Summary from Mariners' Needs Session

Introduction

The panel was moderated by Keld Qvistgaard (DMI). The panelists were:

- Nick Hughes (NIS)- Head of Norwegian Ice Service
- Duke Snider (NI) – Ice Navigator
- John Parker (CIS)- Head of Canadian Ice Service
- Thomas Bøggild (GPS) –Greenland Pilot
- Bjorn Kay (MMA) – Master Mariner, instructor

Panel Discussion

Keld opened the session by asking the Ice Service representatives for their reactions to the Mariner Survey.

Nick: There are some very clear messages from the users. We see the need to develop more high quality, accurate, automated products to reduce the workload on analysts and help to advise users.

Questions to the Ice Service Heads:

❏ Do you have workplan/strategy (high level or detailed) to address the mariner messages?" **If yes**, please share some details. **If no**, what is preventing? Decision, resources, low priority?

❏ Do you plan to change your ice service focus on one or more of the topics/messages over the next few years to address mariner's ice information requirements?"

❏ Do you think the mariners expect too much (free of charge)?

❏ Where do you see the potential/need for international collaboration to address the mariner's ice information requirements?

❏ How would you address the requirements versus a fixed budget?

John: Some information from the mariner survey is consistent with CIS survey results. Workplan: CIS has been looking to modernize products and make them more accessible to clients. SIGRID3 is being made more available. Products are being compressed. Satellite image mosaics are coming. More and more products are not the answer. Concerning forecasts, we haven't been doing much. Current charts have forecast drift arrows and are valid for up to 18hrs. The new models create opportunity for new and different products. We need to determine what information is helpful to the mariner for 5 days out – it can't be egg charts. What does it look like, format wise? Consistency and coherence across domains is important. We need to continue to work together to ensure definitions are consistent (e.g. ice edge).

Concerning requirements and fixed budgets – the obstacles are more with IT systems, not budgets. The limitation is IT related. We are stuck in producing the same products in the same systems for 20years.

Nick: MetNO has been looking at product improvements for a while. We have upgraded our GIS systems and are working on the back end data storage systems to provide flexible product delivery on demand.

Keld: What is the timeframe for change?

Nick: Many projects, such as Extreme Earth are under Horizon2020. There is another University of Tromsø project for integrating satellite products and forecasts into a single product.

John: We are on the precipice of an inundation of information. Analysts need to understand the layers of ice information that models are producing so they can interpret it and use for themselves. There are many internal developments occurring, but they aren't ready for customers.

Duke: A simple sailor doesn't know or care about massive amounts of data. It is critical to know who the user is and what that user needs. CIS has looked to a small group of users in the Canadian Coast Guard but they have many more users than that. There are cruise ships and hundreds of tourism related users. CIS needs to look broader at users.

> **Questions to Mariners:**
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> ❑ Would you accept more automated products to allow for the suite of products to expand into additional services?
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> ❑ Several survey comments indicate ice service improvements over the past years. What would you consider the next priority area of work or gap for the ice services?
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> ❑ Which ice products minimum and/or mandatory for any journey to Polar Waters?
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> ❑ What would you consider the differenced in newcomers to Polar Waters requirements versus the advanced/experienced users requirements?
>
> ❑ What is needed to ensure scalable ice information is used widely on vessels in 5 years?

Concerning an explosion of products, you must look at user needs for which products will be useful. Navigators don't see the need for a massive investment in passive microwave sensors – there is not enough resolution. Let's not have an explosion of products but go back to ensure relevance.

Keld: We have contradictory information concerning Passive Microwave Radiometer (PMR) data. More than 20 mariners responding to the survey indicated that they use PMR data – even though they require better than 50m resolution.

John: We don't plan on inundating our clients with products. The volume of data will explode and we need to determine how to distill all of that into relevant information for users.

Thomas: On board ships, we get a suite of products from DMI including pre-cut SAR images for specific areas. It is completely automatic so we don't have to wait 12hrs to get the products anymore. We can't do risk assessment with old information. We still want the traditional ice charts – we need both. Automation should free up resources to provide a tailored service to the user. Mainly we are on cruise ships that have fairly high capacity data links. However, we would be flooded with hourly forecasts - even 6 hourly can be too much. Depending on the weather/conditions, they may need more information but not all the time.

Keld: Products still look different sometimes – even though the background information is the same. Not all producers follow the same product standards. Perhaps we would
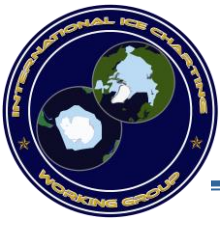
be better giving the users the background information and letting them display it the way they like.

Bjorn: Thanks for listening and responding to our needs. The Helsinki meeting was a success and IICWG has done much to respond. We should keep one picture in mind – the information flow on the bridge. Mariners need a small but important set of products. We have 2 customer groups: 50% are well experienced with special needs and special training; the other half has never seen ice and need lots of basic help. We need to be more careful to determine which products are necessary and which can be automated.

Questions to Marine Training Centers:

❑ Ice information needs/contents of basic/advanced ice courses? Value of certificate?

❑ What is the link to the Polar Code implementation?

❑ How do you see the future collaboration between ice services and marine training centers (training, knowledge, technical, data exchange, ice in ECDIS)?

Duke: How do you give a mariner 10 years of experience in no time? That's the hard part. The Polar Code does not address the training issues or needs. The Polar Code allows pilots to get certified with advanced polar training without having ever sailed in ice-encumbered waters. To get a Nautical Institute Ice Navigator certification, they must show competence in ice-encumbered waters. It is not just scalability of the products but of the users of the products as well. Some pilots don't need complete ice navigator training, and some do. We also need pilots that have no ice certification to be able to understand the products.

