AIS Binary Messages

Submitted by United Kingdom

SUMMARY

Executive Summary: Guidance on use of AIS Binary Messages is being formulated
through the IMO NAV Sub-Committee. There are implications for
MSI broadcasts and therefore CPRNW should both be aware of the
issues and be involved in formulating the guidance.

Action to be taken: See paragraph 9

Related documents: NAV 54/18, NAV 54/18/1, NAV 54.INF.8

Introduction

1.   The guidance on the application of AIS Binary Messages was reviewed at IMO NAV 54 in July
2008. There were 4 papers submitted. These were:
  - NAV 54/18 (Japan) - proposal on the application of binary messages
  - NAV 54/18/1 (Sweden)
  - NAV 54/18/2 (Japan) - ship to ship binary messages for collision avoidance
  - NAV 54/INF.8 (Finland and Estonia) - the Baltic AIS trial (AISBALTIC) project.

2.   NAV 54/18, NAV 54/18/1 and NAV 54/INF.8 are attached for reference. NAV 54/18/2 has little
relevance with respect to the promulgation of MSI.

3.   NAV 54/18, in Annex 2 (Table 2), proposed a range of new binary messages. These included
details of: derelicts, drifting mines, wrecks, casualties to aids to navigation, etc. Several of these
categories are existing subjects for navigational warnings within the WWNWS.

4.   NAV 54/18/1 provided a balanced narrative which emphasized the limitations as well as the
benefits of using AIS binary messages. It recommended establishing a Correspondence Group to review
the work on AIS binary messages undertaken so far and develop guidance on its future use.

5.   NA 54/INF.8 described the Baltic trial and noted several observations. In paragraph 12 it states
that: *Binary messages proved to be very useful for VTS. . . . . .The use of binary systems should be
part of the VTS functions.*

6.   The outcome of discussions on this agenda item at NAV 54 was that a Correspondence Group was
set up, to be led by Sweden, as recommended by NAV 54/18/1.

The Issues

7.   There are a number of issues relevant to CPRNW that arise from the papers submitted to IMO. These include, but are not limited to:

- If incidents are broadcast both as navigational warnings through the WWNWS and as AIS binary messages, there should be co-ordination to ensure no conflicting information is broadcast by the different systems and the messages are initiated and cancelled at the same time.
- It should be clear to mariners through which systems they get their up-to-date MSI for specific geographical locations. There is a danger they will expect to get it through AIS and therefore not properly monitor NAVTEX or SafetyNET.
- The above can be resolved by ensuring that binary messages are used only to broadcast local warnings, as defined in IMO Resolution A.706 (as amended) i.e. covering inshore waters, often within the limits of jurisdiction of harbour or port authorities. However, while in the past VTS areas were usually only in port approaches and subject to local warnings, they may now also extend beyond that into areas traditionally subject to coastal warnings. Also AIS messages can be broadcast from coastal stations outside of VTS areas and there is a danger that "local" may be interpreted as within VHF range of the station rather than in accordance with the WWNWS definition. At this time it would probably be safest to attempt to limit use of MSI binary messages to within port and VTS areas.
- Many vessels, particularly non-SOLAS vessels, will not be fitted with AIS and will be unable to receive binary messages. Therefore warnings will still need to be broadcast traditionally in all areas for the foreseeable future.
- The same criteria and descriptive terms should be used in AIS as for Coastal Warnings e.g. NAV 54/18 Table 2-7 Status of A to N "*Light off*" versus MSI Manual/S53-Appendix 1 "*Unlit*". It is potentially confusing for the mariner if different terms are used in the different systems.

8.   Also it seems that through this agenda item at IMO NAV matters associated with broadcasting MSI are now being discussed there and not just at IMO COMSAR. This could lead to ill informed decisions and recommendations being implemented.

Recommendations

9.   It is recommended that:

- NAVAREA and National Co-ordinators engage with their maritime administrations to ensure issues associated with this subject are fully understood.
- NAVAREA Co-ordinators and IHB (on behalf of IHO members) join the Correspondence Group and help to shape the guidance on use of binary messages, particularly with respect to those dealing with MSI, and try to limit usage to within Port and VTS areas.
- IHO actively engages at IMO NAV and ensures that primacy of the WWNWS is maintained with respect to broadcasting Navigational Warnings.

IMO

E

SUB-COMMITTEE ON SAFETY OF
NAVIGATION
54th session
Agenda item 18

NAV 54/18
28 March 2008
Original: ENGLISH

REVISION OF THE GUIDANCE ON THE APPLICATION OF AIS BINARY MESSAGES

Proposal on the application of binary messages

Submitted by Japan

	SUMMARY
Executive summary:	This document contains the proposal on the modification of Trial Set of Binary Messages adopted at the forty-ninth session of the Sub-Committee and the addition of New Binary Messages
Strategic direction:	5.2
High-level action:	5.2.4
Planned output:	5.2.4.2
Action to be taken:	Paragraph 5
Related document:	SN/Circ.236

Introduction

1   At the forty-ninth session of the Sub-Committee on Safety of Navigation held in July 2003, seven (7) binary messages were adopted as a trial set of Application Specific Messages utilizing Binary Messages 6 and 8. It was also agreed that the trial messages should be evaluated for their effectiveness and practicability during a trial period of 4 years. Member Governments were encouraged to make the evaluation and, when they recognize the need, to propose new binary messages.

2   Accordingly, in Japan, a study committee was organized by inviting experts such as professors, knowledgeable engineers, pilots and captains of large ships, in order to take up a study-and-research work on the binary messages raised by the IMO Sub-Committee on Safety of Navigation. In due course, the committee conducted a field test at sea to evaluate the need, effectiveness and practicability of the messages.

IMO60
60 YEARS IN THE SERVICE OF SHIPPING

Notes on Studies

3   The Committee carried out the study-and-research work on binary messages as follows:

    .1   Collection of opinions from maritime related people

        A questionnaire was sent out via a web link to shipping agents, maritime organizations, etc., asking their opinions about the formats, contents, etc., of the defined seven (7) binary messages and new parameters which they wish to newly include in binary messages.

    .2   Consideration for possible improvement for the "NAV 49 Trial Set of Message"

        On the basis of outcome of the questionnaire and findings from other studies, the committee discussed whether the "NAV 49 trial messages" need additional parameters and/or contents to be included and other aspects concerned.

    .3   Consideration for probable applications of New Binary Messages

        Response to the questionnaire brought up new probable applications of binary messages requested for practical use.

The Committee rearranged the inputted requests and/or comments and discussed about parameters and formats, of new binary messages for future inclusion in the items of proposal.

