Workshop on Safe Navigation in the Arctic

October 15-16, 2012

Hotel Deca

Seattle, Washington

Breakout session 4: Models for Determining Needs and Resources

Beate Kvamstad
My Mandate....

• Models for determining needs and resources in the Arctic
• Alternate models (including partnerships) for meeting the identified needs, providing examples (e.g., in the Barents Sea)
• MARINTEK’s extensive involvement in coordination of relevant projects between industry, government, and research institutions in addressing challenges in the Arctic

• Present the projects, the partners, the activities and the main impact of the projects.
The Projects

Ongoing initiatives:
• SvalMar – Identification of new maritime services at Svalbard (NRC)
• Safe Operations in the Easter Barents Sea (Norwegian – Russian, NRC)
• Shared situational awareness (ESA IAP)
The Projects

2006
- ARCEMOP – Arctic Emergency Operations (2006-2009)
  - MarCom – Broadband at Sea (2007-2010)
- CVArtic (2008 - 2010)

2010
- ArctiCOM – Arctic Satellite Communication (2010 -2011)
- ArkKOM (2010 -2011)
- A Holistic Approach to Safety at Sea (2011)
- COINCR – Communication for ConocoPhillips (2012 - 2016)

Ongoing initiatives:
- SvalMar – Identification of new maritime services at Svalbard (NRC)
- Safe Operations in the Easter Barents Sea (Norwegian – Russian, NRC)
- Shared situational awareness (ESA IAP)
Main Objective:
Identify the maritime users requirements for broadband solutions at sea

Partners:

Industry: Mobikom, Kongsberg NorControl IT, Vizada, Telenor

Users: Fosen Shipping Company, The Norwegian Coastal Administration, Statoil

Governmental: The Norwegian Space Centre, The Norwegian Coastal Administration

Research: The Norwegian University of Science and Technology, Singapore Maritime Institute, Wroclaw University of Technology

Activities:

User requirements and gap analysis: Interviews and meetings, literature studies (shipping companies, governmental institutions, vessel officers and crew, equipment and service suppliers)

Technology demonstration: Antenna design and multihop/mesh network (PhD), communication solution (Gullfaks and Trondheim)

Results and impact:

• Maritime user requirements to broadband communication systems
• The role of communication in Safety at Sea
• Technology demonstrations
• Identified special needs in the Arctic!
MarSafe North –
Maritime Safety Management in the High North

The study areas covered by the project are:
• Nautical Operations and Transport
• Dynamic Risk Assessment and Emergency Response
• Territorial Security Control and Resource Supervision
• Infrastructure and Integrated Coastal Zone Management

by utilizing novel underpinning technologies for:
• Environmental Surveillance and Sensing Technologies
• Arctic Communications
• Radio Navigation and Tracking

The project has a total budget of 23 million NOK, where 9 million is funded by the Norwegian Research Council, the MarOff program. MarSafe North started in September 2008 and was ended in November 2011.

The main objective of MarSafe North was to provide recommendations that will contribute to increased maritime safety in the High North, equivalent or better than the safety level in the North Sea.
MarSafe North Activities

• Extensive workshop activities
  – Meetings with all maritime user groups in the High North (fisheries, transport, governmental, equipment and service providers, the Governor of Svalbard, industry at Svalbard.....)
• Providing input to IMO e-Navigation workgroup (coordinated by the Norwegian Coastal Administration)
• Publishing papers and reports
• Field tests
  – Satellite system coverage and GNSS/dGNSS coverage between Longyearbyen and Svalbard
  – Ice trackers on the east coast of Svalbard
  – Identification and assessment of places of refuge at Svalbard (IMO requirements), communication coverage tests at each site
  – Wearable antennas
  – Data integrations
Deployment of 6 ice tracking buoys on drifting ice (5) and iceberg in the Barents Sea

Deployment of ITB on drifting ice

Refueling

Helicopter flight

Deployment of ITB on iceberg

Helicopter LIMSAR* SA 365 N2.
KNM Otto Sverdrup Longyearbyen to Kirkenes September 2009

EGNOS and Galileo coverage

VSAT coverage
MarSafe North Results

Communications, surveillance and tracking
1. Improve communication services (broadband satellite communication system(s), on-site and terrestrial communication systems)
2. Improve satellite services for traffic and environmental monitoring (AIS, SAR and optical satellites)
3. Improve infrastructure for navigational information exchange (dGNSS, metocean)
4. Improve technologies for tracking and tracing of people and equipment

Maritime operations
5. Improve VTS services for remote assistance, pilotage and VTS collaboration
6. Establish safe sailing corridors with validated navigational information
7. Ensure Arctic presence and increased activity
8. Improve decision support systems and procedures for operational planning
9. Specify common safety procedures across organizations, information systems and people
10. Develop and provide Arctic e-Navigation services
11. Develop special requirements for smaller (e.g. leisure) vessels (e.g. AIS, communication equipment and life saving appliances)
12. Improve the understanding of arctic GNSS conditions

Vessels and constructions
13. Design and certify vessels, constructions and equipment for operations in ice and Arctic climate conditions

