NEW YORK STATE | NYSERDA

Maritime Technical Working Group

Virtual Presentation

November 13, 2025 | Zoom Webinar

Purpose of today's meeting

1. To share State and member updates
2. Discuss the draft Autonomous Vessel Uses in Offshore Wind Study
3. Strategize priorities and needs moving forward

Member Updates

State Updates

Update on the Autonomous Vessel Uses in Offshore Wind Study

Autonomous Vessel Study Update

1. Study Recap
2. Technology and Use Cases, and Challenges
3. Regulatory Context and Jones Act Compliance
4. Workforce Development and Training
5. Applications for New York Harbor and Future Actions for Integration
6. Discussion and Next Steps

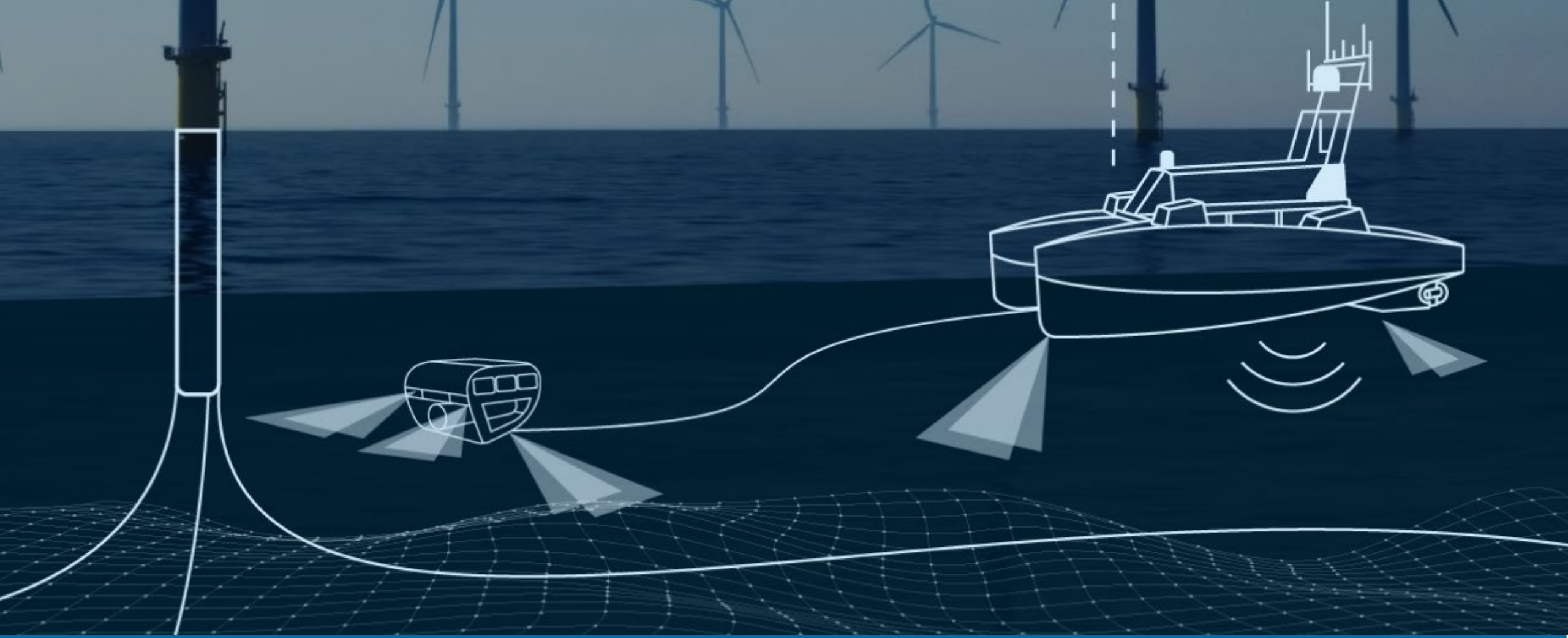


Figure source: BalticWind.EU (2025), "Ocean Winds Supports the Implementation of Innovative Unmanned Robots to Operate on BC-Wind Offshore Wind Farm."

