Modernizing Canadian Waterways: the Canadian Coast Guard Perspective

Mariners’ Workshop 2017: Modernizing Canadian Waterways
Canadian e-Navigation Concept

Pre-Voyage
- Sailing Plan Preparation
- National User Needs Matrix
- Maritime Information Portal

Voyage
- Real Time and Forecast Data
- AIS ASM National Survey
- CCG AIS Network & AIS AtoN

Post-Voyage
- Pre-Voyage + Voyage Information
- Analysis on shore
- Improvements
- Started at the end of August at Sand Heads site.
- This site was selected because both Met/Hydro stations are on the same site.
- Data were broadcasted each 5 minutes from Mount Parke AIS station.
AIS Met/Hydro Message Test Bed
Western Region

Display on board PPU

Met/Hydro Message Content

Photo credit: Greg Keeling
Display can be set to only show information available
Icon is displayed but no info when clicking on it.

ECDIS System Display

- Issues noted with the capacity of some ECDIS system to display the information.
- In some cases, the icon is displayed but not the message.
- In other situations, there is no display at all.
- Reason are still unclear:
  - Old version not updated;
  - Settings;
  - Officers’ knowledge of the system;
  - Etc.
- Working with BC Pilots to further investigate the situation.

Given broadcast would be outside Compulsory Pilotage Areas in a near future, it is important to have the true picture about ECDIS display capacity.
Display on board ECDIS

AIS Met/Hydro Message Test Bed
Western Region

Photo credit: Greg Keeling
- On the 3rd week of Sept., the test bed was expanded to 18 other Met/Hydro stations.
- With the exception of Sand Heads, rate of broadcast for other stations is at 15 min.
- Pilots’ collaboration was solicited to document display on ECDIS.
Next Steps

• Seeking to expand the test bed to other regions:
  - Great Lakes → Met/Hydro
  - St. Lawrence → Met
  - Atlantic → Met (Hydro not available yet)

• Automate all collection/verification processes to make it operational

• Add other Met/Hydro stations, including ECCC buoys

• Consult mariners prior to adding other Met/Hydro stations to ensure there is a need for the data.

• Test other AIS ASM Messages and evaluate their relevancy:
  - Ice recommended route.
  - Air gap.
  - Etc.
Ice Recommended Route AIS
Current Situation
Figure 11-3

Graphic description of a waypoint/polyline, showing angle and distance between points.

(If one side of a polyline is to be a boundary (e.g., edge of ice area), this is defined by the left side of the line in order of sequence from the initial sub-area point (Point 0)).
• **AIS AtoN:**
  An international survey was conducted last Fall and 26 national authorities out of 40 solicited responded to the questionnaire.
  - Results were presented at an IALA international workshop on AIS AtoN and will help Coast Guard develop a consistent national approach.
  - Over the coming months, we plan to start testing real and virtual AIS AtoN in specific areas and collect feedback from mariners.

• **Navigational Warnings System:**
  - A beta version of a system developed initially by Denmark should be available in the coming months. Denmark developed this system in collaboration with the IHO – WWNWS working group.
  - This new system will significantly improve the collection of information and the issuance of warnings. It will also improve tracking of warnings and link automatically with NOTMAR.
Maritime Domain Awareness

- Information Sharing
- Security
- Prevention
- Marine Safety
Maritime Domain Awareness is a broad concept – it includes awareness for defence and security purposes, but contributes equally to marine safety and accident prevention

Partnership and shared responsibility:
- Collaboration and partnership are required to drive mutual benefits
- Duplication and overlap of systems and data is costly and counter-productive
- The needs of diverse users need to be clearly understood

Canadian leadership on an international issue:
- Marine transportation is a global activity. Canadian initiatives and systems must conform to international conventions and standards
- Unity of effort can place Canada in a favourable position as this area evolves internationally
- The Government of Canada – and the Coast Guard are to act as the force for Canadian synchronization and strategic direction
Maritime Domain Awareness
Data Collection and Analysis

- GPS for precise ship positioning
- Satellite images of ice conditions
- Aerial patrols to detect spills, and to monitor ice conditions
- Meteorological information to support safe navigation in bad weather
- Marine Communication and Traffic Services Centres
  - Vessel Monitoring
  - Radars
  - Radio Communication
  - Cameras
- Differential GPS
- Fixed aids to navigation
- Water level gauges
- Tug Escorts
- Weather buoys
- Local marine pilots
- Vessel construction standards
- Ship inspections
- On-board radar
- Automatic Identification System to transmit ship positions
- Floating aids to navigation
- Sea floor surveys
- Under keel clearances
- Icebreaking
- Crew certification
- Vessel traffic services
- Nautical charts and publications
- Navigational safety information

Regulations ➔ Policies ➔ Services
CCG Communications Infrastructure
As part of its maritime security program, Coast Guard provides vessel identification and tracking information to partner agencies using its traffic monitoring systems including radar, Automatic Identification System (AIS) and Long Range Identification and Tracking (LRIT) systems.

The use of these tracking and identification systems is integral in providing Canada with enhanced Maritime Domain Awareness.

Coast Guard also has special arrangements with specific stakeholders to share INNAV and/or AIS data (e.g. Ports Authorities and Oceans Network Canada).
As the federal maritime service delivery organization, the Coast Guard has already taken a leadership role, in partnership with other government departments and agencies:

- Implementation of the Automatic Information System (AIS)
- Deployment of Long Range Identification Tracking (LRIT)
- Electronic transmission of authorized and quality assured information to assist navigation planning on the St Lawrence river (Marinfo)
Next Steps

Seek out innovative ways to maximize information sharing in support of mutual transparency and improved operational outcomes.

Ensure reliable data is available to mariners.

Focus investments on best return to all end users of navigation information.

Ongoing, open communication with all stakeholders and cooperation with government partners to offer world-leading Canadian marine services.
Conclusion

Coast Guard is the foundation of and a leader in the monitoring of maritime activity, resource-sharing, maritime domain awareness, and Government and community engagement.

e-Navigation is a key deliverable to resource-sharing.

Coast Guard is committed to working closely with stakeholders to better understand and support their business.