



Company of Master Mariners of Canada

Review of the Seminar

“Canadian Arctic Issues in a Changing Climate”

Organized by the Company of Master Mariners of Canada

In conjunction with

The Marine Affairs Program of Dalhousie University



And

Lloyd’s Register, North America





Company of Master Mariners of Canada



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Marine Affairs Program

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The Company of Master Mariners of Canada, Maritimes Division
in conjunction with:
Lloyd's Register and, the Marine Affairs Program of Dalhousie University
will present a seminar on **Wednesday, December 6, 2006**

"Canadian Arctic Issues in a Changing Climate"
Room 1020, Kenneth C. Rowe Building
6100 University Ave., Dalhousie University
Halifax, NS

Meet and Greet

Welcome Address – Capt. Jim Calvesbert, *Company of Master Mariners of Canada*

Panel #1 – IS POLAR CLIMATE REALLY CHANGING?

Moderator Dr. Dick Morgan, Climatologist

- Dr. Glen Lesins - *Physics & Atmospheric Science, Dalhousie University*
- Dr. Paul Hill – *Oceanography Department, Dalhousie University*
- Mr. John Falkingham – *Canadian Ice Service, Environment Canada*

Discussion

Coffee break – hosted by *Marine Affairs Program, Dalhousie University*

Panel #2 – THE REALITIES OF ARCTIC NAVIGATION

Moderator – Capt. Jim Calvesbert, *Company of Master Mariners of Canada*

- Capt. Tony Potts, *Commanding Officer, CCGS Louis S. St. Laurent, Canadian Coast Guard*
- Capt. Gene Barry, *Retired Commanding Officer, Icebreakers, Canadian Coast Guard*
- Capt. Alex MacIntyre, *Arctic Ice Pilot*

Discussion

COMMERCIAL SHIPPING ; ARCTIC EXPERIENCE, PAST, PRESENT AND PERHAPS

Thomas Zagon, *Enfotec Technical Services, Fednav Inc., Montreal*

COMMERCIAL SHIPPING PREPARES FOR ARCTIC TRANSITS; IMO AND CLASSIFICATION SOCIETY INITIATIVES

Mr. Bud Streeter, *Vice-President, Lloyd's Register North America*

Lunch – hosted by *Lloyd's Register, N.A.*

Panel #3 – ARCTIC SOVEREIGNTY – MILITARY CAPABILITY

Moderator – Cdr. Ken Hansen, *Centre for Foreign Policy Studies, Dalhousie University*

- Capt.(N) Colin Plows – *Canada Command HQ, Ottawa*
- Capt. Ali Laaouan, - *Deputy OiC, Joint Rescue Coordination Centre Halifax*

Discussion

Coffee Break – hosted by the *Company of Master Mariners of Canada*

Panel #4 – ARCTIC JURISDICTION - LEGAL AND ENVIRONMENTAL CHALLENGES

Moderator – Capt. Angus McDonald, *Company of Master Mariners of Canada*

- Dr. David VanderZwaag, *Marine and Environmental Law Institute, Dalhousie*
- Dr. Jacob Verhoef - *Director, Geological Survey of Canada, NRCan*
- Capt. Alan Knight - *Senior Marine Inspector, Marine Safety, Transport Canada*

Discussion

Closing Remarks – Capt. Jim Calvesbert, *Company of Master Mariners of Canada*

1600 End of Seminar



Review of the seminar
“CANADIAN ARCTIC ISSUES IN A CHANGING CLIMATE”

This seminar was an initiative of the Company of Master Mariners of Canada, supported by the Marine Affairs Program of Dalhousie University and Lloyd’s Register, North America. It took place on Wednesday, December 6, 2001 in the Kenneth C. Rowe Management Building, Dalhousie University, from 8.45 am until 4 pm.

The objective of the seminar was to provide accurate perspectives on current arctic issues based on science and experience and to stimulate intelligent discussion.

Welcome and opening remarks were made by Capt. Jim Calvesbert, Master of the Maritimes Division of The Company of Master Mariners of Canada (CMMC) and by Capt. Peter Turner, Master of the national Company.



