1st HSSC MEETING
Singapore, 22-24 October 2009

Paper for Consideration by HSSC

IMO ACTIVITIES AFFECTING HSSC

Submitted by:	IHB
Executive Summary:	This paper summarizes recent discussions and decisions taken by IMO that may be relevant to the work of HSSC.
Related Documents:	HSSC Work Programme

Introduction

The principal IMO decisions and discussions that may affect the work of HSSC arose from the 85th and 86th meetings of the Maritime Safety Committee, held in November 2008 and May 2009 respectively and the 55th meeting of the IMO Sub Committee on the Safety of Navigation (NAV55) which met at the end of July 2009 The IHO, as an accredited observer to IMO was formally represented by the IHB at these meetings. A number of representatives drawn from hydrographic offices also formed part of various national delegations.

Mandatory Carriage Requirements for ECDIS

MSC85 approved and MSC86 adopted changes to SOLAS V/19 allowing a phased implementation of a mandatory carriage requirement for ECDIS in addition to the existing requirements for High Speed Craft (HSC). The dates of implementation are 2012 – 2018 depending on the class of ship and tonnage, as follows:

Ship type	Size	New ships	Existing ships
Passenger ships	>= 500 GT	constructed on or after 1 July 2012	constructed before 1 July 2012: not later than the first survey on or after 1 July 2014
Tankers	>= 3000 GT	constructed on or after 1 July 2012	constructed before 1 July 2012: not later than the first survey on or after 1 July 2015
Cargo ships, other than tankers	>= 10 000 GT	constructed on or after 1 July 2013	
	>= 3000 < 10 000 GT	constructed on or after 1 July 2014	
	>= 50 000 GT		constructed before 1 July 2013: not later than the first survey on or after 1 July 2016
	>= 20 000 < 50 000 GT		constructed before 1 July 2013: not later than the first survey on or after 1 July 2017
	>= 10 000 < 20 000 GT		constructed before 1 July 2013: not later than the first survey on or after 1 July 2018

ENC Coverage

The IHB presented a report on ENC availability (NAV 55/11) to NAV55. This was well received. However, the International Chamber of Shipping (ICS), whilst acknowledging the IHO's report of the steadily increasing availability of ENCs, stated that it still had reservations that an "adequate" coverage of ENCs would be available by the 2010 date indicated by the IHO. The IHO was requested to provide updates at future NAV sessions and to confirm at NAV57 in 2011 that "adequate" coverage has been achieved.

It is vitally important, therefore, that Member States cooperate to the fullest extent possible to ensure that adequate ENC coverage is achieved by 2010; otherwise, the mandatory carriage requirement for ECDIS could still be in doubt.

Development of an IMO e-Navigation Strategy

IALA has already provided significant input to the IMO considerations on e-Navigation and is continuing its work with a very active e-NAV Committee. IALA presented a report on its progress with e-Navigation to NAV55. (report is available at: *http://www.iho-ohi.net/mtg_docs/International_Organizations/IMO/NAV55-WP5.pdf* The IHB represents the IHO in the IALA e-NAV Committee, assisted by interested Member States.

MSC86 recognised IHO's potential contribution to its work on e-Nav and invited IHO to join IALA in providing input to the development of the IMO strategy on e-Navigation being developed under the auspices of NAV. An e-Navigation Strategy Implementation Plan Working Group was established at NAV55 to progress the ongoing work in IMO, which is scheduled to be completed by 2012. NAV55 also established an inter-sessional Correspondence Group to work during the year until the next meeting of NAV in July 2010. In particular, the e-Nav CG will:

- Develop a list of shipboard and shore-based user needs,
- Identify functions and services to support these user needs
- Develop an outline system architecture
- Undertake an initial gap analysis
- Develop or recommend an appropriate cost-benefit methodology

The IHB will represent the IHO in the work of the CG but interested Member States are encouraged to participate as well. The Co-ordinator of the CG will be Mr. John Erik Hagen of the Norwegian Coastal Administration. Those wishing to take part should make contact with him at: *john.erik.hagen@kystverket.no*.

Development of Procedures for Updating Shipborne Navigation and Communications Equipment

NAV55 instructed its technical working group to develop an MSC Circular on guidance for updating shipborne navigation and communications equipment in conjunction with the IMO Sub-committee on Communications and Search and Rescue (COMSAR). This would be reviewed at NAV56 in July 2010 and then forwarded to MSC 88 in December 2010. It was agreed that IMO S/N Circular 266 (guidance on the maintenance of ECDIS software) was appropriate to use as a model for the new circular. The initial draft produced by the NAV Technical Working Group is shown at Annex A to this report. It should be noted that this issue originally arose from discussions at IHO Stakeholders forums and subsequently at CHRIS.

AIS Binary Messages

NAV55 considered the revision of guidance on the application of AIS binary messages. In particular, NAV55 considered the work of a NAV Correspondence Group under the coordination of Sweden. Amongst other things, this CG developed a draft IMO Safety of Navigation circular on the use of AIS Application Specific Messages and a proposal to maintain an AIS binary International Application (IA) Catalogue to allow for future amendments and the introduction of new messages on a regular basis.

The draft IMO Safety of Navigation circular on the use of AIS Application Specific Message provides details on the various parameters that can be transmitted via AIS binary message, including meteorological and hydrographic elements, such as wave height, tidal heights and currents. The draft circular also provides guidance on how these types of information might be displayed. This draft circular will now be forwarded to MSC87 for approval. Relevant extracts from the IMO Working Paper is attached at Annex B, C and D for

information. Annex B shows the table of meteorological and hydrographic data to be included in AIS binary messages, Annex C shows examples of how meteorological and hydrographic data in AIS binary messages might be displayed, and Annex D provided details on the organisation, structure and management of the AIS binary International Application (IA) Catalogue.

