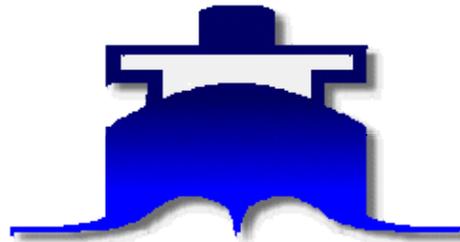

United States Coast Guard

Office of Navigation Systems



**Providing navigation
safety information for
America's waterways**

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

**Smart Rivers
Sept.ember 13-15, 2011
LOMA Workshop
New Orleans, LA**



**Homeland
Security**



Automatic Identification System (AIS)

- ✓ AIS History
- ✓ Regulations...Who? Where? When?
- ✓ What is AIS?
- ✓ How AIS works?
- ✓ AIS Data Accuracy?
- ✓ AIS @ www.navcen.uscg.gov
- ✓ Questions & Answers

Shipboard AIS



Homeland Security



AIS History & Timeline

WRC'97
AIS1 Ch.87B
AIS2 Ch.88B

SOLAS
V/19.2.4

2002 IMO
Diplomatic
Conference

SOLAS
V/19.2.4

IMO
MSC 74 (69)
Performance

ITU-R M.1371-1
Technical

IEC 61993-2
Testing &
Certification



OPA
'90

ADSSE
ITU-R
M.825-3

National
Dialog
Group

Marine Board
Ports &
Waterways
Study

FCC
Notice
DA-02-1362

105th
Congress

VTS LMR
Public
Meeting

MTSA - 11/02
Interim - 7/03
Final - 10/03
Deadline - 1/04

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.



AIS Timeline

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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)

AIS Timeline

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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

WRC'97
AIS1 Ch.87B
AIS2 Ch.88B

SOLAS
V/19.2.4

2002 IMO
Diplomatic
Conference

SOLAS
V/19.2.4

IMO
MSC 74 (69)
Performance

ITU-R M.1371-1
Technical

IEC 61993-2
Testing &
Certification

1990-----1994-----1997----1998----1999----2000----2001----2002---2003--2004

OPA
'90

ADSSE
ITU-R
M.825-3

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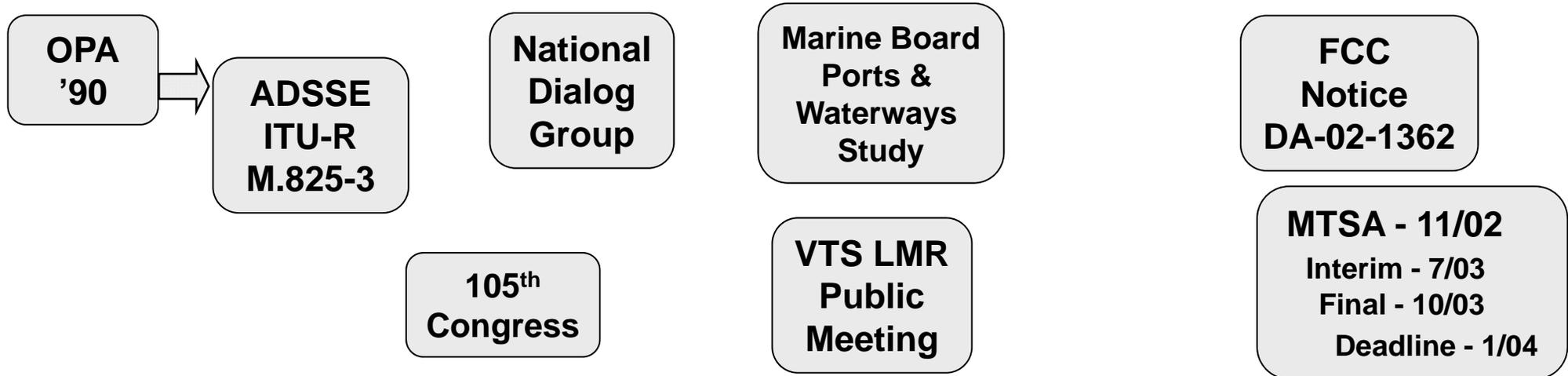
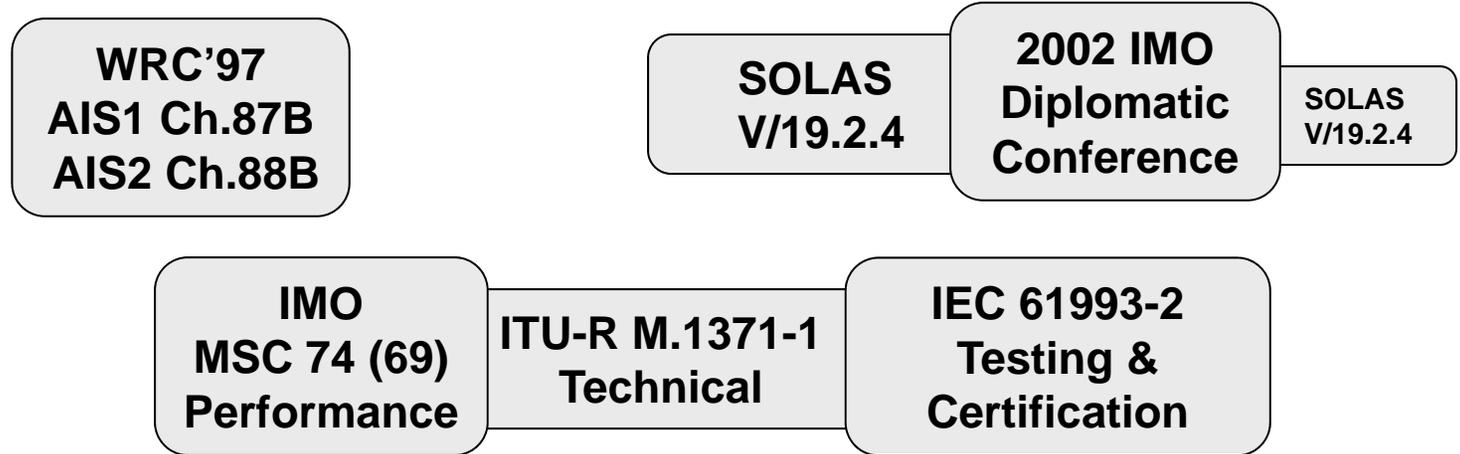
TRB recommends AIS

To achieve the committee's vision of the future, all major vessels must be required to carry certain advanced navigation information systems so they can participate in traffic management schemes and navigate safely in and out of all U.S. ports.

The USCG should work toward the implementation of international carriage requirements for electronic navigation and identification/location systems on board all major vessels using U.S. ports and should continue to take steps to provide necessary communications frequencies to ensure the international compatibility of AIS.

Applying Advanced Information Systems to Ports and Waterways Management (1999), Marine Board

AIS Timeline



Public Meeting to establish AIS carriage

September 1998, the USCG conducted a public meeting to solicit comments on the establishment of a new Vessel Traffic Service (VTS) in the Lower Mississippi River area and a potential Automatic Identification System (AIS) carriage requirement for certain vessels operating in the new VTS area.

The primary purpose of the meeting was to discuss which vessels should carry Automatic Identification Systems (AIS) and what performance, technical, testing, and certification standards the systems should meet.

- Ref: 63 FR 49939, Sep. 18, 1998



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



AIS Timeline

WRC'97
AIS1 Ch.87B
AIS2 Ch.88B

SOLAS
V/19.2.4

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Final - 10/03
Deadline - 1/04

AIS Regulatory History...recap

- ✓ Oil Pollution Act of 1990, precursor AIS (ADSSE) on Alaskan tankers
- ✓ CG Authorization Act '97, Congress seeks AIS-based VTS and AIS carriage
- ✓ Nat'l Dialog Group & Public Meeting in NOLA, AIS-Based VTS (1998)
- ✓ NPRM VTS Lower Mississippi River (2000), towards an AIS-Based VTS
- ✓ Safety of Life at Sea Convention (SOLAS) V/19.2.4 (2000), 12/02 (amended)
- ✓ Marine Transportation & Security Act of 2002
- ✓ USCG AIS Temporary Final Rule: 07/01/03
 - Implements SOLAS (Int'l) & MTSA (domestic) in VTS areas
- ✓ USCG AIS Final Rule: 10/22/03, effective 11/24/03, deadline: 12/31/04
 - Deferred requirements on F/V and small passenger vessels
 - Request for Comments: 10 questions on AIS Expansion prior to 1/9/04
 - 3 Public Meetings, 180+ commenter's
- ✓ CG&MT'04 mandates electronic charts on same population as MTSA AIS
- ✓ CG expanding carriage beyond VTS
 - NPRM published 12/16/08, comments NLT 4/15/09

Who has to have AIS?

- *Internationally Adopted & Required*
 - *IMO SOLAS Regulation V/19.2.4*
 - All ships of 300 gross tonnage or greater & passenger vessels irrespective of size on international voyage; 500 gross tonnage or greater domestically
- *Mandated by Congress*
 - *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 \geq 150 GT, all others \geq 300 GT
 - ❑ Per SOLAS Regulation V/19.2.4
 - ✓ Self-propelled commercial vessels \geq 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 \geq 26 feet and \geq 600 hp
 - ✓ Vessel certificated to carry \geq 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
≥ 65 ft	2,167
< 65 but ≥ 50 pax	1,062
> 30 kts & > 12 pax for hire	6
Dredges	35
Total (U.S.)	16,323
Foreign Flag ≥ 65ft	1,119
Total (All)	17,442



What is AIS?

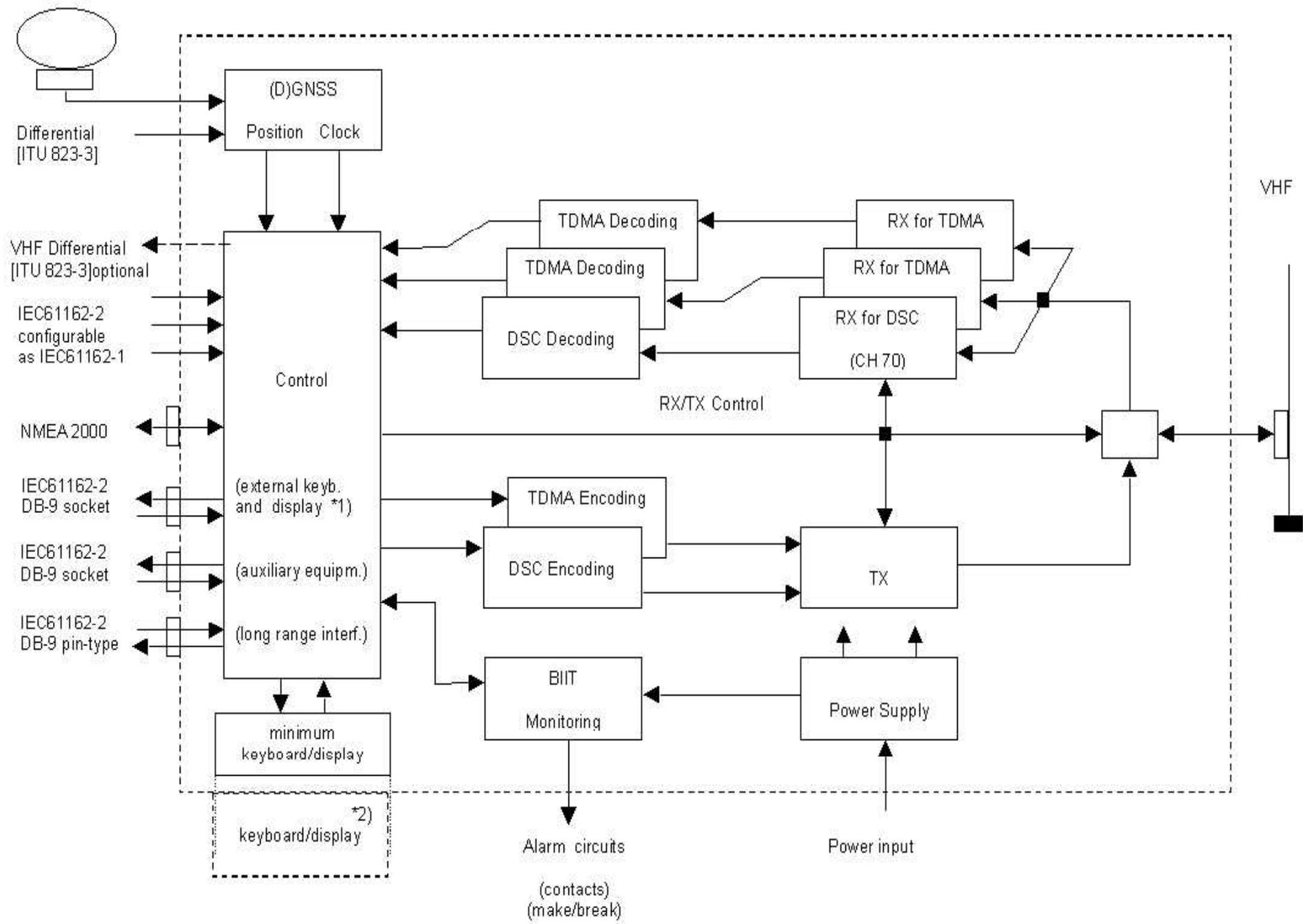
An Autonomous Continuous Non-Proprietary Ship-to-Ship Navigation Broadcast System

