

**IHO Colours & Symbols Maintenance Working Group (C&SMWG)
15th Meeting, BSH, Rostock, Germany, 2-4 May 2005**

Ref: HA405/004/033-01

NOTE: this is an internal document of the UKHO and is supplied for information purposes for use of the IHO C&SMWG15 only. It must not be copied or distributed to any other party without the express permission of the UKHO. Please contact Andrew for more details (Email: Andrew.Coleman@UKHO.gov.uk)

CHARTING OF AIS ON NAVAIDS

Reference

HA405/8004/033-01 Nautical Charts – Policy – Automatic Identification Systems

Introduction

1. Following some correspondence on the charting of AIS on Navigational Aids, UKHO's Head of Charting (National) required a document to be drafted on UKHO's planned treatment of AIS for charts (paper and ENC), NMs, NP 100, ALRS and ALL for approval in UKHO, agreement with MCA and ready for despatch to Trinity House well before the IALA Meeting 12 April (E20 in reference file).

Background

2. The charting of AIS (Automatic Identification Systems) on Navigational Aids (otherwise referred to as Nav aids, Aids to Navigation or AtoN) was first raised with UKHO by Keith Berry, Harbourmaster, Port of Dundee (by email dated 13/12/04 – E2 in reference file). Dundee planned to fit the fairway buoy with an AIS transceiver, capable of transmitting wave heights to vessels approaching the R Tay. Annual NM 17A (2005) lists other trials of AIS on Nav aids around UK.
3. Further research into the fitting of AIS to nav aids was undertaken, and some related papers and correspondence are in the reference file. A particular useful source of information is IALA 'Recommendation A-126 on The Use of the AIS in Marine Aids to Navigation, Edition 1, Dec 2003' (copy at E6 in reference file). The following extract explains the possible uses of AIS on Nav aids:

The primary purpose of applying AIS to AtoN is to promote and enhance safety and efficiency of navigation by one or more of the following:

- Providing a positive and all-weather means of identifying an AtoN on AIS and on ships' radar displays (when linked to AIS);
- Complementing existing signals from AtoN;
- Transmitting accurate positions of floating AtoN (possibly corrected by DGNS);
- Indicating if a floating AtoN is off station;
- Providing reference points for a ship's radar;
- Providing a complementary service to Racons;

- Providing Synthetic AIS AtoN (Note 1);
- Providing Virtual AIS AtoN (Note 2);
- Marking or delineating tracks, routes, areas, and limits (for example areas to be avoided and Traffic Separation Schemes (TSS));
- Marking of offshore structures (for example wind turbines, oil and gas platforms);
- Providing weather, tidal, and sea state data.

Note 1. Synthetic AIS AtoN – the AtoN physically exists, but the AIS Station is located remotely from the AtoN. Synthetic AIS AtoN may be ‘Monitored’ or ‘Predicted’.

Note 2. Virtual AIS AtoN – used to transmit a message 21 for an AtoN that does not physically exist. [More details of synthetic and virtual AIS AtoN are available in the paper, but are not relevant for permanent paper charting purposes, although they may be relevant for ECDIS].

A further set of benefits may include the following:

- Monitoring the status of an AtoN;
- Tracking an AtoN that is off position;
- Identifying ships involved in collisions with AtoN;
- Gathering real-time information on the ‘state of health’ of an AtoN;
- Remotely controlling changes in AtoN parameters.

AIS may be applied to both floating and fixed AtoNs, and more than one AIS message format may be transmitted as noted above. The service provider has an obligation to verify the broadcast information and the correct operation of the AIS for AtoN.

Consultation

4. IMO SN/Circ.243 (Guidelines for The Presentation of Navigation-Related Symbols, Terms and Abbreviations) states:

These guidelines apply to all shipborne navigational systems and equipment. The symbols listed in the appendix should be used for the display of navigation-related information to promote consistency in the symbol presentation on navigational equipment. The symbols listed in the Appendix should replace symbols which are currently contained in existing performance standards. Where a standard symbol is not available, another symbol may be used, but this symbol should not conflict with the symbols listed in the appendix.

The symbol for an AIS based AtoN is quoted as:

Diamond with crosshair centred at reported position. (Shown with chart symbol. Chart symbol not required for radar.)

An extract is at E16 of the reference file. It is not known what consultation there was between IMO and IHO in deciding on this symbol [Later: Mathias Jonas of the CSMWG was involved]. Such a symbol is definitely unsuitable for paper charts; for example, combining with the magenta Racon circle would be impossible.

5. **UK’s Maritime Coastguard Agency (MCA)** (Joe Collins, Head of Navigation Safety Branch), when consulted, stated that “this is primarily an Aid to Navigation issue – I’d welcome the General Lighthouse Authorities views in the first instance” (E14 in reference file).
6. **General Lighthouse Authorities (GLA):** Representatives of Trinity House (Nick Ward, Duncan Glass) and Northern Lighthouse Board (Guy Platten) were consulted and they consequently discussed the issue in a GLA inter-exchange

group (which included Irish Lights). They were definite that AIS on Nav aids should be charted, and suggested a method which was not fully practical and to which UKHO responded (E16 in reference file). Subsequently they tabled the issue at an IALA AIS Committee meeting, which issued a Liaison Note, at Annex (Comments in [] added). This liaison note will be submitted to the IALA Aids to Navigation Management Committee meeting 12-15 April.

