

Possible Cooperation Between PAME and IALA



INPUT PAPER FROM IALA TO THE PAME II-2014 MEETING OF SEPTEMBER 2014

1. Background

1.1. Resolution of February 2010

Between 10 and 12 February 2010, representatives of Canada, Denmark, Norway, Russian Federation, USA, and IALA met to discuss marine navigation in the Arctic. The result was a resolution in which the said nations and IALA:

ENVISION that the said nations should, in Arctic waters, take the opportunity to:

- initiate the establishment of a common Arctic ship reporting and data sharing system;
- develop a common approach to marine traffic awareness and monitoring;
- move towards a single, harmonised system of marine aids to navigation;
- anticipate and mitigate risk to maritime traffic and the marine environment;

RECOMMEND that, for Arctic waters, IALA support the said nations in relation to:

- enhancing marine traffic awareness and providing a forum for those establishing ship reporting and data sharing systems;
- the marking of polar routes and development of virtual aids to navigation;
- the application of risk management methodology; and
- the importance of improving hydrographic services in the region.

This resolution was advised by IALA to IMO MSC 87 as IMO paper MSC87/INF.15.

1.2. PAME I-2014

IALA was invited by the Arctic Council's Working Group on the **Protection of the Arctic Marine Environment** (PAME) to participate in its meeting PAME I-2014 at Girdwood, Alaska, USA, from 11 to 13 February 2014.

The IALA Deputy Secretary-General represented IALA at the meeting and made a presentation on the work of IALA, including Polar Regions.

The Record of Decisions of that PAME I-2014 meeting included the following text.

Arctic Marine Shipping Assessment (Agenda Item 4)

1) AMSA I(A) – Linking with International Organizations

- ✓ *PAME thanks IALA Deputy Secretary General Michael Card for his presentation on IALAs services and products it provides, and its Arctic focused activities and his suggested areas for cooperation between IALA and PAME. PAME invites IALA to submit a paper to PAME II-2014 elaborating upon opportunities for collaboration in areas of common interest.*

2. IALA Council meeting of May 2014

At its 57th Session, held at A Coruna, Spain, on 25 May 2014, the IALA Council was informed of the outcome of PAME I-2014 concerning IALA, and agreed that the IALA Secretariat should provide an input paper to the PAME II-2014 meeting, elaborating on areas of possible cooperation between IALA and PAME, and subsequently reporting to the IALA Council in 2015. The Councillors from Norway and Sweden both expressed particular interest in the possible cooperation.

3. Examples of IALA Activity with Arctic importance

3.1. Aids to Navigation

Provision of aids to navigation in polar areas has considerable challenges. IALA Guideline 1108 on *Providing AtoN Services in Polar Regions* contains guidance for aids to navigation professionals working in the polar environment. Refer to this document, provided separately.

In addition to traditional Aids to Navigation (AtoN), IALA works with the concept of “virtual AtoN”. The virtual AtoN can be transferred by radio signal from shore Authorities and displayed on a ship’s electronic chart display even though there is no actual AtoN at the indicated location. Virtual AtoNs can be used to mark channels or hazards when the deployment of a physical AtoN is not possible, or when the channel or hazard is temporary. The virtual AtoN concept can be developed as a tool for increased safety of navigation taking into consideration special conditions in the Arctic. Terrestrial AIS is presently used for communication on virtual AtoN, but other communications systems could be used. AIS can also be used to transmit polygons using IMO approved messages. These might be used to indicate navigational information, but there seems to be little use of this capability at present.

3.2. Vessel tracking

The IALA-NET vessel tracking system composes a group of national maritime authorities which provide ship AIS reports from their terrestrial AIS systems to a central server, and then have access to the data of other contributors. The central server is operated for IALA by the Danish Maritime Authority. At present, the following countries provide their terrestrial AIS data to IALA-NET.

- Denmark including Greenland - Danish Maritime Safety Administration
- Finland - Finnish Maritime Administration
- Norway - Norwegian Coastal Administration
- USA - U.S. Dept. of Transportation
- Sweden – joining now
- Australia - Australian Maritime Safety Authority
- China - China Maritime Safety Administration
- Estonia - Estonian Maritime Administration
- Ireland - Commissioners of Irish Lights
- Latvia - Maritime Administration Of Latvia
- Oman - Arabian Maritime & Navigation Aids Services
- Montenegro - Maritime Safety Department of Montenegro
- Poland - Maritime Office Gdynia
- Iraq - The General Company for Ports of Iraq
- Faroe Islands
- Bulgaria

- France
- Ukraine
- Chile

Information on IALA-Net may be found at

http://www.iala-aism.org/wiki/ialanet/index.php/Main_Page

Clicking on “Get Started” in the menu at left will reveal instructions for joining IALA-NET. Other links in the menu provide technical information on the data format, statistics, and display. There is no fee for membership, only a commitment to provide terrestrial AIS vessel tracking data to the other members of IALA-Net in exchange for receiving their data.

