Commercial Shipping in the Arctic

Marine Board Workshop
Safe Navigation in the Arctic

October 15-16, 2012
1. The Shortest Distance Between Two Points
2. Northern Sea Route
3. Commercial Arctic Shipping Analysis
4. American Arctic Infrastructure
5. Arctic Commercial Challenges
6. Questions?
Arctic Shipping Routes

- NW Passage shipping route
- NE Passage shipping route

- Russia’s Anticipated Claim Area
- Wrangel Plain
- Greenland (Denmark)
- Arctic Ocean

Legend:
- Lomonosov Ridge
- Russia’s Current EEZ
- 80-89 Average Ice Extent
- 90-99 Average Ice Extent
- 00-06 Average Ice Extent
- Sept. 12, 2007 Ice Extent

Projection: Polar Stereographic; Sources: NOAA, ESRI
The Northern Sea Route

- Planning a transit on the Northern Sea Route
- Risk Assessment/Risk Mitigation
- Comply with NSR Administration requirements—
  - Vessel must be Ice Class 1A (Arc-4) or higher
  - Propellers must be stainless steel or high-strength bronze
  - Ice Passport must be developed, approved, an onboard
  - Onboard emergency response equipment must comply with RMRS regulations
  - 60 days supplies onboard
  - Ship must be able to store waste for 30 days
  - Officers must be experienced ice navigators
  - Waiver of liability insurance is granted
The Northern Sea Route

- NSR Administration will provide instructions and pre-voyage advice to the Master
- Meteorological/ice conditions forecast for the transit window
- Vessel’s ice-going ability, with or without icebreakers
- Available hydrographic data – reliability of their aids to navigation (including high latitude effect to gyro compasses)
- Available communications facilities-ability to provide reliable comms at high latitudes
- Crew selection—ice navigation—additional training
- Available SAR facilities considered
The Northern Sea Route

- Ice Passport Specifics
  - Selection of safe speed subject to ice thickness and concentration, with or without icebreaker support
  - Determine safe distance when led by an icebreaker
  - Assessment of available icebreakers—making the best choice selection
  - Wide range of recommendations for particular circumstances of ice navigation

- Search and Rescue Support
  - NSR escort agreement required with Atomflot for icebreakers
  - Ship contingency plans reviewed and updated based on the voyage risk assessment and in agreement with Atomflot.
  - Additional emergency equipment on the icebreaker
  - Icebreakers equipped with suitable towing gear?
Commercial Analysis for Container Shipping in the Arctic

- Commercial attractiveness of NSR
- Comparison of routes
- Conclusion
Commercial attractiveness of NSR

- Can NSR present an opportunity for shorter transit time?
- Can NSR present an opportunity for offering a cheaper product?
- Can NSR present an opportunity for higher reliability?
- The joker!
Comparison of routes – Transit time

- Columbine Maersk
- Vessel size 8500 TEU
- 11,300 nautical miles
Comparison of routes – Transit time

- 7,600 nautical miles?
- Average speed 13kn?
- 4 month transit window

- 11,300 nautical miles
- Average speed 13kn
- Full year transit window
Comparison of routes – Transit time

- Transit time in the traditional network 36 days
- Possible transit time YOK-ROT via NSR:
  - Distance 7.600nm
  - Average speed 13kn
  - Days needed, including inspection etc. 26
- The NSR presents an opportunity for a shorter transit time during the “Ice free” period.
Comparison of routes – Costs

- Size limitation on NSR
- Ice damage (lack of repair facilities)
- Emergency - evacuation options
- Modifying machinery (especially if non-ice classed vessel)
- Ice and extra safety training of crew
- Ice-breaker assistance
- Upgrade of navigation-, communication- and safety equipment
- Actual cost of transiting
Comparison of routes – Costs

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<th>Lifting capacity</th>
<th>Days</th>
<th>Distance</th>
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* The above figures are only indicative as an example, and does not reflect a true picture of the full complexity of container transport
Comparison of routes – Costs

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| Slot costs USD/TEU | 1.238 | 538 |

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Comparison of routes – Reliability

Present network

NSR

- Repair flexibility
- Piracy
- Weather
- Contingency
- Casualty coverage
- Port flexibility
- Complexity
Comparison of routes – Reliability

**Present network**
- Reliability is a key driver
- On-time delivery +99%

**NSR**
- Reliability factors are more insecure and more dominant
- 99% reliability will be very expensive
Comparison of routes – The Joker

- Freight rates!

- Is a faster and more unreliable product, of higher value to customers, then a reliable slower product?
Conclusion

• Shorter transit time? \(\text{YES}\)

• A cheaper product? \(\text{NO}\)
  - Vessel size / Ice breaker costs

• Higher reliability? \(\text{NO}\)

• The joker! \(??\)
Shipping in the American Arctic

The M/V Bremen approaches Barrow, AK
America’s Arctic Infrastructure

Vast Distances
Limited Communications
Limited Road Network
No ports north of Nome
Civil Aviation Intensive
Major Remote Areas
Limited Commercial Access
Difficult Remote Access
American Arctic Traffic Management

- No regulatory scheme exists for ship routing
  - Lengthy process, ultimately approved by International Maritime Organization
- Port Access Routing Study (PARS) Started in 2010
- Interagency Clearance Process
- US/Russia Negotiations
- IMO Approval
Arctic Commercial Challenges

Exxon Valdez

M/V Explorer

Prinsendam

M/V Selendang Ayu
Questions & Answers
Questions?