NAV55 endorsed the proposal to maintain an AIS binary International Application (IA) Catalogue. This catalogue would be based on ISO19135, with the following arrangements in place:

- Register Owner: IMO
- Register Manager: IMO Maritime Safety Division
- Control body: IMO sub committee on Safety of Navigation (NAV)

A study of Annex D to this report shows that there are obvious parallels with the IHO governance arrangements for S-100.

AIS Aids to Navigation

MSC 86 considered a proposal from Japan to include certain virtual aids to navigation (AtoN) on charts. As a result, MSC86 directed the NAV Sub committee to develop new symbols for AIS AtoN. This will begin at NAV 56 in July 2010. At NAV55, Denmark reported on a Danish study gathered from AIS AtoN trials. IHO and IALA reiterated the view expressed at MSC86 that the need for so-called "virtual" AtoN must be considered from first principles, before any symbols were developed or authorised. IALA reported that it will be organising a workshop on the matter in January 2010 and its outcome would be reported to NAV56. The IHB will participate in the IALA workshop on behalf of IHO. Annex C to this report provides an indication of the scope of the requirement for additional AIS symbology as it relates to meteorological and hydrographic data.

Action Required of CHRIS

The CHRIS is invited to:

a. **Note** this report

b. **Take any actions** considered necessary

Annex A to HSSC1-04.2A

ANNEX 5

DRAFT GUIDANCE ON PROCEDURES FOR UPDATING SHIPBORNE NAVIGATION AND COMMUNICATION EQUIPMENT

Background

1 As navigation and radiocommunication equipment becomes increasingly software dependent, updates to application software to meet changes in IMO and ITU regulatory requirements are needed. This applies in the case of retrospective changes to regulations which apply to all relevant ships.

2 Means should be provided to replace software or install updates to software in systems aboard ships.

3 Manufacturers should provide customers with timely access, for example by website, to a list showing the relevant regulations currently in effect for the equipment, equipment software versions, compliance status and regulatory approvals for the listed configurations/versions.

4 Adequate navigation and radiocommunication equipment software maintenance arrangements should be implemented by ship owners and be supported by equipment manufacturers. Equipment should provide the means to display, on demand, the current applicable software versions.

Procedures

5 Member Governments should promulgate information to all affected parties in relation to IMO and ITU regulatory changes that have the potential to affect maritime navigation and radiocommunication equipment.

6 Equipment manufacturers should provide timely access to information pertaining to maritime navigation and radiocommunication equipment application software, for the relevant changes, originating from IMO and ITU regulations. This may necessitate changes in operating systems, firmware and hardware to fulfil Type Approval and to meet the changed requirements.

7 Shipowners should ensure that the vessel's equipment is up to date with the latest requirements.

8 In addition to the above, in the case of ECDIS refer to SN.1/Circ.266.

***

APPLICATION-SPECIFIC MESSAGES
RECOMMENDED FOR INTERNATIONAL USE

1 Meteorological and hydrographic data

1.1 This message allows the distribution of meteorological and hydrographic information. This message should not be transmitted when positional information or time of measurement are not available. If there is no data available, default value to be transmitted is the highest available binary value for that particular data field. It is to be displayed as not available (not 9999 or zero or similar). This message takes 2 slots. Not all the information specified in the tables will be available at all stations.

Table 1.1
Meteorological and Hydrographic data

Parameter	No. 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.
Source ID	30	MMSI number of source station.
Spare	2	Not used. Should be set to zero.
IAI	16	DAC = 001; **FI = 31**
Latitude	24	Measuring position, 0 to + /- 90 degrees, 1/1000th minute.
Longitude	25	Measuring position, 0 to + /- 180 degrees, 1/1000th minute
Date and time	16	Time of transmission, Day, hour, minute, (ddhhmm in UTC) Bits 15-11: day; 1-31; 0=not available=default Bits 10-6: hour; 0-23; 24=not available=default Bits 5-0: minute; 0-59; 60=not available=default.
Average wind speed	7	Average of wind speed values for the last 10 minutes. 0-120 kts, 1 kt (values larger than 120 knots should be regarded as invalid).
Wind gust	7	Wind gust is the maximum wind speed value reading during the last 10 minutes, 0-120 kts, 1 kt (values larger than 120 knots should be regarded as invalid).
Wind direction	9	0 - 359 degrees, 1 degree (values larger than 359 degrees should be regarded as invalid).
Wind gust direction	9	0 - 359 degrees, 1 degree (values larger than 359 degrees should be regarded as invalid).
Air temperature	11	Dry bulb temperature - 60.0 to + 60.0 degrees Celsius 0.1 of a degree (2-complements coding/decoding shall be used) (values larger than 60 degrees should be regarded as invalid).
Relative humidity	7	0 - 100%, 1% (values larger than 100% should be regarded as invalid).