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
<ul style="list-style-type: none">› collision avoidance› vessel traffic service tool› coastal surveillance	<ul style="list-style-type: none">› self-reporting (autonomous)› polling (interrogation)› tele-command (assignment)	<ul style="list-style-type: none">› any 2 VHF-FM Marine Channels› Ch. 87B & 88B world-wide› 2250 reports/min./channel

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



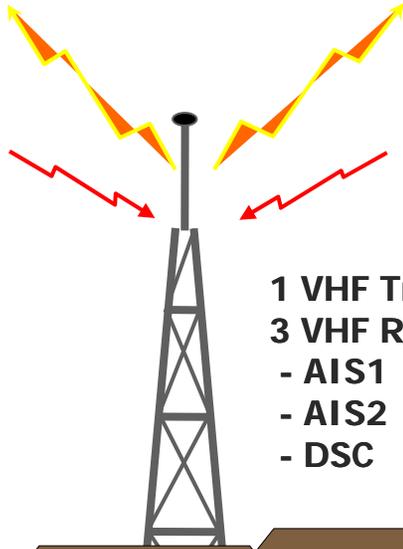


*1) The external keyboard/display may be e.g. a radar, ECDIS or dedicated devices.

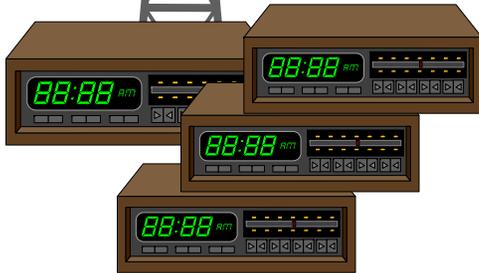
*2) The internal keyboard/display may optionally be external.

AIS how...

Time-Division Multiple Access (TDMA)



- 1 VHF Transceiver
- 3 VHF Receivers
- AIS1 Ch.87B
- AIS2 Ch.88B
- DSC Ch.70



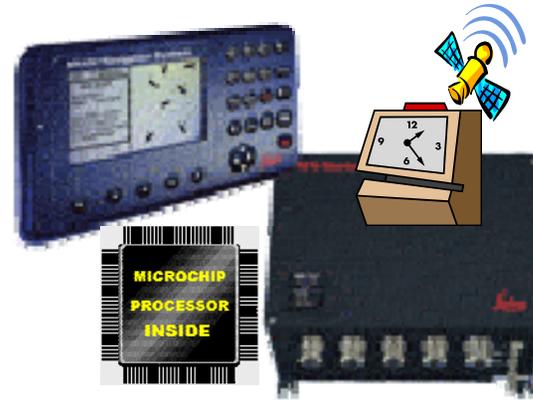
COMMUNICATE

Broadcasts and manages the flow of AIS data sentences



Gyro/Heading Rate of Turn

per SOLAS requirements
Speed Log (optional)



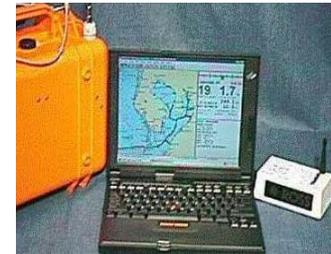
←!AIVDM,2,2,7,A,2220<5<PTq2r7P2222220p4q@T<tdE2r' P0,2*4E...

NMEA-0183/IEC61162

!ECBBM,2,2,0,0,8,>@fQp0PPPPPP>1>D93?;5@fb80,0*64→

ASSEMBLE

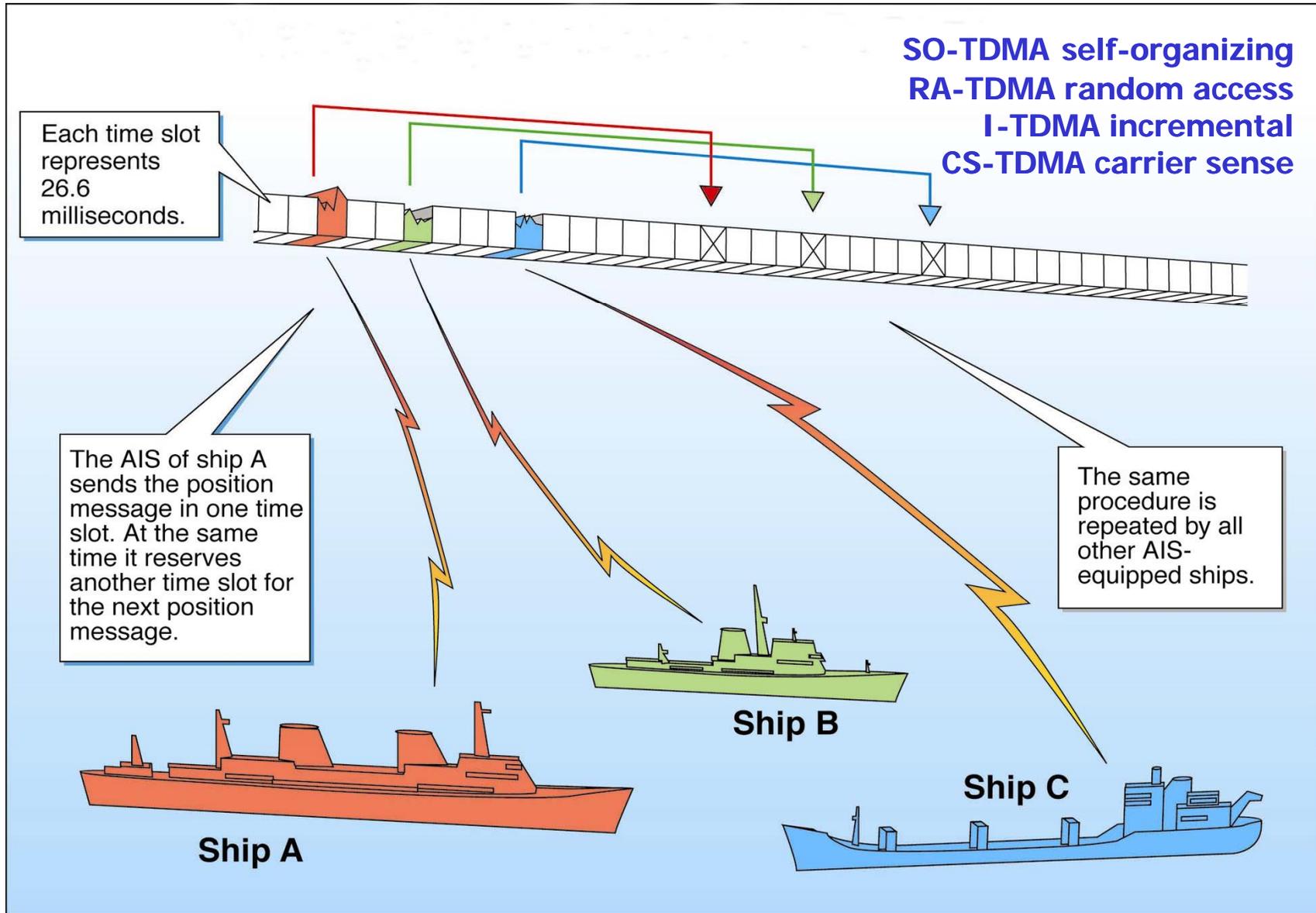
Gathers positioning, heading, vessel data and assembles it into an AIS compliant data sentences



READ

AIS data sentences may be read/sent on/to multiple devices

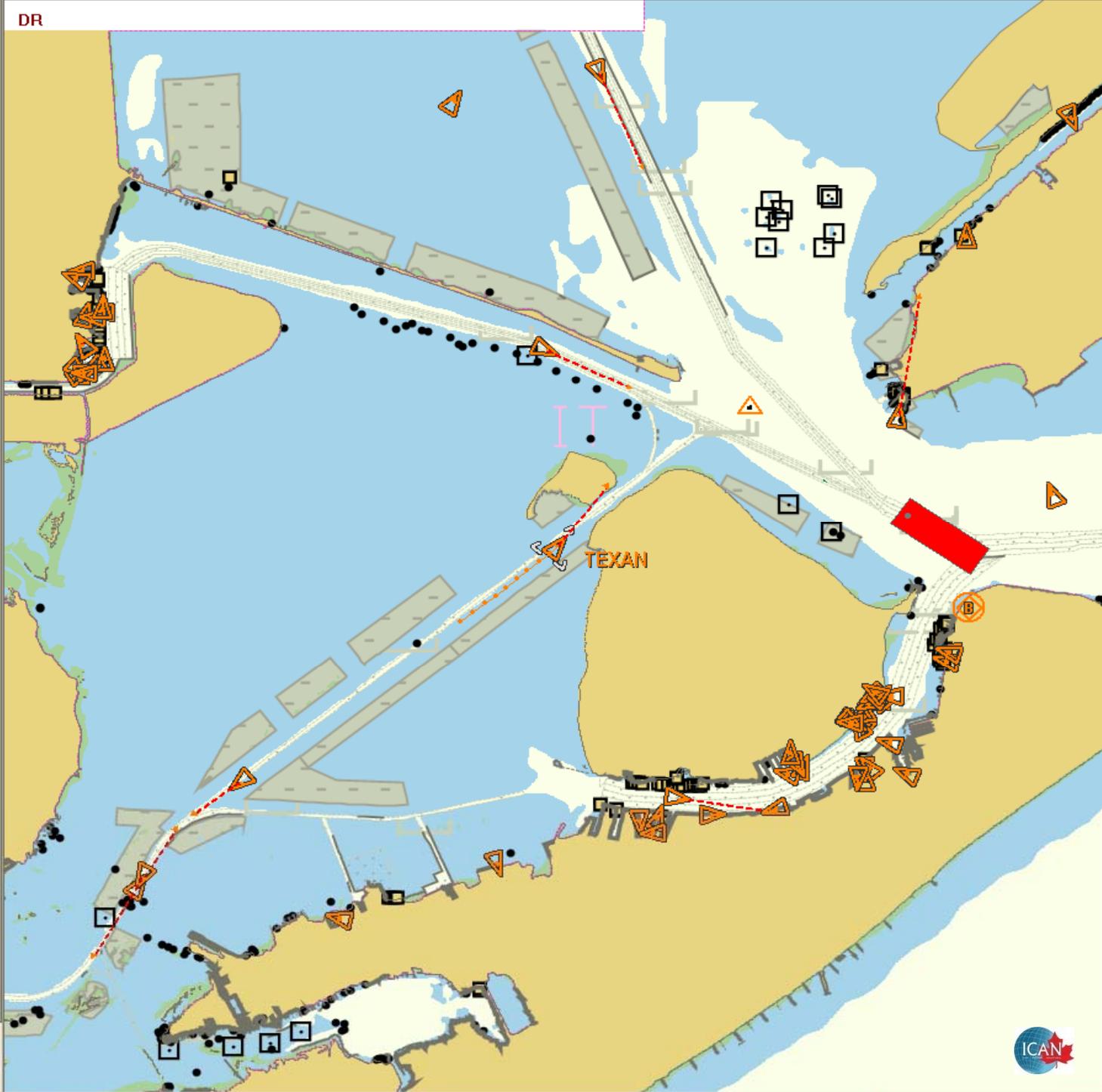
time-division multiple access protocol (TDMA)



AIS Rx	All Targets	S57	S57 ?	S57 Lists	New
Nav	Route	GPS	AIS Info	AIS ?	AIS Tx

AIS Targets	CPA	Type
OTTO CANDIES	01:16:21	Cl...
DAVIDSON	N/A	Cl...
TRACIE L	N/A	Cl...
WALTER D NU...	01:18:18	Cl...
GALTEX	N/A	Cl...
SEA HERO	N/A	Cl...
VIKING	N/A	Cl...
MOBILIAN	N/A	Cl...
PAT MCDANIEL	01:42:01	Cl...
SAN PATRICIO	01:15:36	Cl...
SUSANNAH_G...	01:19:29	Cl...
ROBYN S	03:16:13	Cl...
ATIAC	N/A	Cl...

