# United States Coast Guard

## Office of Navigation Systems


## "We Help Mariners Get There"

Jorge Arroyo | eNavigation | U.S. Coast Guard | Washington, DC

Homeland Security

# What is AIS?

**An Autonomous Continuous Non-Proprietary Ship-to-Ship Navigation Broadcast System**

**Internationally adopted (ITU-R M.1371) & required (IMO SOLAS Regulation V/19.2.4) on all tankers & passenger vessels irrespective of size, ships of 300 gross tonnage or greater on international voyage; of 500 gross tonnage or greater on domestic voyage.**

| Purpose | 3 Modes of Operation | Frequency agile |
|---|---|---|
| ➢collision avoidance<br>➢vessel traffic service tool<br>➢coastal surveillance | ➢self-reporting (autonomous)<br>➢polling (interrogation)<br>➢tele-command (assignment) | ➢any 2 VHF-FM Marine Channels<br>➢Ch. 87B & 88B world-wide<br>➢2250 reports/min./channel |

**Multiple standard interfaces (NMEA 183) & display options (e.g. ECDIS/radar/PC)**

# AIS Carriage Regulations 33 CFR 164.46

The following must have a properly installed, operational, type-approved AIS

- *On international voyage:*
  - ✓ Tankers, Passenger ≥ 150 GT, all others ≥ 300 GT
    - ❑ Per SOLAS Regulation V/19.2.4
  - ✓ Self-propelled commercial vessels ≥ 65 feet
    - ❑ Except fishing and small passenger vessels (<150 passengers)
- *Within a VTS area:*
  - ✓ Self-propelled commercial vessel 65+ feet
    - ❑ Except fishing & small passengers vessels
  - ✓ Towing vessel ≥ 26 feet and ≥ 600 hp
  - ✓ Vessel certificated to carry ≥ 150 passengers

# AIS Rulemaking [Changes in **Bold-type**]

- ✓ 10/23/03 current AIS requirement published (33 CFR 164.46)
- ✓ 07/01/03-01/09/04, 3 meetings & comment period re: AIS expansion
- ✓ 10/31/05, agenda entry re: expansion of AIS to **all** navigable waters
- ✓ 12/16/08, NPRM published; 04/15/09, comment deadline (73 FR 78295)
- Proposed compliance date: NLT 7 month after Final Rule
- AIS prices: Class A, $2,800-5,000; Class B, $700-1,500
  - Installation cost will vary by display options & interfacing
  - SOLAS requires interfacing to GPS, THD, ROT, back-up power
- Potentially could effect 17,442 vessels/14,506 small biz's, i.e.
  - Commercial self-propelled vessels of ≥ 65 feet
    - **No exclusions**
  - Towing vessels ≥ 26 feet and > 600 hp
  - Vessels with **≥ 50** passengers (vice 150 for hire)
  - **Hi-Speed vessels with ≥ 12 passengers for hire**
  - **Certain dredges & floating plants, &**
  - **Vessel moving certain dangerous cargoes**

| Estimated Expanded AIS Population | |
|---|---|
| **Ships** ≥65ft | **2,973** |
| **Freight Ship** | 298 |
| **Industrial Ship** | 748 |
| **MODU** | 210 |
| **OSV** | 553 |
| **Research Vessel** | 97 |
| **School Ship** | 19 |
| **Tank Ship** | 122 |
| **Unclassified** | 385 |
| **Unknown** | 541 |
| **Fishing** ≥65ft | **5,520** |
| Documented | 4,571 |
| Undocumented (est.) | 949 |
| **Towing** ≥26ft & ≥600hp | **4,560** |
| **Passenger** | **3,235** |
| ≥65ft | 2,167 |
| <65' but ≥50 pax | 1,062 |
| >30kts & >12 pax for hire | 6 |
| **Dredges** | **35** |
| **Total** (U.S.) | **16,323** |
| **Foreign Flag** ≥65ft | **1,119** |
| **Total** (All) | **17,442** |

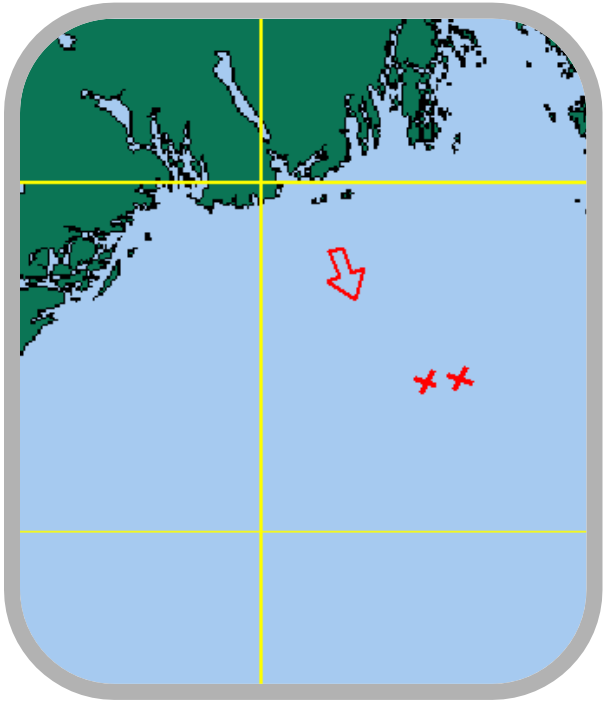
# AIS Certification Standards Update

- IEC 61993-2 Class A published in 2001
  - Edition 2 completed – publication 2012
- IEC 62287-1 Class B Carrier-sense (CS) published in 2006
  - Edition 2 published – 29 Oct 10
- IEC 62320-1 AIS base station published in 2007
  - Edition 2 in development
- IEC 62320-2 AIS AtoN base station published in 2008
- IEC 62288 – Navigation Presentation published in 2008
  - Edition 2 in development
- IEC 62287-2 Class B SOTDMA (SO)
  - Final stages – publication 2012
- IEC 61097-14 AIS SART published in 2009
  - Their use became permissible 1/1/10

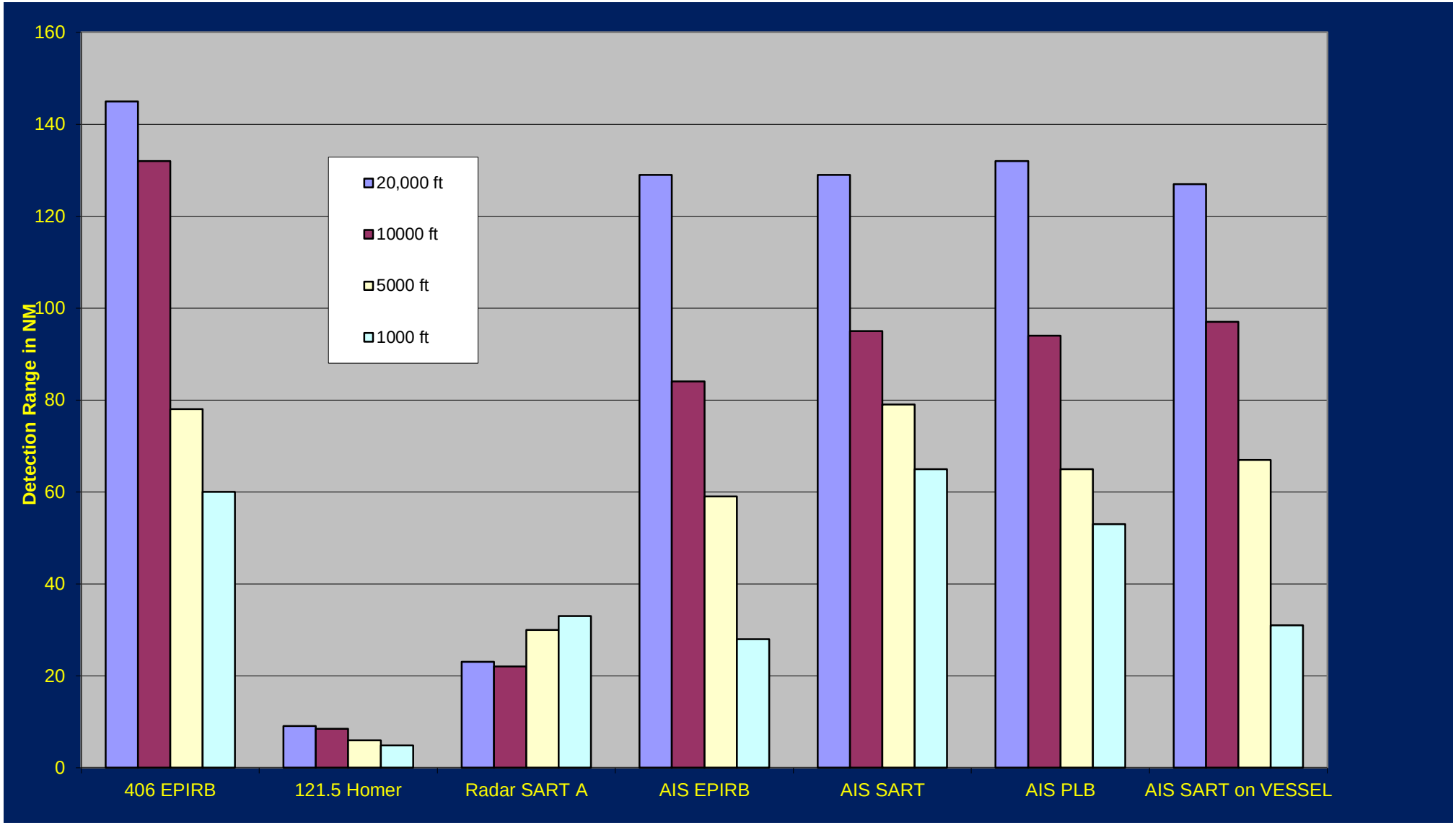
# AIS SART – GMDSS Search and Rescue AIS Transmitter


NEW PRODUCT – Part of GMDSS from Jan. 2010:

- Alternative to traditional radar SART, for use in life boats / rafts
- Location is automatically shown on electronic chart / ECDIS
- Each AIS-SART has a unique code, unlike radar-SART & 121.5, thus many in the same area will not overload the search system.
- Transmit 1 burst of 8 transmissions every minute, using SOTDMA
- 1 W ERP output / 96 hours operation



# Key West Trials Aviation Results

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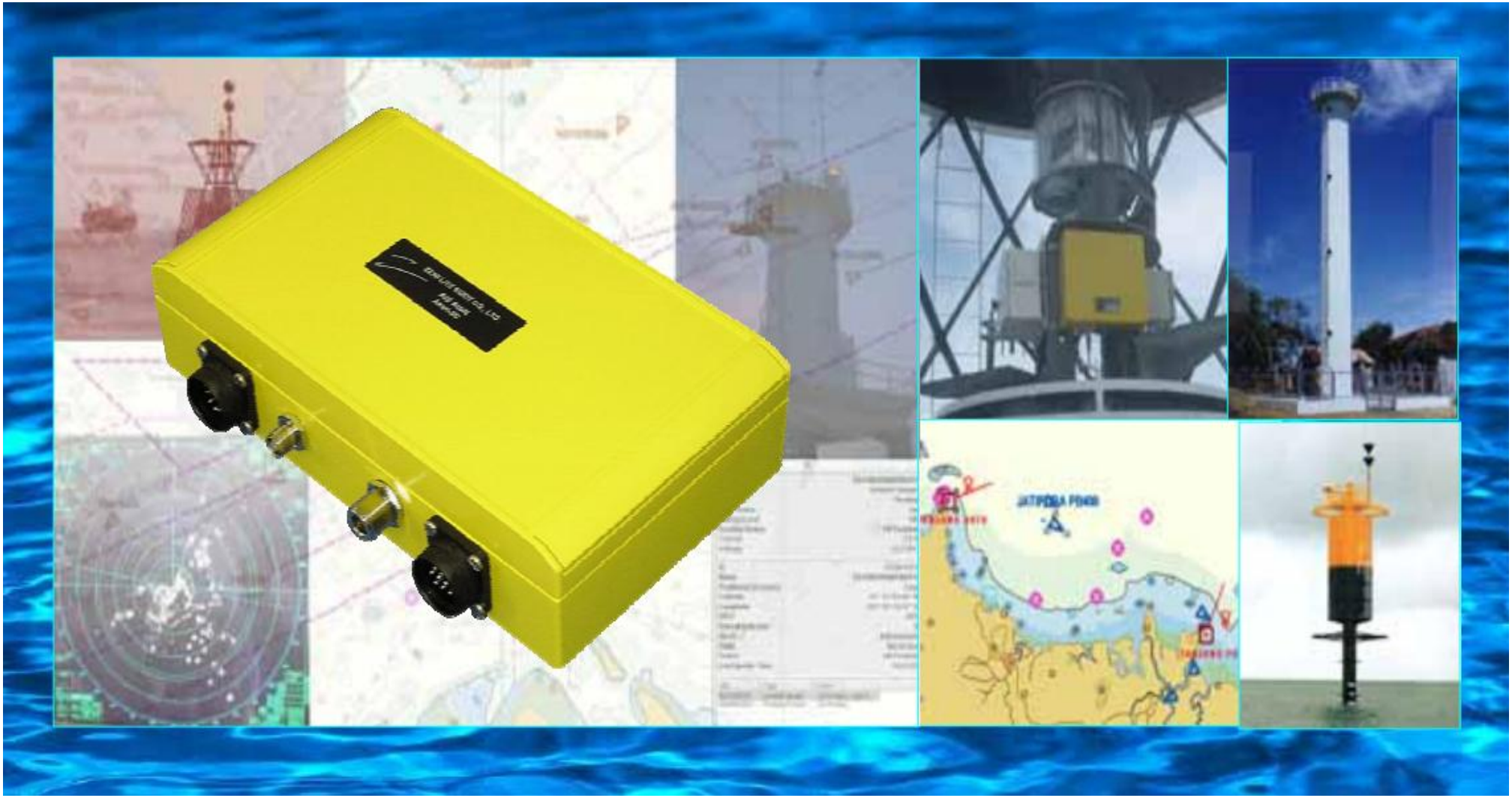
# AIS AtoN



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| ID# | ITU-R M.1371 AIS Message Descriptions | AU | AS | IN | Slots |
|---|---|---|---|---|---|
| 1,2,3 | Position Reports – autonomous (au), assigned (as), or interrogated (in) | x | x | x | 1 |
| 4 | Base Station Report – UTC/date, position, slot nr. | | x | | 1 |
| 5 | Class A Report - static and voyage related data | x | x | x | 2 |
| 6,7,8 | Binary Message – addressed, acknowledge or broadcast | x | x | x | 5/2 |
| 9 | SAR aircraft position report | x | x | x | 1 |
| 10,11 | UTC/Date - enquiry and response | | x | x | 1 |
| 12,13,14 | Safety Text Message – addressed, acknowledge or broadcast | | x | x | 5/2 |
| 15 | Interrogation – request for specific messages | | x | x | 1 |
| 16 | Assignment Mode Command | x | x | | 1 |
| 17 | Binary Message – DGNSS Correction | | x | | 1 |
| 18,19 | Class B Reports – position & extended | x | x | | 2 |
| 20 | Data Link Management – reserve slots | | x | | 1 |
| 21 | ATON Report – position & status | x | x | x | 2 |
| 22 | Channel Management | | x | | 1 |
| 23 | Group Assignment | | | | 1 |
| 24 | Class B-CS Static Data | | | x | 1 |
| 25 | Binary Message - single-slot | | | | 1 |
| 26 | Binary Message - multi-slot (STDMA) | | | | 5 |
| 27 | Long-range Report | x | | | 1 |

### 3.19 Message 21: Aids-to-navigation report

This message should be used by an Aid-to-Navigation (AtoN) AIS station. This station may be mounted on an aid-to-navigation or this message may be transmitted by a fixed station when the functionality of an AtoN station is integrated into the fixed station. This message should be transmitted autonomously at a Rr of once every three (3) min or it may be assigned by an assigned mode command (Message 16) via the VHF data link, or by an external command. This message should not occupy more than two slots.