Annex B to HSSC1-04.2A

Parameter	No. of bits	Description
Dew point	10	- 20.0 - + 50.0 degrees, 0.1 degree (2-complements coding/decoding shall be used) (values lower than -20 and larger than 50 degrees should be regarded as invalid).
Air pressure	9	800 - 1200 hPa, 1 hPa A value representing 0 – 400 is sent by the 9 binary bits. The air pressure is achieved by adding 800 to the sent value. At mean sea level. (values larger than 400 should be regarded as invalid)
Air pressure tendency	2	0 = steady 1 = decreasing 2 = increasing 3 = unknown.
Horizontal visibility	8	0.0 - 25.0 NM, 0.1 NM 0.0 - 12.7 NM, 0.1 NM (00000000 to 01111111: The MSB indicates that the maximum range of the visibility equipment has been reached and the reading shall be regarded as, equal or better than x.x NM. Example: 10110010 – Visibility is equal or better than 5.0 NM).
Water level (incl. tide)	12	Deviation from local chart datum, 10.0 to + 30.0 m 0.01 m A value representing 0 – 4000 is sent by the 12 binary bits. The water level is achieved by adding -10.0 to the sent value (received values larger than 4000 should be regarded as invalid).
Water level trend	2	0 = steady 1 = decreasing 2 = increasing 3 = unknown
Surface current speed (incl. tide)	8	0.0 - 25.0 kts 0.1 kt (values larger than 25.0 should be regarded as invalid)
Surface current direction	9	0 - 359 degrees, 1 degree (values larger than 359 degrees should be regarded as invalid)
Current speed, #2	8	Current measured at a chosen level below the sea surface, 0.0, 25.0 kts, 0.1kt. (values larger than 25.0 should be regarded as invalid)
Current direction, #2	9	0 - 359 degrees, 1 degree (values larger than 359 degrees should be regarded as invalid).
Current measuring level, #2	5	Measuring level in m below sea surface, . 0 .30 m 1 m (values larger than 30 metres should be regarded as invalid).
Current speed, #3	8	0.0 - 25.0 knots, 0.1 knot (values larger than 25.0 should be regarded as invalid).
Current direction, #3	9	0 - 359 degrees, 1 degree (values larger than 359 degrees should be regarded as invalid).
Current measuring level, #3	5	Measuring level in m below sea surface, 0 . 30 m, 1 m (values larger than 30 metres should be regarded as invalid).

Parameter	No. of bits	Description
Significant wave height	8	0.0 - 25.0 m, 0.1 m (values larger than 25.0 should be regarded as invalid).
Wave period	6	Period in seconds, 0 - 60 s, 1 s (values larger than 60 seconds should be regarded as invalid).
Wave direction	9	0 - 359 degrees, 1 degree (values larger than 359 degrees should be regarded as invalid).
Swell height	8	0.0 - 25.0 m, 0.1 m (values larger than 25.0 should be regarded as invalid).
Swell period	6	Period in seconds, 0 - 60 s, 1 s (values larger than 60 seconds should be regarded as invalid).
Swell direction	9	0 - 359 degrees, 1 degree (values larger than 359 degrees should be regarded as invalid).
Sea state	4	According to Beaufort scale, 0 to 12, 1
Water temperature	10	-10.0 - + 50.0 degrees, 0.1 degree (2-complements coding/decoding shall be used) (values lower than -10 and larger than 50 degrees should be regarded as invalid).
Precipitation (type)	3	According to WMO 306 0 = Reserved 1 = Rain 2 = Thunderstorm 3 = Freezing rain 4 = Mixed/ice 5 = Snow 6 = Reserved 7 = Not available
Salinity	9	0.0 - 50.0, 0.1. (values larger than 50.0 should be regarded as invalid).
Ice	2	Yes/No 00 = No 01 = Yes 10 and 11 = not available
Spare	3	
Total	**352**	**Occupies 2 slots**

Annex C to HSSC1-04.2A

.4 provide opportunities for improving the efficiency of transport and logistics;

.5 support the effective operation of contingency response, and search and rescue services;

.6 demonstrate defined levels of accuracy, integrity and continuity appropriate to a safety-critical system;

.7 integrate and present information on board and ashore through a human-machine interface which maximizes navigational safety benefits and minimizes any risks of confusion or misinterpretation on the part of the user;

.8 integrate and present information on board and ashore to manage the workload of the users, while also motivating and engaging the user and supporting decision-making;

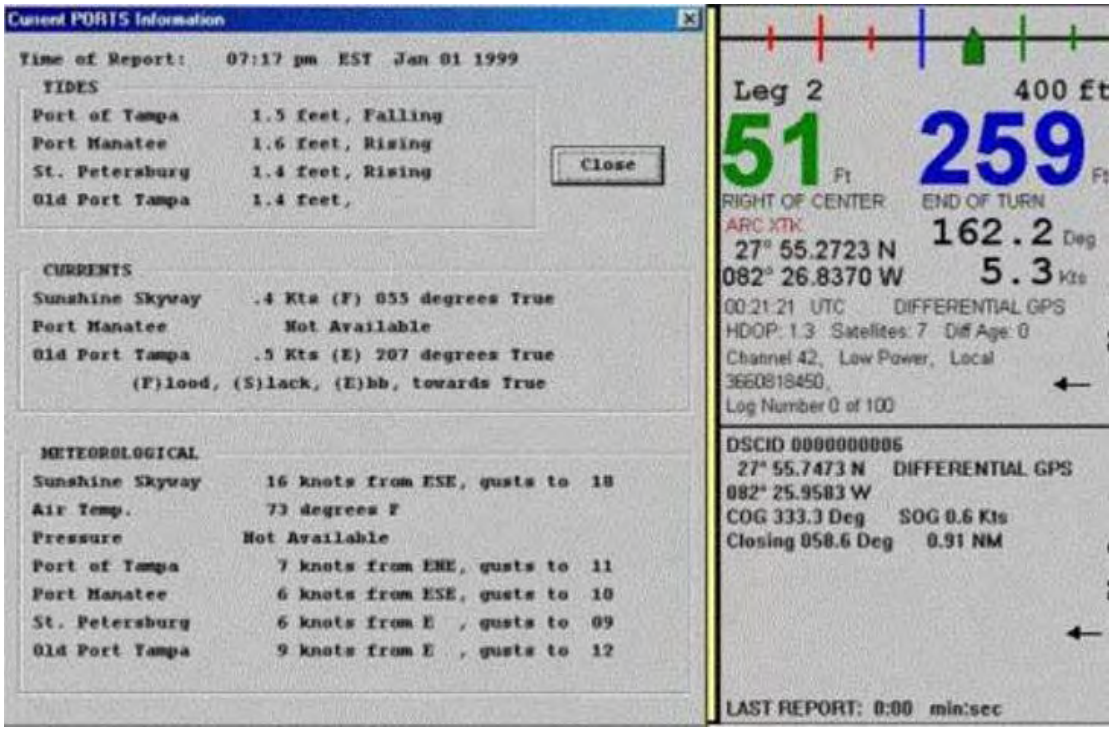
In the interim, the following guiding principles should apply to the display of AIS Application-Specific Messages information both for shipborne equipment/systems (e.g., ECDIS, radar and INS) and for shore-based systems (e.g., VTS Centre console):

