



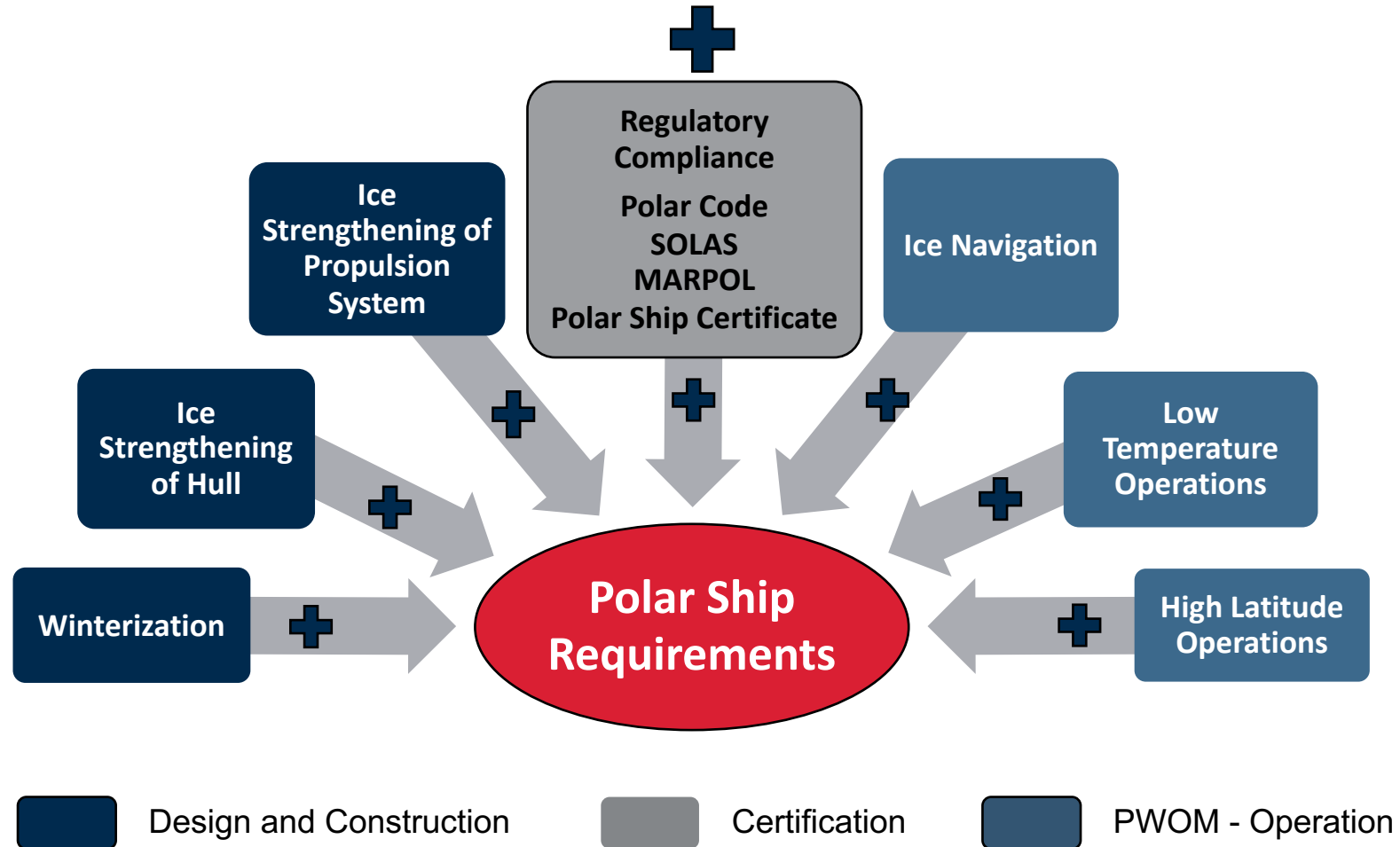
Polar Waters Voyage Planning: An Operators Perspective