TABLE 70

| Parameter | Number of bits | Description |
|---|---|---|
| Message ID | 6 | Identifier for Message 21 |
| Repeat indicator | 2 | Used by the repeater to indicate how many times a message has been repeated. See § 4.6.1, Annex 2; 0-3; 0 = default; 3 = do not repeat any more |
| ID | 30 | MMSI number, (see Article 19 of the Radio Regulations and ITU-R M.585) |
| Type of aids-to-navigation | 5 | 0 = not available = default; refer to appropriate definition set up by IALA; see Table 71. |
| Name of Aids-to-Navigation | 120 | Maximum 20 characters 6-bit ASCII, as defined in Table 44.<br>"@@@@@@@@@@@@@@@@@@@@" = not available = default<br>The name of the Aid-to-Navigation may be extended by the parameter "Name of Aid-to-Navigation Extension" below. |
| Position accuracy | 1 | 1 = high (< 10 m)<br>0 = low (> 10 m);<br>0 = default<br>The PA flag should be determined in accordance with Table 47. |
| Longitude | 28 | Longitude in 1/10 000 min of position of an aid-to-navigation (±180°, East = positive, West = negative.<br>181° ($6791AC0_h$) = not available = default) |
| Latitude | 27 | Latitude in 1/10 000 min of an aid-to-navigation (±90°, North = positive, South = negative.<br>91° ($3412140_h$) = not available = default) |
| Dimension/ reference for position | 30 | Reference point for reported position; also indicates the dimension of an aid-to-navigation (m) (see Figure 41 and § 3.3.3), if relevant[(1)]. |
| Type of electronic position fixing device | 4 | 0 = Undefined (default);<br>1 = GPS<br>2 = GLONASS<br>3 = Combined GPS/GLONASS<br>4 = Loran-C<br>5 = Chayka<br>6 = Integrated Navigation System<br>7 = surveyed. For fixed AtoN and virtual AtoN, the charted position should be used. The accurate position enhances its function as a radar reference target.<br>8 = Galileo |

| Parameter | Number of bits | Description |
|---|---|---|
| | | 9 -15 = not used |
| Time stamp | 6 | UTC second when the report was generated by the EPFS (0-59 or 60 if time stamp is not available, which should also be the default value<br>or 61 if positioning system is in manual input mode<br>or 62 if electronic position fixing system operates in estimated (dead reckoning) mode<br>or 63 if the positioning system is inoperative) |
| Off-position indicator | 1 | For floating aids-to-navigation, only: 0 = on position; 1 =off position;<br>NOTE – This flag should only be considered valid by receiving station, if the aid-to-navigation is a floating aid, and if time stamp is equal to or below 59. For floating AtoN the guard zone parameters should be set on installation. |
| AtoN status | 8 | Reserved for the indication of the AtoN status.<br>00000000 = default |
| RAIM-flag | 1 | RAIM (Receiver autonomous integrity monitoring) flag of electronic position fixing device; 0 = RAIM not in use = default; 1 = RAIM in use see Table 47 |
| Virtual AtoN flag | 1 | 0 = default = real AtoN at indicated position; 1 = virtual AtoN, does not physically exist. (2) |
| Assigned mode flag | 1 | 0 = Station operating in autonomous and continuous mode = default<br>1 = Station operating in assigned mode |
| Spare | 1 | Spare. Not used. Should be set to zero. Reserved for future use. |
| Name of Aid-to-Navigation Extension | 0, 6, 12, 18, 24, 30, 36, ... 84 | This parameter of up to 14 additional 6-bit-ASCII characters for a 2-slot message may be combined with the parameter "Name of Aid-to-Navigation" at the end of that parameter, when more than 20 characters are needed for the Name of the Aid-to-Navigation. This parameter should be omitted when no more than 20 characters for the name of the A-to-N are needed in total. Only the required number of characters should be transmitted, i. e. no @-character should be used. |
| Spare | 0, 2, 4, or 6 | Spare. Used only when parameter "Name of Aid-to-Navigation Extension" is used. Should be set to zero. The number of spare bits should be adjusted in order to observe byte boundaries. |
| **Number of bits** | **272-360** | **Occupies two slots** |

# The nature and type of AtoN can be indicated with 32 different codes

0 Default, Type of A to N not specified
1 Reference point
2 RACON
3 Fixed structure off shore, i.e. wind farms
4 Spare, Reserved for future use.
5 Light, without sectors
6 Light, with sectors
7 Leading Light Front
8 Leading Light Rear
9 Beacon, Cardinal N
10 Beacon, Cardinal E
11 Beacon, Cardinal S
12 Beacon, Cardinal W
13 Beacon, Port hand
14 Beacon, Starboard hand
15 Beacon, Preferred Channel port hand
16 Beacon, Preferred Channel starboard hand
17 Beacon, Isolated danger
18 Beacon, Safe water
19 Beacon, Special mark
20 Cardinal Mark N
21 Cardinal Mark E
22 Cardinal Mark S
23 Cardinal Mark W
24 Port hand Mark
25 Starboard hand Mark
26 Preferred Channel  Port hand
27 Preferred Channel Starboard hand
28 Isolated danger
29 Safe Water
30 Special Mark
31 Light Vessel / LANBY/ Rigs

# IEC 62288

Edition 1.0 2008-07

# INTERNATIONAL STANDARD

**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**

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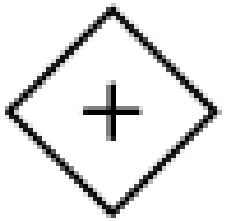
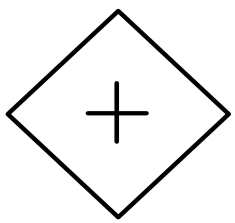
# Existing & Proposed IEC 62288 Symbol

**Replace the following graphic:**

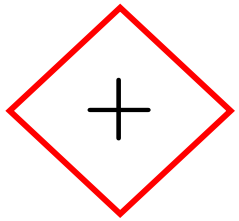


Basic shape (SN243)

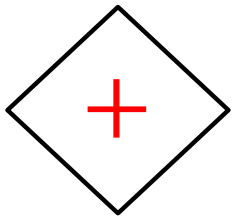
**with:**



On station



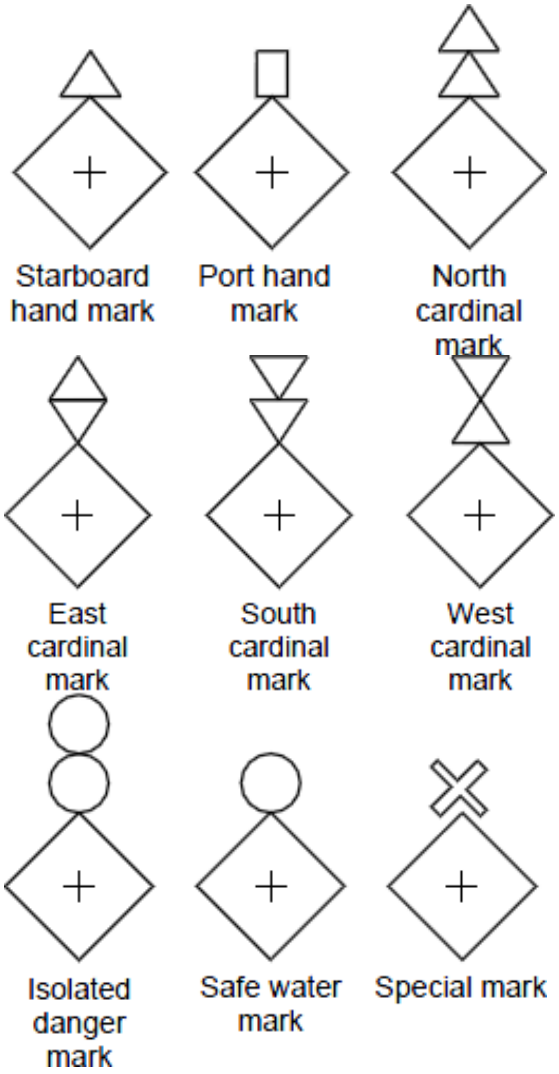
Basic shapes
Off station

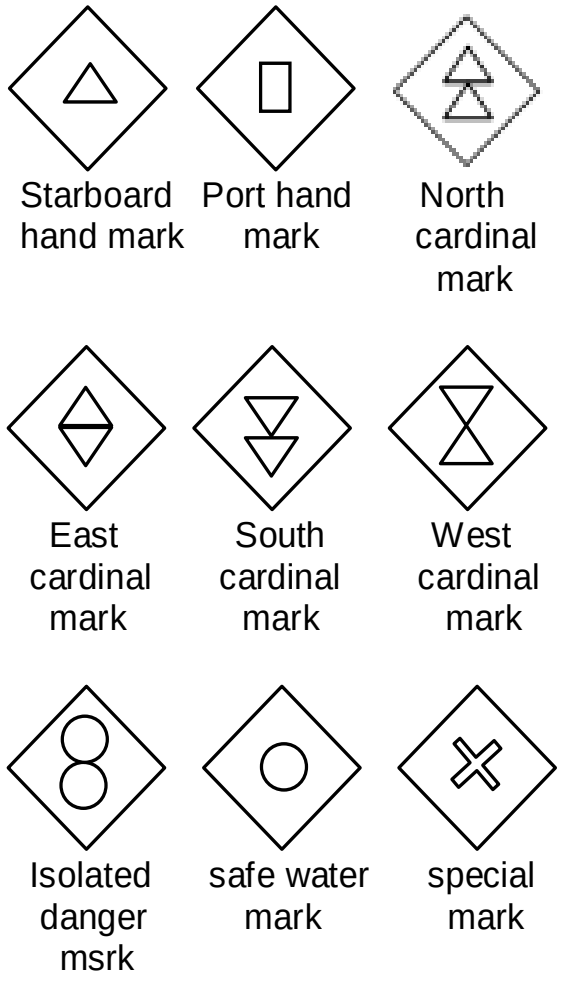


Status indication

(SN243)

# Currently 2 options under consideration



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| 4 | Base Station Report – UTC/date, position, slot nr. | | x | | 1 |
| 5 | Class A Report - static and voyage related data | x | x | x | 2 |
| 6,7,8 | Binary Message – addressed, acknowledge or broadcast | x | x | x | 5/2 |
| 9 | SAR aircraft position report | x | x | x | 1 |
| 10,11 | UTC/Date - enquiry and response | | x | x | 1 |
| 12,13,14 | Safety Text Message – addressed, acknowledge or broadcast | | x | x | 5/2 |
| 15 | Interrogation – request for specific messages | | x | x | 1 |
| 16 | Assignment Mode Command | x | x | | 1 |
| 17 | Binary Message – DGNSS Correction | | x | | 1 |
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| 22 | Channel Management | | x | | 1 |
| 23 | Group Assignment | | | | 1 |
| 24 | Class B-CS Static Data | | | x | 1 |
| 25 | Binary Message - single-slot | | | | 1 |
| 26 | Binary Message - multi-slot (STDMA) | | | | 5 |

# AIS can transfer data via binary messages…

- Provides a means to use other applications
  - Encode application on the transmission side
  - Decode application on the receive side
  - Sent as either General or Addressed broadcast
    - Addressed messages (MMSI-to-MMSI) receives an acknowledgement that the binary message was received

# Application Specific Message Format



### 3.3.8.2.6 Message 8: Binary broadcast message

This message will be variable in length, based on the amount of binary data. The length should vary between 1 and 5 slots.

TABLE 22

| Parameter | Number of bits | Description | | |
|---|---|---|---|---|
| Message ID | 6 | Identifier for Message 8; always 8 | | |
| Repeat indicator | 2 | Used by the repeater to indicate how many times a message has been repeated. See § 3.3.8.2.1.1 | | |
| Source ID | 30 | MMSI number of source station | | |
| Spare | 2 | Not used. Should be set to zero | | |
| Binary data | Maximum 968 | Application identifier | 16 bits | Should be as described in § 3.3.8.2.4.1 |
| | | Application data | Maximum 952 bits | Application specific data |
| Total number of bits | Maximum 1 008 | Occupies 1 to 5 slots | | |

# IMO SN/Circ.236
# AIS BINARY GUIDANCE
## 4-YR TRIAL PERIOD
## May 2004 - 2008

INTERNATIONAL MARITIME ORGANIZATION
4 ALBERT EMBANKMENT
LONDON SE1 7SR

Telephone: 020 7735 7611
Fax: 020 7587 3210

IMO

*E*

Ref.

SN/Circ.236
28 May 2004

**GUIDANCE ON THE APPLICATION OF AIS BINARY MESSAGES**

1 The Maritime Safety Committee, at its seventy-eighth session (12 to 21 May 2004), approved SN/Circ.236 on Guidance on the application of AIS binary messages as prepared by the Sub-Committee on Safety of Navigation at its forty-ninth session (30 June to 4 July 2003).

2 Automatic Identification System (AIS) is a working system for ship identification and tracking that has the capability of the service of binary messages. The concept, functional requirements, and technical constraints are described in annex 1.

3 The Sub-Committee on Safety of Navigation, at its forty-ninth session selected seven (7) binary messages as shown in annex 2 to this circular to be used as a trial set of messages. The idea is to use this set of 7 messages for a trial period of 4 years with no change. It should be noted that 4 additional system-related messages identified in Recommendation ITU-R M.1371 are needed for the operation of the system.

4 The criteria for selecting the 7 trial messages were:

.1 demonstrated operational need;

.2 a cross-section of users, including ships, VTS, pilots, and port authorities; and

.3 messages already developed for format and content.

5 In addition, messages were limited to a maximum number of 3 slots to reduce the potential for overloading the AIS frequencies designated for IMO.

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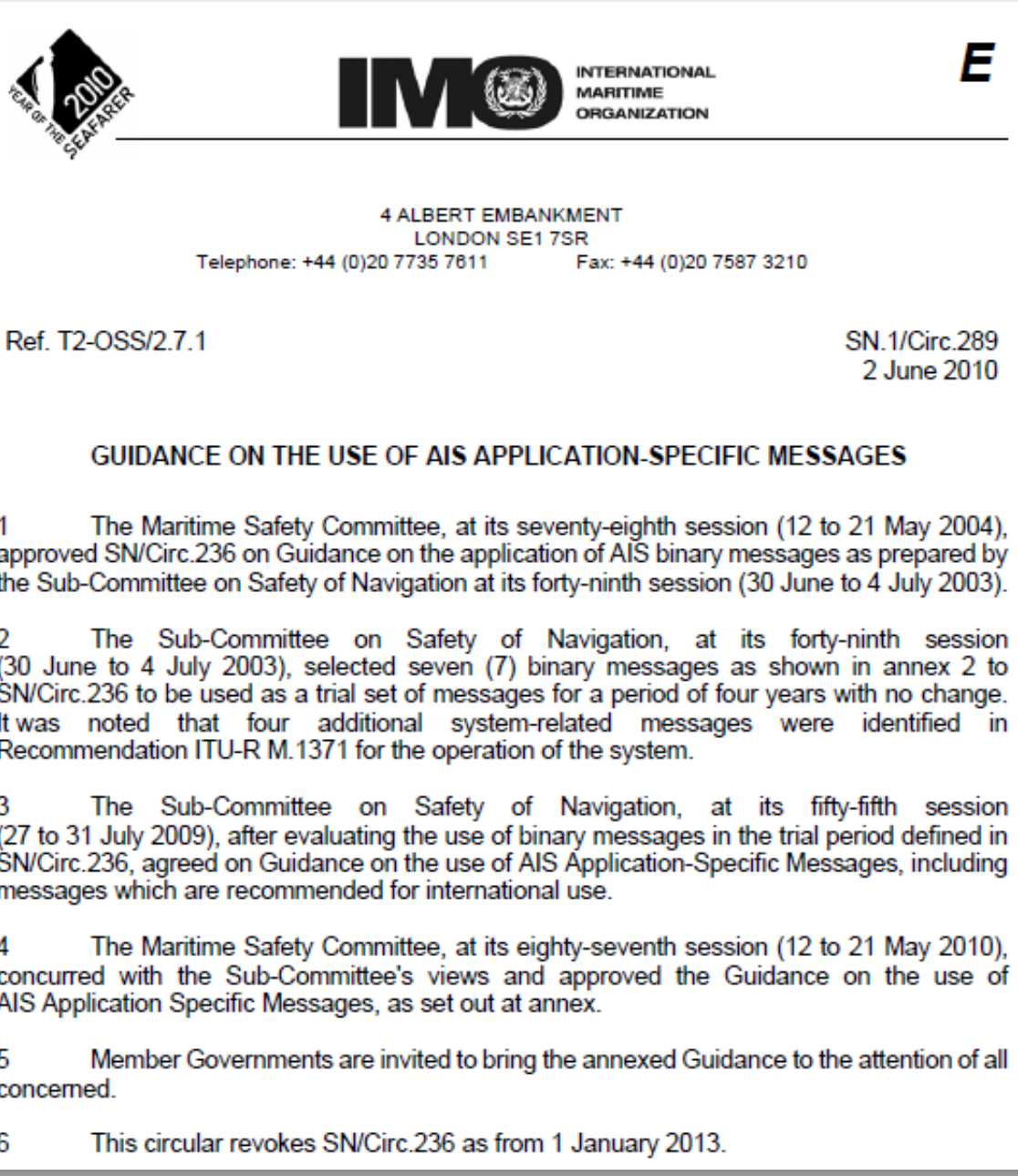
# IMO SN/Circ.236 ASM's

- ❑ Met/Hydrological*
- ❑ Dangerous cargo indication*
- ❑ Fairway closed*
- ❑ Tidal window*
- ❑ Extended ship static & voyage-related data*
- ❑ Number of persons on board**
- ❑ VTS-generated/synthetic targets**

# IMO SN/Circ.289
# AIS ASM GUIDANCE
## 22 ASM's



INTERNATIONAL MARITIME ORGANIZATION

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Telephone: +44 (0)20 7735 7611 Fax: +44 (0)20 7587 3210

Ref. T2-OSS/2.7.1

SN.1/Circ.289
2 June 2010

GUIDANCE ON THE USE OF AIS APPLICATION-SPECIFIC MESSAGES

1 The Maritime Safety Committee, at its seventy-eighth session (12 to 21 May 2004), approved SN/Circ.236 on Guidance on the application of AIS binary messages as prepared by the Sub-Committee on Safety of Navigation at its forty-ninth session (30 June to 4 July 2003).

