United States Coast Guard
Office of Navigation Systems

"We Help Mariners Get There"

ENAV and the Future of Navigation
New AIS Rules and Requirements

Jorge Arroyo | Navigation Systems | U.S. Coast Guard | Washington, DC

- e-Navigation
  - Refresher
  - Status: IMO Strategy Plan
  - IALA ENAV

- CMTS ENAV Strategy
  - and the Future of Navigation

- New AIS Rule
  - Timeline
  - Comments Received | Action Taken
  - New AIS Requirements

Development of an E-Navigation Strategy

INTERNATIONAL MARITIME ORGANIZATION

E

IMO

MARITIME SAFETY COMMITTEE
81st session
Agenda item 23

MSC 81/23/10
19 December 2005
Original: ENGLISH

WORK PROGRAMME

Development of an E-Navigation strategy

Submitted by Japan, Marshall Islands, the Netherlands, Norway, Singapore,
the United Kingdom and the United States

SUMMARY

Executive summary:	It is proposed to add a new item on E-Navigation to the work programme of the Sub-Committee on Safety of Navigation (NAV) and also to that on Radiocommunications and Search and Rescue (COMSAR). The aim should be to develop a strategic vision for the utilization of existing and new navigational tools, in particular electronic tools, in a holistic and systematic manner. E-Navigation would help reduce navigational accidents, errors and failures by developing standards for an accurate and cost effective system that would make a major contribution to the IMO's agenda of 'safe, secure and efficient shipping on clean oceans'.
Action to be taken:	Paragraph 22
Related documents:	None

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E-Navigation Definition

E-navigation is an international effort adopted by the International Maritime Organization (IMO) and the International Association of Marine Aid to Navigation and Lighthouse Authorities (IALA) for...

"the harmonized collection, integration, exchange and presentation of maritime information onboard and ashore by electronic means to enhance berth to berth navigation and related services, for safety and security at sea and protection of the marine environment"

IMO ENAV Correspondence Group

INTERNATIONAL MARITIME ORGANIZATION

IMO

E

SUB-COMMITTEE ON SAFETY OF
NAVIGATION
53rd session
Agenda item 13

NAV 53/13
20 April 2007
Original: ENGLISH

DEVELOPMENT OF AN E-NAVIGATION STRATEGY

Report of the Correspondence Group on e-navigation

Submitted by the United Kingdom

SUMMARY

Executive summary: The Correspondence Group established by NAV 52, having consulted COMSAR 11, has agreed the scope of e-navigation and the approach to developing a system architecture, presenting complementary 'component' and 'descriptive' models. The Group has derived from this a range of key issues to be addressed in a future work programme, taking account of the benefits and the obstacles arising. The output of

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REPORT OF THE MARITIME SAFETY COMMITTEE ON ITS NINETY-FOURTH SESSION

E-navigation matters

9.15   The Committee approved the e-navigation Strategy Implementation Plan (SIP), as set out in document NCSR 1/28, annex 7. In this context, the Committee noted the view expressed by the United Kingdom that it supported the approval of the SIP without prejudice to the discussions relating to the approval of an unplanned output to progress the work further on e-navigation under agenda item 18 (see paragraphs 18.16 and 18.17).

IMO ENAV Strategy Implementation Plan (SIP)

- Prioritized 5 e-Navigation Solutions

- Adopts 18 Tasks

- Supports 16 Maritime Service Portfolios

- To develop 3 Guidelines (now into 1):
  - Human Centered Design (HCD)
  - Usability Testing, Evaluation & Assessment (U-TEA)
  - Software Quality Assurance (SQA)

IMO SIP 5 Prioritized ENAV Solutions

- improved, harmonized and user-friendly bridge design;

- means for standardized and automated reporting;

- improved reliability, resilience and integrity of bridge equipment and navigation information;

- integration and presentation of available information in graphical displays received via communications equipment; and

- improved communication of VTS Service Portfolio

IMO SIP ENAV Tasks

- 18 tasks adopted

- 2015–2019

- What needs to get done for implementation of e-Navigation, including:

  - T17 Further develop the MSPs

    o Maritime Service Portfolios…

What is Maritime Service Portfolio?

A model for "the means of providing electronic information in a harmonized way"

Marine Service Portfolios

- Maritime Assistance Service

- Nautical Chart Service

- Nautical Publications Service

- Ice Navigation Service

- Meteorological information service

- Real time hydrographic and environmental information

- Search and Rescue Service

- VTS Information Service

- Navigational Assistance Service

- Traffic Organization Service

- Local Port Service

- Maritime Safety Information Service

- Pilotage Service

- Tug Service

- Vessel Shore Reporting

- Tele-medical Assistance Service
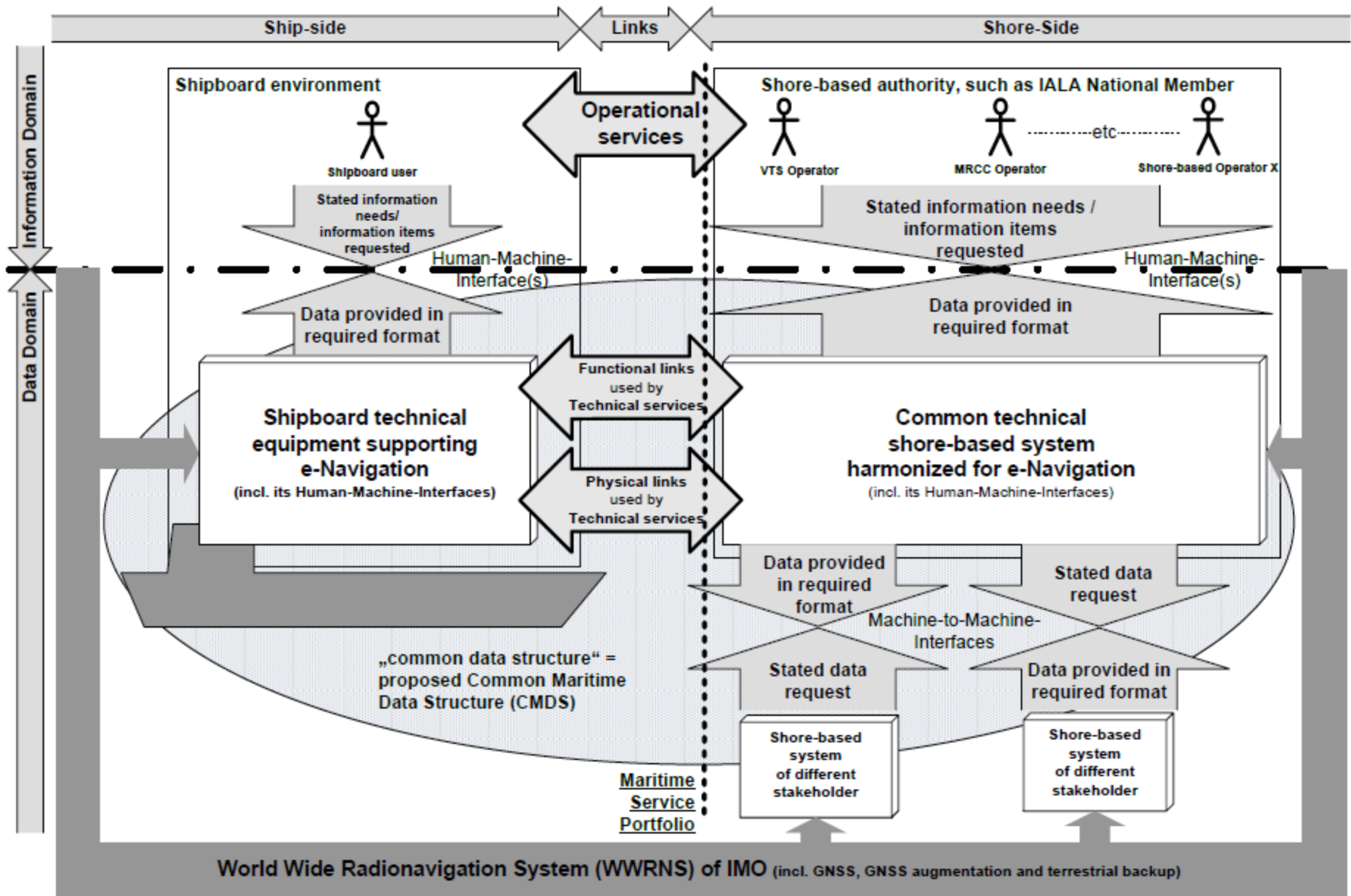
IALA ENAV