3.3. Development of data communications for e-Navigation

IALA is involved in several works related to maritime data communication. Members of IALA contribute with their expertise in several committees. The IALA’s e-Navigation Committee is developing a VHF Data Exchange System (VDES), which will encompass the existing two AIS radio channels, and add other channels for terrestrial and satellite data exchange between ship and shore or ship and ship.

Present work is concentrated on finalising the channel plan and working with the United Nations agency the International Telecommunications Union (ITU) to have the channels allocated at the World Radio Conference in 2015.

To progress the work, the IALA Communications Working Group will meet between 01 and 05 September 2014, and again between 13 and 17 October 2014 during the 15th session of the IALA ENAV Committee. Present plans for the VDES scheme include a 100 KHz bandwidth data channel and two channels for satellite detection of AIS for vessel tracking. Two way data exchange ship-satellite is still in discussion. The VDES could be applicable in Arctic waters.

IALA also envisages that the 500 KHz marine band, presently used for Navtex broadcasts, will be used for a more modern data transfer method. The Navdat concept looks a suitable candidate.

Both VDES and Navdat would be free services. Full development of VDES will rely on shore authorities upgrading their existing AIS base station networks to VDES.

3.4. Data modelling and Maritime Service Portfolios for e-Navigation

IALA’s ENAV Committee is presently working with the International Hydrographic Organisation (IHO) to define data formats for AtoN and VTS products within the IHO S-100 geographic information system. IALA has been allocated the S-200 number series within the S-100 system for this. IALA has been allocated a domain within the IHO S-100 registry for this purpose. Recent IALA documents explain further. Several formats could be developed for special Arctic related information as well.

Maritime Service Portfolios are described by IMO as sets of operational and technical services and their level of service provided by a stakeholder in a given sea area, waterway, or port. IMO has recognised that Polar areas will require specific Maritime Service Portfolios (MSPs) for e-Navigation. (MSP examples include meteorological, tidal, and ice information.) IALA’s ENAV Committee will be working to create recommendations on content and quality for MSPs.

3.5.e-Navigation projects and test-beds

IALA is participating in several projects together with Member States and industry. In addition Member States are actively involved and they are conducting several relevant projects within the IALA domain.

3.6.Vessel Traffic Services (VTS)

IALA guidance documents for VTS cover technical matters, operations, and VTS operator training. IALA also runs the World VTS Guide, which provides information on most VTS services available throughout the globe.

<http://www.worldvtsguide.org/>

Several IALA Members operate VTS services and Ship Reporting Systems (SRS) in the Arctic. IALA will continue to develop guidelines and recommendations, technical, operational and training concepts, including those necessary for Arctic needs.

4. Possible cooperation areas

The following are two suggestions for cooperation areas between PAME and IALA, namely vessel tracking and vessel services, and e-Navigation services from shore. The two are closely related.

4.1.Vessel tracking and services for safety of navigation

IALA-NET, with its existing international cooperation for sharing of ship AIS data, might be a basis for, or a model for, developing a broader cooperation in the Arctic for vessel tracking and for voluntary coordinated voyages through sharing of positions and planned routes. Several projects, listed in the Annex show that this may be possible. Cooperation between PAME and IALA might contribute to and harmonize development of such services.

Existing standardised AIS messages from ships carry information on vessel name, type, course speed, destination, etc. but this does not include information on ice-classification, fuel used, endurance, rescue capabilities, and similar. Cooperation on standardised messages, for AIS, internet, or other communications channels, might benefit maritime domain awareness, maritime safety, and Search and Rescue in the Arctic.

4.2.e-Navigation maritime services from shore in the Arctic

Various Arctic States already provide services from shore for the benefit of Arctic shipping. Some of these are listed in the Annex, an example being the web-based sharing of ice data and meteorological data.

As Arctic navigation grows, and as e-Navigation develops, the benefits of harmonisation of shore services, reporting and tracking systems, and aids to navigation become increasingly apparent. IALA will be working on harmonising some Maritime Service Portfolios (groups of shore services) in the next four-year IALA technical work period. As this work is just commencing, advice from Arctic States on the types of shore services will be essential.

An exchange of information between IALA and PAME on specific requirements in the Arctic for maritime services from shore might have merit.

5. Proposed action

IALA suggests that PAME may wish to consider cooperation with IALA in the areas of IALA's work with an Arctic importance. The possible cooperation area 4.1 above may be a good choice.

IALA focuses on maritime safety, security, and the protection of the maritime environment with no political aspect. Achievements are made by the contribution and expertise provided by Member States and industry.

IALA believes that a decision to cooperate should have clear benefit for Arctic navigation and the Arctic environment.

Michael Card
Deputy Secretary-General
IALA-AISM
2014-08-01

End of main text. Annex follows.