2 The Sub-Committee on Safety of Navigation, at its forty-ninth session (30 June to 4 July 2003), selected seven (7) binary messages as shown in annex 2 to SN/Circ.236 to be used as a trial set of messages for a period of four years with no change. It was noted that four additional system-related messages were identified in Recommendation ITU-R M.1371 for the operation of the system.

3 The Sub-Committee on Safety of Navigation, at its fifty-fifth session (27 to 31 July 2009), after evaluating the use of binary messages in the trial period defined in SN/Circ.236, agreed on Guidance on the use of AIS Application-Specific Messages, including messages which are recommended for international use.

4 The Maritime Safety Committee, at its eighty-seventh session (12 to 21 May 2010), concurred with the Sub-Committee's views and approved the Guidance on the use of AIS Application Specific Messages, as set out at annex.

5 Member Governments are invited to bring the annexed Guidance to the attention of all concerned.

6 This circular revokes SN/Circ.236 as from 1 January 2013.

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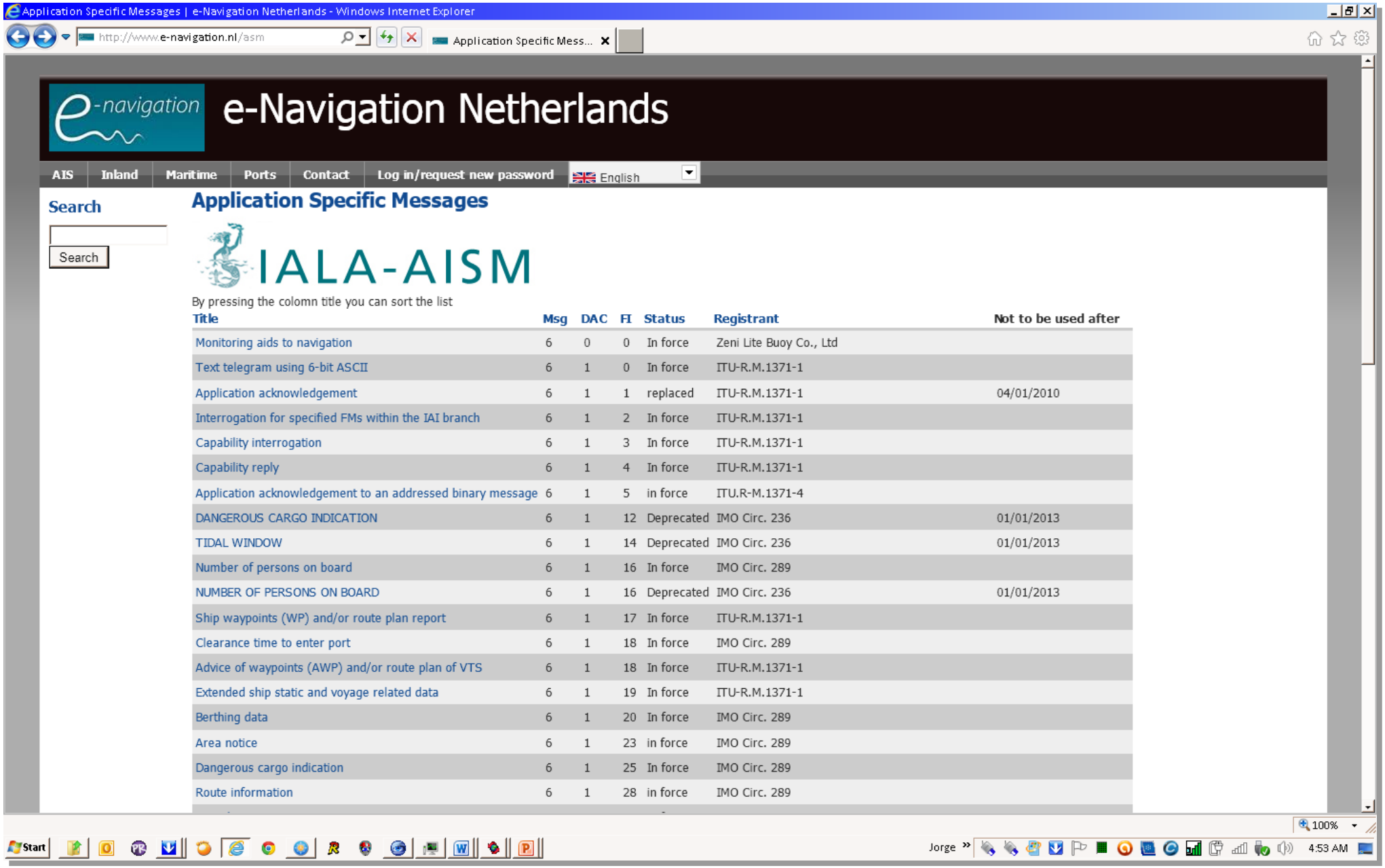
# IMO SN/Circ.289 ASM's

- ❑ Clearance time to enter port
- ❑ Marine traffic signal
- ❑ Berthing data
- ❑ Weather observation report from ship
- ❑ Area notice – broadcast & addressed
- ❑ Extended ship static and voyage-related data*
- ❑ Dangerous cargo indication*
- ❑ Environmental Data
- ❑ Route information – broadcast & addressed
- ❑ Text description – broadcast & addressed
- ❑ Meteorological and Hydrographic [sensor] data
- ❑ Tidal window

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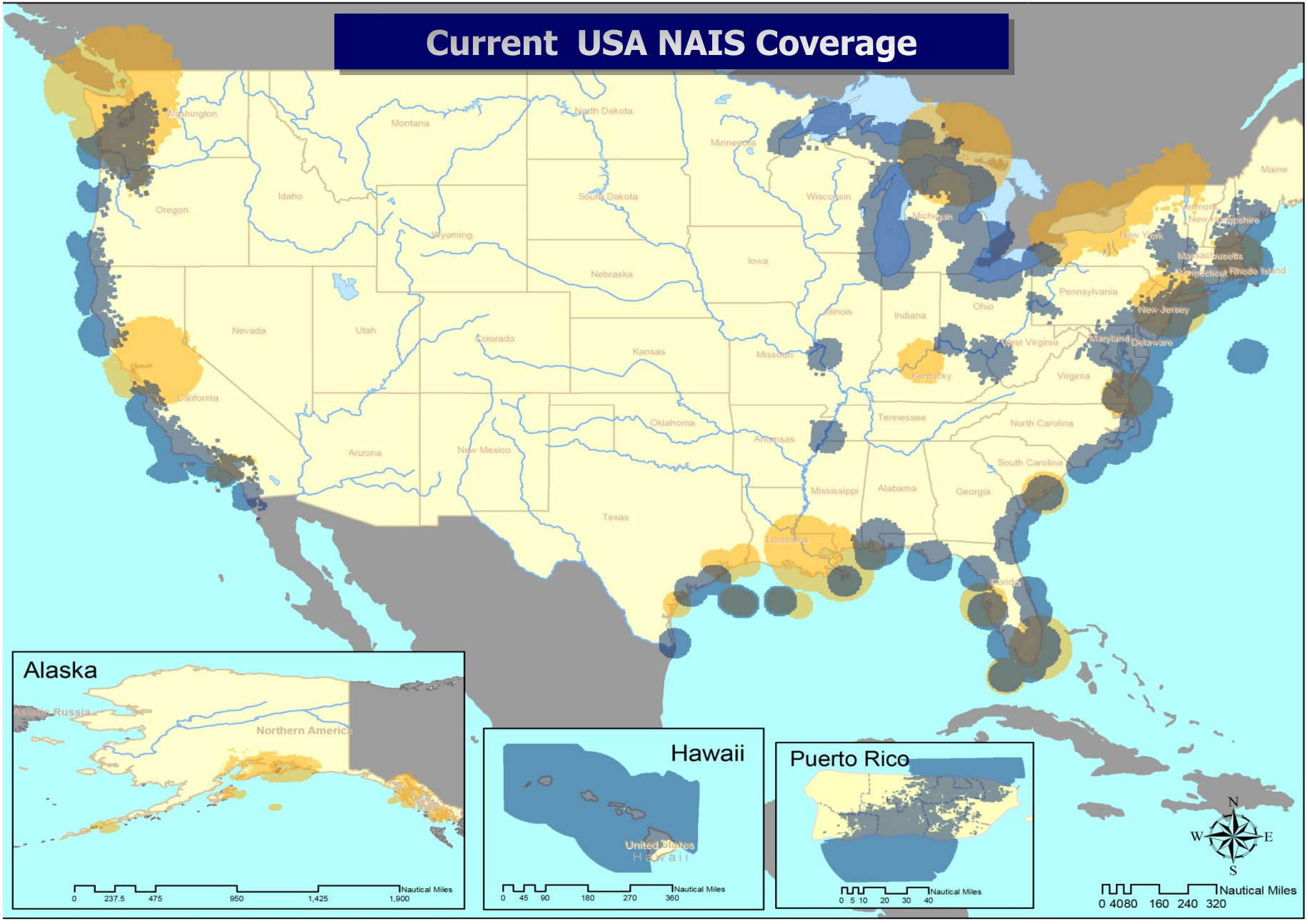
www.e-navigation.nl/asm

# Future ASM developments…

- International Assoc. of Marine Aids to Navigation & Lighthouse Authorities (IALA) Guidelines & Recommendations
  - ✓ E-Navigation Committee, Portrayal Working Group
  - ✓ Maintaining an AIS ASM catalogue
- Radio Technical Commission for Maritime Services (RTCM) Standards
  - ✓ Special Committee 121 - AIS ASM
  - ✓ Special Committee 129 - Navigation Portrayal
  - ✓ Special Committee 109 – Electronic Chart Systems
- U.S. Coast Guard
  - ✓ To expand our AIS ASM test beds to Louisville KY and with USACE LOMA effort
  - ✓ To require ECS and its integration with AIS (including ASM's)
  - ✓ Expanding transmit capability to our Nation-wide AIS (NAIS)
  - ✓ To provide NOAA PORTS via NAIS

# Current USA NAIS Coverage

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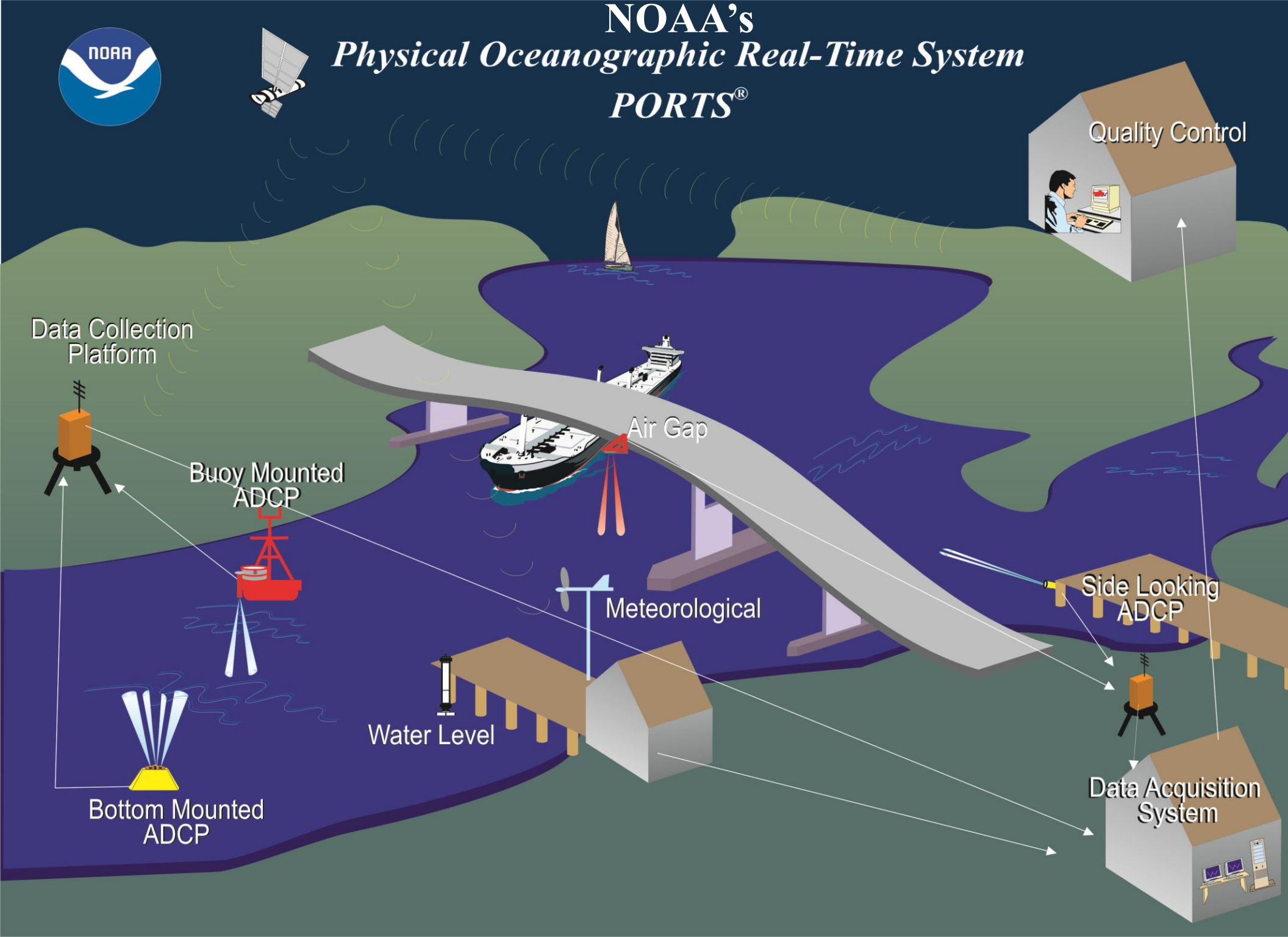
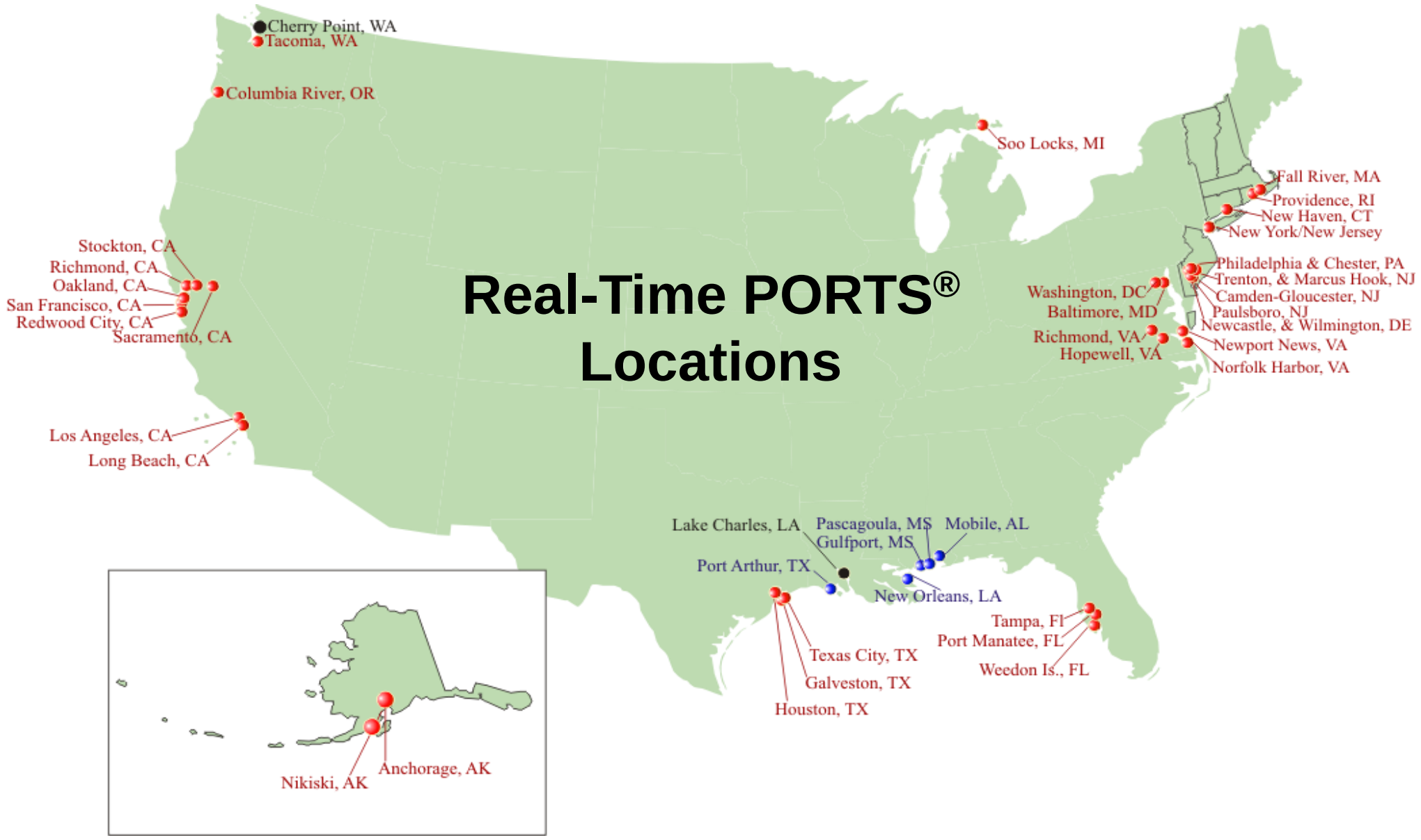

