Arctic Marine Transport: Today & Tomorrow

3rd Symposium on the Impacts of an Ice-Diminishing Arctic on Naval and Maritime Operations

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Topics:

• Brief Review ~ Current Arctic Marine Use
• Arctic Marine Shipping Assessment 2009 Report
Today’s Arctic Marine Use

- Hard Minerals

World’s Largest Zinc Mine

Zinc & Coal

High Grade Iron Ore??

World’s Largest Nickel & Palladium Mine

Nickel & Copper
Today’s Arctic Marine Use

- Hard Minerals
- Marine Tourism

Zinc & Coal

High Grade Iron Ore??

Nickel & Copper
Today’s Arctic Marine Use

• Hard Minerals
• Marine Tourism
• Key Fisheries

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Nickel & Copper
Today’s Arctic Marine Use

- Hard Minerals
- Marine Tourism
- Key Fisheries
- Oil & Gas

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Nickel & Copper
Today’s Arctic Marine Use

- Hard Minerals
- Marine Tourism
- Key Fisheries
- Oil & Gas
- Summer Sealift

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Nickel & Copper
Today’s Arctic Marine Use

• Hard Minerals
• Marine Tourism
• Key Fisheries
• Oil & Gas
• Summer Sealift
• Exploration/Science

High Grade Iron Ore??

Zinc & Coal

Nickel & Copper

Arctic Ocean Marine Routes
Arctic Marine Shipping Assessment of the Arctic Council (2005-2008)
Notable icebreaker Voyages:
Arktika, August 1977
Sovetskij Soyuuz, August 1991
Polar Sea and Louis S. St-Laurent, July and August 1994
Sea ice, 16 September 2002

by Mapping Solutions, Anchorage, 2005
for L. Brigham, USARC
Arctic Council ~ Intergovernmental Forum
AMSA Lead Countries for PAME ~ Canada, Finland & USA
AMSA Focus ~ Marine Safety & Marine Environmental Protection

Key Challenge ~ Many Non-Arctic Stakeholders
Table of Contents

Executive Summary with Recommendations

Introduction

Arctic Marine Geography, Climate and Sea Ice

History of Arctic Marine Transport

Governance of Arctic Shipping

Current Marine Use & the AMSA Shipping Database

Scenarios, Futures and Regional Futures to 2020

Regional Futures: Bering Strait Region, Canadian Arctic and Northwest Passage, Northern Sea Route and Adjacent Areas

Human Dimensions

Environmental Considerations and Impacts

Regional Environment Case Studies: Aleutian Islands/Great Circle Route, Barents and Kara Seas, Bering Strait, Canadian Arctic

Arctic Marine Infrastructure
Shipping traffic in the Arctic for the AMSA Survey year 2004.
Russian Arctic Shipping 2004
AMSA Scenarios: Plausible Futures for Arctic Navigation to 2050

~ Complexity ~
AMSA Key Uncertainties for Future Arctic Marine Transportation

- Stable legal climate
- Radical change in global trade dynamics
- Climate change is more disruptive sooner
- Safety of other routes
- Socio-economic impact of global weather changes
- Oil prices (55-60 to 100-150 USD?)
- Major Arctic shipping disasters***
  - Limited windows of operation (economics)
  - Rapid climate change
- Maritime insurance industry

- China, Japan & Korea become Arctic maritime nations
  - Transit fees
- Conflict between indigenous & commercial use
- Arctic maritime enforcement
- Escalation of Arctic maritime disputes
  - Shift to nuclear energy
- New resource discovery
  - World trade patterns
- Catastrophic loss of Suez or Panama Canals
  - Global agreements on construction rules and standards
High demand and unstable governance set the stage for an economic ‘rush’ for Arctic wealth and resources.

High demand and stable governance lead to a healthy rate of development, includes concern for preservation of Arctic ecosystems & cultures.

Low demand and unstable governance bring a murky and under-developed future for the Arctic.

Low demand & stable governance slow development in the region while introducing an extensive eco-preserve with stringent “no-shipping zones”.

Scenarios on the Future of Arctic Marine Navigation in 2050

Arctic Race

Arctic Saga

Polar Lows

Polar Preserve

AMSA/GBN Scenarios Workshops – April & July 2007
The Future of Arctic Marine Navigation in 2050
“Circum-Arctic Resource Appraisal: Estimates of Undiscovered Oil and Gas North of the Arctic Circle”

- 13% Undiscovered Oil
- 30% Undiscovered Natural Gas
- 20% Undiscovered Natural Gas Liquids

http://pubs.usgs.gov/fs/2008/3049/
Long known as a storehouse of untapped natural resources, high commodity prices and a growing worldwide demand in recent years have the Arctic poised as a significant contributor to the global economy.
Selected AMSA Findings

(A) -- UNCLOS ~ Fundamental framework & IMO ~ Competent UN agency

(B) -- Winter Arctic sea ice cover remains & near or complete disappearance of multi-year ice

(C) -- No specially-tailored, mandatory IMO environmental standards for vessels operating in the Arctic

(D) -- AMSA data survey ~ nearly all destinational traffic

(E) -- Key drivers ~ Natural resource development & regional trade
Selected AMSA Findings

(F)--Many factors of uncertainty influencing future Arctic marine activity

(G)--Arctic residents ~ concerns & recognition of benefits

(H)--Most significant threat ~ release of oil through accidental or illegal discharge

(I)--General lack of marine infrastructure (exceptions: Norwegian coast & northwest Russia)
AMSA Recommendations: Three Broad, Interrelated Themes

- Enhancing Arctic Marine Safety
- Protecting Arctic People and the Environment
- Building the Arctic Marine Infrastructure
Recommendation Highlights

- **Arctic States Decide** ~ Cooperatively support IMO efforts to strengthen, harmonize & regularly update international standards for vessels operating in the Arctic.

- **Arctic States Decide** ~ Support mandatory application of relevant parts of the IMO Guidelines.

- **Arctic States Decide** ~ Development & implementation of a comprehensive, multi-national SAR instrument.

- **Arctic States Recognize** ~ Explore the need for internationally designated areas for environmental protection (one tool: PSSA).

- **Arctic States Should Consider** ~ Ratification of the IMO ‘Ballast Water Convention’.
Recommendation Highlights

- **Arctic States Decide** ~
  - Enhance Cooperation in oil spill prevention
  - Engage organizations addressing the effects of ship noise, disturbance and ship strikes
  - Improved practices & technologies to reduce current/future air emissions

- **Arctic States Recognize** ~ Improvements to Arctic marine infrastructure to enhance safety & environment protection (Arctic marine traffic awareness system)

- **Arctic States Decide** ~ Develop circumpolar environmental response capabilities (circumpolar & regional agreements)
AMSA 2009:

• Baseline Assessment
• Arctic Council Policy Document
• Strategic Guide

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