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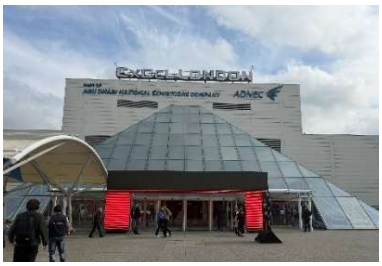
No. 26-05. Oceanology International 2026: USV Trends and UK Regulatory Initiatives

◆ Introduction

This report outlines participation in "Oceanology International 2026 (OI 2026)[1] ," held at Excel London[2] in London, UK, from March 10 to 12, 2026. Organised by RX[3], the European Commission[4] describes this exhibition as a leading international forum for marine science, technology, and engineering.



OI2026 Venue

The three-day exhibition brought together 461 companies from over 30 countries, attracting 15,709 visitors in total. At the venue, numerous products related to marine science, technology, and engineering were on display, and demonstrations of full-scale exhibits, such as ships and USV, were conducted at the adjacent dockside. Additionally, conference zones such as the Coast Theatre were established, where a total of 203 speakers participated in seminars and panel discussions.

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1 https://www.oceanologyinternational.com/london/en-gb/blog/press-releases/oceanology-international-2026-wrap-up.html
2 https://www.excel.london/
3 https://rxglobal.com/rx-uk
4 https://blue-economy-observatory.ec.europa.eu/events/oceanology-international-2026-global-nexus-ocean-technology-2026-03-10_en

View of the exhibition booths

During this visit, the author observed a significant number of exhibits featuring Uncrewed Surface Vessels (USV). USV, which are surface vessels operating without a crew on board, are attracting growing attention worldwide.[5] Japan is no exception, with recognised challenges including insufficient testing and development infrastructure (demonstration facilities and field sites) and the absence of adequate regulatory frameworks for unmanned marine vehicles.[6]

This report presents case studies from Europe and the UK, compiled from booth visits and seminars at the venue. The content reflects the author's own observations and is not intended as an endorsement of any specific company.

◆Notable USV Exhibitors

ACUA OCEAN's Exhibition Booth

(1) ACUA Ocean[7]

A startup based in Plymouth, UK. As a USV equipped with a hydrogen fuel cell, it was the first in the industry to obtain certification under Annex 2 of The Workboat Code Edition 3[8], the safety implementation standards for small workboats and pilot boats, as authorised by the UK Maritime and Coastguard Agency (MCA)[9].[10] In addition, its flagship USV, the "Pioneer," runs on hydrogen fuel and achieves 24-hour, zero-emission operation.[11]

(2) Ocean Infinity[12]

Based in Southampton, UK, Ocean Infinity is an industry-leading marine technology company. It seeks to replace the complex operations of large, manned vessels with

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5 https://oceanexplorer.noaa.gov/technology/usv/
6 https://www8.cao.go.jp/ocean/policies/kaiyo_wg/2kai/pdf/shiryo2.pdf
7 https://www.ocean.tech/
8 https://www.gov.uk/government/publications/the-workboat-code-edition-3
9 https://www.gov.uk/government/organisations/maritime-and-coastguard-agency
10 https://www.lr.org/en/knowledge/press-room/press-listing/press-release/2025/uks-first-rouv-certified-under-workboat-code-3-as-lloyds-register-awards-compliance-to-acua-oceans-pioneer/
11 https://www.bbc.co.uk/news/articles/ckgzm0xr909o
12 https://oceaninfinity.com/

unmanned alternatives. Rather than relying solely on fully autonomous navigation, the company prioritizes remote operation, in which human operators monitor and control missions from a land-based Remote Operation Centre (ROC).

(3) XOCEAN[13]

An Ireland-based company, XOCEAN operates USV equipped with hybrid power sources (solar panels, batteries, and small generators). Notably, it leverages high-speed internet services such as Starlink[14] and the Global Navigation Satellite System (GNSS) to remotely control its USV worldwide, including in Japan, from a Remote Operation Centre on land.

XOCEAN's exhibition booth

(4) Maritime Robotics[15]

Headquartered in Norway, Maritime Robotics offers vessels tailored to various applications, ranging from eco-friendly small boats to USV capable of long-term operation. Having established a sales track record with Japanese firms, its products support surveys of shallow waters and harbour topography. Beyond vessel sales, the company also provides the onboard systems that serve as the navigational "brain," enabling a higher degree of automation.

