

**17<sup>th</sup> CHRIS MEETING  
Rostock, Germany, 5-9 September 2005**

**Paper for Consideration by CHRIS**

**AGENDA ITEM 7: Marine Information Objects (MIO)**

**Proposal for a New Work Item for HGMIO: Aids to Navigation Status**

1. Summary

<b><i>Submitted by:</i></b>	IHB
<b><i>Executive summary:</i></b>	IALA has established a WG to study how to transmit to ships at sea the status of Aids to Navigation (AtoN) and display this information on ECDIS. IHO participation in this WG has shown that AtoN status could form an MIO layer on top of the ENC. Following a request by IALA, an IHO-IALA workshop on this topic took place at the IHB on 28 June 2005, which has confirmed the appropriateness and feasibility of developing AtoN status as a new MIO category.
<b><i>Actions to be taken:</i></b>	CHRIS is requested to approve "Aids to Navigation Status" as a new Work Item for HGMIO.
<b><i>Related documents:</i></b>	Doc. CHRIS17-7A

2. Introduction / Scope

IALA has established an e-ANSI (Electronic Aids to Navigation Service Information) Working Group with the aim to provide automatically real-time information to ships on the status of Aids to Navigation (AtoN) that are critical for the safety of navigation and the protection of the marine environment. It is intended that any change in the operational status of an AtoN, from the charted information, be indicated preferably on an ECDIS. E-ANSI should complement the IHO-IMO WWNWS. In areas where AIS is in use, it is believed that this system would be suitable for broadcasting e-ANSI messages. More information in Annex B.

3. Analysis/Discussion.

Participation of IHO representatives in e-ANSI WG meetings has shown that AtoN status could be displayed on an ECDIS, on top of the ENC, as a Marine Information Object (MIO) layer. Following a request from the IALA Secretary-General to the IHB President (see Annex A), an IHO-IALA workshop on "International Standardization of e-ANSI Information in ECDIS" took place at the IHB on 28 June 2005. The Workshop was successful in initiating the definition of a specific MIO layer for e-ANSI and in determining an action plan for establishing a Register for S-57 e-ANSI objects/attributes as well as the best approach to display e-ANSI information. More information in CHRIS17-7A.

4. Benefits.

Displaying information on AtoN status on ECDIS, as an MIO layer, should enable mariners to assimilate the total real-time situation of charted information, AtoNs and shipping in their vicinity rapidly and unambiguously in all weather conditions, thus contributing to improve the safety of navigation.

5. Working Groups.

HGMIO, in liaison with TSMAD (data encoding) and CSMWG (data display).

6. Other relevant information.

IHO contribution to e-ANSI will mainly consist in providing S-57 / S-52 expertise in developing and implementing the “AtoN Status” MIO layer. The estimated resource required on the IHO side is of 15 persons x days.

7. Priority.

High.

8. Target completion date.

2007.

9. Action Required.

CHRIS is requested to approve “Aids to Navigation Status” as a new Work Item for HGMIO.

**IALA Letter to IHB on Aids to Navigation Status and ECDIS**

*Note: ANIS (Aids to Navigation Information Service) has now been changed to e-ANSI (Electronic Aids to Navigation Service Information).*

Vice Admiral Alexandros Maratos  
President,  
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MC 98011 Monaco Cedex  
PRINCIPAUTE DE MONACO

St Germain en Laye, 27 January 2005

Our ref : C05-056

**Re : ANIS4 WG**

Dear Admiral Maratos,

First of all, I would like to express my thanks for sending IHO representatives to the 3rd meeting of the ANIS WG which took place on 12-13 January 2005 at IALA Headquarters, St Germain en Laye, and for your acceptance to host the next meeting at the IHB on 28-30 June 2005.

From the discussions held with the IHO representatives, it appeared that the implementation of the ANIS concept should have no impact on the IMO/IHO World-Wide Navigation Warning System (WWNWS). In effect, it is intended to make use of local communication means, e.g. Automatic Identification Systems (AIS) in areas where it is in use, to broadcast the relevant ANIS information in an appropriate data format.