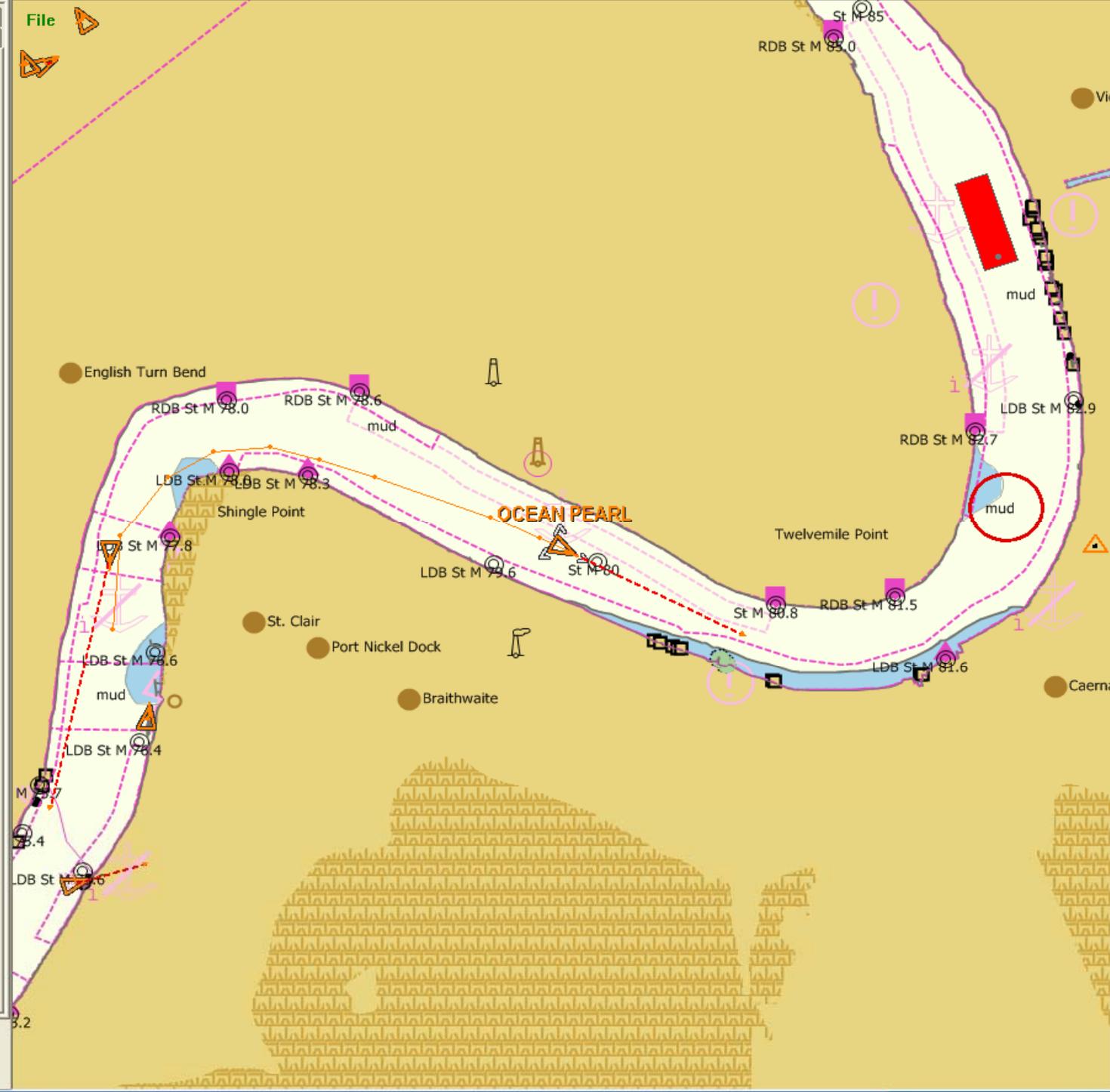
Remote Name TEXAN
MMSI Number 366904340
Call Sign WDB4969
Latitude 29° 20' 33.95" N
Longitude 094° 49' 36.58" W
Range 2.542 Nm
Bearing 264.8° T
COG 037.9° T
SOG 6.90 mi
Nav Status Under Way Engine
Destination N/A
Length 16.0 m
Beam 8.0 m
Type of Ship Tug
Hazardous Cargo N/A
Time Since Last Update 00h 01m 15s
Draught 0.0
ETA To Destination N/A



AIS Rx	All Targets	S57	S57 ?	S57 Lists	New
Nav	Route	GPS	AIS Info	AIS ?	AIS Tx

AIS Targets	CPA	Type
CAPT RONNIE ...	N/A	Cl...
JACKIE B	N/A	Cl...
MARTIN COMM...	N/A	Cl...
REGINA H.	N/A	Cl...
AARON C MCKI...	N/A	Cl...
CROSBY HUST...	N/A	Cl...
SIVI SHIRAH	N/A	Cl...
NED MERRICK	N/A	Cl...
MR T	N/A	Cl...
SEBRING	N/A	Cl...
DELTA STAR	N/A	Cl...
CREOLE QUEEN	N/A	Cl...
GREAT CLOVE	N/A	Cl...

Remote Name OCEAN PEARL
MMSI Number 271000767
Call Sign TCCZ4
Latitude 29° 52' 21.06" N
Longitude 089° 56' 24.36" W
Range 2.208 Nm
Bearing 234.2° T
COG 117.0° T
SOG 9.55 mi
Nav Status Under Way Engine
Destination NEW ORLEANS
Length 179.0 m
Beam 32.0 m
Type of Ship Cargo ship
Hazardous Cargo N/A
Time Since Last Update 00h 02m 13s
Draught 0.0
ETA 2/1/2006 8:00:00 AM



What's AIS Look Like...to machines?

!AIVDM,1,1,,A,13u?etPv2;0n:dDPwUM1U1Cb069D,0*24

!AIVDM,1,1,,A,13u?etPv2;0n:dDPwUM1U1Cb069D,0*24

!AIVDM,2,1,7,A,8030ot1?0P65inC<CO<I5nsv`Tst5P22220IT
hTr0d4I4e2q90222222,0*12

!AIVDM,2,2,7,A,2220<5<PTq2r7P22222220p4q@T<tdE2r`P0
,2*4E

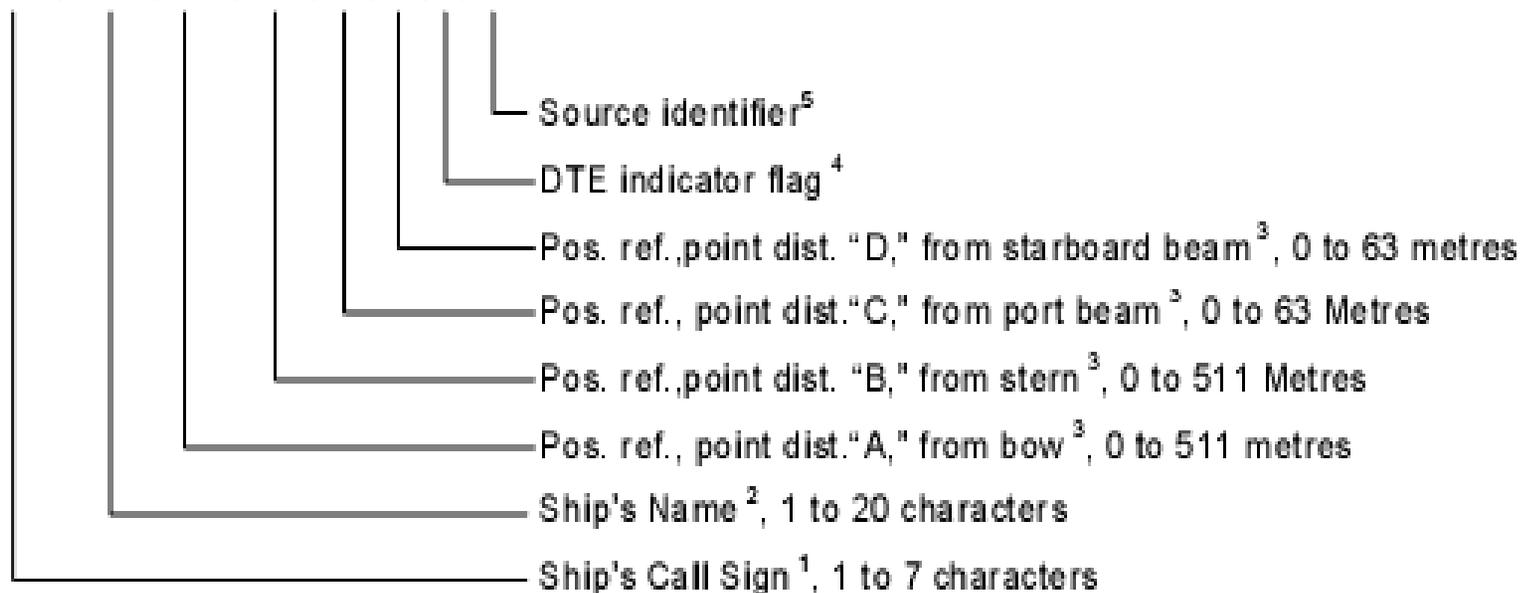
!AIVDM,2,1,9,A,8030ot1?0P65inC<CO<IGnsvJ4st5P22220`
4pF04pr0UK2qM022210E,0*47

!AIVDM,2,2,9,A,@U@F0Hu9@G30gP220HD@E84j1UDdts31o
00,2*78

SSD – AIS Ship static data

This sentence is used to enter static parameters into a shipboard AIS unit. The parameters in this sentence support a number of the ITU-R M.1371 messages.

