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Jennifer A. Carpenter  
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June 27, 2022

RDML Wayne Arguin  
Assistant Commandant for Prevention Policy  
U.S. Coast Guard  
2703 Martin Luther King Jr. Avenue, SE  
Washington, DC 20593

Re: Electronic Chart and Navigational  
Equipment Carriage Requirements  
(Docket No. USCG-2021-0291)

Dear Admiral Arguin:

The American Waterways Operators is the tugboat, towboat, and barge industry's advocate, resource and united voice for safe, sustainable and efficient transportation on America's waterways, oceans and coasts. Our industry's 5,000 towing vessels and 33,000 barges comprise the largest segment of the U.S.-flag domestic fleet. The tugboat, towboat and barge industry supports more than 270,000 jobs in related industries nationwide. Each year, our vessels safely, securely and efficiently move more than 665 million tons of cargo critical to the U.S. economy.

On behalf of AWO's member companies, thank you for the opportunity to comment on the Advanced Notice of Proposed Rulemaking (ANPRM) for Electronic Chart and Navigational Equipment Carriage Requirements. As the Coast Guard acknowledges, electronic chart technology has advanced significantly over the past two decades, and it is time to revise the agency's chart and navigational equipment carriage requirements to reflect the widespread adoption of electronic charts and the resulting benefits for waterways safety and efficiency.

This rulemaking is particularly critical due to the 2020 initiation of the National Oceanic and Atmospheric Administration's (NOAA) program to "sunset" the production of paper and raster nautical charts by 2025. Although Navigation and Vessel Inspection Circular (NVIC) 01-16 permits the use of electronic navigational charts (ENCs) in lieu of paper charts, with the discontinuation of paper charts, vessel operators need regulatory certainty to invest in electronic chart systems (ECS) and related equipment for their fleets.

**Electronic charts should be required, with appropriate exemptions, provided that related equipment requirements are reasonable.**

Electronic charts are an important tool to improve navigational safety. Because they can integrate with other navigational systems, such as electronic position fixing devices (EPFD) and automatic identification systems (AIS), can display more information about charted objects, and can provide warnings or alerts about navigation hazards and course deviations, they supplement the situational awareness of the vessel operator in ways that paper charts are unable to do. For these reasons, AWO believes that the use of electronic charts and related navigational equipment should be required for U.S. towing vessels of more than 26 feet in overall length and 600 horsepower, with appropriate exemptions. These exemptions should include vessels operating in limited geographic areas, as determined by the local Captain of the Port. However, if it is to require electronic chart use, the Coast Guard must ensure that requirements for related navigational equipment are reasonable and that compliant equipment is readily available and affordable, as discussed below.

**The IEC and RTCM standards are too prescriptive for most U.S. towing vessels.**

Most U.S. towing vessels do not engage on international voyages, are not subject to the International Convention for the Safety of Life at Sea, and therefore, are not required to carry an Electronic Chart Display and Information System (ECDIS). Because of the expense of these systems, most domestic towing vessels that have adopted electronic charts have chosen to use software-based, platform-independent ECS with display systems that meet the ECS manufacturer's specifications. These specifications ensure the selection of equipment with adequate capabilities to reliably run the charting software, such as sufficient memory for charts, routes, tracks, and publications, along with virus and cyber protections to prevent corruption and unwanted access. The IEC and RTCM standards integrate hardware and software requirements and require hardware to be manufactured to withstand adverse operational conditions. However, standard consumer electronic equipment is no longer as susceptible to environmental degradation or vibration and is much more widely available and affordable than ECS that meet the IEC and RTCM standards. Further, off-the-shelf computers and monitors have been used with software-based, platform-independent ECS safely and effectively for many years, and AWO is aware of no marine casualty data indicating that a hardware insufficiency or failure has contributed to an accident. Therefore, AWO urges the Coast Guard to permit the use of software-based, platform-independent ECS with display systems that meet the ECS manufacturer's specifications for all non-SOLAS U.S. towing vessels operating on domestic routes both inside and outside of the territorial sea baseline.

**Integration of certain electronic navigational equipment with ECS enhances safe navigation.**

AWO recommends that EPFD, AIS, and gyro compass, satellite compass (if fitted) or other means to determine a vessel's heading should be required to be integrated with ECS to maximize the effectiveness of the ECS and enhance navigational safety. Together, this equipment supplies the ECS with real-time information regarding the position, speed, and heading of the vessel and the location of other vessels in the waterway. Towing vessels are required to carry this equipment and integration with this equipment is already standard for many existing ECS.

Marine radar, magnetic compasses, and voyage data recorders should not be required to be integrated with ECS. While towing vessels are required to be equipped with marine radar, AWO believes that the integration of marine radar with ECS should be optional because it is not necessary to the effectiveness of the ECS and is not typical for existing ECS. Meanwhile, many towing vessels are not equipped with magnetic compasses and are not required to carry voyage data recorders. Of course, the operator of a vessel that is so equipped should be free to integrate this equipment with the ECS if the operator chooses to do so.

**Screen size requirements should be adjusted for certain types of vessels.**

AWO recommends against identifying a specific scale for ENC in regulation because ENC are pre-scaled. ECS software enables the user to zoom in and out and automatically adjusts the scale and the level of detail displayed on the screen. The scale of an ENC and display settings of an ECS should be acceptable provided, as stated in current regulation, that the chart is “of a large enough scale and [has] enough detail to make safe navigation of the area possible.”

