

# The Nippon Foundation MEGURI2040 Fully Autonomous Ship Project



無人運航船プロジェクト

**MEGURI**  
**2040**

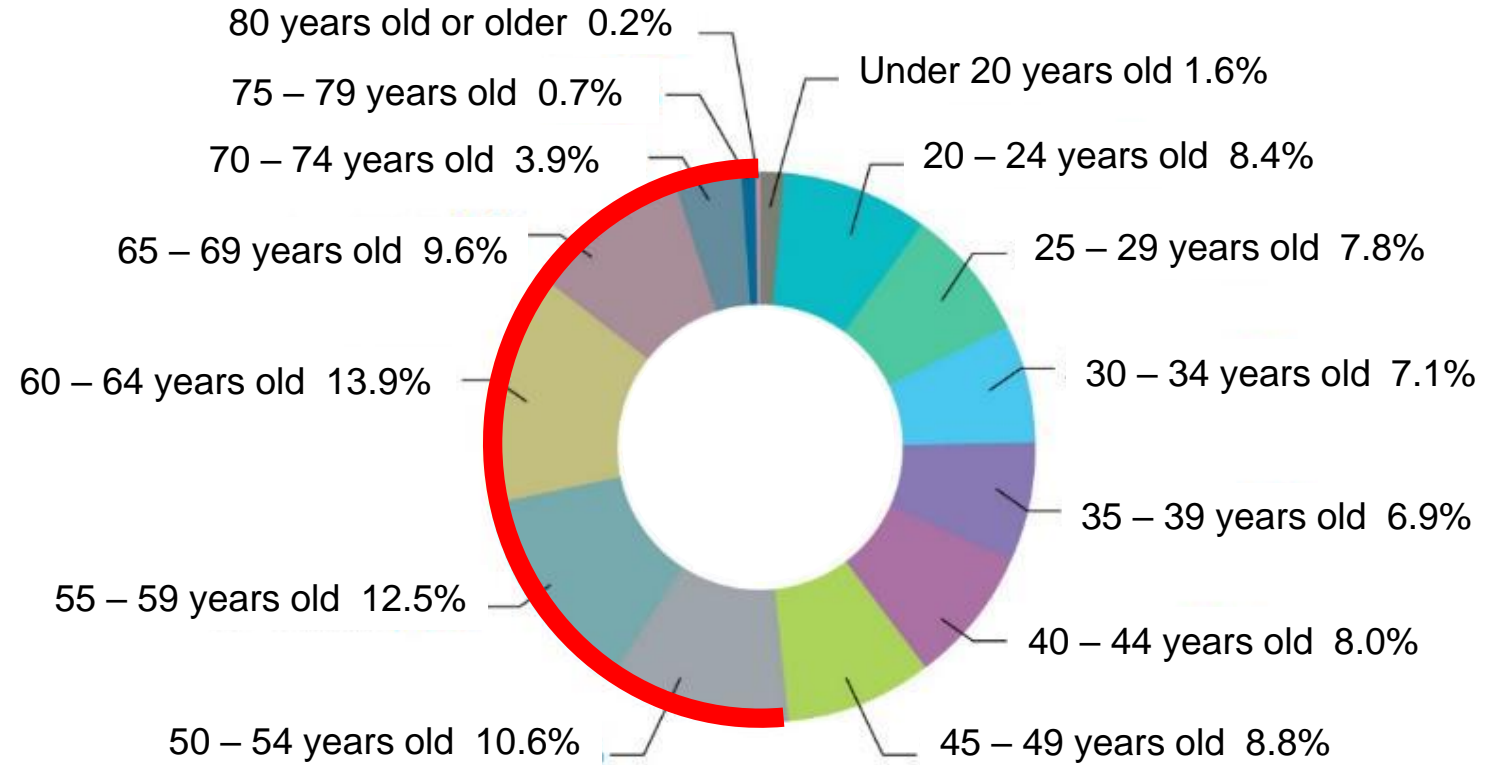
日本  
財団  
THE NIPPON  
FOUNDATION

# Project background in Japan

## Depopulation and demographic aging

Percentage of senior citizens at least 65 years old in Japan is 28.1%.  
Aging seafarers at least 50 years old engaged in coastal shipping is more than 50%.  
Maintaining shipping to connect 400 islands along the coast lines is difficult.