Capt. Peter Turner, National Master, CMMC

The Seminar was structured to offer topical information in presentations by panels of experts, each panel session being followed by a period for inter-action with attendees.

The topic of the first panel “*IS POLAR CLIMATE REALLY CHANGING?*” was described by Dr. Glen Lesins, Physics and Atmospheric Science, Dr. Paul Hill, Oceanography, both Dalhousie University professors, Mr. John Falkingham, Canadian Ice Service, Environment Canada. The Moderator of this Panel was, Dr. Dick Morgan, Climatologist and retired Navy officer.



Panel 1 (l to r) John Falkingham, Dr. P. Hill, Dr. G. Lesins, Dr. R. Morgan

SUMMARY:

The Moderator in opening remarks spoke briefly of climate change trends and observed that there appeared to be a tendency to speculate and sensationalize climate change and international study groups could be politically influenced.

Dr. Lesins reminded the audience of the 65 million years of climate change and of the glacial cycles. In the last 100 years we have data from instruments and in the past twenty-seven years data from satellites. The latter provide excellent geographic coverage and regional variability can be identified. As an example, it was noted that while the Barents Sea and Greenland cooled, it was less cold along the coasts of Siberia and Greenland. Atmospheric pressure also influences temperature and there is a significant effect on ice cover from the solar system.

In summarizing, Dr. Lesins noted the relatively warmer temperatures in the Arctic, these past 20 years and that warming may be induced by fossil fuel burning and that CO₂ is an important factor influencing temperature.

Dr. Hill, noted that polar ice cover is variable; that melting may be influenced by surface air temperature, wind which breaks up the ice, cloud cover and cloud cover created by advection from relatively warm ocean water. Dr. Hill agreed with Dr. Lesins that there has been a “pull-back” of ice cover from the Siberian coast which may enhance the possibility of the Northern Route from east Russia to its western extremity and China being open to shipping. This “pull back” observed in 2003 and in 2005 there were record low temperatures in the Polar regions.

Statistical data showed that throughout the 20th century there was not much change in winter ice.

In summers, ice cover declined generally but was subject to the impact of strong winds weakening the ice and water vapour rising from open water. Looking ahead to the next 100 years one must realize that sea ice cover will be variable.

Mr John Falkingham, Environment Canada, in noting the increased public interest in the Arctic and prognostications for change, observed that between 1979 and 2006, there was a decreasing tendency in Arctic regions and ice was indeed pulling back from the Siberian and Alaska coasts, yet even in this past summer ice was heavy around Point Barrow, northeastern tip of Alaska. In the period 1971 - 2005, there has been a decrease in summer ice cover generally but there variations such as, 1978, 1979, 1991 and 1992 when severe ice conditions were prevalent in summer months.

Observations showed a 12% decrease in TAC cover, a 44% decrease in Hudson's Bay and the Labrador Sea, while there is a reducing trend in the Beaufort Sea and Peel Sound while Lancaster Sound had no decreasing tendency.

In conclusion, Mr. Falkingham predicted that the Arctic summer shipping season may be extended from the current three months to six months by the end of this century but there will continue to be extreme inter-annual variability in Arctic ice conditions. The North-west Passage will not likely become an east-west corridor for shipping and ice cover each winter will remain a barrier. Our understanding of the Arctic climate system is far from complete but current trends may well continue.

In summing up, Dr. Morgan stated that high Arctic temperatures experienced during the mid 20th Century were the result of rapid and significant increase in warming during the 1920-40 period. This was followed by a cooling trend of near-similar magnitude between 1940 and 1970. Subsequent temperature change has not been as significant in amplitude and rate of warming as that prior to 1950. Analysis of data supports the hypothesis that Arctic climate change, including ice coverage, has been governed primarily, by regional intra-decadal and low frequency natural oscillations in atmospheric pressure, ocean circulation patterns and probably, solar variability.