Education and training
14. Educate and train seafarers and personnel for normal maritime operations
15. Select and educate personnel for abnormal maritime operations
16. Facilitate remote training ship-shore
17. Use dynamic risk assessment as a tool for training of shared situational awareness
18. Define special training requirements

Information and data
19. Provide information management transparency for shared situational awareness
20. Offer improved quality and integrity for information sources
21. Use sensors to capture real time data for maritime operations
22. Improve models for oil spill, ice drift and metocean forecasts
23. Increase mapping activity for Electronic Navigational Charts (ENC)
24. Gather data for further research and innovation

Emergency preparedness, Search and Rescue (SAR) and Escape, Evacuation and Rescue (EER)
25. Establish emergency preparedness procedures for self assistance
26. Optimize use of available SAR and oil spill first response resources
27. Design appropriate life saving appliances (e.g. clothing, life boats)
28. Establish places of refuge

Analysis of maritime safety management in the High North

Future and visions for maritime safety management in the High North
MarSafe North Impact

- The list of 28 requirements have been communicated to the Norwegian Government
- New projects have been initiated, and not only by MARINTEK:
  - Maritime 21 – Norwegian maritime strategy for research and innovation in the High North
  - Data integration for shared situational awareness (BarentsWatch, open and internal)
  - Using cameras for remote monitoring of towing operations (the Norwegian Coastal Administration)
  - New initiative on shared situational awareness, initiated by the industry and financed by the European Space Agency (ESA)
- Realized that further investigations into communication technologies to support safe and efficient operations
  - ArctiCOM project, financed by the European Space Agency
  - ArkKOM project, financed by the Norwegian Space Agency
  - MARENOR and COINOR projects
  - Business potential?
The Projects

2006 - 2016

- **ARCEMOP** – Arctic Emergency Operations (2006-2009)
- **MarCom** – Broadband at Sea (2007-2010)
- **QVArctic** (2008 - 2010)
- **MarSafe North** – Maritime Safety Management (2008 - 2011)
- **ArcticOM** – Arctic Satellite Communication (2010 -2011)
- **ArkKOM** (2010 -2011)
- **A-Lex** – "From Hamburg to Yamburg" (2010 – 2012)
- **A Holistic Approach to Safety at Sea** (2011)
- **COINCR** – Communication for ConocoPhillips (2012 - 2016)

**Ongoing initiatives:**
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Objectives of ArctiCOM

• Estimate possible gaps between offered (satellite) communication capacity and predicted demand for communication services in the Arctic region in the time span 2010-2020, and recommend future activities aiming to reduce/close these gaps

• Activities:
  • Overview of state-of-the-art and common practices
  • Estimation of future communication demands in the Arctic (2010-2020)
  • Prediction of offered communication capacity in the Arctic (2010-2020)
  • Analysis of future communication gaps
  • Development of graphical and interactive tool to visualise results (Google Earth overlays)
  • Recommendations for future activities and roadmap
A holistic overview of Safety-at-Sea (2010)

- A project financed by the Norwegian Coastal Administration and Maritimt Forum Nord

- The main objective was to identify gaps and challenges to maritime operations in Norwegian waters in general, and in the northern areas specific. The project also identified possible actions for increased safety at sea.

- The most important recommended actions were:
  - Establishment of a national forum for operational emergency preparedness and safety at sea.
  - Development and adjustment of emergency preparedness infrastructure, meeting the future increase in ship and offshore activity.
  - Improved cooperation between private and public resources for handling safety at sea.
  - Improved quality on metocean (wave, current, wind, ice) to fishing and commercial shipping.
A: 15th October: MV Aura leaves port of Hamburg at noon. Permissions to enter Port of Yamburg and the NSR are given. Insurance from Skuld has been granted.

B: The vessel is sailing from Hamburg through the North Sea, Norwegian Sea and into the Barents Sea in the vicinity of the Danish and Norwegian coast (economic zone using ordinary shipping lanes), but outside 12 miles territorial waters. Speed is 10 knots with daily fuel consumption 10 tons.

C: After midnight 22 October, 15 nm north of Fisherman’s Peninsula, engine stops completely. Auxiliary engine is being started. Vessel drifts towards SSE, in direction the Eastern part of Fisherman’s peninsula and the Motovskiy Bay with a speed of three knots. Water depth is 230 meter.

D: Early morning 22 October, MV Aura meets a Russian pilot vessel at the entrance of Kola Bay. MV Aura is being laid for anchor in the international part of the port. At 05:30 on 23 October MV Aura leaves Murmansk port for Yamburg.

E: At 25 October 08:30, when the vessel is about to enter the Kara Strait, the engine suddenly stops again. Repeated attempts to locate the source of the problem and restart the engine are failing, and the wind and the current push the vessel rapidly in direction the rocky shore of Vaigach Island, 20 miles away.
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2015


2016

- COINCR – Communication for ConocoPhillips (2012-2016)

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Future Emergency Operations in the High North Public-Private Partnership?

Who pays for safety at sea?
Thank you for your attention!

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