1. Use **consistent** symbology across all displays
2. **Uniqueness** – only one possible meaning
3. **Non-ambiguous** – ability to determine differences (i.e. distinct)
4. **Intuitively obvious** – an easily recognized symbol, icon or pattern
5. Have a **basic symbol** for different categories. Further attributes should be enhancements (not changes) to the basic symbol.

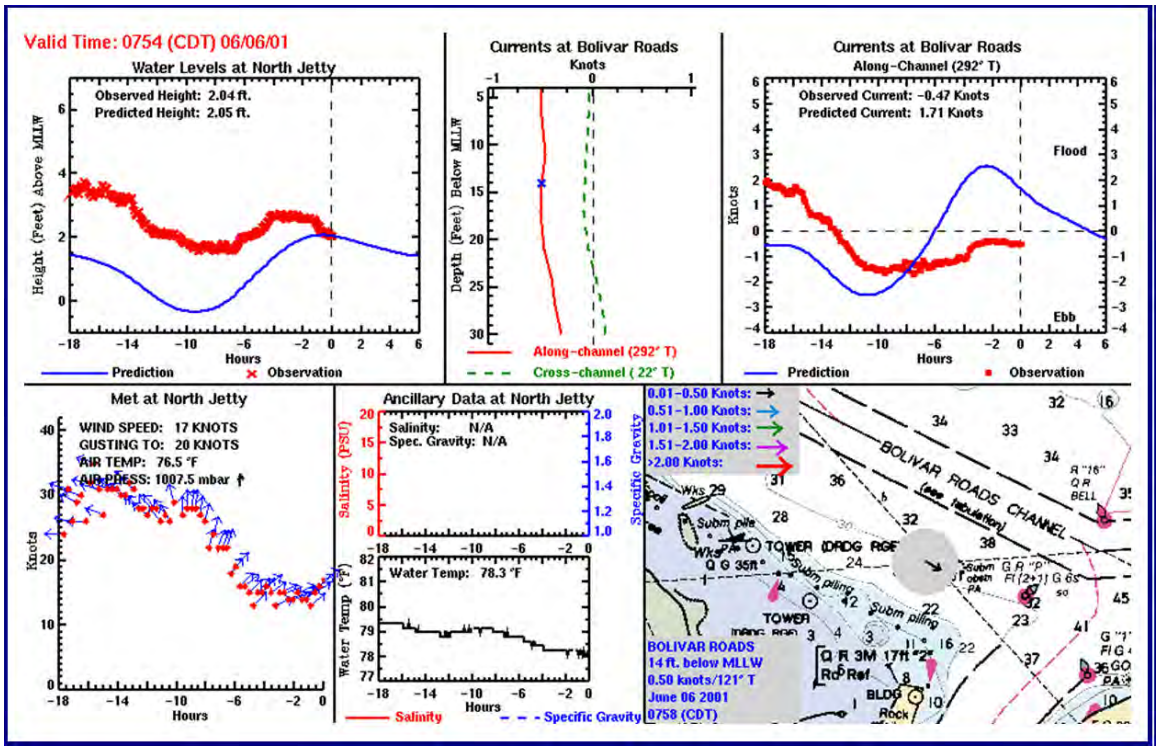
Application-Specific Message Information: Portrayal Examples

"Portrayal" is the process of representing or depicting (i.e. showing an example of what is or could be). The following are selected examples of how some of current and new Application Specific Messages applications are being portrayed. This includes alpha-numeric, graphs, symbols, and geographic (i.e. spatial) information.

Meteorological and hydrographic data (FI = 11, FI = 26)



