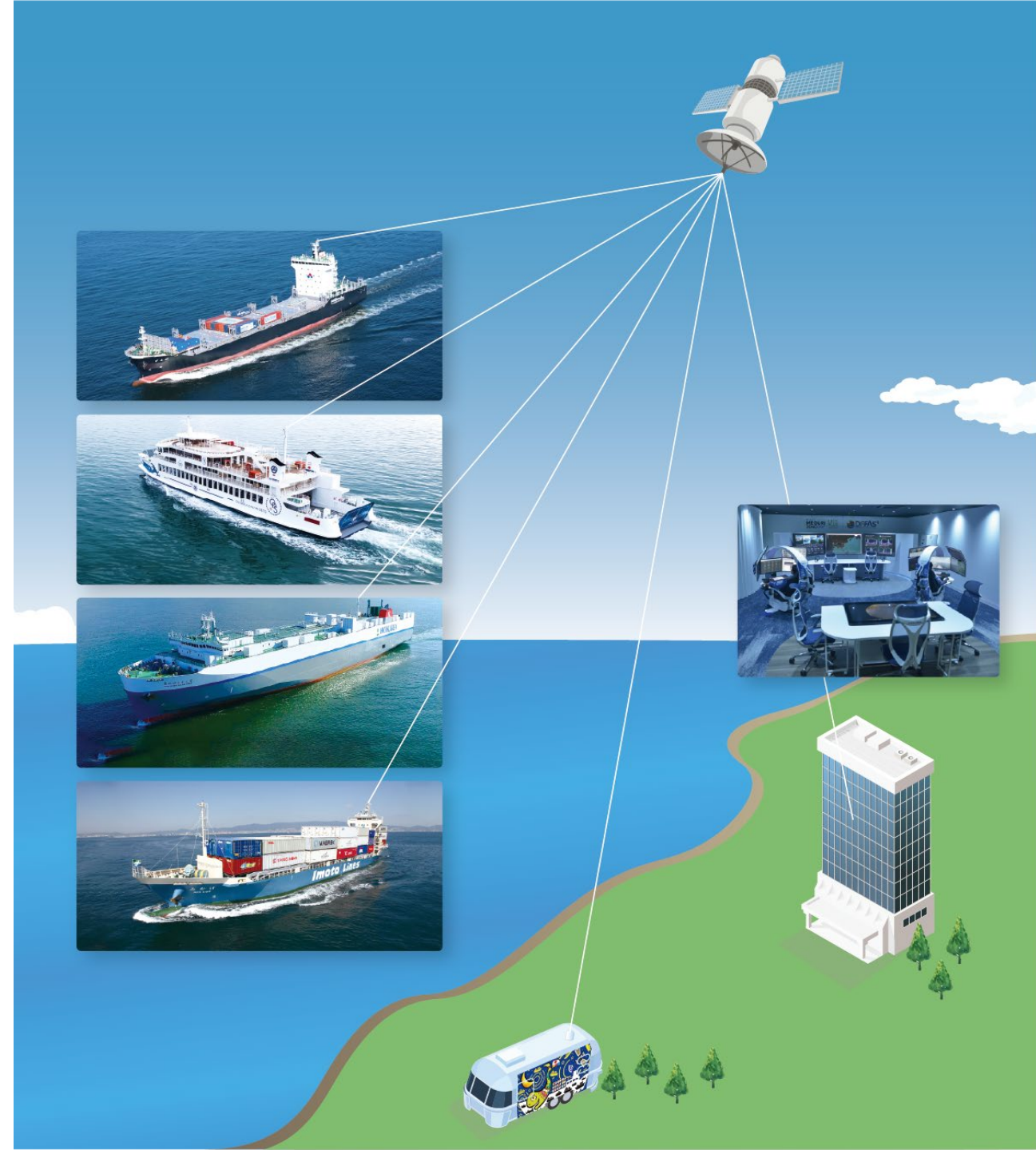


Fully Autonomous Ship Project “MEGURI2040”

