



Overview of
MASS (Maritime Autonomous
Surface Ship) Applications

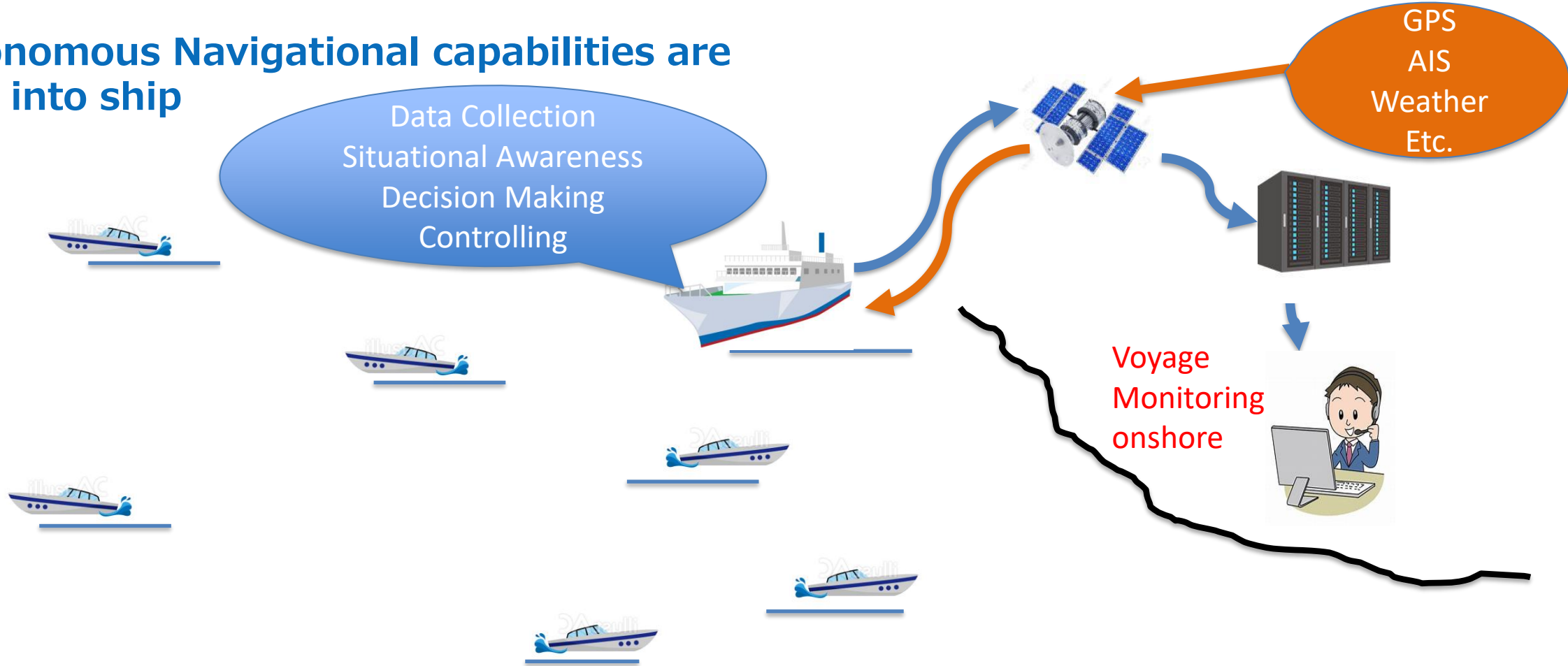
ClassNK MASS Project Team
Noriyuki (Nori) Kajita

Apr. 5th. 2023

- Many types of MASS are developing and testing all over the world.
- Relationship between humans and the system is different between each application.
(Partial autonomous to fully autonomous)
- But all of the MASS system (Navigation) has capabilities of
 - **Data Collection (Own position, heading, speed, surrounding information, etc..)**
 - **Situational awareness**
 - **Decision-making (including route planning)**
 - **Controlling (Control engine, rudder and other devices)**
- 2 typic MASS navigational types will be introduced.

