



Radio Technical Commission for Maritime Services

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**Before the Federal Communications Commission
Washington, D. C.**

Ms. Marlene H. Dortch
Secretary
Federal Communications Commission
445 12th Street, SW
Washington, DC 20554

In the Matter of)
)
Part 80 of the Commission’s Rules and the Use of) WT Docket No. 21-230
the Automatic Identification System for Devices)
that Can Be Used to Mark Fishing Equipment)
)
)

**COMMENTS OF THE
RADIO TECHNICAL COMMISSION FOR MARITIME SERVICES (RTCM)**

Introduction

The Radio Technical Commission for Maritime Services (RTCM) is a non-profit organization whose objectives include improving marine navigation, maritime safety and search and rescue for all at sea through the appropriate use of maritime electronic navigation and radiocommunications systems and practices. Established by the U.S. government in 1947 to support technical decision-making in the area of maritime radiocommunications which in 1982 became a membership non-profit 501(c)(3) organization¹, RTCM develops, encourages and supports needed improvements in maritime communications and electronic navigation through

¹ RTCM membership is comprised of the maritime stakeholders from the US and foreign governments, marine equipment manufacturers, maritime communications service providers, marine dealers and distributors, US government contractors, technical standards organizations, technical service organizations, marine pilots organizations, marine transportation services, marine insurance providers and many other interested parties in the marine industry in the US and abroad.

technical standards, studies, reports, and participation in other domestic and international technical standards and regulatory bodies.

RTCM works intimately with and is a Category A liaison² member of the International Electrotechnical Commission (IEC) Technical Committee 80 – on Maritime navigation and radiocommunication equipment and systems. RTCM is also a member of the US National Committee (USNC) Technical Advisory Group (TAG) for IEC TC80³. The scope of TC80 is to prepare certification standards for maritime navigation and radiocommunication equipment and systems used on ships, and where appropriate on shore, for safety of navigation as well as distress and safety communications purposes. TC80 has currently published 38 standards of which 34 support International Maritime Organization (IMO) requirements and 7 apply solely to various types of AIS equipment. Certain of these IEC TC80 standards were initially developed by RTCM before being incorporated by IEC. TC80 develops and maintains certification test standards for all of the Automatic Identification System (AIS) devices and displays which should be considered in this rulemaking. Most IMO-member administrations rely upon IEC TC80 standards to meet their Safety of Life at Sea (SOLAS) Convention for type approvals of navigation and radiocommunications equipment carried aboard ships as required under the convention.

RTCM is also a sister organization to the International Association of Marine Aids to Navigation and Lighthouse Authorities (IALA), the first developers of AIS. IALA has produced numerous guidelines and recommendations on AIS use, including AIS Aids to Navigation and Mobile Aids to Navigation devices and applications. RTCM and its members have participated in their development and continue to have a close working relationship with IALA.

The US Coast Guard and the Federal Communications Commission typically implement these RTCM and IEC TC 80 standards incorporating them by reference into Titles 33 and 46 (USCG) and Title 47 Part 80 and 95 (FCC) of the US Code of Federal Regulations.

Because RTCM develops navigation and radiocommunications equipment standards and actively follows and participates in the developments of AIS, we are submitting comments to this Notice of Proposed Rulemaking (NPRM).

² The IEC defines Category A liaisons as “Organizations that make an effective contribution to the work of the technical committee or subcommittee for questions dealt with by this technical committee or subcommittee. Such organizations are given access to all relevant documentation and are invited to meetings. They may nominate experts to participate in a WG”. ISO/IEC DIR 1 Edition 11.0 2014-05 §1.17.2.1.

³ The U.S. National Committee of the International Electrotechnical Commission (USNC/IEC) serves as the focal point for U.S. parties who are interested in the development, promulgation and use of globally-relevant, voluntary consensus standards. The USNC is the United States’ representative to the IEC and is sponsored by the American National Standards Institute.

