



U.S. Coast Guard

Maritime Autonomy:
The Future is Technology

2023 Maritime Risk Symposium

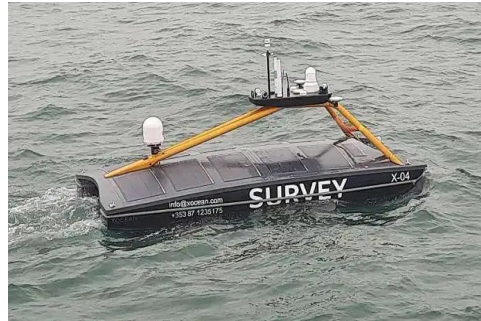
Captain Dan Cost, P.E.
Chief, Office of Design & Engineering Standards (CG-ENG)



USCG Autonomy Engagement in MTS



- Space recovery operations
- Oceanographic survey
- Automated / Remote Control functions on existing ships



XOcean's uncrewed surface vehicles (USVs) – Ocean data-collector



Bedrock – Undersea ocean exploration



American Courage – Semi-autonomous Great Lakes Bulker



SpaceX droneship



MAYFLOWER 400 – Autonomous AI vessel traversing the ocean

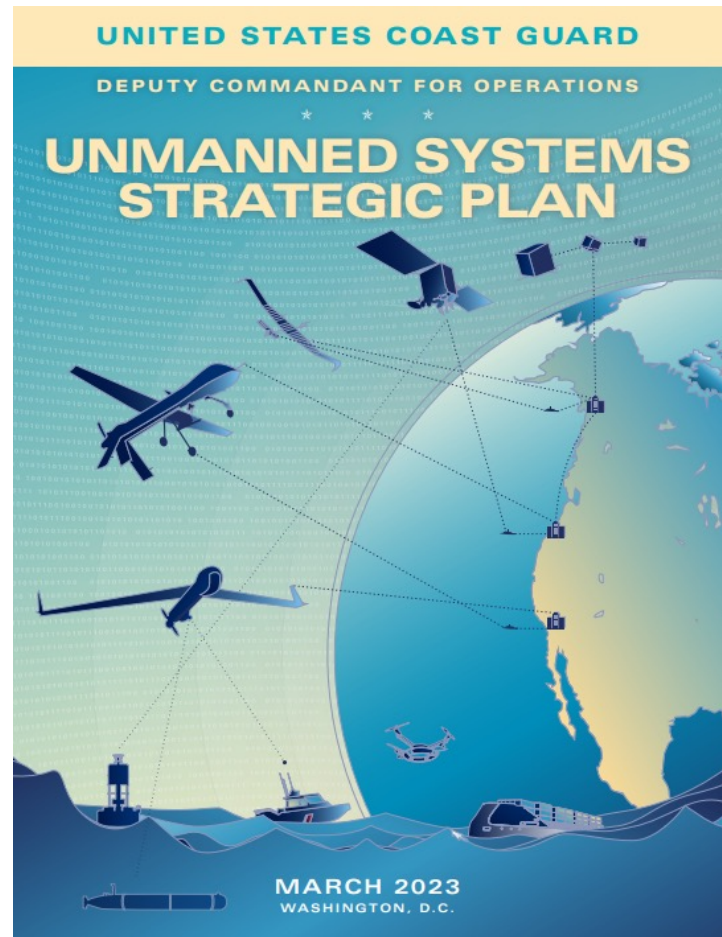


USCG DCO Unmanned Systems Strategic Plan



Strategic Goal 2: Establish a prevention and response framework essential to facilitate the safe use of remotely operated and autonomous vehicles and systems in the MTS

- Objective 2.1 - Implement a risk-based regulatory, compliance, and assessment regime for safe use of emerging autonomous and unmanned technologies in the maritime industry, while developing and incorporating international and industry recognized standards.
- Objective 2.2. Develop expertise in remotely operated and autonomous systems to support prevention and response activities.
- Objective 2.3. Collaborate with domestic and international partners, apply lessons learned in development and testing of unmanned systems, and support development of industry standards and international requirements for remotely operated and autonomous vehicles.





USCG Autonomous Tech Engagement Actions - Domestic



- Automated and Autonomous Vessel Policy Council – AutoPoco
 - ❖ Technical knowledge development
 - ❖ Regulatory framework development
 - ❖ Manning training and credentialing assessment



SpaceX droneship

- Current Efforts
 - ❖ Encourage technology testing/analysis in compliance with existing regulations
 - ❖ Collaborate with early adopters
 - ❖ Leverage existing authorities for alternate designs and equivalents
 - ❖ Consider mariner and workforce functions and training requirements
 - ❖ Evaluate pilot program (NDAA Sec 11504)
 - Remote over the horizon monitoring and procedures for unaccompanied operation of spaceflight recovery vessel
 - Unmanned vessel transits and test operations outside of 12 nm



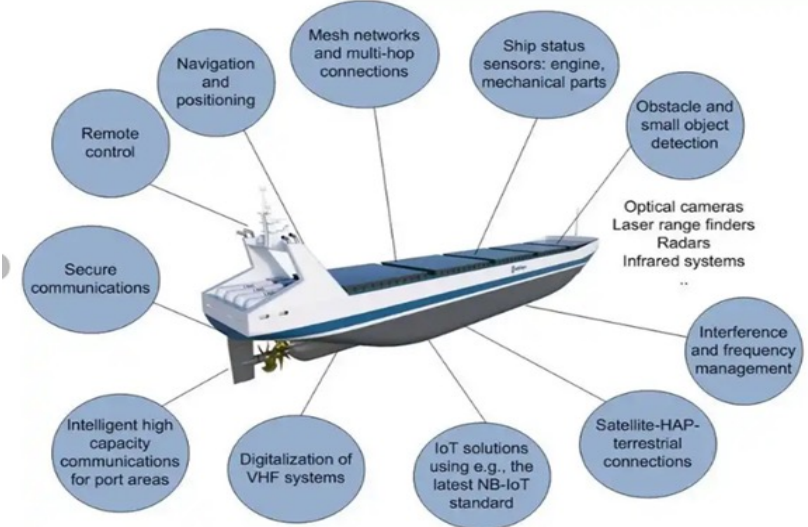
USCG Autonomous Tech Engagement Actions - International



- IMO – Marine Autonomous Surface Ships (MASS)
 - ❖ 3 committees (MSC, LEG, FAL) have conducted Regulatory Scoping Exercises
 - ❖ Identified Common Gaps and Themes
 - ❖ Developed Roadmap (Plan) for requirements that will support MASS Operations
 - ❖ MSC – Developing MASS Code
 - ❖ MASS JWG (MSC, LEG, FAL) – considering common gaps and themes



- Common themes & gaps
 - ❖ Role/meaning of master, crew responsible person
 - ❖ Remote operator / control station
 - ❖ Connectivity/cybersecurity
 - ❖ Terminology



Connectivity challenges of an autonomous ship.

[Connectivity challenges of an autonomous ship. | Download Scientific Diagram \(researchgate.net\)](#)