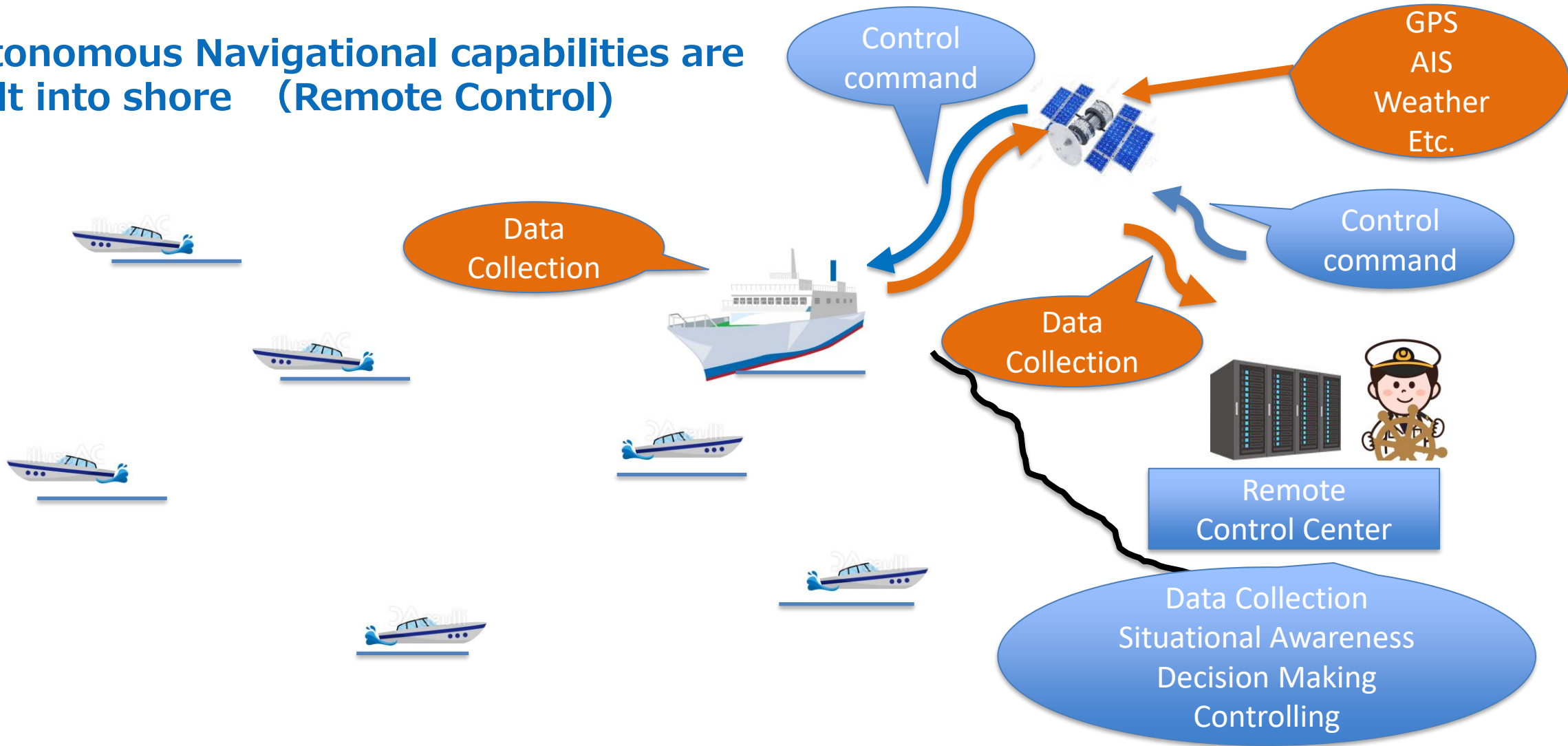
1. Type of MASS

- Autonomous Navigational capabilities are built into ship