James Bond | June 2019



Requirements of Polar Ships

Open Water Ship Requirements



IMO: Voyage Planning

- SOLAS Chapter V – Safety of Navigation Annex 23

The Annex to IMO Resolution A.893(21), Feb 2000, “Guidelines for Voyage Planning”, should be followed on all vessels. The key elements of the Voyage Plan are:

- Appraising** all relevant information
- Planning** the intended voyage
- Executing** the plan taking account of prevailing conditions
- Monitoring** the vessel’s progress against the plan continuously

2 Appraisal

2.1 All information relevant to the contemplated voyage or passage should be considered. The following items should be taken into account

3 Planning

3.1 On the basis of the fullest possible appraisal, a detailed voyage or passage plan should be prepared which should cover the entire voyage or passage from berth to berth

4 Execution

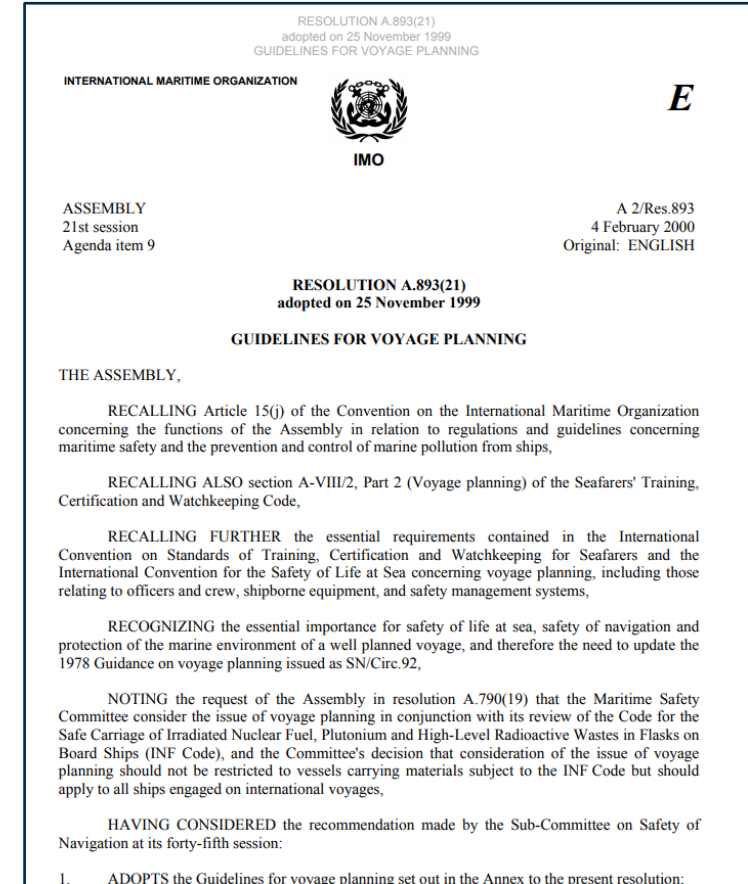
4.1 Having finalized the voyage or passage plan, as soon as time of departure and estimated time of arrival can be determined with reasonable accuracy, the voyage or passage should be executed in accordance with the plan or any changes made thereto.

