Recent Arctic Shipping in Bering Strait and the Russian Maritime Arctic

- Rapid Climate Change
- Globalization ~ Arctic Natural Resources
- Indigenous Peoples Challenges
- Regional & Global Geopolitics

ACCAP WEBINAR
UAF IARC
18 March 2020

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ACCAP Webinar Topics ~ Recent Arctic Shipping in Bering Strait and the Russian Maritime Arctic

- Arctic Traffic & Global Links
- Changing Arctic Marine Access
- Arctic Marine Shipping Assessment
- Recent Traffic Through Bering Strait
- NSR & Yamal LNG Developments
- NSR Key Future Issues
September ice extent, 2015
Arctic Linkages to the Global Economic System

• International Fishing (10%)
• Hard Minerals ~ Palladium (40%), Nickel (22%), Diamonds (20%), Platinum (15%), Zinc (10%)
• Estimated Arctic Hydrocarbons ~ Undiscovered Natural Gas (30%) & Oil (13%)
  • Potential: Rare Earths (25%), Coal & Fresh Water
  • Global Marine Tourism industry
• Regional Trade to Northern Communities & Infrastructure Development

“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/

New Arctic Resource Discoveries
Changing Summer Arctic Sea Ice Coverage ~ 1979-2012
Arctic Sea Ice Minimum Extents ~ 2007 & 2012

09/11/2007

09/16/2012
Winter & Spring Months
2017 & 2018
Arctic Council ~ Intergovernmental Forum
AMSA Lead Countries for PAME ~ Canada, Finland & USA
AMSA Focus ~ Marine Safety & Marine Environmental Protection
13 Major Workshops & 14 Town Hall Meetings

Key Challenge ~ Many Non-Arctic Stakeholders
Table of Contents

- Executive Summary with Recommendations
- Arctic Marine Geography
  Climate & Sea Ice
- History
- Governance
- Current Use/Database
- Scenarios to 2020 & 2050
- Human Dimensions
- Environmental Impacts
- Infrastructure

www.pame.is
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 or change in Suez or Panama Canals
  - Global agreements on construction rules and standards
Scenarios on the Future of Arctic Marine Navigation in 2050

**Arctic Race**
High demand and unstable governance set the stage for an economic ‘rush’ for Arctic wealth and resources.

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

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

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

AMSA/GBN Scenarios Workshops ~ April & July 2007
The Future of Arctic Marine Navigation in 2050
Enhancing Arctic Marine Safety

Protecting Arctic People and the Environment

Building the Arctic Marine Infrastructure

AMSA RECOMMENDATIONS (17) ~ THEMES
Summer Traffic:
1 May 2019 – 1 Dec 2019

Bering Strait Maritime Traffic
Reflects vessels transmitting positions via AIS (Automatic Identification System)
Winter Traffic:
30 Nov 2018 – 31 Apr 2019

Bering Strait Maritime Traffic
Reflects vessels transmitting positions via AIS (Automatic Identification System)
Bering Strait Maritime Traffic
Reflects vessels transmitting positions via AIS (Automatic Identification System)
Bering Strait Maritime Traffic 2019
Reflects vessels transmitting positions via AIS (Automatic Identification System)

Graphic shows how vessel traffic is distributed across the Bering Strait
Majority of Maritime Activity on the Russian side is comprised of cargo vessels and tankers
Majority of Maritime Activity on the U.S. side is comprised of tugs and barges
Most Active Day of Maritime Traffic in Bering Strait – Sept 2, 2019
Reflects vessels transmitting positions via AIS (Automatic Identification System)
## Bering Strait Ship Traffic 2009-2019