Climate change in the Arctic is still under scientific investigation due to the limited data available prior to satellite surveys which started in the 1970s. Oceanographers are warning of changes in the thermo-haline circulation and cooling of the Gulf Stream. Solar scientists are predicting a period of reduced solar activity in the latter part of this century and climatologists have identified interdecadal natural oscillations in regional polar climates.

The topic of the second Panel, "***THE REALITIES OF ARCTIC NAVIGATION***" was described by, Capt. Tony Potts, Commanding Officer of the *Canadian Coast Guard Ship (CCGS) Louis S. St.-Laurent*, Capt. Gene Barry, retired CCG Commanding Officer with much Arctic experience and Capt. Alex MacIntyre, an experienced Arctic ice pilot. The Moderator for this Panel was Capt. Jim Calvesbert, recently retired from Canadian Coast Guard.



Panel 1 (l to r) Capt. A. MacIntyre, Capt. G. Barry, Capt. T. Potts, Capt. J. Calvesbert

Capt. Potts had recently returned from the Arctic in the Coast Guard's most powerful ice-breaker. His ship had been doing seismic reflection surveys in the Beaufort Sea in connection with Canada's claim for an extension of jurisdiction beyond 200 miles. The ship had to force a way through the Northwest Passage, clogged with hard multi-year ice. He stated that in the Arctic, ice conditions change from year to year. Multi-year ice is as hard as reinforced concrete and even powerful ice-breakers must be navigated with care and skill to avoid damage. About one-third of Arctic sea ice is estimated to be from 3 - 10 metres thick. As ice melts near coasts, wind shifts will move multi-year ice to replace the melted ice.

Capt. Potts stated that in the Arctic there will be hazards to vessels as long as multi-year ice exists; even when it is broken, it is hard and can damage ships. He pointed out that there is virtually no infrastructure to support shipping in the Arctic region. There are no ship-repair facilities, no fuel supplies and much fuel is needed to force a ship through ice. There is only one dock in the Arctic and that is at a former mine site at Nanisivik, northeast of Baffin Island. This dock is now a Coast Guard facility.

Another significant hazard to shipping is the lack of up-to-date hydrography which would facilitate safe passages through the straits in the archipelago. Reference was made to the long winter when there is total darkness, multi-year ice cover, terrible storms and dense fog. Hydrographers were aboard the CCGS *Louis S. St.-Laurent* this year and hydrographic survey was done en route.

Capt. Gene Barry, in his presentation, corroborated much of what was said by Capt. Potts. He added that if shipowners wished to use the Northwest Passage as a shorter route between the Atlantic and the Pacific, supposing there was more open water than there is at present, their ships would be liable to damage from growlers and bergy bits, broken multi-year ice, difficult to detect and sometimes concealed among first-year ice.

Hull damage could result in an oil pollution incident with disastrous consequences to the environment and heavy penalties to the polluter. Capt. Barry pointed out that if a ship were heavily reinforced to force ice, it would be more expensive to run in open water due to increased fuel consumption. He noted that a Canadian shipping company with many years experience with their ship designed for the Arctic used experienced pilots.

Of the natural resources discovered in the high Arctic, great quantities are still there. To extract these and ship them south would be costly. Arctic conditions are hard to predict and vary from year to year. For commercial shipping there could be huge costs.

Capt. Alex MacIntyre spoke of his experience guiding passenger-carrying vessels on “expedition cruising” which is a growing business. The vessels carry about 100 “adventurers” and a crew of about 150. Since there are no ports or docks, passengers use Zodiac type boats for visits ashore to the bleak, desolate islands and to isolated villages. The ships report to Transport Canada’s communications centre located near Iqaluit. It is known as NORDREG and it monitors shipping in the Arctic. The Arctic Waters Pollution Prevention Act and its regulations apply to commercial ships. The region is divided into zones and vessels are permitted to navigate in a zone, between specific dates, depending upon the strength and power of the ship. The idea is to prevent damage and possible pollution by a ship unsuited to the ice cover at the time of year.