NOAA's
Physical Oceanographic Real-Time System
PORTS®
Quality Control
Data Collection Platform
Air Gap
Buoy Mounted ADCP
Meteorological
Side Looking ADCP
Water Level
Bottom Mounted ADCP
Data Acquisition System

# Real-Time PORTS® Locations

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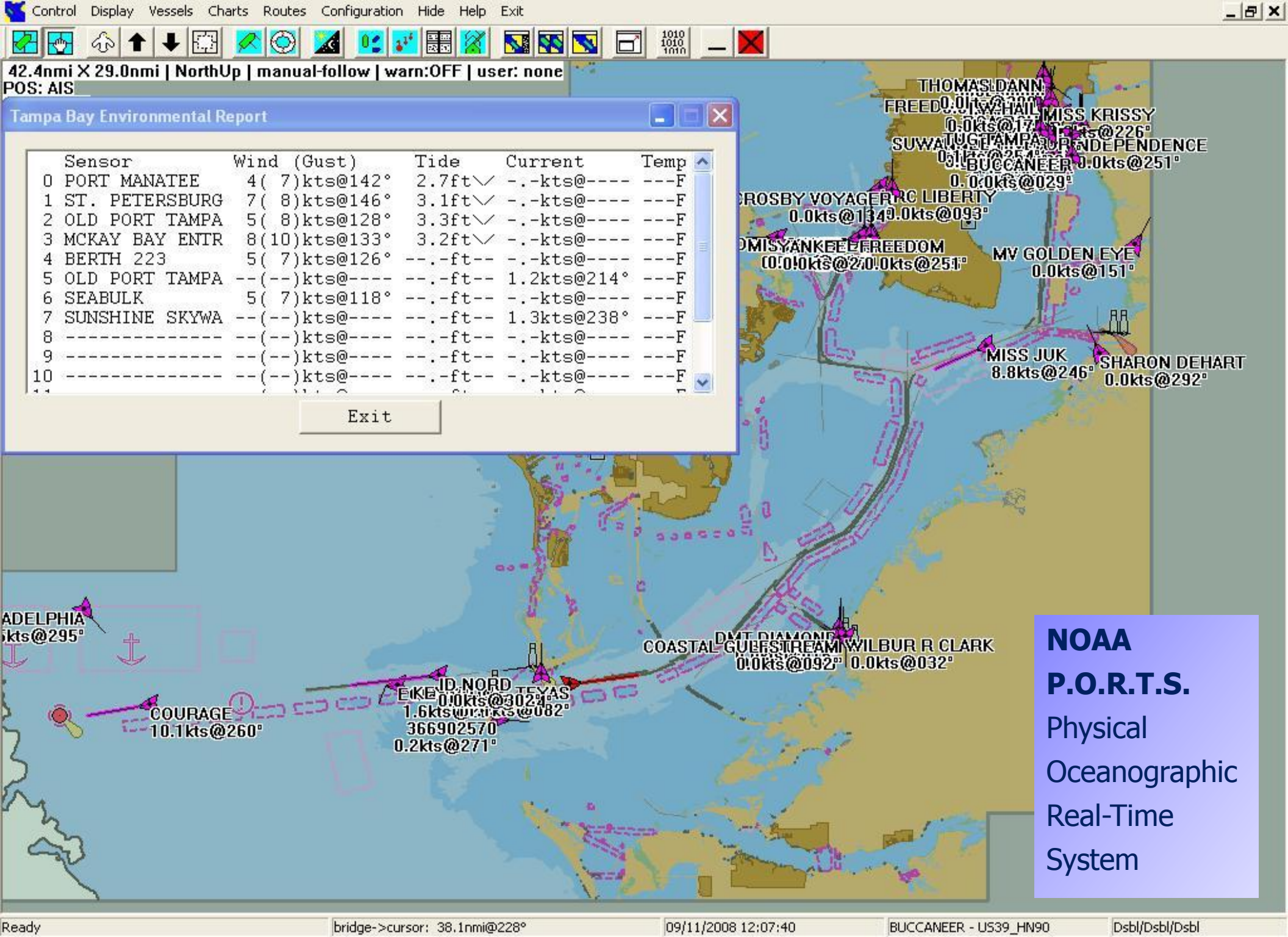
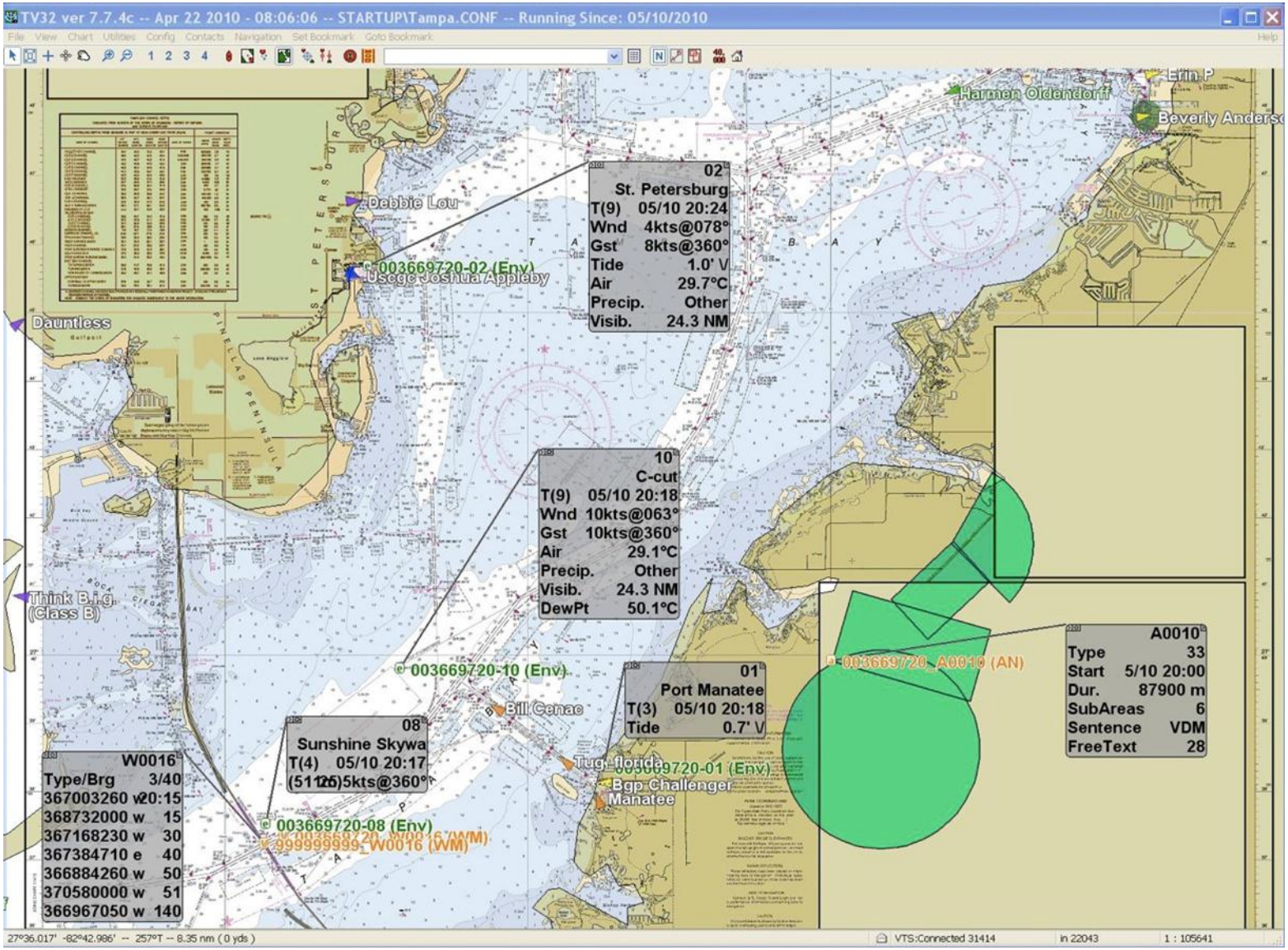
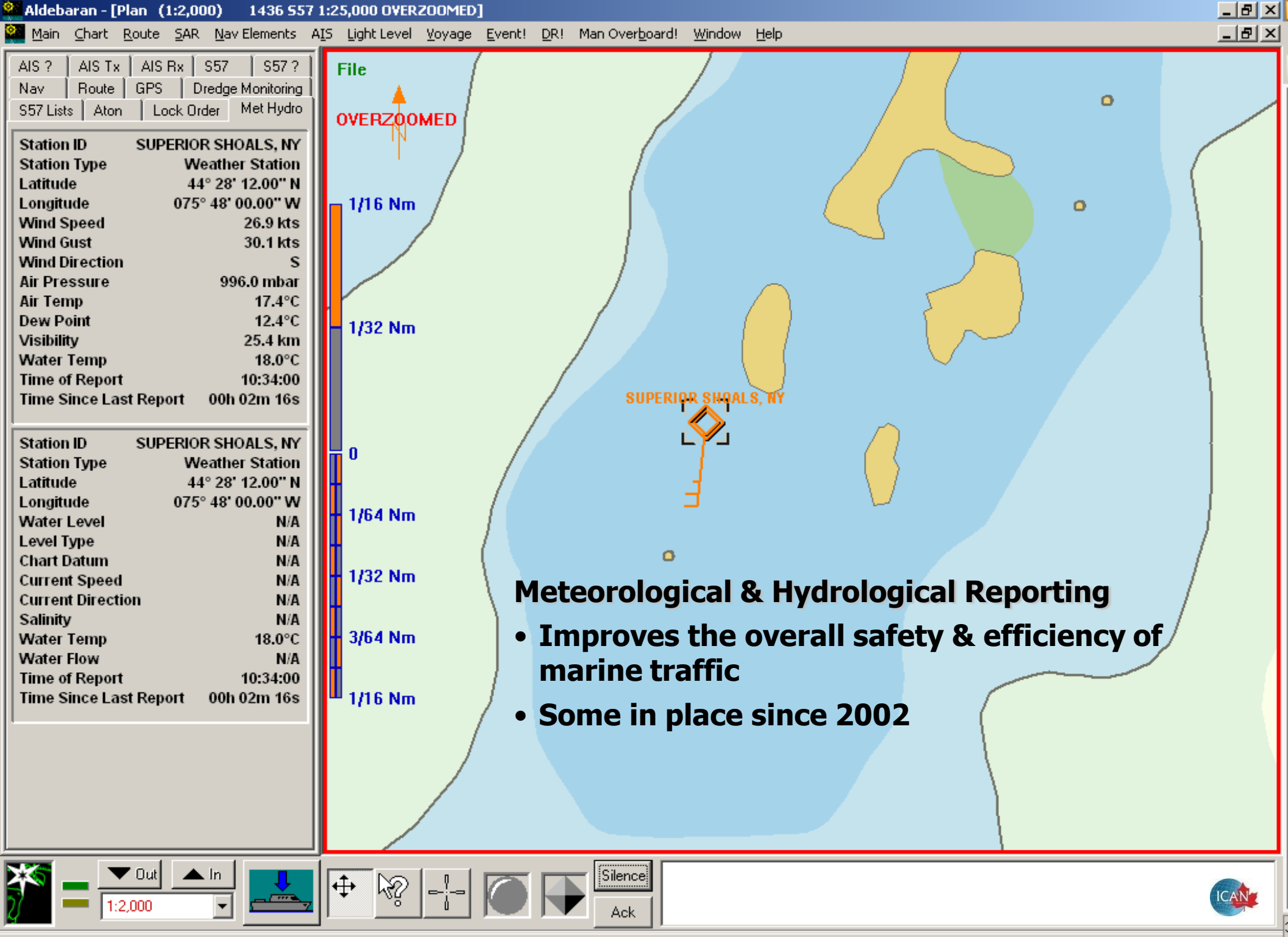
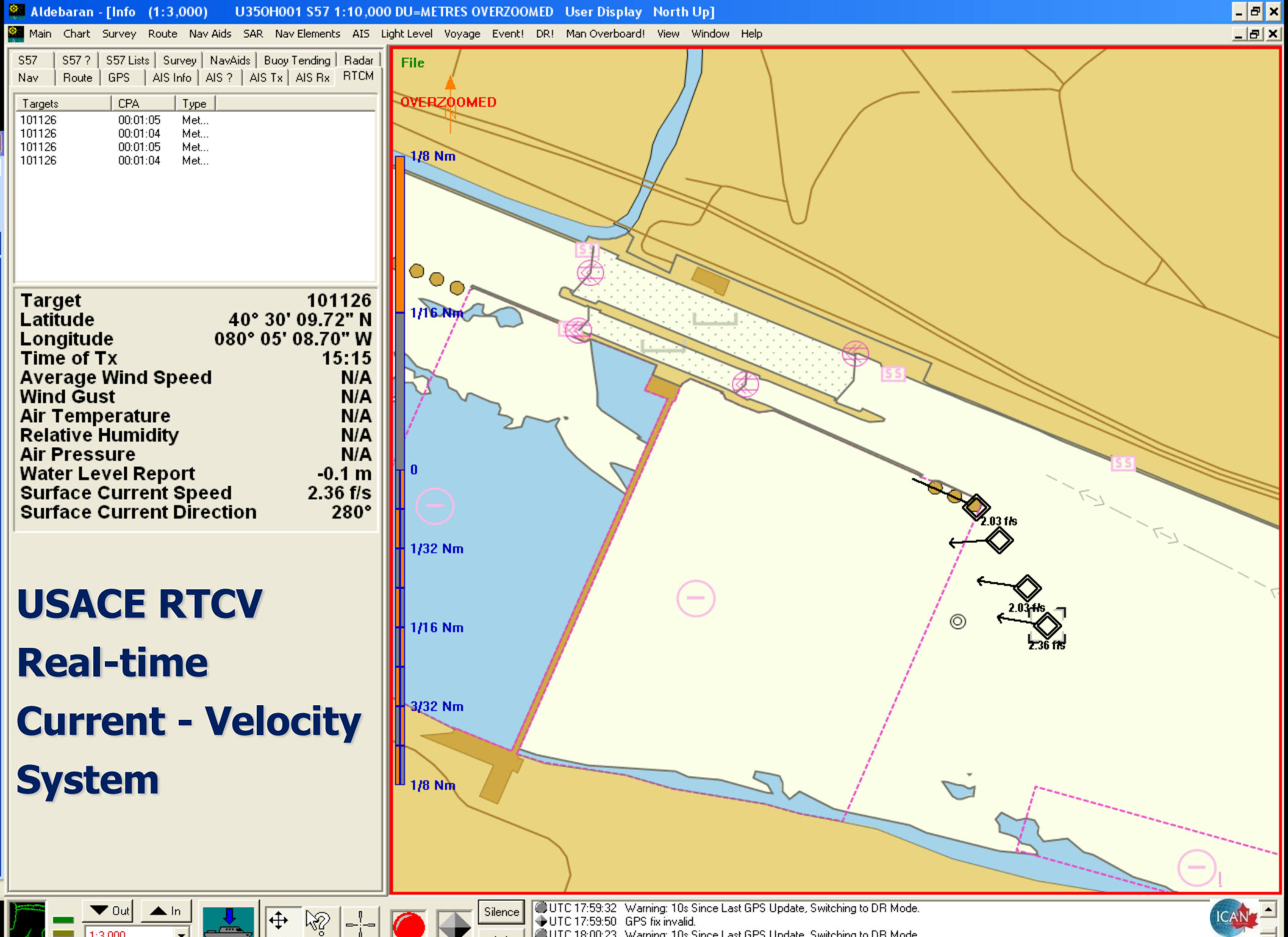

