United States Coast Guard

Office of Navigation Systems

Providing navigation safety information for America's waterways

Jorge Arroyo
Program Analyst
U.S. Coast Guard Headquarters
Washington, DC

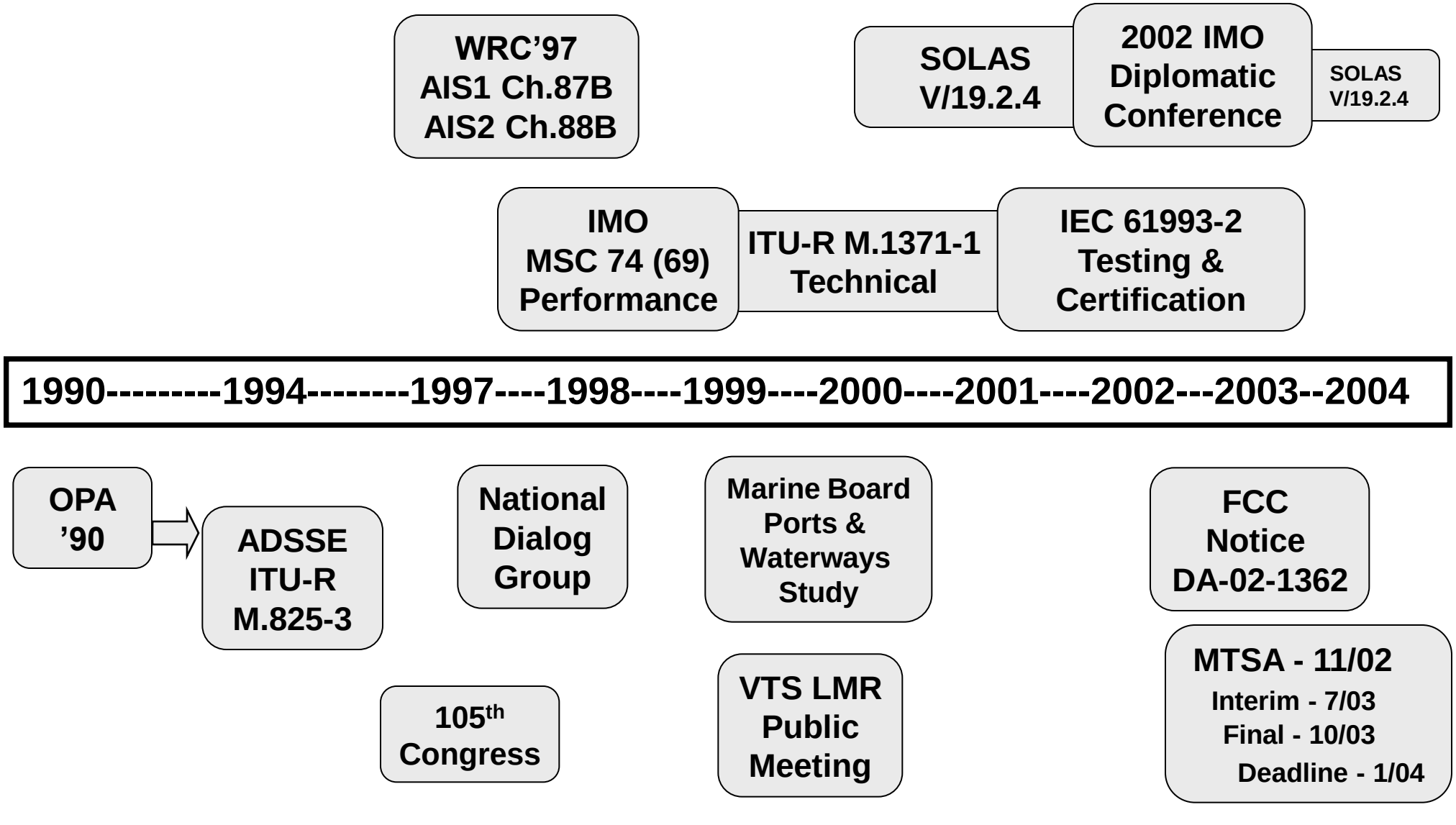
International Boat builders' Exhibition and Conference (IBEX)
October 17th, 2011
Louisville, KY

Homeland Security

Automatic Identification System (AIS)

- ✓ U.S. AIS History
- ✓ Regulations…Who? Where? When?
- ✓ AIS Update
- ✓ Application Specific Messaging
- ✓ AIS @ www.navcen.uscg.gov
- ✓ Questions & Answers

AIS History & Timeline



What started the USCG on AIS?

In 1990, Congress passed the Oil Pollution Act which participation in VTS mandatory and directed the USCG to seek ways to have 'dependent surveillance' of all tankers bound for Valdez, Alaska.

To that end, in 1993 the USCG developed *Automated Dependent Surveillance Shipboard Equipment (ADSSE),* based on Digital Selective Calling (DSC) protocol.

Congress supports/mandates AIS!

In 1997, Congress…stated that AIS "technology should be the foundation of any future VTS system" and that it "strongly believes that this technology will significantly improve navigational safety, not just in select VTS target ports, but throughout the navigable waters of the U.S", and, that we "continue working with stakeholders…"

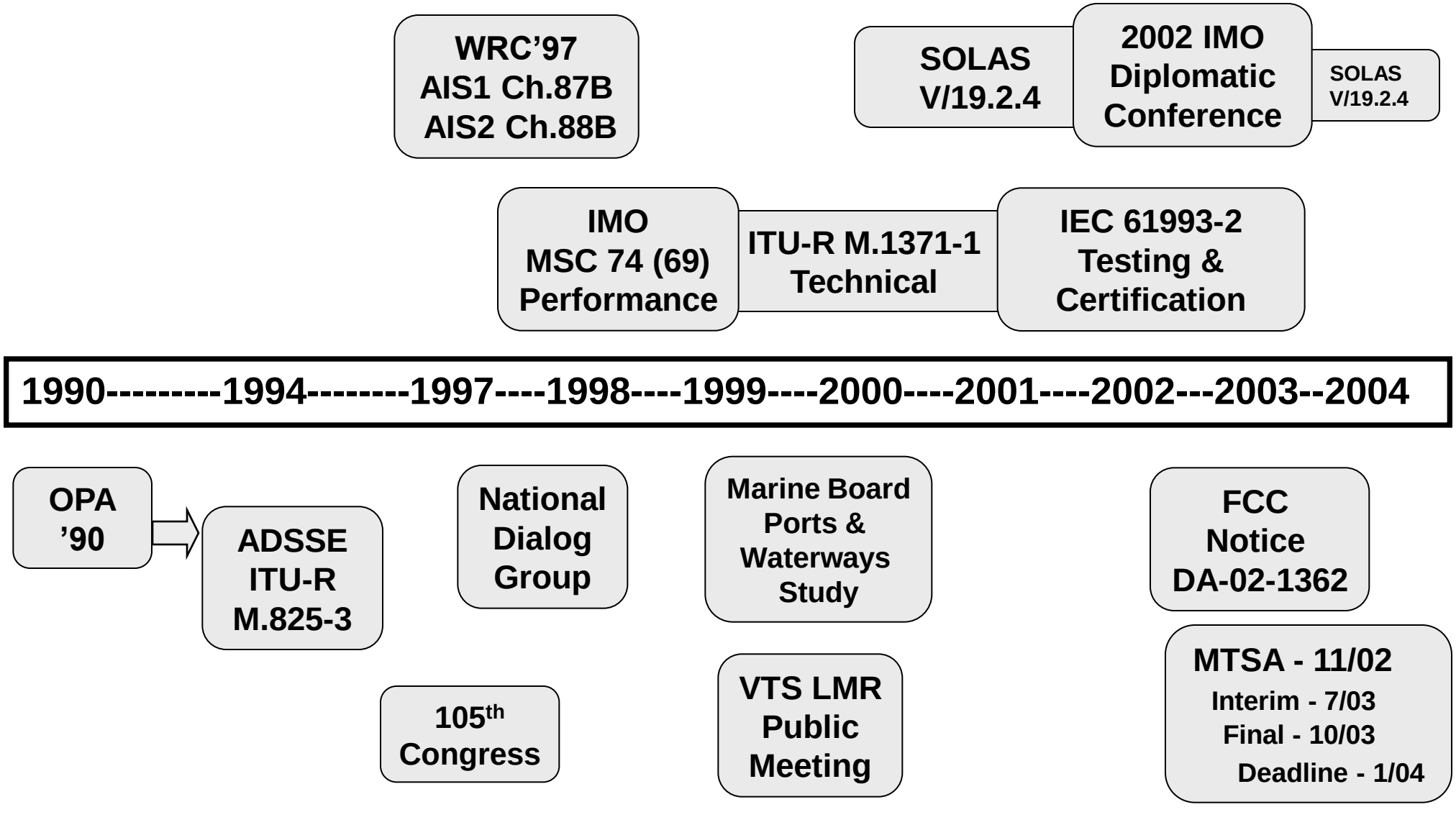
H.R. Rep. No. 236, 105th Cong., 1st Sess. (1997)

Industry endorses AIS!

In 1999, the National Dialog Group, comprised of the marine private and public representatives, stated they:

"strongly endorse the widespread use of AIS employing dGPS and onboard transponder technologies…that national use of AIS technology on the greatest number of vessels is essential both as a foundation of a VTS system…improving navigation safety…strongly urge the USCG to take the lead…in developing equipment and procedural standards that will promote universal use of AIS technology", which will "be less intrusive and distracting to the mariner than will a voice-based control system…"

AIS Timeline



Towards an AIS-based VTS

In an effort to facilitate vessel transits, enhance good order, promote safe navigation, and improve upon existing operating measures on the waterway. The USCG proposed to establish a Vessel Traffic Service on the Lower Mississippi River and transfer certain vessel traffic management provisions on the river.

By implementing a proposed transition to VTS in a phased manner which would allow for the orderly transition from existing regulations and practices to operating procedures appropriate to an AIS-based VTS.

- Ref: 65 FR 24616, Apr. 24, 2000

Mandated by Congress in 2002

- *Marine Transportation & Security Act of 2002*
  - Commercial self-propelled vessels 65 feet or greater;
  - Towing Vessels over 26 feet or greater and 600 hp or more;
  - Passenger vessels as determined by USCG; and
  - those the USCG deems necessary for safety.

