IMO POLARIS Update: Current Usage and Status

James Bond | 1 Nov 2022
Regulatory Regime: POLAR CODE

- IMO Polar Code:
  - In force for almost six years for new ships
  - Existing ships compliance by 1\textsuperscript{st} intermediate survey after 1 Jan 2018
- This means that ....... any SOLAS certificated ship going into Polar waters must comply with the Polar Code and have a Polar Ship Certificate (PSC) and an accompanying Polar Waters Operating Manual (PWOM)
Polar Code: TRAINING

- Standards of Training Certification & Watchkeeping of Seafarers
  - Masters, chief mates and officers in charge of a navigational watch are to be qualified in accordance with Chapter V of the STCW Convention, 1978, as amended
  - The requirements are set out in regulation V/4 of the STCW Convention and detailed in Section A-V/4 of the STCW Code
  - Polar training requirements are dependent upon ship type and concentration of ice in the intended / certificated area of operation
    - More stringent for tankers and passenger ships than others
    - More stringent as ice concentrations increase
# Polar Code: POLAR SHIP CERTIFICATE


### Typical Language:

5.1 Limited to operation in polar waters in accordance with the outcome of the accepted system for determining operational limitations appropriate to the ice strengthening applied.

Name of System: POLARIS

### Operational Limitations

The ship has been assigned the following limitations for operation in polar waters:

1. **Ice Conditions:**

2. **Temperature (°C):**

3. **High Latitudes:**

This certificate is valid until subject to the annual/intermediate survey in accordance with section 1.3 of the Code.

### Category (Choose an item or ship as follows):

<table>
<thead>
<tr>
<th>Ice Class</th>
<th>Ice Strengthened Draft Range</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Maximum Draft</td>
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<tr>
<td></td>
<td>All</td>
</tr>
</tbody>
</table>

### Operational Limitations

- **Polar Service Temperature:**
  - **2.5.1:**

- **Maximum expected time of rescue:**
  - **2.4.**

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4 | IMO POLARIS Update: Current Usage and Status
IMO POLARIS

- Relates Ice Class to an Ice Regime
- Methodology of choice: **IMO’s POLARIS**
  - POLARIS = Polar Operational Limit Assessment Risk Indexing System
  - Documented in IMO MSC.1/Circ.1519
- Multiple uses
  - Evaluating risk of immediate operation
  - Voyage planning:
    - Where and when can a PC6 operate, PC4, 1C, etc?
    - How does the operational window change between a IA Super and a PC6?
- Risk evaluated based on Ice Class & ice regime encountered
- POLARIS outcome is a **single value** Risk Index
  - RIO = \((C_1 \times RV_1) + (C_2 \times RV_2) + (C_3 \times RV_3) + (C_4 \times RV_4)\)
  - \(C_1\)…\(C_4\) concentrations of ice types within ice regime (mixture of different ice types and ice free water)
  - \(RV_1\)…\(RV_4\) Risk Values (RV) for each ice class
POLARIS Status

• POLARIS is interim guidelines, no real proposals to update because of lack of data
• Still we see some surprising activities in polar waters – Is POLARIS “getting the job done”?
• Recall: POLARIS is an index indicating relative risk of operating a given ice class in a defined ice regime
  • Ice Class defines strength, not capability
  • Ice Class is a proxy, within POLARIS, for safe operations …a higher ice class means it is safer to transit in nastier ice
  • Capability is dependent upon hull form, power and crew
**POLARIS Sticking Point: Risk Values**

- Ice Classes in Risk Value tables provide clear guidance
- Issue: Non Ice Class line is problematic

### Winter Risk Values (RVs)

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<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 1ST STAGE 30-50 cm</th>
<th>THIN FIRST YEAR 2ND STAGE 50-70 cm</th>
<th>MEDIUM FIRST YEAR 1ST STAGE 70-95 cm</th>
<th>MEDIUM FIRST YEAR 2ND STAGE 95-120 cm</th>
<th>THICK FIRST YEAR 1ST STAGE 120-200 cm</th>
<th>SECOND YEAR 200-250 cm</th>
<th>LIGHT MULTI YEAR 250-300 cm</th>
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- Issues for No Ice Class: This is being used by industry as the “catch all”
  - Yachts (steel, aluminium, FRP and composite), non cargo ship hull forms
• Decision Guidance is not fully being used as intended:
  • Recall Working Group discussion regarding “Go”, “No Go” as being too strict and subject to challenge
  • Intent was that “Ops subject to special consideration” means stop, wait for ice conditions to change or obtain assistance
  • “Elevated Ops Risk” was to mean reduce speed to near zero with the understanding that the ship is in ice conditions that could exceed structural capacity
  • Evident that planning voyage and “desktop exercises” are incorporating negative RIOs with planned mitigation (this was not the intent)
Open water means a large area of freely navigable water in which sea ice is present in concentrations less than 1/10. No ice of land origin is present.

- Issue: If a Polar Ship Certificate Para 2.2 lists ship operations restricted to “open water” there is a possible 61ºN versus 59ºN dichotomy
- In Labrador Sea, Davis Strait and Baffin Bay ice charts often show presence of icebergs and no sea ice
- Current work around: Instead of “open water” increase to “Other”. This implies operations for which the operator did not intend and triggers additional training.
- Problem lies within phrase “large area of freely navigable water”, this is undefined and varies ship to ship
Operational Data in Ice Covered Waters to Support Industry Needs

• **Industry Needs:**
  - Emission Reductions
    - Improved efficiency in ice covered waters
      - Less power for the same ice conditions through (principally) a reduction in ice resistance
    - Route optimisation
      - Avoiding difficult ice, means less power consumed
  - A clearer (more accurate?) safety regime
    - When is it safe (to go faster)?
    - What ice to avoid?
    - Reduction in steel weight = increased DWT = increased efficiency
  - Data to support reasonable regulatory regime updates
How to address industry needs?

• Data, data, data
  • Collaboration on data collection
  • Tools and platforms to use industry ships as measuring systems
  • Capture operational feedback
  • Dedicated measurement campaigns
  • Data sharing

The foundation of updating POLARIS, Polar Code (if necessary), Energy Efficiency regulations is strong operational data combined with environmental data

*The alternative is misshaped or inadequate regulations / and operating regime that will lead to accidents or economic penalties for industry.*
What Else Can be Done?

- Tools for remote sensing
  - Ice concentration is only part of the story (ease of navigation)
  - Ice thickness, ice strength and stage of decay are all needed to evaluate the actual risk profile. What measurement tools could be developed to deploy on ships?
- Pre-emptive approach to regulation updates
  - Less of a “head in the sand” approach to the maturity of existing regulations
  - Re-examination of known incidents
  - Gather the data to support regulatory updates
Thank You

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