Control Display Vessels Charts Routes Configuration Hide Help Exit
42.4nmi X 29.0nmi | NorthUp | manual-follow | warn:OFF | user: none
POS: AIS
Tampa Bay Environmental Report
Sensor Wind (Gust) Tide Current Temp
0 PORT MANATEE 4( 7)kts@142° 2.7ft↘ -.-kts@---- ---F
1 ST. PETERSBURG 7( 8)kts@146° 3.1ft↘ -.-kts@---- ---F
2 OLD PORT TAMPA 5( 8)kts@128° 3.3ft↘ -.-kts@---- ---F
3 MCKAY BAY ENTR 8(10)kts@133° 3.2ft↘ -.-kts@---- ---F
4 BERTH 223 5( 7)kts@126° --.-ft-- -.-kts@---- ---F
5 OLD PORT TAMPA --(--)kts@---- --.-ft-- 1.2kts@214° ---F
6 SEABULK 5( 7)kts@118° --.-ft-- -.-kts@---- ---F
7 SUNSHINE SKYWA --(--)kts@---- --.-ft-- 1.3kts@238° ---F
8 ---------- --(--)kts@---- --.-ft-- -.-kts@---- ---F
9 ---------- --(--)kts@---- --.-ft-- -.-kts@---- ---F
10 ---------- --(--)kts@---- --.-ft-- -.-kts@---- ---F
Exit
THOMAS DANN
MISS KRISSY
0.0kts@226°
SUWA
TUG TAMPA
INDEPENDENCE
BUCCANEER 0.0kts@251°
0.0kts@029°
CROSBY VOYAGER
RC LIBERTY
0.0kts@134°
0.0kts@093°
OMISYANKEE FREEDOM
0.0kts@251°
MV GOLDEN EYE
0.0kts@151°
MISS JUK
8.8kts@246°
SHARON DEHART
0.0kts@292°
ADELPHIA
kts@295°
COASTAL GULFSTREAM
WILBUR R CLARK
0.0kts@092°
0.0kts@032°
EIKE
ID NORD
0.0kts@302°
1.6kts@082°
COURAGE
10.1kts@260°
366902570
0.2kts@271°
NOAA
P.O.R.T.S.
Physical
Oceanographic
Real-Time
System
Ready
bridge->cursor: 38.1nmi@228°
09/11/2008 12:07:40
BUCCANEER - US39_HN90
Dsbl/Dsbl/Dsbl

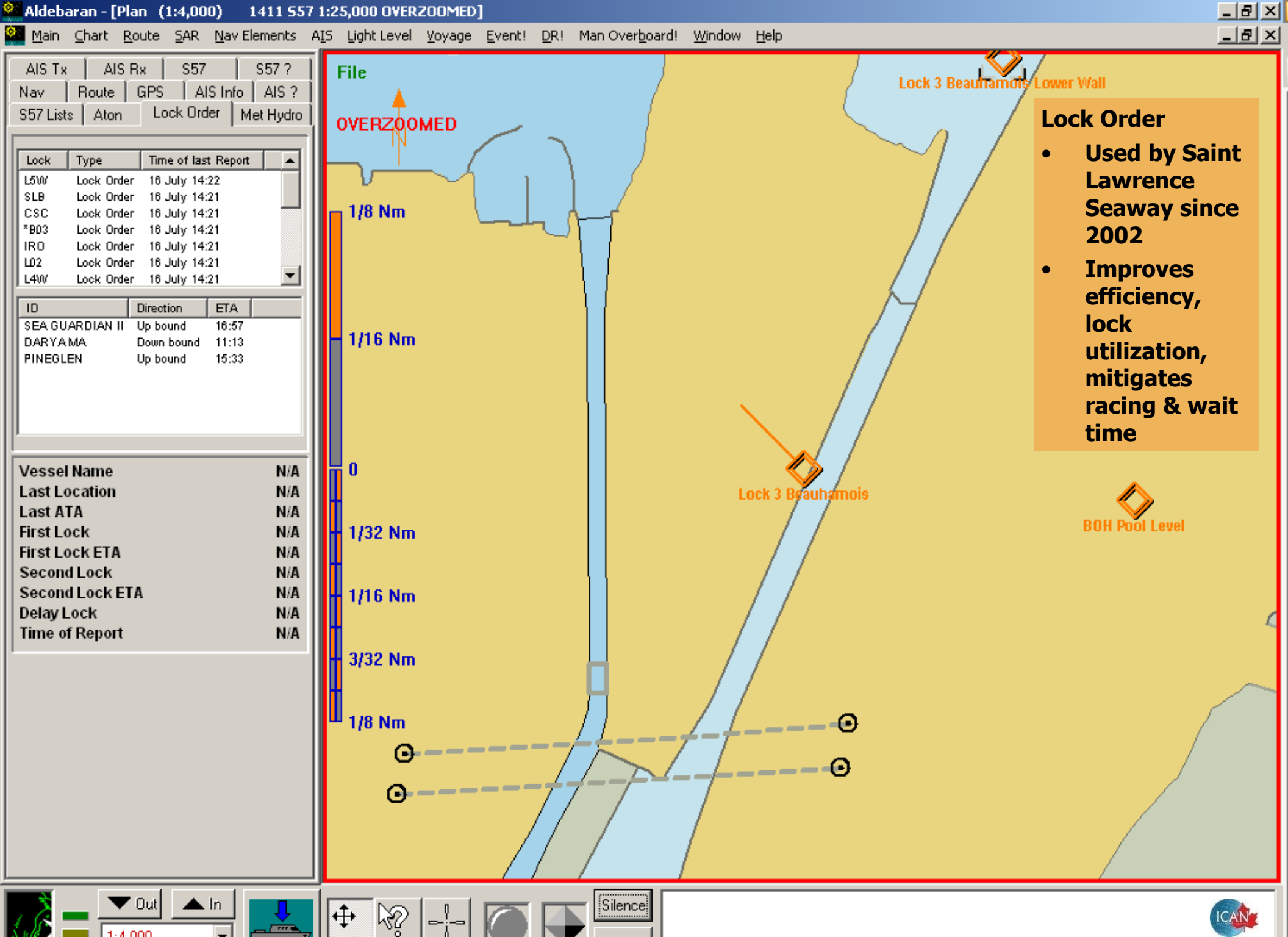
# AIS ASM NOAA PORTS Portrayal




Homeland Security

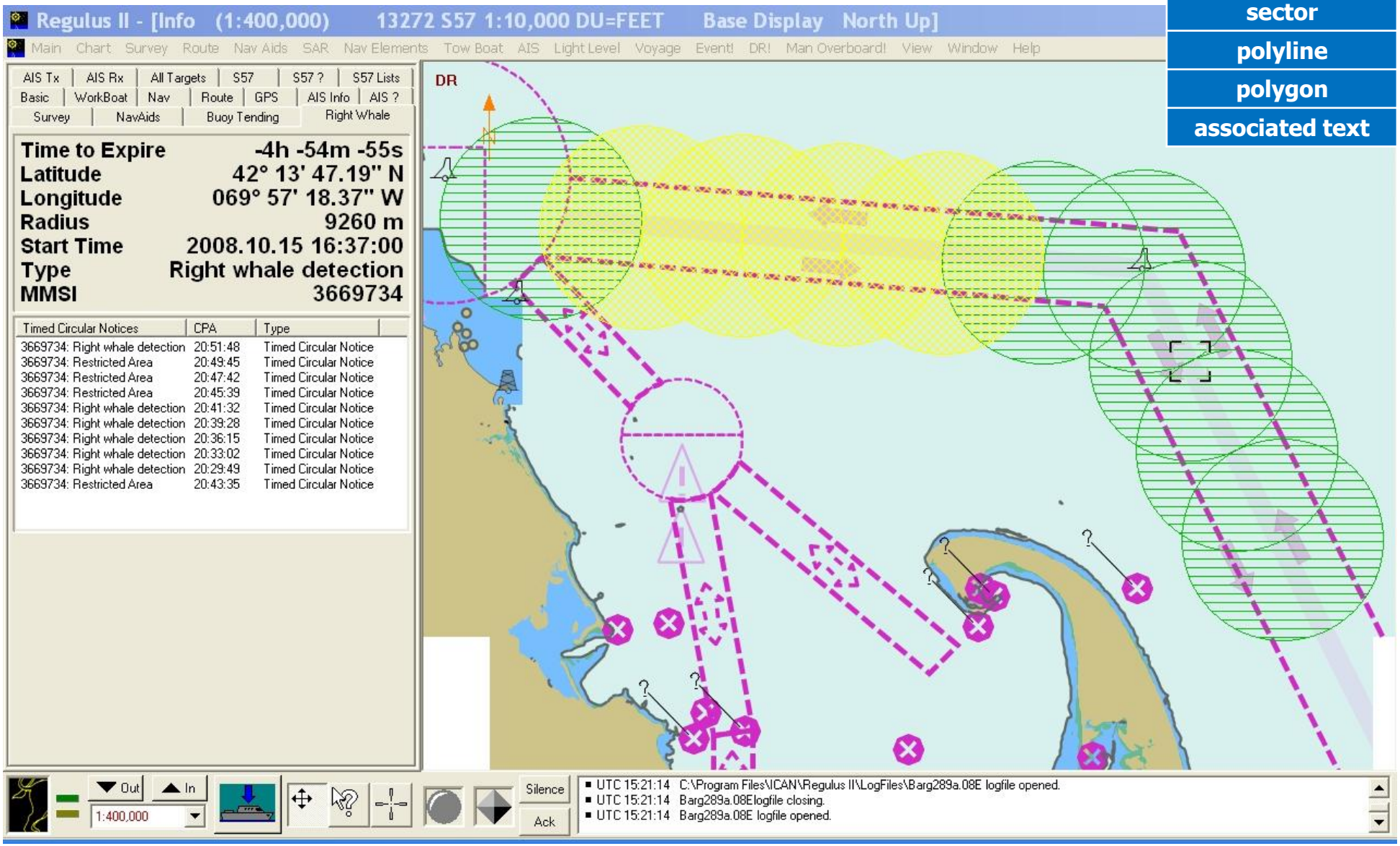

Aldebaran - [Plan (1:2,000) 1436 S57 1:25,000 OVERZOOMED]
Main Chart Route SAR Nav Elements AIS Light Level Voyage Event! DR! Man Overboard! Window Help
AIS ? AIS Tx AIS Rx S57 S57 ?
Nav Route GPS Dredge Monitoring
S57 Lists Aton Lock Order Met Hydro
Station ID SUPERIOR SHOALS, NY
Station Type Weather Station
Latitude 44° 28' 12.00" N
Longitude 075° 48' 00.00" W
Wind Speed 26.9 kts
Wind Gust 30.1 kts
Wind Direction S
Air Pressure 996.0 mbar
Air Temp 17.4°C
Dew Point 12.4°C
Visibility 25.4 km
Water Temp 18.0°C
Time of Report 10:34:00
Time Since Last Report 00h 02m 16s
Station ID SUPERIOR SHOALS, NY
Station Type Weather Station
Latitude 44° 28' 12.00" N
Longitude 075° 48' 00.00" W
Water Level N/A
Level Type N/A
Chart Datum N/A
Current Speed N/A
Current Direction N/A
Salinity N/A
Water Temp 18.0°C
Water Flow N/A
Time of Report 10:34:00
Time Since Last Report 00h 02m 16s
File
OVERZOOMED
1/16 Nm
1/32 Nm
0
1/64 Nm
1/32 Nm
3/64 Nm
1/16 Nm
SUPERIOR SHOALS, NY
Meteorological & Hydrological Reporting
• Improves the overall safety & efficiency of marine traffic
• Some in place since 2002
Out
In
1:2,000
Silence
Ack


Aldebaran - [Info (1:3,000) U350H001 S57 1:10,000 DU=METRES OVERZOOMED User Display North Up]
Main Chart Survey Route Nav Aids SAR Nav Elements AIS Light Level Voyage Event! DR! Man Overboard! View Window Help
S57 S57 ? S57 Lists Survey NavAids Buoy Tending Radar
Nav Route GPS AIS Info AIS ? AIS Tx AIS Rx RTCM
Targets CPA Type
101126 00:01:05 Met...
101126 00:01:04 Met...
101126 00:01:05 Met...
101126 00:01:04 Met...
Target 101126
Latitude 40° 30' 09.72" N
Longitude 080° 05' 08.70" W
Time of Tx 15:15
Average Wind Speed N/A
Wind Gust N/A
Air Temperature N/A
Relative Humidity N/A
Air Pressure N/A
Water Level Report -0.1 m
Surface Current Speed 2.36 f/s
Surface Current Direction 280°
USACE RTCV
Real-time
Current - Velocity
System
File
OVERZOOMED
1/8 Nm
1/16 Nm
0
1/32 Nm
1/16 Nm
3/32 Nm
1/8 Nm
2.03 f/s
2.03 f/s
2.36 f/s
Out In
Silence
UTC 17:59:32 Warning: 10s Since Last GPS Update, Switching to DR Mode.
UTC 17:59:50 GPS fix invalid.


Aldebaran - [Plan (1:4,000) 1411 S57 1:25,000 OVERZOOMED]
Main Chart Route SAR Nav Elements AIS Light Level Voyage Event! DR! Man Overboard! Window Help
AIS Tx AIS Rx S57 S57 ?
Nav Route GPS AIS Info AIS ?
S57 Lists Aton Lock Order Met Hydro
Lock Type Time of last Report
L5W Lock Order 16 July 14:22
SLB Lock Order 16 July 14:21
CSC Lock Order 16 July 14:21
*B03 Lock Order 16 July 14:21
IRO Lock Order 16 July 14:21
L02 Lock Order 16 July 14:21
L4W Lock Order 16 July 14:21
ID Direction ETA
SEA GUARDIAN II Up bound 16:57
DARYA MA Down bound 11:13
PINEGLEN Up bound 15:33
Vessel Name N/A
Last Location N/A
Last ATA N/A
First Lock N/A
First Lock ETA N/A
Second Lock N/A
Second Lock ETA N/A
Delay Lock N/A
Time of Report N/A
File
OVERZOOMED
1/8 Nm
1/16 Nm
0
1/32 Nm
1/16 Nm
3/32 Nm
1/8 Nm
Lock 3 Beauharnois Lower Wall
Lock 3 Beauharnois
BOH Pool Level
Lock Order
• Used by Saint Lawrence Seaway since 2002
• Improves efficiency, lock utilization, mitigates racing & wait time
Out In
Silence

# Area Notice (Geo-referenced Information)

- circle or point
- rectangle
- sector
- polyline
- polygon
- associated text




Homeland Security

# Area Notice Descriptions

Anchorage Area: Anchorage closed
Anchorage Area: Anchorage open
Anchorage Area: Anchoring prohibited
Anchorage Area: Deep draft anchorage
Anchorage Area: Shallow draft anchorage
Anchorage Area: Vessel transfer operations
Cancellation – cancel area per Msg Linkage ID
Caution Area: Cluster of fishing vessels
Caution Area: Derelicts (drifting objects)
Caution Area: Divers down
Caution Area: Dredge operations
Caution Area: Fairway closed
Caution Area: Fishery – nets in water
Caution Area: Harbour closed
Caution Area: Marine event
Caution Area: Marine mammals habitat
Caution Area: Marine mammals in area – reduce speed
Caution Area: Marine mammals in area – report sightings
Caution Area: Marine mammals in area – stay clear
Caution Area: Protected habitat – no fishing or anchoring
Caution Area: Protected habitat – reduce speed
Caution Area: Protected habitat – stay clear
Caution Area: Risk (define in Associated text field)
Caution Area: Seaplane operations
Caution Area: Survey operations
Caution Area: Swim area
Caution Area: Traffic congestion
Caution Area: Underwater operation
Caution Area: Underwater vehicle operation
Chart Feature: Bridge closed
Chart Feature: Bridge fully open
Chart Feature: Bridge partially open
Chart Feature: Channel obstruction
Chart Feature: Reduced vertical clearance
Chart Feature: Semi-submerged object
Chart Feature: Shoal area
Chart Feature: Shoal area due east
Chart Feature: Shoal area due north
Chart Feature: Shoal area due south
Chart Feature: Shoal area due west
Chart Feature: Submerged object
Chart Feature: Sunken vessel
Clearance granted – proceed to berth
Distress Area: Person overboard
Distress Area: Pollution response area
Distress Area: SAR area
Distress Area: Vessel abandoning ship
Distress Area: Vessel collision
Distress Area: Vessel disabled and adrift
Distress Area: Vessel fire/explosion
Distress Area: Vessel flooding
Distress Area: Vessel grounding
Distress Area: Vessel listing/capsizing
Distress Area: Vessel requests medical assistance
Distress Area: Vessel sinking
Distress Area: Vessel under assault
Environmental Caution Area: Heavy icing
Environmental Caution Area: Restricted visibility
Environmental Caution Area: Strong currents
Environmental Caution Area: Hazardous sea ice
Environmental Caution Area: High waves
Environmental Caution Area: High wind
Environmental Caution Area: Storm front (line squall)
Environmental Caution Area: Storm warning
Information: Icebreaker waiting area
Information: Location of response units
Information: Pilot boarding position
Information: Places of refuge
Information: Position of icebreakers
Instruction: Await instructions prior to …
Instruction: Contact Port Administration here
Instruction: Contact VTS at this point/juncture
Instruction: Do not proceed beyond this point/juncture
Other – Define in associated text field
Proceed to this location – await instructions
Report from ship: Icing info
Report from ship: Miscellaneous information
Restricted Area: Active military OPAREA
Restricted Area: Drifting Mines
Restricted Area: Entry approval required prior to transit
Restricted Area: Entry prohibited
Restricted Area: Firing – danger area.
Restricted Area: Fishing prohibited
Restricted Area: No anchoring.
Rouge or suspicious vessel
Route: Alternative route
Route: Recommended route
Route: Recommended route through ice
Security Alert – Level 1/2/3
Vessel requesting non-distress assistance
VTS active target

Automatic Identification Sys

www.navcen.uscg.gov/?pageName=AIS

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## Automatic Identification System (AIS)

