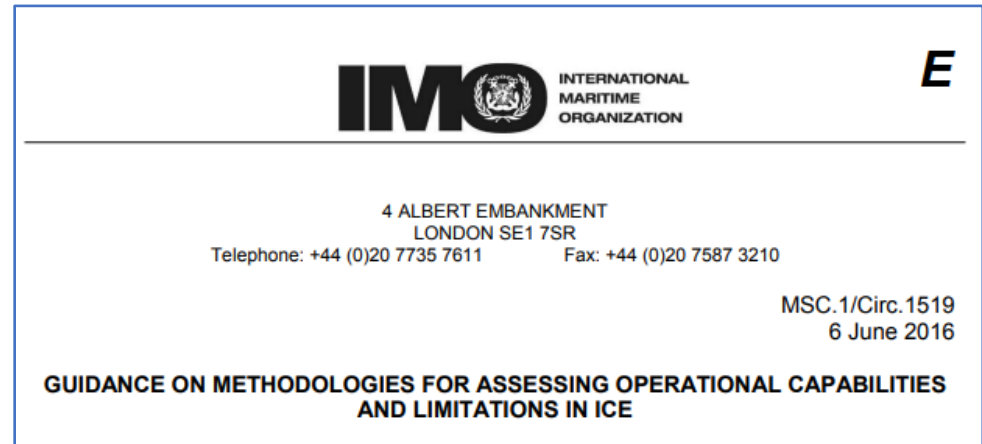


IMO POLARIS IACS Overview

4th PAME Shipping Best Practices Information Forum
London, Nov 2020

- IMO POLAR CODE, Section 1.5, requires that in order to establish operational limitations, an assessment of the ship and its equipment is to be carried out, taking into consideration the anticipated range of operating and environmental conditions and various hazards listed in the Code
- **Ship specific limitations for anticipated conditions**
- With respect to ice this requires a means to link nominal capability to probable ice conditions for the area and time of year of planned voyage
- IMO POLARIS is a methodology that quantifies risk of operating in an ice regime for a specified ice class (Polar Class, Baltic Ice Class, or none)

- MSC.1/Circ.1519 provides Guidance on Methodologies For Assessing Operational Capabilities and Limitations In Ice
- Risk evaluated based on Ice Class & ice regime encountered



- Outcome is a single value Risk Index

$$\text{RIO} = (\text{C}_1 \times \text{RV}_1) + (\text{C}_2 \times \text{RV}_2) + (\text{C}_3 \times \text{RV}_3) + (\text{C}_4 \times \text{RV}_4)$$

$\text{C}_1 \dots \text{C}_4$ concentrations of ice types within ice regime (mixture of different ice types and ice free water, as obtained from national ice services)

$\text{RV}_1 \dots \text{RV}_4$ Risk Values (RV) for each ice class

- RIO provides guidance and is not intended to replace the judgement of the ship's Master
- Powerful information for voyage planning

RIO _{SHIP}	Ice classes PC1-PC7	Ice classes below PC 7	Color Code
20 ≤ RIO	Normal operation	Normal operation	
10 ≤ RIO < 20			
0 ≤ RIO < 10			
-10 ≤ RIO < 0	Elevated operational risk	Operation subject to special consideration	
-20 ≤ RIO < -10	Operation subject to special consideration	Operation subject to special consideration	
-30 ≤ RIO < -20			

Winter Risk Values (RIVs)													
POLAR SHIP Category	ICE CLASS	ICE FREE	NEW ICE	GREY ICE	GREY WHITE ICE	THIN FIRST YEAR 1ST STAGE	THIN FIRST YEAR 2ND STAGE	MEDIUM FIRST YEAR 1ST STAGE	MEDIUM FIRST YEAR 2ND STAGE	THICK FIRST YEAR	SECOND YEAR	LIGHT MULTI YEAR	HEAVY MULTI YEAR
		--	0-10 cm	10-15 cm	15-30 cm	30-50 cm	50-70 cm	70-95 cm	95-120 cm	120-200 cm	200-250 cm	250-300 cm	300+ cm
A	PC1	3	3	3	3	2	2	2	2	2	2	1	1
	PC2	3	3	3	3	2	2	2	2	2	1	1	0
	PC3	3	3	3	3	2	2	2	2	2	1	0	-1
	PC4	3	3	3	3	2	2	2	2	1	0	-1	-2
	PC5	3	3	3	3	2	2	1	1	0	-1	-2	-2
B	PC6	3	2	2	2	1	1	1	0	-1	-2	-3	-3
	PC7	3	2	2	2	1	0	0	-1	-2	-3	-3	-3
C	IAA	3	2	2	2	2	1	1	0	-1	-2	-3	-4
	IA	3	2	2	2	1	0	0	-1	-2	-3	-4	-5
	IB	3	2	2	1	0	-1	-2	-2	-3	-4	-5	-6
	IC	3	2	1	0	-1	-2	-3	-3	-4	-5	-6	-7
	No Ice Class	3	1	0	-1	-2	-3	-4	-5	-6	-7	-8	-8

Decreasing ice class

Increasing ice thickness (severity)

Increased Risk

- IACS members can provide guidance on evaluation of the risks posed to the ship by ice conditions in relation to the ship's assigned ice class as part of the Polar Code mandatory operational assessment
- Information on ship-specific capabilities and limitations in relation to the above assessment is to be included in the Polar Water Operational Manual (PWOM)
- Acting as Recognized Organizations issue a Polar Ship Certificate (PSC)
- PSC lists the method that is used to establish limitations when operating in ice (POLARIS, AIRSS, Zone/Date, NSR Administration)

Class	ABS	BV	CCS	CRS	DNV-GL	IRS	KR	LR	NK	PRS	RINA	RS
# PSC issued	20	106	25	0	270	0	6	102	74	1	8	170

Data: Provided by IACS members as of July 2020

- IMO POLARIS recognized as a valuable methodology for establishment of operational limitations in ice by shipping community
- Appears to be the methodology of choice, except for ships classed with RS engaged on voyages via Northern Sea Route where NSRA Zone/Date requirements are most commonly used reflecting the experience of ice navigation in the region.
- Evidence that it is being used during the extremely important operational assessments and for voyage planning

- IACS members ABS and LR were part of the team at IMO that created POLARIS adapting the Canadian Arctic Ice Regime Shipping System (AIRSS) with valuable input from Canada, Finland, Sweden, Denmark and Russia.
- Areas of potential update, recognized as system weakness at the time of its creation include:
 1. A means to decide between using winter ice RVs or decayed ice RVs needs development / agreement
 2. 1 Oct as the transition from first year ice to second year ice creates an abrupt change in RIO (30 Sept versus 1 Oct)
- Any refinement to Risk Values needs to be made through detailed review of ship transits and “difficulty” experienced / reported.

Thank you
Any Questions?