4.2 Factors which should be taken into account when executing the plan, or deciding on any departure therefrom including

5 Monitoring

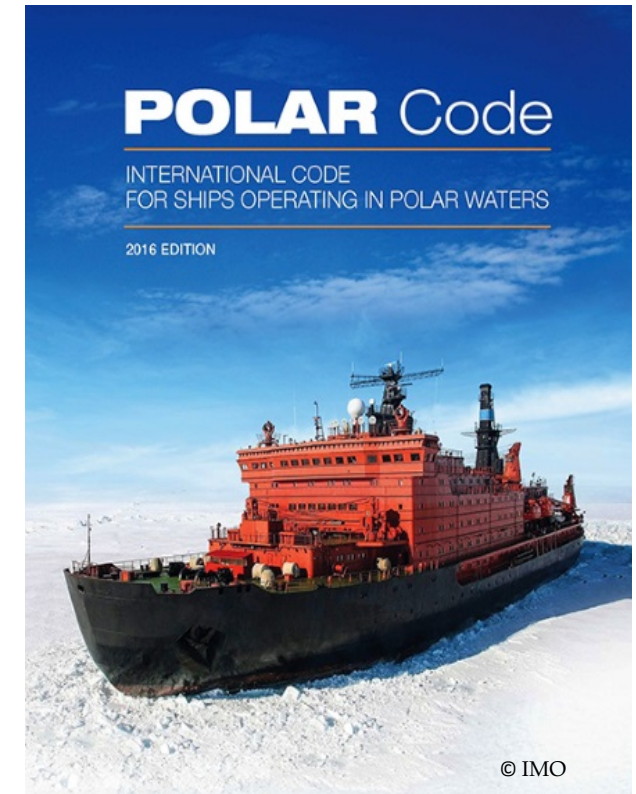
5.1 The plan should be available at all times on the bridge

5.2 The progress of the vessel should be closely and continuously monitored.



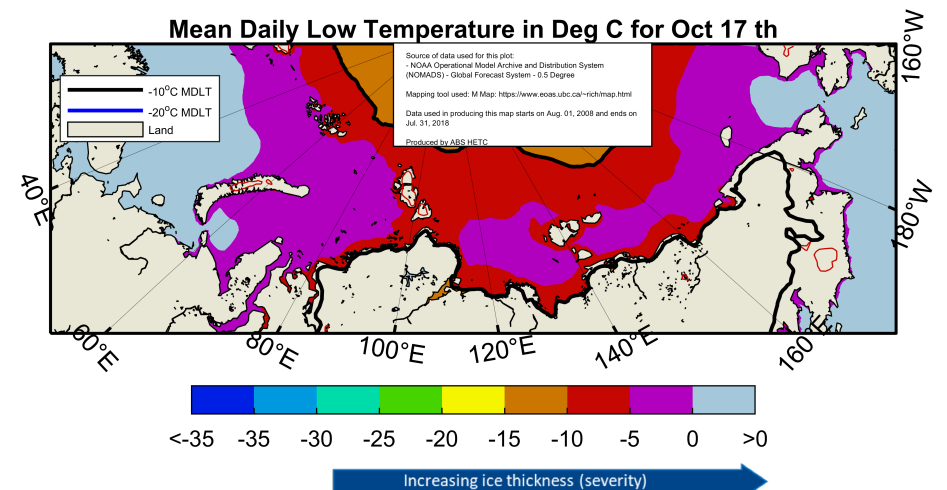
IMO: Voyage Planning

- SOLAS Chapter 14 – Polar Code Chapter 11
- (11.1) The goal of this chapter is to ensure that the Company, master and crew are provided with sufficient information to enable operations to be conducted with due consideration to safety of ship and persons on board and, as appropriate, environmental protection
- (11.2) In order to achieve the goal set out in paragraph 11.1 above, the voyage plan shall take into account the potential hazards of the intended voyage
- (11.3) In order to comply with the functional requirement of paragraph 11.2 above, the master shall consider a route through polar waters, taking into account the following:
 1. the procedures required by the PWOM;
 2. any limitations of the hydrographic information and aids to navigation available
 3. current information on the extent and type of ice and icebergs in the vicinity of the intended route;
 4. statistical information on ice and temperatures from former years;
 5. places of refuge;
 6. current information and measures to be taken when marine mammals are encountered relating to known areas with densities of marine mammals, including seasonal migration areas;
 7. current information on relevant ships' routing systems, speed recommendations and vessel traffic services relating to known areas with densities of marine mammals, including seasonal migration areas;
 8. national and international designated protected areas along the route; and
 9. operation in areas remote from search and rescue (SAR) capabilities