Stage2 Project Outcomes



Mitsuyuki UNNO
The Nippon Foundation
May 15th, IMO MSC111



Project Background

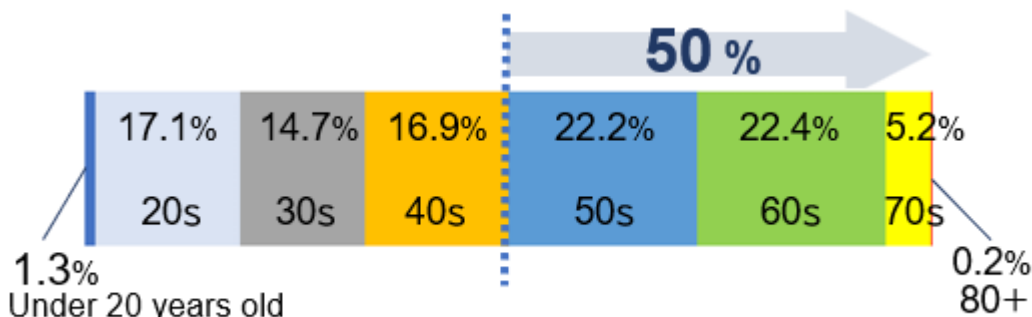
“Issues” of Japanese Shipping

■ Population Decline

- Senior population rate* in Japan: **28.1%**

■ Situation of Domestic Shipping

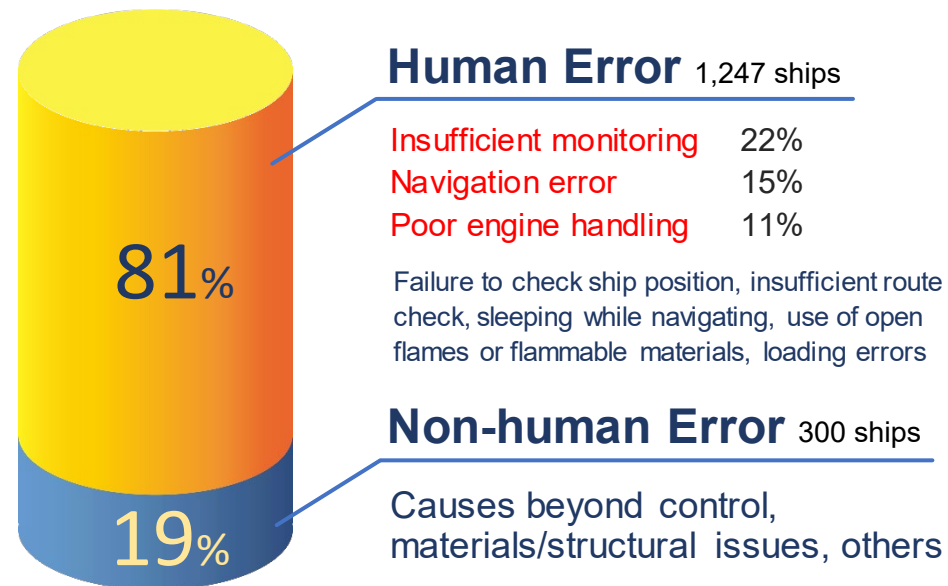
- Aging crew (**50s+ accounting for 50%**)
- Difficulty in securing transportation for residents in 400+ remote islands



Source: Japan Federation of Coastal Shipping Associations

■ Maritime Accidents causes

- **81%** of accidents by human errors



Failure to check ship position, insufficient route check, sleeping while navigating, use of open flames or flammable materials, loading errors