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**

U.S. AIS Carriage Population

Vessel Service	SOLAS	IR 7/1/02	FR 11/23/03	NPRM 12/16/08
Fishing Boat	1	749	-	5,520
Cargo Ship	154	77	77	298
Industrial Vessel	21	11	11	748
MODU	1	-	-	210
Offshore Supply Vessel	55	433	432	553
Passenger Vessel	81	576	171	3,235
Public/Research/School	10	18	16	116
Tank Ship	102	15	15	122
Towboat/Tug	13	2,215	2,212	4,560
Dredge	-	-	-	35
Other	-	11	13	385
Unknown	-	16	16	541
Foreign >65'<300GT				1,119
Totals	438	4,121	2,963	17,442

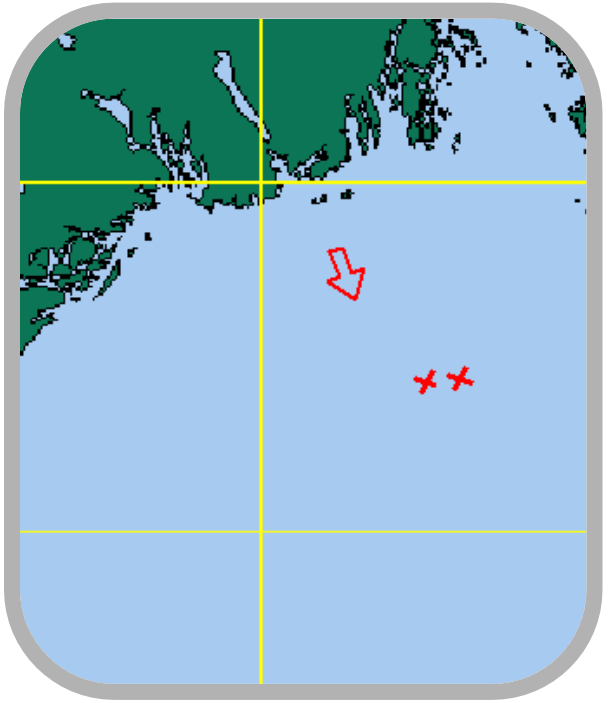
AIS Certification Standards Update

- IEC 61993-2 Class A published in 2001
  - -Edition 2 completed – publication 2012
- IEC 62287-1 Class B published in 2006
  - -Edition 2 published – 29 Oct 10
- IEC 62320-1 AIS base station published in 2007
- IEC 62320-2 AIS AtoN base station published in 2008
- IEC 61097-14 AIS SART published in 2009
  - -Their use became permissible 1/1/10
- IEC 62287-2 Class B SOTDMA
  - -Still in development – publication 2012

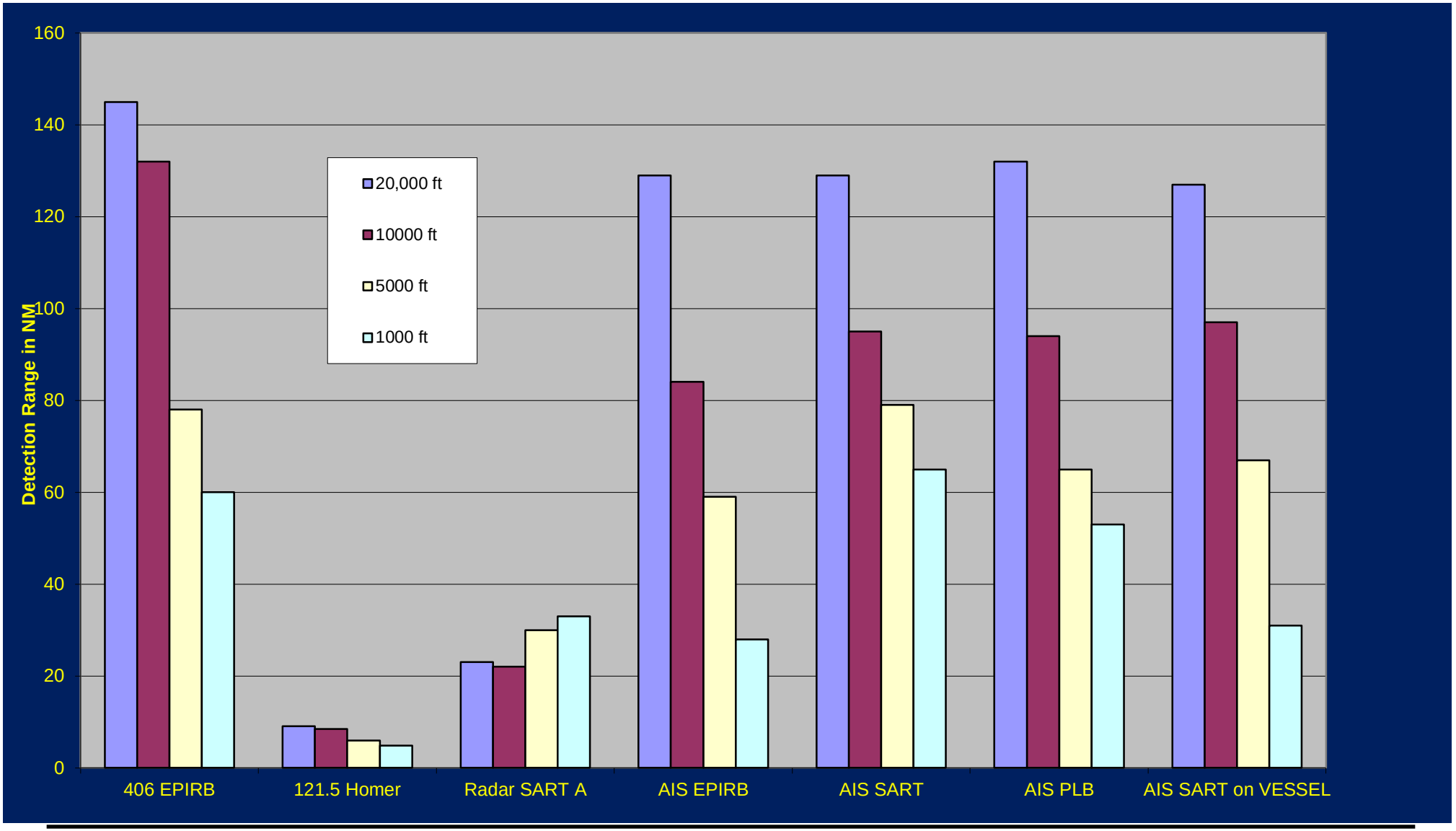
AIS SART – GMDSS Search and Rescue AIS Transmitter

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



Homeland Security

ID#	ITU-R M.1371 AIS Message Descriptions - Applications	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

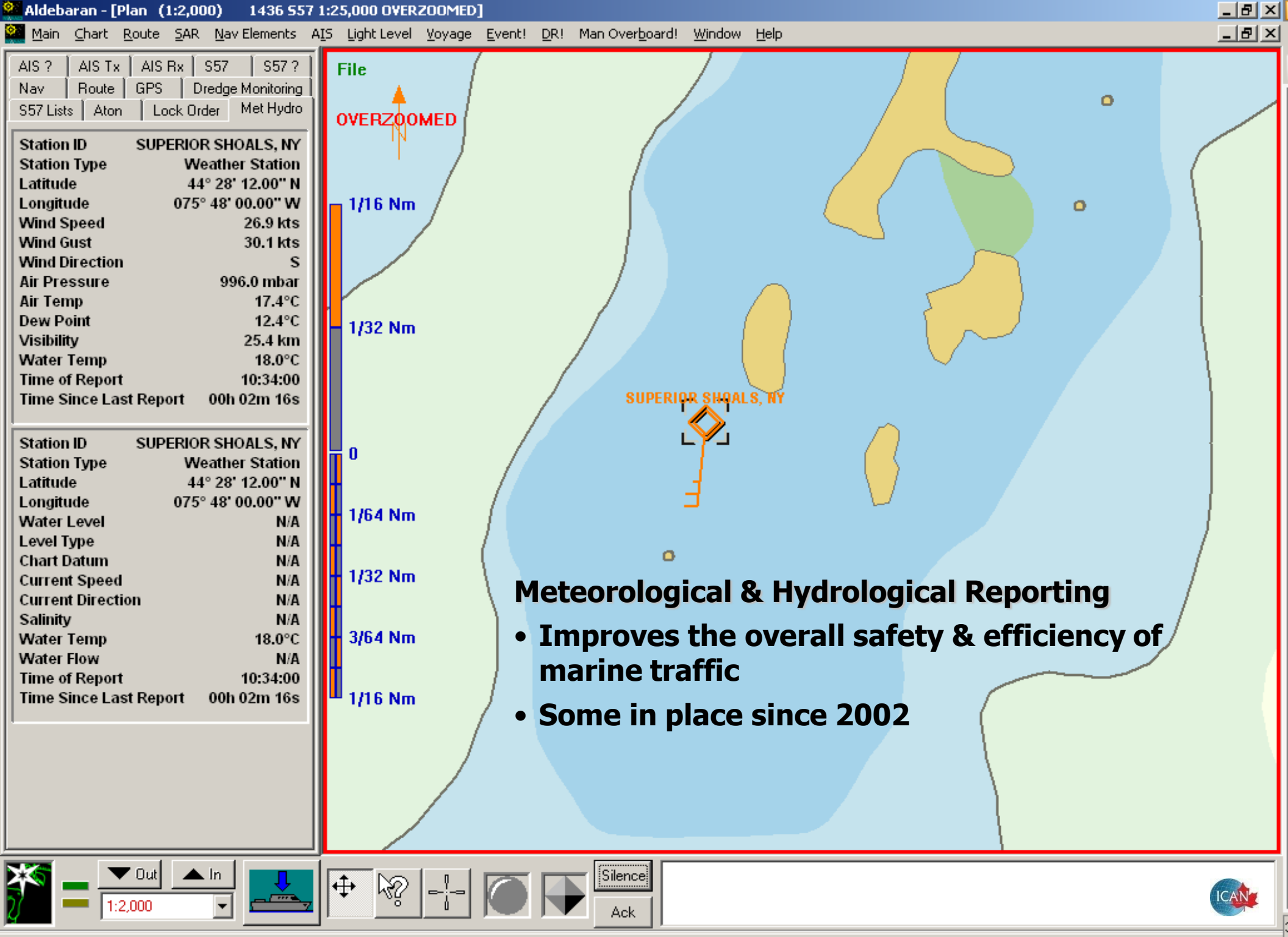
Application Specific Message Format

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		


Aldebaran - [Plan (1:2,000) 1436 557 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

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

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.

6 In addition to these 7 messages and 4 system-related messages, the Sub-Committee agreed to allow 2 additional messages in the 4-year trial period to test the process of introducing new binary

Homeland Security

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

IMO INTERNATIONAL MARITIME ORGANIZATION

E

4 ALBERT EMBANKMENT
LONDON SE1 7SR
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.

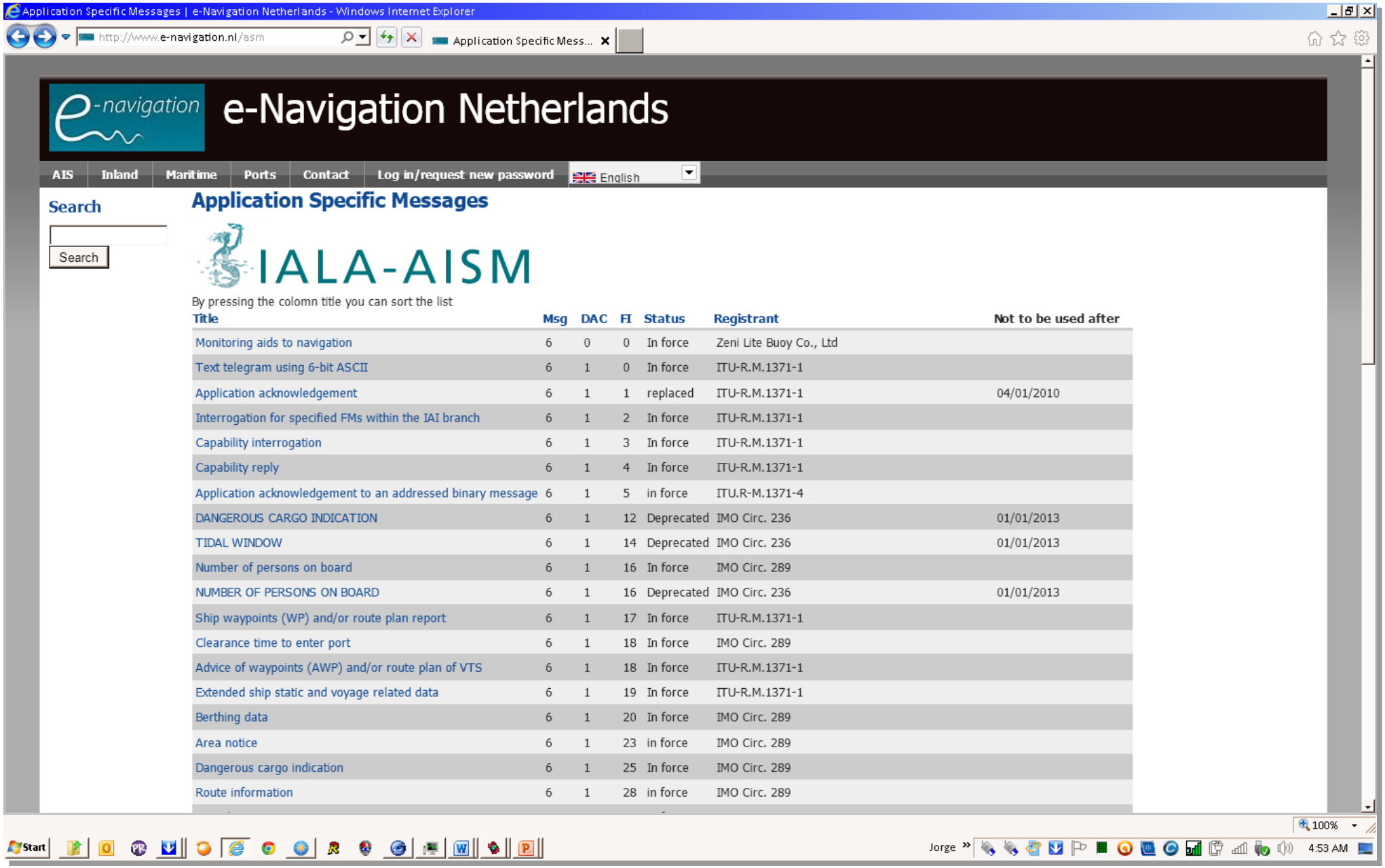
6 This circular revokes SN/Circ.236 as from 1 January 2013.

