United States Coast Guard
Office of Navigation Systems

National Marine Electronics Association Conference & Expo
October 1st, 2015
Baltimore, MD

“We Help Mariners Get There”

Expanding AIS Carriage and New Operating Requirements

Jorge Arroyo | AIS Subject Matter Expert | USCG Headquarters | Washington, DC
AIS Rulemaking Timeline [NPRM Proposed Changes in Bold-type]

✓ 07/01/03 published Temporary Interim Rule and Request for Comments
✓ 10/23/03 current AIS requirement (33 CFR 164.46)
✓ 07/01/03-01/09/04 sought AIS expansion comment
✓ 10/31/05 notice expansion of AIS to all waters
✓ 12/16/08 NPRM … 4/15/09 comment deadline

- Commercial self-propelled vessels of ≥ 65 feet
  No exclusions, i.e. fishing and small passenger vessels
- Towing vessels ≥ 26 feet & >600 hp
- Vessels with ≥ 50 passengers (vice 150 for hire)
- Hi-speed passenger vessels (≥ 12 pax)
- Certain dredges & floating plants, &
- Vessel moving certain dangerous cargoes
AIS Meetings & Comment Period...

• Public Meetings
  - Washington, DC – March 5th, 2009
    o 30+ attendees, 11 commenters
  - Seattle, WA – March 25th, 2009
    o 30+ attendees, 12 commenters

• Comment period closed: April 15th, 2009
  o 80+ submissions, 300+ comments regarding AIS
New AIS Carriage Requirements...

Effective March 2\textsuperscript{nd}, 2015, these commercially self-propelled vessels, operating on U.S. navigable waters, must have a properly installed, operational Automatic Identification System (AIS) no later than March 1\textsuperscript{st}, 2016

- vessels of $\geq$ 65 feet in length
- towing vessels of $\geq$ 26 feet in length & $>600$ hp
- vessels certificated to carry $>150$ passengers
- dredges and floating plants that operate in/near a commercial channel
- vessels engaged in the movement of certain dangerous cargo, flammable or combustible liquid cargo in bulk

<table>
<thead>
<tr>
<th>Effected Vessels by Type</th>
<th>2003 SOLAS</th>
<th>2015 Domestic</th>
<th>Total Vessels</th>
</tr>
</thead>
<tbody>
<tr>
<td>Foreign ship $&gt;65' &lt;300GT$</td>
<td>1,119</td>
<td></td>
<td>1,119</td>
</tr>
<tr>
<td>Fishing</td>
<td>1</td>
<td>-</td>
<td>2,906</td>
</tr>
<tr>
<td>Towing</td>
<td>13</td>
<td>2,212</td>
<td>1,429</td>
</tr>
<tr>
<td>Passenger</td>
<td>81</td>
<td>171</td>
<td>288</td>
</tr>
<tr>
<td>Cargo</td>
<td>154</td>
<td>77</td>
<td>247</td>
</tr>
<tr>
<td>OSV</td>
<td>55</td>
<td>432</td>
<td>151</td>
</tr>
<tr>
<td>MODU</td>
<td>1</td>
<td>-</td>
<td>31</td>
</tr>
<tr>
<td>Industrial</td>
<td>21</td>
<td>11</td>
<td>220</td>
</tr>
<tr>
<td>Research</td>
<td>10</td>
<td>11</td>
<td>54</td>
</tr>
<tr>
<td>School</td>
<td>5</td>
<td>10</td>
<td>15</td>
</tr>
<tr>
<td>Tank Ships</td>
<td>102</td>
<td>15</td>
<td>35</td>
</tr>
<tr>
<td>Unknown</td>
<td>16</td>
<td>134</td>
<td>150</td>
</tr>
<tr>
<td>Unclassified</td>
<td>13</td>
<td>326</td>
<td>339</td>
</tr>
<tr>
<td>Dredges</td>
<td>-</td>
<td>17</td>
<td>17</td>
</tr>
<tr>
<td>U.S. Total</td>
<td>438</td>
<td>2,963</td>
<td>5,848</td>
</tr>
<tr>
<td>Total</td>
<td>4,520</td>
<td>5,848</td>
<td>10,368</td>
</tr>
</tbody>
</table>
Noteworthy AIS provisions...

- Applies to all navigable waters, no exceptions.