<table>
<thead>
<tr>
<th>Year</th>
<th>Northbound</th>
<th>Southbound</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>2009</td>
<td>136</td>
<td>126</td>
<td>262</td>
</tr>
<tr>
<td>2010</td>
<td>128</td>
<td>114</td>
<td>242</td>
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<td>2011</td>
<td>124</td>
<td>115</td>
<td>239</td>
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<tr>
<td>2012</td>
<td>154</td>
<td>162</td>
<td>316</td>
</tr>
<tr>
<td>2013</td>
<td>171</td>
<td>173</td>
<td>344</td>
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<tr>
<td>2014</td>
<td>130</td>
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<tr>
<td>2015</td>
<td>232</td>
<td>220</td>
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</tr>
<tr>
<td>2016</td>
<td>158</td>
<td>182</td>
<td>340</td>
</tr>
<tr>
<td>2017</td>
<td>164</td>
<td>196</td>
<td>360</td>
</tr>
<tr>
<td>2018</td>
<td>183</td>
<td>175</td>
<td>358</td>
</tr>
<tr>
<td>2019</td>
<td>248</td>
<td>246</td>
<td>494</td>
</tr>
</tbody>
</table>
IMO Approved
Bering Strait
Ship Routing
Measures

Northern Sector
Natural Resources Reserve
Of Russian Federation

2,7 bln. tons

55 trln. m³

7,3 bln. tons

CONDENSATE

OIL

NATURAL GAS

Запасы по категориям
A+B₁+C₁+B₂C₂

* courtesy of the Ministry of Natural Resources of Russia
NATURAL RESOURCE PROJECTS – DRIVERS OF ARCTIC SHIPPING IN THE RUSSIAN ARCTIC
1. Kara Gate strait (~10-40 m)
2. Vilkitsky Strait (100-200 m)
3. Sannikov Strait (13 m)
4. Dmitry Laptev Strait (6.7 m)
5. Long Strait (33 m)

Stephenson, Brigham et al. 2014, *Polar Geography*
15. Government of the Russian Federation to prepare in accordance with Strategy of spatial development of Russian Federation in collaboration with regional public authorities and by 01 October adopt a comprehensive plan of modernization and expansion of backbone infrastructure, which should ensure by 2024::

   a) Development of “West-East” and “North-South” transport corridors for cargo transportation, through, among others:·

   <...>

   Development of Northern Sea Route and increase flow of goods through it to 80 million tons.
### Arctic Projects with Rosatomflot Participation (From Rosatomflot 2017)

Contracts Signed/Finalization Stage ~ All Russian Arctic Natural Resources Development

<table>
<thead>
<tr>
<th>№</th>
<th>Project &amp; Operator</th>
<th>Project Capacity per year</th>
<th>Life Span</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1.1 Yamal Trade LLC, LNG tankers</td>
<td>16.5 mln tons LNG</td>
<td>2014 – 2040</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1.2 Yamal LNG, Port Fleet</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Novoport Oil Deposit, Gazprom Neft</td>
<td>8.5 mln tons crude oil</td>
<td>2014 – 2017…40</td>
<td>contract</td>
</tr>
<tr>
<td>3</td>
<td>Norilsk Nickel, p. Dudinka</td>
<td>1.3 mln tons nonferrous &amp; precious metals</td>
<td>1975 – 2017…40</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Coal from Taimyr (VostokCoal)</td>
<td>10 mln tons coal</td>
<td>2017 – 2040</td>
<td></td>
</tr>
</tbody>
</table>

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**Bar Chart:**

- **X-axis:** Years (2016 to 2024)
- **Y-axis:** Tons (0 to 40)
- **Legend:**
  - Project 1: Blue bar
  - Project 2: Green bar
  - Project 3: Yellow bar
  - Project 4: Red bar
Northern Sea Route Cargo Traffic, Generated by the Projects already Active and Potential Projects

mln. tons

- active in 2018 - potential projects

USSR Max Traffic

- 6.1
- 6.5
- 5.5
- 2.3
- 1.5
- 2
- 2.5
- 5.3
- 20
- 29
- 36
- 60
- 80
- 45
- 55
- 65
- 90

2018
2024
2025
2030
Yamal Project: LNG Icebreaking Carrier Plan

**WINTER** (mid Nov ~ June)
- ARC7 15 LNGCs shuttle to Europe
- Light ice-class LNGCs (ARC4 or less, up to 11 ships) to Asia
  - Distance: 13,700 miles
  - One voyage: 55 days @10 knots

**SUMMER** (July ~ mid Nov)
- ARC7 15 LNGCs to Asia via NSR transit.
  - Distance: 4,900 miles
  - One voyage: 20 days @10 knots