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

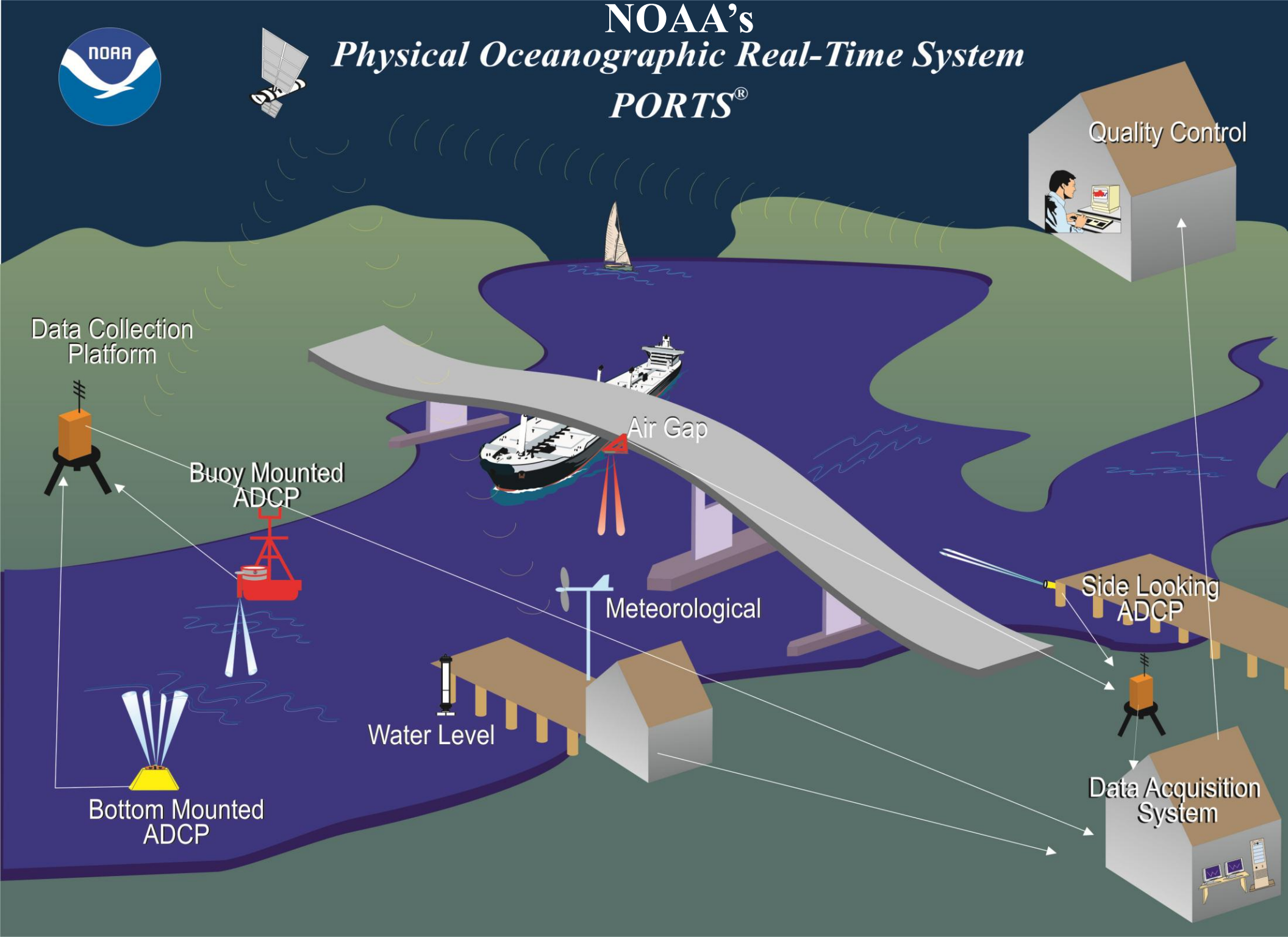
Future ASM developments…

- 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 expand mandatory AIS carriage to all U.S. waters
  - ✓ To require ECS and its integration with AIS (including ASM's)
  - ✓ To provide NOAA PORTS via NAIS

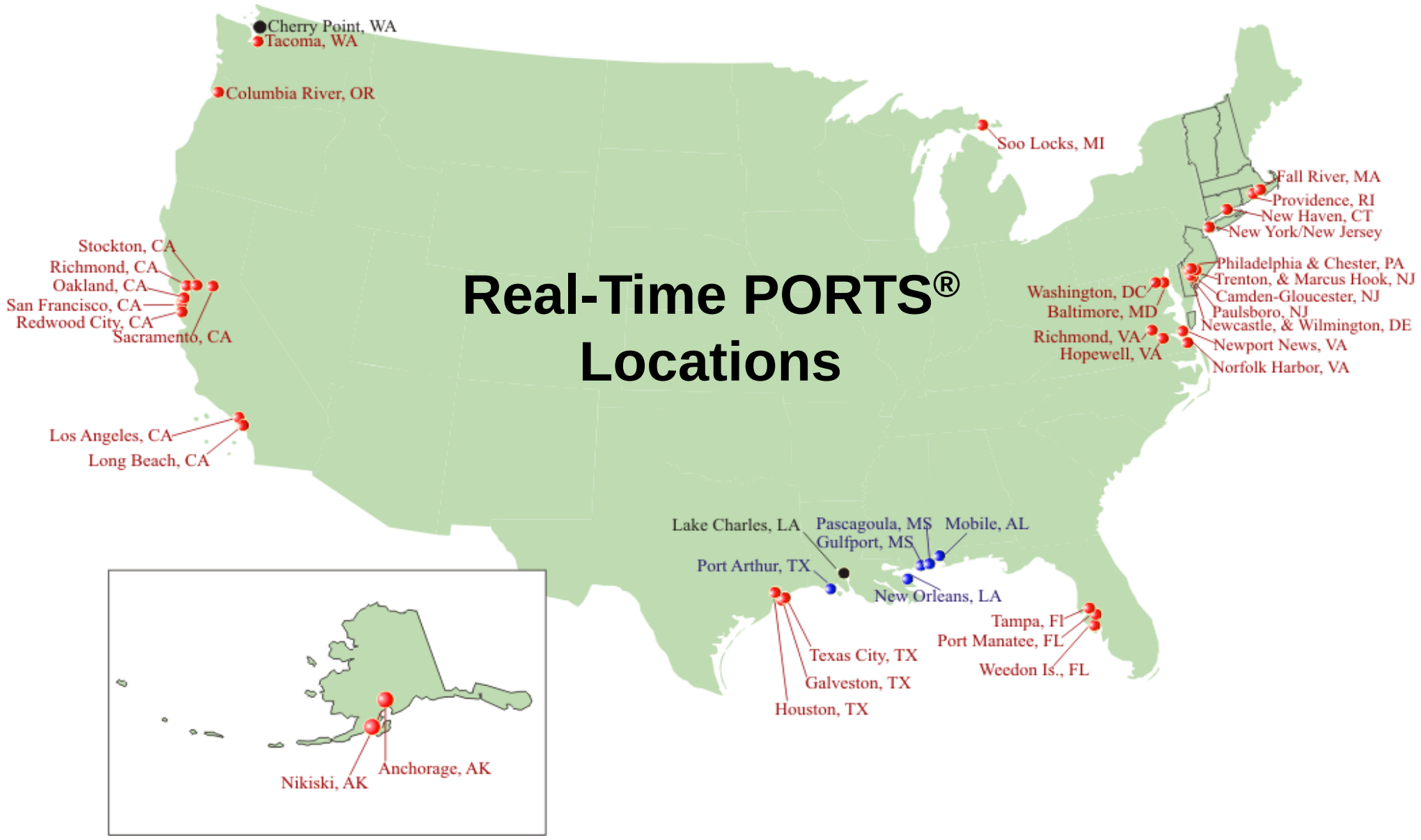

Application Specific Messages | e-Navigation Netherlands - Windows Internet Explorer
http://www.e-navigation.nl/asm
Application Specific Mess...
e-navigation
e-Navigation Netherlands
AIS
Inland
Maritime
Ports
Contact
Log in/request new password
English
Search
Search
Application Specific Messages
IALA-AISM
By pressing the colomn title you can sort the list
Title
Msg
DAC
FI
Status
Registrant
Not to be used after
Monitoring aids to navigation 6 0 0 In force Zeni Lite Buoy Co., Ltd
Text telegram using 6-bit ASCII 6 1 0 In force ITU-R.M.1371-1
Application acknowledgement 6 1 1 replaced ITU-R.M.1371-1 04/01/2010
Interrogation for specified FMs within the IAI branch 6 1 2 In force ITU-R.M.1371-1
Capability interrogation 6 1 3 In force ITU-R.M.1371-1
Capability reply 6 1 4 In force ITU-R.M.1371-1
Application acknowledgement to an addressed binary message 6 1 5 in force ITU.R-M.1371-4
DANGEROUS CARGO INDICATION 6 1 12 Deprecated IMO Circ. 236 01/01/2013
TIDAL WINDOW 6 1 14 Deprecated IMO Circ. 236 01/01/2013
Number of persons on board 6 1 16 In force IMO Circ. 289
NUMBER OF PERSONS ON BOARD 6 1 16 Deprecated IMO Circ. 236 01/01/2013
Ship waypoints (WP) and/or route plan report 6 1 17 In force ITU-R.M.1371-1
Clearance time to enter port 6 1 18 In force IMO Circ. 289
Advice of waypoints (AWP) and/or route plan of VTS 6 1 18 In force ITU-R.M.1371-1
Extended ship static and voyage related data 6 1 19 In force ITU-R.M.1371-1
Berthing data 6 1 20 In force IMO Circ. 289
Area notice 6 1 23 in force IMO Circ. 289
Dangerous cargo indication 6 1 25 In force IMO Circ. 289
Route information 6 1 28 in force IMO Circ. 289
100%
Start
Jorge
4:53 AM

