

AUTONOMOUS MEASURING PLATFORMS

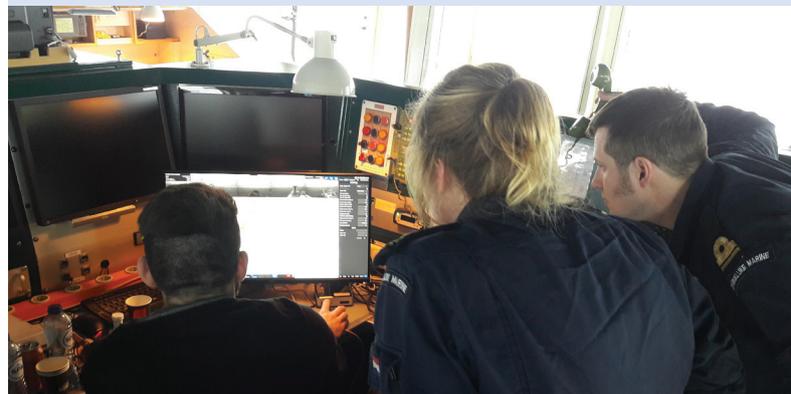
Water quality and quantity, and the ecological status of water bodies, are generally monitored by large vessels and by stationary sensors in a monitoring network. Some of these manned vessels are inflexible, expensive and over-dimensioned. A government-funded reconnaissance study was launched to investigate the options for replacing manned vessels with unmanned platforms. The major benefits of these unmanned platforms are that they can be deployed 24/7, they are cheaper to operate (>90%), and they cut carbon emissions by up to 95%. In addition, by contrast with stationary systems, a range of sensors can be deployed and the platform can conduct monitoring activities in adverse weather conditions that would force a manned vessel to stay in port.

The overall goal of the project is to accelerate the introduction of autonomous multipurpose measurement platforms in the Netherlands and abroad. Geophysical, geochemical and other techniques can be combined in the platform. Accelerating implementation implies not only technical feasibility but also the authorisation of the use of systems of this kind. However, there is no legislation for unmanned/autonomous platforms at present. A nautical safety plan for autonomous vessels was developed by a consortium of the Ministry of Infrastructure and Water Management, Rijkswaterstaat, the Dutch national shipping company, the Royal Dutch Navy, the Dutch coastguard and the harbour authorities of Den Helder in order to remedy this legislative gap. The safety plan includes scenarios to be tested before permission can be granted to take the crew off the vessel and to sail unmanned. An example of a scenario is a head-on approach of two vessels in which the autonomous vessel is expected to manoeuvre to starboard. In November 2017, two commercial companies demonstrated the capabilities of the vessels in the Dutch part of the North Sea: the vessels passed all the tests in the scenarios as described in the safety plan. The sensor used in this test was a multi-purpose water quality sensor that measured oxygen, turbidity, pH, conductivity, chlorophyll A, blue-green algae and temperature. The coastguard and the navy assessed the performance of the autonomous vessel during the tests and submitted their independent advice to the Dutch Ministry of Infrastructure and Water Management.

The collaboration between what is technically possible (for the private sector), what is legally permissible (in policy terms) and the application of this innovation is unique in the world. The introduction of autonomous multipurpose measurement



Unmanned vessel during the test in November 2017



Royal Dutch Navy personnel assessing performance in one of the scenarios from the safety plan

platforms that can operate safely and continuously on Dutch and other waterways, measuring and sending the data real-time to users, will have numerous applications and will push field measurements forward to the next stage. 

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Further reading:

Verheul (2017) Varende Drones op de Noordzee. Available on <https://www.deltares.nl/en/publications/>