Trans Shipment in Europe (Zeebrugge port)
15 YAMAL Arc7/PC4 LNG Carriers:
Year-round Westbound & Seasonal Eastbound from Sabetta
YAMALMAX GAS CARRIERS ROUTES (2018)

Data sources: Ministry of Transport, companies; analysis of GECON
International Transit Voyages via the Northern Sea Route in 2018

**Number of Vessels:** 27

- Russian Flag: 8
- China: 8
- Portugal: 2
- Panama: 2
- Liberia: 2
- Denmark: 1
- Netherlands: 1
- Finland: 1
- Antigua & Barbuda: 1
- St. Kitts & Nevis: 1

**Cargo Total:** 491 342 tons

- Bulk: 306 620
- Liquid: 98 977
- General: 48 738
- Container: 32 716
- Fish: 4 291

**Largest Vessel:** 76 180 dwt (bulk)

**Average Time on NSR:** 9.7 days

**1st Voyage Start:** July 24 Eastbound

**Last Voyage Completed:** December 04 Westbound
Icebreaking (Double Acting) Container Ship
*Norilskiy Nickel* ~ Year-round Navigation to Murmansk
Varendey Offshore Terminal in the Pechora Sea ~ Shuttle Tankers to Murmansk
New Generation Icebreakers is the Basis for Year-round Navigation along the Northern Sea Route

**Universal atomic icebreaker** Project 22220 (IB60) with the propulsion power of 60 MW

**KM Icebreaker** 9 [2] AUT2-ICS EPP

Length - 173,3 m, beam - 34 m, draught maximum - 10,5 m, minimum operating draught - 8,55 m. Water displacement – 33 540 tons.

IB60 is equipped with dual-reactor nuclear power plant RITM-200 with the overall power of 175 MW.

**Icebreaking capability:**
The icebreaker navigates with even speed of 1,5-2 kn at full draught and power through flat solid ice with maximum thickness of 2,9 – 3,0 m.

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**Atomic turbo-electric icebreaker** Project 105010 (IB Leader) with the propulsion power of 120 MW

**KM Icebreaker** 9 [2] AUT2-ICS ЕРР СD<60 HELIDECK-H Special purpose ship

Length – 209,0 m, beam – 47,5 m, maximum draught – 13,0 m, water displacement – 70 674 tons

IB Leader is equipped with dual-reactor nuclear power plant RITM-400 with the overall power of 315 MW.

**Icebreaking capability:**
The icebreaker navigates with even speed of 1,5-2 kn at full draught and power through flat solid ice with maximum thickness of 4,1 m.

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**Line Icebreaker Aker ARC 123**

Ice class: **Icebreaker** 8 (designed for RMRS)

Propulsion power: 40 MW

Length overall: 154,8 m (with towing notch – 160.0 m)

Beam: 31,4 m

Draught max: 9.0 m

Main fuel type: Liquefied Natural Gas

**Icebreaking capability:** flat ice 2,85 m thick with constant speed 2 knots
NSR Key Future Issues

- Complexity ~ Multiple Drivers & Uncertainties
- 2 Key Factors: (1) Economics of the Global Shipping Enterprise and (2) Global Demand & Commodities Prices
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  - IMO Polar Code Enforcement by Russia & Flag States
- Large Russian Arctic Marine Infrastructure Gap Remains.
Thank You & Questions
U.S. Coast Guard *Polar Security Cutter* (Polar Icebreaker)

- Instrument of National Policy in the Arctic & Antarctic ~ Unique National Asset
  - U.S. Sovereign & Naval Presence in All Polar Maritime Regions
  - Independent, Highly Mobile USCG Base with High Endurance

- Conducts USCG Multi-missions in U.S. Territorial Sea & EEZ ~ Arctic & Antarctic Research ~ Incident Response ~ Arctic Ocean SAR/Safety ~ Command & Control

- U.S. Polar Capable Ships in Federal Fleet Since 1867 Alaska Purchase (USRCS)
- Commercial Arctic Marine Transportation ~ Not Normally a Convoy Icebreaker