### Demographics of coastal shipping seafarers As of October 1, 2019



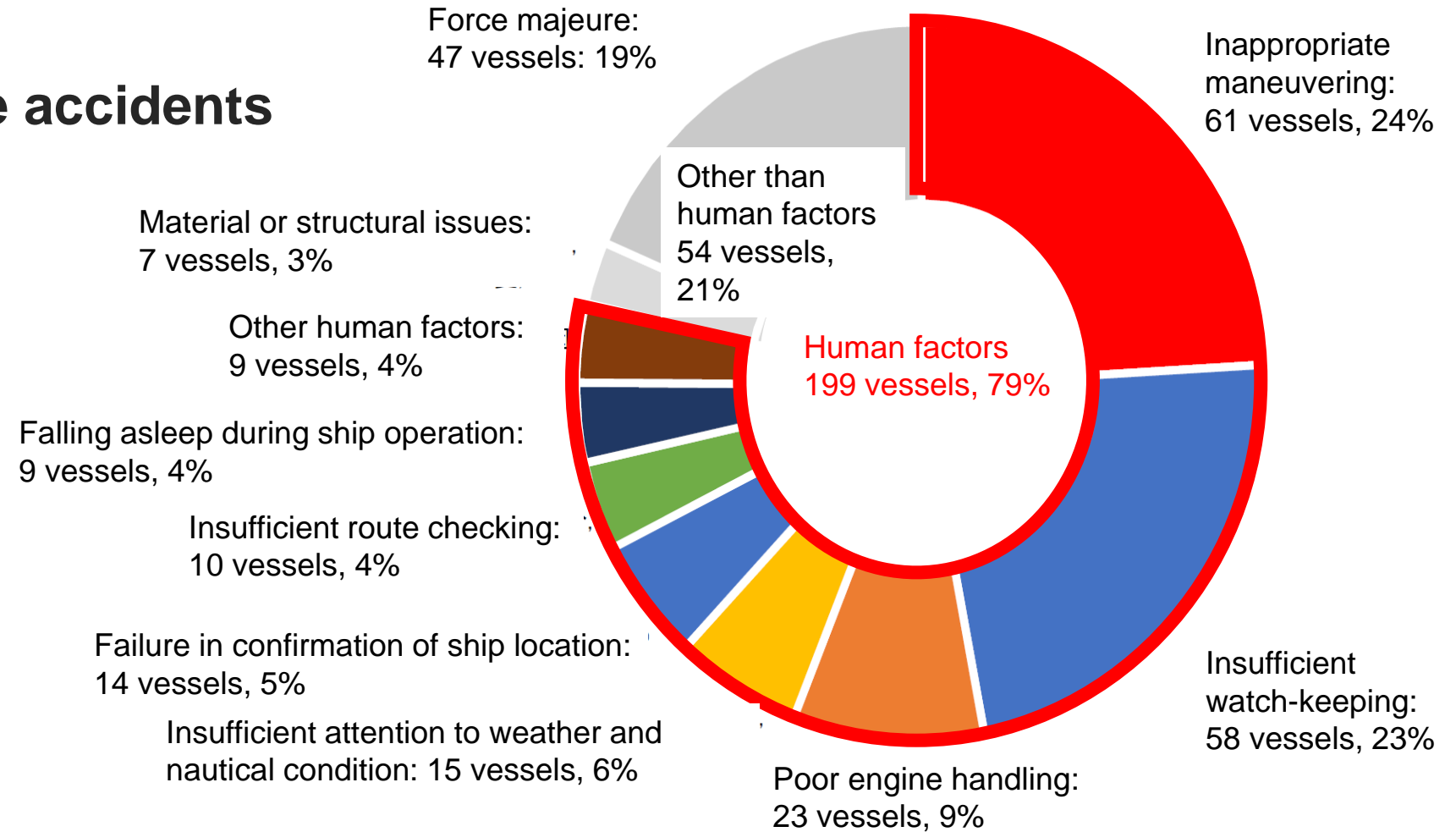
Source: Japan Federation of Coastal Shipping Associations website