Study Recap

Purpose & Scope of the Study

Purpose
Addresses knowledge gaps in autonomous vessel deployment, navigation, and offshore wind impacts.

Provide a guidance document for shared learning.

Key Themes
Regulatory alignment, workforce and training, infrastructure modernization, cybersecurity resilience, and Jones Act compliance.

Scope
Literature review
Stakeholder interviews
Case Studies
Synthesis: opportunities, constraints, risks, application

Types & Classifications of Autonomous Vessels

Types
Surface, underwater, and remotely operated vessels—each with varying human involvement

Degrees of Autonomy
Range from crewed ships with automation to fully self-governing vessels

Classification Systems
Defined by IMO, European Commission, and Lloyd's Register, outlining levels of autonomy and human control

IMO Levels
Four tiers → crew-assisted automation to fully autonomous operation

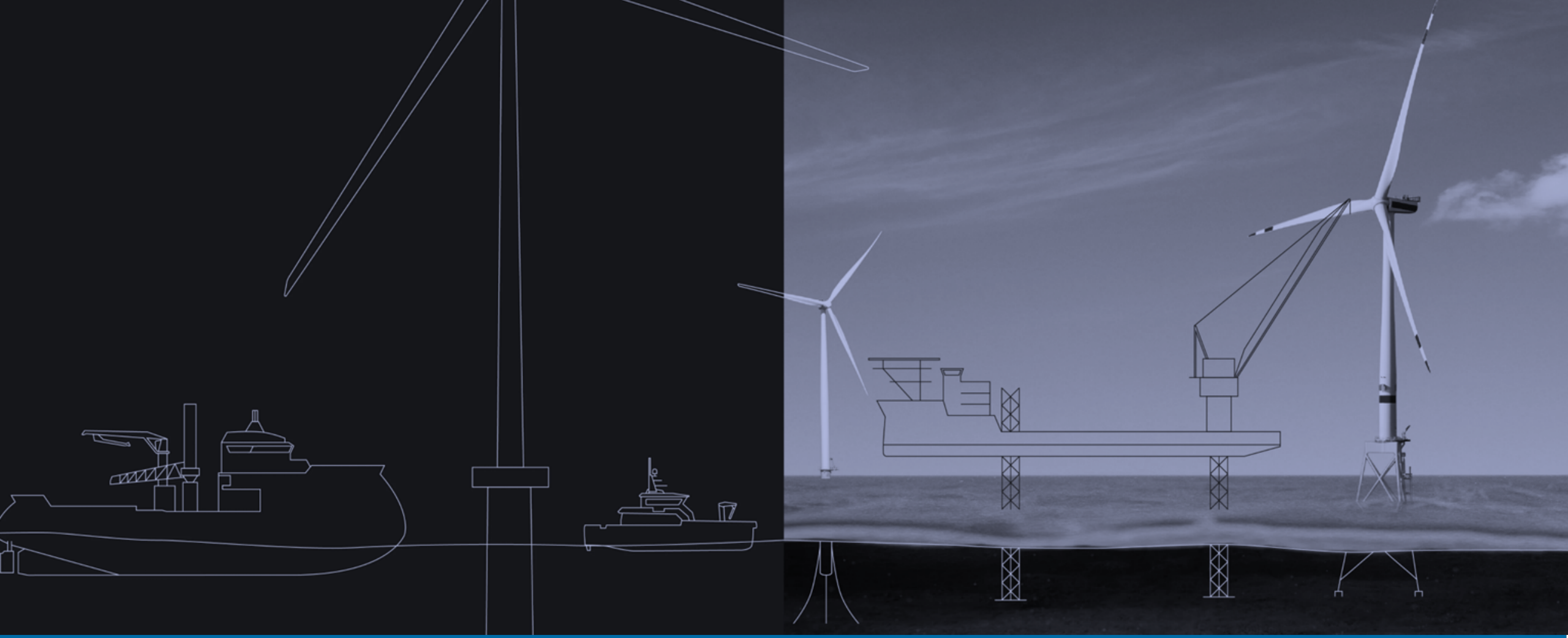
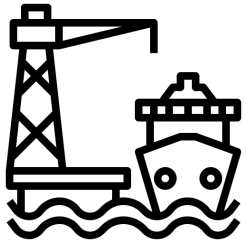


Figure source: DNV. *Offshore Wind Vessels in the U.S.* www.dnv.us/maritime/offshore-wind-vessels-in-us .