`$--SSD,c—c,c—c,xxx,xxx,xx,xx,c,aa*hh<CR><LF>`



ID#	ITU-R M.1371 AIS Message Descriptions	A U	A S	I N	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



AIS Position Report

TABLE 15a

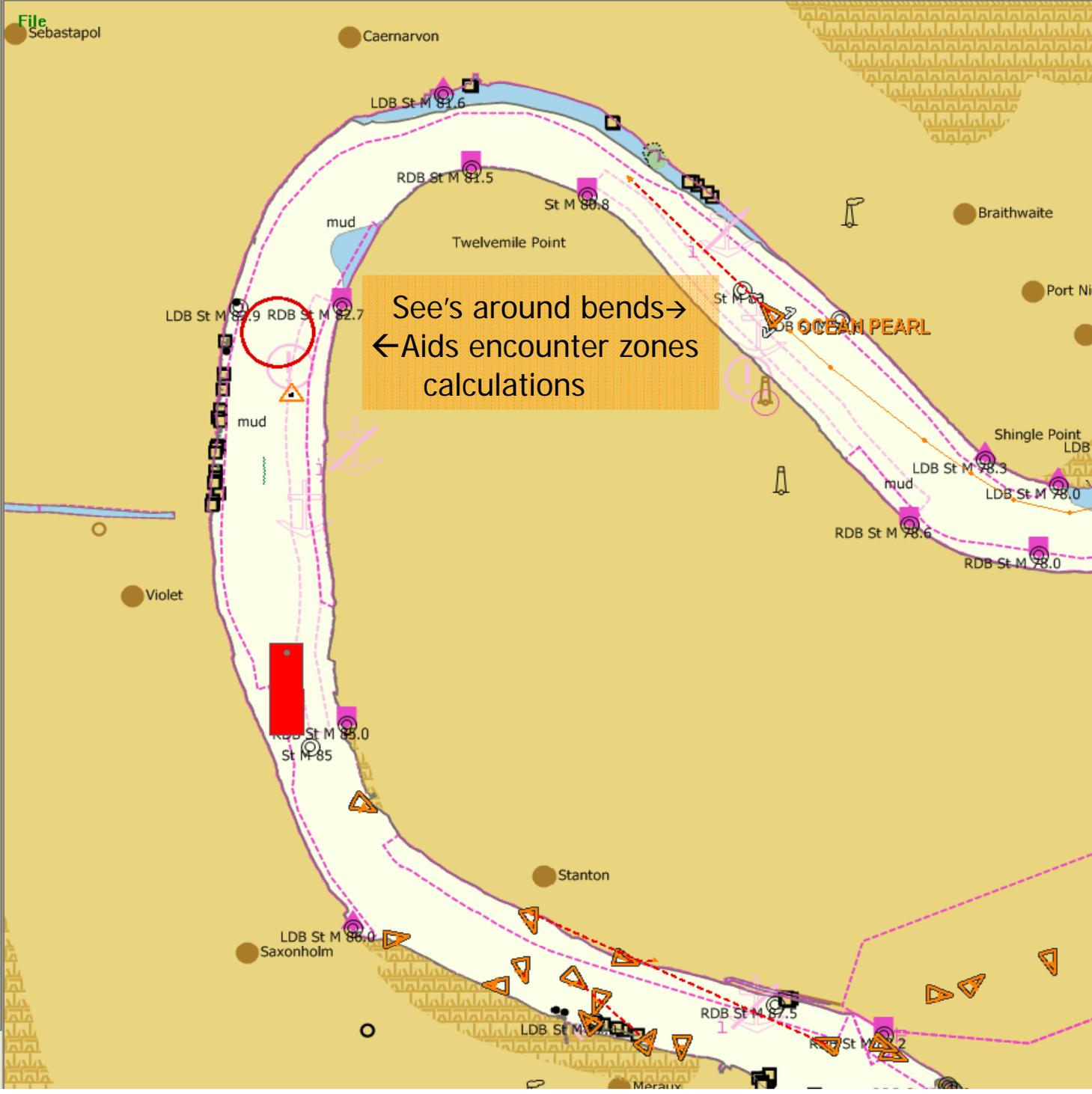
Parameter	Number of bits	Description
Message ID	6	Identifier for this message 1, 2 or 3
Repeat indicator	2	Used by the repeater to indicate how many times a message has been repeated. Refer to § 4.6.1; 0-3; 0 = default; 3 = do not repeat any more
User ID	30	MMSI number
Navigational status	4	0 = under way using engine, 1 = at anchor, 2 = not under command, 3 = restricted manoeuvrability, 4 = constrained by her draught, 5 = moored, 6 = aground, 7 = engaged in fishing, 8 = under way sailing, 9 = reserved for future amendment of navigational status for ships carrying DG, HS, or MP, or IMO hazard or pollutant category C (HSC), 10 = reserved for future amendment of navigational status for ships carrying DG, HS or MP, or IMO hazard or pollutant category A (WIG); 11-14 = reserved for future use, 15 = not defined = default
Rate of turn ROT _{AIS}	8	+127 (-128 (80 _b) indicates not available, which should be the default). Coded by ROT _{AIS} = 4.733 SQRT(ROT _{INDICATED}) degrees/min ROT _{INDICATED} is the rate of turn (720°/min), as indicated by an external sensor. +127 = turning right at 720°/min or higher -127 = turning left at 720°/min or higher
SOG	10	Speed over ground in 1/10 knot steps (0-102.2 knots) 1 023 = not available, 1 022 = 102.2 knots or higher
Position accuracy	1	1 = high (<10 m; differential mode of e.g. DGNSS receiver) 0 = low (>10 m; autonomous mode of e.g. global navigation satellite system (GNSS) receiver or of other electronic position fixing device); 0 = default
Longitude	28	Longitude in 1/10 000 min (±180°, East = positive, West = negative. 181° (6791AC0 _b) = not available = default)
Latitude	27	Latitude in 1/10 000 min (±90°, North = positive, South = negative. 91° (3412140 _b) = not available = default)
COG	12	Course over ground in 1/10° (0-3599). 3600 (E10 _b) = not available = default. 3 601-4 095 should not be used
True heading	9	Degrees (0-359) (511 indicates not available = default)
Time stamp	6	UTC second when the report was generated (0-59 or 60 if time stamp is not available, which should also be the default value or 62 if electronic position fixing system operates in estimated (dead reckoning) mode or 61 if positioning system is in manual input mode or 63 if the positioning system is inoperative)
Reserved for regional applications	4	Reserved for definition by a competent regional authority. Should be set to zero, if not used for any regional application. Regional applications should not use zero
Spare	1	Not used. Should be set to zero
RAIM-flag	1	RAIM (Receiver autonomous integrity monitoring) flag of electronic position fixing device; 0 = RAIM not in use = default; 1 = RAIM in use
Communication state	19	See below
Total number of bits	168	



AIS Rx	All Targets	S57	S57 ?	S57 Lists	New
Nav	Route	GPS	AIS Info	AIS ?	AIS Tx

AIS Targets	CPA	Type
CAPT RONNIE ...	N/A	Cl...
JACKIE B	N/A	Cl...
MARTIN COMM...	N/A	Cl...
REGINA H.	N/A	Cl...
AARON C MCKI...	N/A	Cl...
CROSBY HUST...	N/A	Cl...
SIVI SHIRAH	N/A	Cl...
NED MERRICK	N/A	Cl...
MR T	N/A	Cl...
SEBRING	N/A	Cl...
DELTA STAR	N/A	Cl...
CREOLE QUEEN	N/A	Cl...
GREAT CLOUD	N/A	Cl...

Remote Name OCEAN PEARL
MMSI Number 271000767
Call Sign TCCZ4
Latitude 29° 52' 21.06" N
Longitude 089° 56' 24.36" W
Range 2.501 Nm
Bearing 215.6° T
COG 117.0° T
SOG 9.55 mi
Nav Status Under Way Engine
Destination NEW ORLEANS
Length 179.0 m
Beam 32.0 m
Type of Ship Cargo ship
Hazardous Cargo N/A
Time Since Last Update 00h 04m 06s
Draught 0.0
ETA 2/1/2006 8:00:00 AM



See's around bends →
 ← Aids encounter zones calculations

ID#	ITU-R M.1371 AIS Message Descriptions	A U	A S	I N	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



Navigation toolbar with icons for zoom, pan, and other map functions. A dropdown menu shows the vessel ID: 367006030. A speed indicator shows 40.000.

Ship Particulars (Vessel Data Card)

Static | Position | Extra | CPA | Alarms

Schd# 367006030 367006030

Name Tug Petaluma IMO# 7666

Callsign WCX2520 Remove << >>

Type 52-Tug Length 82'0"

Cargo 0-AllShips Beam 26'3"

Destination Broad S Draft 13'1"

Dest ETA Apr 10 10:00 UTC Antenna Offsets...

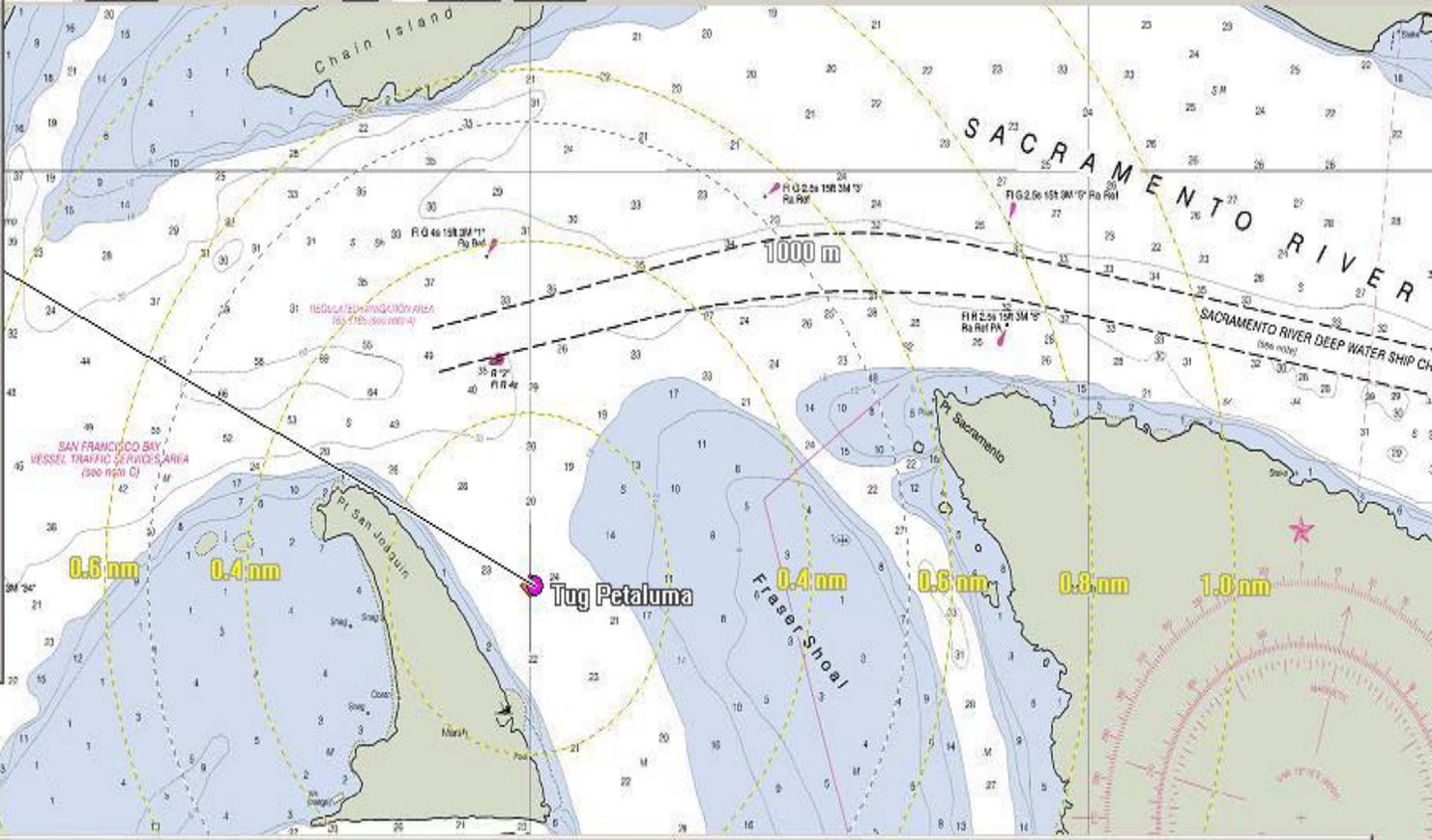
Region flag 0 POB 0 from bow 0'0"