# Project background in Japan



Human errors causes 80% of accidents

## Current status of marine accidents



- ✓ **Depopulation and demographic aging**
- ✓ **Human errors causes 80% of accidents**



**Autonomous and unmanned ships can be a major solution**

# Why MEGURI2040 project?

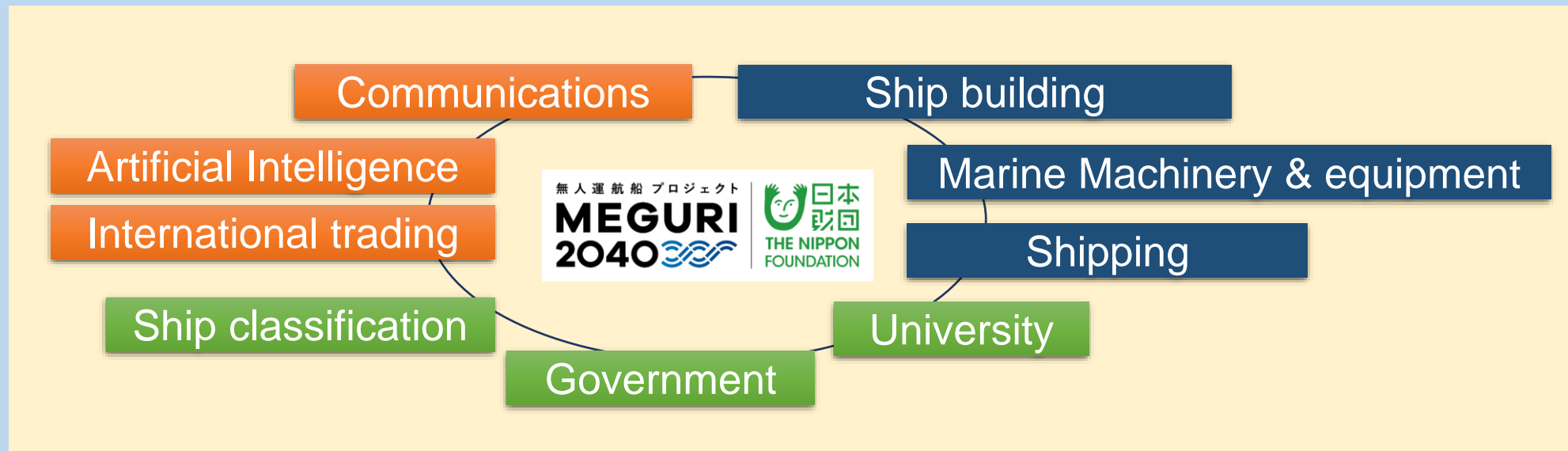
(MEGURI2040の意義)

## Issues

While **growing demand** of autonomous ship navigation in Japan, **consolidation** of related **technologies and stakeholders** was necessary, to **accelerate the development**.