In answer to a question on garbage disposal, Capt. Potts stated that garbage and waste oils were segregated and incinerated at high temperature where possible but much of it was crushed, compacted and packaged for return to base.

A cruise ship operator stated that in the southern summer about 36 commercial ships are cruising in the Antarctic. Some of these may come to the Arctic in the northern summer. He asked what assistance could be expected from the Coast Guard. Capt. Potts said that this could not be easily answered because in the short shipping season, the few ice-breakers in the Arctic are mostly busy with specific tasks. However, he recommended that the ship operator should discuss the matter with CCG in Ottawa.

In answer to a question about the replacement of Canadian Coast Guard’s ageing ice-breakers, Capt. Potts stated that the *CCGS Louis S. St.-Laurent* (now 37 yrs old) would not be replaced until 2017. He added that CCG have seasonal operations, such as, Arctic for a number of weeks in summer and fall and some weeks in the St. Lawrence in winter and spring. In response to a comment, Capt. Potts said that CCG encouraged officers to give their views on the ship and conditions during post-operation de-briefing.

Capt. Potts had mentioned Swedish and Russian ice-breakers transiting the Arctic route and in answer to a query stated that the Swedish vessel had received approval from Transport Canada before entering the Arctic; the Russian was on charter to Shell and that company had sought and received approval for the vessel’s operations.

The next session entitled, “**COMMERCIAL SHIPPING PREPARES FOR ARCTIC TRANSITS: IMO AND CLASSIFICATION SOCIETY INITIATIVES**” comprised a presentation by Mr. Tom Zagon, of FEDNAV, Montreal and Mr. Bud Streeter, Vice-President of Lloyd’s Register North America Inc..



Mr. Tom Zagon

Mr. Zagon’s presentation covered the period of FEDNAV’s service to Canada’s Arctic, firstly in the 1960s with the annual re-supply of stations and settlements in Eastern Arctic, then the movement of construction materials and equipment required for resource exploitation and the introduction of their purpose-built bulk carrier “ARCTIC” in 1978. This ship carried ore concentrates from Nanisivik on Baffin Island to North Europe. When oil was being exported from Bent Horn on Cameron Island the company converted the “ARCTIC” to an Oil Bulk Ore (OBO) ship. The ship is still in service but for the new Voisey’s Bay, Labrador project, the company built a ship and incorporated features based on experience with the “ARCTIC”. Mr. Zagon showed maps and pictures of the Arctic and locations of mineral resources. Oil from Bent horn was exported between 1985 - 1997 (two trips per year were possible), Nanisivik’s ore was exported from 1974 - 2002, good quality ore was taken from the Polaris mine at Little Cornwallis from 1982- 2002. To extract minerals from the high Arctic is costly and can be shipped out for limited periods each year, so, it depends on world commodity prices.

Mr. Zagon showed pictures of Red Dog, Alaska, where zinc and lead concentrates are being shipped, Raglan nickel concentrate since 1998, gold ore from Nalung, Greenland and Voisey’s Bay, Labrador, where nickel and copper are being shipped, year round.

Mr. Zagon was with Enfotec Technical Services delivering ice and other information, including feasibility studies for winter navigation, for Canarctic Shipping Ltd, which operated the “ARCTIC” until its operations were taken over by FEDNAV. Enfotec presently is a subsidiary of FEDNAV in Montreal.

WINTERISATION AND THE POLAR CODE

Mr. Bud Streeter of Lloyd's Register, formerly, Director General of Transport Canada's Marine Safety Branch and well-known at IMO, spoke about IMO's POLAR CODE and how IMO persuaded the International Association of Classification Societies (IACS) to move away from the traditional hull ice classifications to a new concept in which the whole ship and its crew would be considered for "WINTERIZATION", the basis of the Polar Code.



Mr. Bud Streeter

IACS appreciating that vessels operating in cold climates, e.g., St. Lawrence in winter, Arctic in summer, North Russia sea route, Baltic Sea in winter, Antarctica, require special rules for hulls, machinery, equipment, deck fittings, electronic equipment, accommodation insulation, life-saving and fire-fighting equipment, crew training and personal protective clothing plus stability considerations when icing occurs.