- What is AIS?
- How AIS Works
- Types of AIS
- AIS Messages
  - Class A Position Report
  - Class A Static & Voyage Data
  - Class B Reports
- Nationwide AIS (NAIS)
- Carriage Requirements
- Reference Information
- Frequently Asked Questions

## Primary Mission Areas:

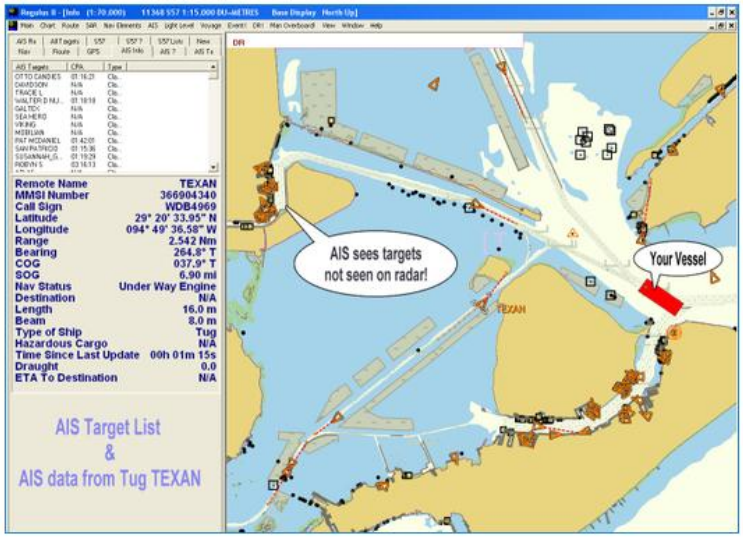
- Global Positioning System
- Differential GPS
- Nationwide DGPS
- Long Range Identification and Tracking
- Civil GPS Service Interface Committee
- Automatic Identification System
- Nationwide AIS (NAIS)
- Electronic Navigation & Charting
- Maritime Telecommunications
- LORAN C (archive)

## Services & Reporting:

- Receive Free LNM Updates
- Receive Free GPS Status Messages
- Receive NANU Updates

## AUTOMATIC IDENTIFICATION SYSTEM OVERVIEW

Picture a shipboard radar or an electronic chart display that includes a symbol for every significant ship within radio range, each as desired with a velocity vector (indicating speed and heading). Each ship "symbol" can reflect the actual size of the ship, with position to GPS or differential GPS accuracy. By "clicking" on a ship symbol, you can learn the ship name, course and speed, classification, call sign, registration number, MMSI, and other information. Maneuvering information, closest point of approach (CPA), time to closest point of approach (TCPA) and other navigation information, more accurate and more timely than information available from an automatic radar plotting aid, can also be available. Display information previously available only to modern Vessel Traffic Service operations centers can now be available to every AIS user as seen below.




**What You See With AIS** (click on image above to enlarge in a new browser window)

With this information, you can call any ship over VHF radiotelephone by name, rather than by "ship off my port bow" or some other

Start Jorge 1:55 PM

How AIS Works

www.navcen.uscg.gov/?pageName=AISworks

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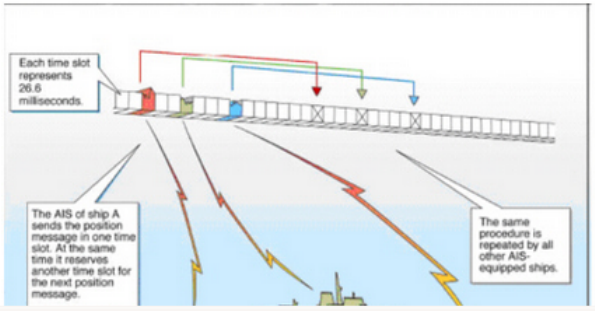
## HOW AIS WORKS

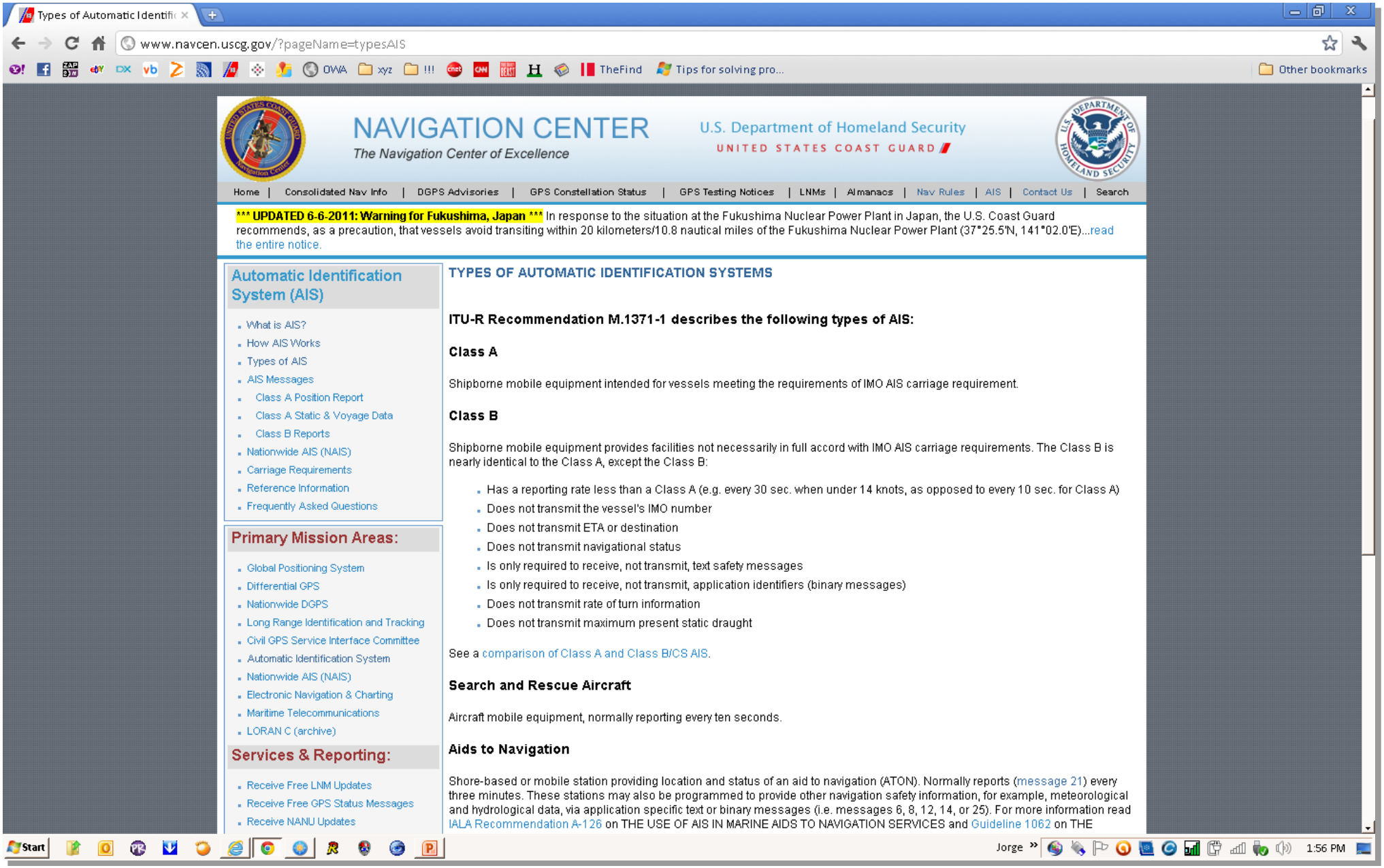
Each AIS system consists of one VHF transmitter, two VHF TDMA receivers, one VHF DSC receiver, and standard marine electronic communications links (IEC 61162/NMEA 0183) to shipboard display and sensor systems ( AIS Schematic). Position and timing information is normally derived from an integral or external global navigation satellite system (e.g. GPS) receiver, including a medium frequency differential GNSS receiver for precise position in coastal and inland waters. Other information broadcast by the AIS, if available, is electronically obtained from shipboard equipment through standard marine data connections. Heading information and course and speed over ground would normally be provided by all AIS-equipped ships. Other information, such as rate of turn, angle of heel, pitch and roll, and destination and ETA could also be provided.

The AIS transponder normally works in an autonomous and continuous mode, regardless of whether it is operating in the open seas or coastal or inland areas. Transmissions use 9.6 kb GMSK FM modulation over 25 or 12.5 kHz channels using HDLC packet protocols. Although only one radio channel is necessary, each station transmits and receives over two radio channels to avoid interference problems, and to allow channels to be shifted without communications loss from other ships. The system provides for automatic contention resolution between itself and other stations, and communications integrity is maintained even in overload situations.

Each station determines its own transmission schedule (slot), based upon data link traffic history and knowledge of future actions by other stations. A position report from one AIS station fits into one of 2250 time slots established every 60 seconds. AIS stations continuously synchronize themselves to each other, to avoid overlap of slot transmissions. Slot selection by an AIS station is randomized within a defined interval, and tagged with a random timeout of between 0 and 8 frames. When a station changes its slot assignment, it pre-announces both the new location and the timeout for that location. In this way new stations, including those stations which suddenly come within radio range close to other vessels, will always be received by those vessels.




Start | Jorge | 1:55 PM


Types of Automatic Identifi
www.navcen.uscg.gov/?pageName=typesAIS
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Automatic Identification System
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Maritime Telecommunications
LORAN C (archive)
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TYPES OF AUTOMATIC IDENTIFICATION SYSTEMS
ITU-R Recommendation M.1371-1 describes the following types of AIS:
Class A
Shipborne mobile equipment intended for vessels meeting the requirements of IMO AIS carriage requirement.
Class B
Shipborne mobile equipment provides facilities not necessarily in full accord with IMO AIS carriage requirements. The Class B is nearly identical to the Class A, except the Class B:
Has a reporting rate less than a Class A (e.g. every 30 sec. when under 14 knots, as opposed to every 10 sec. for Class A)
Does not transmit the vessel's IMO number
Does not transmit ETA or destination
Does not transmit navigational status
Is only required to receive, not transmit, text safety messages
Is only required to receive, not transmit, application identifiers (binary messages)
Does not transmit rate of turn information
Does not transmit maximum present static draught
See a comparison of Class A and Class B/CS AIS.
Search and Rescue Aircraft
Aircraft mobile equipment, normally reporting every ten seconds.
Aids to Navigation
Shore-based or mobile station providing location and status of an aid to navigation (ATON). Normally reports (message 21) every three minutes. These stations may also be programmed to provide other navigation safety information, for example, meteorological and hydrological data, via application specific text or binary messages (i.e. messages 6, 8, 12, 14, or 25). For more information read IALA Recommendation A-126 on THE USE OF AIS IN MARINE AIDS TO NAVIGATION SERVICES and Guideline 1062 on THE
Start
Jorge
1:56 PM


AIS Messages
www.navcen.uscg.gov/?pageName=AISMessages
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AIS MESSAGES
The following is a listing of current AIS Messages:
Message ID | Name | Description | Priority | Access scheme | Communi-cation state | M/B
1 | Position report | Scheduled position report; (Class A shipborne mobile equipment) | 1 | SOTDMA, RATDMA, ITDMA(1) | SOTDMA | M
2 | Position report | Assigned scheduled position report; (Class A shipborne mobile equipment) | 1 | SOTDMA(9) | SOTDMA | M
3 | Position report | Special position report, response to interrogation; (Class A shipborne mobile equipment) | 1 | RATDMA(1) | ITDMA | M
4 | Base station report | Position, UTC, date and current slot number of base station | 1 | FATDMA(3)(7), RATDMA(2) | SOTDMA | B
5 | Static and voyage related data | Scheduled static and voyage related vessel data report; (Class A shipborne mobile equipment) | 4(6) | RATDMA, ITDMA(2) | N/A | M
6 | Binary addressed message | Binary data for addressed communication | 4 | RATDMA(10), FATDMA, ITDMA(2) | N/A | M/B
7 | Binary acknowledgement | Acknowledgement of received addressed binary data | 1 | RATDMA, FATDMA, ITDMA(2) | N/A | M/B
8 | Binary broadcast message | Binary data for broadcast communication | 4 | RATDMA(10), FATDMA, ITDMA(2) | N/A | M/B
9 | Standard SAR aircraft position report | Position report for airborne stations involved in SAR operations, only | 1 | SOTDMA, RATDMA, ITDMA(1) | SOTDMA ITDMA | M
10 | UTC/date inquiry | Request UTC and date | 3 | RATDMA, FATDMA, ITDMA(2) | N/A | M/B
UTC/date | Current UTC and date if | 3 | RATDMA, ITDMA(2) | SOTDMA | M
Start
Jorge
1:56 PM

Nationwide Automatic Ider

www.navcen.uscg.gov/?pageName=NAISmain

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## Nationwide AIS

- Nationwide AIS (NAIS)
- AIS vs NAIS
- NAIS Expansion
- Report an NAIS Problem
- NAIS Data Formats
- Request NAIS Data

## Primary Mission Areas:

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- Nationwide DGPS
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- Electronic Navigation & Charting
- Maritime Telecommunications
- LORAN C (archive)

## Services & Reporting:

- Receive Free LNM Updates
- Receive Free GPS Status Messages
- Receive NANU Updates
- Join CGSIC (free)
- Report an ATON Discrepancy or Outage
- Report a GPS Problem
- Report a DGPS Problem
- Report an LRIT Problem
- Report an NAIS Problem

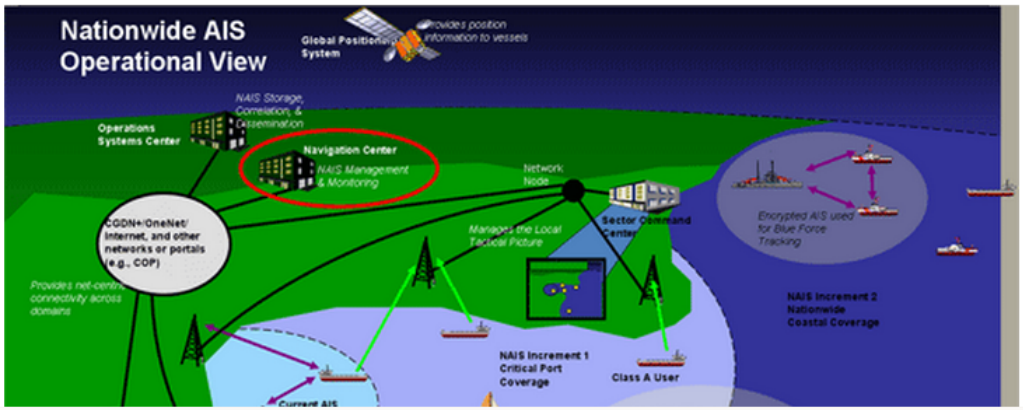
## NATIONWIDE AUTOMATIC IDENTIFICATION SYSTEM

The Nationwide Automatic Identification System (NAIS) consists of approximately 200 VHF receiver sites located throughout the coastal continental US, inland rivers, Alaska, Hawaii and Guam. NAIS is designed to collect AIS transmissions from local vessels. Currently, NAIS collects valuable maritime data in 58 critical ports throughout the United States for use by Coast Guard operators and port partners. The primary goal of NAIS is to increase Maritime Domain Awareness (MDA) through data dissemination via a network infrastructure, particularly focusing on improving maritime security, marine and navigational safety, search and rescue, and environmental protection services.

In response to the Maritime Transportation Security Act of 2002, the NAIS Project was initiated and officially chartered in December 2004. NAIS allows the USCG to collect safety and security data from AIS-equipped vessels in the nation's territorial waters and adjacent sea areas, and share that data with USCG operators and other government partners. AIS data collected improves the safety of vessels and ports through collision avoidance and the safety of the nation through detection, identification, and classification of vessels.

NAIS consists of an integrated system of AIS, data storage, processing, and networking infrastructure. In addition, NAIS integrates with other systems for purposes of sharing infrastructure, quicker implementation, and improved performance.

You may click on the picture below to view a larger version of the image in a new browser window.




