Planning a Late Season NSR Voyage

James Bond | 1 Nov 2022
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Late Oct / Early Nov 2021 on the NSR

Early Winter Freeze Traps Ships in Arctic Ice, Highlighting Weak Safety Regime

Stuck in ice ships scattered along

Two icebreakers are on the way to rescue ice-locked ships on Northern Sea Route

Arctic shippers eye release from Russian ice captivity

November 10, 2021
Overview

• QUESTIONS, QUESTIONS, QUESTIONS
  • Who got “stuck”?  
    - When? Where?
  • What were the ice conditions?
  • Was this foreseeable?
    - Was there a point when a different decision could have been made?
  • Did the safety regime stumble, falter, or fail?

• EXPLORATION OF ANSWERS
  • Is there data available that would / could have led to a different outcome?
Press reported that some 20 vessels were stuck on the NSR in late fall of 2021, including this sample of bulkers:

<table>
<thead>
<tr>
<th>Name</th>
<th>Class Society</th>
<th>Dimensions</th>
<th>Ice Class</th>
<th>Transit Direction</th>
<th>NSR Entry Date</th>
<th>NSR Exit Date</th>
<th>Duration (days)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Admiral Schmidt</td>
<td>ABS</td>
<td>250m LOA, 43.1m beam</td>
<td>PC6</td>
<td>West to East</td>
<td>27 Oct</td>
<td>10 Nov</td>
<td>15</td>
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<tr>
<td>Kumpula</td>
<td>DNV</td>
<td>197m LOA, 32.6m beam</td>
<td>1A</td>
<td>East to West</td>
<td>6 Nov</td>
<td>8 Dec</td>
<td>33</td>
</tr>
<tr>
<td>Nordic Nuluujaak</td>
<td>DNV</td>
<td>230m LOA, 38.0m beam</td>
<td>1A</td>
<td>West to East</td>
<td>24 Oct</td>
<td>20 Nov</td>
<td>28</td>
</tr>
<tr>
<td>Nordic Qinngua</td>
<td>DNV</td>
<td>230m LOA, 38.0m beam</td>
<td>1A</td>
<td>West to East</td>
<td>30 Oct</td>
<td>20 Nov</td>
<td>22</td>
</tr>
<tr>
<td>Golden Pearl</td>
<td>DNV</td>
<td>225m LOA, 32.2m beam</td>
<td>1C</td>
<td>West to East</td>
<td>8 Oct 26 Oct - Murmansk</td>
<td>19 Oct – Murmansk 20 Nov</td>
<td>12 26</td>
</tr>
<tr>
<td>Golden Suek</td>
<td>DNV</td>
<td>225m LOA, 32.2m beam</td>
<td>1C</td>
<td>East to West</td>
<td>28 Sep 18 Oct - Murmansk</td>
<td>10 Oct – Murmansk 20 Nov</td>
<td>14 34</td>
</tr>
</tbody>
</table>

- **NSR Boundaries:** East = Diomede Island and West = 50° Longitude
- **Observations:**
  - Golden Suek and Golden Pearl transits East to West ≈ 13 days
  - Stuck ships transits = 22-34 days
Where were the Sticking Points

- Who got held up (speed, \(\leq 3\) knots), Where and When

<table>
<thead>
<tr>
<th>Name</th>
<th>Delay date(s)</th>
<th>Delay Duration</th>
<th>Location</th>
<th>Comment</th>
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<tr>
<td>Admiral Schmidt (PC6)</td>
<td>30 Oct 3/4 Nov 6/7 Nov</td>
<td>4 hrs</td>
<td>77.3, 101.5 (Strait Kara &amp; Laptev Seas) 73.1, 162 (East Siberia Sea) 70.6, 169.5 (East Siberia Sea)</td>
<td>Transit: Baffinland to Asia (loaded 12-14 Oct) Decision date: 4 Oct (south of Iceland)</td>
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<tr>
<td>Nordic Nuluujaak (1A)</td>
<td>30 Oct to 13 Nov</td>
<td>325 hrs</td>
<td>75.3, 155.6 (East Siberian Sea)</td>
<td>Transit: Baffinland to Asia (loaded 8-10 Oct) Decision date: 17 Oct (south of Iceland)</td>
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<tr>
<td>Nordic Qinngua (1A)</td>
<td>31 Oct 7 Nov 9 - 13 Nov</td>
<td>13 hrs 7 hrs 120 hrs</td>
<td>77.0, 72.6 (Kara Sea) 76.0, 151.7 (Laptev / East Siberian Sea) 75.9, 158.5 (East Siberian Sea)</td>
<td>Transit: Baffinland to Asia (loaded 8-11 Oct) Decision date: 24 Oct (north of Iceland).</td>
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<tr>
<td>Golden Pearl (1C)</td>
<td>30 – 31 Oct 1 -3 Nov 8 - 13 Nov</td>
<td>11 hrs 48 hrs 105 hrs</td>
<td>76.5, 97.5 (eastern Kara Sea) 77.4, 102.0 (Strait Kara &amp; Laptev Seas) 75.9, 158.5 (East Siberian Sea)</td>
<td>Shanghai to Murmansk and back to Shanghai Loaded in Murmansk 19-25 Oct Decision Date: 25 Oct (Murmansk)</td>
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<tr>
<td>Golden Suek (1C)</td>
<td>28 Oct to 1 Nov 2 - 13 Nov</td>
<td>100 hrs 270 hrs</td>
<td>76.2, 148.2 (Laptev / East Siberian Sea) 75.6, 159.5 (East Siberian Sea)</td>
<td>Shanghai to Murmansk and back to Shanghai Loaded in Murmansk 11-18 Oct Decision Date: 18 Oct (Murmansk)</td>
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</tbody>
</table>
- Risk evaluated based on Ice Class & ice regime encountered
- Outcome is a **single value** Risk Index
- \[ \text{RIO} = (C_1 \times \text{RV}_1) + (C_2 \times \text{RV}_2) + (C_3 \times \text{RV}_3) + (C_4 \times \text{RV}_4) \]
  - \(C_1\)…\(C_4\) concentrations of ice types within ice regime (mixture of different ice types and ice free water)
  - \(\text{RV}_1\)…\(\text{RV}_4\) Risk Values (RV) for each ice class