An important consideration of ECS display systems is screen size. In small towing vessels, particularly those tugs that operate in harbor services, wheelhouse space is constrained and large screens can reduce the operator’s visibility of the waterway. For towing vessels that engage in harbor services, including work in a fleeting area or conduct harbor-assist operations, AWO recommends that the Coast Guard accept ECS displays of 12 inches or more.

**Requirements for back-up arrangements should give vessel operators flexibility to choose the most appropriate and cost-effective option.**

NVIC 01-16 requires vessels operating outside of the territorial sea baseline using an ECS as the primary means of navigation to be equipped with an independent redundant arrangement. AWO recommends that the applicability of requirements for back-up arrangements be carried over from the NVIC to regulation. However, AWO urges the Coast Guard to provide operators of these vessels with greater flexibility than permitted in the NVIC in selecting back-up arrangements.

We recommend a system equivalent to the ECS as a back-up arrangement for SOLAS vessels of 500 GT or greater. Each unit should be connected to an uninterruptible power supply (UPS). All towing vessels have two generator sets for providing power, and SOLAS class vessels have an emergency generator in addition to the primary generators. In the event of a generator failure, a UPS provides immediate battery back-up capability until the vessel’s other generator or emergency generator comes online.

For non-SOLAS vessels on domestic voyages outside the territorial sea baseline, a back-up arrangement should be required, but the vessel operator should have the flexibility to choose the arrangement that is most suitable for the vessel. Many towing vessels have insufficient space on the wheelhouse’s forward console for two equivalent systems. Acceptable back-up arrangements should therefore include an equivalent or a non-equivalent system, such as a laptop running a software-based, platform-independent ECS that meets the ECS manufacturer’s specifications, which can be readily available if the primary computer

malfunctions, and which can be easily situated on the forward console in a location visible and accessible to the operator. Approved paper charts should also be acceptable as a back-up arrangement.

**ECS are cost-effective relative to paper charts.**

AWO members report that their crews spend from 1-2 hours to 12 hours per month updating paper charts, depending on the size of the vessel's area of operation. Mates/pilots tend to handle the updates, and paper charts are replaced when a new edition is produced or when the chart becomes worn. For large companies, the cost of maintaining paper charts can climb to more than \$4,000 per month. Alternatively, an ECS subscription service for large companies costs approximately \$500 per vessel per year, and the chart catalog is automatically updated. AWO members report very few technician callouts for ECS maintenance, and the operator's IT department or the ECS service provider can remotely log in and resolve most issues when needed. Systems that meet the IEC or RTCM standards are very capital-intensive, costing \$15,000 per vessel to purchase and install. Conversely, computers meeting manufacturer specifications for software-based, platform-independent ECS can be readily purchased for hundreds of dollars.

**Prescriptive ECS training courses or requirements are not necessary.**

ECDIS training is not appropriate for mariners whose vessels are equipped with other types of ECS. The hardware and software features of an ECDIS are entirely different from software-based, platform-independent ECS programs and equipment. The framework established by NVIC 01-16 for mariner familiarization is effective, and vessel operators should continue to be able to provide mariners with either in-house or third-party training.

**Requirements for ENC and ECS must be phased in.**

As part of this rulemaking, AWO urges the Coast Guard to provide for a phase-in process that allows vessel operators to continue to use existing ECS in lieu of paper charts consistent with NVIC 01-16 in order to spread the cost of purchasing and installing newly compliant ECS and related equipment over a reasonable time period. This would give operators time to budget and schedule the installations during planned shipyard periods.

**The Coast Guard must ensure that NOAA's sunset program does not disrupt vessel operations or jeopardize vessel operators' compliance with chart carriage requirements.**

Vessel operators are concerned about how long the Coast Guard will provide notice to mariner chart corrections for charts that NOAA has discontinued. If the Coast Guard eliminates chart corrections for cancelled charts, they will no longer be considered currently corrected and cannot be used to meet chart carriage requirements. Given the pace of NOAA's sunset program and the length of time that this rulemaking may take, AWO strongly encourages the Coast Guard to continue producing chart corrections for charts cancelled by NOAA until its ENC and ECS regulations are fully phased in.

Additionally, NOAA has developed a system called NOAA Custom Chart that will enable users to create and print paper charts or have large format charts printed by a NOAA-certified print-on-demand (POD) agent. AWO has recommended to NOAA that traditional paper chart products remain available through POD agents until the Custom Chart application is fully tested, functional, and operational. However, in order for operators to utilize the Custom Chart system to obtain paper charts that meet chart carriage requirements, the system must be approved by the Coast Guard. AWO encourages the Coast Guard to work expeditiously to approve the Custom Chart tool to ensure that vessel operators who rely on paper charts are able to obtain them as NOAA's sunset program continues.

We thank you again for the opportunity to comment on this ANPRM for Electronic Chart and Navigational Equipment Carriage Requirements. We would be pleased to answer any questions or provide further information to assist the Coast Guard in advancing this rulemaking.

Sincerely,

A handwritten signature in black ink that reads "Jennifer Carpenter". The signature is written in a cursive style with a large, prominent initial "J".

Jennifer A. Carpenter  
President & CEO