Conclusions

4   According to the suggestions the committee has presented through studies, discussions and considerations, we propose the following concerning the binary messages:

    .1   Modification of the "NAV 49 Trial Set of Message"

        –   Modification of the applications

            a)   To combine the messages Application 1 "Meteorological and Hydrological Data" and Application 4 "Tidal Window";

                These are treated separately as Application 1 and 4 so far and both provide data of natural phenomena, i.e. most advantageous and important information for users in the marine traffic area. Integration of both messages could improve recognition by uses.

            b)   To modify Application 3 "Fairway Closed" to "Port and Fairway Closed";

                Port Closed information is necessary for the safe navigation of the ship as well as Fairway Closed information.

–   Rearrangement of the format parameters

To modify formats of the messages by rearranging parameters;

These modifications are required in view of making the binary messages to be further widely utilized and the slots to be more effectively used.

Table 1 (annex 1) describes these proposals in detail.

.2   New binary messages

Table 2 (annex 2) shows formats and parameters of the proposed applications in detail.

Action requested of the Sub-Committee

5   The Sub-Committee is invited to consider the proposal on application of binary messages.

***

ANNEX 1

Table 1: Proposal on Modification of Formats of NAV 49 Trial Set

Name of Message	Description	Addressed/ Broadcast	(primary) Transmit Station	(primary) Receive Station	Message Table No. (*)	Remarks
Meteorological & Hydrological Data and Tidal Window	To arrange parameters as follows, since this message takes a form to integrate the message "Meteorological and Hydrological Data" with "Tidal Window". - To add place and date/time in LT of observation, weather, notices and warnings. - To add "time at next highest current speed, time at next turn of current direction, time at turn of current direction after the next, time at next low tide, water level at next low tide, time at next high tide and water level at next high tide" to the current forecast which provides information on the time period of high and low tide. - To delete Parameter "Current measuring level, #3" as the level is not necessary to that level. - Current information should be obtained at and provided for only one observation point.	B	Ba	Mo	Table 1-1	
Dangerous Cargo Indication	To rearrange Parameter as follows so as to reduce the input workload of ship operators. - To delete Parameter "ATD from Last Port of Call"; the actual time of departure is less needed. - To delete Parameter "ETA at Next Port of Call"; the estimated time of arrival may be derived from a voyage related information.	A	Mo	Ba	Table 1-2	

Name of Message	Description	Addressed/ Broadcast	(primary) Transmit Station	(primary) Receive Station	Message Table No. (*)	Remarks
Port and Fairway Closed	To arrange the contents as follows so as to make the message provide information usable in case of port close as well. - To add name of the closed port or fairway. - To add (brief) reason of closing. - To add coordinates of the centre point in the closed area. - To add an extending direction of the closed fairway. - To reduce the number of bits for a text information on the start point of closing. - To add and define Parameter "End of closing" in terms of "day, month, hour and minute".	B	Ba	Mo	Table 1-3	
Extended Ship Static and Voyage Related Data	No change is proposed.	B	Mo	Ba/Mo	Table 1-4	
Number of Persons on Board	No change is proposed.	A	Mo	Ba	Table 1-5	
PSEUDO-AIS TARGETS	No change is proposed.	B	Ba	Mo	Table 1-6	

Note 1: A; Addressed Message, B; Broadcast Message, Ba; Base Station (= Shore Station), Mo; Mobile Station (= Ship Station)
   2: (*); These tables are given in the following pages.

Table 1-1: **Message "METEOROLOGICAL/HYDROLOGICAL DATA AND TIDAL WINDOW"**

Editorial Classification	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	11 or 14
Addition	Observation place	120	(20 characters)
Common	Observation position, Lat	24	** deg **.*** min
Common	Observation position, Lon	25	*** deg **.*** min
Common	Date and time of observation (UTC)	11	** hour** min
Addition	Date and time of observation (LT)	11	** hour** min
	Average wind speed	7	*** knots
	Wind gust	7	*** knots
	Wind direction	9	*** deg
	Wind gust direction	9	** deg
	Air temperature	11	** deg
	Relative humidity	7	*** %
	Dew point	10	** deg
	Air pressure	9	**** hPa
	Air pressure tendency	2	decreasing/steady/increasing
	Horizontal visibility	8	**.* nm
Addition	Weather	4	Fine/Cloudy/Rain/Fog/Snow/Typhoon (Hurricane, Monsoon)
Addition	Caution, Warning	2	Gale/High seas
	Water level Now	9	**.* m
Editorial Classification	Parameter	No. of bits	Description

Editorial Classification	Parameter	No. of bits	Description
	Water level trend Now	2	decreasing/steady/increasing
	Surface current speed	8	**.* knots
	Surface current direction	9	*** deg
	Current speed, #2	8	**.* knots(max. 25.0 knots)
	Current direction, #2	9	*** deg
	Current measuring level, #2	5	** m
Deletion	Current speed, #3; Current direction, #3; Current measuring level, #3		
	Significant wave height	8	**.* m
	Wave period	6	** sec
	Wave direction	9	*** deg
	Swell height	8	**.* m
	Swell period	6	** sec
	Swell direction	9	*** deg
	Sea state	4	0 ~ 12
	Water temperature	10	**.* deg
	Precipitation (type)	3	0 ~ 8
	Ice	2	Yes/No
	Salinity	9	**.* %
Addition	Sunrise (LT)	11	** hour** min
Addition	Sunset (LT)	11	** hour** min
Addition	Time of (next) max. Current speed (LT)	11	** hour** min
	Current direction at (next) observation time	9	*** deg
	(Next) max. current speed	8	**.* knots(max. 25.0 knots)
Addition	Time of (next) current turn (LT)	11	** hour** min
Addition	Time of current turn after the next (LT)	11	** hour** min
Addition	Time of next low tide (LT)	11	** hour** min
Addition	Water level at next low tide	9	**.* m

Editorial Classification	Parameter	No. of bits	Description
Addition	Time of next high tide, (LT)	11	** hour** min
Addition	Water level at next high tide	9	**.* m
Deletion	Current direction and speed, #1 - #3		
	Sub-total	(568)	
	Spare bits	16	Not used. Should be set to zero.
	Total Number of bits	584	

This message is intended to provide meteorological and hydrological data at present in coastal areas. This message is transmitted by a competent authority.				
3 slots	Transmission: Shore station	Reception: Ship station	Broadcast	-

Table 1-2:   Message "DANGEROUS CARGO INDICATION"

