



MASS Nav PT Work package 2-6 report template

Member State: FRANCE

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

Test bed activities in France mainly concern remote operation of either drones or ship. Hence, the relevant autonomy level is between IMO's 3 and 4 degree of autonomy.

3 companies have undertaken or undertake projects using drones and vessel: IX Blue, Sea Owl and Sea Proven.

IX Blue drone objective is to recover hydrographic and bathymetric data. It is operated under degree 3 of autonomy.

Sea Proven tests an USV dedicated to the tracking of cetaceans and pollutants. The referred degree of autonomy is 3.

Sea Owl drone is to be used for security missions within oil platforms. It is operated with a degree of autonomy comprised between 3 and 4: the action of the drone is triggered by a specified factor but the mission must be validated by the human remotely operating the drone. The COLREG management is the only autonomous part of the drone action.

Sea Owl also tests a remotely operated 80 metres vessel intended to manage drones within oil platforms. It is operated with degree of autonomy 3.

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

In the Sea Owl project, the remotely operated drone uses S57 data, enhanced with company data (e.g go and no-go areas), converting the conventional chart into a decision chart. Further, all the relevant maritime safety information are inserted in the vessel monitoring and alert system.

Regarding the remotely operated vessel, crew is onshore and operates the vessel through the same supporting functions (including ECDIS) as if it were onboard.

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.

French regulations draws a line between drones and vessels, based on criteria such as length, power, speed, gross tonnage and presence of human onboard or not.

Taking this into consideration, there is so far no requirement of any navigational data for the testing of drones.

Intended autonomous or remotely operated vessels however must be fitted with the same level of navigational data that conventional vessels. This means that the same SOLAS or national requirements apply.

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

Shom is part of a project aimed at renewing the future French hydrographic capacity by using a fleet of unmanned surface vehicles and autonomous underwater vehicles.

The data collected in this way are intended to be used in the Shom's official products and services.

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.

Some academic work is carried out on ontology and knowledge database (KB) to structure and store maritime regulations information and nautical instructions (mainly based on RDF (Resource Description Format) data model and semantic web standards).

The text in "natural language" of these publications is not machine readable whereas information structured in a knowledge database consisting of a network that represents semantic relations between concepts is machine queryable.

The ENC data (S-57 or S-101 using ISO 8211) is not adequate for software based on spatial analysis (e.g algorithm able to determine the best route using features of the ENC). Spatial indexation of ENC data, e.g Hexagonal Hierarchical Spatial Index, could be a solution to foster spatial analysis.