- International technical association established in 1957.
- Aids to navigation authorities, manufacturers, consultants, and, scientific and training institutes
- Technical Committees create Standards, Recommendations, and Guidelines
  - AtoN Requirements and Management (ARM)
  - Vessel Traffic Services (VTS)
  - Engineering (ENG)
  - e-Navigation (ENAV)
    - ENAV15 started new 4-year work program
   - >140 registered participants
    - ~25 countries, Sister Organizations

New IALA ENAV WG Structure
New Technical Domains

1. Harmonization: Data modeling & message systems

2. Implementation: Test beds

3. Telecommunications: ENAV Comms

4. ENAV Services: Maritime Service Portfolios

5. PNT: Shore Technical Infrastructure
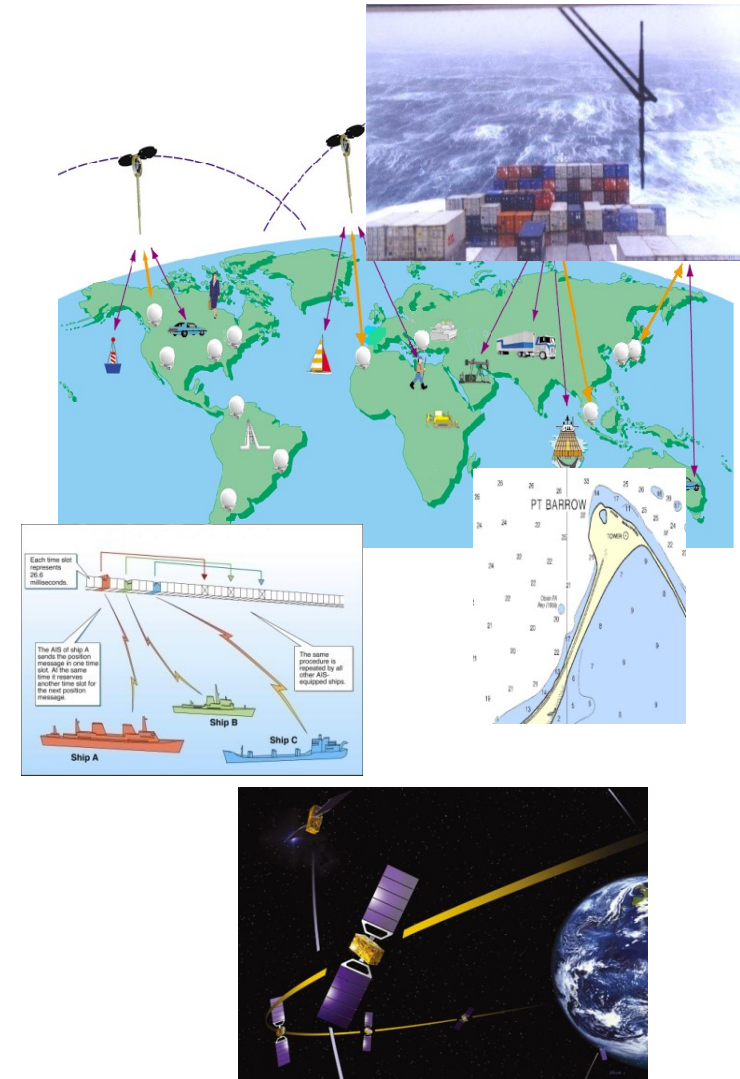
"The ultimate goal of e-Navigation efforts in the U.S. is to use timely and reliable information to make the U.S. Marine Transportation System operate better."
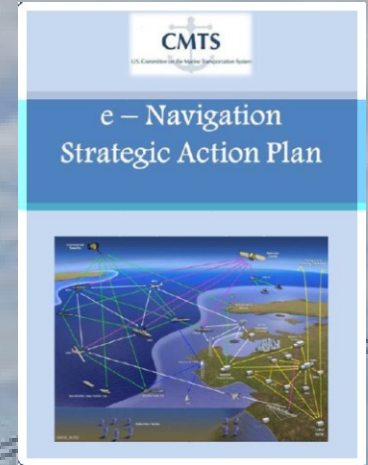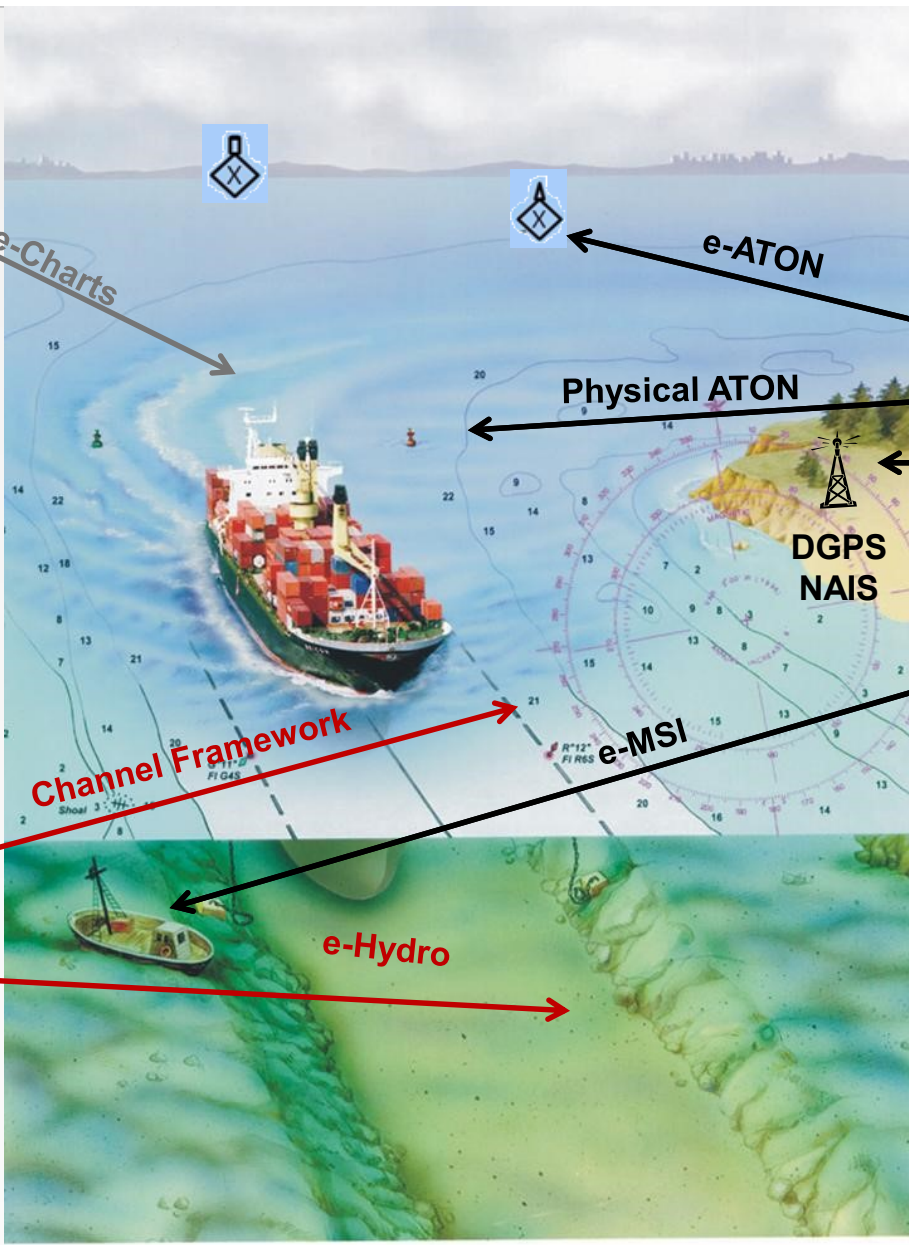
2011

