ITAR Regulation of COLREGs Hinders Safety and American Innovation

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Disclaimer: The following is an opinion piece and is not legal advice. The author is not a lawyer.

The International Regulations for at-sea Collisions (COLREGS) are the "rules of the road" for maneuvering safely at sea. Compliance with COLREGS is required for all vessels by both U.S. and international law. Despite being a critical safety feature required by law, the International Traffic and Arms Regulations (ITAR) currently prevent the export of COLREGS-compliant autonomous vessel technology from the US. In this case, an "export" includes piloting a USV into international waters to conduct a survey.

A Primer on COLREGs

The International Regulations for Preventing Collisions at Sea (72 COLREGS), and the U.S. Inland Navigation Rules (33 CFR 83), together form what is colloquially called COLREGS (U.S. Coast Guard, 2023). COLREGS is the "rules-of-the-road" for safe navigation on the water. All vessels operating in U.S. and international waters are required to comply with COLREGS. Although the exact interpretation of how COLREGS applies to uncrewed vessels is still undecided (Suffern, 2024), there is broad agreement in industry that all USVs should be piloted in a manner consistent with COLREGS. Compliant autonomous maneuvering behaviors have been demonstrated, and the methodology is well published in detail (Benjamin, 2017). However, some COLREGS rules are still not broadly implemented autonomously, such as the autonomous identification of light signals (Part C of COLREGS), as it is challenging to implement in all conditions.

Figure 1: Commercial Uncrewed Ocean Drones, such as Chance Maritime MC29, have safety technology to avoid collisions.

ITAR

The International Traffic in Arms Regulations (ITAR) governs "the manufacture, export, and temporary import of defense articles, the furnishing of defense services, and brokering activities involving items described on the [United States Munitions List]" (DDTC, 2025). ITAR regulated equipment may not be exported without a license issued by the Department of State. Moreover, only U.S. persons can develop ITAR controlled technologies in the U.S. This excludes any individual with a temporary visa, such as a student visa, or H-1B work visa. Additionally, technical data must be stored on U.S.-based servers with security controls to prevent leakage to foreign entities. Taken together, these restrictions place a significant burden on organizations to protect ITAR controlled designs and equipment, and restrict their ability to hire or sponsor talent with a temporary visa. Thus, the regulations should only be used when it is in the interests of U.S. defense and not applied broadly.

ITAR and COLREGs

Although COLREGS compliance is a critical safety feature required by law, ITAR regulates COLREGS compliant autonomy, designating it as "Significant Military Equipment" in 22 CFR 120.1:

> ** (4) Control and monitoring systems for autonomous unmanned vessels capable of on-board, autonomous perception and decision-making necessary for the vessel to **navigate while avoiding fixed and moving hazards, and obeying rules-of-the road** without human intervention;*

As written, collision avoidance without COLREGS compliance is not controlled; however as soon as one follows the rules of the road, the technology becomes controlled. In effect, this means that the regulation very narrowly restricts technology specific to COLREGS compliant behavior.

Comparison to other Domains

ITAR regulation of maritime surface rules is unique, as no such equivalent export controls exist for air, ground, or undersea maneuvering. Thus, it is legal to export software that ensures a self-driving car drives on the right side of the road, but it is illegal to export software that drives a boat on the right side of a channel. Because the underlying technology is so similar, there is little to be gained controlling one over the other.

Kamikaze Drones

Explosive drone boats have significantly changed the landscape of naval war, both when employed by Ukrainians against the Russian Navy, and when employed by Houthis against commercial ships (Maltezou, 2024). However, an explosive vessel, which is trying to strike a target, isn't going to maneuver in a manner consistent with COLREGS. Thus, this regulation is not applicable to kamikaze drones.

International Access to Technology

COLREGS compliant software such as MOOS-IvP, including source code and methods, is already broadly available to the public worldwide. Such software can be downloaded by anyone and used on their uncrewed boat. Perplexingly, if a U.S. company installed that same open-source software on a USV they built, they would be restricted from "exporting" the USV without a license.

Conclusions

ITAR restriction of COLREGS compliant autonomy creates a poor incentive structure for industry, and conflicts with established safe maneuvering law. The continued presence of this regulatory hurdle hinders American innovation and hinders safe technology development.

References

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