Nav 1-AtAnchor from port 0'0"

Pilot Disp# 0 Vessel Bubble Labels

VHF 0 Save to File Set All

OK Cancel Apply Help



Safety Text Messages

Message	Source	Dest	Time (UTC)	MID	Seq	Channel A	Channel B	Idx
✉ mayday.de,tug.petaluma,wcx2520,367006030,pos:n 38^ 3.514' w121^50.98...	367006030 - Tug Petalu...	All	04/10 - 12:09	14		Received [1]		22
✉ mayday.de,tug.petaluma,wcx2520,367006030,pos:n 38^ 3.514' w121^50.98...	367006030 - Tug Petalu...	All	04/10 - 12:13	14			Received [1]	23
✉ mayday.de,tug.petaluma,wcx2520,367006030,pos:n 38^ 3.514' w121^50.98...	367006030 - Tug Petalu...	All	04/10 - 12:16	14		Received [1]		24
✉ mayday.de,tug.petaluma,wcx2520,367006030,pos:n 38^ 3.514' w121^50.98...	367006030 - Tug Petalu...	All	04/10 - 12:19	14			Received [1]	25
✉ mayday.de,tug.petaluma,wcx2520,367006030,pos:n 38^ 3.514' w121^50.98...	367006030 - Tug Petalu...	All	04/10 - 12:22	14		Received [1]		26
✉ ^gd_?e9	923659445	304262671	04/10 - 12:24	12			Received [1]	27
✉ mayday.de,tug.petaluma,wcx2520,367006030,pos:n 38^ 3.514' w121^50.98...	367006030 - Tug Petalu...	All	04/10 - 12:25	14		Received [1]		28

Send Broadcast to All Repeat (3 min) To: 367006030 [367006030] : Tug Petaluma Show All Messages

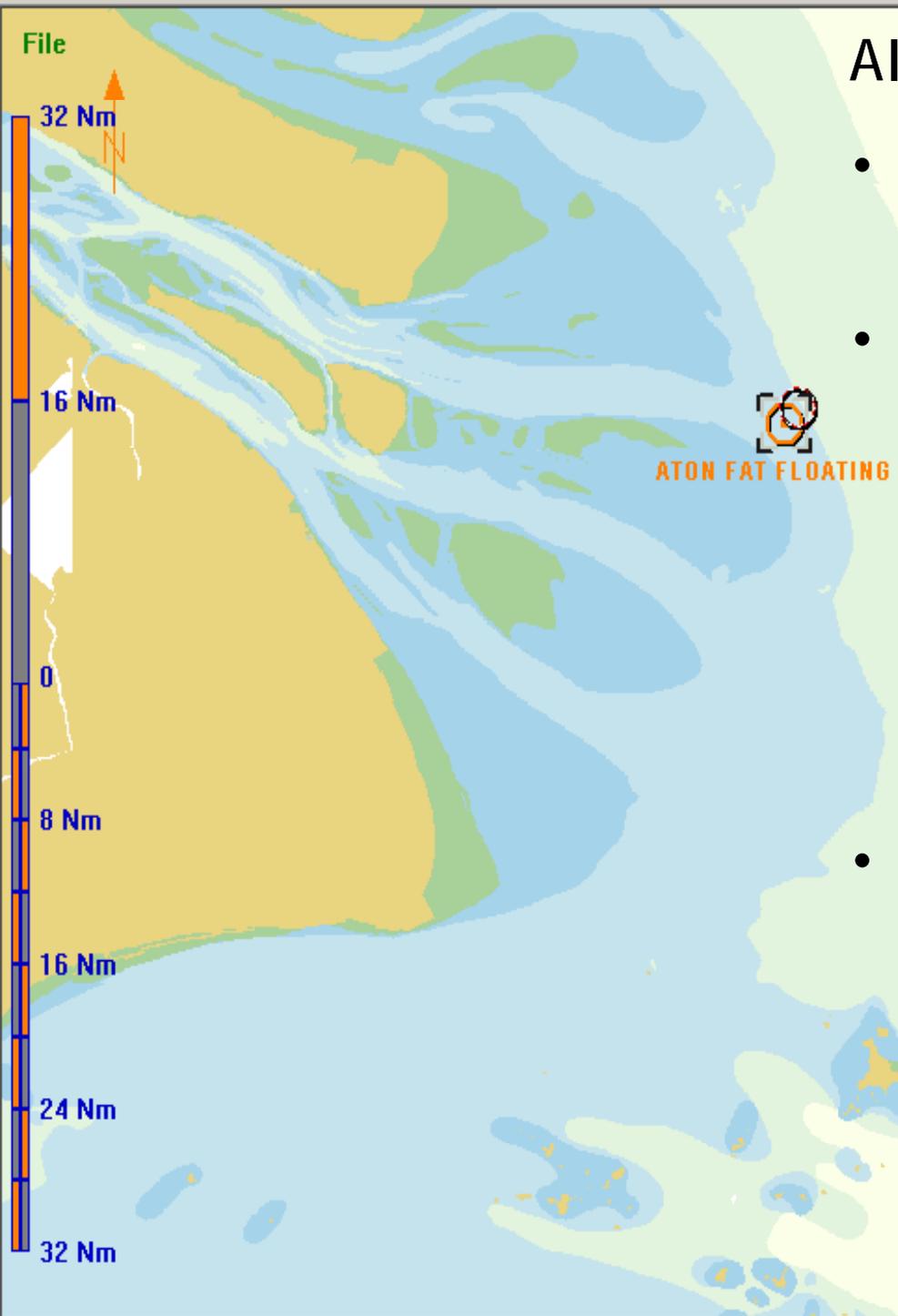
ID#	ITU-R M.1371 AIS Message Descriptions	A U	A S	I N	Slots
1,2,3	Position Reports – autonomous (au), assigned (as), or interrogated (in)	x	x	x	1
4	Base Station Report – UTC/date, position, slot nr.		x		1
5	Class A Report - static and voyage related data	x	x	x	2
6,7,8	Binary Message – addressed, acknowledge 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



AIS Info	AIS ?	AIS Tx	AIS Rx
Nav	Route	GPS	
S57	S57 ?	S57 Lists	Aton
AID	Type		
MUDAH_SELATAN	Light, without sectors		
TG_TUAN	Light, without sectors		
TEST_AIS	Special Mark		
ATON FAT FLOATING	Port hand Mark		

ATON	ATON FAT FLOATING
Type	Port hand Mark
Sub Type	Floating
Position Status	Off Position

ID	201
Name	ATON FAT FLOATING
Positional Accuracy	High
Latitude	31° 19' 49.37" N
Longitude	122° 20' 10.21" E
EPFS	GPS
Repeat Indicator	0
Mode	Autonomous
RAIM	Not In Use
Status	Off Position
Last Update Time	09:44:29



AIS ATON's

- Monitors 'health' & position
- Improves availability by reducing time to respond to outages because of near real time monitoring.
- Improves "visibility" to AIS equipped vessels.

ID#	ITU-R M.1371 AIS Message Descriptions	A U	A S	I N	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



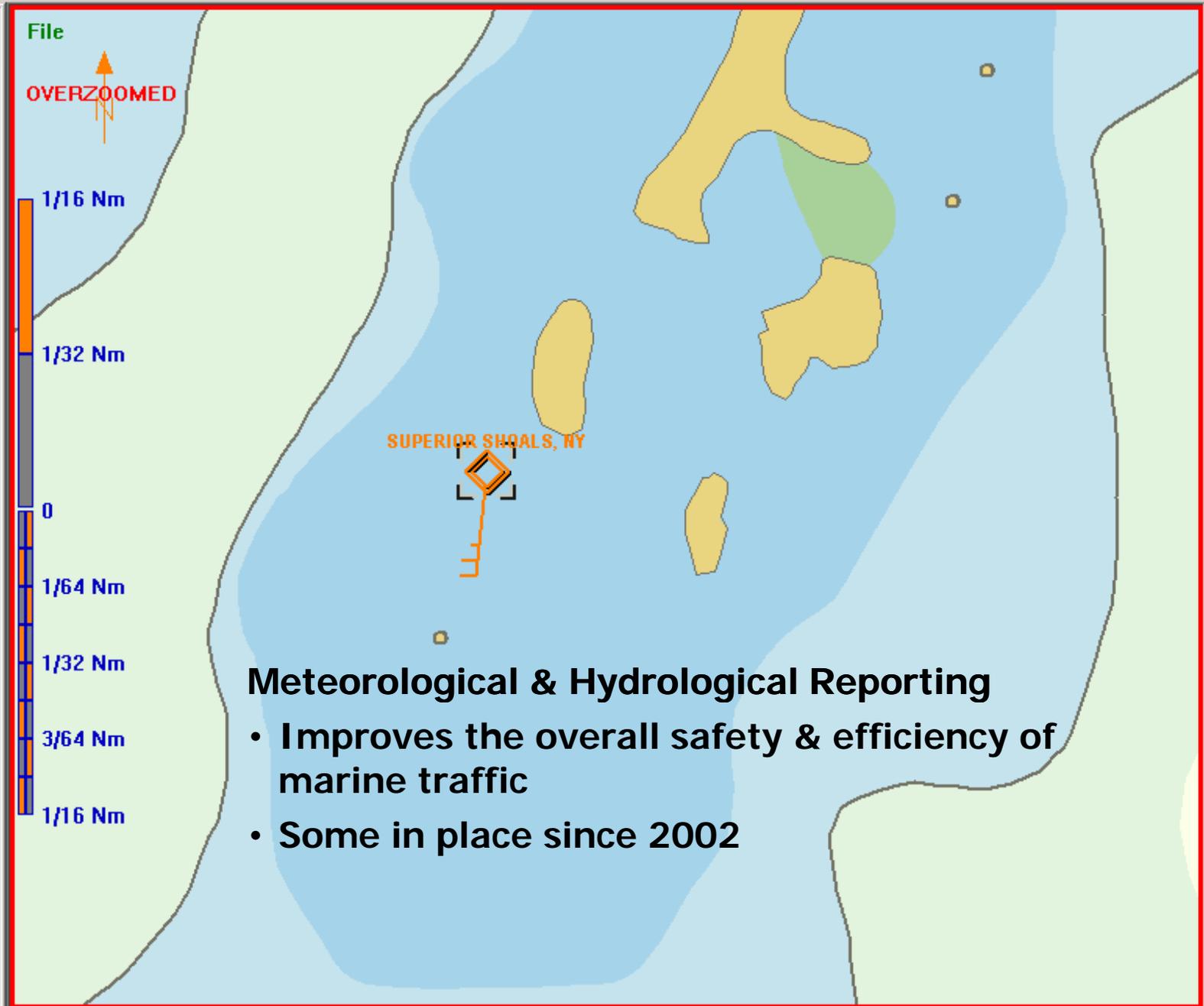
AIS can transfer data via binary messages...

- 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

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



Meteorological & Hydrological Reporting

- Improves the overall safety & efficiency of marine traffic
- Some in place since 2002

Navigation controls including zoom in/out buttons, a scale indicator set to 1:2,000, a compass, and a 'Silence' button.