Future ASM developments…

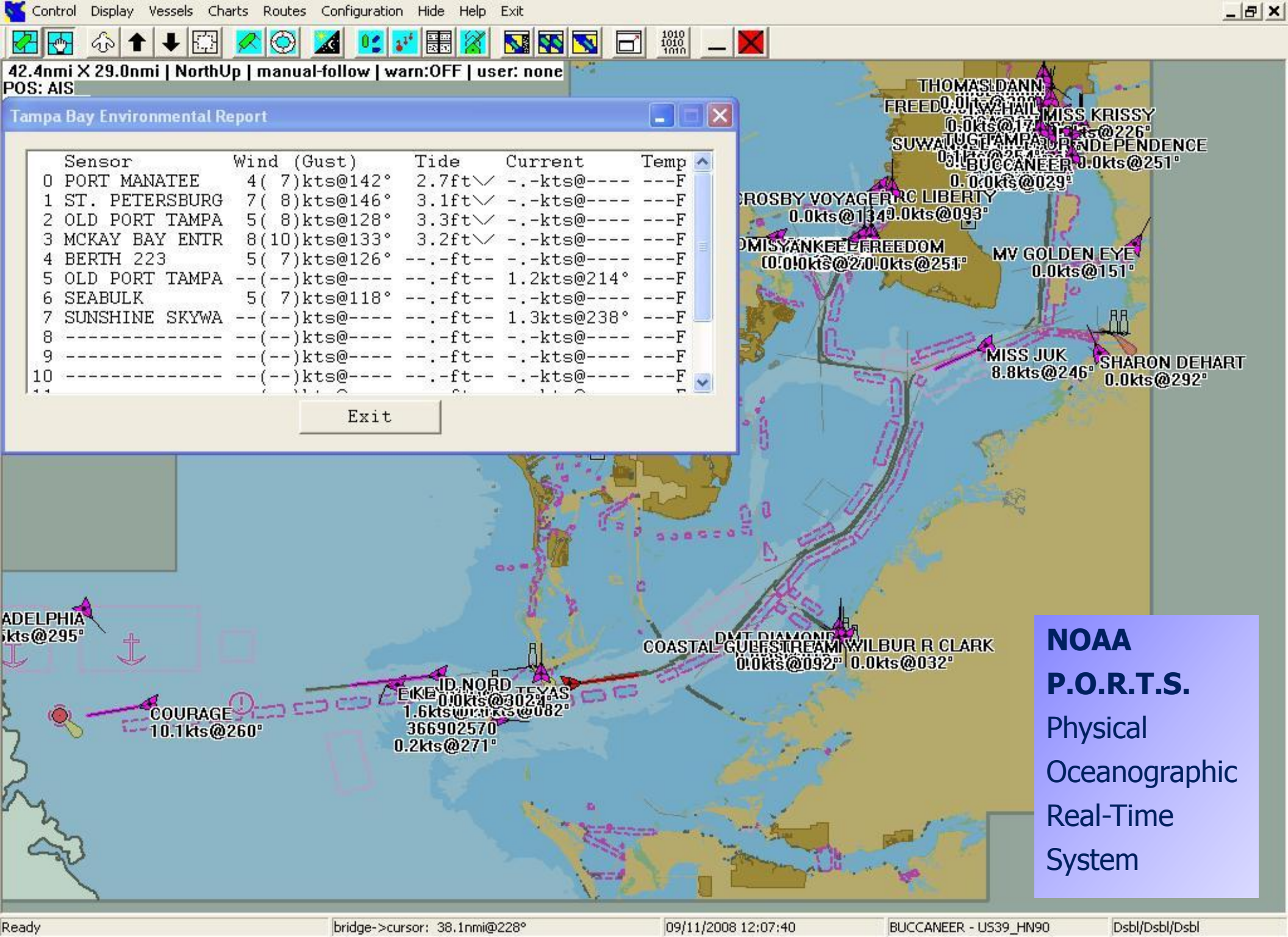
- International Assoc. of Marine Aids to Navigation & Lighthouse Authorities (IALA) Guidelines & Recommendations
  - ✓ E-Navigation Committee, Portrayal Working Group
  - ✓ Maintaining an AIS ASM catalogue
- Radio Technical Commission for Maritime Services (RTCM) Standards
  - ✓ Special Committee 121 - 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 expand mandatory AIS carriage to all U.S. waters
  - ✓ To require ECS and its integration with AIS (including ASM's)
  - ✓ To provide NOAA PORTS via NAIS

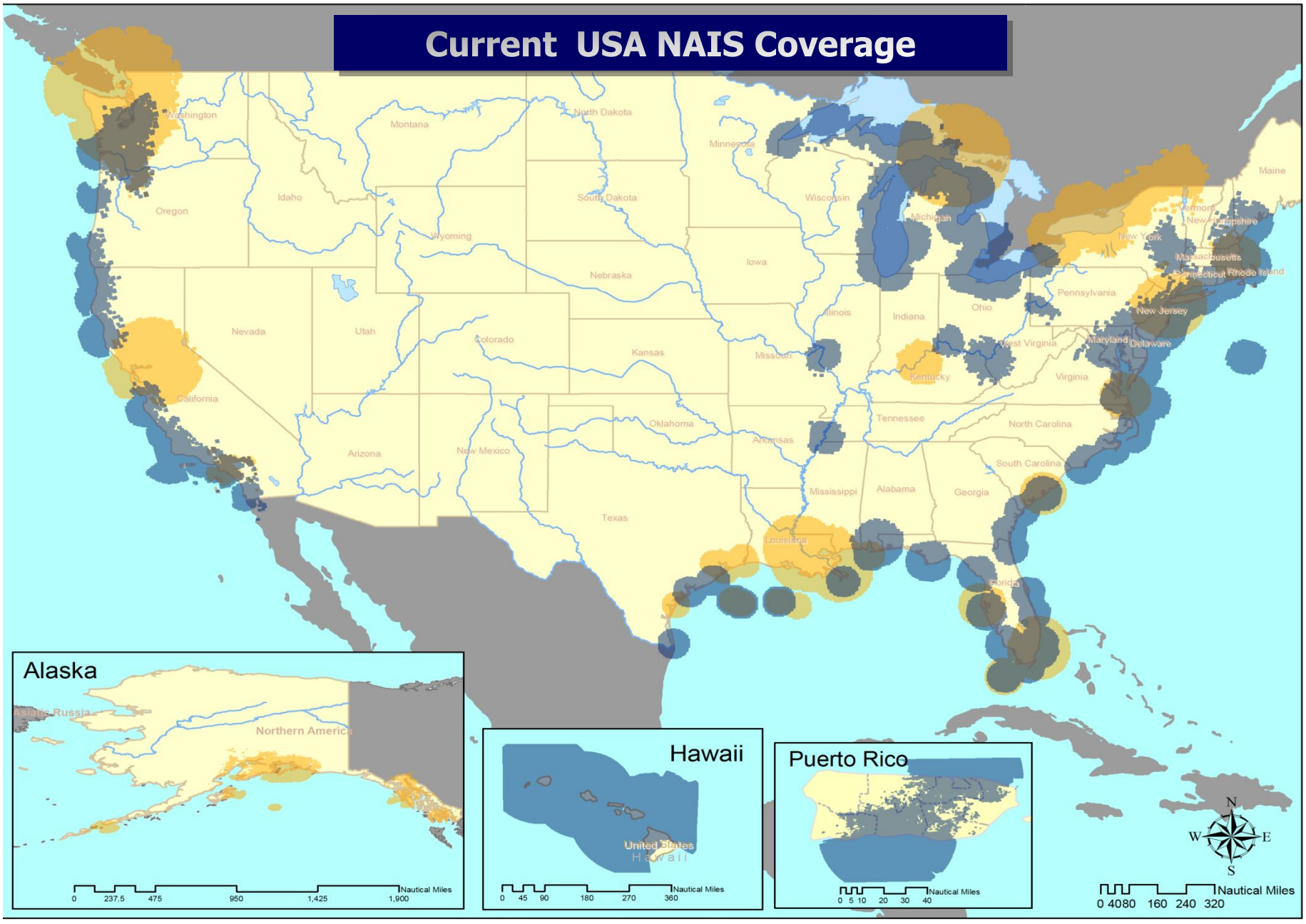

NOAA's
Physical Oceanographic Real-Time System
PORTS®
Quality Control
Data Collection Platform
Air Gap
Buoy Mounted ADCP
Meteorological
Side Looking ADCP
Water Level
Bottom Mounted ADCP
Data Acquisition System

Real-Time PORTS® Locations



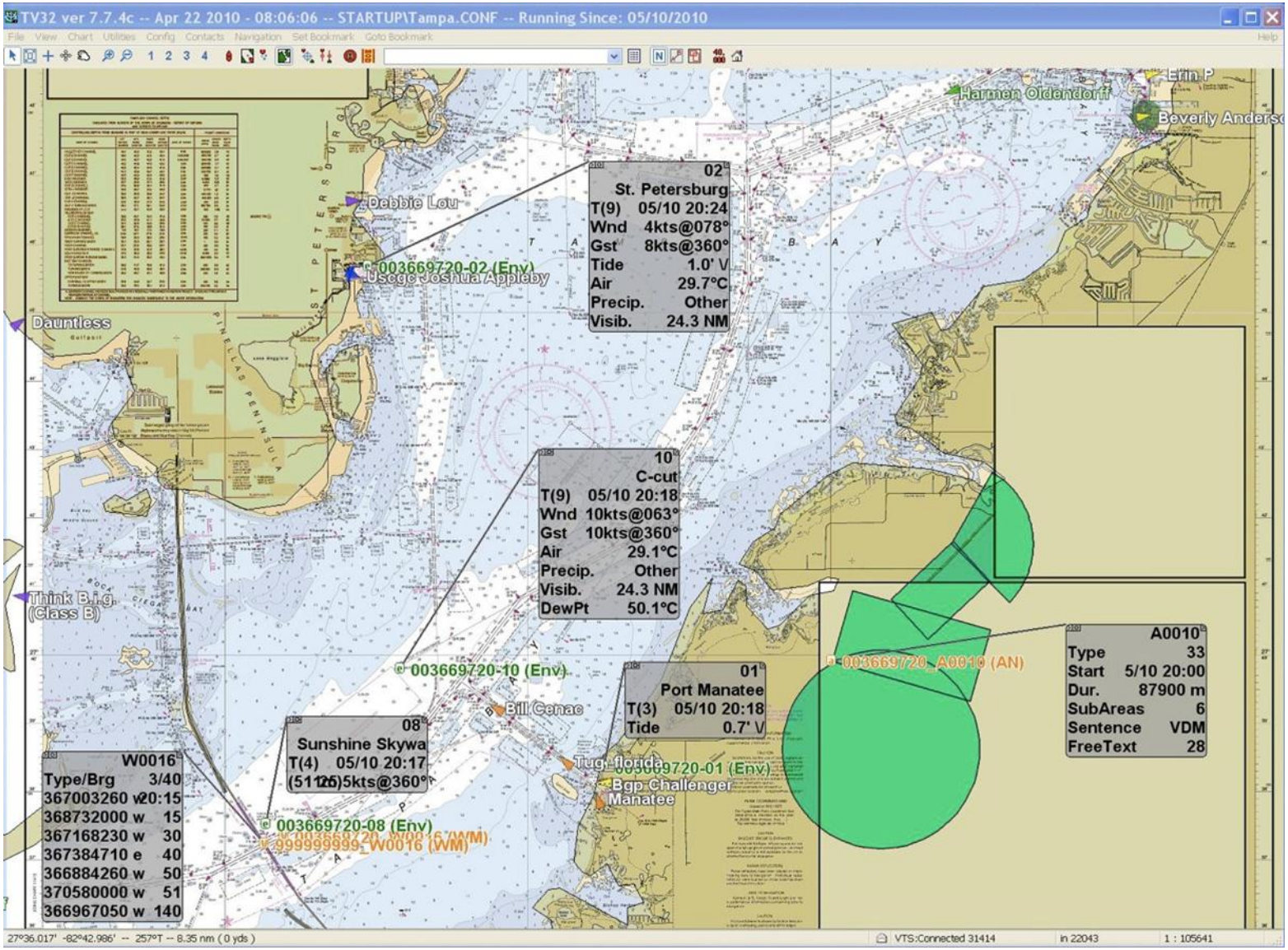
Homeland Security


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
DMT DIAMOND
WILBUR R CLARK
0.0kts@092°
0.0kts@032°
EIKE
ID NORD
0.0kts@302°
1.6kts@082°
366902570
0.2kts@271°
COURAGE
10.1kts@260°
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