Emerging markets and sources of cargoes in remote very cold areas, call for new technological solutions in making ships and personnel fit, effective and safe. With classification societies' clients, operations, routes and weather patterns are studied; risk analyses raise awareness to problems and guidance to solutions. One risk to be considered is that if the vessel became a major casualty in Arctic conditions, could the traditional lifesaving equipment be used and could the crew survive if stranded on ice awaiting rescue which could be a long time coming in a remote area.

Mr. Streeter mentioned that the Winterization rules would be applied according to a ship's operations such as, seasonal transits through cold areas or prolonged operations in areas with sub-zero temperatures and the operational areas would be categorized as, mild, moderate or severe in terms of temperature.

Unfortunately there was no time for questions on these two presentations as it was lunch-time. Mr Streeter was the lunch host, much appreciated by all present.

AFTERNOON SESSION.

Capt. Calvesbert introduced Commander Ken Hansen the Moderator of Panel #3, the theme of which had the title, “**ARCTIC SOVEREIGNTY - MILITARY CAPABILITY**”. Commander Ken Hansen, of the Center for Foreign Policy Studies, then introduced the speakers, Captain (N) Colin Plows, Canada Command HQ., Ottawa, Captain Ali Laaouan, (Air Force) and Deputy Officer in Charge at Joint Rescue Coordination Centre, Halifax.



Panel 3 (l to r) Capt. A. Laouann, Capt.(N) C. Plows, Cdr. K. Hansen

Cdr. Hansen, by way of setting the scene, described as an interesting period, that since 2004 when the National Defence Policy was declared by Government. The Navy had started thinking in new ways and adopting new partners (when given by Government a major role in the defence of Canada). Much has been written about the Arctic and the Navy has probed (to the ice edge) in annual sorties since 2002. In Ottawa, defence capabilities are being discussed as is the acquisition of “utility” aircraft for Arctic service and from the Chief of Naval Staff they are discussing a suitable naval vessel while an Arctic Warfare School is being established.

Cdr. Hansen, just before calling upon Capt. Plows, announced that R/Admiral Dean McFadden, Commander Joint Task Force, Atlantic, sent “GREETINGS” to the participants in this Seminar.

Capt. Plows’ presentation aimed to overview what the Canadian Forces were doing with regard to Sovereignty in the Arctic, emphasizing that the post-Cold War military threat is considered low. He noted the significant CF role of support to other government departments in operations other than those in the traditional military security areas. These include, natural disasters, civil emergencies, search and rescue and policing. Capt. Plows described the new Canada Command an operational re-structure in the CF which aims to bring continental operational planning and control of previously separated elements under one chain of command. National operations

including Arctic operations have headquarters in Yellowknife, now thirty years old and being updated. Serious efforts are being made to address Arctic issues including “domain awareness”. Before concluding Capt. Plows described CF exercises in the Arctic this past summer. He added that a Canadian Forces Arctic Strategy was needed, also, a National Surveillance Plan, enhanced Arctic Situational Awareness and an adequate presence of Canadian Forces.

The next speaker was Air Force Capt. Ali Laaouan, who outlined the responsibilities of the national Rescue Coordination system including a long-standing shared DND/Coast Guard mandate. With speed/time/distance examples, he highlighted the practical challenge arising from the great distances involved in staging rescue operations in the far north. Fuelling and landing strips are essential to the aircraft making transits from their bases and these facilities are few and far between. By the time the aircraft reaches the Arctic it may have enough fuel for a very short search.

Capt. Laaouan went on to describe the CF aircraft currently employed in search and rescue. RCC when tasked with a SAR emergency in the Arctic would likely call upon Canada Command for the use of CF assets, whether aircraft or land forces and would call the Coast Guard if they had ships in the area or they may charter aircraft or call upon the RCMP to assist.

DISCUSSION PERIOD - 8 questions were addressed/

UNDERWATER SURVEILLANCE; Suzanne Lalonde, University of Montreal, inquired about the ability to detect submarines below the Arctic ice. Cdr. Hansen responded that although there have been experimental systems in place there is not a current operational detection system.