- Individual deviations (waivers) are permissible, but only for vessels:
  - that solely operate within a very confined area
    e.g. shipyard, fleeting area, etc.
  - on short & fixed schedules
    e.g. a bank-to-bank river ferry service
  - otherwise not likely to encounter other AIS users

Extends the deviation period from 1 to 5-years and broadens it to vessels on which AIS would be impractical, i.e. lack of display, power, open exposed conning position, etc.
Noteworthy AIS Provisions...

• Spells out ‘effective operating conditions’ to include:
  o the ability to reinitialize the AIS | know password
  o the accurate broadcast of an official MMSI
  o the accurate input, upkeep, and updating
  o the ability to access AIS info from conning position

• AIS is primarily for the person controlling the vessel, who must maintain a periodic watch

• AIS text messaging solely in English & for navigation safety

• Permits the use of approved AIS Application Specific Messaging (ASM) for vessels (<1/min.)
Noteworthy AIS provisions...

• AIS does not relieve you of navigation rules signaling or radiotelephone requirements

• AIS (& assoc. sensors) shall remain on when:
  o Underway, at anchor, and at least 15 min. prior to unmooring
  o Except if it compromises safety or security
  o Securing it must be logged, reported, promptly restored

• Inoperative AIS is now a reportable deficiency, but, not a ‘no sail’ item

Prohibits mobile AIS from air, ashore or on non-self propelled vessels
Noteworthy AIS provisions…

AIS Class B devices permissible on:

- dredges,
- fishing industry vessels, and
- vessels certificated to carry <150 passengers that do not operate in:
  - Vessel Movement Reporting System area, or
  - at speeds >14 kts
Want to find out more?

AIS FREQUENTLY ASKED QUESTIONS

1. What is AIS?
2. What is an MMSI, how do I get one, and how do I program my AIS?
3. What is the AIS rule and are there alternatives to the rule for small businesses?
4. Do AIS Class B devices meet current USCG AIS carriage requirements?
5. How does AIS help to increase security (and what is NAIS)?
6. When must AIS be in operation?
7. Does the installation of the AIS require additional equipment in order for the AIS to operate properly?
8. Will it be necessary to have electronic navigational charts for use with the AIS?
9. Are fishing vessels subject to AIS carriage, and is onboard Vessel Monitoring System (VMS) an acceptable substitute for the AIS?
10. Why have some AIS units stopped broadcasting valid position reports?
11. Why am I unable to see an AIS vessel’s name or other static information (dimensions, call sign, etc.)?
12. Why do I sometimes see more than one vessel with the same MMSI or vessel name (i.e. NAUT)?
13. I just purchased and installed an AIS Class B, will AIS Class A user ‘see’ me?
14. Do AIS Class B devices meet current USCG AIS carriage requirements?
15. Is the USCG considering expanding AIS carriage to other vessels or outside of VTS areas?
16. How can I get a copy of an AIS presentation I saw (or heard about it) that was given at...
17. Where can I get AIS data?
18. Reserved for future use.
19. What is AIS Channel Management?
20. Can I use my AIS in an emergency or for distress messaging?
21. Is the Coast Guard broadcasting AIS Aids to Navigation Reports?
22. Have an AIS question not answered here?

1. What is AIS? Per 47 CFR §80.5, AIS is a maritime navigation safety communications system standardized by the International Telecommunication Union (ITU) and adopted by the International Maritime Organization (IMO) that provides vessel information, including the vessel’s identity, type, position, course, speed, navigational status and other safety-related information automatically to appropriately equipped shore stations, other ships, and aircraft, receives automatically such information from similarly fitted ships, monitors and tracks ships; and exchanges data with shore-based facilities. Read more on what it is, how it works, what it broadcasts, and, the messages it uses, etc.
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## Comparison of AIS mobile devices