However, the suggestion made by the IHB representative, Mr Michel Huet, that ANIS information could form a Marine Information Object (MIO) layer, to be shown on top of the ECDIS/ENC display, was considered with interest by the meeting. As a result, it has tentatively been planned that the next meeting of the ANIS WG will include a one-day workshop on the matter.

I would therefore be grateful if appropriate IHO experts could be invited to attend this meeting, with a view to developing an MIO layer on ANIS information, based on the IHO standard S-57, as well as a symbology consistent with that used for ECDIS.

I look forward hearing from you.

Yours sincerely,

Torsten Kruuse  
IALA Secretary General

## IALA Recommendation on electronic aid to navigation service information (e-ANSI) (Draft)

### Part 1 – Introduction and Description

#### 1. Introduction

The objective of the Electronic Aids to Navigation Service Information (e-ANSI) is to provide automatically real-time information to ships on the status of aids to navigation that are critical for the safety of navigation and the protection of the marine environment. The concept is that the ECDIS or other suitable Electronic Display used on board the ship for navigational purposes can indicate when knowledge is received that the operational status of an AtoN has changed from the information provided on charts of the area, or when aids to navigation are being used to mark uncharted wrecks or other new hazards so that mariners have up to date navigational information on the area in which they are sailing.

As shipborne display techniques develop, the method of presentation should enable mariners to assimilate the total real-time situation of charted information, AtoNs and shipping in their vicinity rapidly and unambiguously in all weather conditions.

It is intended that e-ANSI will complement the IMO/IHO World-Wide Navigational Warning Service (WWNWS) by introducing a method capable of advising shipping automatically of any changes to the status of the Aids to Navigation Service in their immediate vicinity that would present a serious risk to their navigational safety. The information broadcast to shipping also being provided to the WWNWS National Co-ordinator for action as necessary within the WWNWS.

#### 2. Description

e-ANSI is based fundamentally on the use of remote monitoring system by Aids to Navigation Authorities and the use of local communication systems to broadcast the relevant information in an appropriate data format. In areas where AIS is in use, the system would also be suitable for broadcasting e-ANSI messages.

Remote monitoring systems are currently used by many Aids to Navigation Authorities to gather information about the performance of selected Aids, for both operational and maintenance purposes. E-ANSI would select from the monitoring system information relevant to the operational status of all monitored Aids, compare it with a list of malfunctions/defects appropriate for that particular type of Aid (see Part 2) and if the malfunction or defect is included in the list, automatically initiate an immediate broadcast to local shipping.

In addition, Aid to Navigation Authorities will be able to initiate immediate warnings to shipping through e-ANSI if there is:

- a shipping casualty or other uncharted hazard in the local area; or,
- a malfunction or defect to an Aid to Navigation is reported by any other means, including un-monitored aids.

To ensure that shipping entering the area is aware of the danger while the navigational risk continues to be present:

- e-ANSI “change of status” messages will be continuously broadcast at intervals of 2 – 3 minute until the status of the Aid is returned to normal;
- e-ANSI “uncharted hazard” messages will be continuously broadcast at intervals of 2 – 3 minutes until either the hazard has been removed or the information has been incorporated onto