"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 ENAV Trident

Shared Waterway Responsibility

NOAA — NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION · U.S. DEPARTMENT OF COMMERCE

PORTS | Weather
ENC | RNC | POD
Tides & Currents
Hydrographic Survey

US Army Corps of Engineers®

IENC
Chart Booklets
Hydrographic Surveys

e-Charts

e-ATON

Physical ATON

DGPS NAIS

Channel Framework

e-MSI

e-Hydro

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

UNITED STATES COAST GUARD 1790

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Western Rivers Buoy Data

KML
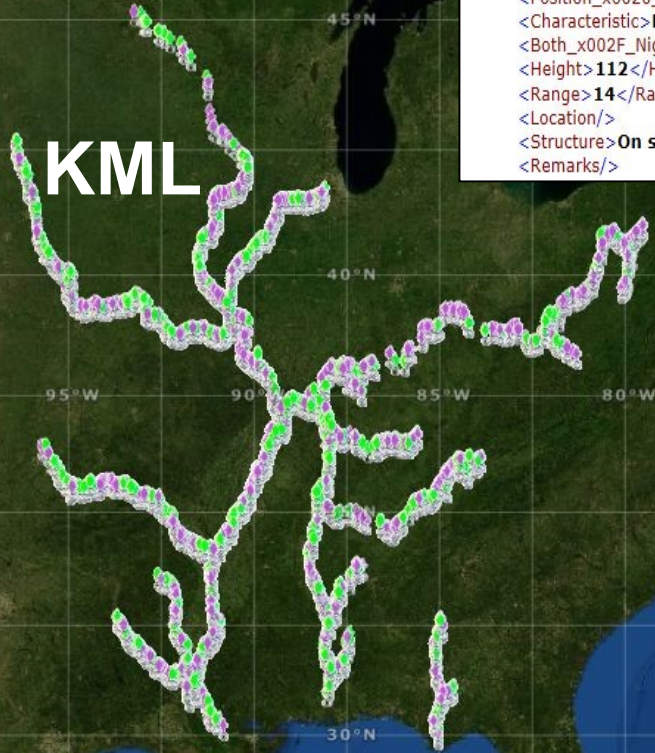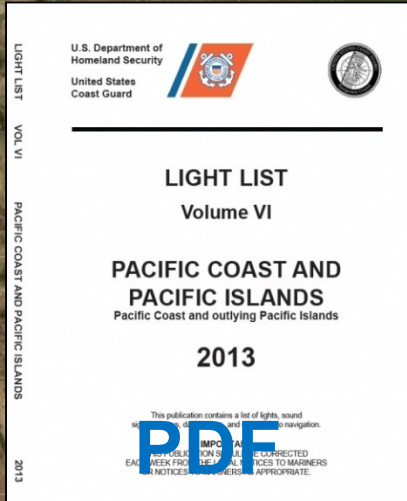
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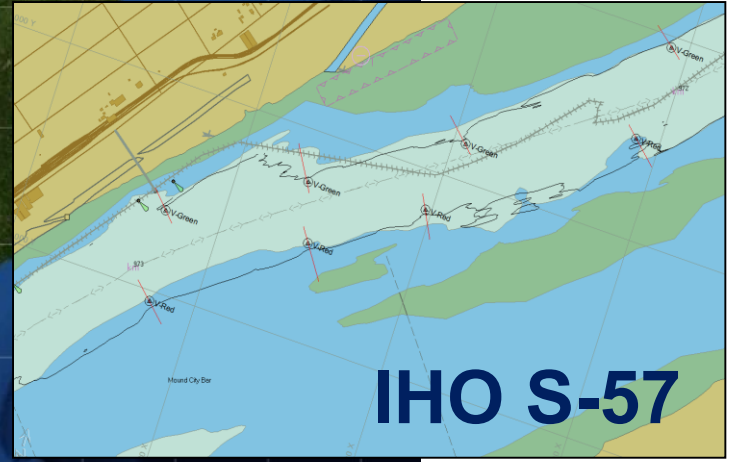   <LLNR>760</LLNR>
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    <Position_x0020__x0028_Longitude_x0029_>124-44-12.950W</Position_x0020__x0028_Longitude_x0029_>
    <Characteristic>Fl (2)W 20s</Characteristic>
    <Both_x002F_Night_x002F_Day>Night</Both_x002F_Night_x002F_Day>
    <Height>112</Height>
    <Range>14</Range>
    <Location/>
    <Structure>On skeleton tower. 9</Structure>
    <Remarks/>