<table>
<thead>
<tr>
<th>Shipboard AIS</th>
<th>Class A</th>
<th>Class B/SO</th>
<th>Class B/CS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transmit Power (Watts)</td>
<td>12.5 W / 2 W (low-power)</td>
<td>5 W / 2 W (low-power)</td>
<td>2 W</td>
</tr>
<tr>
<td>Primary Access Scheme</td>
<td>Self-organizing Time-Division Multiple Access (SOTDMA)</td>
<td>SOTDMA</td>
<td>Carrier-sense TDMA non-competing with SOTDMA units</td>
</tr>
<tr>
<td>Position Reporting Rate</td>
<td>Either every 2, 3 ½, 6 or 10 s based on speed and course change. Every 3 min. when ≤ 3 kts.</td>
<td>Either every 5, 15 or 30 s based on speed (2-14, 14-23, &gt;23 kts) Every 3 min. when ≤ 2 kts.</td>
<td>Every 30 s Every 3 min. when ≤ 2 kts.</td>
</tr>
<tr>
<td>Static Data Reporting Rate</td>
<td>Every 6 min</td>
<td>Every 6 min</td>
<td>Every 6 min</td>
</tr>
<tr>
<td>Frequency Range</td>
<td>25 kHz bandwidth between 156.025 MHz to 162.025 MHz</td>
<td>25 kHz bandwidth between 156.025 MHz to 162.025 MHz</td>
<td>25 kHz bandwidth at minimum between 161.500 MHz to 162.025 MHz</td>
</tr>
<tr>
<td>Dedicated DSC Receiver for Channel Management</td>
<td>Yes</td>
<td>Yes</td>
<td>Time-shared</td>
</tr>
<tr>
<td>Position Source / WGS-84 to 1/10,000 of minute of arc</td>
<td>Internal Global Navigation Satellite System &amp; connection to an External Electronic Positioning System (EPFS)</td>
<td>Internal GNSS</td>
<td>Internal GNSS</td>
</tr>
<tr>
<td>Digital Interfaces</td>
<td>2 Input-Output &amp; Multiple Presentation Outputs</td>
<td>Optional</td>
<td>Optional</td>
</tr>
<tr>
<td>Display</td>
<td>Multiple Keyboard Display (MKD)</td>
<td>MKD</td>
<td>Optional</td>
</tr>
<tr>
<td>Safety Text Messaging</td>
<td>Receive &amp; Transmit</td>
<td>Receive &amp; Transmit</td>
<td>Transmit Optional, and only with non- alterable pre-configured messages</td>
</tr>
<tr>
<td>Application Specific Messaging</td>
<td>Receive &amp; Transmit</td>
<td>Receive &amp; Transmit (up to 3 slots)</td>
<td>Receive Optional, cannot Transmit</td>
</tr>
<tr>
<td>Transmit Data</td>
<td>All</td>
<td>No Rate of Turn, Navigation Status, Destination, ETA, Draft, or IMO#</td>
<td>No Rate of Turn, Navigation Status, Destination, ETA, Draft, or IMO#</td>
</tr>
</tbody>
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1. What is AIS?
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3. What is the AIS rule and are there alternatives to the rule for small businesses?
4. Do AIS Class B devices meet current USCG AIS carriage requirements?

15. Is the US Coast Guard considering expanding AIS carriage to other vessels or outside of VTS areas? Yes. On January 30th, 2015 the Coast Guard published a Final Rule (80 FR 5281), which on March 2nd, 2015, expands AIS carriage (68 FR 60599) to most commercial vessels (see those affected here) operating on any U.S. navigable waters, and harmonizes U.S. AIS requirements with Regulation VI/19.2.4 of the Safety of Life at Sea Convention and §102 of the Maritime Transportation Act of 2002. The docket containing comments submitted, supporting documents, and the regulatory analysis to this and our proposed rulemaking (73 FR 76295) can be found at www.regulations.gov [Search: USCG-2005-21869]. Printer-friendly PDF forms of these 2015 requirements, our 2008 proposed rule, an amalgamation of both, our 2003 requirements, and a chart-comparison of all three.

12. Why do I sometimes see more than one vessel using the same MMSI or vessel name (i.e. MVNA)?
13. I just purchased and installed an AIS Class B, will AIS Class A user ‘see’ me?
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2. What is an MMSI, how do I get one, and how do I program my AIS? A unique and official 9-digit Maritime Mobile Service Identity (MMSI) number is required for every AIS station. To obtain one, go to the MMSI page. After initial programming, users must ensure their AIS is always in effective operating condition and broadcasting accurately (33 CFR §164.46(d)).

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AUTOMATIC IDENTIFICATION SYSTEM

USCG AIS Encoding Guide

Minimizes Updates
USCG AIS Encoding Guide

Vessel/ABCD Dimensions For Vessel or Vessel+Tow
2-digit numeric codes for Type of Ship are composed from 1st and 2nd digit columns or as defined in columns 3x or 5x.

