

Space technology to drive autonomous ships

It was reported by the European Space Agency (ESA) from Paris on 30 November that Director General Jan Wörner had signed a Memorandum of Intent with Rolls-Royce, as the two entities agree to investigate how space technology can be used to develop autonomous and remote-controlled ships.

The partners will pool their expertise to analyse and implement space-enabled services for autonomous and remote-controlled shipping, which reduces the opportunity for human error and allows ships' crews to concentrate on more valuable tasks.

It is understood that the plan is to study the applications of various space assets to autonomous shipping, such as satellite-based positioning, better situational awareness using Earth observation data, and satellite communications (satcom) services for improved onboard connectivity.

Collaboration with the Rolls-Royce Ship Intelligence division aims to develop and validate new ship-to-shore integrated land-based and satellite-based systems.

ESA has been working on these for some time under its Satellite for 5G (S45G) initiative.

S45G aims at developing and demonstrating integrated satellite- and terrestrial-based 5G services, across multiple vertical markets and various use cases.

It was reported that the 5G next generation of communication services will rely on this harmonious integration of networks, driving a convergence of fixed and mobile services, including satcom services.

Weave together terrestrial and space services

Furthermore, it was reported that ESA is supporting the technological and supply chain evolutions that are required to weave together terrestrial and space services, with a focus on the transport sector (maritime, aviation and land based), and on other markets such as public safety and media.

This unified space-and-ground service is what will enable the operation of commercial autonomous shipping, as well as drive innovation in future commercial marine vessels, cargo logistics and smart ports, it is understood.

The two partners, ESA and R-R, have agreed to cooperate to test, validate and innovate on satcom connectivity technologies and applications between vessel

and shore, as well as support the testing and modelling of the safety-critical software that would make self-operated ships viable.

Future Rolls-Royce navigation and telecommunication equipment will be able to be tested at ESA's technical centre in The Netherlands, capitalising on the centre's space-grade facilities.

Jan Wörner said: *'Space technologies provide tangible benefits for the citizens of Europe. Partnerships, such as this one with Rolls-Royce, take solutions originally developed for the unique challenges of the space environment and bring them down to Earth.'*

'Space 4.0 and ESA's Satellite for 5G initiative enable, support and foster developments, validations and trials of products and applications in diverse areas of the maritime industry, and this partnership between ESA and Rolls-Royce will enable satellites to serve ship intelligence, marine operations, navigation, cargo logistics, maritime safety, healthcare, passenger and crew communications.'

Picture captions

An autodocking system automates the first and last phases of the crossing right up to the quay.

Autodocking systems use additional sensors to assess proximity to harbour structures such as moles at the entrance, and distance to the berth. The propulsion system is adjusted by the system to bring the ferry safely and with minimum energy consumption to and from the docks.

Photo: Copyright: Rolls-Royce Plc © Id 387300.

ESA will improve satellite-based ship identification and tracking in partnership with the European Maritime Safety Agency and exactEarth to meet the requirements of users, particularly those of government agencies such as coastal administrations.

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