Editorial Classification	Parameter	No. of bits	Description
	Message ID	6	Identifier for the message 6, always 6
	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
	Sequence number	2	0 - 3
	Destination ID	30	MMSI number of destination station
	Retransmit Flag	1	Retransmit Flag should be set upon retransmission: 0 = no transmission = default; 1 = retransmitted
	Spare	1	Not used. Should be set zero.
	IAI	16	12
	Last Port of Call	30	UN Locode (5 characters)
Deletion	ATD from Last Port of Call (UTC)		Actual Time of Departure; ** month ** day ** hour ** minute
	Next Port of Call	30	UN Locode (5 characters)
Deletion	ETA at Next Port of Call (UTC)		Estimated Time of Arrival; ** month ** day ** hour ** minute
	Main Dangerous Good	120	(20 characters)
	IMD category of Main Dangerous Good	24	(4 characters)
	UN Number of Main Dangerous Good	13	1 - 3363
	Value of Quantity of Main Dangerous Good	10	1 - 1023
	Unit of Quantity of Main Dangerous Good	2	in kg/tons/kilo-tons
	Sub-total	(317)	
	Spare	43	Not used. Should be set to zero.
	Total Number of bits	360	

This message provides information on the main dangerous goods being carried on board. This message is transmitted by an interrogated ship on request from a competent authority.				
2 slots	Transmission: Ship station	Reception: Shore station	Addressed	Acknowledgement: Requested

Table 1-3: Message "HABOR AND FAIRWAY CLOSED"

Editorial Classification	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	13
Addition	Name of Harbour or Fairway closed	120	(20 characters)
Addition	Reason for closing (in brief)	2	Accident at sea/Accident on land/others
	Reason for closing (in detail)	120	(text)
Addition	Centre of closed area, Lat	24	** deg **.*** min
Addition	Centre of closed zone, Lon	25	*** deg **.*** min
Addition	(approx.) Direction of Closed Fairway	3	East/West/South/North/South to North/East to West
Modification	Start position of closing	90	(15 characters)
Modification	End position of closing	90	(15 characters
	Extension of closed area (radius)	10	0 – 1000
	Unit of extension value	2	m/km/nm/cbl
	Starting date and time of closing (LT)	20 (4+5+5+6)	** day ** month ** hour ** min
Modification	Ending date and time of closing (LT)	20 (4+5+5+6)	** day ** month ** hour ** min
	Sub-total	(582)	
	Spare	2	Not used. Should be set to zero.
	Total Number of bits	584	

This message provides reasons, positions and duration for closing of harbours and fairways.				
This message is transmitted by a competent authority.				
3 slots	Transmission: Shore station	Reception: Ship station	Broadcast	-

Table 1-4:   Message "EXTENDED SHIP STATIC AND VOYAGE RELATED 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	15
Air Drought	11	In 1/10m, 2047 = height over keel 204.7 m or greater, 0 = not available = default
Spare	5	Not used. Should be set to zero.
Total Number of bits	72	This International Function Message uses one slot.

This message is used to report the height over keel of a ship.			
1 slot	Transmission: Ship station	Reception: Shore/Ship station	Broadcast	-

Table 1-5:   Message "NUMBER OF PERSONS ON BOARD"

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.
IAL	16	16
Number of persons	13	Current number of persons on-board, including crew members: 0 - 8191; Default = 0 = not available; 8191 = 8191 or more.
Spare	3	Not used. Should be set to zero.
Total Number of bits	72	This International Function Message uses one slot.

This message is used to report the number of persons on board.				
1 slot	Transmission: Ship station	Reception: Shore station	Addressed	Acknowledgement: Not required

Table 1-6:   Message "PSEUDO-AIS TARGETS"

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	17
VTS Target 1	120	Refer to table below; occupies 2 slots
VTS Target 2	120	Optional; refer to table below; occupies 2 slots
VTS Target 3	120	Optional; refer to table below; occupies 3 slots
VTS Target 4	120	Optional; refer to table below; occupies 3 slots
Total Number of bits	Max 536	3 slots

Each VTS Target should be structured as follows:

Parameter	No. of bits	Description
Type of Target Identifier	2	Identifier Type; 0 = The target identifier should be the MMAI number. 1 = The target identifier should be the IMO number. 2 = The target identifier should be the call sign. 3 = Other (default)
Target ID	42	Target Identifier. The Target ID should depend on Type of Target Identifier above. When call sign is used, it should be inserted using 6-bit ASCII. If Target Identifier is unknown, this field should be set to zero. When MMSI or IMO numbers used, the least significant bit should equal bit zero of the Target ID.
Spare	4	Not used. Should be set to zero.
Latitude	24	Latitude in 1/1000 of a minute.
Longitude	25	Longitude in 1/1000 of a minute.
COG	9	Course over ground in degrees (0 - 359); 360 = 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.)
Parameter	No. of bits	Description
SOG	8	Speed over ground in knots; 0 - 254; 255 = not available = default
Total Number of bits	120	

This message should be used to transmit VTS targets.

This message should be variable in length, based on the amount of VTS targets.

The maximum of VTS Targets transmitted in one International FM 16 should be seven (7).

Because of the resulting effects of VDL channel loading, the transmission of International FM 16 should be no more than necessary to provide the necessary level of safety.

A VTS target should be only used, when the position of the target is known. However, the target identity and/or course and/or time stamp and/or speed over ground may be unknown.

This message is transmitted by a competent authority.

3 slots	Transmission: Shore station	Reception: Ship station	Broadcast	-

***

ANNEX 2

Table 2: Proposals on New Binary Messages

Name of Message	Description	Addressed/ Broadcast	(primary) Transmit Station	(primary) Receiv. Station	Massage Table No. (*)	Remarks
Clearance Time To Enter Port	Date, Time and Position	A	Ba	Mo	Table 2-1	Refer to Proposal from Germany
Rejection Of Approach To Harbour Entrance	Oil spilling, in Dangerous wreck , Heavily damaged	A	Ba	Mo	Table 2-2	
Derelicts (Drifting Objects)	Time and position of recognition, Name of Derelicts	B	Ba/Mo	Ba/Mo	Table 2-3	
Drifting Mines	Time and position of recognition, Drifting direction,	B	Ba/Mo	Ba/Mo	Table 2-4	
Wreck	Time and position of wreck, Wreck marking buoy, Navigable water-depth	B	Ba	Mo	Table 2-5	
Area To Be Noticed	Nature of Notice, Reason, Number of the corners of polygon, Positions of corners	B	Ba	Mo	Table 2-6	New, original Proposal
Aids To Navigation	Name, Position, Type, Status, Light character, Date and time of trouble occurred	B	Ba	Mo	Table 2-7	
Marine Traffic Signal	Station name, Position, Status, Signal in serve, Time and type of next signal	B	Ba	Mo	Table 2-8	
Fishing Activities	Fishing method, Radius of fishing circle with unit, Position of the centre of circle	B	Ba	Mo	Table 2-9	
Pilotage	On/off board of Pilot, Voyage with or without Pilot, Position and time of Pilot aboard	A	Mo	Ba/Mo	Table 2-10	
Navigation Support Lines	Name and type of lines, Start and end position of lines	B	Ba	Mo	Table 2-11	

Name of Message	Description	Addressed/ Broadcast	(primary) Transmit Station	(primary) Receiv. Station	Massage Table No. (*)	Remarks
Berth Data	Name and position of berth	A	Ba	Mo	Table 2-12	
Extended Voyage Related Data	Contact point on board, Agent and contact point, Name of berth at destination	A	Mo	Ba	Table 2-13	
Weather Report From Ships	Weather, Visibility, Wind speed, Wind direction and Air pressure observed on ships in navigation	B	Mo	Ba/Mo	Table 2-14	

Note: 1: A; Addressed Message, B; Broadcast Message, Ba; Base Station (= Shore Station), Mo; Mobile Station (= Ship Station)
          2: (*); These tables are given in the following pages.