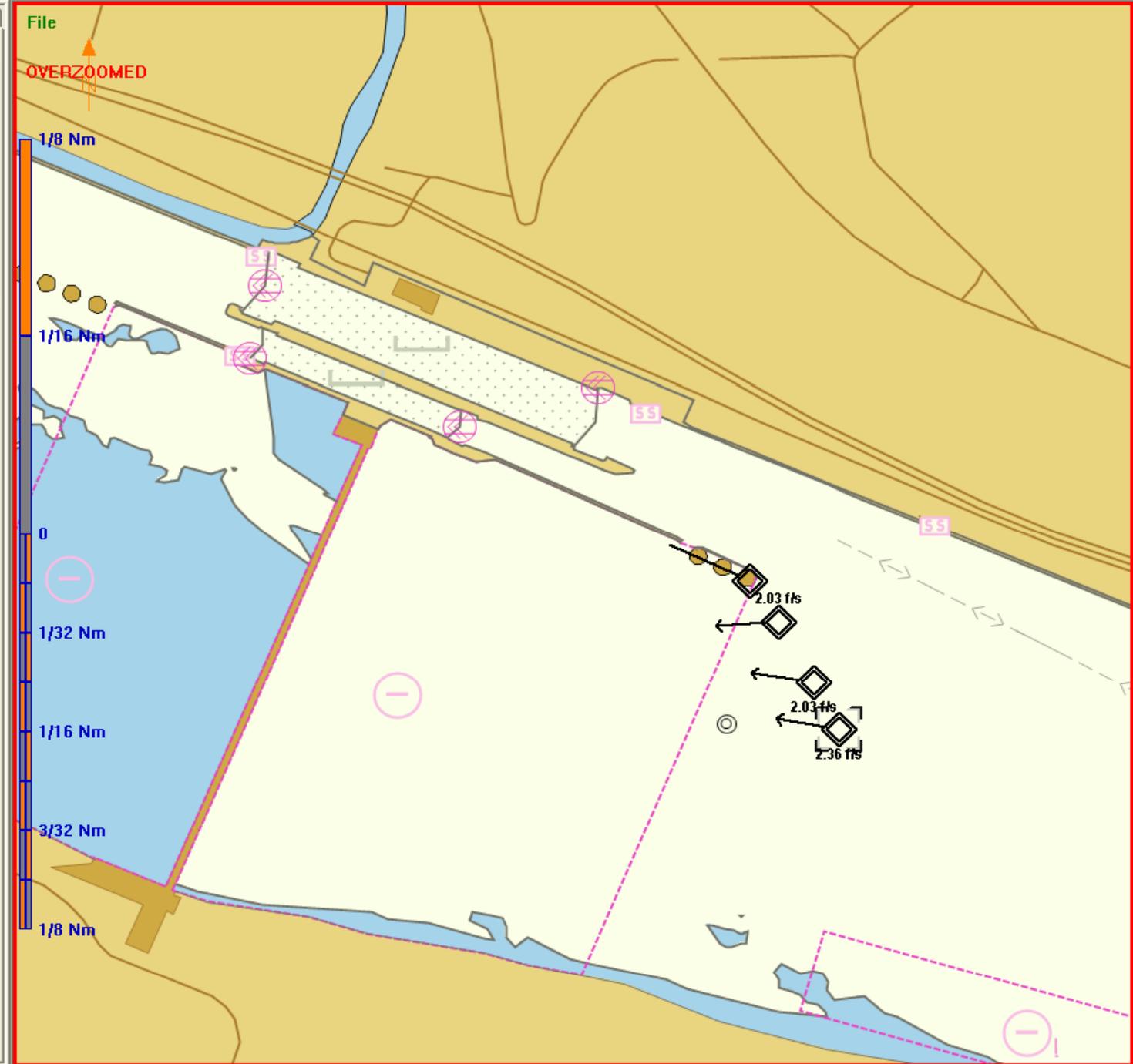


S57	S57 ?	S57 Lists	Survey	NavAids	Buoy Tending	Radar
Nav	Route	GPS	AIS Info	AIS ?	AIS Tx	AIS Rx
RTCM						

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°

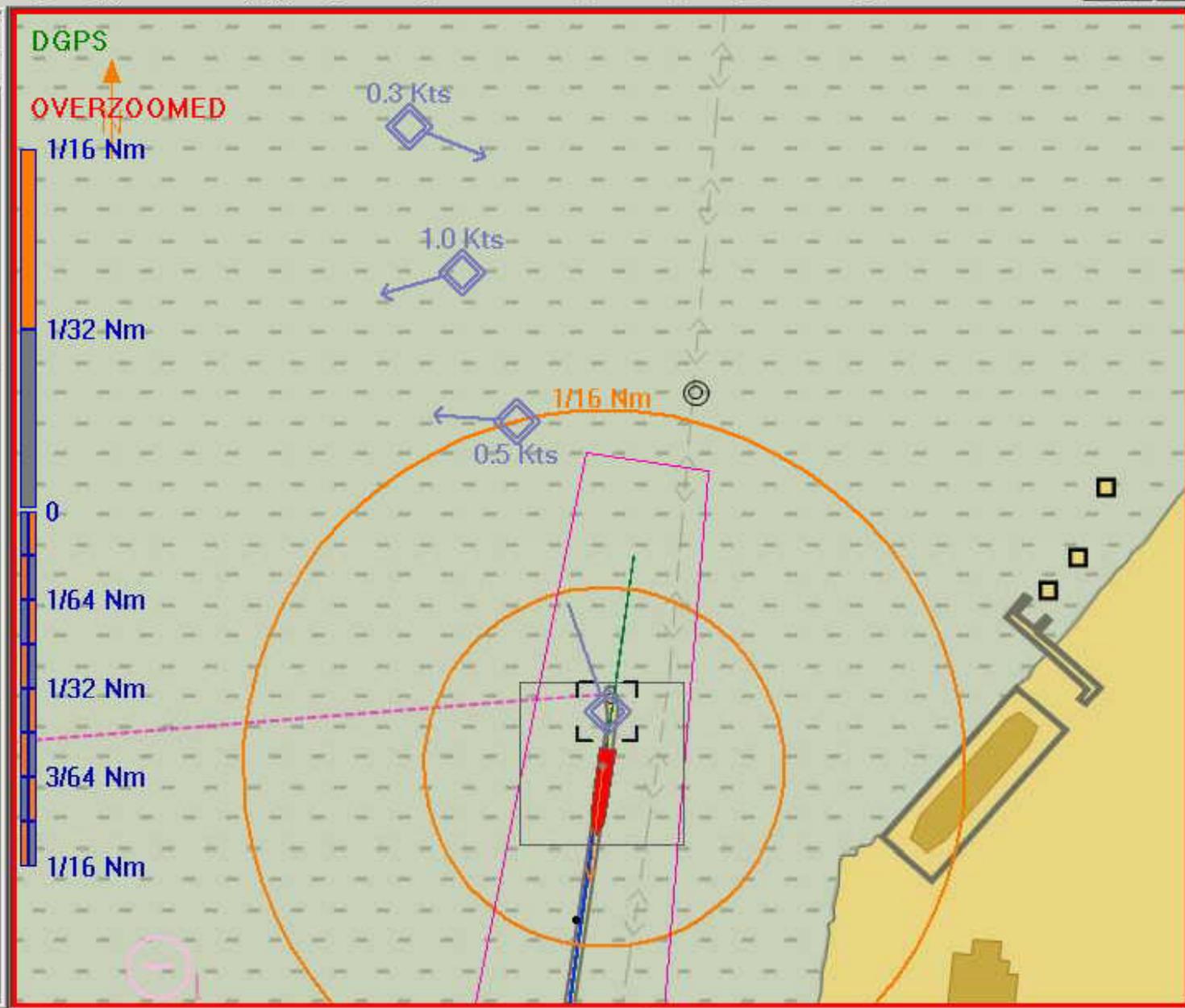
USACE RTCV
Real-time
Current - Velocity
System



AIS Tx		AIS Rx		All Targets	
Nav	Route	GPS	AIS Info	AIS ?	
S57	S57 ?	S57 Lists	methydro		
Target	6025				
Latitude	33° 12' 44.82" N				
Longitude	088° 17' 14.34" W				
Time of Tx	14:25				
Wind Direction	340°				
Average Wind Speed	1 kts				
Surface Current Direction	N/A				
Surface Current Speed	N/A				