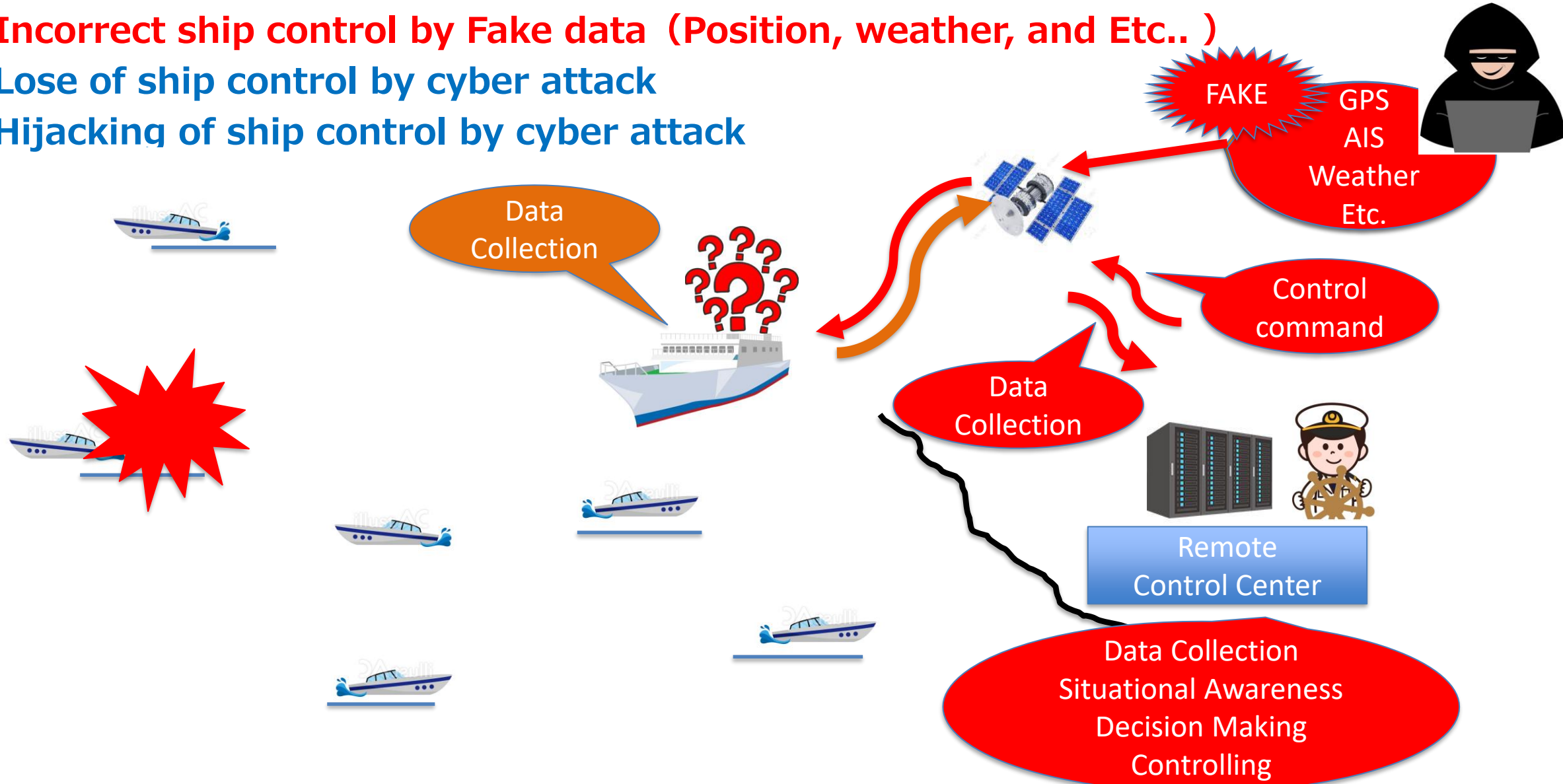
1. Type of MASS

- Autonomous Navigational capabilities are built into shore (Remote Control)