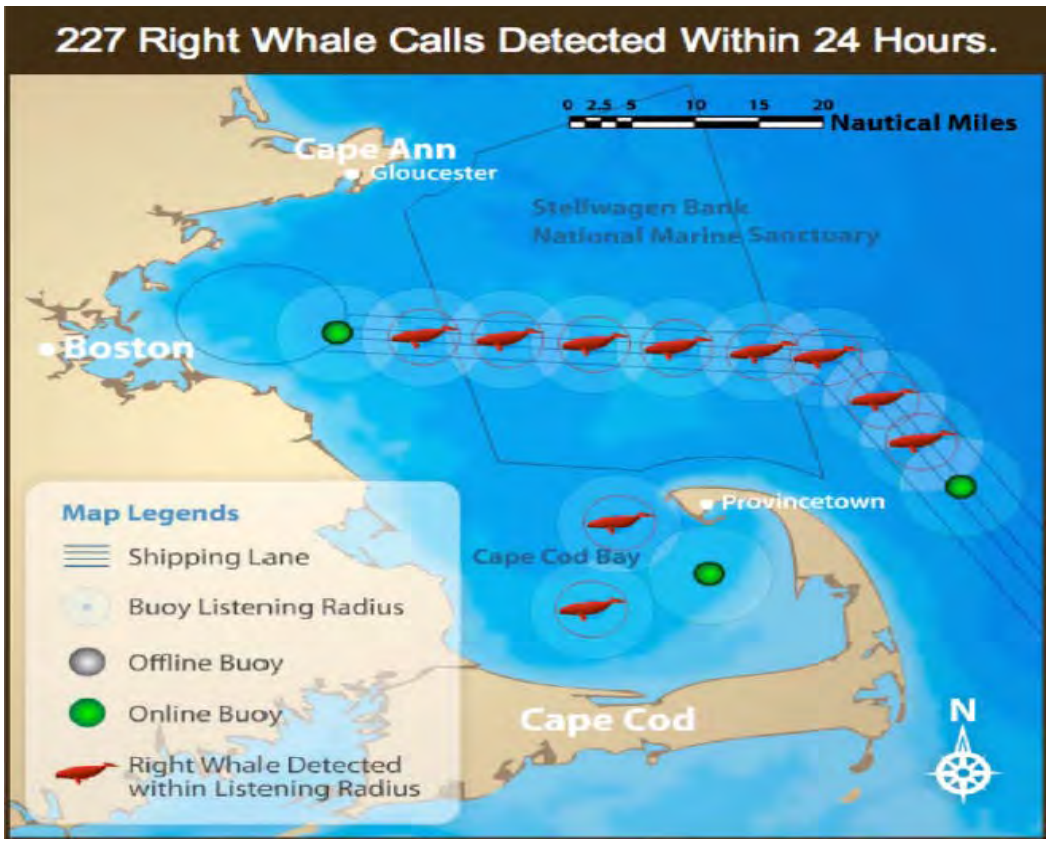
Example 1 – This is an example of real-time alpha-numeric data pertaining to tidal changes, current flow velocity, and meteorological conditions. Transmitted as an AIS Application-Specific Message from a VTS Centre, the information is displayed on Portable Pilot Units (PPUs) that are carried on board vessels by Maritime Pilots.



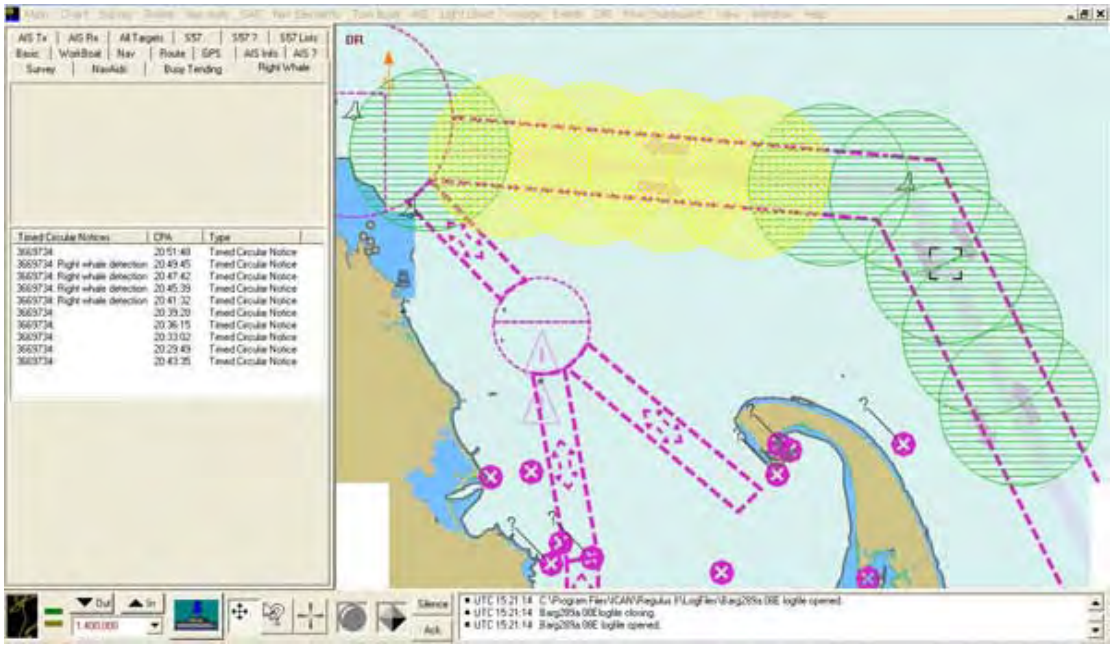
Example 2 – This is a graphical display of both predicted and observed met/hydro data. While similar to alpha-numeric text in terms of data content, the information is displayed as a time-series graphs capable of depicting differences and trends (i.e. predicted vs. observed). This also includes alpha-numeric text that is displayed over geographic data (a raster navigational chart).

Annex C to HSSC1-04.2A

Area Notice – Broadcast (FI = 22)