Aid	Type	Status

Current velocity via AIS



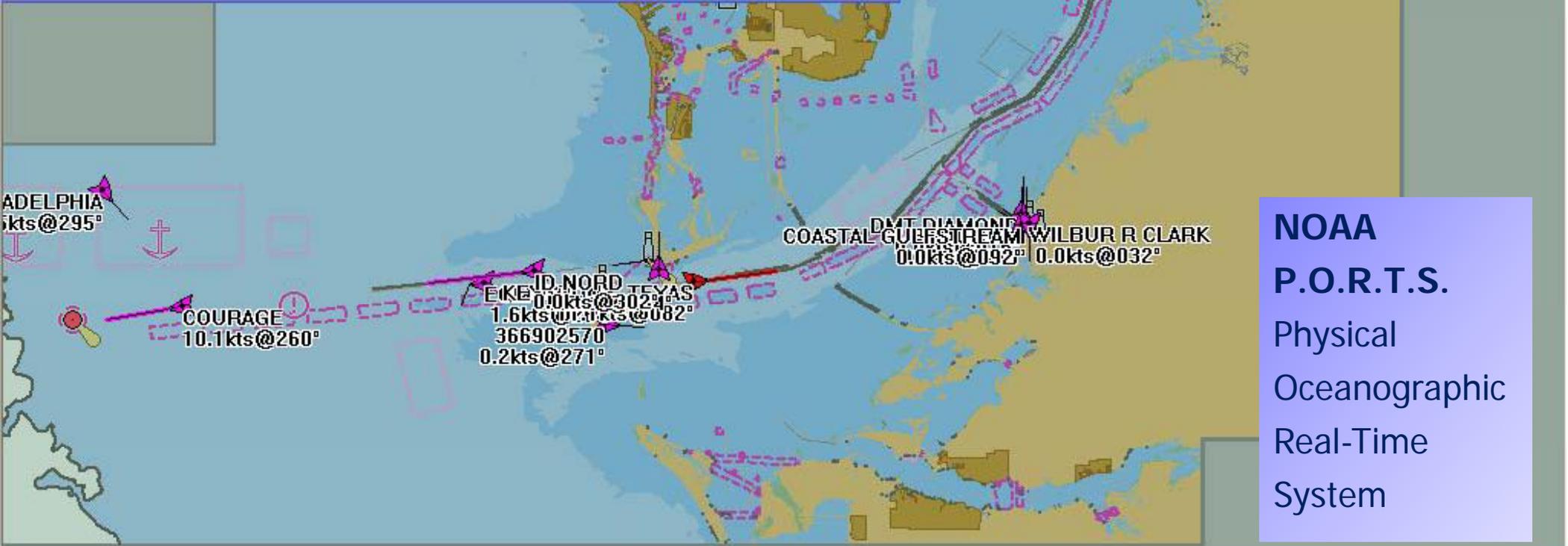


42.4nmi X 29.0nmi | NorthUp | manual-follow | warn:OFF | user: none
 POS: AIS

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



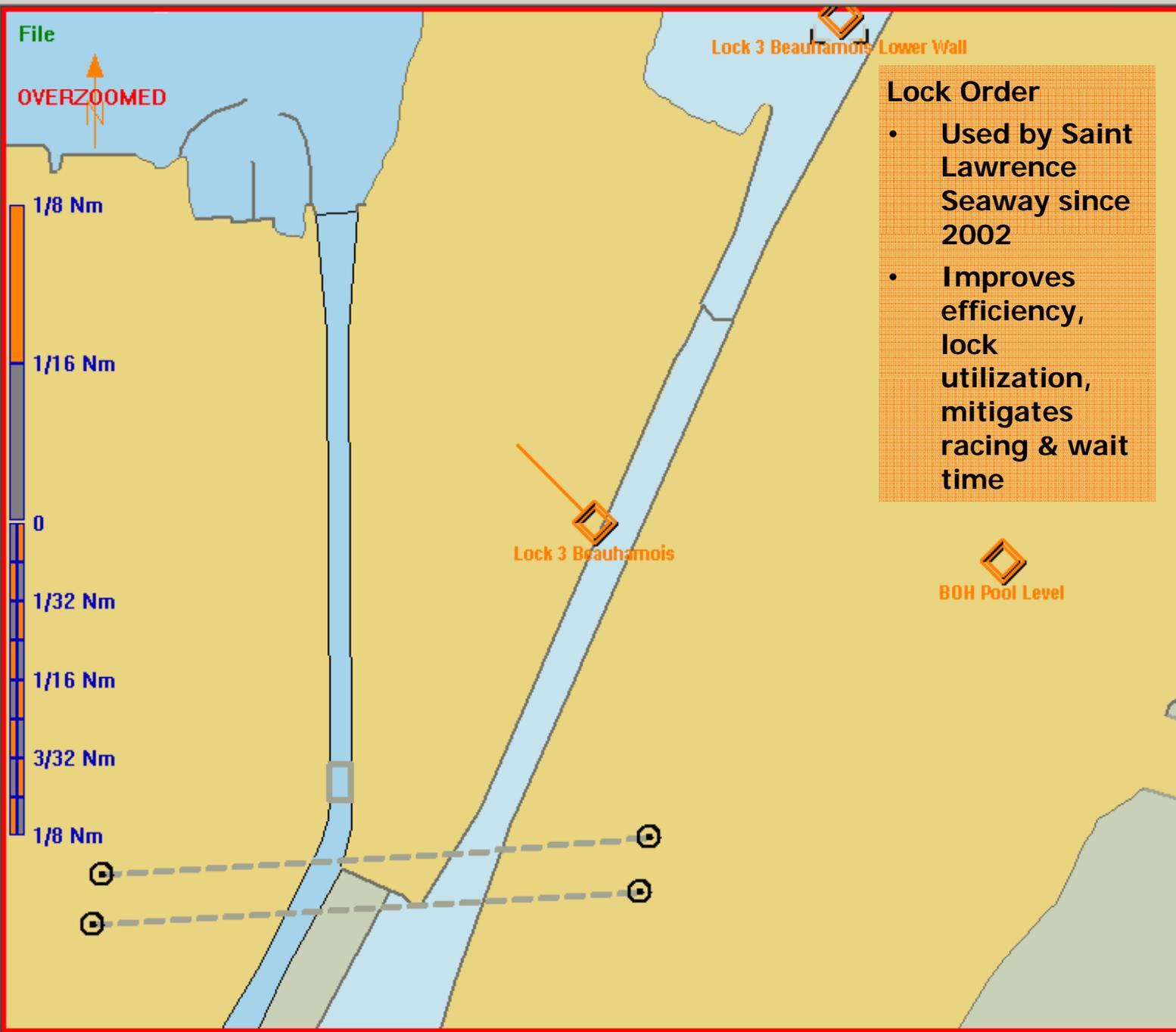
NOAA
P.O.R.T.S.
 Physical
 Oceanographic
 Real-Time
 System

AIS Tx	AIS Rx	S57	S57 ?
Nav	Route	GPS	AIS Info
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
IR0	Lock Order	16 July 14:21
LD2	Lock Order	16 July 14:21
L4W	Lock Order	16 July 14:21

ID	Direction	ETA
SEA GUARDIAN II	Up bound	16:57
DARYAMA	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



Lock Order

- Used by Saint Lawrence Seaway since 2002
- Improves efficiency, lock utilization, mitigates racing & wait time

BOH Pool Level

What AIS broadcasts

- MARITIME MOBILE SERVICE IDENTIFIER
- UNIVERSAL TIME STAMP (GPS)

Dynamic Data (Messages 1,2 or3)

-every 2-10 seconds per speed and course change

- POSITION & ACCURACY (+/-10m)
- NAVIGATION STATUS
- COURSE OVER GROUND
- SPEED OVER GROUND
- ❖ HEADING
- ❖ RATE OF TURN

Static & Voyage Data (Message 5)

-every 6 minutes or upon change

- VESSEL NAME & CALL SIGN
- VESSEL TYPE & DIMENSIONS
- ❖ VESSEL IMO NUMBER
- ❖ STATIC DRAFT
- ❖ HAZARDOUS CARGO FLAG
- ❖ DESTINATION & ETA

Aids to Navigation

- POSITION, STATUS, DISCREPANCIES

Safety Related & Binary Applications

- SHORT TEXT MESSAGING < 156 characters
- DATA MESSAGING & BINARY APPLICATIONS

Weather & Hydrological Information-

- NOAA Physical Oceanographic Real Time System
- NWS-Real-time weather buoy (C-MAN station)
- USACE Real-time Current Meter System (RTCM)

Vessel Traffic Service (VTS)-

- Distress Alerts
- Urgent Notices & Warnings
- Traffic Advisories
- Virtual--targets
- Additional Hydro & Meteorological Information

Other possible uses-

- Search and Rescue
- Port Partners
- Lock/Canal operations
- ... endless opportunities!



AIS is accurate, but, not always true!

!AIVDM,1,1,,A,13u?etPv2;0n:dDPwUM1U1Cb069D,0*24

- Digital sentencing (with checksum) ensures accuracy.
- Yet, does not guarantee that what you receive is!
- What's You See Is What You Get (WYSWIG)
- So trust, but, verify!

LOGGING

759 ft

Rte:1-Norfolk In
Dest:Norfolk Southern
Tag: 60

DGPS

IN TO 1TS

1TS-NN/NFK1

TIME 13:33:46

SUN 12 DEC

ETA 15:27

SATS	BCN	289.0
Used: 6	SS	80
Recd: 8	SNR	19
	AGE	4

Ant. Off.: Port 51.8 ft

Vector: 3.00 min

HDG 286°

COG 288°

SOG 12.1_{KT}

ROT Deg/Mir +2679.5°

BRG 284°

TTG 00:02

DIST 0.452_{NM}

X R 203_{FT}

Cursor N 36 56' 47.166" RNG 0.271NM TTG 00:01
PositionW 76 0' 29.099" BRG 126°

1/4nm error!