AIRSHIPS, The panelists were asked by Mr. John Gratwick, whether airships or other vehicles were being considered for Arctic operations. An attendee from military HQ in Ottawa indicated that airships were not being proposed at this time. Capt. Turner (CMMC) observed that he had some experience, when with Dome Petroleum in Beaufort Sea, of balloons with radar equipment were tried but were not effective due to the very cold conditions.

COOPERATION WITH THE U.S. Martin Karlsen suggested that cooperation with the US would be a way to mitigate sovereignty conflict as well as military shortage of resources. The panelists emphasized that there are many long-standing mechanisms through which Canada and the US address continental issues and that communication between the two countries is not seen as a problem.

POLAR CONTINENTAL SHELF PROJECT. Bob Taylor of Natural Resources Canada asked if DND planners had a part in this large international effort which has existed since the 1960s. He outlined the considerable Arctic experience and practical resources, including caches of fuel, within this project. The panelists were not familiar with the Project, another DND person present indicated that indeed DND was in communication with the Project’s Canadian participants. The question underscored the large matrix of public/private/national/international activity in the Arctic and the challenge of building an overall national Arctic policy.

ARCTIC CHANNEL DEPTHS. David Griffiths, (ex-Navy) inquired about the available channels in the Arctic which have sufficient depth for submarine operations. Panelists were not able to discuss this matter.

S. A.R. RESPONSE TIME Capt. Turner (CMMC) inquired about the adequacy of response times to Arctic incidents. He raised the issue of approval requirements which would add to the time for responding to emergency beacon calls. Capt. Laaouan addressed this in some detail, mentioning again the challenges of distance from SAR aircraft bases to northern emergencies as well as the practical aspects of monitoring emergency beacon transmissions. He stated that approvals to respond and task aircraft and ships are embedded within the SAR structure and require no additional consent.

NEW COAST GUARD ICE-BREAKER. Rod Stright (ex-CCG) asked if DND would consider placing military personnel and equipment on board a new, improved Coast Guard Arctic Ice-breaker. The panelists agreed in principle to this good concept and note that there were precedents. Capt. McDonald (CMMC) stated that he did not favour government building Ice-breakers for the Navy but they should be built for the Coast Guard and available to perform joint operations with Canadian Forces on Sovereignty-related or security missions. Such a new vessel should have flight decks strong enough for military helicopters and there should be quarters which may be used by detachments of troops, such as Rangers, Navy or Police personnel. The vessel, as in the case of existing ice-breakers would be available for scientific work and in winter may be deployed in the ice-infested St. Lawrence Gulf.

After a coffee break, hosted by The Company of Master Mariners, participants returned to hear the speakers of Panel #4, the title of which was, “**ARCTIC JURISDICTION - LEGAL AND ENVIRONMENTAL CHALLENGES**”. The Moderator of this Panel was Capt. Angus McDonald, Company of Master Mariners of Canada. After he was introduced by Capt. Calvesbert, Capt. McDonald introduced the speakers who were, Dr. David VanderZwaag, Canada Research Chair in Ocean Law and Governance, Marine and Environmental Law Institute, Dalhousie University, Dr. Jacob Verhoef, Director, Geological Survey of Canada, Natural Resources Canada (NRCan), BIO, Dartmouth and Capt. Alan Knight, Senior Marine Inspector, Marine Safety, Transport Canada, Maritimes Region, Dartmouth.



Panel 4 (l to r) Dr. D. VanderZwaag, Capt. A. Knight, Dr. Jacob Verhoef, Capt. A. McDonald

Professor David VanderZwaag addressed two main jurisdictional issues facing Canada in the Arctic – the legal status of the Northwest Passage and the legal future of high seas areas beyond national jurisdiction.