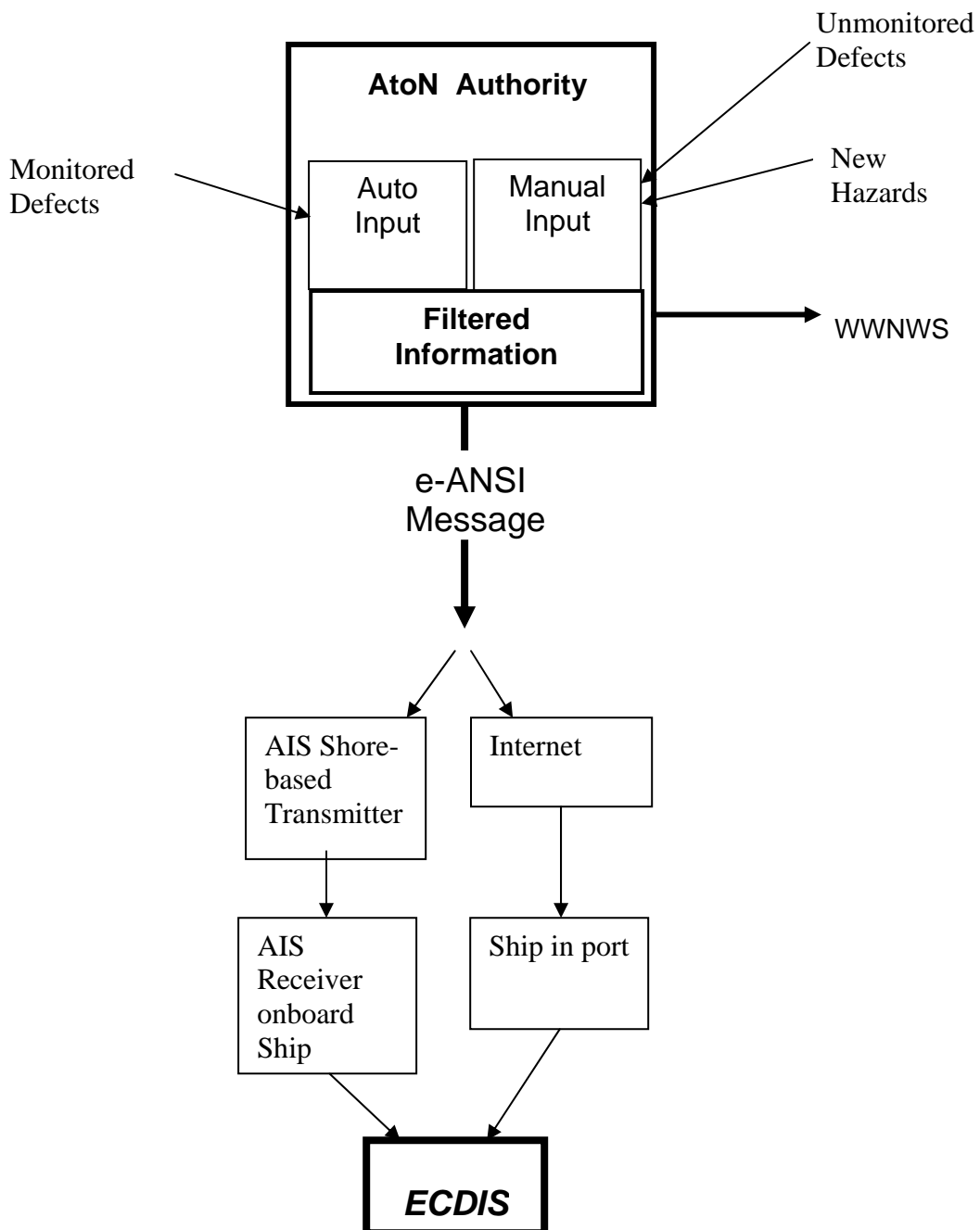
a chart. In the latter case, the message will continue to be broadcast for six weeks after the charts of the area has been updated by the appropriate Charting Authority.

When no malfunction or defect has been identified or reported and there are no uncharted hazards in the area concerned, e-ANSI will broadcast a communication check message at intervals of 30 minutes.

Aids to Navigation Authorities should inform mariners on the limits of the areas concerned by the service.

### Electronic Aid to Navigation Service Information (e-ANSI)

#### Illustrative ECDIS Functional Diagram



- Notes.**
1. Communication check e-ANSI messages are broadcast at intervals of 30 minutes.
  2. Malfunction/defect e-ANSI messages are broadcast at intervals of 2 – 3 minutes until the malfunction/defect is rectified.
  3. New or uncharted hazard e-ANSI messages are broadcast at intervals of 2-3 minutes until either the hazard is removed or the hazard has been charted for a period of six weeks.

### **3. e-ANSI messages**

Initially there will be five different types of e-ANSI messages, respectively containing information on the following situations:

- Message type 1 - A drifting floating aid and its current position;
- Message type 2 - A new or uncharted hazard;
- Message type 3 - The malfunction of an AtoN;
- Message type 4 – A message to cancel any Message Type 1, 2 or 3 that is no longer applicable; and,
- Message type 5 – A communication check message.

Details of the information contained in each type of message are given in Part 3.