◆ Institutional Challenges to USV Adoption

At a panel session held at the venue, titled "EXPLORING THE FUTURE POTENTIAL OF IN-WATER TEST FACILITIES FOR DUAL-USE "[16], industry operators and regulatory authorities engaged in a candid exchange of views on the practical institutional challenges surrounding the 'barriers to testing and certification' hindering USV

Scene from the panel session

13 https://xocean.com/
14 https://starlink.com/
15 https://www.maritimerobotics.com/
16 https://www.oceanologyinternational.com/london/en-gb/programme/session-details.4738.255927.panel-exploring-the-future-potential-of-in_water-test-facilities-for-dual_use.html

adoption. In the UK, the MCA navigates innovative technologies through the interpretation and application of existing laws and regulations. Where these do not provide sufficient coverage, guidance such as MGN 664 is applied, and exemptions from existing regulations may be granted where necessary. To obtain such certifications or exemptions, applicants must demonstrate the basis for their risk assessments and safety cases and secure MCA approval.

(1) Legal Framework: The Paradox of the "Vicious Cycle" of Testing and Certification

ACUA Ocean, speaking as an industry representative, highlighted that the current safety certification process imposes a “brutal” burden on startups in terms of both cost and effort. In response, Sam Hodder of the MCA, the regulatory authority, acknowledged that a structural contradiction exists: “in order to have the data available to demonstrate your safety case, you need to have a vessel that you could take out, like a test on, and you can't take out and trial your vessel because you can't get it coded because it's not been able to demonstrate a safety case.” The session further underscored that relying solely on physical testing at sea proves insufficient and risky for demonstrating compliance with the Collision Regulations (COLREGs)[17] in congested waters. Consequently, there is a growing recognition that safety evidence must be provided using “digital twins (simulations)”[18], which accurately replicate vessel hulls and real-world physical phenomena in a virtual space.

(2) Documentation: An Obstacle to Flexible and Rapid Technology Development

ACUA Ocean further emphasised the challenges startups face in independently preparing the complex documentation demanded by regulatory authorities on safety standards and risk assessments. The requirement for re-certification even upon minor changes to a vessel's specifications was also criticised as a factor that stifles the flexible and rapid approach to technological development, one of “failing fast and improving fast”.

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17 https://www.imo.org/en/about/conventions/pages/colreg.aspx

18 https://www.classnk.or.jp/hp/ja/news.aspx?id=14402&layout=1&type=p

◆ UK Initiatives Addressing the Above Challenges

(National Centre for Marine Autonomy / NCMA)

To address these two challenges, the UK launched national-level initiatives centred on the Plymouth region. There, the UK Ministry of Defence (MoD)[19] has designated the National Centre for Marine Autonomy (NCMA)[20], fostering collaboration among industry, academia, and government as outlined below.

(1) Addressing Regulatory Inconsistencies: A Phased Testing Framework and Dedicated Test Environments

To break the "vicious cycle" of testing and certification, Plymouth Marine Laboratory (PML)[21] and the University of Plymouth[22], key NCMA partners, are collaborating with the MCA to develop the Maritime Regulatory Innovation Framework (MRIF)[23]. Rather than mandating full safety certification from the outset, this framework permits phased sea trials by establishing operational risk mitigation measures (initial safety cases), such as the deployment of standby vessels and emergency shutdown procedures. This allows prototype vessels to undergo specification changes and equipment modifications mid-process without delay. Complementing this framework, "Smart Sound Plymouth"[24], an approved test area spanning approximately 1,000 square kilometres, serves as a dedicated testing ground. Furthermore, efforts are underway to supplement safety evidence using digital twins for scenarios where physical testing carries unacceptable risk.

(2) Alleviating the Documentation Burden: Hands-On Expert Support

To address challenges in documentation, the NCMA provides hands-on, close-proximity support, with experts from universities and PML working closely alongside company teams throughout the process. They offer direct, hands-on assistance, helping to clarify the intent behind regulatory enquiries and determine how best to formulate responses and translate them into submission documents, substantially

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19 https://www.gov.uk/government/organisations/ministry-of-defence
20 https://www.marineautonomy.org.uk/
21 https://pml.ac.uk/news/plymouth-is-to-be-the-national-centre-for-marine-autonomy/
22 https://www.plymouth.ac.uk/research/marine-autonomy
23 https://www.gov.uk/government/publications/projects-selected-for-the-regulators-pioneer-fund/projects-selected-for-the-regulators-pioneer-fund-2022
24 https://smartsoundplymouth.co.uk/

reducing the time and financial burden on companies and enabling more agile technological development.

◆ Conclusion

Through booth visits and seminars at OI 2026, this report has compiled information on initiatives surrounding USV development and deployment. It appears that USV are at an inflection point toward integration with existing legal frameworks and broader social deployment. Japan faces similar challenges, including insufficient development environments such as demonstration facilities and field sites, and the need to establish appropriate regulatory frameworks for unmanned marine vehicles. Industry-academia-government collaboration is widely regarded as a cornerstone in addressing these challenges. The UK initiatives examined in this report offer instructive models for Japan as it seeks to bring new technologies to market more quickly. These include phased testing and certification frameworks, dedicated test environments, and sustained hands-on support through public-private-academic partnerships.

The next Oceanology International is scheduled to take place at Excel London from 14 to 16 March 2028.

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View of the River Thames from the venue

All photos were taken by the author