Homeland Security

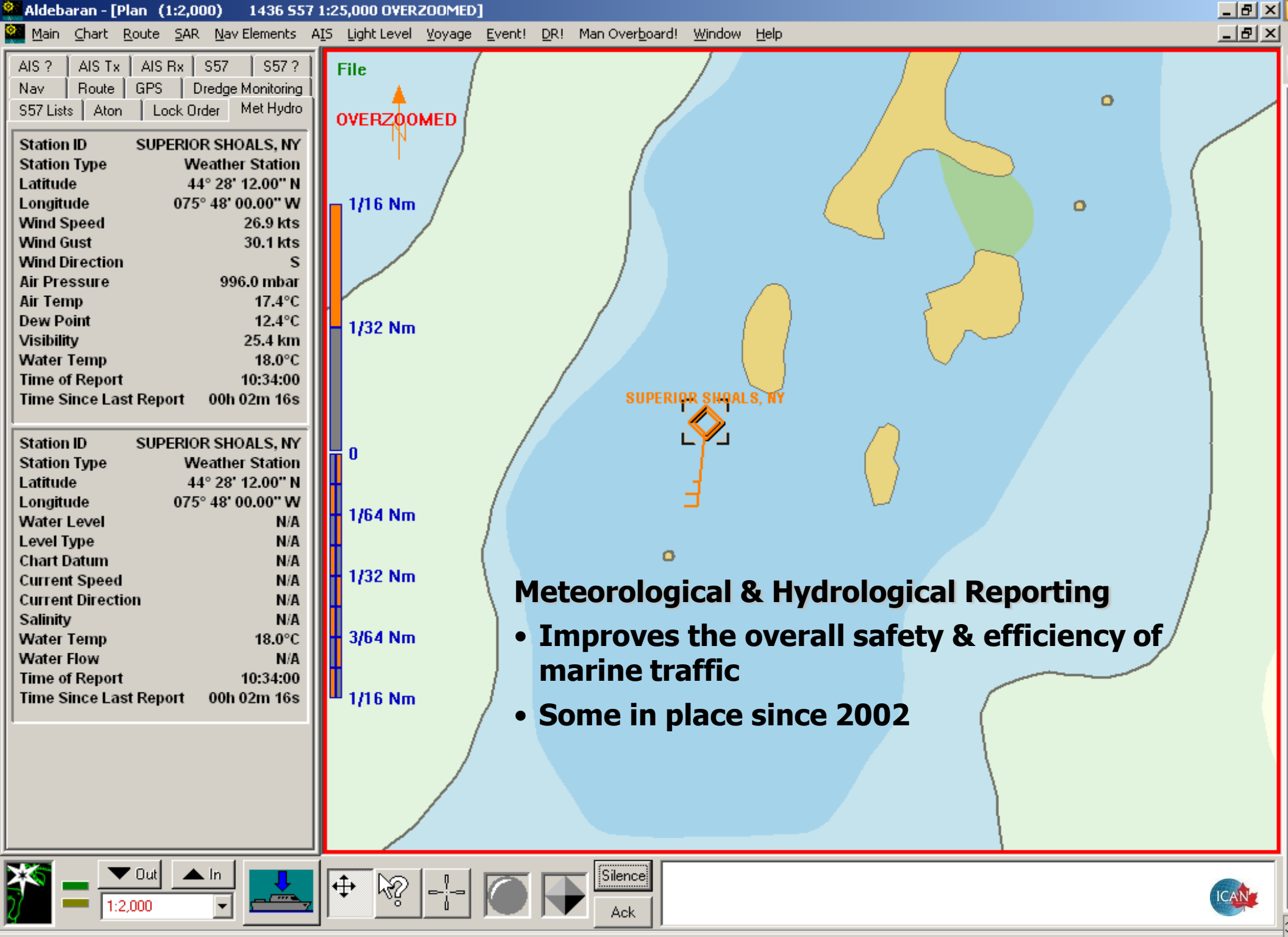
AIS ASM NOAA PORTS Portrayal

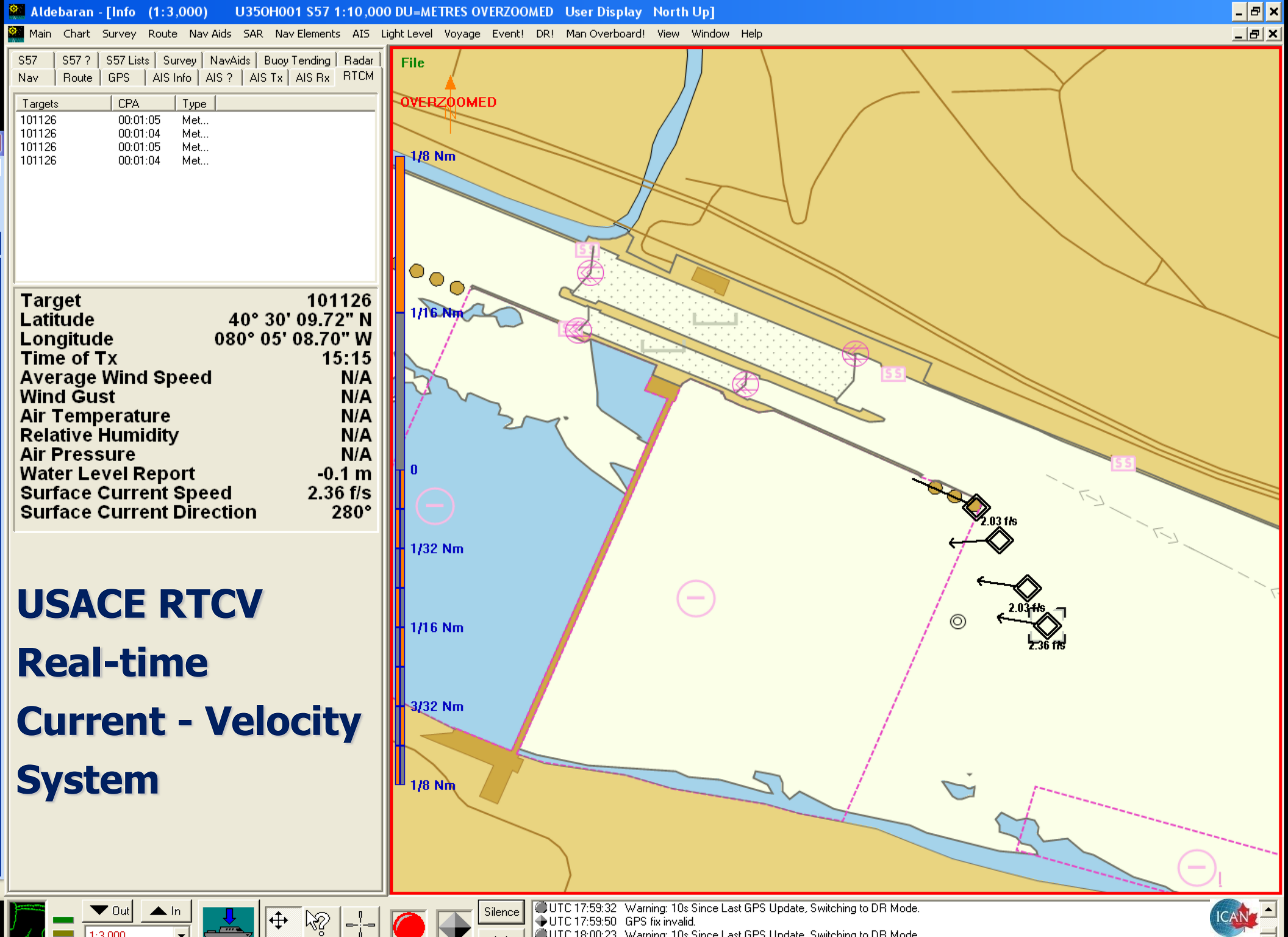


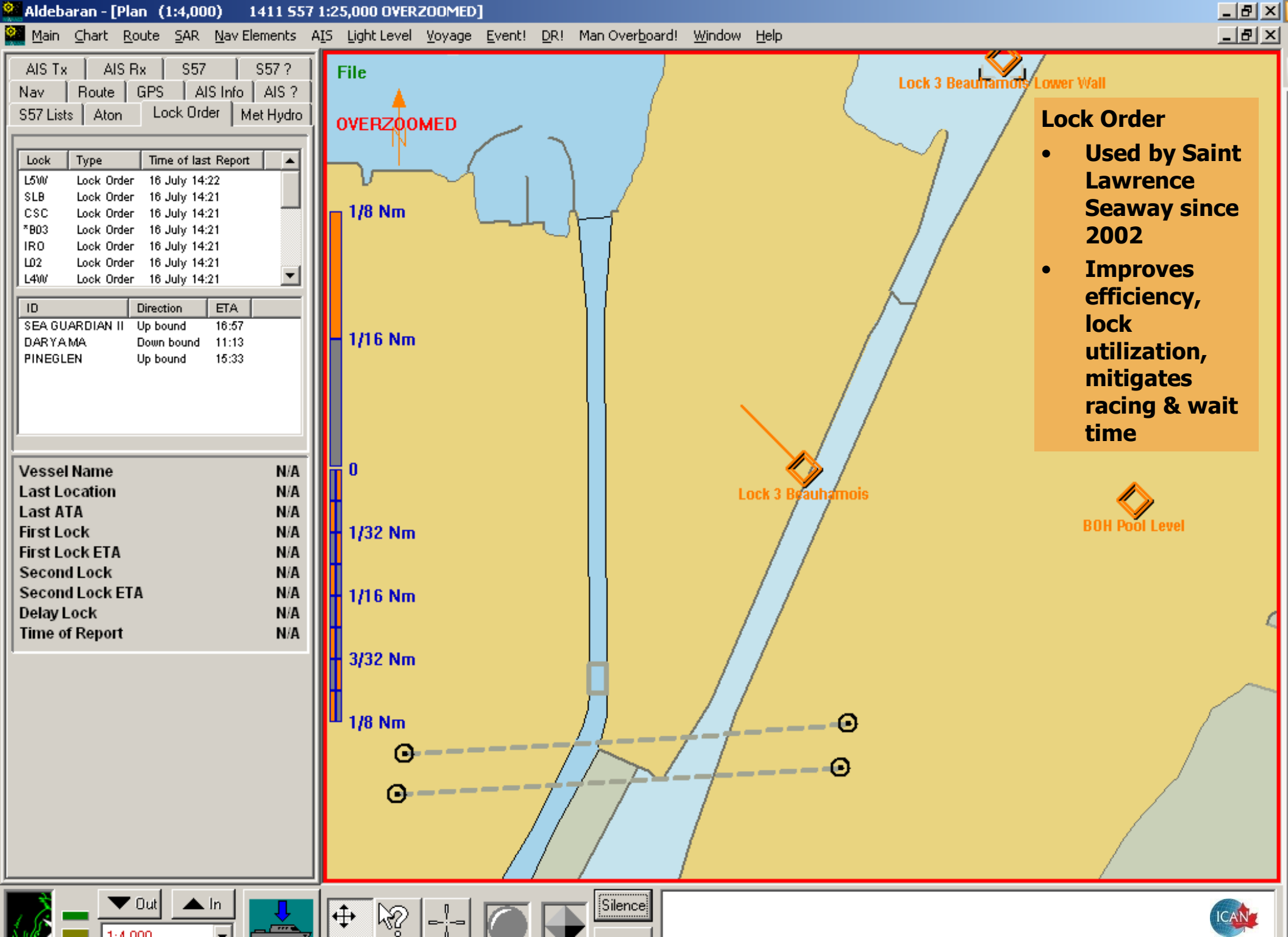
Homeland Security

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 expand mandatory AIS carriage to all U.S. waters
  - ✓ To require ECS and its integration with AIS (including ASM's)
  - ✓ To provide NOAA PORTS via NAIS