### **4. Display of e-ANSI Information**

e-ANSI messages will be connected directly to the ship's "Operational Display" through the interface standards set out in IEC Publication 1162 – "Digital Interface – Navigation and Radiocommunication equipment on board ships".

In the first instance the "Operational Display" is expected to be an Electronic Display and Information System (ECDIS). However developments are currently taking place on "Head-up" chart displays and on three dimensional displays that are expected to be able to reproduce the view seen from the bridge of a ship in clear weather conditions in the form of a "virtual reality display".

The attention of ships' navigating officers will be drawn to a change of the status of an AtoN by the appropriate chart symbol flashing or by a similar form of attention getting and the details of the malfunction will be available on selection. In the case of a new wreck or other uncharted hazard, the attention will be drawn to the situation by the area concerned being highlighted in a manner similar to the change of status of an AtoN and the details will be available on selection.

Message Types 1 and 3 are transmitted continuously at intervals of 2-3 minutes until the hazard, disruption or malfunction is removed or rectified. Information from these messages should stop being on receipt of an appropriate Message type 4.

Message Type 2 is transmitted continuously at intervals of 2-3 minutes until either the hazard is removed or a period of six weeks has elapsed since the hazard was charted by the local Charting Authority. Information from these messages should stop being displayed on receipt of an appropriate Message type 4.

Message Type 5 is transmitted at intervals of 30 minutes when no messages type 1, 2, or 3 are being transmitted. Messages of this type should not be shown on the display but information about the latest communication check should be available on selection

**Part 2**

**AtoN Operational malfunctions/defects  
that should initiate an e-ANSI message**

<b>IDENTITY</b>	<b>TYPE OF AtoN</b>	<b>NATURE OF MALFUNCTION/DEFECT</b>
	Light	Total failure Reduction of range to less than 50% of nominal range Incorrect character/code
	Leading Light	Total failure of one or both lights Reduction of range to less than 50% of nominal range of one or both lights
	Sector Light	Total failure Reduction of range to less than 50% of nominal range
	Synchronised Lights	Failure of synchronisation
	Buoy Light vessels Light float LANBY	Sunk Drifting Out of position Top Cardinal mark unrecognisable
	Beacon	Missing Top mark unrecognisable
	Fog signal	Total failure
	Racon	Total failure 3 MHz band failure 9 MHz band failure Incorrect character/code
	DGNSS station	Total failure Reduction of range to less than 70% of nominal range Monitored GNSS unreliable
	AIS as AtoN	Creation (virtual AtoN) Total failure
	VTS	Total failure

### Part 3 – e-ANSI Message construction

Message Section	Contents of section	e-ANSI Message Type				
		1	2	3	4	5
1	Message Identifier	Yes	Yes	Yes	Yes <sup>1</sup>	Yes
2	Date and time of transmission of message	Yes	Yes	Yes	Yes	Yes
3	Description of message	Drifting Floating Aid	New or uncharted hazard	AtoN malfunction or defect	Cancellation of e-ANSI message	Communication check
4	Identity of AtoN <sup>2</sup>	Yes		Yes		
5	Charted position <sup>3</sup> of AtoN	Yes		Yes		
6	Location of new or uncharted hazard		Yes <sup>4</sup>			
7	Nature of hazard, malfunction or failure		Yes	Yes		
8	Last known position <sup>2</sup> of AtoN when different to charted position <sup>2</sup>	Yes				
9	Date and time of last known position	Yes				
10	Present track and estimated speed of drift of AtoN	Yes				
11	Date and time of occurrence		Yes	Yes		
12	Estimated duration of new or uncharted hazard	Optional	Optional	Optional		
13	Spare					
14	Spare					
15	Spare					
16	Spare					
17	Spare					
18	Spare					

<sup>1</sup> The Message Identifier for a Message Type 4 should be the same as that used for the message being cancelled.

<sup>2</sup> Identity of AtoN given in IHO international chart related documentation to be used.

<sup>3</sup> All positions to be obtained by reference to the IHO WGS 84 geodetic datum.

<sup>4</sup> The location of the new hazard may be identified by a position defined by its latitude and longitude and the radius of a circle surrounding that position or by developing a polygon of positions each defined by its latitude and longitude