Statistical Information on Ice and Temperature

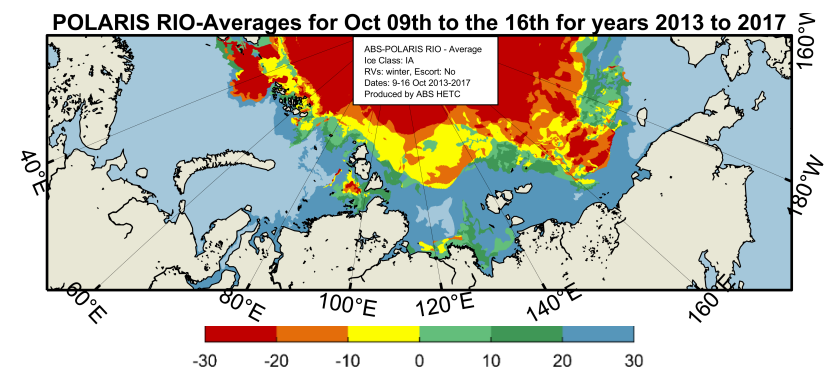
- Temperature: May be an important limitation
 - For an existing ship the temperature limit may be from:
 - steel grades in the hull
 - life saving appliances
 - other essential equipment
- Ice: Is likely an important limitation
 - IMO POLARIS methodology available:
 - Ice class dependent
 - Ice regime dependent
 - Highly variable year on year
 - Need to look at averaged multi-year data
 - Refine by looking at data for individual years
- Capture information in PWOM for the intended area and time of year of operation, emphasize in Voyage Plan