6. Annex – Some relevant projects and activity in the Arctic

6.1. Vessel tracking and reporting, and weather and ice information – Denmark

Denmark's "ArcticWeb" is an effort from the Danish Maritime Authority to improve maritime safety in the Arctic region.

<https://arcticweb.e-navigation.net/>

6.2. Arctic information – Norway

The Norwegian ArcticWeb provides simple access to comprehensive Arctic data and information, which is searchable in one place. Currently information on the Norwegian Continental Shelf is available; work is ongoing to cover other Arctic Regions.

<http://www.arcticweb.com/>

6.3. Vessel Traffic Services – Norway

The Norwegian Coastal Administration (NCA) operates five VTS centres and among these is the Vardø VTS responsible for the Norwegian Polar NAVAREA XIX (AOR-E). It covers traffic monitoring in the northern areas by means of radar monitoring, ship reporting and Satellite and terrestrial AIS. The NCA has an advanced ocean monitoring centre named « EMSA North Atlantic Information Management Center ». The information centre coordinates the exchange of maritime traffic monitoring information between Norway, Iceland, Denmark, Greenland, Faroe Islands and the UK. The Norwegian Information Centre uses data from the Norwegian satellite AIS and makes it possible to identify the ship movements over large ocean areas.

6.4. e-Navigation projects – Denmark and Sweden

The MonaLisa 2.0 project, led by Sweden and the proposed EfficienSea2 project led by Denmark. The content of each project includes Arctic navigation.

MonaLisa 2.0 continues the work on dynamic route exchange ship-ship, (perhaps of less interest in the uncrowded waters of the Arctic) and work towards efficient, safe and environmentally friendly maritime transport.

<http://www.sjofartsverket.se/en/MonaLisa/>

<http://www.sjofartsverket.se/en/MonaLisa/MONALISA-20/>

The project MONALISA Ice (MICE) was mentioned during PAME 1-2014 plenary discussions by the delegate from Sweden.

<http://www.sjofartsverket.se/en/About-us/Research-and-Innovation--/MONALISA-Ice1/>

EfficienSea 2 will be aimed at development of the “Maritime Cloud”, including its application and preliminary testing in Arctic waters.

<http://www.ufficiensea.org/>

(Applies to the completed EfficienSea project. There is no website for the proposed EfficienSea 2 project yet, as EU funding is still being sought.)

The Maritime Cloud concept envisages the use of ships’ receivers which automatically and seamlessly select the appropriate communications channels for data transfer. These would include satellite communications, VDES, 500 KHz, Iridium, etc.

<https://dma-enav.atlassian.net/wiki/display/MC/Maritime+Cloud+Technical+Description>

Note In connection with the development of e-Navigation, IALA notes HELCOM Recommendation 34E/2 of 03 October 2013, which included testing of proactive route planning, testing and validating e-Navigation services in the Baltic Sea region, and preparing a joint input by the Baltic Sea countries to IMO and IALA.

6.5. e-Navigation project – Norway and Chile

Norway has a well-established mechanism for testing communication solutions in the Arctic/Antarctic regions.

A test bed on communication and SAR conducted between Chile and Norway can be mentioned, as both countries have a long coastlines bordering on polar areas with extensive and remote Search and Rescue areas.

<http://www.kystverket.no/en/About-Kystverket/International-work/enavigation/News/e-navigation-workshop-held-in-Chile/>

6.6. Barents Watch – Norway

BarentsWatch is a comprehensive monitoring and information system for large parts of the world's northern seas. By coordinating information and developing new services based on the combination of data, BarentsWatch disseminates a better factual basis and more comprehensive picture of the activities in, and condition of, the seas and coastal areas.

The system makes relevant information and services more easily accessible for authorities, decision-makers and general users. The system simplifies access to and ensure the exchange of public information.

<http://www.barentswatch.no/en/>

6.7. Barents SRS - Norway

A mandatory ship reporting system "Barents SRS" has been established in a defined Arctic Regions. This system is developed as a joint cooperation between Norway and Russia. A format, content of reports, times and geographical positions for submitting reports, the Authority to whom reports should be sent and available services has been defined and recognised by the IMO.

6.8.Space systems – Norway

AIS Satellites

On 12th July 2010, AISSat-1 was the first Norwegian satellite to be launched capable of capturing AIS in real time from polar orbit. AISSat-2 was launched on 8th July 2014 to provide better coverage and reliability for continuous operations. A third satellite, AISSat-3, is planned for launching in mid-2015.

ARCTICSAT is a 12 months feasibility study on situational awareness in the Arctic being carried out for the European Space Agency (ESA) by a contracting consortium comprising MARINTEK, Kongsberg Seatex and Kongsberg Satellite Services, the Norwegian Coastal Administration, GeoCento, Astrium and the British Antarctic Survey.

<http://www.sintef.no/home/MARINTEK/About-MARINTEK/Departments/Maritime-Transport-Systems/Projects/ARCTICSAT/>

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