Ship's Position
•Via PPU
•Via AIS

LOGGING
759 ft

Rte:1-Norfolk In
Dest:Norfolk Southern
Tag: 60

DGPS
THIMBLE

IN TO THIMBLE-1TS

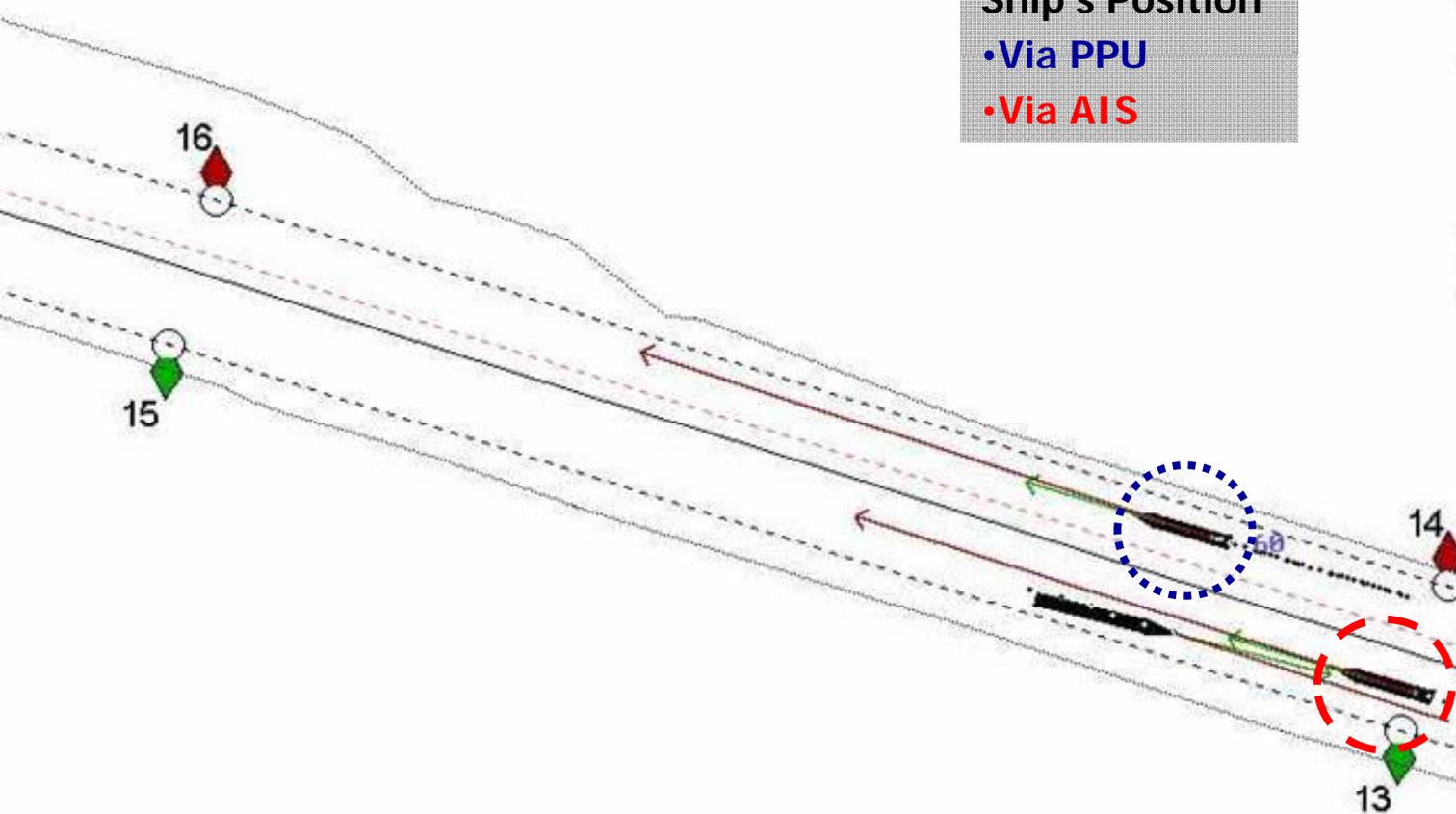
TIME 14:16:54
SUN 12 DEC

ETA 15:22

SATS	BCN	289.0
Used: 5	SS	80
Recd: 7	SNR	20
	AGE	6

Ant. Off.: Port 51.8 ft
Vector: 3.00 min

Ship's Position
•Via PPU
•Via AIS



HDG 287°

COG 289°

SOG 12.7 KT

ROT Deg/Min +2767.7°

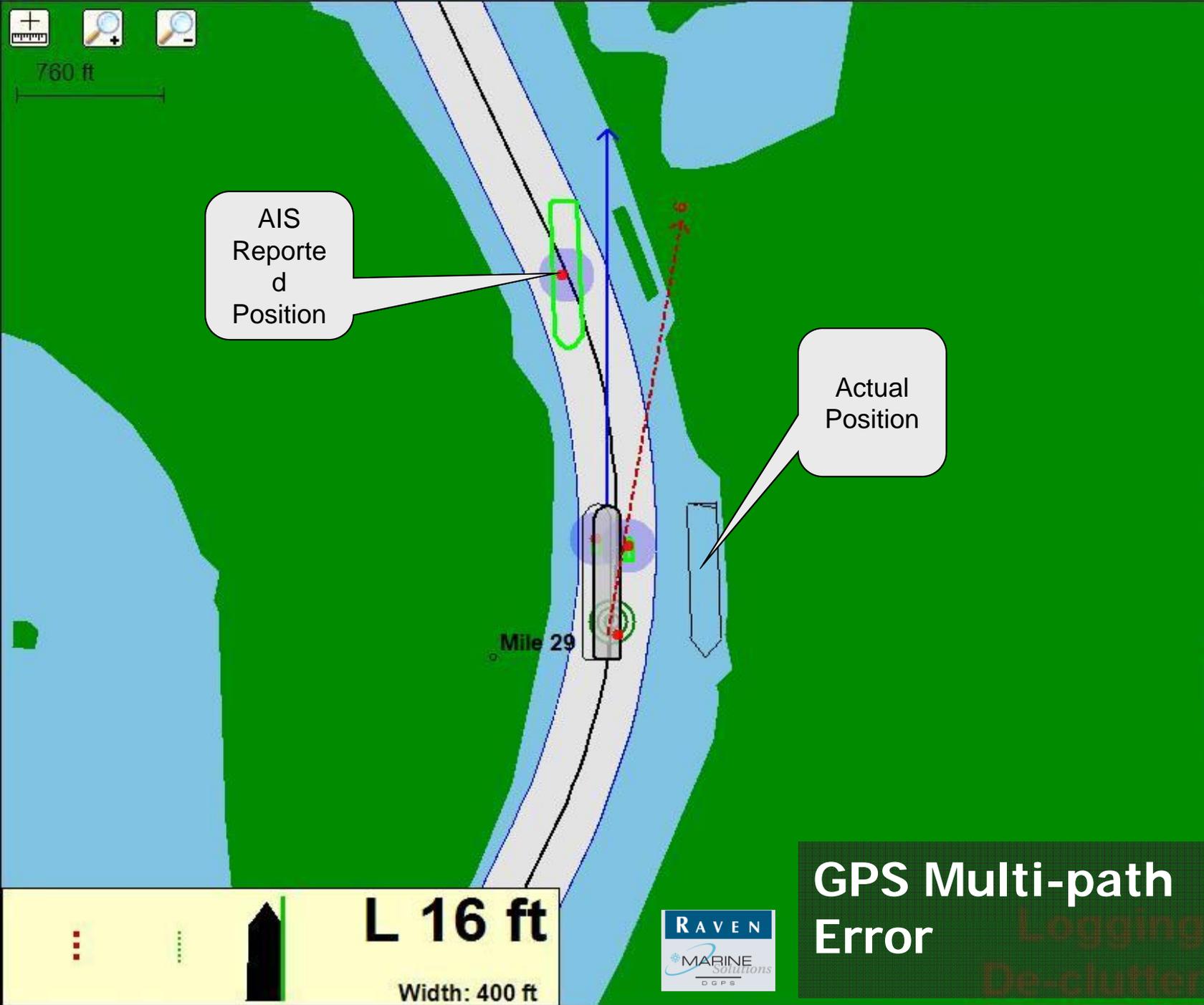
BRG 287°

TTG 00:14

DIST 2.943 NM

X R 340 FT





DGPS		
HDG:	208.0°	
COG:	217.8°	
SOG:	3.7 kt	
NEXT:	CalRiv271	
BRG:	229.1°	
TTG:	:11	
DIST:	68 ft	
DEST:	Buoy #8	
ETA:	05:14₁₀	
DIST:	41.8 nm	
Closest AIS	DIST/BRG	SOG/COG
CARL	0.1 / 221°	3.8 / 209°
EDITH	0.1 / 201°	3.5 / 209°
NAVION SCOTI	0.3 / 202°	0.0 / 000°
JO ANN EDWA	0.4 / 043°	0.1 / 075°
CREOLE PASS	0.7 / 053°	0.0 / 000°

17:52:06
3/27/2006

Log File Ref: 20113

Menu

Layout: LCH 09



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U.S. Department of Homeland Security

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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.](#)

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:

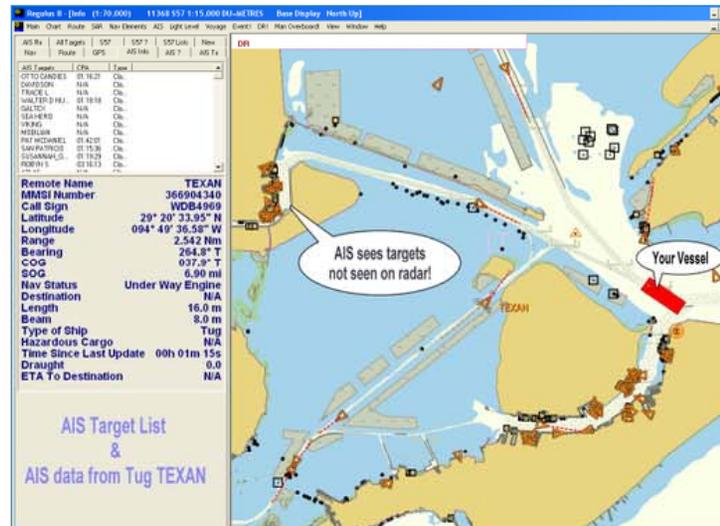
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- Differential GPS
- Nationwide DGPS
- Long Range Identification and Tracking
- Civil GPS Service Interface Committee
- Automatic Identification System
- Nationwide AIS (NAIS)
- Electronic Navigation & Charting
- Maritime Telecommunications
- LORAN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



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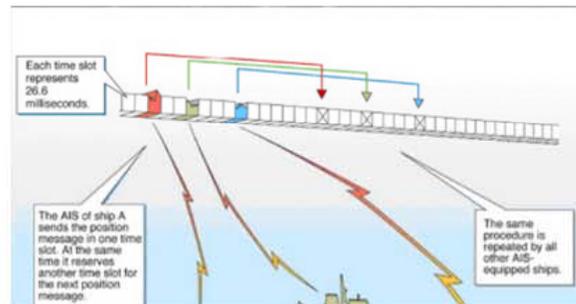
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HOW AIS WORKS

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.





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- Receive Free GPS Status Messages
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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



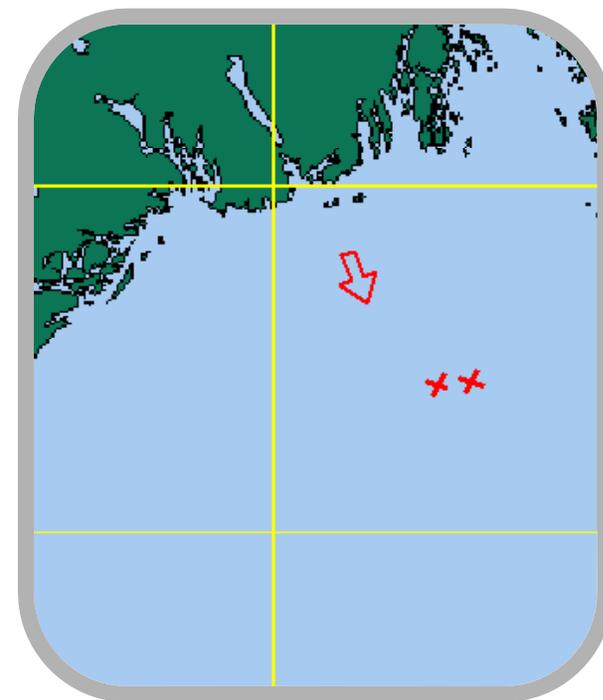
AIS Class A & B Comparison	Class A	Class B/CS
Transmit Power	2w	12.5w / 2w (low-power)
Reporting Rate	2 - 10 sec - speed and/or course dependent	30 sec. fixed
Communication Protocol	SO-TDMA Self-Organizing amongst Class A's	CS-TDMA Carrier-Sense(s), polite to Class A's
Frequency Range & Bandwidth	156.025 -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 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





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Primary Mission Areas:

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- Nationwide AIS (NAIS)
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- 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	Communication 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



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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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- 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 an LRIT Problem
- Report an NAIS Problem

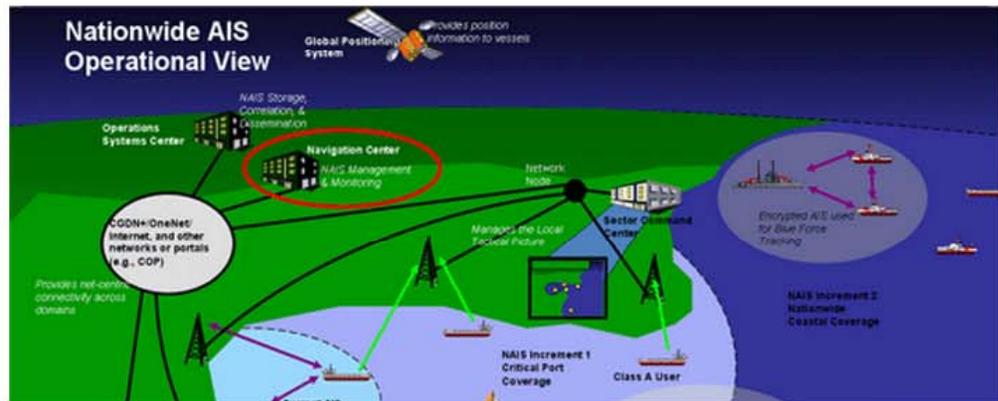
NATIONWIDE AUTOMATIC IDENTIFICATION SYSTEM

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.





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AUTOMATIC IDENTIFICATION SYSTEM IMO CARRIAGE REQUIREMENTS

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 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 Safety 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 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.

www.navcen.uscg.gov/?pageName=AISFAQ#15

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\(04MAR09\).pdf](#)audio.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 radins 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 22308, 73101(703) 313 5000



View Rule

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DHS/USCG

RIN: 1625-AA99

Publication ID: Spring 2011

Title: Vessel Requirements for Notices of Arrival and Departure, and Automatic Identification System

Abstract: This rulemaking proposes to expand the applicability for Notice of Arrival and Departure (NOAD) and Automatic Identification System (AIS) requirements. These expanded requirements would better enable the Coast Guard to correlate vessel AIS data with NOAD data, enhance our ability to identify and track vessels, detect anomalies, improve navigation safety, and heighten our overall maritime domain awareness. The NOAD portion of this rulemaking could expand the applicability of the NOAD regulations by changing the minimum size of vessels covered below the current 300 gross tons, require a notice of departure when a vessel is departing for a foreign port or place, and mandate electronic submission of NOAD notices to the National Vessel Movement Center. The AIS portion of this rulemaking proposes to expand current AIS carriage requirements for the population identified in the Marine Transportation Security Act (MTSA) of 2002.

Agency: Department of Homeland Security(DHS)

Priority: Other Significant

RIN Status: Previously published in the Unified Agenda

Agenda Stage of Rulemaking: Final Rule Stage

Major: No

Unfunded Mandates: No

CFR Citation: [33 CFR 160](#); [33 CFR 161](#); [33 CFR 164](#); [33 CFR 165](#)

Legal Authority: [33 USC 1223](#); [33 USC 1225](#); [33 USC 1231](#); [46 USC 3716](#); [46 USC 8502 and ch 701](#); sec 102 of PL 107-295; EO 1223; ...

Legal Deadline: None

Timetable:

Action	Date	FR Cite
NPRM	12/16/2008	73 FR 76295
Notice of Public Meeting	01/21/2009	74 FR 3534
Notice of Second Public Meeting	03/02/2009	74 FR 9071
NPRM Comment Period End	04/15/2009	
Notice of Second Public Meeting Comment Period End	04/15/2009	
Final Rule	12/00/2011	

Additional Information: We have indicated in past notices and rulemaking documents, and it remains the case, that we have worked to coordinate implementation of AIS MTSA requirements with the development of our ability to take advantage of AIS data (68 FR 39355-56 and 39370, July 1, 2003). The docket number for this rulemaking is USCG-2005-21869. The docket can be found at www.regulations.gov.

Regulatory Flexibility Analysis Required: Undetermined

Government Levels Affected: None

Small Entities Affected: Businesses

Federalism: No

Included in the Regulatory Plan: No

RIN Information URL: www.regulations.gov

Public Comment URL: www.regulations.gov

RIN Data Printed in the FR: No

USCG AIS Report Form

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 To report a system outage, discrepancy or problem, go here: [ATON, GPS, DGPS, NAIS, LRIT](#)
 For our Frequently Asked Questions (FAQs) go here: [AIS, GPS, DGPS, LRIT, NavRules](#)
 For other inquiries visit these external links or use the submission form that follows:

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- [Coast Guard Academy, recruiting, lighthouses, or history](#)
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Subject * AIS

Category * Please select category ==>

Name * Please select category ==>

Phone Number *

Email Address *

* Denotes required fields

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Office of Navigation Systems



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