Comments

Presentation of AIS information on shipborne navigation displays

Of the many relevant international standards listed by FCC in its NPRM, perhaps the most relevant and important one not listed is IEC 62288⁴, which describes how AIS information is to be shown by compliant shipboard navigation displays such as Electronic Chart Display and Information System (ECDIS), Electronic Chart Systems (ECS) and radar. IEC 62288 effectively applies to all international shipping under the IMO SOLAS Convention. The US Coast Guard applies IEC 62288 to navigation equipment type approved by the Coast Guard.⁵ RTCM also applied IEC 62288 and its AIS presentation requirements in its non-SOLAS radar and ECS standards.⁶ The US Coast Guard accepts this RTCM ECS standard by U.S. flagged vessels in the use of electronic charts and publications in lieu of paper charts, maps and publications.⁷

IEC and RTCM-compliant shipborne navigation displays present AIS transmissions with symbology specified by IMO⁸. These AIS symbols show the operator whether the AIS transmission is coming from a ship, a ship or person in distress, an aid to navigation, a search and rescue aircraft, etc. The forthcoming IEC 62288 Ed.3 includes symbology for AIS transmissions from IALA and ITU-R-recognized⁹ mobile aid to navigation devices and Autonomous Maritime Radio Devices (AMRD) Group B¹⁰ devices as well.

The accuracy and integrity of displayed symbols used for navigation depend upon proper application of various AIS transmitting devices. The plethora of unauthorized Class B AIS devices sold as fishing equipment markers disrupt that accuracy and integrity. Their transmissions are symbolized as ships and not as an aid to navigation or other hazard, to the consternation of other mariners. Worse, transmissions from easily obtained, low cost, commonly available AIS search and rescue transmitters (SARTs) used to mark fishing gear are displayed to

⁴ [IEC 62288 Ed.2:2014](#) *Maritime navigation and radiocommunication equipment and systems – Presentation of navigation-related information on shipborne navigational displays – General requirements, methods of testing and required test results*. Edition 3 is in the final stages of development and should be published early next year (2022). IEC 62288 implements IMO Resolution MSC.191(79) *Performance standards for the presentation of navigation-related information on shipborne navigational displays*, which is “applicable for all displays on the bridge of the ship”.

⁵ See USCG [Navigation and Vessel Inspection Circular No. 8-03, Change 3](#) dated 24 April 2017.

⁶ [RTCM Standard 11201.0, Marine Radar Equipment for Ships Not Required to Comply with SOLAS Radar Carriage Requirements](#) dated 9 November 2019, and [RTCM Standard 10900.7, Electronic Chart Systems \(ECS\)](#) dated 5 April 2017.

⁷ See [USCG Navigation and Vessel Inspection Circular No. 01-16 CH-2](#) dated 21 May 2020.

⁸ IMO [SN.Circ/243 Rev.2 Guidelines for the presentation of navigation-related symbols, terms and abbreviations](#), 14 June 2019.

⁹ E.g. [Rec. ITU-R M.585-8](#) and [Rec. ITU-R M.2135](#).

¹⁰ Group A AMRDs transmit on channels AIS 1 and 2. Group B AMRDs transmit on channel 2006 (160.9 MHz)

other ships as persons or ships in distress. Such misuse is a clear safety hazard to shipping whose prohibition must be actively enforced.

AIS private aids to navigation

The purpose of all AIS devices transmitting on channels AIS 1 and AIS 2 is to aid in the navigation and safety of all nearby vessels. In situations where the location and extent of fishing gear needs to be visible to and affects the safe navigation of transiting vessels, an AIS aid to navigation (or mobile aid to navigation) device may be appropriate.

The Commission in its NPRM indicated that it has “granted temporary waiver of its rules to permit certification and use of AIS Aid to Navigation (AtoN) stations.”¹¹ An Aid to Navigation is defined as “any device external to a vessel or aircraft intended to assist a navigator to determine position or safe course, or to warn of dangers or obstructions to navigation.”¹² In [33 CFR 66.01-5](#), the Coast Guard specifies the application procedure for private aids to navigation, including AIS aids to navigation¹³. Since the US Coast Guard is responsible for the safety of navigation in US waters, it is only appropriate that the Coast Guard be the agency which decides what application aids in the safe navigation of vessels, and what applications do not.