XML

IHO S-57

XLS

River	No.	Name and Location	Mile	Bank	Characteristic				Structure (Up/Down)		Remarks	Mile	Latitude	Longitude
	SORIND	OBJNAM (1)	OBJNAM (2)		LITCHR	SIGGRP	COLOUR	SIGPER	INFORM (1)	INFORM (2)	STATUS			

Analog-to-Digital Navigation Data

eATONS were used during last years America's Cup
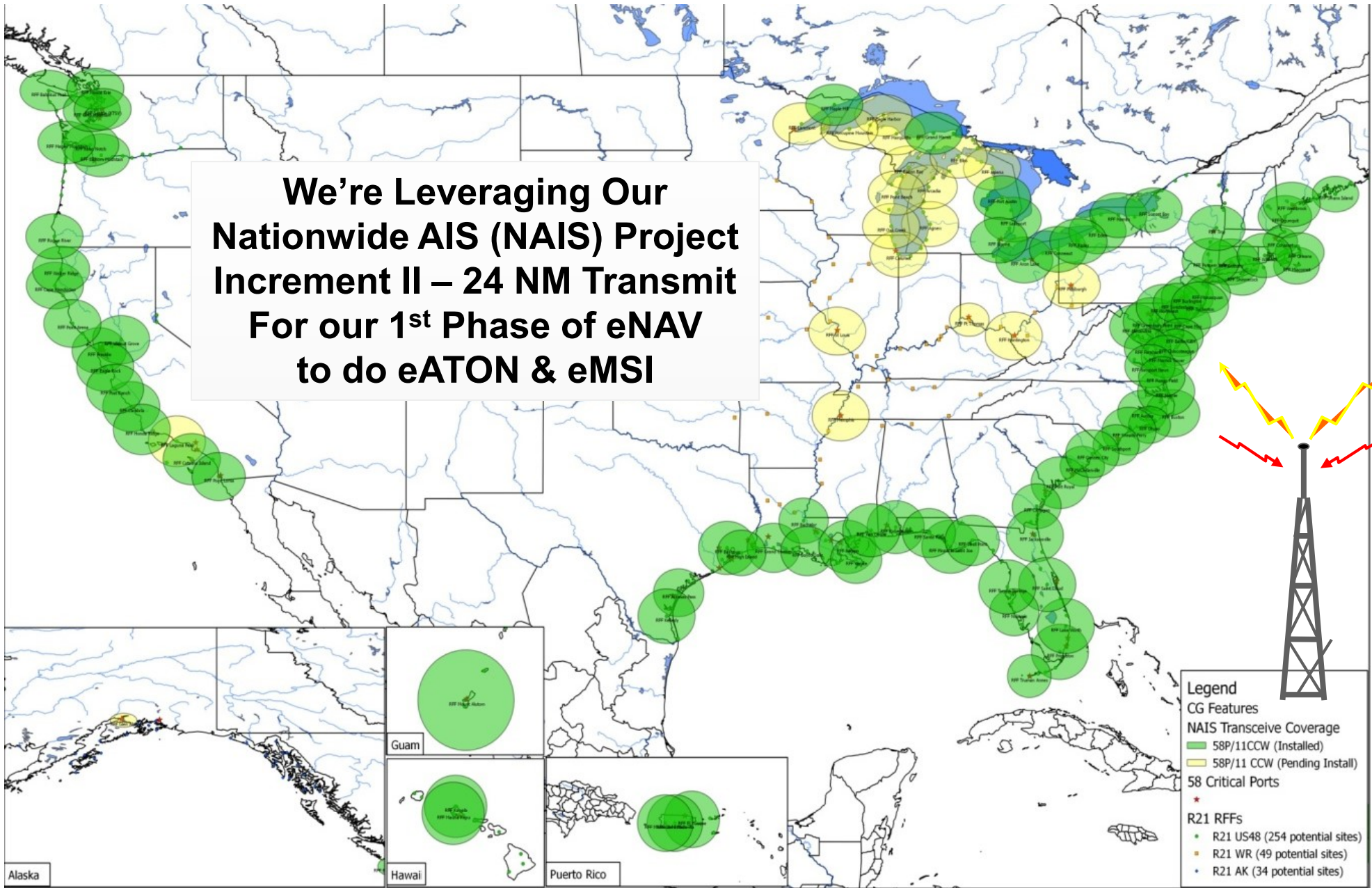
We're Leveraging Our Nationwide AIS (NAIS) Project Increment II – 24 NM Transmit For our 1st Phase of eNAV to do eATON & eMSI

Legend

CG Features

NAIS Transceive Coverage
- 58P/11CCW (Installed)
- 58P/11 CCW (Pending Install)

58 Critical Ports
- ★

R21 RFFs
- R21 US48 (254 potential sites)
- R21 WR (49 potential sites)
- R21 AK (34 potential sites)

Alaska

Guam

Hawaii

Puerto Rico

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Adding eATONs to the ATON Family

Synthetic AIS

Virtual AIS

Potential Physical AIS

Virtual AIS
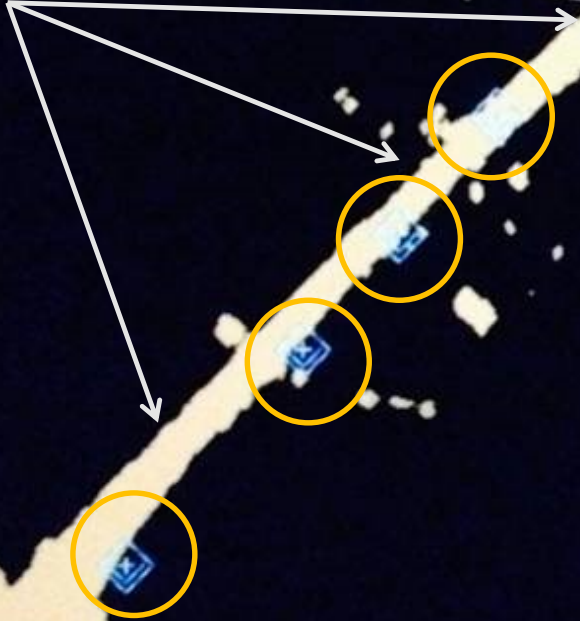
NOAA PORTS Tampa & Chesapeake Bay