Source: Japan Coast Guard Annual Report 2021

Major solution >> **Developing Fully-Autonomous / Automated Ships**

Key Challenges and Our Vision

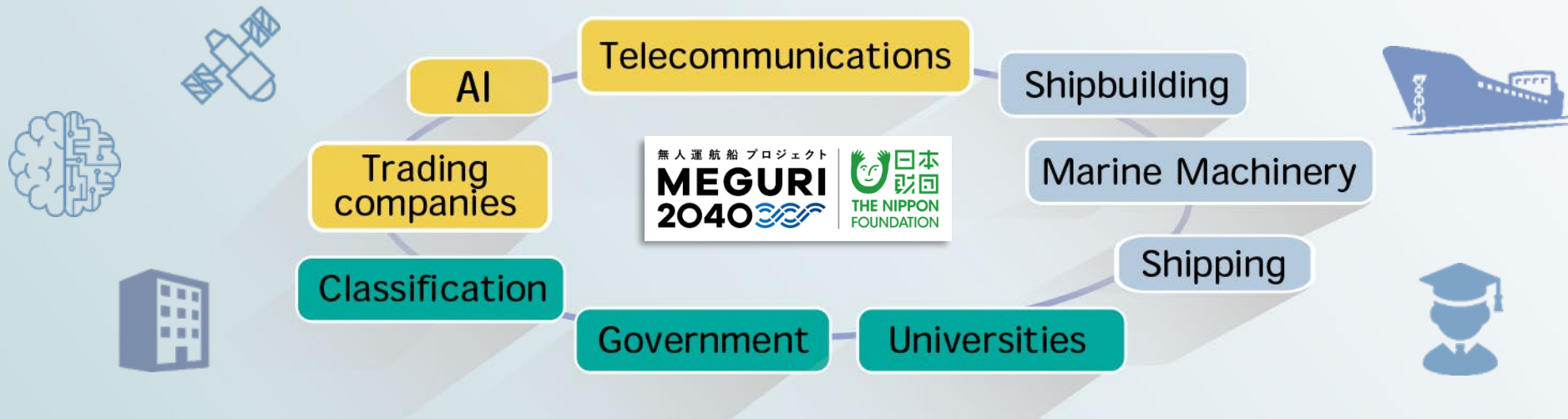
Issues

- Challenges of Development Efforts by Individual Organizations
- Japan's Leadership in Shaping International Standards

Solution

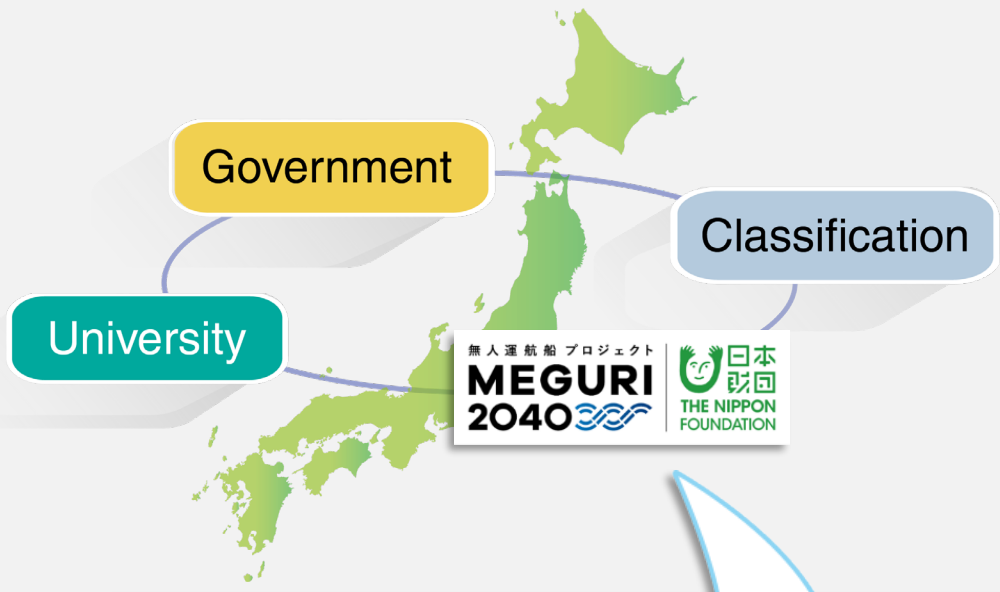
All-Japan Initiatives

Engaging **diverse industries**, including AI, telecommunications, and trade





Our Vision >> Support private-sector initiatives and Revitalize the industry

“All-Japan” Consortium



53 Companies
 shipbuilding / shipping, navigation system, marine machinery
 AI, ICT, telecommunications, trading companies etc.

World's First MASS Demonstration (Jan 2022 ~ Mar)

| Type/Name | World's First |
|---|---|
|  <p>Container Ship SUZAKU</p> | Autonomous Navigation in Congested Waters |
|  <p>Container Ship Mikage</p> | Autonomous Navigation by commercial container ships |
|  <p>Car Ferry Soreiyu</p> | Autonomous docking and undocking of large ferries |
|  <p>Car Ferry Sunflower Shiretoko</p> | Autonomous Navigation in long-distance (750km), long-duration (18hours) |
|  <p>Sightseeing Boat Sea Friend Zero</p> | Autonomous Navigation by sightseeing boat |
|  <p>Amphibious vehicle Yanba Nyagaten Go</p> | Autonomous Navigation by amphibious vehicle |

Showcased Japan's advanced technological capability

Directions of “Stage2”

Goals

- Stage1 : The world’s first autonomous operation trial by 2021 (Completed)
- Stage2 : Launch fully autonomous ships as commercial services by 2025 (Completed)**
- Stage3 : Expand fully autonomous ships to cover 50% of domestic ships by 2040

Challenges

1. Technology : Collision-avoidance, Berthing/Un-berthing tech. improvements
2. Rules/Standards : Insurance, Rules and Domestic Laws in line with International Conventions
3. Social Acceptance : Advancing social acceptance of fully autonomous ships