Traffic congestion and overloading of channels AIS 1 and 2

Problems regarding traffic congestion and overloading of channels AIS 1 and 2 have been well documented in [ITU-R Report M.2287](#) and addressed by IMO in [Resolution MSC.140\(76\)](#). It is a common problem worldwide, including in the US, and is one that cannot be ignored or exacerbated by the unfettered use of other devices transmitting on channels AIS 1 and 2.

AIS message types and TDMA access schemes

The Commission in its NPRM asked “Could the impact [to AIS 1 and 2 overloading or traffic congestion] be further reduced if devices that could be used to mark fishing equipment utilized a carrier-sense time-division multiple-access (CSTDMA) system used by Class B AIS transceivers, as opposed to random access time-division multiple access (RATDMA) used by other AIS devices?”¹⁴ AIS devices generally operate with one of four access schemes: Self-Organizing Time Domain Multiple Access (SOTDMA), Fixed Access Time Domain Multiple

¹¹ NPRM para 3.

¹² 33 C.F.R. §62.3.(a)

¹³ The USCG Navigation Center [AIS Frequency Asked Questions webpage #21 What are AIS AtoN and AIS Aids to Navigation Report](#) elaborates on the Coast Guard’s AIS private AtoN application procedure proscribed in 33 CFR 66.01-05.

¹⁴ NPRM para. 17.

Access (FATDMA), CSTDMA and RATDMA¹⁵. SOTDMA is used by Class A shipborne AIS devices. SOTDMA is effective, but it is processor-intensive and generally more expensive than other types of AIS. CSTDMA is used by Class B shipborne AIS devices and is designed to be “polite”, useable by large numbers of users without degrading the VHF data link or affecting devices using SOTDMA (Class A) devices. Since AIS Message 21 *Aids to Navigation Report 21* is a two-slot message, it cannot use CSOTDMA, but instead uses FATDMA and in limited cases, RATDMA. FATDMA, when used by AIS AtoNs, can be operated without degrading the VHF data link if configured properly and if managed by a competent authority. RATDMA is used by AIS search and rescue transmitters (SARTs) and is intentionally “rude”, randomly selecting and transmitting on a slot regardless of its current use. AIS SARTs using RATDMA are also inexpensive since it has no receiver and does no slot management. RATDMA’s “rudeness” is appropriate for a ship in distress transmitting its location. It is wholly inappropriate in devices operating on the navigation safety channels AIS 1 and AIS 2 lacking a receiver and slot management capability for purposes other than distress. This access scheme however would be appropriate if transmitting on channel 2006.

The International Telecommunications Union Sector for Radiocommunications (ITU-R) is revising its AIS standard Recommendation ITU-R M.1371-5¹⁶ is considering including a new Message #28 *Single Slot Aids to Navigation Report* which, if adopted, would allow AIS to be more commonly, inexpensively and safely used for mobile aids to navigation as well as for other purposes. Unlike Message #21, Message #28 would be a one-slot message, which could use the “polite” CSTDMA access scheme and would be far less likely to cause VHF data link congestion on channels AIS 1 and 2. While work is ongoing, completion of this revised AIS standard has been delayed by the pandemic and the need for coordination with the International Maritime Organization.

Recommendation ITU-R M.1371-5 also provides for AIS application specific messages (ASMs).¹⁷ IMO provides guidance on the use of ASMs¹⁸ and IEC 62288 describes how ASMs are presented on shipboard navigation displays. Although no ASM dedicated to fishing equipment exists, IMO SN.1/Circ.289 has specified an *Area Notice – Broadcast* which could

¹⁵ Class A AIS devices operate with an additional protocol, Incremental Time Domain Multiple Access (ITDMA). ITDMA is used as a means to transition to SOTDMA operation.

¹⁶ [Rec. ITU-R M.1371-5 Technical characteristics for an automatic identification system using time-division multiple access in the VHF maritime mobile band](#). This standard is the primary technical standard for AIS and is applicable for all transmissions on channels AIS 1 and 2. Its universal applicability is necessary to ensure international interoperability of this maritime safety system. It is currently under revision at ITU-R WP5B. Those interested in participating in its development, including the proposed new AIS MSG#28, are encouraged to join [US Working Party 5B](#) sponsored by the National Telecommunications and Information Administration and become involved.