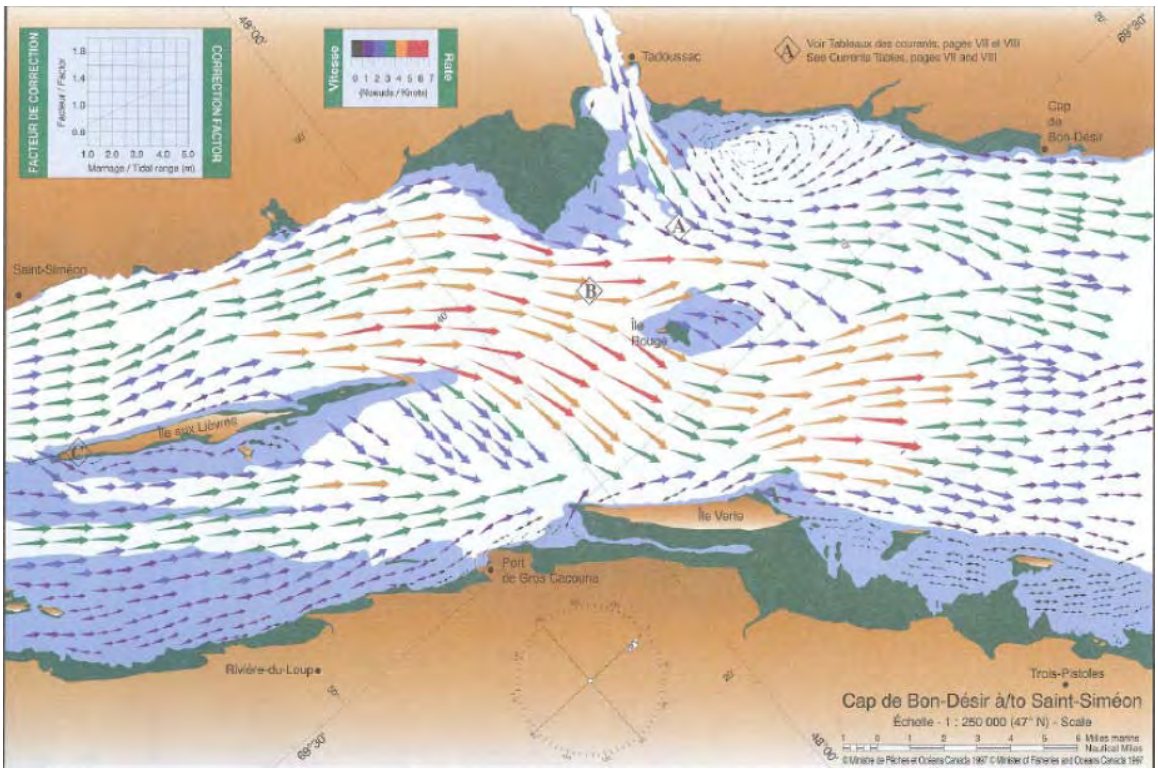


Example 1 – This is an example of shore-based geographic display of a marine sanctuary area, traffic separation scheme, locations of passive-acoustic buoys, and acoustic detections of North Atlantic right whales (an endangered species). The red-green colour scheme indicates the status of buoy operation.

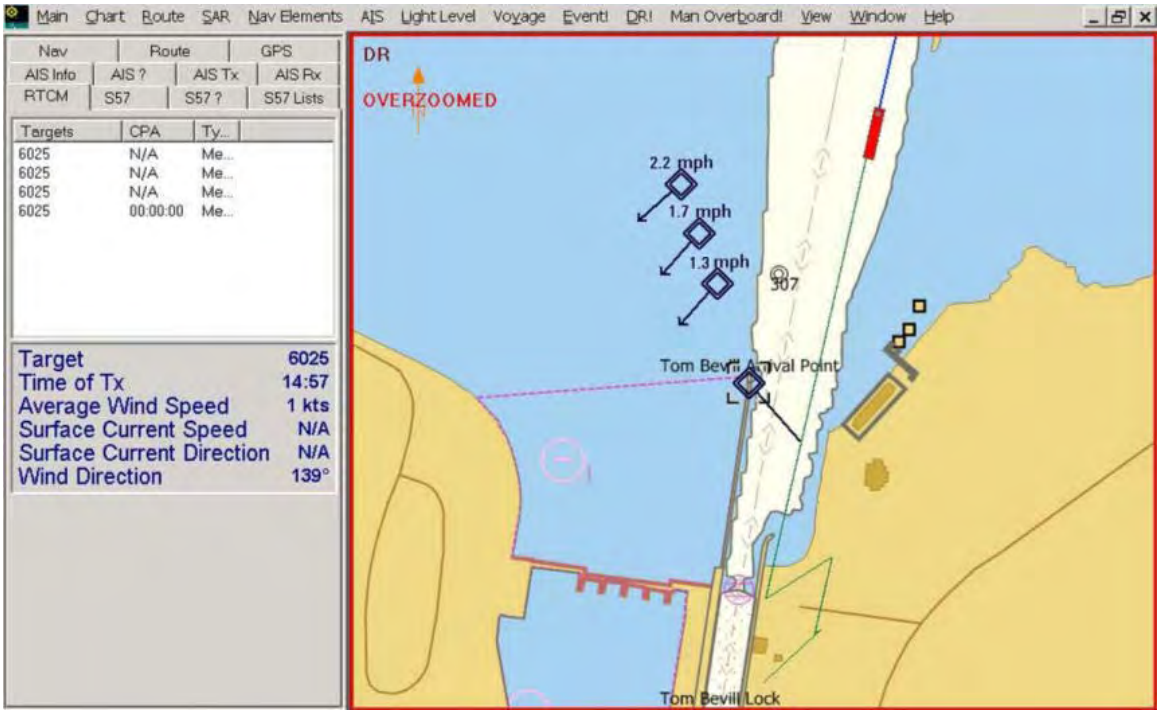


Example 2 – This is an example of data pertaining to the date/time detection and location of North Atlantic right whales (an endangered species) in a traffic separation scheme within a marine sanctuary area. Transmitted via AIS Application-Specific Message from an Operations Centre, this information is displayed on shipborne Electronic Chart System (ECS) as semi-transparent red-yellow-green colours that do not obscure the underlying Electronic Navigational Chart (ENC) data.