<table>
<thead>
<tr>
<th>Polar Ship Category</th>
<th>ICE CLASS</th>
<th>Ice Free</th>
<th>NEW ICE</th>
<th>GREY ICE</th>
<th>GREY WHITE ICE</th>
<th>THIN FIRST YEAR 200-250 cm</th>
<th>THIN FIRST YEAR 300+ cm</th>
<th>MEDIUM FIRST YEAR 70-95 cm</th>
<th>MEDIUM FIRST YEAR 95-120 cm</th>
<th>THICK FIRST YEAR 120-200 cm</th>
<th>SECOND YEAR 250-300 cm</th>
<th>LIGHT MULTI YEAR 300+ cm</th>
<th>HEAVY MULTI YEAR 300+ cm</th>
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GOLDEN PEARL (1C)

ABS-POLARIS RIOs for GoldenPearl 2021

ABS-POLARIS RIO
Ice Class: IC, RIO = None
RVs: winter, Escort: No
Dates: 20 Jul-19 Oct 2021
Current Date: 07-Oct-2021
Ship: GoldenPearl
Was this “Event” Foreseeable?

• Observations:
  - Golden Suek (1C) and Golden Pearl (1C) transits East to West ≈12 days
  - Stuck ships transits ≈ 20 to 25 days
  - Icebreaker escort arranged to transit through the East Siberian Sea (14/15 Nov)

• ABS POLARIS videos reveal
  - PC6 ship although making a near identical voyage to the 1A ships did not experience significant delay
  - Ships were operating in ice regimes beyond that intended under IMO POLARIS
  - Did the safety regime fail? Damage? Pollution incident? Human injury?

• Was this foreseeable? Did Voyage Planning Fail?
  - Historical ice data may show trends
  - Air temperature trends
  - Prediction models from Ice Services
Was this “Event” Foreseeable?

- Watch for “Decision Dates”
  - Admiral Schmidt 4 Oct
  - Golden Pearl 25 Oct
  - Golden Suek 18 Oct
  - Nordic Qinngua 24 Oct
  - Nordic Nuluujaak 17 Oct

- 2018 shows
  - “tongue” in East Siberian Sea significant 20-22 Oct
  - closure between Kara and Laptev Seas 26-28 Oct

- 2020 very open

- NSR is where sea ice extent change is most notable compared to long term median ice edge
Was this “Event” Foreseeable?
For Polar Code Operational Assessments:
- Review historical ice data
- Review air temperature data

Voyage planning is required

Requirement to receive ice information on a regular basis when in Polar waters

Who is making the strategic chartering decisions? Are they well informed? Sufficiently knowledgeable? 2020 was good, “let’s do it again!”

Operational decisions (tactical) responsibility of the Master
• For Polar Code Operation Assessments:
  - Typically use latest five years of data, conservatively averaged

• Decisions dates around 20 Oct
  - PC6 should anticipate ice along route but shouldn’t be a significant challenge
  - 1A should anticipate presence of challenging ice, route through likely
  - 1C should anticipate presence of very significant ice, arrange icebreaker escort
Decision dates for the Murmansk to Shanghai leg were 18 and 25 Oct
Decision dates for the Murmansk to Shanghai leg were 18 and 25 Oct.
But 2021 was worse than “typical” – Foreseeable?

- Leading indicator for sea ice to form is cold air temperatures
- On 20 Oct “Decision Day”, 2021 temperature is indicating that sea ice will be growing very rapidly compared to recent years
Conclusions

- Voyage planning is a critical component of safe Polar Shipping
- Data is available to support decision making
- IMO POLARIS methodology appears sound
- Year on Year variability is significant, especially along the NSR
- Are chartering opportunities / decisions being made with the correct and sufficiently detailed information?
- Were some poor decision made? Likely
- Is the Safety Regime weak - NO
Thank You

www.eagle.org

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