Table 2-1: Message "CLEARANCE TIME TO ENTER PORT"

Parameter	No. of bits	Description
Message ID	6	Identifier for Message 6 (always 6)
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
Sequence number	2	0 - 3
Destination ID	30	MMSI number of destination station
Retransmit flag	1	Retransmit flag should be set upon retransmission: 0 = no retransmission = default; 1 = retransmitted
Spare	1	Not used. Should be set to zero.
IAI	16	Two-digit number (Should not be overlapped with any of the one used in other message.)
Clearance time to enter port, (UTC)	20	** day ** month ** hour ** minute
Clearance time to enter port, (LT)	20	** day ** month ** hour ** minute
Place	120	(Name of the port and berth, 20 characters)
Position, Lat	24	*** deg **.*** min
Position, Lon	25	***deg **.*** min
Sub-total	(297)	
Spare	63	Not used. Should be set to zero.
Total Number of bits	360	

This message is intended to provide specified ships with information on the granted port to call and time to enter.				
This message is transmitted by a competent authority responsible for control of ships to enter/leave port.				
2 slots	Transmission: Shore station	Reception: Ship station	Addressed	Acknowledgement: Required

Table 2-2: Message "REJECTION OF APPROACH TO HARBOUR ENTRANCE"

Parameter	No. of bits	Description
Message ID	6	Identifier for Message 6 (always 6)
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
Sequence number	2	0-3
Destination ID	30	MMSI number of destination station
Retransmit flag	1	Retransmit flag should be set upon retransmission: 0 = no retransmission = default; 1 = retransmitted
Spare	1	Not used. Should be set to zero.
IAI	16	Two-digit number (Should not be overlapped with any of the one used in other message.)
Place	120	Name of Port (20 characters)
Position, Lat	24	** deg **.*** min
Position, Lon	25	*** deg **.*** min
Reason for Rejection	2	Oil spilling, in danger to sink, heavily damaged, etc.
Sub-total	(259)	
Spare	101	Not used. Should be set to zero.
Total Number of bits	360	

This message provides specified ships with information on rejection of approach to a harbour entrance.

This message is transmitted by a competent authority responsible for control of ships to approach a harbour entrance.

2 slots	Transmission: Shore Station	Reception: Ship Station	Addressed	Acknowledgement: Required.

Table 2-3: **Message "DERELICTS (DRIFTING OBJECTS)"**

Parameter	No. of bits	Description
Message ID	6	Identifier for Massage 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	Two-digit number (Should not be overlapped with any of the one used in other message.)
Time of Recognition (UTC)	20	** day ** month ** hour ** minute
Time of Recognition (LT)	20	** day ** month ** hour ** minute
Place of Recognition	120	(20 characters)
Position of Recognition, Lat	24	** deg **.*** min
Position of Recognition, Lon	25	*** deg **.*** min
Type of Derelicts (Drifting objects)	3	Containers/Lumbers/Drums/Other/Unknown
Drifting Direction	3	N/NE/E/SE/S/SW/W/NW
Sub-total	(271)	
Spare	89	Not used. Should be set to zero.
Total Number of bits	360	

This message is intended to provide information on derelicts recognized at sea.				
This message is transmitted by a station which recognized the derelicts (drifting objects) at sea.				
2 slots	Transmission: Shore/Ship Station	Reception: Ship/Shore Station	Broadcast	-

Table 2-4: **Message "DRIFTING MINES"**

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	Two-digit number (Should not be overlapped with any of the one used in other message.)
Time of Recognition (UTC)	20	** day ** month ** hour ** minute
Time of Recognition (LT)	20	** day ** month ** hour ** minute
Place of Recognition	120	(20 characters)
Position of Recognition, Lat	24	** deg **.*** min
Position of Recognition, Lon	25	*** deg **.*** min
Drifting Direction	3	N/NE/E/SE/S/SW/W/NW
Sub-total	(268)	
Spare	92	Not used. Should be set to zero.
Total Number of bits	360	

This message intended to provide information on drifting mines recognized at sea.				
This message is transmitted by a station which recognized a mine drifting at sea.				
2 slots	Transmission: Shore/Ship Station	Reception: Ship/Shore Station	Broadcast	-

Table 2-5:   Message "WRECK"

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	Two-digit number (Should not be overlapped with any of the one used in other message.)
Time of Sinking occurred (UTC)	20	** day ** month ** hour ** minute
Time of Sinking occurred (LT)	20	** day ** month ** hour ** minute
Place of Sinking	120	(20 characters)
Position, Lat	24	** deg **.*** min
Position, Lon	25	*** deg **.*** min
Wreckage Marking Buoy	2	Yes/No/Unknown
Residual Water-depth (Navigable Water-depth)	6	0-62m: 63m; 1m step
Sub-total	(273)	
Spare	87	Not used. Should be set to zero.
Total Number of bits	360	

This message is intended to provide information on a sunken ship downed by accidents or disasters, including position, navigable water-depth, etc. This message is transmitted by a competent authority.				
2 slots	Transmission: Shore Station	Reception: Ship Station	Broadcast	-

Table 2-6:   Message "AREA TO BE NOTICED"

Parameter	No. of bits	Description
Message ID	6	Identifier of Message 8 (always 8)
Repeat Indicator	2	Used by the repeater to indicate how many times a message bas been repeated.
Source ID	30	MMSI number of source station
Spare	2	Not used. Should be set to zero.
IAI	16	Two-digit number (Should not be overlapped with any of the ones used in other messages.)
Navigational Restrictions	3	No restriction, Prudent manoeuvring required, Navigation and/or Anchoring prohibited, No Overtaking, Two-way navigation prohibited, etc.
Reason	120	(20 characters) e.g.; Under construction, Divers working, etc.
Date and Time of Commencement (LT)	20	** day ** month ** hour ** minute
Date and Time of Expiration (LT)	20	** day ** month ** hour ** minute
Number of Polygonal Apexes	3	* (Number)
Position 1, Lat.	24	** deg **.*** min
Position 1, Lon	25	*** deg **.*** min
Position 2, Lat	24	** deg **.*** min
Position 2, Long	25	*** deg **.*** min
Position 3, Lat	24	** deg **.*** min
Position 3, Lon	25	*** deg **.*** min
Position 4, Lat	24	** deg **.*** min
Position 4, Lon	25	*** deg **.*** min
Position 5, Lat	24	** deg **.*** min
Position 5, Lon	25	*** deg **.*** min
Sub-total	(467)	
Spare	117	Not used. Should be set to zero.
Total Number of bits	584	

This message is intended to provide information on navigational restrictions, positions, etc., of an area to be noticed.