¹⁷ “AIS messages where the data content is defined by the application are application specific messages. Examples of this are the binary Messages 6, 8, 25 and 26. The data content does not affect the operation of the AIS. AIS is a means for transferring the data content between stations. A functional message’s data structure consists of an application identifier (AI) followed by the application data.” (Rec. ITU-R M.1371-5 Annex 5)

¹⁸ [IMO SN.1/Circ.289](#)

possibly be amended to mark fishing equipment where other ships need to see them for safety purposes, but where use of a private aid to navigation would be inappropriate. Both IEC 62288 Ed.2:2014 and the forthcoming Ed.3 include provisions for displaying Area Notices.

While it is certainly possible to configure existing AIS device (i.e. a Type 1 AIS AtoN) to transmit an Area Notice without also transmitting its own message (i.e. AtoN MSG#21), certain issues would still need to be resolved. Individual station Maritime Mobile Service Identity (MMSI)¹⁹ registration and station licensing would still be needed. Since operation of these devices may be limited to waters subject to the jurisdiction of the United States²⁰, i.e. the Exclusive Economic Zone (EEZ), some sort of geofencing capability or enforced geo-limited licensing restriction may be prudent. While Area Notice ASM messages (DAC=001, FI=22/23) can range from two to five consecutive TDMA slots, their Area Notice should be limited to two slots. Two slots would allow the broadcast of two sub-areas within the same message:

- 1) Sub-area 1 - Circle/Point, Area Notice Description - 16 “Caution area: fishery - nets in the water”, centered at the broadcasted position; and,
- 2) Sub-area 5 - Associated Text, which could include the parent vessel’s MMSI.

While the AIS AtoN standard, and Class A and B shipborne AIS standards as well, allow the broadcast of ASMs from these devices, a new certification standard for an ASM only device may be appropriate, so these devices are limited in output power, fixed antenna height, and the messages they may broadcast.

AIS operating on 160.900 MHz (channel 2006)

The Commission asked whether it “should maintain consistency with the international maritime approach regarding devices used to mark fishing equipment and authorize operation of these devices on 160.900 MHz”, and “To what extent can the Commission accommodate operation of devices that could be used to mark fishing equipment and incumbents on or near this frequency?”²¹ While the AIS AtoN standard, and Class A and B shipborne AIS standards as well, allow the broadcast of ASMs from these devices, a new certification standard for an ASM only device may be appropriate, so these devices are limited in output power, fixed antenna height, and the messages they may broadcast.

Low cost quasi-AIS devices have become popular as fish equipment markers since they are immediately compatible with AIS equipment already carried by the fishing vessel. Yet that same compatibility can make this use a hazard to navigation. AMRD Group B AIS devices operating on 160.9 MHz retain much of the cost and compatibility advantages without hazarding navigation or requiring USCG private AtoN or similar approval. While a receiver may be

¹⁹ MMSIs are defined by [Rec. ITU-R M.585-8](#). Given that no MMSI allocation exists for ASM devices, a decision would be needed whether to use existing coast station or AtoN, or to seek a new allocation from ITU-R.

²⁰ [33 C.F.R. Subpart B](#).

²¹ NPRM para.19.

needed, its cost and installation could be simple and inexpensive. Recognizing that existing AIS Class A devices have a dedicated DSC receiver used for channel management purposes which may no longer be relevant, RTCM would have no objection to repurposing that receiver to 160.9 MHz to facilitate use of AMRD Group B. AIS-compatible data interfaces²² would allow simple interconnection with any shipborne navigation display. The forthcoming Edition 3 to IEC 62288 will require received AIS AMRD Group B messages be displayed as a hexagon²³. As the Commission noted, these devices do have a 100 mw power limit and 1m height limit²⁴, and use should be sufficiently off shore to avoid any possible interference with licensed land mobile systems. Acknowledging that 160.9 MHz is already internationally recognized for this purpose, RTCM urges the Commission accommodate these devices in an orderly, standards-based way, giving due protection to licensed land mobile users, in order to avoid unregulated proliferation and use of these devices. In doing this, Radio Regulations Appendix 18 footnote r) including its reference to Recommendation ITU-R M.2135 should also be included in FCC rules when implementing the 2019 ITU World Radio Conference Final Acts. RTCM is willing, if asked and if there is a market demand, to develop necessary standards for such devices, or to work in cooperation with IEC TC80 in doing so.