Key Findings: Technology, Use Cases, and Challenges

Key Technological Infrastructure

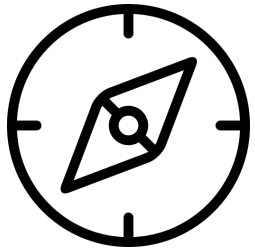
Infrastructure
Ports need upgraded comms, remote control hubs, and automated docking systems



Sensors
Reliable radar, lidar, and cameras enable operation in harsh marine environments

Cybersecurity
Encrypted, fail-safe systems protect against digital threats and malfunctions

Navigation
Advanced algorithms ensure safe routing and compliance with collision regulations



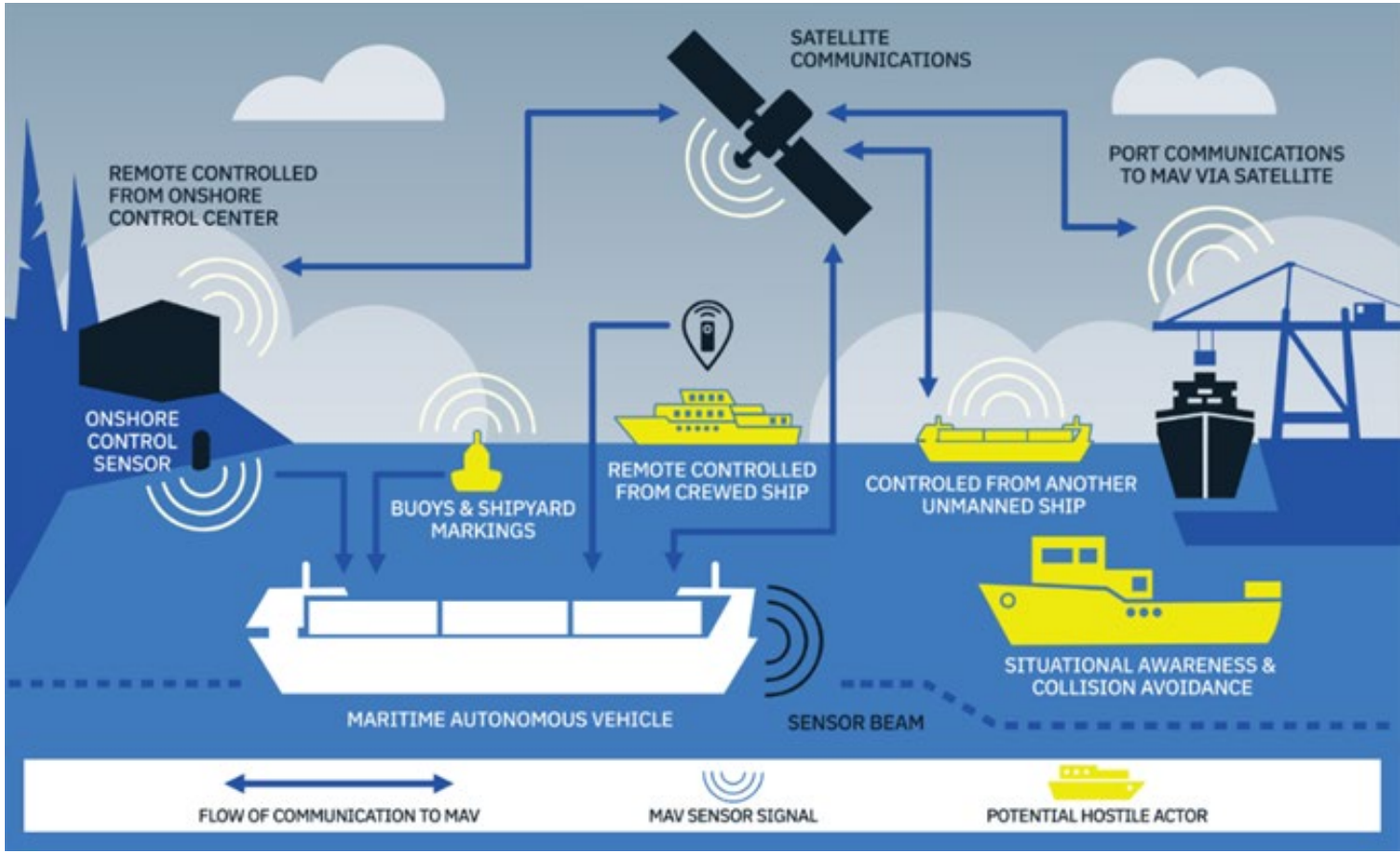
Use Cases

Seabed Mapping
Conduct hydrographic surveys in hazardous or sensitive areas—minimizing human risk

Environmental Monitoring
Track ocean data (temperature, salinity, noise, chlorophyll) over long durations

Asset Inspection
Use ROVs and autonomous systems to generate 3D models for offshore maintenance

Operations & Logistics
Enhance safety, cybersecurity, and port efficiency through automation



Challenges for Adoption

Regulation
Nascent regulations at the international and national level complicate deployment, investment, and compliance

Connectivity
Offshore operations need reliable, high-bandwidth links; retrofits are costly

Infrastructure & Skills
Success depends on modernized ports and a trained workforce skilled in maritime navigation and remote-operations

Safety & Trust
Public confidence relies on transparency and proven safety records

Fugro Blue Eclipse Vessel

Figure source: MaritimEducation. *Safety and Emergency Procedures on Ships.* [redacted].

Policy, Regulatory Context, & Safety Considerations

Current Regulatory Framework

International

IMO Framework
- Developing global safety standards
- Training and crew requirements
- Legal liability
- Nonmandatory rules in 2026
- Mandatory rules by 2030
- Rules in effect by 2032

International Regulations for Preventing Collisions at Sea (COLREGs)
- Navigational “rules of the road” for ships and other vessels

National