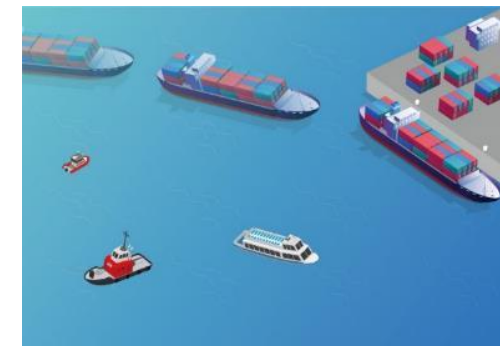
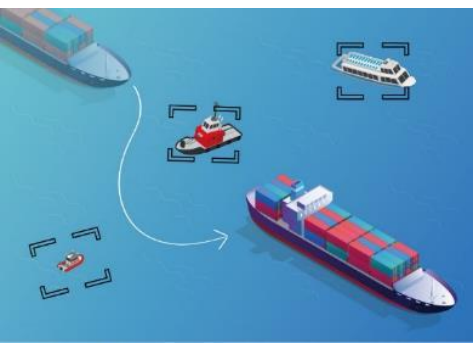
## Solution

Establishing **cross-functional consortium** and launching project by the Nippon Foundation, to facilitate **private-sector leadership** and **integration of industry-wide knowledge and ideas**.



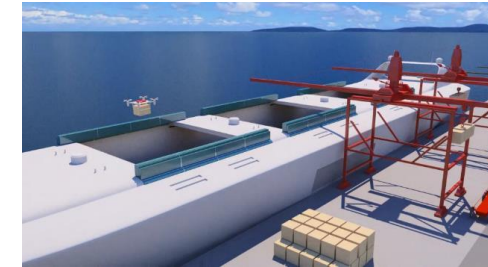
# MEGURI2040 Project aims to:

- ✓ demonstrate autonomous ship navigation technology,
- ✓ contribute to improve the world shipping business environment.



In addition, the project contribute to:

- International rule making
- International Standardization
- Developing human resource and infrastructures for autonomous ship navigation



Open up a **bright vision** of future maritime sector for the **next generations having dreams!**



# Targets of the Project



**Stage 1: Demonstration of a fully autonomous ship navigation in some existing shipping routes by FY2021**

**Stage 2: Commercialization of autonomous ship navigation in full scale by 2025**

**Stage 3: Achieving 50% of coastal shipping to be operated by fully autonomous ships by 2040**

# Demonstration tests

- Long-distance, extended (over 12 hours) navigation
- Navigation through congested area (Tokyo Bay)
- Large ship (over 200 meters long)
- High-speed operation (26 knots, approx. 50km/h)
- Use of drones for mooring support
- Container ship
- Small tourist boat
- Amphibious ship



➤ Demonstrating technological capability through the tests



# List of field proven tests

Test date	Project name	Test vessel Testing route / sea area	Consortium members (◎ = Project leader)
11 January	Autonomous navigation at Sarushima, Yokosuka	Small tourist boat Shin-Mikasa Pier (Yokosuka) → Sarushima	◎ Marubeni Tryangle, Mitsui E&S Shipbuilding, City of Yokosuka
17 January	Development of a smart RoPax ferry	Large RoPax ferry Shin-Moji → Iyonada → Shin-Moji	◎ Mitsubishi Shipbuilding Shin Nihonkai Ferry
25 January	Verification of autonomous navigation technology using a coastal container ship and a RoPax ferry	Container ship Tsuruga → Sakai Port	◎ Mitsui OSK Lines, Imoto Lines, Imoto Senpaku, MOL Marine & Engineering, MOL Ferry, Furuno Electric, Mitsui E&S Shipbuilding, A.L.I. Technologies
7 February		Large RoPax ferry Tomakomai → Oarai	
1 March	Creating the future of autonomous shipping ~Grand Design explored by diverse experts~	Container ship Tokyo Bay → Ise Bay → Tokyo Bay	◎ Japan Marine Science, MTI, Furuno Electric, Japan Radio, BEMAC, Japan Marine United, Ikous (30 companies in total)
14 March	Developing amphibious autonomous shipping technology	Amphibious ship Yanba Agatsuma Lake, Gunma	◎ ITbook Holdings, Abit, Saitama Institute of Technology, Naganohara Town, Japan Amphibious Vehicle Organization