↑ Increasing ice class

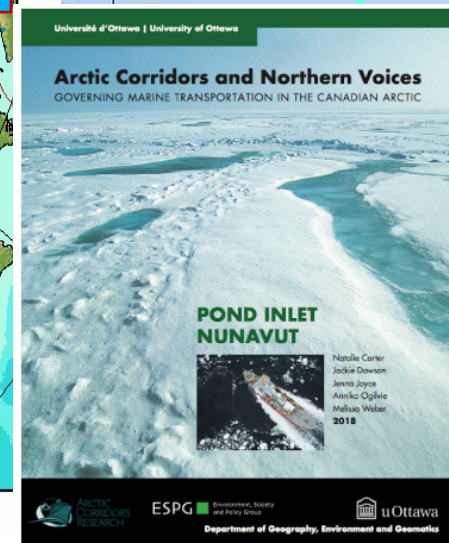
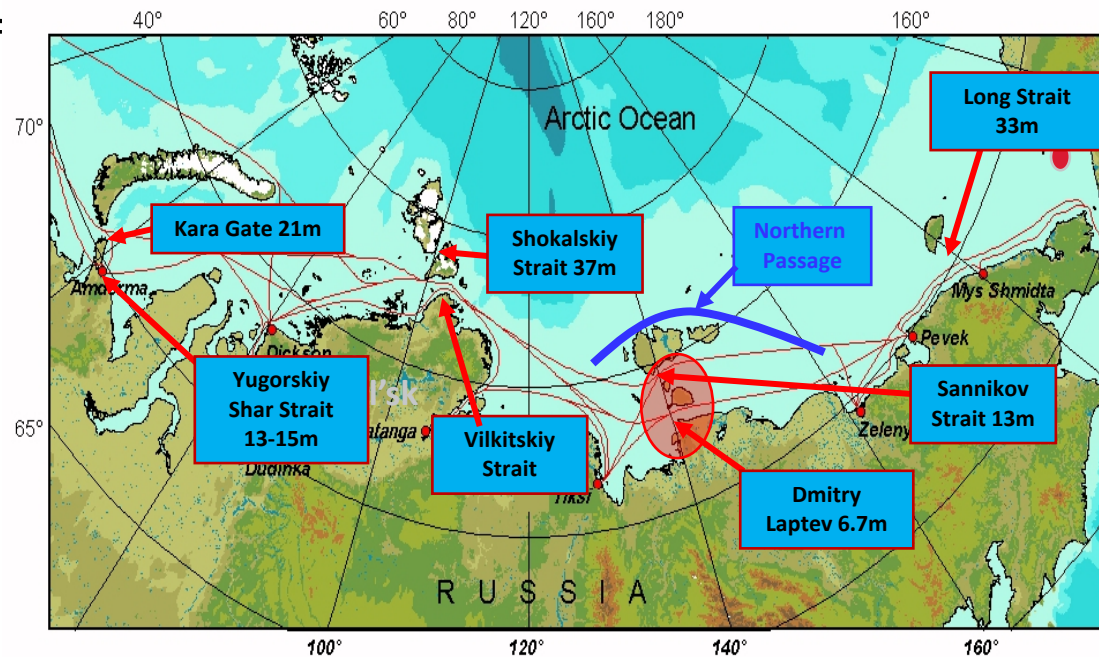
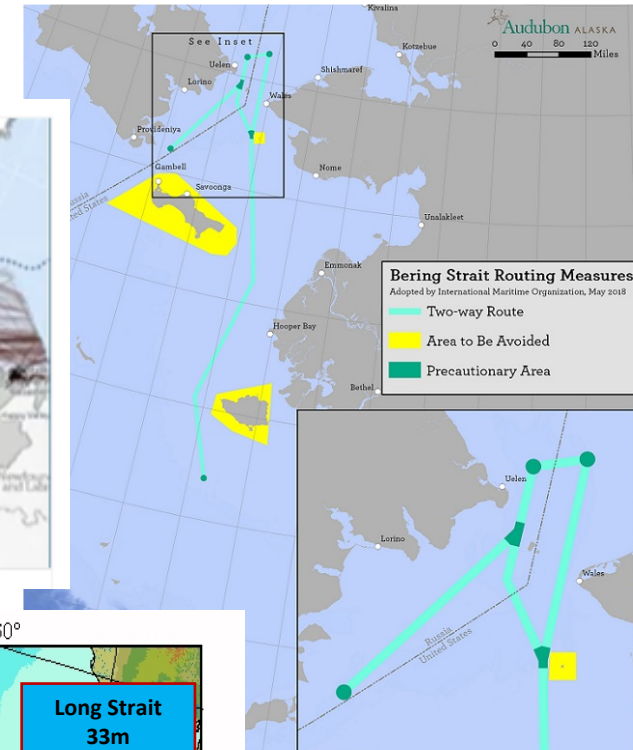
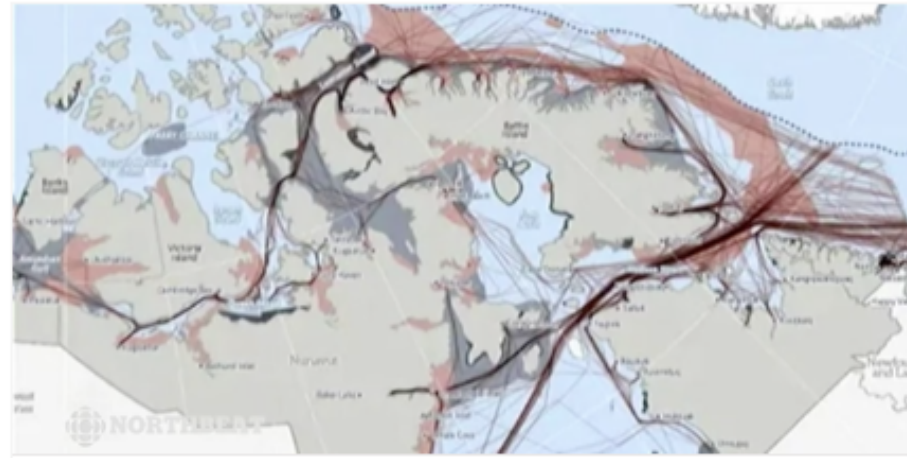
	RISK INDEX VALUES (RIVs) for each Ice Type											
	ICE FREE	NEW ICE	GREY ICE	GREY WHITE ICE	THIN FIRST YEAR 1ST STAGE	THIN FIRST YEAR 2ND STAGE	MEDIUM FIRST YEAR	MEDIUM FIRST YEAR 2ND STAGE	THICK FIRST YEAR	SECOND YEAR	MULTI YEAR	HEAVY MULTI YEAR
PC 1	3	3	3	3	3	2	2	2	2	2	1	1
PC 2	3	3	3	3	3	2	2	2	2	2	1	1
PC 3	3	3	3	3	3	2	2	2	2	2	1	0
PC 4	3	3	3	3	3	2	2	2	2	1	0	-1
PC 5	3	3	3	3	3	2	2	2	1	0	-1	-2
PC 6	3	2	2	2	2	2	1	0	-1	-2	-3	-3
PC 7	3	2	2	2	2	1	1	0	-2	-3	-4	-4
IAS	3	2	2	2	2	2	1	0	-3	-4	-5	-5
IA	3	2	2	2	2	1	0	-2	-4	-5	-6	-6
IB	3	2	2	2	1	0	-1	-2	-3	-4	-5	-6
IC	3	2	2	1	0	-1	-2	-3	-4	-5	-6	-7
No Ice Class	3	1	0	-1	-2	-3	-4	-5	-6	-7	-8	-8