USCG
- Operability requirements
- Safety and security standards
- Policy compliance

Jones Act
- Requires U.S.-built and crewed vessels for coastal trade
- Many current applications are exempt from Jones Act
- Retrofitting and new builds as use cases expand
- Challenges for some autonomous operations

Local

VTS (Vessel Traffic System)
- Real-time application to harbor traffic
- Local notice to mariners

Coordination Efforts

Traditional regulatory framework presumes human decision-making capabilities aboard vessels. International regulations and national policies are in development but slow to keep pace. Opportunities exist to harmonize standards for safe deployment and operations.

Workforce Development and Training

Workforce Considerations

Workforce Opportunities
Autonomous vessels create technology jobs and promote maritime industry as a high-tech career field

Specialized Training Needs
Autonomous vessels require new skills in AI, robotics, and remote operations

Regulatory Compliance
Training must meet international standards and focus on safety, legal operations, and emergency procedures

Safety and Reliability
Emphasize safe operation of autonomous vessels, including emergency response procedures and troubleshooting of cables, connectors, and other components of autonomous systems

CRIS team with a remotely operated vehicle used for benthic survey activities

Applications for New York Harbor and Future Actions for Integration

Applications for New York Harbor

Large, Active Port and Complex Maritime Traffic
New York Harbor has a strong Vessel Traffic Service infrastructure system to provide tools for mariners and navigational safety controls

Port Infrastructure and Connectivity
New York Harbor's advanced industrial infrastructure enables integrated systems like AIS, radar, and real-time data streams

Technological Innovation
Advance OSW projects with new tools and procedures, but present unique risks.