# Demonstration tests ①

- Small tourist boat

Passengers: 236 Smooth water area

Passengers: 94 Coasting area



Small tourist boat  
“Sea Friend Zero”

1/11: Sarushima, Yokosuka



# Demonstration tests ②

- Length over all: 222m
- Speed: 26knots approx. 50km/h



Large LoPax ferry  
“Soleil”

1/17: Shin-Moji ⇔ Iyonada



# Demonstration tests ③

LOA 95.5m  
749 GT  
194TEU

- Operating container ship
- Use of drones for mooring support



Container ship  
“Mikage”

1/24~1/25: Tsuruga ~ Sakai Minato



# Demonstration tests ④

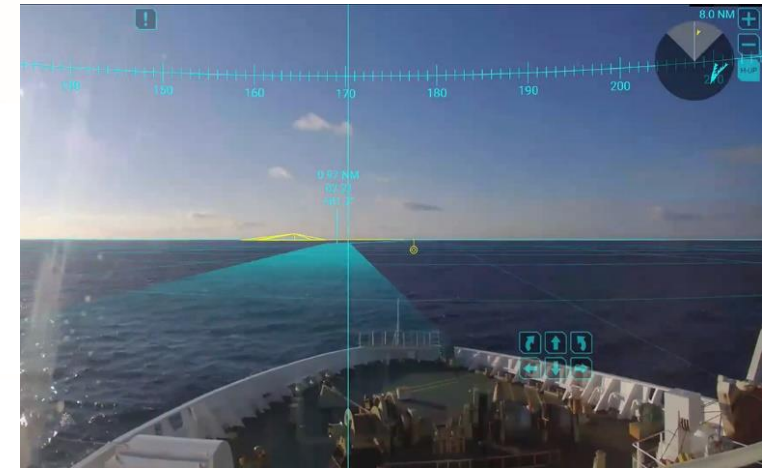
- Navigation: approx. 750km distance, approx. 18 hours

LOA 190m  
11,410 GT  
Speed 25kt



Large RoPax ferry  
“Sunflower Shiretoko”

