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Europe's long-standing interest in maritime unmanned aircraft continues to build, and its industry is hoping to catch up with and surpass U.S. rivals by cracking the technological challenge of operating from warships in high seas.

Automatic launch and recovery of unmanned rotorcraft is a major challenge in the operational environment that is a ship at sea. But when it comes to the delicate maneuvering required to land helicopters onboard patrol boats and frigates— especially in rough weather—machines may soon outperform their masters.

"Today, ship-landing unmanned helicopters requires calm sea, good weather, with an external pilot. But we are getting rid of these constraints," says Jean-Noel Stock, vice president of drones, surveillance and intelligence at Thales, which with French shipbuilder DCNS is developing the D2AD automatic deck-landing system for future naval unmanned aircraft systems (UAS).

France has taken a lead in demonstrating technology for automated land- and ship-based vertical-takeoff-and-landing (VTOL) operations, but the U.K.'s Royal Navy has a potential requirement for a rotary-wing shipboard UAS and a joint program looks possible.

Thales, EADS-Astrium and Indra are among a growing number of European companies developing automatic VTOL systems for unmanned rotorcraft operating in challenging sea-state environments (see p. 33). In October, under the D2AD project, French defense equipment agency DGA completed a four-year demonstration of unmanned rotorcraft capable of landing onboard ships in difficult weather conditions. The project culminated in 30 successful takeoffs and landings of a Boeing H-6U Unmanned Little Bird on the Lafayette-class frigate Guepratte off Toulon Sept. 24-Oct. 4.

"The roughest we got to was Sea State 3, but we gathered enough data to put that into our simulation model and demonstrate our system was [capable] up to Sea States 4 and 5," Stock says. Sea State 5 means waves up to 12 ft., winds to 40 kt. and a frigate flight deck rolling 15-20 deg.

Derived from the launch and recovery system for the Thales Watchkeeper fixed-wing tactical UAS, D2AD includes a shipboard segment using radar sensors for guidance and motion-prediction software to anticipate the ship's movement. The flight segment, which functions independently of GPS and is adaptable to different types of UAVs, involves an airborne beacon and deck-lock harpoon that engages a landing grid and holds the aircraft to the flight deck.