



MASS Nav PT Work package 2-6 report template

Member State: Japan

WP2: Identify and report what test bed activities are happening in each member state's region and which degree of autonomy is predominantly used.

There are two major MASS test beds carried out around Japan. One is led by the Government of Japan. The core organization of this test bed is the Ministry of Land, Infrastructure, Transport and Tourism, our parent organization. Another one is called MEGURI 2040, led by a public interest incorporated foundation, the Nippon Foundation.

Since 2018, the government of Japan has conducted first serious trials of MASS to improve the environment for its development such as establishing safety requirements, which is needed to put MASS into practical use. Autonomous operation trials were conducted with an advanced battery powered ship equipped with autonomous operation function to avoid collision and grounding. Remote control trials were conducted in the Tokyo Bay with a tugboat, which was controlled from an onshore facility in Nishinomiya City 400 km far away from Tokyo. Autonomous berthing/un-berthing trials were conducted with a large vessel more than ten thousand gross tons at a temporarily installed offshore pier. The government of Japan aim at achieving Phase II, that is, controlling ships from land facilities and/or utilizing action proposals led by AI to support mariners, by 2025.

The Nippon Foundation has assembled and made a decision to fund five consortia to conduct verification testing for unmanned ship navigation. So MEGURI 2040 is composed of 5 small projects shown in right part of the slide.

- Smart ferry development is to confirm the effect of strengthened monitoring in detecting engine breakdowns in addition to autonomous navigation including departing and docking of a large coastal ferry.
- Autonomous navigation of small vessels is to develop technologies for fast, inexpensive, unmanned navigation of existing small vessels to realize autonomous navigation technologies for a broad range of small vessels.
- Grand design drawn by diverse specialists is open collaboration to achieve a “new age domestic logistics society” supported by unmanned navigation, created by a diverse group of specialists.
- Verification testing of unmanned technologies is to avert marine accidents caused by human error, and reduce labour requirements in the face of an aging, contracting maritime workforce, through testing using container vessels and car ferries.
- Development of unmanned amphibious driving technology is to conduct open-source development for unmanned driving of amphibious vehicles at the lake. The vehicles will enter the water from land, self-navigate on the water, and return to land.

Each consortium is to begin verification testing by the end of March 2022, with a target of implementing autonomous shipping by 2025. Some of the testing were conducted this year.

WP3: Report on what data MASS operators and MASS navigation systems are using today in each member state's region.

On MEGURI 2040 project, a MASS support centre on land collects and analyses S-57 ENCs, MASS condition, meteorological condition, AIS information, navigational warnings and past maritime accident information, and provide feedback for securing safety and efficiency of MASS navigation.

WP4: Report what navigational data each member states' regulators (e.g. MCA in the UK) are specifying should be used for MASS navigation in either trials or operations of MASS.

In December 2020, the government of Japan has compiled points of concern at designing phase of MASS and published Safety Guidelines for MASS "Design", based on the result of discussion among experts in "Working Group for the safety of MASS". This guideline is only for safety designing of MASS.

In February 2022, the Japanese government updated the guidelines. Topics regarding on-board Automated Operation System and MASS navigation are added to the original one, however, the updated one still does not contain regulation or rules regarding specific hydrographic or navigational data.

WP5: To what degree are member states Hydrographic Offices involved in MASS trials or operations and what data are they currently providing.

Japan Coast Guard (JCG) provided navigational warning data, AIS information and past maritime accident information for Meguri 2040 trials, however, we have not been involved in the MASS trials as a core member.

WP6: Report on what trailing has been done with new navigation standards (e.g. S100) for MASS, or what research into machine readable data has been carried out in each member state's region.

Above mentioned two test beds have been conducted without any S-100 standards. Hydrographic and Oceanographic Department, JCG, has not received information on MASS trials which are carried out around Japan with new navigation standards or researches into machine readable data.