Regulatory Considerations
Regulation still developing and local applications are case-by-case, raising uncertainties regarding compliance

XOCEAN Unmanned surface vessels supporting the development of new offshore wind farms off New York."

Future Actions for Integration

Regulatory Guidelines
Develop harmonized guidelines for safe autonomous vessel deployment ensuring clarity and consistency

Industry Cybersecurity & Monitoring
Invest in cybersecurity and environmental monitoring with remote oversight and emergency intervention capabilities

Workforce Training
Implement training programs for remote vessel operation, risk assessment, and system calibration to build resilience

Collaborative Research
Promote collaboration among researchers, industry, and regulators to innovate and share best practices for risk mitigation

Discussion and Next Steps

1. From your perspective, what are the key opportunities, challenges, and risks linked to future implementation of autonomous vessels in the New York Harbor region?

2. How can groups such as the M-TWG stay actively engaged on matters like safe navigation, protecting the marine transportation system, port investments, and economic growth to facilitate emerging autonomous technologies and effective shared use of the waterways?

3. Are there additional topics around the theme of autonomous vessels that the M-TWG wishes to explore further through additional research and analysis?

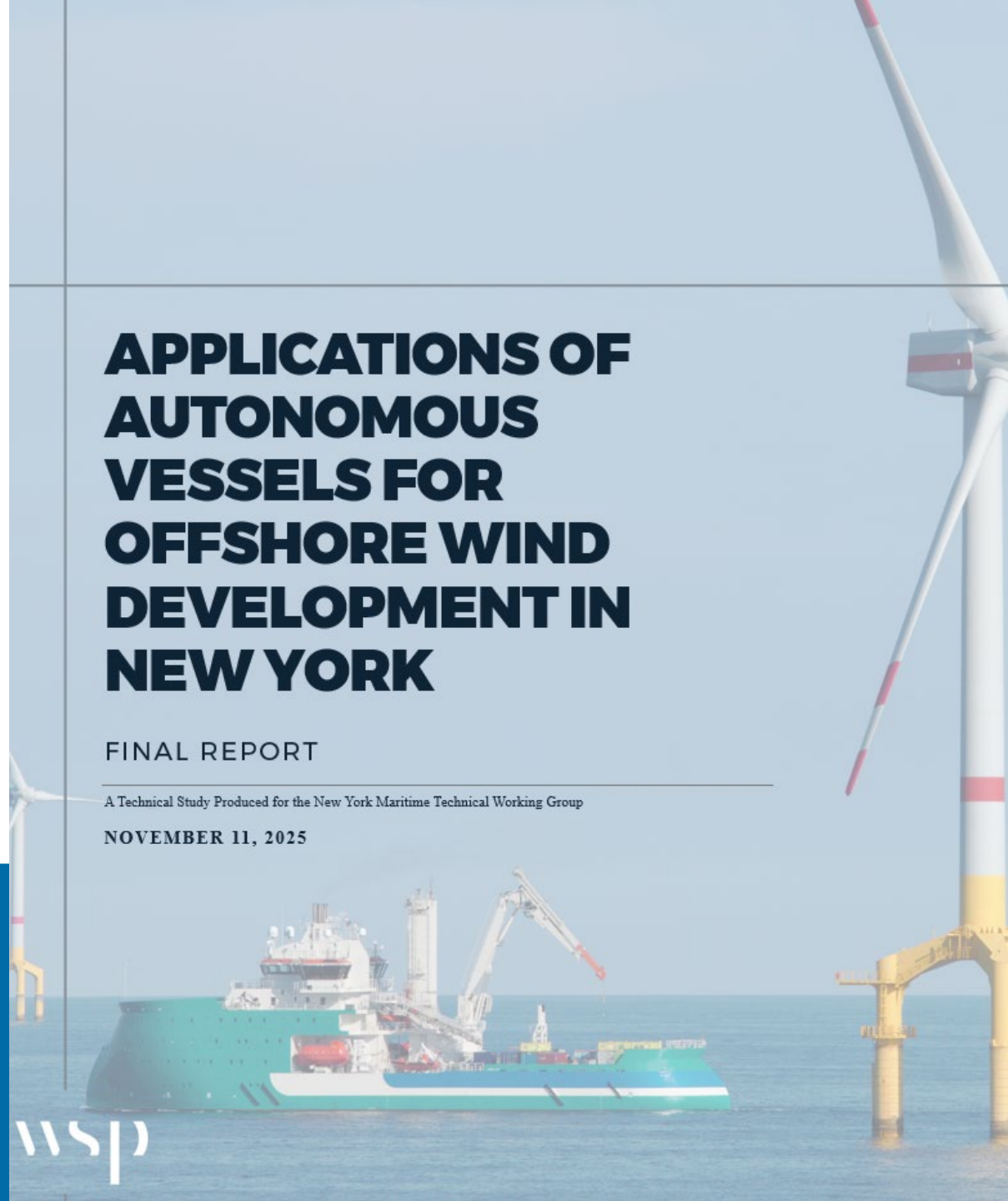
4. Is the M-TWG interested in continuing to track policy and regulatory changes concerning autonomous vessels?