This message is transmitted by a competent authority.

3 slots	Transmission: Shore Station	Reception: Ship Station	Broadcast	-

Table 2-7:   Message "AIDS TO NAVIGATION"

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	Two-digit number (Should not be overlapped with any of the ones used in other messages.)
Name of A to N	120	(20 characters)
Current Position of A to N, Lat	24	** deg **.*** min
Current Position of A to N, Lon	25	*** deg **.*** min
Type of A to N	2	Visual, Radio, Audible, Other
Status of A to N	4	In service/Light off/Irregular light characters/Collapse/Inclined/Shift/Washed away/Drifting/Fell out/Sunk (Submerged)/Intensity drop/Off-air/Power drop/Poor synchronization/Out of service/Other
Nation Code of Light Characters	10	Max: 512 codes
Light Characters	14	Max: 16,384 types
Luminous Range	5	0 - 31 nm.
Date and Time of Trouble occurred (UTC)	20	** day ** month ** hour ** minute
Expected Date and Time of Recovery (UTC)	20	** day ** month ** hour ** minute
Date and Time of trouble occurred (LT)	20	** day ** month ** hour ** minute
Expected Date and Time of Recovery (LT)	20	** day ** month ** hour ** minute
Sub-total	(340)	
Parameter	No. of bits	Description
Spare	20	Not used. Should be set to zero.
Total Number of bits	360	

This message is intended to provide information on operational status, recovery, etc. of Aids to Navigation.

This message is transmitted by a competent authority.

2 slots	Transmission: Shore Station	Reception: Ship Station	Broadcast	-

Table 2-8: **Message "MARINE TRAFFIC SIGNAL"**

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	Two-digit number (Should not be overlapped with any of the ones used in other messages.)
Name of Signal Station	120	(20 characters)
Position of Station, Lat	24	** deg **.*** min
Position of Station, Lon	25	*** deg **.*** min
Status of Signal	1	In regular or irregular service
Signal in Service	5	Flashing letter of I, O or F, or alternating letters of XI, XO or XF, etc., (*1)
Time of next Signal Sift (UTC)	11	** hour ** minute
Time of next Signal Shift (LT)	11	** hour ** minute
Expected Next Signal	5	Letter I, O, F, etc.
Sub-total	(258)	
Spare	102	Not used. Should be set to zero
Total Number of bits	360	

Note: (*1) These are coded signals being adopted in Japan to provide ships with the timing of entering or leaving port.

The codes stand for, e.g., I = "in-bound" only acceptable,
O = "out-bound" only acceptable,
F = both "in- and out-bound" acceptable,
XI = Code will shift to "I" in due time,
XO = Code will shift to "O" in due time, etc.

This message is intended to provide information on a signal station, status of the control signal now, etc., at the entrance of a harbour or channel where the shipping direction is controlled so that the traffic flow be kept in order.

This message is transmitted by a competent authority.

2 slots	Transmission: Shore Station	Reception: Ship Station	Broadcast	-

Table 2-9:   Message "FISHING ACTIVITIES"

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	Two-digit number (Should not be overlapped with any of the ones used in other messages.)
Fishing Method	2	Fixed net, Fishing in crowded or groups, Purse seining, etc.,
Radius of Operating Circle	10	0 - 1000
Unit of Radius above	2	m/km/nm/cable
Center of Circle above, Lat	24	** deg **.*** min
Center of Circle above, Lon	25	*** deg **.*** min
Sub-total	(119)	
Spare	17	Not used. Should be set to zero.
Total Number of bits	136	

This message is intended to provide situation, approx. position, etc, of a fishing activity in operation on water adjoining to a fairway.				
This message is transmitted by a competent authority.				
1 slot	Transmission: Shore Station	Reception: Ship Station	Broadcast	-

Table 2-10:   Message "PILOTAGE"

Parameter	No. of bits	Description
Message ID	6	Identifier for Message 6 (always 6)
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
Sequence number	2	0 - 3
Destination ID	30	MMSI number of destination station
Retransmit flag	1	Retransmit flag should be set upon retransmission: 0 = no retransmission = default; 1 = retransmitted
Spare	1	Not used. Should be set to zero.
IAI	16	Two-digit number (Should not be overlapped with any of the ones used in other messages.)
Pilot	2	on-board/off-board/no input
Pilot Arrangement	2	yes/no/no input
Place of Pilot aboard	120	20 characters
Position above, Lat	24	** deg **.*** min
Position above, Lon	25	*** deg **.*** min
Estimated Date and Time of Pilot aboard (UTC)	20	** day ** month ** hour ** minute
Estimated Date and Time of Pilot aboard (LT)	20	** day ** month ** hour ** minute
Sub-total	(301)	
Spare	59	Not used. Should be set to zero.
Number of bits	360	

This message is intended to provide information on arrangement, estimated boarding time, etc., of a pilot.				
This message is transmitted by a ship station on request from a competent authority.				
2 slots	Transmission: Ship Station	Reception: Ship/Shore Station	Addressed	Acknowledgement: Required

Table 2-11:   Message "NAVIGATION SUPPORT LINES"

Parameter	No. of bits	Description
Message ID	6	Identifier for Massage 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	Two-digit number (Should not be overlapped with any of the one used in other message)
Name of Line	102	(17 characters)
Nature of Line	5	Guide lines/Lead lines/Limits of Arc visibility and light sectors/Recommended fairways/Deep under-water fairways/Fairways advised through shore radar/General boundaries at sea/Port boundaries/Boundaries of zones in ports/Boundaries of fairways/Boundaries of fishing zones/Boundaries of anchorages/Boundaries of airports/Limits of ice fields/Other/Spare (32 types in total)
Line 1 Start Point, Lat	24	** deg **.*** min
Line 1 Start Point, Long	25	*** deg **.*** min
Line 1 End Point, Lat	24	** deg **.*** min
Line 1 End Point, Lon	25	*** deg **.*** min
Line 2 Start Point, Lat	24	** deg **.*** min
Line 2 Start Point, Lon	25	*** deg **.*** min
Line 3 Start Point, Lat	24	** deg **.*** min
Line 3 End Point, Lon	25	*** deg **.*** min
Sub-total	(359)	
Spare	1	Not used. Should be set to zero.
Total Number of bits	360	

This message is intended to provide nomenclature, original function, etc, of lines on a chart which are available as a supporting tool in marine navigation.