Conclusions

7. The proposal at the end of the IALA Liaison Note (at Annex) conforms to UKHO's judgment, ie that the best way to chart AIS on Nav aids is to add the abbreviation AIS as a legend next to the symbol for the Nav aid. To be consistent with other radio transmitted devices such as Racons, the legend should be in magenta. This will help to distinguish from the nav aid's name/designation, light and fog signal descriptions, which are all in black. The legend should be upright for fixed structures, sloping for floating aids, in conformity with normal practice.
8. This symbol/abbreviation will need to be included in the Symbols and Abbreviations Book, Chart 5011 (INT 1). As a New Edition of 5011 has just been closed for printing, it will be necessary to issue a NM correction for the New Edition, as soon as the policy is agreed. This will serve to draw the mariner's attention to the new symbol.
9. If thought necessary, a (T)NM could be published explaining the purpose behind the new symbol. The text of the (T)NM would be used as a basis for revising ANM17A, which would cancel the (T)NM when published.
10. The information provided in The Mariner's Handbook (NP100) can be updated if necessary as the use of AIS on nav aids becomes proven.
11. No note should be added to charts. The boxed publication note refers to ANMs, the Mariners Handbook and Chart 5011 and this is sufficient. To insert a specific note on all charts which include an AIS equipped nav aid could result in a proliferation of notes, the details of which would soon become well known and unnecessary. This would be potentially a huge chart correction load, unwelcome to HOs and chart users alike.
12. Details of the AIS services would be appropriately provided in associated publications (ie Admiralty List of Radio Signal), in a similar way to Racons
13. These proposals are UKHO specific at present. IHO should be asked to consider them, through the Chart Standardization and Paper Chart Working Group (CSPCWG) and other ENC WGs. It is noted that the IALA Liaison Note proposes that IALA should submit a paper to IHO (paragraph 3 of Annex).

Andrew Heath-Coleman
Operations Support (Standards Section)
04 April 2005

AIS16/output/02
4 March 2005

Liaison Note Charting of AtoN AIS

1 Introduction

In response to questions raised in respect of the Charting of AtoN AIS, the AIS Committee, at its 16th Session from 1st to 4th March 2005, developed the following comments.


2 Comments

Discussions within a national hydrographic office [ie UKHO]* have produced the following questions:

1. **Should a buoy with AIS be shown on the chart like a RACON? [This was an early proposal, the answer below refuting it was supplied by UKHO]**

No. If using the magenta circle we would need to be sure that this is not going to proliferate to the majority of buoys (like radar reflectors did). Adding magenta circles to most buoys is likely to create a heavy workload on Hydrographic Offices and make the charts more cluttered, as all associated legends will need to be moved outside the circle.

2. **Should it just show "AIS" like the old fog signal? [It was never proposed to use the fog signal symbol to represent AIS, but to use a legend 'AIS' similar to fog signal legends – the answer here is therefore based on a misunderstanding of the question]**

No. It is thought that use of this 'old' symbol;  may cause confusion – unless the legend *AIS* is written alongside. It is preferred that the letters only are used – i.e. *AIS*

3. **Does it need to be charted at all?**

Yes. The Committee unanimously agree that AtoN AIS needs to be charted.

4. **Does the mariner need to see that other information is available (wind, tide)?**

No. It is assumed that, in the future, onboard display of AIS data is mandated by IMO, then greater detail of the AtoN AIS services can be displayed / charted. In the mean time it is suggested that the following note is shown on the chart:

AIS a number of aids to navigation (AtoN) shown on this chart are fitted with Automatic Identification Systems (AIS). This transmits an AIS AtoN message detailing the type of AtoN, name and position (WGS84). In addition, at selected stations, mariners may receive hydrological and meteorological information via AIS (eg tidal height and weather conditions) provided they have suitably enabled software and displays.

However, it should be noted that there is concern from Hydrographic Offices who do not wish to see proliferation of chart notes. They suggest a Preliminary (P) Notice to Mariners (NM) could be issued once the manner of showing AtoN AIS on the chart is decided and then an annual NM issued to cancel the (P)NM.

The AIS Committee noted the following comments as an initial response:

- The display of AIS information on ECDIS and integrated navigation systems is being addressed by IEC TC80 WG13 and that work is now due for completion.
- Symbols have been proposed for the representation of AIS targets, including buoys and other AtoNs, on electronic displays. It is clearly important that common standards are adopted for such symbology. [This may be a reference to IMO SN/Circ.243, see para 4 of paper].

- The view of most AtoN providers would be that AIS has a role as an AtoN and should be fully integrated into future navigation displays, to optimise the availability of relevant information to the navigator.
- The concept of virtual AtoNs provided by AIS broadcasts is considered to be worth exploring for particular applications, such as new wrecks. This concept obviously depends entirely on representation of such targets on electronic displays.

3 Action Requested

The AIS Committee requests that the ANM Committee consider this information and, recognising the need to agree an appropriate manner of advising the mariner of the presence of AIS on an AtoN, that the simple legend *AIS* (*in italics*) is used. In addition, a paper developed from this Liaison Note should be submitted to the International Hydrographic Office for their consideration.

* notes in [] have been added by UKHO.