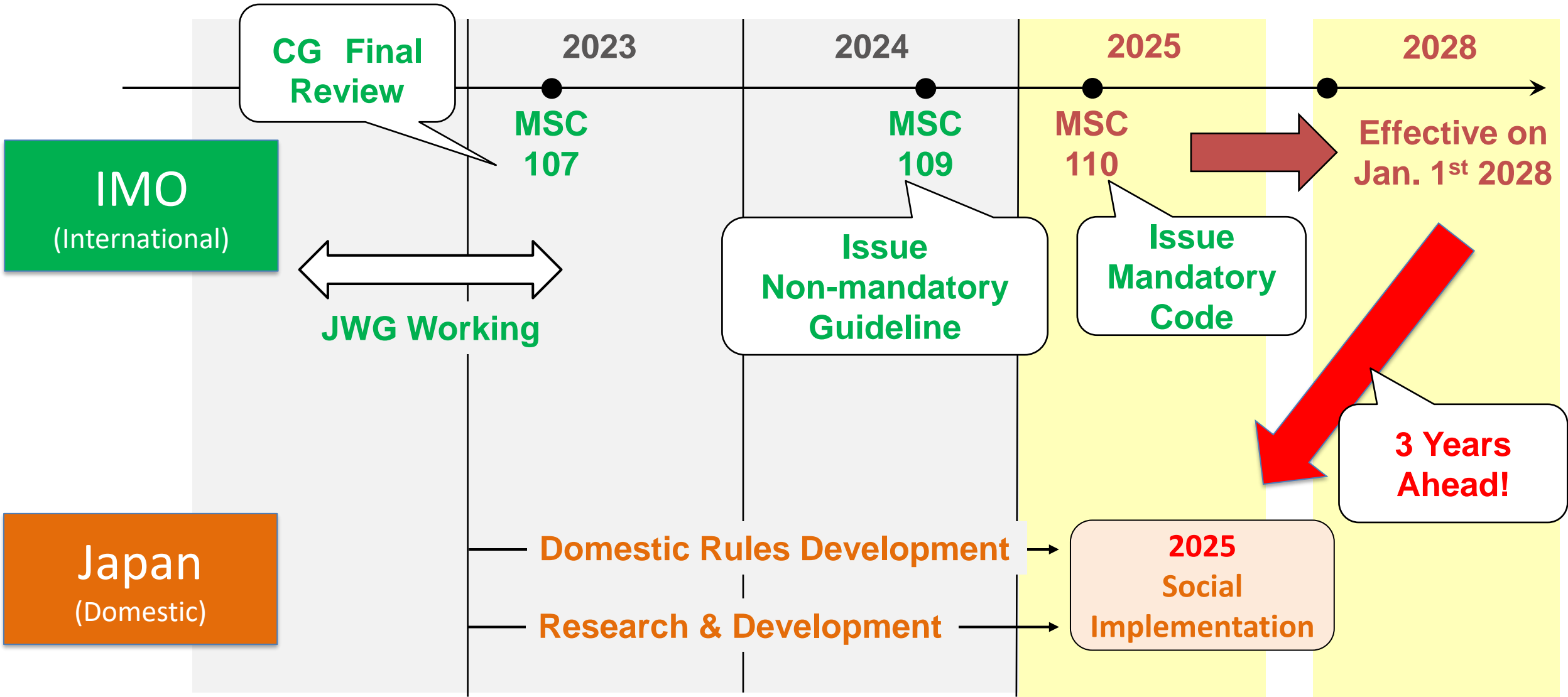


2. Some Scenarios of MASS Cyber accidents/incidents

- **Incorrect ship control by Fake data (Position, weather, and Etc..)**
- **Lose of ship control by cyber attack**
- **Hijacking of ship control by cyber attack**



3. MASS Social Implementation



- Many MASS are developing and testing all over the world.
- Domestic Social Implementation will be earlier than International Social Implementation.
But the risk of cyber accidents/incidents is the same.
- Cyber Security Requirements for MASS (Autonomous Ship) are required as soon as possible!! **SHIFT LEFT!!!**

Cyber Security Accidents/Incidents will happen and have to mitigate minimum damage.

THANK YOU

for your kind attention