This message is transmitted by a competent authority.

2 slots	Transmission: Shore Station	Reception: Ship Station	Broadcast	-

Table 2-12: Message "BERTH DATA"

Parameter	No. of bits	Description
Message ID	6	Identifier for Message 6 (always 6)
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
Sequence number	2	0 - 3
Destination ID	30	MMSI number of destination station
Retransmit flag	1	Retransmit flag should be set upon retransmission: 0 = no retransmission = default; 1 = retransmitted
Spare	1	Not used. Should be set to zero.
IAI	16	Two-digit number (Should not be overlapped with any of the ones used in other messages.)
Name of Berth	120	20 characters
Position of Berth, Lat	24	** deg **.*** min
Position of Berth, Lon	25	*** deg **.*** min
Sub-total	(257)	
Spare	103	Not used. Should be set to zero.
Total Number of bits	360	

This message is intended to prevent ships from moving in an indecisive behaviour and/or at unnecessary slow speed in port, and subsequently contribute to efficiency of overall marine traffic, by providing information on the arranged berth to the ships of no pilot onboard or unfamiliar with the area.

This message is transmitted by a competent authority in charge of controlling ships to enter or leave port.

2 slots	Transmission: Shore Station	Reception: Ship Station	Addressed	Acknowledgement: Required

Table 2-13: Message "EXTENDED VOYAGE RELATED DATA"

Parameter	No. of bits	Description
Message ID	6	Identifier for Message 6 (Always 6)
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
Sequence number	2	0 - 3
Destination ID	30	MMSI number of destination station
Retransmit Flag	1	Retransmit flag should be set upon retransmission: 0 = no retransmission = default; 1 = retransmitted
Spare	1	Not used. Should be set to zero.
IAI	16	Two-digit number (Should not be overlapped with any of the ones used in other messages.)
Contact point on board	40	(Telephone No.; eleven-digit number, Ship telephone No.; eleven-digit number
Berth at next Port of Call	120	(20 characters)
Shipping Company or Agent	120	(20 characters)
Contact point above	54	(Telephone No.: fifteen-digit number; "Nation Code.; three digit" "Ship telephone No.; eleven-digit" "Spare; one-digit")
Sub-total	(422)	
Spare	162	Not used. Should be set to zero.
Total Number of bits	584	

This message is intended to provide ships with contact point onboard, name of the berth at next port of call, etc. This message is transmitted by a ship station interrogated from a competent authority.				
3 slots	Transmission: Ship station	Reception: Shore station	Addressed	-

NAV 54/18
ANNEX 2
Page 20

Table 2-14:   Message "WEATHER REPORT FROM SHIPS"

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	Two-digit number (Should not be overlapped with any of the ones used in other messages.)
Place of Observation	120	20 characters
Position of Observation, Lat	24	** deg **.*** min
Position of Observation, Lon	25	*** deg **.*** min
Date and Time of Observation (UTC)	11	* day ** month ** hour ** minute
Date and Time of Observation (LT)	11	** day ** month ** hour ** minute
Weather	4	Fine/Cloudy/Rain/Fog/Snow/Typhoon (Hurricane, Monsoon)
Visibility (View)	8	**.* nm
Average Wind speed	7	*** knots
Wind direction	9	*** degrees
Air pressure	9	**** hPa
Sub-total	(284)	
Spare	76	Not used. Should be set to zero.
Total Number of bits	360	

This message is intended to provide ships and/or shore institutes with weather information observed on a ship in navigation.				
2 slots	Transmission: Ship Station	Reception: Ship/Shore Station	Broadcast	-

_____

REVISION OF THE GUIDANCE ON THE APPLICATION OF
AIS BINARY MESSAGES

Submitted by Sweden

<table>
<tr><td colspan="2" align="center">SUMMARY</td></tr>
<tr><td><i>Executive summary:</i></td><td>This document proposes and gives the reasoning for a revision of SN/Circ.236 on the application of AIS binary messages</td></tr>
<tr><td><i>Strategic direction:</i></td><td>5.2</td></tr>
<tr><td><i>High-level action:</i></td><td>5.2.4</td></tr>
<tr><td><i>Planned output:</i></td><td>5.2.4.2</td></tr>
<tr><td><i>Action to be taken:</i></td><td>Paragraph 23</td></tr>
<tr><td><i>Related documents:</i></td><td>SN/Circ.236 and NAV 53/INF.12</td></tr>
</table>

Introduction

1   The AIS system has since its introduction proven to be quite useful for its main purposes although there are some technical limitations. The occurrence of inferior installations and incorrect/incomplete handling has also been frequently observed.

2   IMO has given guidance on the application of AIS binary messages in SN/Circ.236, developed by the Sub-Committee on Safety of Navigation at its forty-ninth session (30 June to 4 July 2003). SN/Circ.236 states that after a four year trial period "all SOLAS ships and a large number of non-SOLAS vessels are expected to be equipped with AIS, allowing IMO to evaluate the benefit and practicability of AIS binary messages, as well as the loading of the AIS frequencies".

3   The trial period has the merit of AIS binary messages been demonstrated but also the difficulty to get appropriate user interfaces onboard for non-standardized messages, except for very specialized purposes with a small user group.

IMO60
60 YEARS IN THE SERVICE OF SHIPPING

Background

4   Recommendation ITU-R M.1371-3, annex 5, provides guidance for the design of the application specific part of the binary message, called "function messages". The function messages are divided into "International Function Messages" and "Regional Function Messages" with the intention to allow regional development of messages in addition to the messages that are internationally agreed.

5   The increasing number of shipborne AIS units and the establishment of shorebased AIS infrastructure have in some areas lead to a high utilization of the limited capacity of the AIS VHF data link (VDL) and a further increase can be expected. Therefore, it is important that IMO gives guidance for the use of AIS binary messages so that the main functions of AIS will not be impaired.

6   When the use of binary messages is discussed it is important to focus on the main functions of the whole AIS system. The technical characteristics, the loading of VDL, the man-machine interface and other available or emerging communication methods must be taken into account.