Tidal window (FI = 14)



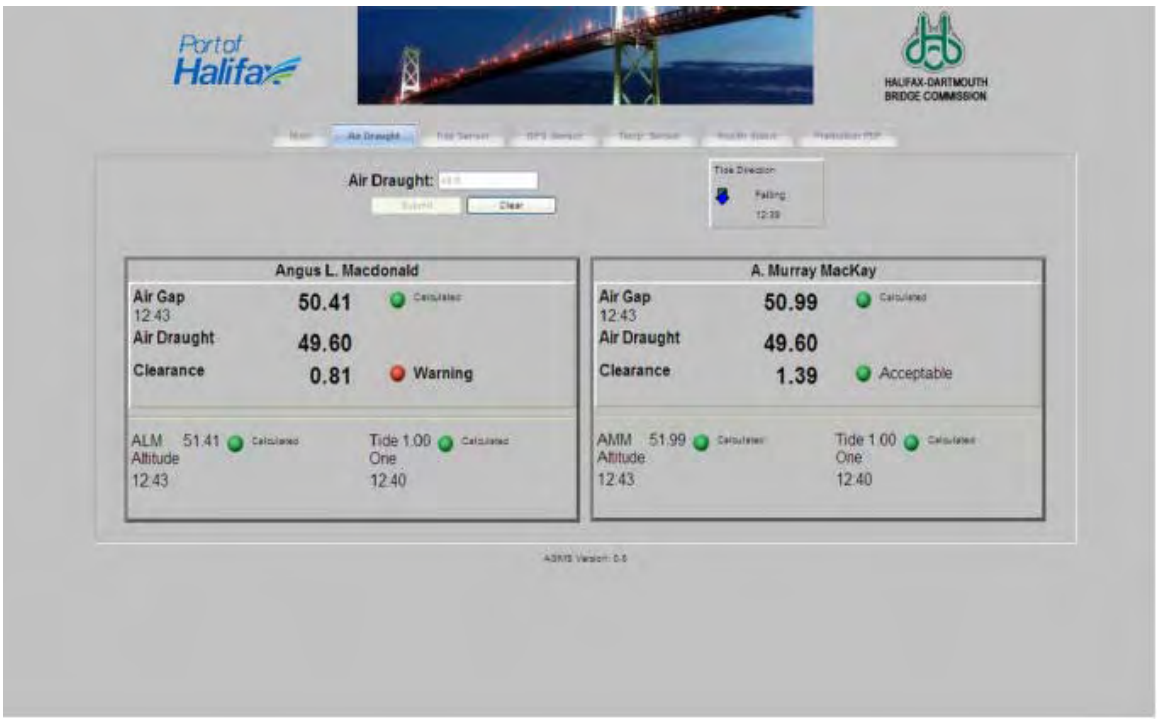
Example 1 – This is a geographical example of tidal current data. Current flow information is shown as coloured arrows (symbols) that indicate both the direction and speed of current flow for a date/time period at a specific location. This display is similar to the colour scheme used in the “Tidal Atlas” that is issued as a printed nautical publication.



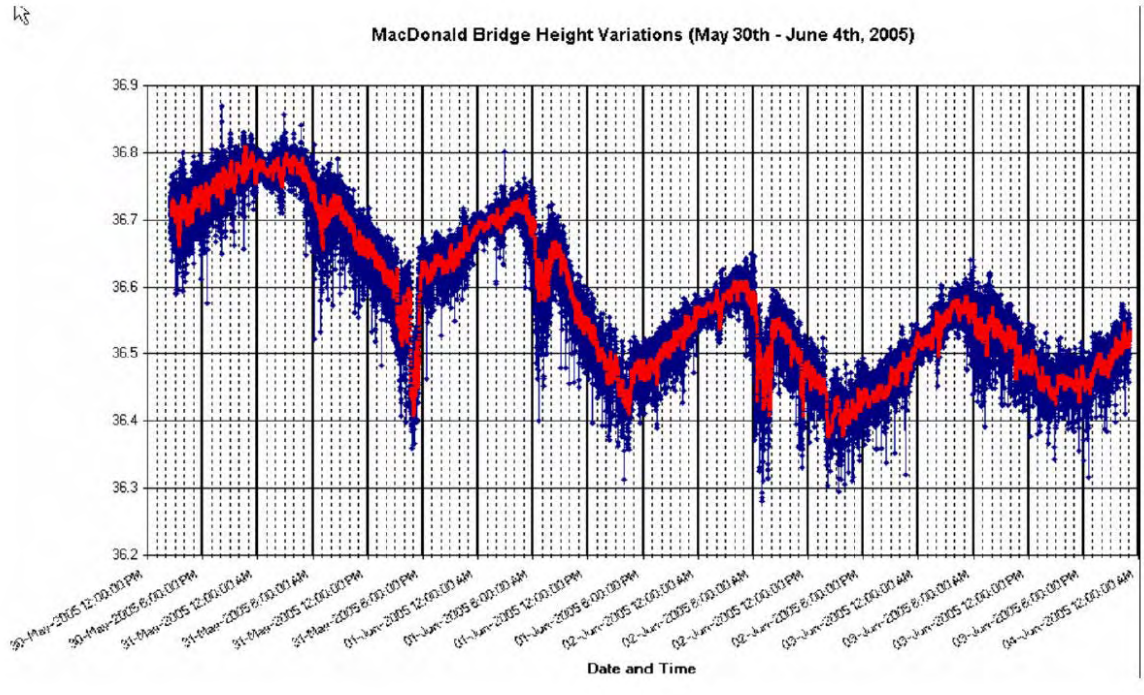
Example 2 – This is a geographic display of current flow data at the entrance of a lock on a major inland waterway. Current flow information is shown as arrow symbols that indicate the surface current speed/direction on a continuous basis. This information is transmitted via AIS Application-Specific Message from a VTS Centre, and displayed on an Electronic Chart System installed on board a towboat vessel using Inland ENC data.