After giving a brief history of the “chess game” with the United States over the legal status of the Northwest Passage, he provided an overview of the three main legal regimes possibly applicable to Northwest Passage waters. Canada’s ideal and legal stance is that the waters are internal in status and thus subject to full Canadian sovereignty and total control over foreign shipping including, for example, the right to prohibit selected transits, such as carriage of certain hazardous cargoes. Two main legal foundations to support the internal waters claim were described, namely, that the waters represent “historic waters” subject to long-term Canadian exclusive control and the waters are validly considered internal because international law allows straight baselines to be drawn around a fringe of islands in the immediate vicinity of a coastline. The United States’ position is that the Northwest Passage is an international strait where the right of transit passage would apply to foreign vessels and where the coastal state would face major regulatory constraints such as not being able to impose its own pollution control or safety at sea standards. The third possible legal regime was described as a “murky middle ground” whereby if Canada’s claim to internal waters status was not upheld, Canada could still rely on the “Article 234 overlay.” Article 234 of the *1982 Law of the Sea Convention* grants coastal states special legislative and enforcement powers over foreign ships where waters are ice-covered for most of the year. Various potential controversies over interpretation of Article 234 were reviewed, for example, the question of how far Canada could go in prohibiting or restricting transits by “risky” foreign ships such as oil tankers or hazardous waste carriers.

Professor VanderZwaag concluded his discussion of the Northwest Passage dispute by highlighting three future options for Canada-US relations. The countries could let the dispute “fester” but that approach may become more difficult to maintain if Arctic shipping does increase. The two neighbors could negotiate and extend the 1988 Arctic Accord to also cover commercial vessels (not just government ice breakers) and perhaps even broader cooperation in

relation to shipping. The countries could also resort to third party dispute resolution procedures, either non-binding (for example, conciliation) or binding (for example, arbitration).

Governance of high seas areas beyond national jurisdiction in the Arctic was described as a largely neglected international issue which melting ice scenarios may soon place on the “front burner.” Three main options for addressing ocean governance beyond national maritime zones of jurisdiction were summarized: a law of the sea approach where flag state jurisdiction would prevail as the prime principle for controlling activities such as shipping and fishing; a regional “sui generis” approach where the five Arctic littoral states would assume management responsibilities; and a multilateral Arctic Ocean Agreement approach. The latter approach, involving international negotiation among Arctic states and other states with Arctic interests, might even designate the high Arctic Ocean as a marine protected area perhaps subject to some restricted uses such as tourism and marine scientific research.

Dr. VanderZwaag concluded by emphasizing two major complications standing in the way of addressing high seas governance in the Arctic. Views of states are in conflict over whether existing law of the sea provisions provide an adequate foundation for controlling high sea uses such as bioprospecting, and various international processes to further international discourse have yet to run their course.

Dr. Jacob Verhoef discussed the key areas of UNCLOS, viz., Coastal State authority diminishing seawards; under Article 76, can claim an extended continental shelf; this extended area (in the Beaufort Sea) is about the size of the three prairie provinces. Canada also claims the sea area beyond the EEZ 200 miles to the edge of the continental shelf. Canada approved UNCLOS and ratified it in 2003. By 2013 Canada will be allowed to submit its claim for these seaward extensions of jurisdiction.

Dr Verhoef explained that the method of substantiating Canada’s claim would be to construct detailed maps of the claimed area and do seismic reflection surveys. In the Arctic region, Russia submitted a claim for 50% of the Arctic but Canada, US and Denmark protested. Canada would like to claim the Eastern and Western Arctic but Canada may have to negotiate with USA, Russia and Denmark. Submitting a claim is no easy matter. Dr. Verhoef referred to an Australian claim submitted in 2005 on a total of 624 kilos of paper.

Capt. Alan Knight, the final speaker in the Seminar described a completely new approach by Transport Canada in the Arctic. T.C. has published a pamphlet on which is the Vision Statement; “A healthy and productive Arctic Ocean and coasts that support environmental, economic and socio-cultural values for current and future generations.”