Technical limitations

7   The principle of operation of AIS is based on the use of well defined time slots. Under steady-state conditions, each unit pre-announces its planned transmissions in order to give other units, within its coverage area, the possibility to avoid transmissions in the same timeslot (Self Organized Time Division Multiple Access – STDMA). Each ship makes up a "cell" together with other ships in its coverage area. Ships normally participate in several cells which partly overlap each other and receive transmissions that are not coordinated in time. Weaker signals are discriminated in the receiver if there is a sufficient difference in signal strength.

8   The resulting effect is, that there is a high probability of successful reception of an AIS message from ships close to own ship and that the probability decreases with increasing distance and load on the VDL. The throughput, the percentage of messages that are successfully received, will vary.

9   The coverage area of a ship in position R can be estimated as a circular area with the radius "r". If free timeslots are available can "r" approximately be determined by the height of the transmitting and receiving antennas (line of sight). When the load on VDL is increased over the nominal capacity, will "r" decrease and be determined by the availability of time slots.

10   Shore based AIS stations normally have coverage areas which are much larger than the coverage areas of ships. The shore based stations therefore receive transmissions from multiple different uncoordinated cells which may cause garbling. With a high load on the VDL this problem increases.

11   Slots may also be reserved for use by the shore based AIS stations. These slots are "protected" up to 120 Nm from the transmitting stations by all mobile units that have received the reservation message (ships approaching the station normally do not receive the message at such a long distance). Such slots may also be used by ship stations when interrogated from a shore station. Mobile stations may be interrogated for dynamic and static data; other messages must be transmitted in slots reserved by the unit itself.

12   The resulting effect of the reservations from shore based stations is that a significant number of slots can be made unavailable for use by ships in large areas without making the slots free from interference. The probability of receiving transmissions from shore stations decreases with increasing distance between ship and shore station and with increasing load on the VDL.

13   The mechanism for transmission of unscheduled messages, for example when a ship increases its update rate due to a change of course, involves an increased risk of collision with other transmissions. The probability for a successful reception of such messages decreases with increasing load on the VDL and with distance.

14   For broadcasted AIS message there is no function available to check if and by whom the message is successfully received. This problem is normally mitigated by repeated transmissions which increase the probability for successful reception but increases the VDL load. For addressed messages an acknowledgement can be requested from the receiving part, which also creates a load on the VDL.

Load on the VDL

15   In some areas a relatively high load on VDL has been observed and under extreme VHF conditions the nominal maximum load can be exceeded. The load on the VDL is expected to increase further due to an increased use of AIS, both on board and ashore. Examples are:

–   General increase in ship traffic
–   Mandatory carriage of AIS for ships >500 tons in domestic traffic
–   Voluntary installation of AIS on ships <500 tons
–   Local requirements in special areas
–   Use of AIS for inland shipping
–   Expected requirements on AIS for fishing vessels
–   AIS on pleasure crafts
–   AIS on AtoN
–   Increased number of transmitting basestations
–   Distribution of DGNSS corrections via AIS
–   Introduction of new services utilizing AIS binary messages

16   In order to not impair the main functions of AIS, which is based on the transmissions from ships, the transmissions from shorestations must leave sufficient VDL-capacity for the transmissions from ships. The accumulated effect of slot reservations from multiple shore stations, which are valid up to 120 Nm from each station, must be considered.

17   A significant load on the VDL can be caused by AIS binary messages. This type of load is to a large extent under control of the administrations by decisions on the services provided via AIS.

AIS binary messages

18   ITU Recommendation ITU-R M.1371-3 provides the Technical Characteristics for AIS and facilitates theoretically for a large number of different AIS binary messages, that may be developed nationally or regionally. The capacity of the VDL does however limit the amount of messages that can be transmitted without impairing the mainfunction of AIS.

19   The practical use of AIS binary messages is presently further limited by the onboard availability of a suitable user interface, dedicated SW and presentation display. Every AIS binary message will require unique software for the interpretation and presentation of its information to the recipient.

Future development

20   There is an increasing demand for digital communication between shore and ship, shown for example in the concept of e-navigation. These demands can not be fulfilled by binary messages via the present AIS-equipment, and therefore additional communication means are required.

21   A possible future way to increase the capacity for communication would be to use AIS binary messages to advice ships on an additional, local VHF radio channel, which could be used for non-safety critical data-communication. This additional channel could then be used by a modified AIS equipment or a separate new equipment.

Proposal

22   It is proposed to set up a Correspondence Group with the task to review and amend SN/Circ.236 Guidance on the application of AIS binary messages. The new document should include an updated list of recommended AIS binary messages and guidance for their application and also guidance for the application of regionally/nationally developed AIS binary messages. Draft Terms of Reference (ToR) for a Correspondence Group on AIS binary messages is set out at annex.

Action requested of the Sub-Committee

23   The Sub-Committee is invited to note the comments and information provided above and to decide as appropriate.

<p align="center">***</p>

ANNEX

DRAFT TOR FOR A CORRESPONDENCE GROUP ON AIS BINARY MESSAGES

The Correspondence Group should evaluate the use of binary messages in the trial period as identified in SN/Circ.236 and select and propose a revised set of AIS binary messages for international use. The Correspondence Group should in the selection of messages consider:

–   the operational need;

–   other/existing methods to fulfil the need;

–   user interface onboard, both for presentation and input of information; and

–   the technical limitations.

The Correspondence Group should develop guidance for the use of AIS binary messages to ensure that the main functions of AIS are not impaired due to overloading of the VDL. In developing the guidance, consideration should be given to the use of binary messages defined by IMO as well as binary messages developed regionally.

[The Correspondence Group should further evaluate the need for additional means of communication, given the increasing demand for digital communication between shore and ships.]

_____

SUB-COMMITTEE ON SAFETY OF
NAVIGATION
54th session
Agenda item 18

NAV 54/INF.8
25 April 2008
ENGLISH ONLY

REVISION OF THE GUIDANCE ON THE APPLICATION OF AIS BINARY MESSAGES

The Baltic AIS trial (AISBALTIC) project

Submitted by Finland and Estonia

<table>
<tr><td colspan="2" align="center">**SUMMARY**</td></tr>
<tr><td>*Executive summary:*</td><td>This document describes the activities undertaken, preliminary results and future actions of the Baltic AIS trial (AISBALTIC) project. The aim of the project is to enhance the use of Automatic Identification System (AIS) binary messages</td></tr>
<tr><td>*Strategic direction:*</td><td>5.2</td></tr>
<tr><td>*High-level action:*</td><td>5.2.4</td></tr>
<tr><td>*Planned output:*</td><td>5.2.4.2</td></tr>
<tr><td>*Action to be taken:*</td><td>Paragraph 24</td></tr>
<tr><td>*Related document:*</td><td>SN/Circ.236 – Guidance on the Application of AIS Binary Messages</td></tr>
</table>

Introduction

1   Maritime safety, security and environmental authorities monitor vessel traffic and provide information and services to vessels. Today AIS is one of the most significant information sources for these activities. At the same time there is an observed need to reduce workload caused on ships and authorities by various demands for reporting and to improve quality and reliability of information available. This can be achieved by reducing verbal communication, i.e. VHF radio traffic and minimizing the requirement of providing the same information time and time again to different systems. While doing this, the availability of the specific information needed by maritime safety and environmental authorities to enhance safety, security and protection of the environment can also be improved.