Nationwide AIS Towers and Current AIS -ATON

District 13
(2) Puget Sound
(1) Columbia River

District 9
None deployed at this time due to limited transmit capabilities

District 1
(24) Hudson River
(9) Ambrose Channel
(11) Boston Harbor

Joint Capabilities Technical Demonstration (JCTD)
Louisville, KY
Number of AIS-ATON: TBD

District 11
(25) San Francisco Bay and Approaches
(1) San Diego Harbor

District 8
(20) Mississippi River (New Orleans to Baton Rouge)
(2) Calcasieu Channel

District 5
(1) Delaware Bay Approach
(3) New Castle Range
(9) Chesapeake Channel

District 17
(2) Cook Inlet
Broadcast Through Marine Exchange Alaska (MXAK)

Guam

District 14
(2) Honolulu

District 7
(9) Jacksonville
(7) Key West
(7) Tampa Bay/St. Petersburg
(10) Miami

Alaska

Hawaii

Puerto Rico

Legend
Sites
US ACoE Sites
NAIS Transceive Sites
NAIS Receive Sites

Modeled Coverage
NAIS I2 Transceive
Approved, Installed
Approved, Not Ordered

See our Home Page for more Info…and please provide us your Feedback

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 $\geq$ 65 feet

    No exclusions, i.e. fishing and small passenger vessels

  - ➤ Towing vessels $\geq$ 26 feet & >600 hp

  - ➤ Vessels with **$\geq$ 50** passengers (vice 150 for hire)

  - ➤ **Hi-speed passenger vessels ($\geq$ 12 pax)**

  - ➤ **Certain dredges & floating plants, &**

  - ➤ **Vessel moving certain dangerous cargoes**

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AIS Meetings & Comment Period…

- **Public Meetings**
  - **Washington, DC – March 5th, 2009**
    - **30+ attendees, 11 commenters**
  - **Seattle, WA – March 25th, 2009**
    - **30+ attendees, 12 commenters**
- **Comment period closed: April 15th, 2009**
  - **80+ submissions, 300+ comments regarding AIS**

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AIS Public Comments or Concerns

- **Will not help security…all vessel needed**

  o **Yes, it would be beneficial for our maritime domain awareness that all vessel have AIS, but, knowing what we know—AIS users—allows to better manage our resources in finding what we don't know**

- **Not here…not needed…exempt my waterway**

  o **We didn't create a patchwork of waterways, but, we did broaden the exemption provisions**

- **Not capturing total economic impact—no ECS**

  o **Electronic Charts Systems are not required by this rule nor necessary for the operation of AIS**

- **Don't need it…I've never collided…I have VMS**

  o **Vessel Monitoring System (NOAA fishery requirement) are not real-time device nor designed for ship-to-ship navigation safety communications**

AIS Public Comments or Concerns

- **Carriage on floating plants and/or other vessel that lack onboard power**

  - Floating plants are omitted from the requirements; exemptions provisions are provided for vessel that lack power

- **Continuous operation on unmanned moored vessel**

  - Use of mobile AIS on unmanned craft is made impermissible

- **AIS conning information from display-less Class B**

  - Display exemption is permissible

- **Would attract vessels and/or disclose fish areas**

  - While AIS will divulge location, it does not track fish catch activity

- **Extend implementation period >7months**

  - Implementation period extended to 13 months (3/1/16)

AIS Public Comments or Concerns

- **Waivers indefinite or >1 year**

  - ○ **Exemption period is extended to 5-years**

- **Exempt tows >1200hp, assist towers, carrying <150 passengers**

  - ○ **600 hp threshold is mandated per MTSA'02; passenger threshold is amended to >150**

- **Undue economic burden**

  - ○ **To mitigate impact on small entities applicability raised to >150 passenger threshold, and, the broader use of lower cost AIS Class B's**

- **AIS Class B yes…on hi-speed vessels no**

  - ○ **Use of AIS Class B is permissible on dredges, fishing vessels, and small passenger vessels that operate outside VTS/VMRS or <14 knots**

Noteworthy AIS Rule Changes…

- **AIS (& assoc. sensors) shall remain on when:**
  - Underway
  - At anchor
  - At least 15 min. prior to unmooring
  - Except if it compromises safety or security
    - Securing it must be logged & reported to USCG

- **AIS does not relieve you of sound, lights or shapes nor radiotelephone requirements**

No changes to what was proposed

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Noteworthy AIS Rule Changes…

- **AIS is primarily for the person controlling the vessel, who must maintain a periodic watch**
  - Use of **AIS** mobiles from ashore or on unmanned vessels is prohibited

- **AIS messaging must be in English & solely for navigation safety information**
  - Allows the use of Application Specific Messaging, that have been adopted by **IMO/IALA**, but, only one/min.

Noteworthy AIS Rule Changes…

- **Applies to all navigable waters, no exceptions.**

- **Spells out 'effective operating conditions' which now includes the:**

  - **ability to reinitialize the AIS**

  - **ability to access AIS from conning position**

  - **accurate broadcast of an official MMSI**

  - **accurate input, upkeep, and updating**

No changes to what was proposed

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Noteworthy AIS Rule Changes...

- **Type-approved Class B be allowed, but, <u>not recommended</u> on vessels that are:**

  - **highly maneuverable**

  - **navigate at high speed**

  - **routinely operate in congested waters, or**

  - **operate in close-quarter situations**

  Allows the use of lower cost AIS Class B devices on: dredges, fishing boats, and vessels certificated <150 passengers that do not operate in a Vessel Traffic Service or at speeds of >30 kts

Noteworthy Proposed AIS Rule Changes…

- Individual yearly deviations/waivers 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 to 5-years and broadens it to vessels on which AIS would be impractical, i.e. lack of power, open exposed conning position, display requirement on vessels allowed to use AIS Class B

Effective March 2nd, 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 1st, 2016

- vessels of 65 feet or more in length
- towing vessels of 26 feet or more in length and more than 600 hp
- vessels certificated to carry more than 150 passengers
- dredges that operate near a commercial channel
- vessels engaged in the movement of certain dangerous cargo, or flammable or combustible liquid cargo in bulk

Fishing Vessels:	
-Undocumented	64
-Documented	2,842
Total fishing vessels	**2,906**
Freight ship	247
Industrial vessel	220
MODU	31
OSV**	151
Research	54
School	10
Tank Ship	35
Towing	1,429
Unclassified type	326
Unknown service	134
Passenger	288
Dredges	17
Total Population	**5,848**

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Current AIS Prices

Class B: $499 – $1,700
Class A: 2,900 – $3,990

Furuno FA150 AIS Transponder

Product ID: FJ1150-15   MFG ID: FA150

Furuno FA150 is a shipborne Universal AIS (Automatic Identification System) Transponder capable of exchanging navigation and ship data between own ship and other ships or coastal stations.