Jorge 1:57 PM

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Automatic Identification Sys
www.navcen.uscg.gov/?pageName=AISCarriageReqmts
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Receive NANU Updates
AUTOMATIC IDENTIFICATION SYSTEM IMO CARRIAGE REQUIRMENTS
On October 22nd, 2003 the Coast Guard published a Final Rule (68 FR 60559) that amended a previously promulgated Interim Rule (63 FR 39953) that harmonized the AIS mandates of the Safety of Life at Sea Convention, as amended by the 73rd (MSC 73) and 76th Session (MSC 76) , and, the Maritime Transportation Security Act of 2002 (MTSA) , which delineates U.S. AIS carriage requirements as follows:
Title 33, Code of Federal Regulations
§ 164.01 Applicability
(a) This part (except as specifically limited by this section) applies to each self-propelled vessel of 1600 or more gross tons (except as provided in paragraphs (c) and (d) of this section, or for foreign vessels described in §164.02) when it is operating in the navigable waters of the United States except the St. Lawrence Seaway.
(b) * * *
(c) Provisions of §§164.11(a)(2) and (c), 164.30, 164.33, and 164.46 do not apply to warships or other vessels owned, leased, or operated by the United States Government and used only in government noncommercial service when these vessels are equipped with electronic navigation systems that have met the applicable agency regulations regarding navigation safety.
§ 164.46 Automatic Identification System (AIS).
(a) The following vessels must have a properly installed, operational, type approved AIS as of the date specified:
(1) Self-propelled vessels of 65 feet or more in length, other than passenger and fishing vessels, in commercial service and on an international voyage, not later than December 31, 2004.
(2) Notwithstanding paragraph (a)(1) of this section, the following, self-propelled vessels, that are on an international voyage must also comply with SOLAS, as amended, Chapter V, regulations 19.2.1.6, 19.2.4, and 19.2.3.5 or 19.2.5.1 as appropriate (Incorporated by reference, see § 164.03):
(i) Passenger vessels, of 150 gross tonnage or more, not later than July 1, 2003;
(ii) Tankers, regardless of tonnage, not later than the first safety survey for safety equipment on or after July 1, 2003;
(iii) Vessels, other than passenger vessels or tankers, of 50,000 gross tonnage or more, not later than July 1, 2004; and
(iv) Vessels, other than passenger vessels or tankers, of 300 gross tonnage or more but less than 50,000 gross tonnage, not later than the first safety survey for safety equipment on or after July 1, 2004, but no later than December 31, 2004.
(3) Notwithstanding paragraphs (a)(1) and (a)(2) of this section, the following vessels, when navigating an area denoted in table 161.12(c) of § 161.12 of this chapter, not later than December 31, 2004.
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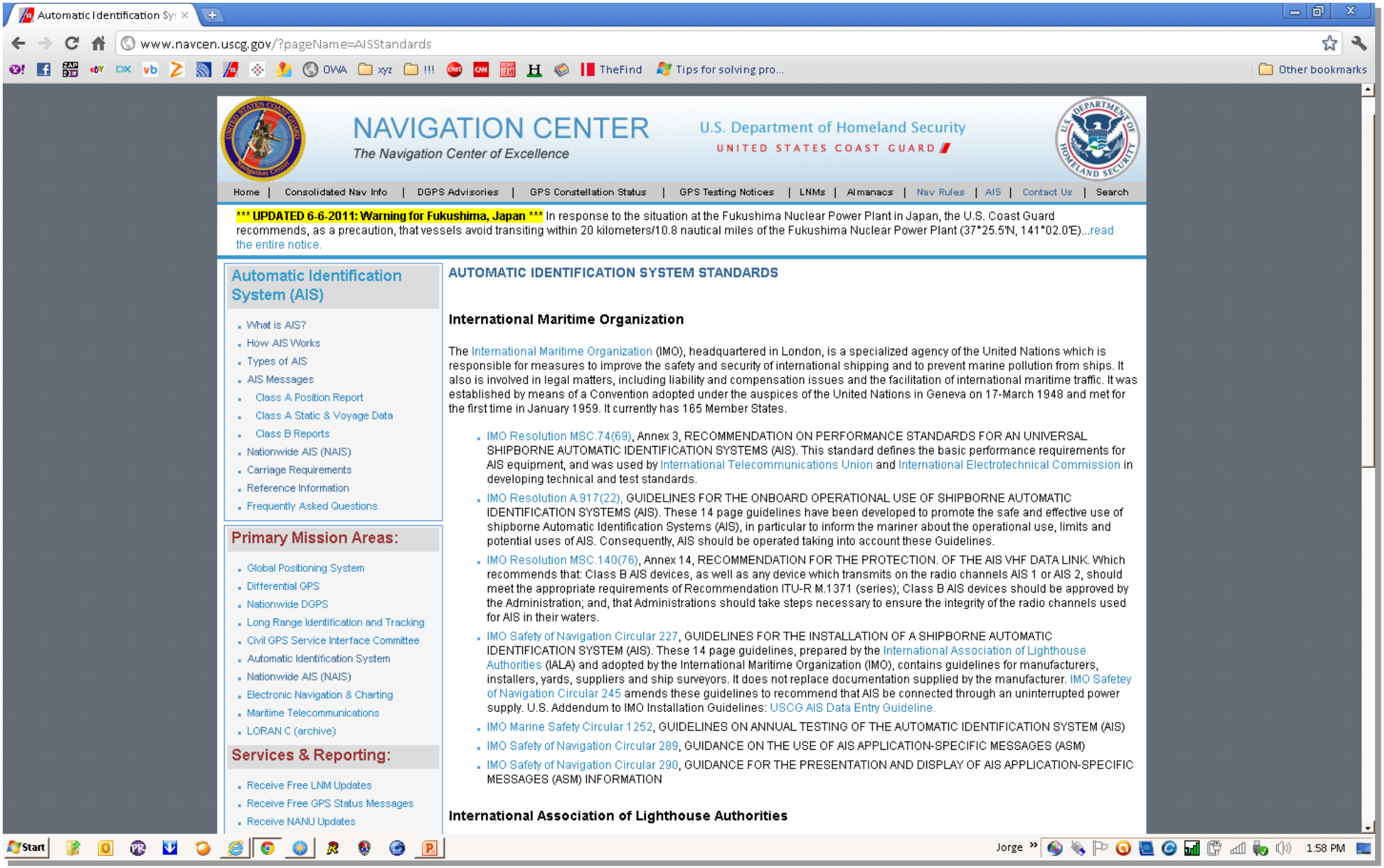
Automatic Identification Sy
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*** UPDATED 6-6-2011: Warning for Fukushima, Japan *** In response to the situation at the Fukushima Nuclear Power Plant in Japan, the U.S. Coast Guard recommends, as a precaution, that vessels avoid transiting within 20 kilometers/10.8 nautical miles of the Fukushima Nuclear Power Plant (37°25.5'N, 141°02.0'E)...read the entire notice.
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AUTOMATIC IDENTIFICATION SYSTEM STANDARDS
International Maritime Organization
The International Maritime Organization (IMO), headquartered in London, is a specialized agency of the United Nations which is responsible for measures to improve the safety and security of international shipping and to prevent marine pollution from ships. It also is involved in legal matters, including liability and compensation issues and the facilitation of international maritime traffic. It was established by means of a Convention adopted under the auspices of the United Nations in Geneva on 17-March 1948 and met for the first time in January 1959. It currently has 165 Member States.
IMO Resolution MSC.74(69), Annex 3, RECOMMENDATION ON PERFORMANCE STANDARDS FOR AN UNIVERSAL SHIPBORNE AUTOMATIC IDENTIFICATION SYSTEMS (AIS). This standard defines the basic performance requirements for AIS equipment, and was used by International Telecommunications Union and International Electrotechnical Commission in developing technical and test standards.
IMO Resolution A.917(22), GUIDELINES FOR THE ONBOARD OPERATIONAL USE OF SHIPBORNE AUTOMATIC IDENTIFICATION SYSTEMS (AIS). These 14 page guidelines have been developed to promote the safe and effective use of shipborne Automatic Identification Systems (AIS), in particular to inform the mariner about the operational use, limits and potential uses of AIS. Consequently, AIS should be operated taking into account these Guidelines.
IMO Resolution MSC.140(76), Annex 14, RECOMMENDATION FOR THE PROTECTION. OF THE AIS VHF DATA LINK. Which recommends that: Class B AIS devices, as well as any device which transmits on the radio channels AIS 1 or AIS 2, should meet the appropriate requirements of Recommendation ITU-R M.1371 (series); Class B AIS devices should be approved by the Administration; and, that Administrations should take steps necessary to ensure the integrity of the radio channels used for AIS in their waters.
IMO Safety of Navigation Circular 227, GUIDELINES FOR THE INSTALLATION OF A SHIPBORNE AUTOMATIC IDENTIFICATION SYSTEM (AIS). These 14 page guidelines, prepared by the International Association of Lighthouse Authorities (IALA) and adopted by the International Maritime Organization (IMO), contains guidelines for manufacturers, installers, yards, suppliers and ship surveyors. It does not replace documentation supplied by the manufacturer. IMO Safetey of Navigation Circular 245 amends these guidelines to recommend that AIS be connected through an uninterrupted power supply. U.S. Addendum to IMO Installation Guidelines: USCG AIS Data Entry Guideline.
IMO Marine Safety Circular 1252, GUIDELINES ON ANNUAL TESTING OF THE AUTOMATIC IDENTIFICATION SYSTEM (AIS)
IMO Safety of Navigation Circular 289, GUIDANCE ON THE USE OF AIS APPLICATION-SPECIFIC MESSAGES (ASM)
IMO Safety of Navigation Circular 290, GUIDANCE FOR THE PRESENTATION AND DISPLAY OF AIS APPLICATION-SPECIFIC MESSAGES (ASM) INFORMATION
International Association of Lighthouse Authorities
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AIS Frequently Asked Ques
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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?
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18. What is a MMSI and where can I get one for my AIS?
19. What is AIS Channel Management?
20. Can I use my AIS in an emergency or for distress messaging?
21. 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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AIS Frequently Asked Ques
www.navcen.uscg.gov/?pageName=AISFAQ#15
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Tips for solving pro...
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15. Is the USCG considering expanding AIS carriage to other vessels or outside of VTS areas? Yes. On December 16th, 2008 the Coast Guard published a proposed rule (73 FR 78295) to amend the current AIS regulations, and, expand AIS requirements-beyond Vessel Traffic Service (VTS) areas to all U.S. navigable waters and require AIS carriage for additional commercial vessels, including commercial vessels carrying 50 or more passengers, fishing vessels 65 feet or greater, hi-speed passenger vessels, dredges and floating plants operating in or near channels or fairways, and vessels carrying or moving certain dangerous cargo. See a breakdown of vessels affected. We invite you to visit www.regulations.gov (Search: USCG-2005-21899) to view the public comments submitted on our proposal and to register for email notifications regarding future actions on this rulemaking; and, www.reginfo.gov (RIN: 1625-AA99) for its timetable.
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Arroyo@IWC(04MAR09).pdfaudio.mp3 (22,501KB)
Arroyo@TSAC(07MAY09).pdf (5.03MB)
Arroyo@NAVSAC(2009).pdf (Transcript and NAVSAC Resolution re: AIS Class B carriage) (565.87KB)
Arroyo@RTCM(17MAY10).pdf (3.27MB)
Arroyo@NMFS-PAC.pdf (10.18MB)
17. Where can I get AIS data? Although the U.S. Coast Guard operates our Nation's AIS network (NAIS), we do not --currently-- make our AIS information available to the general public. There are, however, numerous AIS networks and commercial purveyors that do provide AIS data and track information on the World Wide Web; many of which are listed on Wikipedia's AIS webpage. Local, state and federal government agencies may request U.S. Coast Guard Nation-wide AIS data here.
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19. What is AIS Channel Management? One of the lesser known and potent features of AIS is its ability to operate on multiple channels of the VHF-FM marine band. This frequency agility ensures AIS can be used even when the default channels are otherwise unavailable or compromised. In such conditions, competent authorities, such as the Coast Guard, can use an AIS base station to tele-command shipborne AIS devices to other more appropriate channels when within a defined region(s) of 200 to 2000 square nautical miles. This can be done automatically (and without user intervention) by receipt of the AIS channel management message (AIS message 22) or manually entered via the AIS Minimal Keyboard Display (MKD) or similar input device. Once commanded or inputted the channels management information will stay in memory for 5 weeks or until a vessel exceed 500 nautical miles from the defined region. AIS channel management commands can only be automatically overridden via another channel management message for the same defined region or manually overridden or erased by the user via the unit's channel (regional frequencies) management function—read more. Note, reinitializing or resetting your AIS or transmission channels will not necessarily reprogram your unit back to default channels.
20. Can I use my AIS in an emergency or for distress messaging? Yes, but, be aware that AIS safety related text messages are not - currently- received, processed, recognized or acted upon as Global Maritime Distress Safety Systems (GMDSS) messages would be by the Coast Guard or other maritime first responders. Therefore, AIS should not be relied upon as the primary means for broadcasting distress or urgent communications, nor used in lieu of GMDSS such as Digital Selective Calling radios which are designed to process distress messaging. Nonetheless, AIS remains an effective means to augment GMDSS and provides the added benefit of being 'seen' (on radar or chart displays), in addition to being 'heard' (via text messaging) by other AIS users within VHF radio range. For further guidance, see USCG Safety Alert 5-10.
21. Have an AIS question not answered here? Please contact us.
U.S. Coast Guard Navigation Center NAVCEN MS 7310, 7323 Telegraph Road, Alexandria, VA 20598 - 7310 | (703) 313-5900
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www.reginfo.gov [RIN 1625-AA99]


AIS Frequently Asked Ques
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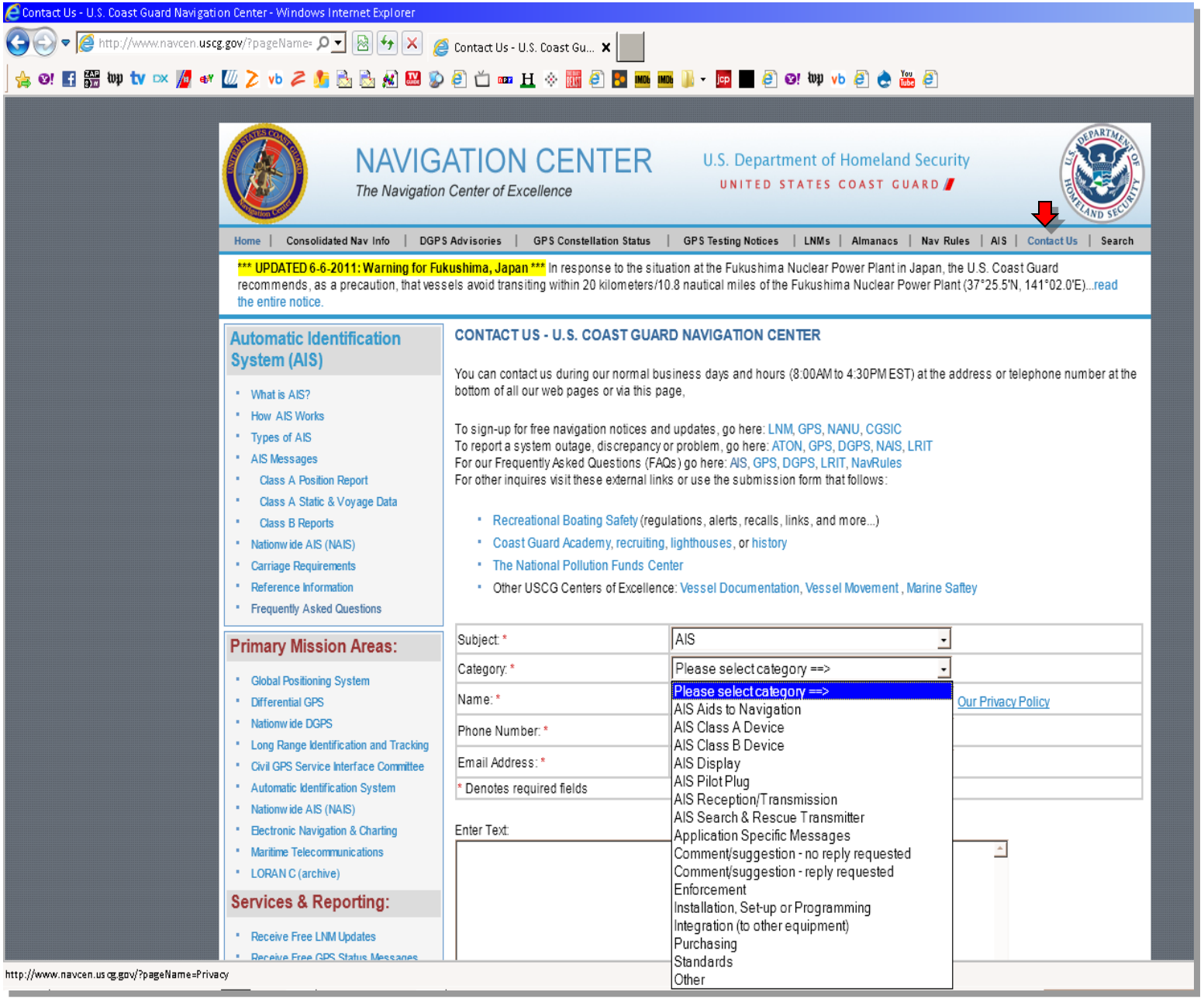
# USCG AIS Report Form