2   VTT Technical Research Centre of Finland, Finnish Maritime Administration, Estonian Maritime Administration, Swedish Maritime Administration, The Finnish Environment Institute (SYKE) and Finnish Coast Guard launched a project named the Baltic AIS trial (AISBALTIC) in May 2007. The project is under the Tedim (Telematics in Foreign Trade Logistics and Delivery

IMO60
60 YEARS IN THE SERVICE OF SHIPPING

Management) umbrella and is a part of the HELCOM Baltic Sea Action Plan. The aim of the project is to enhance the use of AIS binary message information exchanged between vessel traffic and authorities by testing the technical usability of the Automatic Identification System (AIS) binary messages and evaluating the information content of the AIS binary messages.

Project activities

3   Maritime safety, security and environmental authorities in different countries share the same operational information needs. The majority of the information needed is not available by other means than VHF-communication, e-mail or fax, all information exchange methods that increase the workload on board vessels. The starting point of the AISBALTIC project was first to identify very comprehensively the information needs of the authorities, prioritize these information needs based on how essential the information is for their core task and how critical it is to obtain the information reliably and at all times. These information needs where then further analysed and defined until the common information needs of the Baltic Sea maritime safety, security and environmental authorities.

4   The views on operational information needs were gathered and refined in two expert workshops and two Internet based sessions. Thirty-three representatives from Estonia, Denmark, Finland, Germany, Lithuania, Norway, Poland, Sweden, the European Maritime Safety Agency (EMSA), the European Commission and HELCOM participated in the work, representing maritime safety, search and rescue, environment, pollution preventing and combating as well as maritime security authorities.

5   Information needs were surveyed by first identifying the tasks and responsibilities whose successful execution would be significantly improved if the information needed would be available in AIS. Then the information needed for the tasks and responsibilities were gathered. Finally the prioritization of information needs resulted in an extensive list of information items that were considered to be amended to AIS binary messages.

6   A computerized ThinkTank system, enabling the inclusion of a large number of participants in each phase, was used to ensure that the results are comprehensive and include the views of all participants.

7   In parallel with the meetings, full-scale transmission tests of the IMO defined binary message applications defined in SN/Circ.236 were conducted between Maritime Traffic Centre in Helsinki and ships to analyse the technical usability of binary messages. The tests included binary message Applications 1 "Meteorological and hydrological data", 2 "Dangerous cargo indication", 3 "Fairway closed", 5 "Extended ship static and voyage related data" and 7 "Pseudo-AIS targets". Five ships from TallinkSilja, Neste Shipping and the Finnish Coast Guard participated in the tests and were equipped with dedicated software for sending and receiving the new binary messages.

Preliminary results

8   As a result of the meetings and Internet sessions, the participants concluded that it would be reasonable to evaluate possible changes to the existing messages or introduction of new ones, e.g., regarding following issues:

      .1   improvements in reporting of dangerous cargo. Increased information content is desired;

.2 careful evaluation of the meteorological and hydrological information binary message application aiming to enhance its usability. This includes, e.g., considering whether information from several weather sensors in different locations could be included in the same message and whether it would be reasonable or split up or shorten the message;

.3 amendments of the ship type definition, which presently is very general, to better meet the needs of the users;

.4 consideration of a new binary message, or messages, for multi-use communication of area information from shore to ship. This message could be used, e.g., to indicate an area to be avoided, SAR operation area or an area where other deviating procedures apply. The message might also be used for communication of route information from shore to ship, e.g., recommended routes, recommended tracks through ice, waypoints to anchorage. A similar message for ship-to-shore information could also be motivated; and

.5 extension of "Extended Ship Static and Voyage Related Data" binary message application (SN/Circ.236), which only contains air draught, to include more widely needed data.

Additional observations

9 The comprehensive use of LOCODEs (United Nations Code for Trade and Transport Locations) in the various AIS messages was seen necessary. However, a majority of the mariners are apparently not aware of LOCODEs or the purpose for their use. It was considered that the use of LOCODEs on board ships should be made mandatory and that their use should be supported in a user-friendly way by AIS equipment.

10 It was noted that the onboard usability of a majority of the AIS information is highly dependent on the availability of ECDIS (Electronic Chart Display and Information System) and other equipment capable to display the information in a user-friendly way. Ships equipped only with the Minimum Keyboard and Display (MKD) cannot take the full advantage of the information distributed by AIS.

Observations from the full-scale transmission tests

11 The full-scale transmission tests of binary message applications (SN/Circ.236) between Maritime Traffic Centre in Helsinki and ships showed the usefulness of the binary messages and the potential they provide for future. However, relevant observations were made, e.g.:

.1 older versions of integrated navigation systems do not understand binary messages (including, e.g., interrogation messages for binary messages) and create alarms at reception of those;

.2 the Pilot plugs seem often to be coupled wrongly. Out of five test ships, two were connected correctly, in two ships the transmission line wires were incorrectly connected and in two ships the Pilot plug was not connected at all. The problem might be common, but is usually not noticed because of the infrequent use of the Pilot plug;

.3   the specification of binary message Application 1 "Meteorological and hydrological data" has been interpreted differently by different stakeholders causing differences in implementation and problems in compatibility;

.4   the specification of the Application 1 also assumes that each weather station which is used would have an MMSI number, but this is not always the case; and

.5   the interpretation of the parameter "Extension of closed area (radius)" in binary message Application 3 "Fairway closed" was unclear for the test users.

12   Binary messages proved to be very useful for VTS. The use of VTS footprint messages and other relevant messages should be agreed upon to assure the efficient use of binary messages as a part of VTS systems. The use of binary systems should be a part of VTS systems functions.

Future work

13   To continue the project work, three working groups are established to define and specify the project's common view on amendment needs to the AIS messages. The aim of the working groups is to specify proposals for the binary message information content and take the messages into test use. The focus of the three groups will be the issues identified so far. In order to archive best possible results, both operational substance matter experts and technical experts are invited to each working group. The work of the groups is planned to be finalized during autumn 2008.

Reporting of results

14   The final results of the AISBALTIC project will be reported to the Sub-Committee in 2009.

Action requested of the Sub-Committee

15   The Sub-Committee is invited to note the above information.

_____