Annex C to HSSC1-04.2A

Extended ship static and voyage-related data (FI = 15)

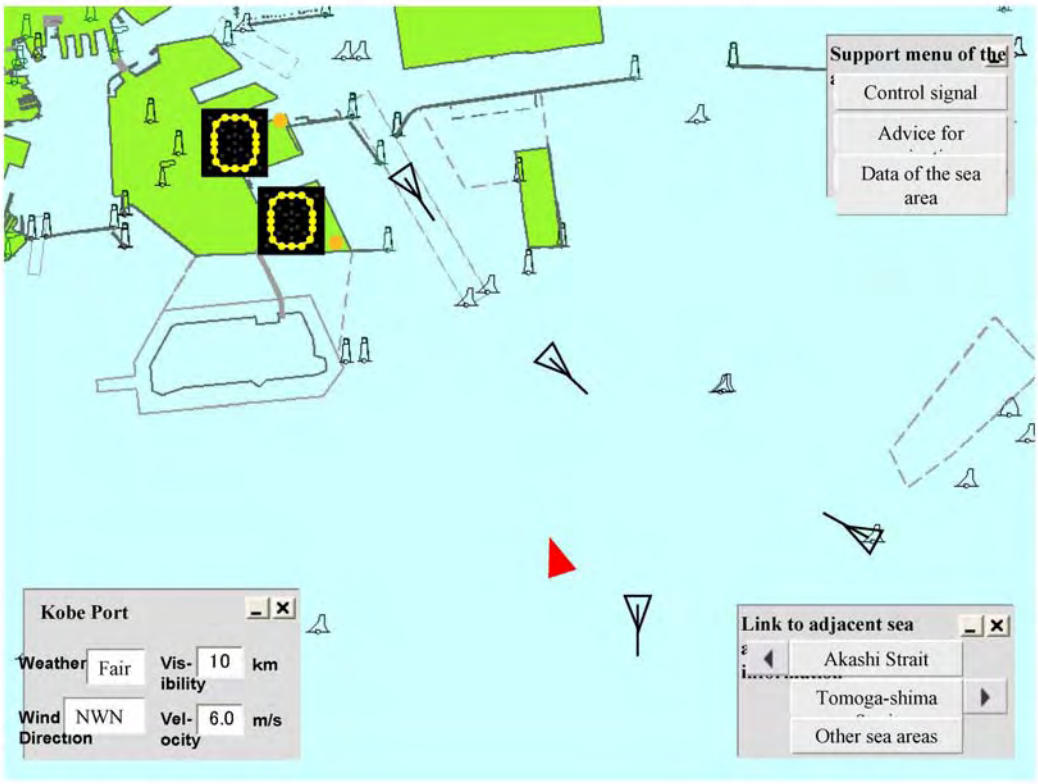


Example 1 – This is an example of real-time alpha-numeric data pertaining to air gap/air draft. Transmitted via AIS Application-Specific Message from a Port Authority, the information is displayed on Portable Pilot Units that are carried on board vessels by Maritime Pilots. A red-greed colour scheme is used to indicate a warning of exceeding minimum clearance parameters.



Example 2 – This is a graphical display of the same air gap/air draft data. While similar to alpha-numeric text in terms of data content, the information is displayed as a date/time series graph that indicates variations and trends.

Marine traffic signal (FI = 19)



Example 1 – This is an example of a geographic display of marine traffic signal data that would be sent from a VTS Centre to a vessel entering port. In addition to displaying information on a signal station and status of the control signal, there are other links capable of providing advice about the harbour and adjacent sea area, and alpha-numeric text information on local weather conditions.

***

Annex D to HSSC1-04.2A

ANNEX 3

IMO AIS APPLICATION-SPECIFIC MESSAGE CATALOGUE

RECOMMENDED ORGANIZATION, STRUCTURE AND MANAGEMENT

1 Main Recommendation

1.1 The IMO AIS Binary Application-Specific Message Catalogue should be organized and managed based on guidance contained in *ISO Standard 19135*.

2 Roles and Responsibilities (*from ISO 19135*)

2.1 Register Owner: [International Maritime Organization (IMO)]

.1 Establishes/hosts the register(s).

.2 Establishes the policy for submission and access.

.3 Has primary responsibility for the management, dissemination, and intellectual content of the Catalogue.

2.2 Register Manager: [Maritime Safety Division]

The Register Manager is responsible for the administration of the Catalogue. This includes:

.1 Publishes guidance on proper submission procedure for proposals.

.2 Once received, from submitting organizations:

a) reviews proposals for completeness

b) returns proposals to the submitting organization if incomplete.

.3 Maintains items within the Catalogue.

.4 Provides periodic reports to the Control Body.

2.3 Control Body: [IMO Sub-Committee on Safety of Navigation]

The Control Body decides on the acceptability of proposals, and/or changes to the content of a catalogue.

2.4 Submitting Organizations:

IMO Member Governments, United Nations specialized agencies, intergovernmental and non-governmental organizations in consultative status may submit proposals based on established submission procedures.

Annex D to HSSC1-04.2A

2.5 Proposers:

Proposers are any stakeholders (e.g., government, industry, academia, and user groups) who submit a proposal via a Submitting Organization.

2.6 Recommended Organization/Structure:

Register Owner	IMO
Register Manager	Maritime Safety Division
Control Body	Sub-Committee on Safety of Navigation (NAV)
Submitting Organizations	IMO Member Governments, United Nations specialized agencies, intergovernmental and non-governmental organizations in consultative status
Proposers	All interested stakeholders

3 Submission Form

Submitter (i.e. IMO Member Government, NGIO, etc.)	
Date of Submission	
Type of Submission (new or revised)	
Name of Application (keep short)	
Type of Message (i.e. msg 6 or 8)	
Proposed DAC and FI	
Intended Use (include typical applications, e.g., AtoN monitoring)	
How portrayed (e.g., text only, graphical on ECDIS/ECS, etc.)	
Number of Slots	
Reporting Rate	
Technical Point-of-Contact	

Message parameters

Parameter	No. of bits	Description

Further Description of Parameters
[as needed]