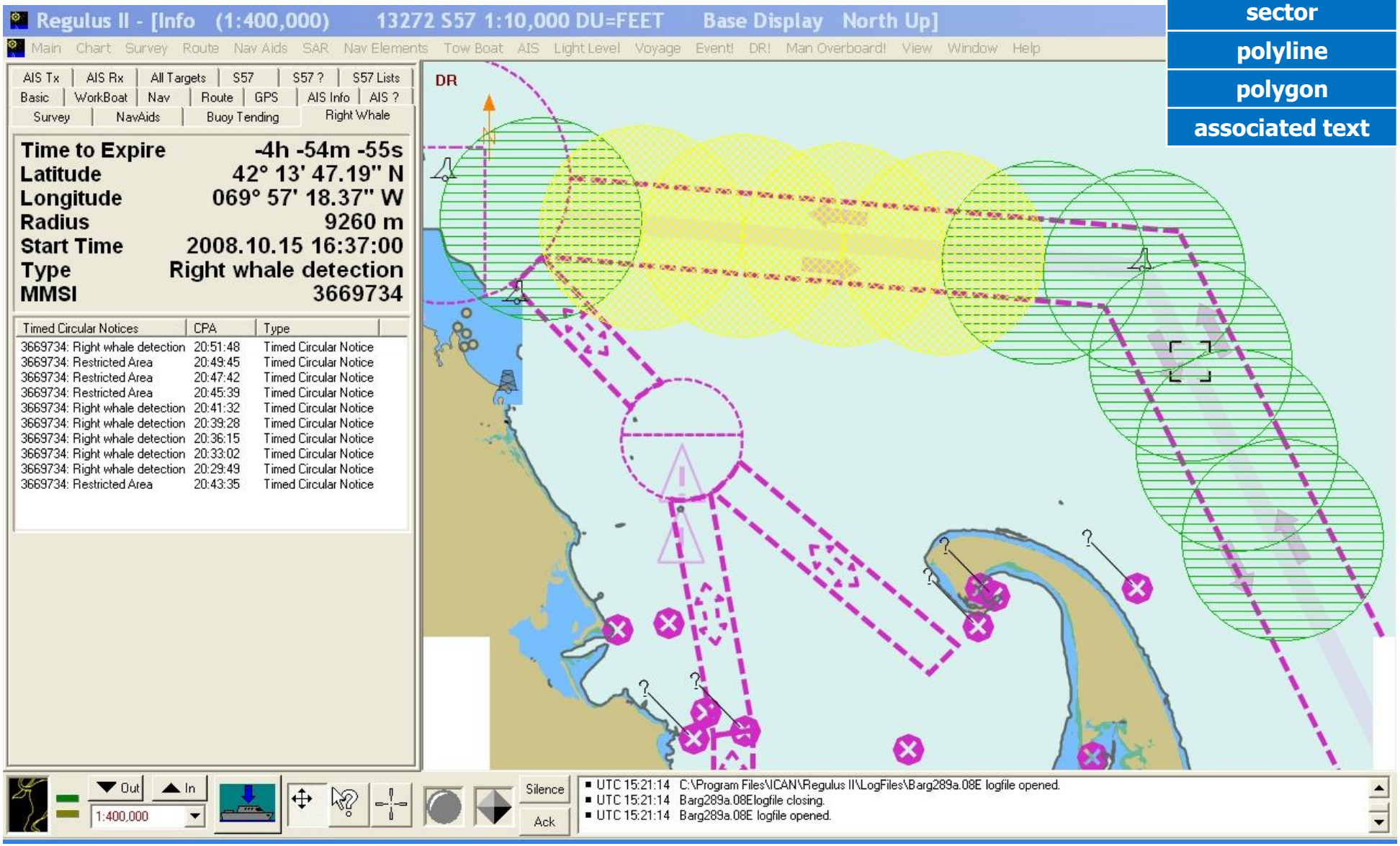

Aldebaran - [Plan (1:2,000) 1436 557 1:25,000 OVERZOOMED]
Main Chart Route SAR Nav Elements AIS Light Level Voyage Event! DR! Man Overboard! Window Help
AIS ? AIS Tx AIS Rx S57 S57 ?
Nav Route GPS Dredge Monitoring
S57 Lists Aton Lock Order Met Hydro
Station ID SUPERIOR SHOALS, NY
Station Type Weather 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 557 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

NAVIGATION CENTER

The Navigation Center of Excellence

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

Home | Consolidated Nav Info | DGPS Advisories | GPS Constellation Status | GPS Testing Notices | LNMs | Almanacs | Nav Rules | AIS | Contact Us | Search

***** 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.

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:

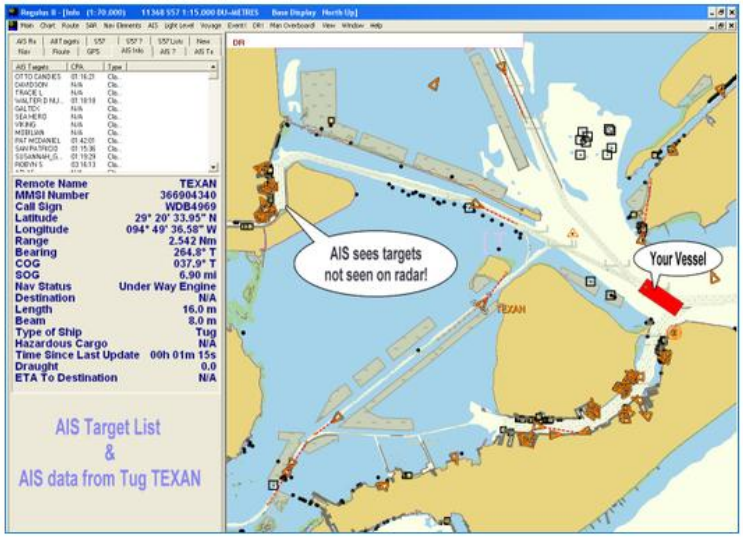
- Global Positioning System
- Differential GPS
- Nationwide DGPS
- Long Range Identification and Tracking
- Civil GPS Service Interface Committee
- Automatic Identification System
- Nationwide AIS (NAIS)
- Electronic Navigation & Charting
- Maritime Telecommunications
- LORAN C (archive)

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

NAVIGATION CENTER

The Navigation Center of Excellence

U.S. Department of Homeland Security

UNITED STATES COAST GUARD

Home | Consolidated Nav Info | DGPS Advisories | GPS Constellation Status | GPS Testing Notices | LNMs | Almanacs | Nav Rules | AIS | Contact Us | Search

***** 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.

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:

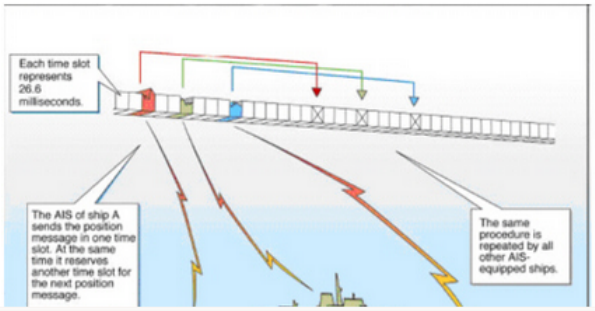
- Receive Free LNM Updates
- Receive Free GPS Status Messages
- Receive NANU Updates

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.

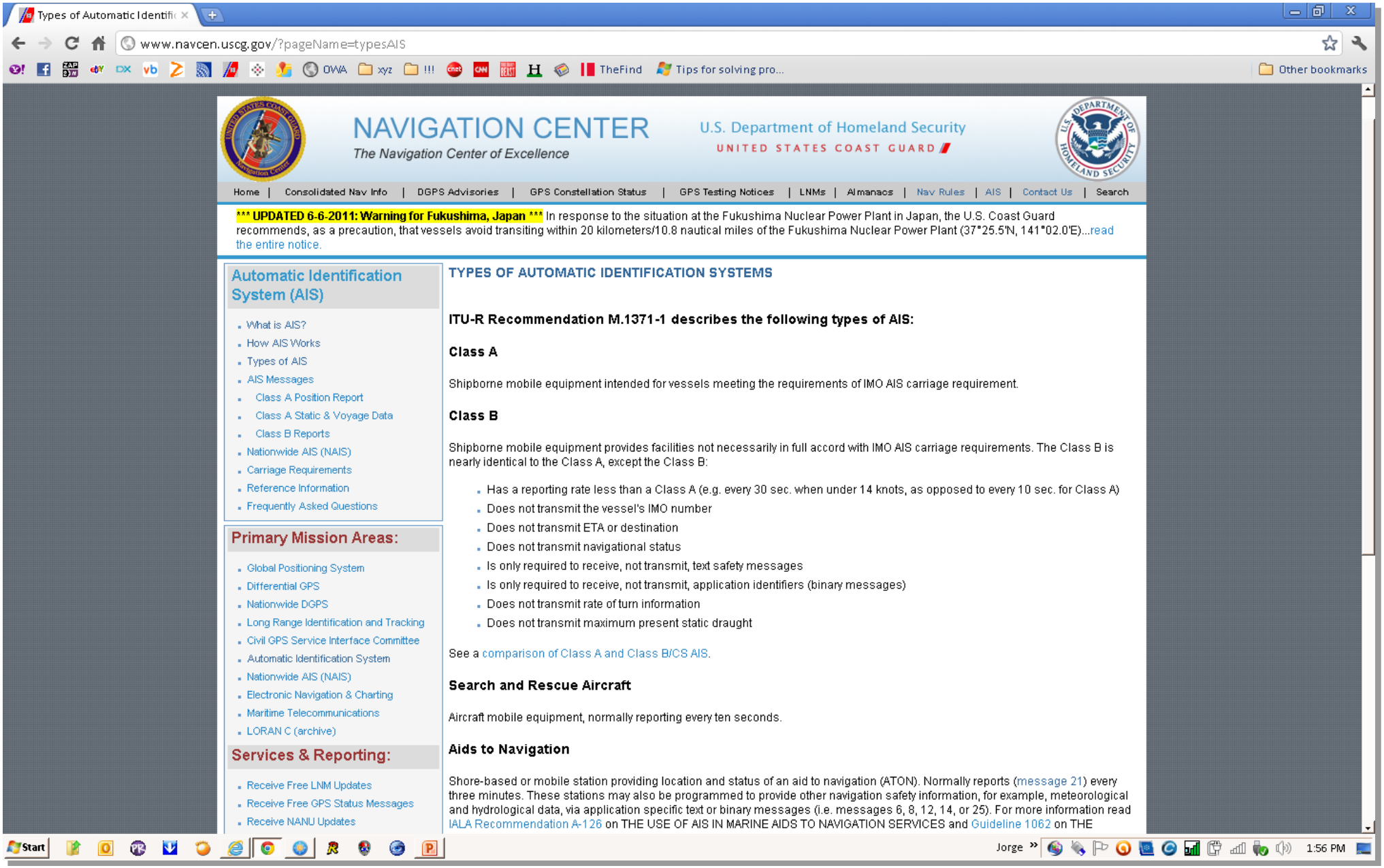
Each station determines its own transmission schedule (slot), based upon data link traffic history and knowledge of future actions by other stations. A position report from one AIS station fits into one of 2250 time slots established every 60 seconds. AIS stations continuously synchronize themselves 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
NAVIGATION CENTER
The Navigation Center of Excellence
U.S. Department of Homeland Security
UNITED STATES COAST GUARD
Home | Consolidated Nav Info | DGPS Advisories | GPS Constellation Status | GPS Testing Notices | LNMs | Almanacs | Nav Rules | AIS | Contact Us | Search
*** 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.
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
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 Class A & B Comparison	Class A	Class B/CS
Transmit Power	2w	12.5w / 2w (low-power)
Reporting Rate	2 - 10 sec - speed and/or course dependent	30 sec. fixed
Communication Protocol	SO-TDMA Self-Organizing amongst Class A's	CS-TDMA Carrier-Sense(s), polite to Class A's
Frequency Range & Bandwidth	156.025 -162.025 MHz @ 12/25 kHz DSC Required	161.500 - 162.025 MHz @ 25 kHz DSC & 12.5 kHz Optional
Position Source	External GNSS & Internal GPS	Internal GPS
Digital Interfaces	2 Input-Output Ports & Multiple Outputs	Optional
Display	Multiple Keyboard Display (MKD)	Optional
Safety Text Messaging	Receive & Transmit	Transmit Optional & Pre-configured
Data	All	No Rate of Turn, Navigation Status, Destination, ETA, Draft, IMO#
CG Type-Approvals	22 Models - 16 Manufacturers	8 Models - 8 Manufacturers
Approximate Cost	$2,800 - 4,000	$700 - 1,500