Availability: Usually ships within 24 hours

List Price $4,495.00   **Our Price** $3,9...

Qty: 1   **+ ADD TO CART**

WISHLIST   EMAIL

100% CERTIFIED

Milltech Marine Online Store

ACR Nauticast2 Class A AIS Transponder

The ACR Nauticast2 AIS Transponder is a class A unit that is specifically designed to fulfill non-SOLAS carriage requirements. This product is packaged in an All-in-One kit that includes the AIS transponder, VHF & GPS antennas, data cables, and pivot mounti... kit. An ECDIS port adapter is included which can directly interface with your ECDIS display or marine navigation package. The system can be ordered for use with 12 or 24 volt DC power.

ACR-2609   **$2,999.00**   Add to Cart

COMNAV MARINE   21410002

ComNav Voyager X3 Class A AIS Transceiver

SKU:	MPN:	Weight:
48523	21410002	9.30 LBS

IN STOCK, & READY to SHIP!

RETAIL: $2,649.00
(YOU SAVE $574.55)

Sale Price: **$2,074.45**

ONLY 1 LEFT

ADD TO CART

Quantity 1...

PayPal CREDIT — Get more time to pay. Check out with PayPal and choose PayPal Credit. Subject to credit approval. See terms. US customers only.

- Free UPS Ground Shipping
- No Sales Tax (outside of NJ)
- Easy 30 Day Returns
- 25' Cleaner Coastline

MARINE SCREENS MISSION
EVERY ORDER = 25' of CLEANER COASTLINE

FURUNO FA30 BLACK BOX AIS

List Price: $1,102.50
Our Price: $805.00
You Save: $297.50 (27%)

SKU: FURFA30

In Stock

Usually ships in 1-2 business days

Humminbird TX AIS Class B Receiver

RRP:	$559.99
Your Price:	$448.82 (You save $111.17)
SKU:	409310-1
Brand:	Humminbird
Condition:	New
Weight:	5.00 LBS
* Extended Warranty:	No Extended Warranty / 2 Year Warranty 39.99 / 3 Year Warranty 59.99

WEST MARINE *NEW!*

AIS-1000 Class B "Send and Receive" AIS Transponder

$699.99 USD

Add To Cart

+ Add AIS-1000 Class B "Send and Receive" AIS Transponder To Project List

AIS-1000 Class B "Send and Receive" AIS Transponder

Simrad AI50 Automatic Identification Sy...

Product ID: SM1139-00   MFG ...

Simrad AI50 AIS Automatic... and be seen. Be in control – avoid collisions at sea. Simrad AI50 AIS transmit function works by broadcasting a digital signal that contains information about your boat's identity, speed and direction to other AIS equipped vessels in your area. Has now received FCC approval for the US.

Availability: Usually ships within 24 hours

100% CERTIFIED BRAND NEW

List Price $1,627.00   **Our Price** $1,248.95

Qty: 1   **+ ADD TO CART**

Comparison Table of AIS mobile devices

Shipboard AIS	Class A	Class B/SO	Class B/CS
Transmit Power (Watts)	12.5 W / 2 W (low-power)	5 W / 2 W (low-power)	2 W
Primary Access Scheme	Self-organizing Time-Division Multiple Access (SOTDMA)	SOTDMA	Carrier-sense TDMA non-competing with SOTDMA units
Position Reporting Rate	Either every 2, 3 ½, 6 or 10 s based on speed and course change. Every 3 min. when ≤ 3 kts.	Either every 5, 15 or 30 s based on speed (2-14, 14-23, >23 kts) Every 3 min. when ≤ 2 kts.	Every 30 s Every 3 min. when ≤ 2 kts.
Static Data Reporting Rate	Every 6 min	Every 6 min	Every 6 min
Frequency Range	25 kHz bandwidth between 156.025 MHz to 162.025 MHz	25 kHz bandwidth between 156.025 MHz to 162.025 MHz	25 kHz bandwidth at minimum between 161.500 MHz to 162.025 MHz
Dedicated DSC Receiver for Channel Management	Yes	Yes	Time-shared
Position Source / WGS-84 to 1/10,0000 of minute of arc	Internal Global Navigation Satellite System & connection to an External Electronic Positioning System (EPFS)	Internal GNSS	Internal GNSS
Digital Interfaces	2 Input-Output & Multiple Presentation Outputs	Optional	Optional
Display	Multiple Keyboard Display (MKD)	MKD	Optional
Safety Text Messaging	Receive & Transmit	Receive & Transmit	Transmit Optional, and only with non-alterable pre-configured messages
Application Specific Messaging	Receive & Transmit	Receive & Transmit (up to 3 slots)	Receive Optional, cannot Transmit
Transmit Data	All	No Rate of Turn, Navigation Status, Destination, ETA, Draft, or IMO#	No Rate of Turn, Navigation Status, Destination, ETA, Draft, or IMO#
International Electrotechnical Commission (IEC) Certification Standard	IEC 61993-2	IEC 62287-2	IEC 62287-1

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Automatic Identification System

- What is AIS?
- How AIS Works
- Types of AIS
- AIS Messages
- AIS Base Station Report
- Class A Position Report
- Class A Static & Voyage Data
- Class B Reports
- AIS ATON Report
- Long Range AIS Report
- Nationwide AIS (NAIS)
- AIS Requirements
- Reference Information
- AIS Encoding Guide & LOCODES
- Frequently Asked Questions

Mission Areas

- Global Positioning System
- Nationwide DGPS
- Nationwide AIS (NAIS)
- AIS (Overview, Messages, etc.)
- Long Range Identification and Tracking
- Local Notice to Mariners
- Light Lists
- Civil GPS Service Interface Committee
- LORAN C (archive)

Subscribe / Report (free)

- Local Notice to Mariners (Weekly)
- GPS Operational Summary (Daily)

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 vessels' 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?

Class A/B Comparison Table

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.

NAVIGATION CENTER
The Navigation Center of Excellence

U.S. Department of Homeland Security
UNITED STATES COAST GUARD

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Automatic Identification System

- What is A...
- How AIS...
- Types of...
- AIS Mess...
  - AIS Bas...
  - Class A...
  - Class A...
  - Class B...
  - AIS AT0...
  - Long Ra...
- Nationwid...
- AIS Requi...
- Referenc...
  - AIS Enc...
- Frequentl...