The terms used are as defined in IMO SOLAS, 46 U.S.C. 2101 or 33 CFR 140.10. Blue and/or italic text denotes amending text not found in the original source (ITU-R M.1371-5)

<table>
<thead>
<tr>
<th>1st digit</th>
<th>2nd digit</th>
<th>[3x] others “engaged in”</th>
<th>[5x] special craft</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0</td>
<td>30 = Fishing vessels, including processors, but, not tenders (see note “3P”)*</td>
<td>50 = Pilot vessel</td>
</tr>
<tr>
<td>1</td>
<td>Reserved for future use</td>
<td>51 = Search and rescue vessels, i.e. USCG boats, USCG Auxiliary, assistance towers</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>WIG</td>
<td>52 = Tugs, light boats, push-boats, towboats or workboats, that do not engaged in towing</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Other vessels engaged in denoted in column [3x]</td>
<td>53 = Fish, offshore or port tenders</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>HSC (Hi-speed Craft) or pan ferries</td>
<td>54 = Commercial response vessels with anti-pollution facilities or equipment</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Special craft, per column 1†</td>
<td>56 = Spare—for assignments to local vessels that are engaged in towing ahead or alongside, and whose dimensions (ABCD values) represent the overall dimensions of the vessel not including its tow*</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Passenger ships other than and passenger ferries; includes shore supply vessels (OSV)</td>
<td>57 = Spare—for assignments to local vessels that are engaged in towing ahead or alongside, and whose dimensions (ABCD values) represent the overall area of the vessel including its tow*</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Cargo (freight) ships, including articulated (ATB) and integrated tug—barge (ITB) vessels</td>
<td>37 = Pleasure craft</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Tankers, including articulated (ATB) and integrated tug tank barge (ITB) vessels</td>
<td>38 = Reserved for future use</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Other types of ship</td>
<td>39 = Reserved for future use</td>
<td></td>
</tr>
</tbody>
</table>

*Remember to also update your Navigation Status accordingly, i.e. Nav Status: 3 = restricted maneuverability; 8 = under sail; 11 = towing astern; 12 = pushing ahead/alongside, etc.

For further information or additional copies visit www.navcen.uscg.gov or email qnav@uscg.mil

***** DRAFT ***** Redistribution with or without USCG indicia is permissible and encouraged ***** DRAFT *****
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“The U.S. vision for e-Navigation is to establish a framework that enables the transfer of data between and among ships and shore facilities, and that integrates and transforms that data into decision and action information.”

“The ultimate goal of e-Navigation efforts in the U.S. is to use timely and reliable information to make the U.S. Marine Transportation System operate better.”
PORTS | Weather
ENC | RNC | POD
Tides & Currents
Hydrographic Survey

IENC
Chart Booklets
Hydrographic Surveys

The
ENAFT
Trident

NAIS
Light List
Navigation Rules
Local Notice to Marines
Urgent Marine Information
Broadcasts

Shared
Waterway
Responsibility
<table>
<thead>
<tr>
<th>River No.</th>
<th>Name and Location</th>
<th>Mile</th>
<th>Bank</th>
<th>Characteristic</th>
<th>Structure (Up/Down)</th>
<th>Remarks</th>
<th>Mile</th>
<th>Latitude</th>
<th>Longitude</th>
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<tr>
<td>XLS</td>
<td>SORIND OBJNAM (1)</td>
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<td>LITCHR</td>
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<td>OBJNAM (2)</td>
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<td>SIGGRP</td>
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<td>INFORM (1)</td>
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<td>STATUS</td>
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<td></td>
</tr>
</tbody>
</table>
eATONS used at last years America’s Cup
We’re Leveraging Our Nationwide AIS (NAIS) Project Increment II – 24 NM Transmit For our 1st Phase of eNAV to do eATON & eMSI
Adding eATONs to the ATON Family

- Synthetic AIS
- Virtual AIS
- Potential Physical AIS
- Missing
eATON provide greater visibility & AIS provide a constant bearing & range
NOAA PORTS
Tampa &
Chesapeake
Bay
United States Coast Guard
Office of Navigation Systems

Questions

Thank You

Jorge.Arroyo@uscg.mil
cgnav@uscg.mil
1-202-372-1563

U.S. Coast Guard
Office of Navigation Systems
Washington, DC 20953