➡ **Solution: Broaden Collaboration Areas**

All-Japan Initiatives for Commercialization

4“MASS” entered Commercial Service

| MASS certificated | Type/Name | Total Cost (TNF grant) | | Ship | Companies |
|-------------------|--|------------------------|---------------------|--|--|
| Dec 5 2025 | Remote Islands Ferry “Olympia Dream Seto” | \$8.2M (\$6.8M) | 65m 942G/T |  | Japan Marine Science (Lead) Ryobi Ferry, Furuno Electric, Mitsubishi Shipbuilding, Tsuneishi Solutions Tokyo Bay(T-SOL) |
| Mar 25 2026 | Container Ship “Mikage” | \$3.4M (\$2.6M) | 95m 749G/T |  | Mitsui O.S.K. (Lead) Imoto Lines, Furuno Electric, T-SOL |
| Feb 9 2026 | RO-RO Ship “Hokuren-Maru No.2” | \$10.4M (\$8.1M) | 173.8m 11,413G/T |  | Kawasaki Kisen (Lead) Kawasaki Kinkai Kisen, Japan Radio, YDK |
| Jan 29 2026 | Container Ship “Genbu” ✕ newly built | \$42.4M (\$35.1M) | 134.9m 5,689G/T |  | MTI (Lead) Ikous, Japan Marine Science, JMU, Furuno Electric, BEMAC, Tokyo Keiki, Nabtesco, Sunflame, T-SOL, Space Compass, JRCS, Terasaki Electric, Naiko Mirai, WNI, EIZO |

Project Period : Oct 2022 ~ Sep 2026

Total Project Budget : About \$64M (TNF support: About \$52M)

[Project Overview Movie\(On YouTube\)](https://youtu.be/EGph-QsECsM)
<https://youtu.be/EGph-QsECsM>

Stage2 Outcomes (Technology)

Tech

Autonomous navigation under ODD

- Fully autonomous navigation (such as Watch, Analysis, Planning, Navigation)
- Also autonomous berthing/unberthing



ROC to enable diverse work for seafarers

ROC enable to

- Send voyage plans to MASS
- Monitor engines and Open/Close valves



Stage2 Outcomes (Rules)

Government certification and class notation of MASS

- Technical requirements and inspection framework for MASS have been established
(enabled autonomous navigation under commercial service in Japan)
- Notation of MASS by Class NK has also been obtained



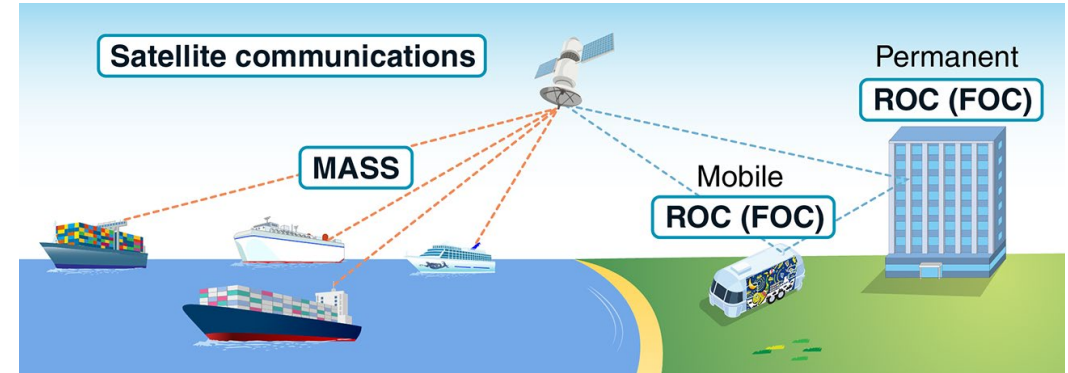
Contributions to IMO and ISO about MASS

- Proposals for MASS Code Based on the Results of MEGURI project
- Proposal to develop Open-Architecture standards started in ISO TC8 SC26



Simultaneous support for multiple MASS from ROC

- Enabling simultaneous land-based support for MASS to facilitate fleet management



Promoting MASS

- Promote understanding of MASS among residents of remote islands
- Providing children with on-site tours, showcase capabilities of the maritime industry, and encourage them to choose a career in the maritime industry



Next Step of MEGURI project

- 1 Supporting to develop use cases and promote MASS**
- 2 Contributing to MASS Code and EBP through MEGURI demonstration data**
- 3 Establishment of new seafarer roles and talent development platforms for the MASS era**





**THE NIPPON
FOUNDATION**