Mission Areas

- Global Positioning System
- Nationwide DGPS
- Nationwide AIS (NAIS)
- AIS (Overview, Messages, etc.)
- Long Range Identification and Tracking
- Local Notice to Mariners
- Light Lists
- Civil GPS Service Interface Committee
- LORAN C (archive)

Subscribe / Report (free)

- Local Notice to Mariners (Weekly)
- GPS Operational Summary (Daily)

AIS FREQUENTLY ASKED QUESTIONS

1. What is AIS?

15. Is the USCG 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 effected here) operating on any U.S. navigable waters, and, harmonizes U.S. AIS requirements with Regulation V/19.2.4 of the Safety of Life at Sea Convention and § 102 of the Maritime Transportation Security 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 formats of these 2015 requirements our 2008 proposed rule, an amalgamation of both, our 2003 requirements, and, a chart-comparison of all three.

16. How can I get a copy of an AIS presentation I saw (or heard about it) that was given at... You can download recent presentations given by Coast Guard Office of Navigation Systems personnel here:

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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.

See AIS FAQ #16 For Copy of this Presentation

www.navcen.uscg.gov or Search: **AIS FAQS**

Home | DGPS Advisories | GPS Constellation Status | MSI Data Downloads | GPS Testing Notices | LNMs | Almanacs | Nav Rules | AIS | N. Amer. Ice Svc | Contact Us | Search

Automatic Identification System

- What is AIS?
- How AIS Works
- Types of AIS
- AIS Messages
  - AIS Base Station Report
  - Class A Position Report
  - Class A Static & Voyage Data
  - Class B Reports
  - AIS ATON Report
  - Long Range AIS Report
- Nationwide AIS (NAIS)
- AIS Requirements
- Reference Information
  - AIS Encoding Guide & LOCODES
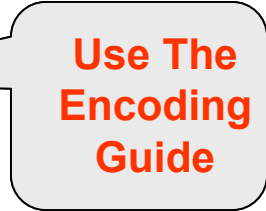- Frequently Asked Questions

Mission Areas

- Global Positioning System
- Nationwide DGPS
- Nationwide AIS (NAIS)
- AIS (Overview, Messages, etc.)
- Long Range Identification and Tracking
- Local Notice to Mariners
- Light Lists
- Civil GPS Service Interface Committee
- LORAN C (archive)

Subscribe / Report (free)

- Local Notice to Mariners (Weekly)
- GPS Operational Summary (Daily)

AIS FREQUENTLY ASKED QUESTIONS

Use The Encoding Guide

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 vessels' 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?
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AUTOMATIC IDENTIFICATION SYSTEM

ENCODING GUIDE

v.2015-01-30

AUTOMATIC IDENTIFICATION SYSTEM is a valuable navigation safety radio communication tool. However, its usefulness is undermined by the broadcast of inaccurate, improper or outdated data. Mariners are reminded that U.S. regulation requires that each AIS be maintained in effective operating condition which includes accurate input and upkeep of AIS data parameters. Failure to do so may subject a vessel to civil penalties; to avoid such action AIS Users should ensure their system is up-to-date and encoded as follows:

Static Data…should be manually inputted at installation & password protected. Remember the password. You will need it to re-encode or update these AIS parameters

- **Maritime Mobile Service Identifier (MMSI), call sign, & vessel name** should match your radio license. There should only be one MMSI assigned to the vessel. If you are licensed-by-rule, input {@@@@@@@} as your call-sign. Names should **not** include abbreviations (except public vessels, i.e. USCG, USCGC, USACE, USS, LAPD, NYFD, etc.) or vessel type precursors, i.e. F/V, M/V, MV, OSV, P/V, REC, S/V, TUG, etc.

  Names exceeding 20 characters (the parameter limit) should **not** be abbreviated, but, may be truncated to 20 characters which include all any unique distinguishing characters. For example, World-wide Traders' tug 123456 should be identified and inputted as {WORLD-WIDE TRA123456}.

  If nameless, use your state registration number preceded by {USA#} as your name, e.g. USA#NY1234YZ. If unnumbered (e.g. associated craft, vessel tenders), use your parent vessel's name followed by a dash {-} and a numerical designator that distinguishes you amongst others. For example, the first tender for the cruise ship *Freedom of the Seas* should be identified and inputted as {FREEDOM OF THE SEA-1}. Additionally, its AIS message 24B call-sign parameter should reflect the last 6-digits of *Freedom of the Seas* MMSI preceded by {A}, e.g. A123456.

- **IMO Number[2]** should match your assigned 7-digit IMO number. If necessary, use leading zeroes (**not** trailing zeroes) to fill this parameter, e.g. 0001234567. Absent an IMO assignment input your U.S. official documentation number preceded by either '100' or '1000', e.g. 1001234567, 1000123456. Input all zeroes vice your official number if your AIS does not provide for exactly 10-digits.

Dynamic Data…should be provided via systems that are properly installed, maintaned & opertaional [3]

- **Type of positioning source** and **accuracy** should be accurately set, i.e. GPS, surveyed, manual input, etc. The positioning source should provide: course over ground in 1/10 degrees, speed over ground in 1/10 knots, vessel position in 1/10 seconds of latitude & longitude, and degree of accuracy (whether greater or less than 10 meters).

- **Heading** data should be integrated into the AIS on vessels of 150 gross tonnage or greater; and, **Rate of Turn** data on vessels of 50,000 gross tonnage or greater (per SOLAS Regulation V/19.2).

- **A Pilot Plug,** on vessels required to embark pilots, should be connected and properly wired to the AIS; and, permanently located within 3 feet of a 3-prong, 120-volt, AC receptacle.

Voyage Related Data…should be manually inputted as necessary to always indicate current conditions

- **Navigation Status** should indicate your current navigational status, i.e. at anchor, underway, engaged in fishing, etc. *Note, vessels engaged in towing should use: Navigation Status '11' when towing astern, or '12' when pushing ahead or alongside.* Remember to change your status when anchored or moored. Doing so reduces the AIS reporting rate of 2–10 seconds to once every 3 minutes; which mitigates network congestion and improves reception range.

- **Static Draft** should indicate the vessel's actual draft. Input the vessel's maximum draft if the actual draft is unknown.

- **Type of vessel** should indicate a *Ship Type* denoted in the accompanying table.

- **Dimensions** should indicate the official dimensions of the vessel. Input meters, **not** feet. Dimensions are described in terms of distance in meters to the positioning-system antenna used by AIS (e.g. GPS antenna). Refer to the diagram. In this example the AIS's GPS antenna is located at the intersection of the two white lines.

  Also to be used by U.S. *ship type 57 (see Table)* to show the overall rectangular proportions of the vessel and its tow—as portrayed by the dark arrow lines within the rectangles in the diagram.