Capt. Knight introduced the ARCTIC MARINE SHIPPING ASSESSMENT which is a direct follow-up to the Arctic Marine Strategic Plan adopted by the Arctic Council ministers in November 2004. Marine Safety as an Arctic Council member advises the Government of Canada. The Council has a mechanism to address the common challenges of the people of the Arctic. A concern to be addressed is the impact of expanded marine activity on the cultures and well-being of Arctic populations.

Transport Canada is doing the assessments to establish the impact of Arctic warming with consequent decrease in ice cover which will open the Russian Northern Sea Route.

The Protection of the Arctic Marine Environment (PAME) was tasked to conduct a comprehensive shipping assessment under the guidance of Canada, Finland and the US, as lead countries, and in collaboration with EPPR (Emergency, Prevention, Preparedness and Response) Working Group. Transport Canada, through its Council membership, is cooperating with Denmark, Iceland, Russia, Finland, USA. Capt. Knight concluded by saying that while international cooperation is beneficial, there is still work to be done.

DISCUSSION PERIOD (Questioners not identified)

SEISMIC SURVEYS Could submarines be used for seismic surveys. The answer was given that submarines, unless modified and fitted with a huge compressor, are not suitable for seismic surveys.

EXISTING LEGAL REGIME - CANADA/US. This appears to have been successful but it appears that others besides Canada and US are interested in the Arctic. Do we have faith in multi-lateral approaches and what about other states claiming waters as theirs?

In answering, (Dr. D VanderZwaag), it was stated that Canada needs a national policy to state what Canadians expect to see in the future; also, government should be initiating a Northern Strategy, one that involves Arctic communities and the Canadian public. There needs to be a public debate, one person here cannot provide the answer.

Question related to first speaker's information about the BASE LINES around territory claimed by Canada and extensions to the edges of the CONTINENTAL SHELVES. If there is no firm EEZ limit at present, where do you start surveys for the future claims?

Canada is talking to the US on this. There may be a problem if we submit a claim and the US disputes the claim. Some claims are submitted to the UN for international study; Canada is working well with Denmark in resolving territorial claims; there may be a potential issue with the Russians in the polar region; we strive to prevent problems.

Will these matters and negotiations delay a conclusion to our territorial claim beyond the 10 year limit allowed by the UN. In answer it was said that it is not essential to solve all problems within the 10 year limit but to submit Canada's claim with supporting data.

IS ARCTIC BASIN TOO LARGE? So far, 64 Large Marine Eco-systems (LME) have been identified in the region. The Arctic Council is studying these LMEs but the surveys of LMEs have been done on an ad hoc basis.

ARCOP EXERCISE - NORTHERN SEA ROUTE; The use of ice-breakers, the issue of cost recovery, Russia, Norway seems to be moving ahead with this. How familiar is Canada with this situation?

There are a number of differences faced by Canada, for example, we have the Inuit situation in Canada's Arctic, we have Ballast Water Guidelines but nothing similar for the Arctic. The Russians are able to promulgate regulations and laws and no one has challenged them. In the 1960s, the Russians (USSR) had the capacity to insist on their sovereignty whereas Canada has politely gone through hoops and bureaucracy.

THE ENVIRONMENTAL ISSUES CONNECTED WITH AN INCREASE IN ARCTIC SHIPPING. A concern expressed about Canada's ability to protect the Northern environment without significant legislative changes.

Mr. Streeter spoke of increased standards for commercial shipping such as double-hulled tankers and under the new WINTERISATION project required by IMO and the classification societies, ships and crews for Arctic operations will be safer than some ships are at present when going into ice-infested waters. Marine Safety will ensure that safety standards are increased for Northern voyages as Capt. Knight stated and fines for pollution under new legislation will be extremely punitive.

Mr. Streeter stated that there was a lack of data when certain rules were being developed; we had to set a base-line and we have established a high-base-line to inhibit accidents and incidents although there is no doubt we gain a lot of knowledge and experience from accidents and incidents. We have to focus on operations and facilities as well as on response to emergencies. Opening the arctic means opening towns and maybe ports. Some planning has been done.

Concluding remarks were presented by the seminar chairman, Captain Calvesbert.