5. Is M-TWG interested in learning more about specific organizations or companies involved in the autonomous vessel industry?

Discussion

Next Steps

1. **M-TWG to Review and Provide Comment on Report:**
   - 2025.11.3 Autonomous Vessel Study_Task 6_Final Report CLEAN - Adobe cloud storage
2. **Comment Period Open Until December 4**
3. **WSP to incorporate comments and finalize report by end of December**



Shared Research Agenda Prioritization

Shared Research Agenda Topics

1. **Acceptable Level of Risk Determination**
   - Installation of fixed infrastructure (e.g., wind turbines, offshore substations, electrical cables) and the addition of new vessel traffic into an existing and busy waterway will introduce a new risk of allision (fixed structures) and potentially increase the risk of collision (vessels) as well as anchor strikes.
2. **Set-Back Distance**
   - Set-back distance refers to the minimum clear distance between a vessel traffic lane and the nearest physical structure that presents a potential for vessel allision (vessel strikes a stationary object).
3. **Impacts to Navigation Radar and Radio Communication Systems [Incl. Automated Identification System (AIS)]**
   - Wind turbine generators can cause a screening or interference effect, obscuring some vessels from the radar of vessels passing by the other side of the wind farm, as well as potential interference to very high frequency (VHF) signals.
4. **Submarine Cable Routing**
   - Cables from OSW energy areas are critical infrastructure needed to connect the OSW farm to the onshore power grid that necessitate shallower burial, heightening the risk of anchor strikes, damage to the cable, and at the worst, the safety of the vessel and crew.
5. **Considerations for Cable Burial Depth**
   - To better protect submarine cables from damage and ships' gear from fouling (e.g., anchor strikes and fishing gear), submarine cables can be buried deeper.
6. **Anchor Strike Liability**
   - Stakeholders are concerned that if cables are inadequately buried, vessel anchors may inadvertently damage a cable, and the vessel owners/operators may be liable for the cost of cable repair and/or outages.
7. **Jones Act-Compliant Vessel Availability**
   - The Merchant Marine Act of 1920, more commonly referred to as the Jones Act, requires that the transportation of cargo and personnel from one U.S. port to another U.S. port must be completed by a vessel that is built, owned, and operated by U.S. citizens or permanent residents.
8. **Construction and Operational Safety Zones**
   - BOEM guidance states that developers are expected to recommend construction safety zones, as was done during construction of the Block Island OSW project.
9. **Seabed Infrastructure Security**
   - Seabed infrastructure, including submarine cables and the OSW turbine generators, is vulnerable to sabotage and physical and/or cyber-attacks from foreign adversaries ("Grey Zone Warfare") or non-state actors.
10. **Future Ports: Regional Shipyard Capacity, Ports Investments, Workforce Development**
    - Offshore energy facilities require operations and maintenance activities to be performed through their construction and operational life. Vessels supporting this work will be transiting from the marine terminals, likely in the New York Harbor region, to the OSW areas.

Next Steps

Thank you!