- **Estimated Time of Arrival** to destination or voyage departure (if moored or anchored). Input Universal Time Coordinated (not local time).
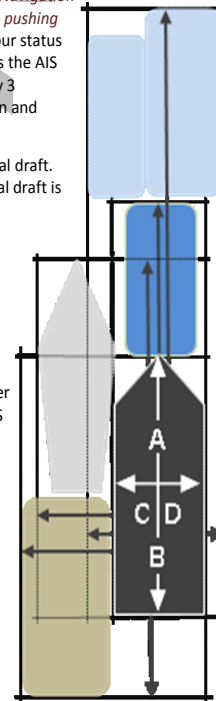
- **Port of destination and your port of origination** should be inputted using ISO 3166 country and UN location codes (UN/LOCODE) [4] for international voyages (per IMO SN/Circ.244) or U.S. GUID [5] for domestic voyages as follows:.

  Origination>Destination using ISO 3166 country & UN/LOCODE
  USNYC>NLRTM …for New York City to Rotterdam[7]

  U.S. GUID[5] may be used in lieu of & UN/LOCODES for vessels inbound to the U.S or for domestic voyages (between any U.S. port or place)[6] as follows:
  CNSHA>USA0VCY …for Shanghai to San Francisco Pier 35

  For domestic voyages as follows: US^GUID |>|><|<>|<|>>|GUID
  US^0YRX>AA?? …a one-way voyage to a port or place[5], but, unknown berth
  US^0WKZ>>0Q1Z-07QJ …a one-way voyage, via an alternate or standard route
  　(i.e. Berwick Bay, LA to New Orleans, LA via Harvey Locks)
  US^0YRX>0Z50 …a one-way voyage
  US^0Y0P><0Q6L …a scheduled route, i.e. Staten Island Ferry
  US^0VCY><0VCY …a voyage to nowhere & back, e.g. an excursion
  US^0NVR<< …at anchored, moored, or on station, e.g. MODU, FPSO
  US^0YQ8<>0YQ8 …operations solely within a confined area, e.g. fleeting area,
  　harbor, Vessel Traffic Service area, etc

Safety-Related Text Messaging…should be short, concise, & used only to exchange pertinent navigation safety-related information

- AIS safety-related text messages (SRM) must be in English and solely to exchange navigation safety information.

- Although not prohibited, AIS text messaging should **NOT** be relied upon as the primary means for distress (MAYDAY) or urgent (PAN PAN) communications.[8]

- Keep SRM concise and as short as possible (less than 90 characters). The use of abbreviations is acceptable and highly encouraged; see the Notice to Mariners, USCG Local Notice to Mariners, Light List and U.S. Nautical Chart No. 1 for a listing of common abbreviations.

- Testing or repair facilities, in conjunction with on-air testing, should also periodically broadcast an AIS SRM: {TEST BCST}. Repair testing should be kept to a minimum and not exceed an hour per day.

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[1] See http://wireless.fcc.gov/services/index.htm {Ship Radio Stations}
[2] Obtained at www.imonumbers.lrfairplay.com/datause.aspx
[3] Per IMO SN/Circ. 227 & 224 or NMEA 4.0 Installation Guidelines
[4] Find Country (ISO 3166) & United Nations Location Codes (UN/LOCODE) at: www.unece.org/cefact/locode/welcome.html
[5] Find U.S. Globally Unique Identifier's (US/GUIDS) for ports, places, berths and routes at: www.navcen.uscg.gov/?pageName=locode
[6] Any port or place in which a vessel is bound to anchor, moor, or maintain station (i.e. Outer Continental Shelf activity)
[7] If AIS lacks angle brackets {>} substitute with parenthesis {) |)(| () | (| ((}
[8] See 47 CFR 80.1109–Distress, urgency, and safety communications

USCG AIS Encoding Guide

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 amplifying text not found in the original source (ITU-R M.1371)

1st digit	2nd digit	[3x] others "engaged in"	[5x] special craft
0 – Not available *DO NOT USE*	0 – All ships of this type	30 – Fishing *vessels, including processors, but, not tenders (see type '53')**	50 – Pilot vessel
1 – Reserved for future use *DO NOT USE*	1 – Carrying DG (Dangerous Goods), HS (Hazardous Substances), or MP (Marine Pollutant), IMO hazard or pollutant category A/X *Carrying < 12 passengers for hire*	31 – Towing, *whose dimensions (ABCD values) represent the overall dimensions of the vessel, not including the tow**	51 – Search and rescue vessels, *i.e. USCG boats, USCG Auxiliary, assistance towers*
2 – WIG	2 – Carrying DG, HS, or MP, IMO hazard or pollutant category B/Y *Carrying > 12 passengers for hire*	32 – Towing and length of the tow exceeds 200 meters (656 ft.) *whose dimensions (ABCD values) represent the overall dimensions of the vessel, not including the tow**	52 – Tugs, *push-boats or work boats, **not** engaged in towing**
3 – Other vessels *engaged in actions denoted in column [3x]*	3 – Carrying DG, HS, or MP, IMO hazard or pollutant category C/Z *Ferry service carrying < 150 passengers*	33 – Engaged in dredging, or underwater operations*, (e.g., salvaging, surveying, but, not diving) **	53 – *Fish, offshore or* port tenders
4 – HSC *(Hi-speed Craft) or passenger vessels < 100 GT, including tenders*	4 – Carrying DG, HS, or MP, IMO hazard or pollutant category D/O *Ferry service carrying > 150 passengers*	34 – Engaged in diving operations*	54 – *Commercial response* vessels with anti-pollution facilities or equipment
5 – Special craft, *per column [5x]*	5 – Reserved for future use *95 – Offshore Supply Vessels (OSV)*	35 – Engaged in military operations	55 – Law enforcement vessels, *i.e. USCG cutters, marine police*
6 – Passenger ships > 100 GT	6 – Reserved for future use *96 – Mobile Offshore Drilling Units (MODUs), Liftboats, Floating Production Systems (FPS), Floating Production Storage and Offloading Vessels (FPSO)*	36 – Sailing *vessels**	56 – Spare–for assignments to local vessels *that are engaged in towing and whose dimensions (ABCD values) represent the overall dimensions of the vessel and its tow**
7 – Cargo *(freight) ships, including Integrated Tug-Barge (ITB) vessels*	7 – Reserved for future use *97 – School, scientific, research or training ships*	37 – Pleasure craft *(recreational vessel)*	57 – Spare–for assignments to local vessels
8 – Tankers	8 – Reserved for future use *98 – Autonomous or remotely-operated craft*	38 – Reserved for future use *[DO NOT USE]*	58 – Medical transports (as defined in the 1949 Geneva Convention and Additional Protocols) *or similar public safety vessels*
9 – Other types of ship	9 – No additional information *contact cgnav@uscg.mil prior to use*	39 – Reserved for future use *[DO NOT USE]*	59 – Ships according to RR Resolution No. 18 (Mob-83)

*Remember to also update your Navigation Status accordingly
For further information or additional copies visit www.navcen.uscg.gov or email cgnav@uscg.mil

USCG AIS Encoding Guide

United States Coast Guard
Office of Navigation Systems

Questions ?

Thank You

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Homeland Security