2/6~2/7: Tomakomai → Oarai



# Demonstration tests ⑤

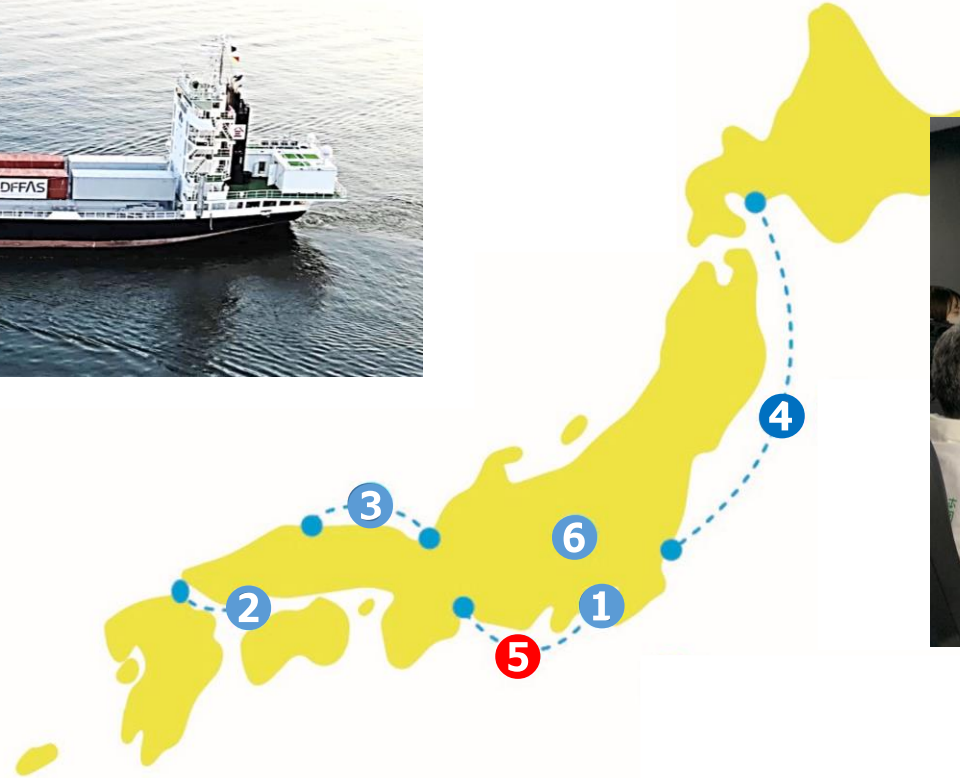
LOA: 94.70m  
749GT  
204TEU

- Navigation through congested area (Tokyo Bay)



Container ship  
“Suzaku”

2/26~3/1: Tokyo bay ↔ Ise bay



Fleet Operation Center

# Demonstration tests ⑥

- Amphibious ship



Amphibious ship  
“Yamadori-Tengu”

Quasi-zenith satellite system  
LOA:11.83m  
11GT  
Speed: 10kt

14 March: Yanba Agatsuma Lake, Gunma



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# MEGURI 2040

Demonstration tests of  
fully autonomous ship



Yanba Dam



Tomakomai



Tsuruga



<https://youtu.be/gNmz5QvQnIA>



Tokyo



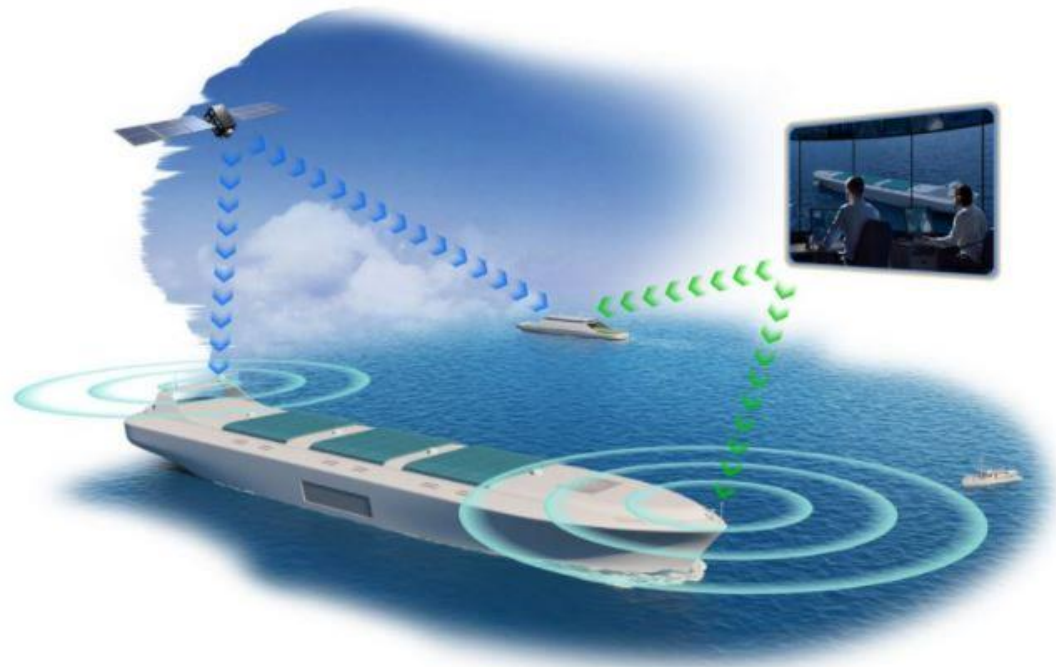
-Shin-Moji



-Yokosuka

Demonstration tests have been carried out at various sea areas from Jan. to Mar. to achieve practical use of fully autonomous ship by 2025





# MEGURI 2040



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