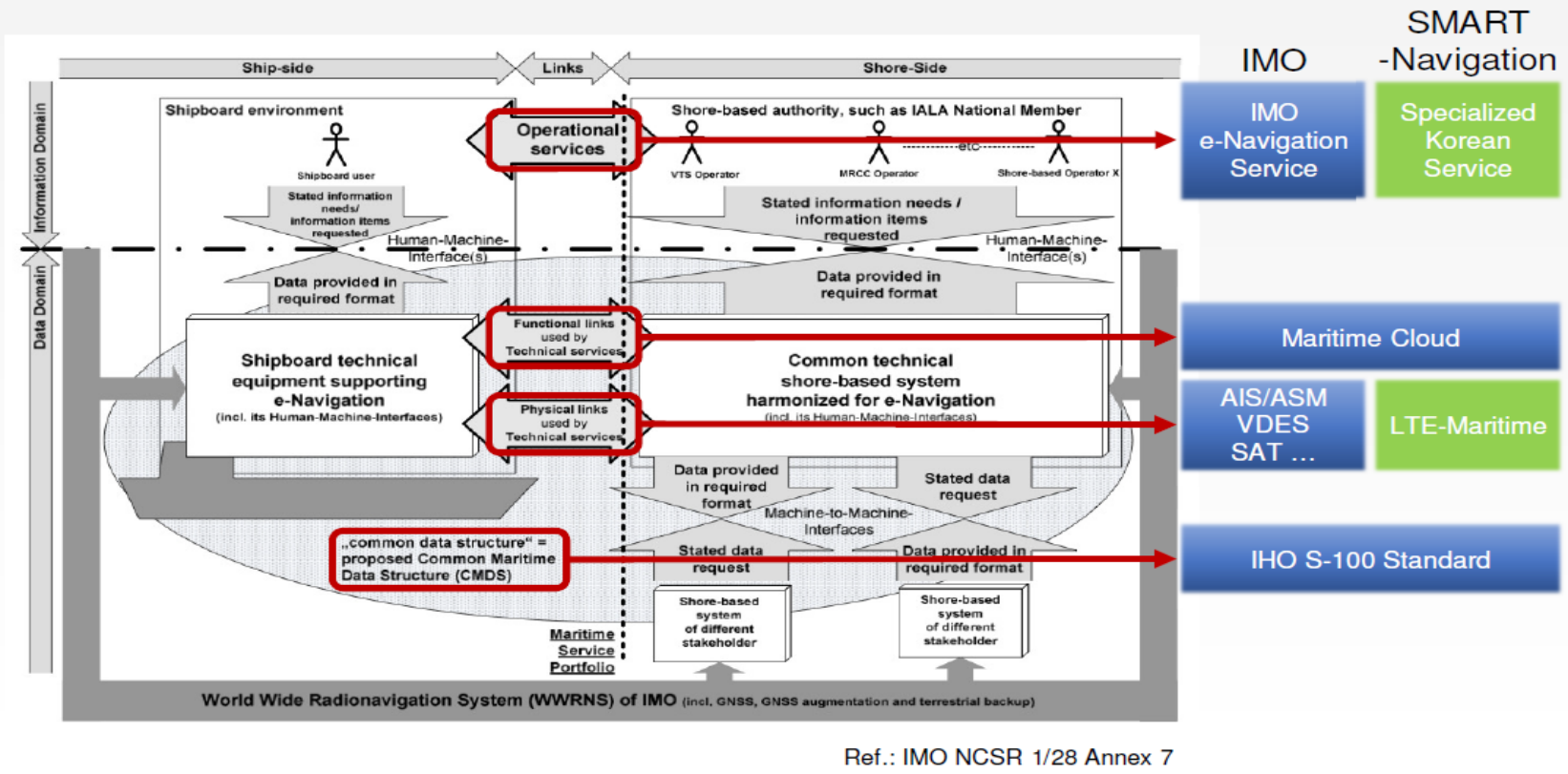


* source: IALA-aism, http://www.iala-aism.org/content/uploads/2016/09/1110-Han-Jin-Lee-SMARTnNav-an-e-nav-project-focusing-on-non-SOLAS-vessels-v1.pdf

V. Conclusions

Conclusions

- **IMO e-Navigation vs. SMART-Navigation**



Ref.: IMO NCSR 1/28 Annex 7

Conclusions

- Contributions to the Polar Hazards

Polar Hazards

- Ice effects
- Topside icing
- Low temperature
- Extended periods of darkness or dayli ght
- High latitude
- Remoteness
- Lack of ship crew experience
- Lack of suitable emergency response equipment
- Potential for escalation of incidents
- Environmental sensitivity

Solution

- To Collect specific data and informatio n on the Polar environment
- To identify risk resulting from data An alysis of Polar environment
- To provide information

* source: IMO code advisory, January 2016, ABS

Thank you for your cooperation!