

VESSEL OPERATION AND NAVIGATION

foul weather areas, where ships currently employ dual pilots for extended periods.

Remote pilotage is already being provided by MPA using radar and VHF. MPA, with IMO's support, intends to expand this service through AIS to nearby international waters.

There are, of course, thorny legal issues associated with a remote pilot assuming any level of control over a ship's movements, but William O'Neil, Secretary-General of IMO, is promoting the legal model of air traffic control of remote pilotage as perfectly acceptable for the maritime world.

Unresolved Technical Issues

There are a number of technical issues about AIS that have yet to be resolved. One of them is which frequency to use in the US' coastal waters. In early 1999 the US Federal Communications Committee (FCC), sold all maritime VHF channels to MariTel for about US\$7m, including VHF channel 87B. Furthermore, VHF channel 88B is currently used by federal law enforcement agencies. Almost everywhere else in the world, VHF Channels 87B ("AIS1") and 88B ("AIS2") are dedicated to AIS.

The US Coast Guard (USCG) has now been charged by the FCC to negotiate with MariTel to obtain channels that can be allocated to AIS in US waters. Even though there seems to have been an understanding that MariTel was to save one set of channels for AIS, it is doubtful that USCG will be able to obtain the same channels for AIS in all US waters. Because of this situation and because USCG was the primary sponsor backing an older, now abandoned, AIS technology that used Digital Selective Calling (DSC - ITU RM 875 and IEC standard 61993-1), USCG has forced IMO, IALA, ITU and IEC to incorporate remote frequency assignment (RFA) through DSC into the UAIS standard. USCG, however, is not receiving support from authorities in other countries to enforce this costly option because other states do not need it. For them AIS1 and AIS2 are perfectly acceptable.

USCG, of course, doesn't need RFA either, even if it ends up with a patchwork of AIS channels, because such a patchwork can be programmed into AIS so that transponders know which frequency to use. There are provisions for this specific functionality in the proposed AIS standard. Nevertheless, USCG is expected to use port state control in US ports to enforce RFA through DSC.

So far the major transponder manufacturers have ignored the RFA part of the proposed standard but may offer it as an extra cost option if it becomes apparent that USCG is successful in enforcing it through inspections, which is not necessarily a given.

If the IEC standard, as is expected, turns out to be unnecessarily convoluted to satisfy the many diverse political/commercial interests of IEC member states, then it will not catch on with transponder manufacturers. Already, the two current major AIS transponder manufacturers (TransponderTech and Marine Data Systems) have signed an interoperability agreement that may well, *de facto*, supersede the yet to be published final IEC standard, especially because it will leave too much open to interpretation.

USCG may try to promote transponders that include RFA as the only ones acceptable. It currently seems, however, that there is only one, small, US-based transponder manufacturer that plans to offer this capability.

Because of the RFA issue there really is no single worldwide standard for Universal AIS. This is causing

a growing rift between the US and the rest of the world. It has also had an adverse effect on AIS implementation because ship operators will wait as long as possible to let the dust settle before committing resources.

Another unresolved issue is how to display AIS targets on an electronic chart. After a test of AIS on cruise ships in British Columbia during the summer of 1999 (see www.uais.org), bridge teams expressed that it was essential that the screen remain uncluttered. They felt that radar and (virtual) AIS targets all representing the same ship needed to be consolidated and that AIS targets should be labeled with only their call sign or a short abbreviation of the name in small print (for target tracking and to assist with contacting vessels by VHF radio). They also felt that a target's course, speed, range, bearing, CPA, TCPA, rate of turn, draft, route, ship type, LoA, full name and other details should be available but only in a new window that would be opened by clicking on an AIS target icon.

Also unresolved is AIS participation by non-SOLAS boats (tugs, fishing boats, yachts). Current rules do not prohibit them from doing so, but it will depend on the cost and the benefits to be gained. With increasing participation the cost will decrease and the value of joining the network will increase exponentially with each additional participant.

But will boats carry an AIS-like transponder?

It is predictable that in the near future, VHF and GPS manufacturers will offer a digital radio modem of some sort as an extra cost option for their products to differentiate themselves in the market. It is improbable, however, that these modems will be AIS transponders. The needs of boats are just too different. Boats do not have rate of turn sensors and do not need remote AIS frequency

assignment. However, they do need position updates from SOLAS ships and other boats for collision avoidance and they do want e-mail, weather charts, electronic chart updates and even web access.

Boats' radio modems are not likely to operate on an AIS frequency. Moreover, there probably won't be enough bandwidth available on AIS channels to accommodate them all. Boats will most likely have to pay for the network they use (GSM, PCS, Teledesic, etc), and there will probably be gateways between the AIS network and boats' radio modem networks. These gateways will be one way only (SOLAS to boats), unless ship operators decide that their ships need to receive AIS-like position updates from boats for collision avoidance reasons. The field here is still wide open.

What next for ship operators?

Following radar, VHF and (D)GPS/ECDIS, AIS promises to significantly enhance the OOW's awareness of his immediate environment, while reducing the need for VHF communications.

The time has come for ship operators to insert themselves into the debate, to ensure that AIS will deliver on this promise, to demand that the same authorities that are pushing AIS carriage requirements offer AIS benefits to the ship operator and the OOW, such as:

- Remote pilotage-like services via AIS to replace conventional pilotage requirements
- Real-time measurement of tides, currents and visibility integrated with ECDIS
- Automatic identification of all, not just SOLAS ships
- Elimination of VHF reporting requirements to VTS/VTIS
- Status of aids to navigation (displaced buoys, etc)

Other reasons for ship operators to involve themselves are more defensive:

- AIS will make it easy for authorities to identify ships traversing their waterways. They could very well use this information to levy user fees to finance AIS and other AtoN infrastructure
- Ensuring that simple, less expensive, non-DSC transponders are made legally acceptable

The International Chamber of Shipping, INTERTANKO, the International Council of Cruise Lines (ICCL) and others should clearly formulate and forcefully present ship operators' interest in AIS policies and change the current course taken with its implementation to better fulfil its potential as an aid to navigation to the OOW. The Chamber of Shipping of British Columbia, for one, is actively involved but needs support from all international shipowners' organisations to achieve these goals. □

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