AIS Messages
www.navcen.uscg.gov/?pageName=AISMessages
NAVIGATION CENTER
The Navigation Center of Excellence
U.S. Department of Homeland Security
UNITED STATES COAST GUARD
Home | Consolidated Nav Info | DGPS Advisories | GPS Constellation Status | GPS Testing Notices | LNMs | Almanacs | Nav Rules | AIS | Contact Us | Search
*** 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.
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
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

NAVIGATION CENTER

The Navigation Center of Excellence

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

Home | Consolidated Nav Info | DGPS Advisories | GPS Constellation Status | GPS Testing Notices | LNMs | Almanacs | Nav Rules | AIS | Contact Us | Search

***** 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.

Nationwide AIS

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

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
- 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

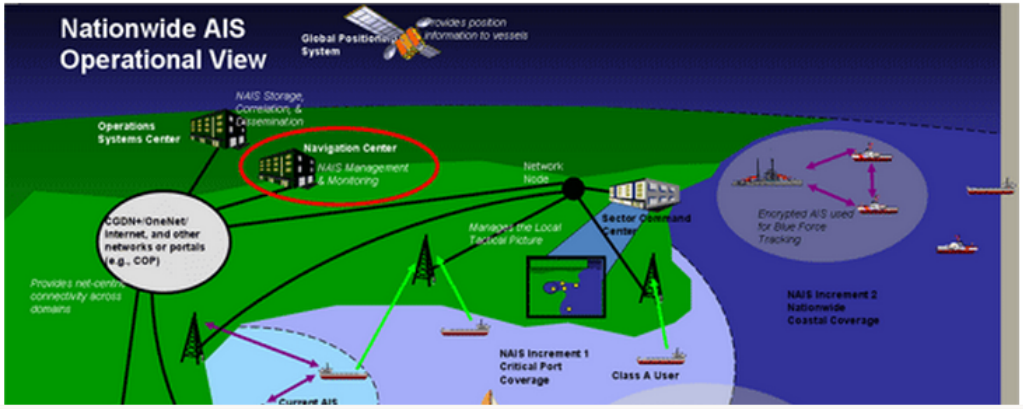
NATIONWIDE AUTOMATIC IDENTIFICATION SYSTEM

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.

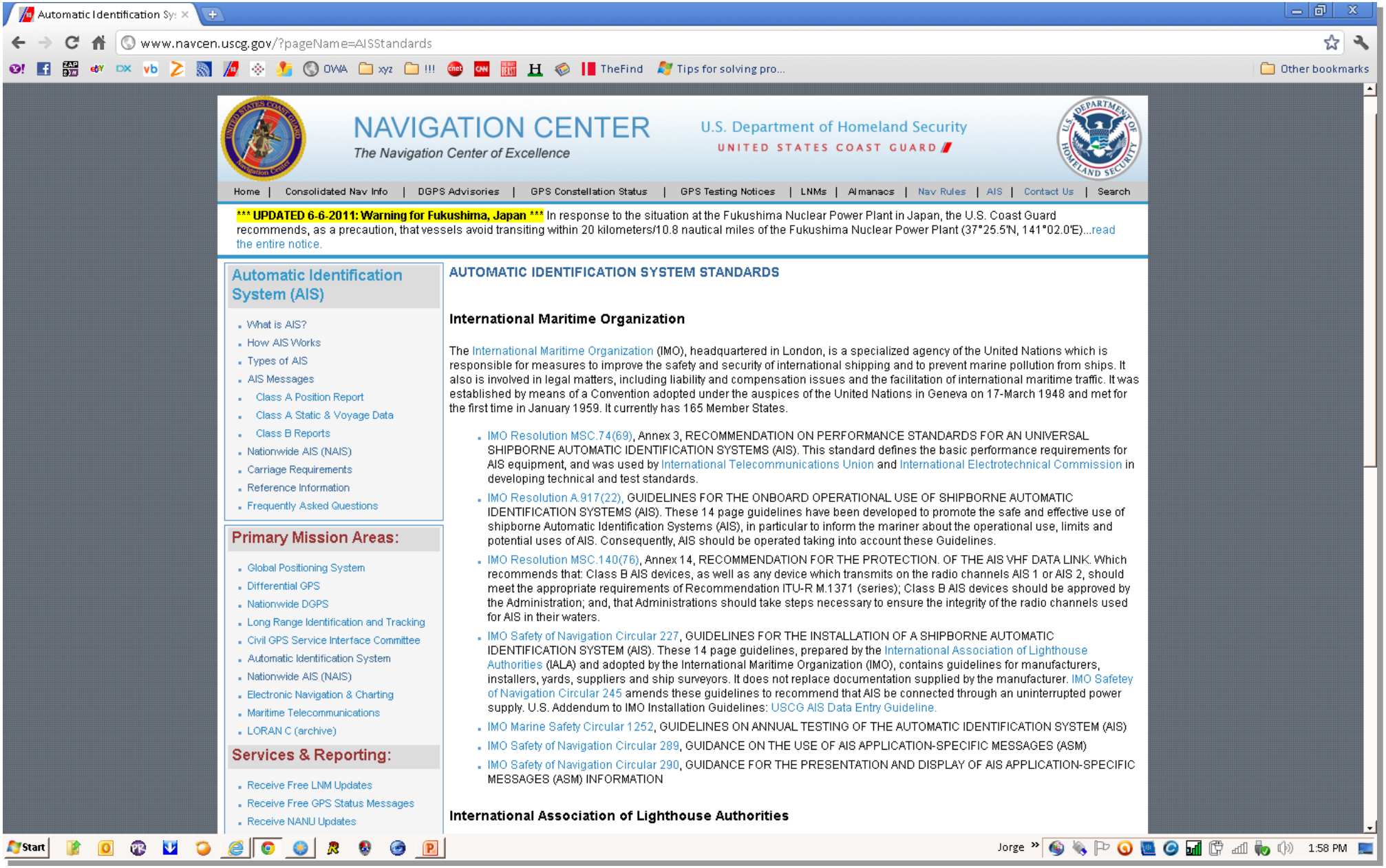


Jorge 1:57 PM

Homeland Security

www.navcen.uscg.gov

Automatic Identification Sys
www.navcen.uscg.gov/?pageName=AISCarriageReqmts
TheFind
Tips for solving pro...
Other bookmarks
NAVIGATION CENTER
The Navigation Center of Excellence
U.S. Department of Homeland Security
UNITED STATES COAST GUARD
Home | Consolidated Nav Info | DGPS Advisories | GPS Constellation Status | GPS Testing Notices | LNMs | Almanacs | Nav Rules | AIS | Contact Us | Search
*** 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.
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 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.
Start
Jorge
1:58 PM


Automatic Identification Sy
www.navcen.uscg.gov/?pageName=AISStandards
NAVIGATION CENTER
The Navigation Center of Excellence
U.S. Department of Homeland Security
UNITED STATES COAST GUARD
Home | Consolidated Nav Info | DGPS Advisories | GPS Constellation Status | GPS Testing Notices | LNMs | Almanacs | Nav Rules | AIS | Contact Us | Search
*** 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.
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 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
Start
Jorge
1:58 PM

AIS Frequently Asked Ques
www.navcen.uscg.gov/?pageName=AISFAQ
NAVIGATION CENTER
The Navigation Center of Excellence
U.S. Department of Homeland Security
UNITED STATES COAST GUARD
Home | Consolidated Nav Info | DGPS Advisories | GPS Constellation Status | GPS Testing Notices | LNMs | Almanacs | Nav Rules | AIS | Contact Us | Search
*** 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.
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
AIS FREQUENTLY ASKED QUESTIONS
1. What is AIS?
2. How do I program my AIS?
3. What is the AIS rule and are there alternatives to the rule for small businesses?
4. How much does an AIS cost?
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. 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.
Start
Jorge
1:59 PM

AUTOMATIC IDENTIFICATION SYSTEM

ENCODING GUIDE

AUTOMATIC IDENTIFICATION SYSTEM (AIS) is an invaluable 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 the accurate input and upkeep of all AIS data fields. Failure to do so may subject a vessel to civil penalties of up to $25,000 per ocurrence. To avoid such penalties AIS user should ensure their system are encoded as follows:

Static Data…should be manually inputted at installation and password protected — know your password, you will need it to reencode your AIS

- **Maritime Mobile Service Identifier** (MMSI), **call sign**, and **vessel name** should mirror the vessel's official radio station license. Vessel names should NOT include precursors or designators, such as: F/V, M/V, MV, OSV, P/V, REC, S/V, TUG, etc. Vessel names of 20 characters or greater should NOT be abbreviated or truncated; previously FCC licensed fleet vessels[1], which should include the segment of its name that is unique to the vessel, e.g.

  MYCOMPANYFLEETBOAT1234 -> MYCOMPANYFLEETB1234
  MYCOMPANYFLEETBOAT ALPHA -> MYCOMPANYFLEET ALPHA

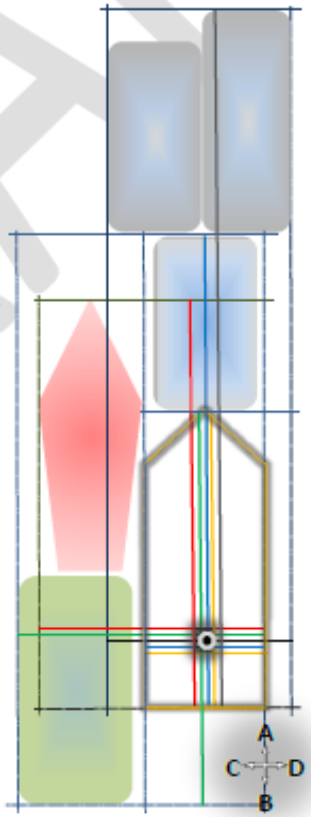
  FCC unlincensed pleasure craft should use {@@@@@@@} as their call-sign and their registration number preceded by {USA#} as their name, e.g. USA#WA1234YZ. If unnumbered (e.g. tenders, associated craft), use their parent ship {name followed by a a dash {-} and a numerical designator that distinguishes it amongst others, e.g. PARENTSHIPNAME-#$_n$ {n = 1, 2, 3…}; and shall reflect the last 6 digits of the parent MMSI preceded by {A}, e.g. A123456, in their AIS message 24B call-sign parameter.
- **IMO Number** should reflect the vessel's assigned[2] IMO number or absent an IMO assignment its U.S. documentation number preceded by {100} or {1000}, e.g. 1001234567, 1000123456.