Thomas   It is not possible to make an ice navigator in a course – they must experience ice on a ship. Our service is for cruise ships, especially for Greenland. We get DMI products. The first choice product is a SAR image but we would never give raw images directly to the captain – he wants an ice chart with colours. Everything is available to the captain but in a hierarchical order.

Duke: FedNav operates in the ice and has very sophisticated users on their ships that can handle high resolution ice charts and satellite info. Different levels of information are needed for less experienced users and for ships that only want to operate near the ice – not in it.

Keld: Turning the discussion back to the Ice Services, how can you cope with this information?

Nick: It goes back to the point about knowing your users. The experience of going on ships and seeing how the information is used is very good the Ice Services. The more you can automate the ordering and supply of info, the better it is for the users.

John: We will have more information than anybody – even the ice analysts - can look at. We need to figure out how to handle it. What do marine hazards look like in general? We need to integrate all of the information – ice, weather, ocean, etc - as well as the raw data that can be shared with certain users. Training must be a high priority. Is there a role for the Ice Services to assist?

Bjorn: For planning execution and monitoring an active sail plan in ice, we need interactive tools. If you want to get close to your customers, we can allow the ice services to come and sit with their customers.

Duke: The first steps have been taken with the Polar Code but the regulatory courses are aimed at the lowest common denominator. We need organizations like IICWG to provide input. IICWG must develop a closer connection to IMO and the Training Institutes. The IICWG is one of the first organizations outside of the regulatory regime to initiate this dialogue between mariners, ice services and training schools. It is exciting to see how far we have come in a year.

Keld: In the survey, the short answer section had comments saying there have been massive improvements in the last 10 years.

Thomas: We learned from the survey that there is confusion about new products. Mariners need ice charts but also need scalable ice charts. There seems to be a gap. There is something available (S411) but we do not know about it. If it is an accessible product that nobody knows about, we should work on education.

Duke: Going through the Northwest Passage, a ship will use charts from 3 or 4 ice services. Alaska NWS charts look different from the other Ice Services. However, the U.S. provides a shapefile for download that can be manipulated. These are not available from CIS, DMI or MetNO. Please, give us good technical ice charts and good shapefiles for the whole NWP.

Bjorn: If these shapefiles could be put into ECDIS then the user would understand the interface great.

Duke: The least experienced mariner will not be looking at shapefiles. I am not convinced that layering ice information on ECDIS is the way to go. There is already too much data available. I would prefer to see ice charts on a separate system. The low-hanging fruit is to get the shapefiles out.

Open Discussion

Kevin Berberich: This has been a great discussion. One important point is that IT limitations are a key obstacle. We need to consider retiring products and services that are no longer needed. We can't just keep adding on.

Oleg Folomeev: I agree about the IT limitations. The point about education is very important. The Polar Code requires retraining every 5 years along with 30 days in polar waters within the last 5 years to renew a Polar Waters Certificate. I am familiar with the training at the Makarov and Sovcomflot training centers in Russia and it is great. They train about 150 ice navigators a year on how to interpret ice information including satellite images. The mariners coming through these centers do not need more training. AARI offers 5 day courses to train mariners who have never been in ice.

Alvaro Scardilli: Passive microwave is what we have been using for a long time since we didn't get SAR imagery until last year. Until we got night vision products, we were totally blind in the winter. Passive microwave isn't good enough. There are a lot of ships in our METAREA that are not always from Argentina, so we don't know if they are even looking at the Argentina Ice Service products.

Jurgen Holfort: BSH ice services are not for ice navigators but for the general public. We are federal employees serving the public and we can't do specialized products for industry. If ice navigators want SAR data, they don't have to come to the ice services, they can go directly to the satellite data providers.

Thomas Bøggild: Of course I can go to the satellite data providers, but when I get the information from DMI, I get a full package – the weather information and the SAR data too.

Jan Lieser: It should be a holistic service – not just an ice service. Ice information should be incorporated into meteorological and environmental information to provide added value.

Soren Olufsen: Users need higher temporal resolution as well as spatial resolution along with interpretation and forecasting. It must be integrated with weather information and easy to access. We must have a good IT department.

As time had expired for this session, Keld concluded the session saying that the collaboration had begun but we must ensure that it continues.

Take-Away Messages … in no particular order

1. Ice Services need to develop more high quality, accurate, automated products to reduce the workload on ice analysts.

2. Ice Services should consider retiring products and services no longer needed.

3. We need to be more careful to determine which products are necessary and which can be automated

4. Ice Services need to determine what information is helpful to the mariner for 5 days out – it can't be egg charts. What does it look like, format wise?

5. Ice Services need to ensure that definitions are used consistently (e.g. ice edge).

6. Ice Services should ensure they are interacting with all of their users – not just a select group.

7. Maritime Training Institutes can provide a forum for Ice Services to get close to their customers.

8. Ice Services should consider providing different levels of information for different levels of experience and operation (e.g. near ice vs. in ice). One size does not fit all.

9. IICWG must develop a closer connection to IMO and the Training Institutes.

10. Ice charts in S411 format are available but most users are not aware of them. Ice Services should provide some education about the availability and use of these products.

11. Ice Services should provide ice chart shapefiles as a routine product.

12. Ice information should be integrated with meteorological, oceanographic and other environmental information to provide added value.