Increased Risk →



What else?

- Bering Strait shipping lanes (US / Russia)
 - Adopted by IMO May 2018
- Low Impact Shipping Corridors (Canada)
 - Work under the Government of Canada's Ocean Protection Plan
 - Refinement following further engagement with indigenous peoples
- NSR draft restrictions
 - A real concern and limitation that needs to be considered



What else?

- Destination shipping
 - Resource development
 - Environmental impact assessment
 - Local community impact
 - Significant regional difference exist
 - Expedition cruise industry
 - Indigenous peoples consultation vital
 - Relatively straight forward permitting in Alaska
 - Canada very different, each region and peoples have different requirements and time lines
 - Due to desire to get closer to nature extra caution, while venturing closer to land in waters that are less well charted, important



Conclusions: Use data and knowledge to operate safely

- Safe Polar operations requires an operator taking a ship into polar waters to:
 - Have a firm understanding of the operating environment; area and time of year (ice, temperature, high latitude, remoteness)
 - Relate the capabilities of the ship and crew to the operating environment
 - Have documentation onboard (PWOM) to assist the crew in mitigating the risk of operating in the highly dynamic polar regions
 - Have a Polar Ship Certificate
 - Have a Voyage Plan for each voyage
 - Reference the PWOM
 - Address issues applicable to the time frame of the voyage, more specific than the PWOM

What else from an Operator's Perspective?

- Are the regulations creating any unintended consequences?

New Construction Decisions

- Polar Code Category B ships (PC6 and PC7) are the polar versions of the highest Baltic ice classes
 - Designed to operate in first year ice with multi-year inclusions
 - Polar Class steel grades are tougher
 - POLARIS affords them a broader operating window than their Baltic counterparts (Baltic classes are strongly penalized for any concentration of multi-year ice)
- So why are 1A and 1AS being ordered instead of PC7 and PC6?
 - Capital cost misperceptions
 - Yard lack of experience leading to risk \$ in pricing
 - Non-ice usability misperceptions
 - Recent EEDI correction readily apparent for 1A and 1AS but buried for PC7 and PC6 (relies on reference to HELCOM ice class equivalency) **(Is this a missed opportunity to promote having PC classes and increased protection of the environment?)**



Thank You

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