Dynamic Data…should be provided via properly installed and integrated external sensors and that are accurate and continuously operational

- **Type of positioning source** and accuracy should be properly identified, e.g. GPS, surveyed or manual input. This same 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 its accuracy (i.e. greater than or less than 10 meters).
- **Heading** and **Rate of Turn** as required per SOLAS Chp. V Regulation 19.2 for vessels of 150 or 50,000 GT or greater, respectively.

Voyage Related Data…should be updated expeditiously

- **Navigation Status** should reflect the current status of the vessel, e.g. at anchor, underway using engines, engaged in fishing, etc. Always remember to change your status from underway to anchored or moored.
- **Type of vessel** shall reflect a ship type denoted in the accompanying table, which is either manually inputted or menu selection.
- **Dimensions** are derived from the distance to AIS or vessel's GPS antenna location to 4 cardinal points (ABCD) expressed in meters NOT feet. Also to be used by 'ship types 91' to convey the rectangular proportions of the tow.
- **Static Draft** should reflect the actual or maximum draft, if the actual draft is unavailable or unknown.
- **Estimated Time of Arrival** to destination or voyage departure, expressed in Universal Time Coordinated NOT local time.



- **Destination** should be encoded using UN/LOCODE[3] or US/GUID[4] codes as follows:

  UN/LOCODE format is required for International voyages

  Origination Country { } Port>Destination { } Port E.g.

  BS FPO>US NYC for Rotterdam to New York City

  US SFO>CN SHA for San Francisco to Shanghai

  US/GUID format is required for U.S. domestic voyages

  US+GUID { > / <> / >< } GUID, E.g.

  US+0YRX>0Z50 for berth to berth voyages

  US+0ZJ5<>0VBM for scheduled circuitous voyages, i.e. ferries

  US+0ZJ5<>0ZJ5 for voyages to nowhere and back

  US+0ZJ5><0ZJ5 operating in a confined area, i.e. fleeting area, marina

  US@0ZJ5 for anchored, moored, or hovering in one location

If AIS lacks angle brackets {>} substitute with parenthesis; { } or () or)(

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

- AIS safety-related text messages (SRM) must be in English and solely to exchange or communicate navigation safety information, such as a SECURITE[4] broadcast.
- Although not prohibited, AIS text messaging should NOT be relied upon as the primary means for broadcasting distress or urgent communications, such as a MAYDAY[4] or PAN PAN[4].
- So as to not congest the AIS network, SRM should be as short and concise. The use of abbreviations and acronyms is highly encouraged. See your Local Notice to Mariners and NOAA Chart No. 1 for a listing of acceptable abbreviations.
- AIS Stations wishing to convey that they are in a test mode may broadcast should periodically broadcast a {TESTING-IGNORE} AIS SRM. Test periods shall not exceed an hour per day.

Embarked U.S. Pilots are highly encouraged to assist mariners in the proper encoding of their AIS

---

[1] See http://wireless.fcc.gov/services/index.htm {Ship Radio Stations}

[2] Obtained at www.imonumbers.lrfairplay.com/datause.aspx

[3] United Nations Location Codes (UN/LOCODE) at: www.unece.org/cefact/locode/service/location.htm

[4] U.S. Geographically Unique ID (GUID) codes at: www.ndc.iwr.usace.army.mil/search/nav_unit_search.aspx

[5] See 47 CFR 80.1109, Distress, urgency, and safety communications

Numeric codes for 'Type of Ship and Cargo Type' are composed from the 1st and 2nd digit columns, or, as denoted in columns 3x, 5x, or 9x.
The terms used are as defined in IMO SOLAS or 46 U.S.C. 2101. Blue fonts denotes amplifying text not found in the original source (ITU-R M.1371-4)

1st digit	2nd digit	Other Vessels Codes (3x)	Special Craft Codes (5x)	USA-Specific Regional Codes (9x)
0 – Not available DO NOT USE	0 – All ships of this type	30 – Fishing*	50 – Pilot vessel	90 – Email cgnav@uscg.mil if you are another type of U.S. vessel not listed in this Table
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; or more than 150 passengers	31 – Engaged in towing by pulling (not pushing or hauling)	51 – Search and rescue vessels, i.e. USCG boats, USCG Auxiliary, assistance towers	91 – Engaged in towing barges by pushing ahead or hauling alongside (i.e. articulated tug-barges, push-boats, workboats); and, its dimensions (ABCD values) represent the overall rectangular dimensions of the vessel AND its tow*
2 – WIG	2 – Carrying DG, HS, or MP, IMO hazard or pollutant category B/Y; or 50-149 passengers	32 – Engaged in towing by pulling and length of the tow exceeds 200 meters (656 ft)	52 – Tugs–seagoing	92 – Engaged in towing other than barges by pushing ahead or hauling alongside (i.e. articulated tug-barges, push-boats, workboats); and, its dimensions (ABCD values) represent the overall rectangular dimensions of the vessel AND its tow*
3 – Other vessels, per column (3x)	3 – Carrying DG, HS, or MP, IMO hazard or pollutant category C/Z; or 12-49 passengers	33 – Engaged in dredging, salvage, survey or underwater operations*	53 – Port or fish tenders	93 – Light boats (i.e. push-boats or work boats NOT engaged in towing; and, dimensions (ABCD values) solely represent the vessel dimensions*
4 – HSC or ferries	4 – Carrying DG, HS, or MP, IMO hazard or pollutant category D/OS; or less than 12 passengers	34 – Engaged in diving operations*	54 – Commercial response vessels with anti-pollution facilities or equipment	94 – Offshore supply vessels (OSV)
5 – Special craft, per column (5x)	5 – Reserved for future use DO NOT USE	35 – Engaged in military operations	55 – Law enforcement vessels, i.e. USCG cutters, marine police	95 – Mobile Offshore Drilling Units (MODU)
6 – Passenger ships or vessels, other than ferries	6 – Reserved for future use DO NOT USE	36 – Sailing vessels*	56 – Spare–for assignments to local vessels work boats operating exclusively within a worksite (e.g. fleeting area, marina)	96 – School, scientific, research or training ships
7 – Cargo ships	7 – Reserved for future use DO NOT USE	37 – Pleasure craft	57 – Spare–for assignments to local vessels involved in a regatta or marine event	97 – Autonomous, remotely-controlled or otherwise self-propelled unmanned craft
8 – Tankers	8 – Reserved for future use DO NOT USE	38 – Reserved for future use DO NOT USE	58 – Medical transports (as defined in the 1949 Geneva Conventions and Addition Protocols) or other public response vessels	98 – Non-self-propelled vessels
9 – Other types of ship, per column (9x)	9 – No additional information	39 – Reserved for future use DO NOT USE	59 – Ships according to RR Resolution No. 18 (Mob-83)	99 – No additional information

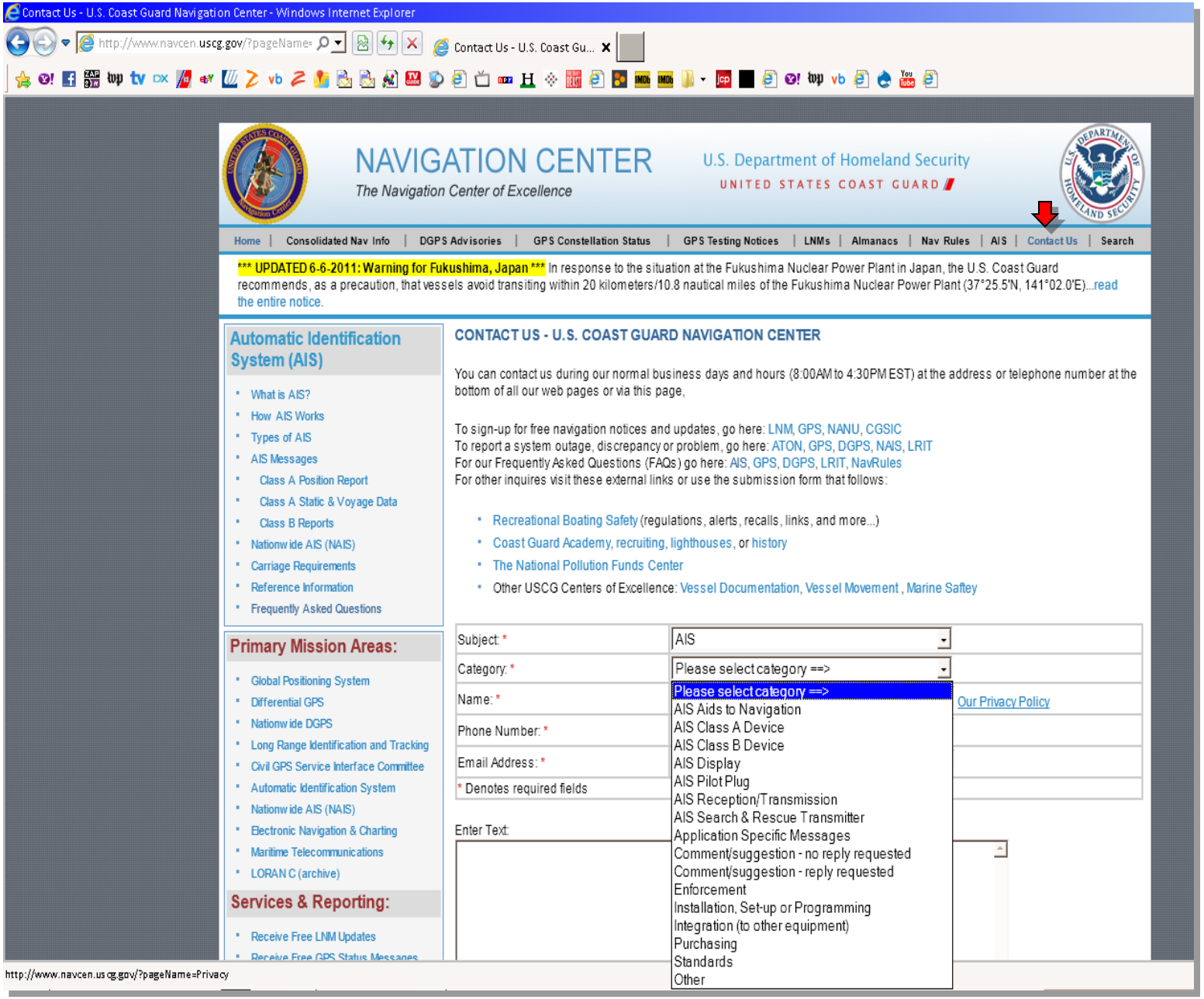
* Remember to update 'Navigation Status' when engaged In fishing, sailing, or restricted in your ability to maneuver; and, 'Ship Type' and Dimensions (ABCD) values when engaged in towing

v.2011-10-17

DRAFT

AIS Frequently Asked Ques
www.navcen.uscg.gov/?pageName=AISFAQ#15
TheFind
Tips for solving pro...
Other bookmarks
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.
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:
NOAD AIS Public Meeting in Washington, DC (05MAR09) and Seattle, WA (25MAR09).pdf (1.06MB) Washington, DC audio.mp3 (12MB) Seattle, WA audio.mp3 (7.83MB)
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.
18. What is a MMSI and where can I get one for my AIS? A unique and official Maritime Mobile Service Identity (MMSI) number is required for every AIS station, see our MMSI page for more information.
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
Start
Jorge
2:00 PM

USCG AIS Report Form



Homeland Security

www.navcen.uscg.gov via 'Contact Us' tab

United States Coast Guard

Office of Navigation Systems

Jorge.Arroyo@uscg.mil
1-202-372-1563
www.navcen.uscg.gov/enav
cgnav@uscg.mil

U.S. Coast Guard
Office of Navigation Systems
2100 Second St. SW
Washington, DC 20953

Homeland Security