RTCM's 2016 Part 80 Petition for Rulemaking

On 16 February 2016, RTCM submitted a comprehensive petition for rulemaking, proposing a comprehensive and streamlined updating of Part 80 regulations. RTCM worked closely with the U.S. Coast Guard and other maritime organizations over several years in preparing this Petition for Rulemaking. On 14 April 2016, the FCC opened a docket and released a Public Notice²⁵ requesting comments on this petition. Comments received were supportive.

The RTCM petition included reworking, updating and clarifying AIS provisions, which included a proposed new Subpart Q *Automatic Identification System (AIS) Stations and Equipment*. Included were provisions for AIS aids to navigation stations, a possible solution, at least in part, to the issues raised in this rulemaking. The new Subpart Q was intended to clarify, simplify and update existing provisions and facilitate the introduction of new AIS devices, should the need arise. Had these changes been implemented, the viability and sale of quasi-AIS devices which eventually necessitated the FCC's 28 November 2018 Enforcement Advisory addressing marketing, sale, or use of fishing net buoys using AIS operating on channels AIS 1 and 2 may possibly have been forestalled. The decision to defer the proposed reworking, updating and clarifying of Part 80 arguably necessitated this current rulemaking as well.

²² Since AIS using 160.9 MHz use the same messages and protocols as AIS using channels AIS 1 and 2, existing IEC 61162-1/NMEA 0183 or NMEA 2000 AIS data interface sentences can be used, and would already be compatible with existing ship navigation displays.

²³ "An AMRD B shall be drawn as hexagon with a thin solid outline with the same basic colour as used for target symbols. The height of the symbol shall be 4 mm." IEC CDV 62288 80/995/CDV dtd 23 April 2021.

²⁴ NPRM para. 20 and ITU-R Radio Regulations Appendix 18 footnote r). Note that ITU now recognizes this frequency (channel 2006) as part of its VHF maritime mobile channeling plan due to its inclusion in Appendix 18.

²⁵ See [DA 16-398](#) and [WT RM-11765](#).

RTCM respectfully requests the Commission reactivate the Part 80 rulemaking which we petitioned over five years ago. Alternatively due to the urgency of this proceeding and the significant updates required in the rest of Part 80, the Commission may want to consider reactivating Subpart Q portion of that petition and the remainder in separate proceedings.

Conclusion

Recognizing this Notice of Proposed Rulemaking proposed no actual new or revised regulations, RTCM urges the Commission to issue a further notice of proposed rulemaking, or include it within RTCM's proposed Part 80 rulemaking, before making any final rule changes.

In summary, RTCM urges

- That the Commission continue to actively enforce the prohibition of AIS devices used to mark fishing equipment which could be displayed as other ships, or as persons or ships in distress,
- That the Commission permit AIS AMRD Group B devices to operate on 160.9 MHz, which would align the U.S. with the use of this frequency and these devices internationally, in accordance with footnote *r*) of Appendix 18 of the international Radio Regulations,
- That the Coast Guard under its existing authority be the agency which decides what applications aid in the safe navigation of vessels, and what applications do not,
- That the Coast Guard be the agency to decide which specific AIS applications are allowed to operate on channels AIS 1 and 2, since that decision affects the safety of navigation of all ships,
- That the Commission note RTCM's willingness, if asked and supported, to develop standards necessary to accomplish the goals of this rulemaking while ensuring navigation safety, and
- That the Commission proceed with rulemaking to update Part 80, including a new Subpart dedicated to AIS, as proposed by RTCM in its 2016 petition. That rulemaking could implement decisions agreed from this proceeding.

This completes RTCM's comments for WT Docket No. 21-230.

Sincerely,



03 August 2021

Ed Wendlandt
President RTCM

date