Sustainable Maritime Transport and its role on Tsunami Monitoring
What does the shipping industry focus on recently?

- Sustainable development fits both the shipping industry and the international community

Sustainable Shipping is a combination of economic, social and environmental factors that focus on energy efficiency and environmental improvement.

- Market share
- Competitiveness
- High efficiency-low carbon
- Profit
- Global Supply Chain
- Customer satisfaction

- Compliance with the safety standards
- Seafarers
- Health – port city
- Gender
- Technologies

- Co2 emission
- Ballast Water Management
- Sox & Nox
- Compliance with the environment protection rules and regulations
Resiliency: essential for sustainable development

- Prevention and rapid recovery of various natural disasters and social risks are the cornerstones of sustainable development

- Shipping and ports are exposed various natural disasters
  - Natural disasters: Tsunamis & earthquakes, flooding, typhoons/heavy rain, dense fog, strong winds
  - Tsunamis (including earthquakes) and typhoons are critical
  - But recent sea level rise due to extreme weather and global warming are becoming a serious risk

- Various social risks also became serious
  - Fire, Explosion, Chemical leaks, Piracy and others
  - Cyber attacks is evolving and damage is growing
Maritime transport and Tsunami

What happens to a ship during a tsunami?

◆ Vessels are advised to move to the deep sea when a tsunami alarm occurs
◆ "I was passing through the Malacca Straits during the Tsunami. I was just sailing around there and there was a slight vibration(?), there was only three vibrations of about 30 seconds every 30 minutes. There was no damage to the ship" - Officer of LNG carrier -
4-1 Tsunami Monitoring by Ship

➢ Limitations of Current Tsunami Monitoring Systems

◆ Cost for installment of monitoring system

◆ Insufficient network coverage

◆ Repair and maintenance cost

➢ Tsunami Monitoring by Ship

◆ Pilot project was conducted by University of Hawaii (funded by NOAA, Matson/Maersk, World Ocean council) (Refer Session 4)

- The research team showed that GNSS-based measurement systems can identify tsunamis that are not easily detectable at the Ocean
Tsunami Monitoring by Ship

- GNSS including GPS is widely used for positioning and navigation of ships.

- GPS-based tsunami monitoring can potentially be an alternative since nearly all ships use GPS by default.
Considerations for introducing a GPS-based tsunami monitoring system on ship

**Cost**
- Install additional equipment to capture subtle vibrations and positional variations
  * Includes solutions for detecting abnormal signals and for interpreting and determining them
- Satellite communication costs

**Who is responsible for implementing it?**
- Voluntary ships and/or supported by government, international Org.

**How to complements to Spoofing and Jamming, weak points of GPS system**

**Collaborate with existing systems for more accurate and early warning alarms**
Way Forward

➢ Strengthening collaboration among maritime safety stakeholders
  - Co-work with all relevant parties including government, shipping industry, classification society, international organization, academia, shipbuilding and etc.

➢ Design for pilot project and implementation
  - Strategies to update and expand existing system
  - Establish a collaborative system for pilot project on ship-based tsunami monitoring
  - Exploring the possibilities for One source - Multi use (ex: SAR, Vessel monitoring)

➢ Plan for active participation of shipping lines
  - Consider incentives such as port due exemption to shipping lines
  - Provide investment justification and the ways to recover cost
Thank you!