French-Japanese cooperation on buried mine countermeasures

To keep pace with evolving underwater threats, considering in particular bottom laid mines and buried mines, France and Japan, through the Direction Générale de l'Armement (DGA), the French defence procurement agency, and the Japanese Acquisition, Technology & Logistics Agency (ATLA), signed a cooperation agreement in 2021 to study an innovative technology based on a mine countermeasures Dual Frequency sonar system.

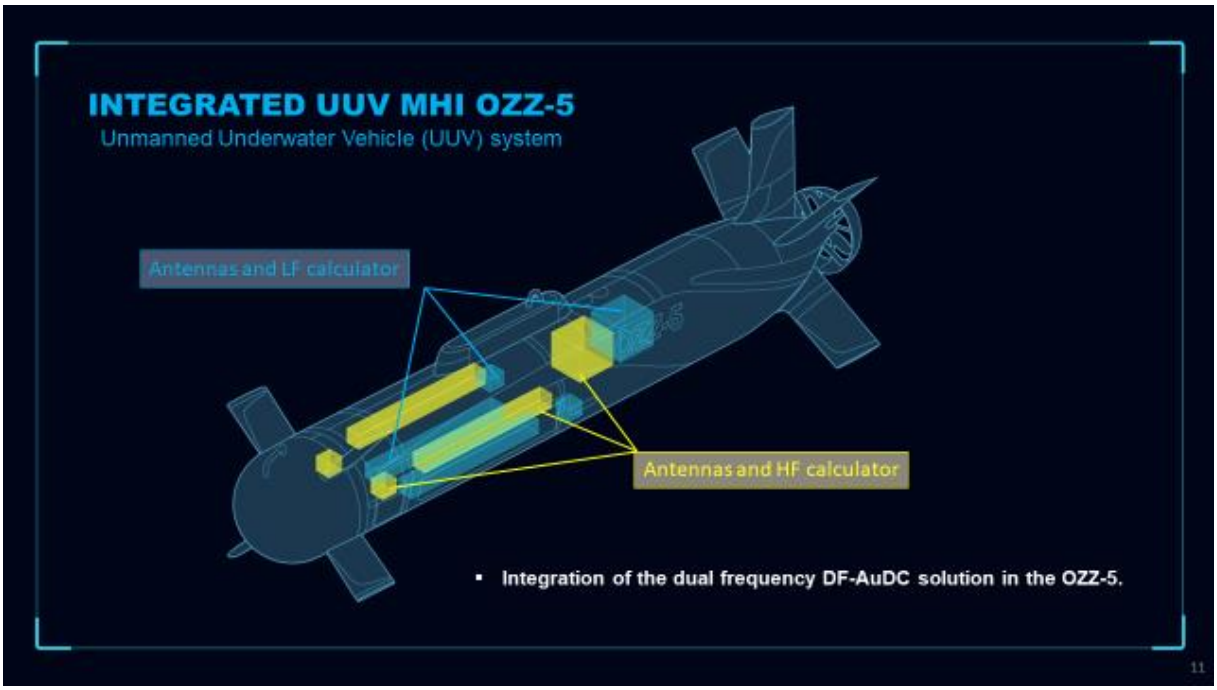
The industrial partners involved in this project Thales DMS on the French side and Mitsubishi Heavy Industries on the Japanese side. The aim is to develop a demonstrator improving the operational capabilities of detection and classification of buried mines from an autonomous underwater vehicle (AUV).

While mines pose a potential threat to everyone at sea, dealing with them effectively is vital to keep key trade corridors open and to guarantee maritime access and force projection—this is especially important for countries with highly valuable assets or ports that have a high volume of commercial traffic.

In this context, the French-Japanese cooperation agreement marked the launch of a five-year project (until 2026) to design, develop and integrate dual-frequency sonar technology, as well as to conduct sea trials in Japan and France (2 evaluation campaigns in Japan in 2023 and 2 additional campaigns in France in 2025). The aim is to build a project meeting the requirements of the French Navy and the Japanese Maritime Self-Defense Forces. This project is also a way for both nations to remain at the forefront of innovation in autonomous mine countermeasures systems.

A complete system for more efficient detection processing

The DF-AuDC (Dual Frequency - Automatic Detection and Classification system) merges the technologies of SAMDIS, Thales' latest generation high-frequency multi-aspect sonar, and MHI's low-frequency multi-aspect sonar. This convergence is embedded within the same OZZ-5 underwater vehicle also developed by MHI.



The system's fully automated processing capability also works in conjunction with a post-mission analysis (PMA) station developed by each industrial partner. The station features computer-aided detection and classification (CAD/CAC) tools and can display the results of the on-board processing on a console on the surface vessel. This keeps human operators in the loop at all times, significantly expanding the system's capabilities and performance to all mission profiles and environments.

This complete system offers a number of key benefits:

- Fewer false alarms
- Higher probability of mine classification
- Detection of buried and partly buried mines
- Lighter operator workload
- Faster target identification

The smart integration of the High Frequency & Low Frequency sonars, coupled with a combined automatic detection and classification function, will not only provide capability and performance enhancement into a single solution but will also mutually benefit from each sonar's processing and imaging. This will result in a unique autonomous mine countermeasure system capable of detecting, classifying and localizing all types of mines from bottom laid mines to fully buried mines.