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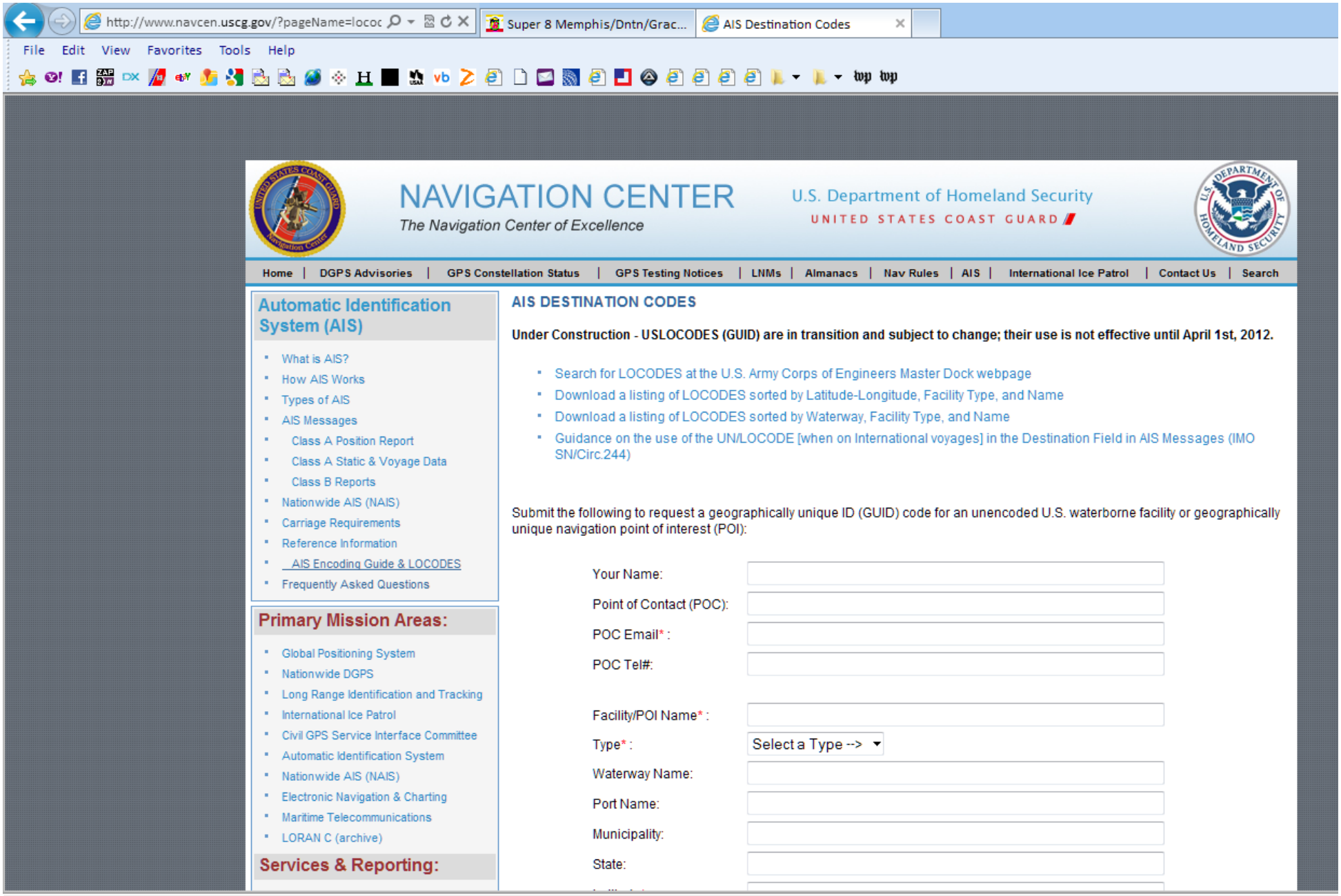


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**www.navcen.uscg.gov 'AIS Encoding Guide' tab**

# AUTOMATIC IDENTIFICATION SYSTEM
# ENCODING GUIDE

**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 all AIS data fields. Failure to do so may subject a vessel to civil penalties of up to $40,000 per ocurrence. To avoid penalties AIS Users in the United States should ensure their system is encoded as follows:

## Static Data...should be input manually at installation & password protected. Remember thee password. You will need it to re-encode or update certain AIS fields

- **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 precursors or designators, e.g. F/V, M/V, MV, OSV, P/V, REC, S/V, TUG. Names exceeding 20 characters (the parameter limit) should not be abbreviated or truncated; except company fleet vessels1 who may do so as needed, but, not their 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** should match your assigned[3] IMO number. Absent an IMO assignment input your U.S. official documentation number preceded by a '1' and zeroes, e.g. 1001234567, 1000123456. Official numbers must be preceded by a leading '1' followed by either one {10} or two zeroes {100} to fill-in all the 10-digits of this parameter. If your AIS does not accommodate 10-digits input all zeroes instead.

## 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. It should be permanently located near a 3-prong, 120-volt, AC receptacle.

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

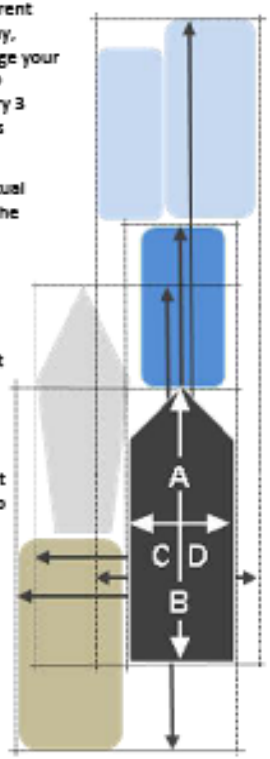
- **Navigation Status** should indicate your current navigational status, i.e. at anchor, underway, engaged in fishing, etc. Remember to change your status when anchored or moored. Doing so reduces the AIS reporting rate to once every 3 minutes vice once every 2–10 seconds. This mitigates network congestion.

- **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 22 (see Table)* to convey 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 (UTC) not local time.




- **Destination** (including origination) should be inputted using ISO 3166 country codes and UN/LOCODE's[4] for international voyages; and US/LOCODE's[5] for voyages to any U.S. port or place[6] as follows:

*Origination>Destination using ISO 3166 country & UN/LOCODE*

**USNYC>NLRTM** ...a New York City to Rotterdam voyage[7]

*Vessels inbound to the U.S. should also include a US/LOCODE*

**CNSHA>USSFO^OVCY** for Shanghai to San Francisco Pier 35

*Domestic voyages, US^US/LOCODE|>|><|<>|<|>>|US/LOCODE*

**US^NYRO>NY5O** ...a one-way voyage

**US^NYOP><NY6L** ...a scheduled route, e.g. ferry service

**US^SFCX><SFCX** ...voyage to nowhere & back, e.g. excursion

**US^LAJ5<>AJ5** ...operations in a confined area, e.g. fleeting area

**US^LBNC<** ...anchored, moored, or on station, e.g. MODU, FPSO

**US^LM7N>>PAPX-GIQJ** ...a one-way voyage, via an alternate route (e.g. New Orleans, LA to Port Arthur, TX via Gulf Inter-coastal Waterway)

## 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 USCG Local Notice to Mariners, Light List and U.S. Nautical Chart No. 1 for a listing of common abbreviations.

- Testing or repair facilities, is 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/default.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. Location Codes (US/LOCODE) 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

**Revised AIS Encoding Guidance Promulgated 12/01/05**

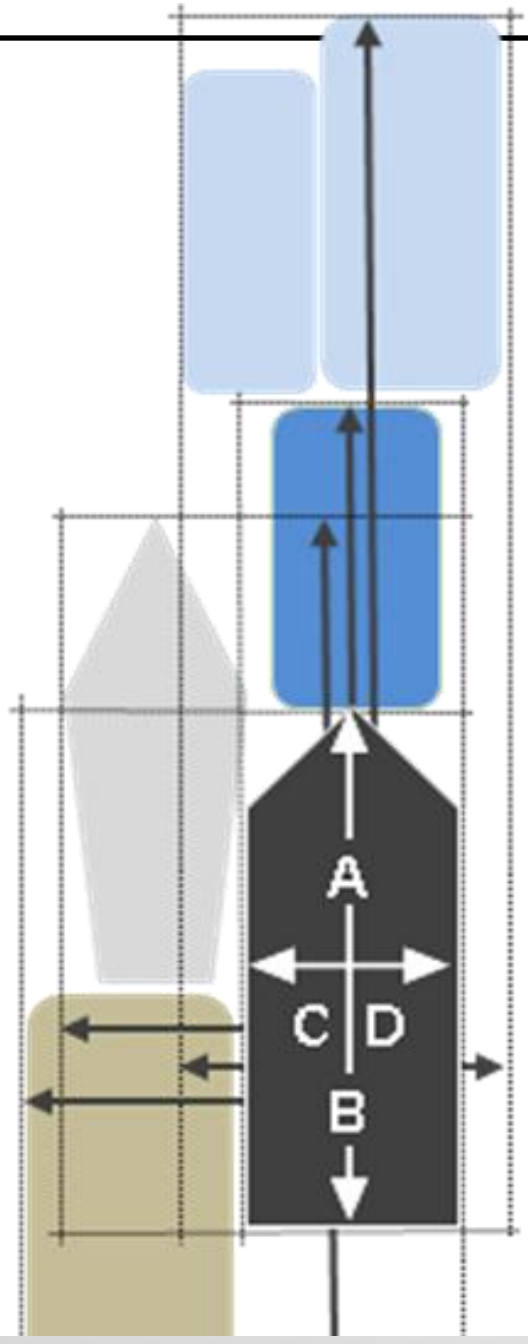
**Maritime Mobile Service Identifier (MMSI), call sign, & vessel name** should match your radio license

- 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 precursors or designators, e.g. F/V, M/V, MV, OSV, P/V, REC, S/V, TUG.
- Names exceeding 20 characters (the parameter limit) should not be abbreviated or truncated.
  - –Except fleet vessels who may do so as needed, but, not their distinguishing characters, e.g. World-wide Traders' tug 123456 -> 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, e.g. FREEDOM OF THE SEA-1.
  - –Additionally, its AIS message 24B call-sign parameter should reflect the last 6-digits of parent's MMSI preceded by {A}, e.g. A123456.
- **IMO Number** should match your assigned IMO number.
  - –Absent an IMO assignment input your U.S. official documentation number preceded by a '1'

**Note major change for vessels without IMO# and Associate Craft**

**Dimensions** should indicate the official dimensions of the vessel. Input meters, **not** feet.

- Dimensions are described in terms of distance in meters to the AIS's GPS positioning-system antenna location
- Vessel's AIS's GPS antenna is located at the intersection of the two white lines.
- U.S. *ship type 22* are to convey the overall rectangular proportions of the vessel and its tow—as portrayed




**Dimension field can now be used to represent the a vessels tow (type22)**

**Destination** (including origination) should be inputted using ISO 3166 country codes and UN/LOCODE's for international voyages; and US/LOCODE's for voyages to any U.S. port or place as follows:

Origination>Destination using ISO 3166 country & UN/LOCODE

USNYC>NLRTM …a New York City to Rotterdam voyage

Vessels inbound to the U.S. should also include a US/LOCODE

CNSHA>USSFO^OVCY for Shanghai to San Francisco Pier 35

Domestic voyages, US^US/LOCODE|>|><|<>|<|>>|US/LOCODE

US^NYRX>NY5O …a one-way voyage

US^NYOP><NY6L …a scheduled route, e.g. ferry service

US^SFCX><SFCX …voyage to nowhere & back, e.g. excursion

**Use of UNLOCODE still required for International voyages, but, we now adopt USLOCODE/GUIDS for domestic voyages. Angle brackets are used to convey routes, round trips, confined ops, anchored/moored**

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

**Note exhortation to use abbreviations and requirement for Test Broadcasts**

**2-digit numeric codes for *Type of Ship and Cargo Type* are composed from 1st and 2nd digit columns; or as defined in columns 2x, 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.1371-4)**

| 1st digit | 2nd digit [4x\|6x\|7x\|8x\|9x] | Codes for specific vessels operating in USA [2x] | Engaged in… Codes [3x] | Special Craft Codes [5x] |
|---|---|---|---|---|
| 0 – Not available<br>*DO NOT USE* | 0 – All ships of this type | *20 – WIG (Wing In Ground) vessels* | 30 – Fishing* | 50 – Pilot vessel |
| 1 – Reserved for future use<br>*DO NOT USE* | 1 – Carrying DG (Dangerous Goods), HS (Hazardous Substances), or MP (Marine Pollutant), IMO hazard or pollutant category A/X; *or use 41/61 if carrying < 12 passengers for hire* | *21 – Engaged in towing other than barges by pushing ahead or hauling alongside (i.e. articulated tug-barges, push-boats, workboats); whose dimensions (ABCD values)* ***solely*** *represent the overall dimensions of the vessel** | 31 – *Engaged in* towing *by pulling (not pushing or hauling)* | 51 – Search and rescue vessels, *i.e. USCG boats, USCG Auxiliary, assistance towers* |
| 2 – WIG *or other vessels denoted in column [2x] operating in U.S waters, including the U.S. EEZ* | 2 – Carrying DG, HS, or MP, IMO hazard or pollutant category B/Y; *or use42/62 if carrying ≥ 12 passengers for hire* | *22 – Engaged in towing barges by pushing ahead or hauling alongside (i.e. articulated tug-barges, push-boats, workboats); whose dimensions (ABCD values) represent the overall rectangular dimensions of the vessel* ***and*** *its tow** | 32 – *Engaged in* towing *by pulling (not pushing or hauling)* and length of the tow exceeds 200 meters (656 ft.) | 52 – *Harbor* tugs |
| 3 – Other vessels *engaged in actions denoted in column [3x]* | 3 – Carrying DG, HS, or MP, IMO hazard or pollutant category C/Z; *or use 43/63 for ferry service carrying < 150 passengers* | *23 – Light boats (i.e. push-boats or work boats* ***not*** *engaged in towing; whose dimensions (ABCD values)* ***solely*** *represent the vessel dimensions of the vessel** | 33 – Engaged in dredging, or underwater operations, *(e.g., salvaging, surveying, but, not diving)** | 53 – *Fish, offshore or* port tenders |
| 4 – HSC *or passenger vessels < 100 GT, including tenders* | 4 – Carrying DG, HS, or MP, IMO hazard or pollutant category D/O; *or use 44/64 for ferry service carrying ≥ 150 passengers* | *24 – Mobile Offshore Drilling Units (MODUs), Liftboats, Floating Production Systems (FPS), Floating Production Storage and Offloading Vessels (FPSO)* | 34 – Engaged in diving operations* | 54 – *Commercial response* vessels with anti-pollution facilities or equipment |
| 5 – Special craft,<br>*per column [5x]* | 5 – Reserved for future use<br>*DO NOT USE* | *25 – 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<br>*DO NOT USE* | *26 – Processing vessels (i.e. fish)* | 36 – Sailing *vessels** | 56 – Spare–for assignments to local vessels *as designated by the USCG Captain of Port* |
| 7 –Cargo *(freight)* ships, *including Integrated Tug-Barge (ITB) vessels* | 7 – Reserved for future use<br>*DO NOT USE* | *27 – School, scientific, research or training ships* | 37 – Pleasure craft *(recreational vessel)* | 57 – Spare–for assignments to local vessels *involved in a marine event* |
| 8 – Tankers | 8 – Reserved for future use<br>*DO NOT USE* | *28 – U.S. public or governmental vessels* | 38 – Reserved for future use<br>*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<br>*—contact cgnav@uscg.mil prior to use* | *29 – Autonomous or remotely-operated craft* | 39 – Reserved for future use<br>*DO NOT USE* | 59 – Ships according to RR Resolution No. 18 (Mob-83) |

**Text in blue italics are clarifications or changes to existing coding standards**
**Note, column 2x changes WIG codes for other specific vessels in the USA, i.e. pushboats**

| Codes 2x currently denote WIG's | Codes for specific vessels operating in USA [2x] |
|---|---|
| 20 – All ships of this type | *20 – WIG (Wing In Ground) vessels* |
| 21 – Carrying DG , HS, or MP, IMO hazard or pollutant category A/X | *21 – Engaged in towing other than barges by pushing ahead or hauling alongside (i.e. articulated tug-barges, push-boats, workboats); whose dimensions (ABCD values) **solely** represent the overall dimensions of the vessel** |
| 22 – Carrying DG, HS, or MP, IMO hazard or pollutant category B/Y | *22 – Engaged in towing barges by pushing ahead or hauling alongside (i.e. articulated tug-barges, push-boats, workboats); whose dimensions (ABCD values) represent the overall rectangular dimensions of the vessel **and** its tow** |
| 23 – Carrying DG, HS, or MP, IMO hazard or pollutant category C/Z | *23 – Light boats (i.e. push-boats or work boats **not** engaged in towing; whose dimensions (ABCD values) **solely** represent the vessel dimensions of the vessel** |
| 24 – Carrying DG, HS, or MP, IMO hazard or pollutant category D/O | *24 – Mobile Offshore Drilling Units (MODUs), Liftboats, Floating Production Systems (FPS), Floating Production Storage and Offloading Vessels (FPSO)* |
| 25 – Reserved for future use | *25 – Offshore Supply Vessels (OSV)* |
| 26 – Reserved for future use | *26 – Processing vessels (i.e. fish)* |
| 27 – Reserved for future use | *27 – School, scientific, research or training ships* |
| 28 – Reserved for future use | *28 – U.S. public or governmental vessels* |
| 29 – No additional information | *29 – Autonomous or remotely-operated craft* |

**Note, column 2x changes WIG codes for specific (vessels, i.e. pushboats) use in the USA**

# United States Coast Guard

## Office of Navigation Systems

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**USACE Inland Electronic Nautical Chart (IENC) Partnering Meeting**
**April 19th, 2012**
**Memphis, TN**

Homeland Security