



Polar Code Workshop

26-27 April 2017

Muggiano, Italy



INSTITUTE OF MARINE RESEARCH
HAVFORSKNINGSINSTITUTTET

Polar Code workshop

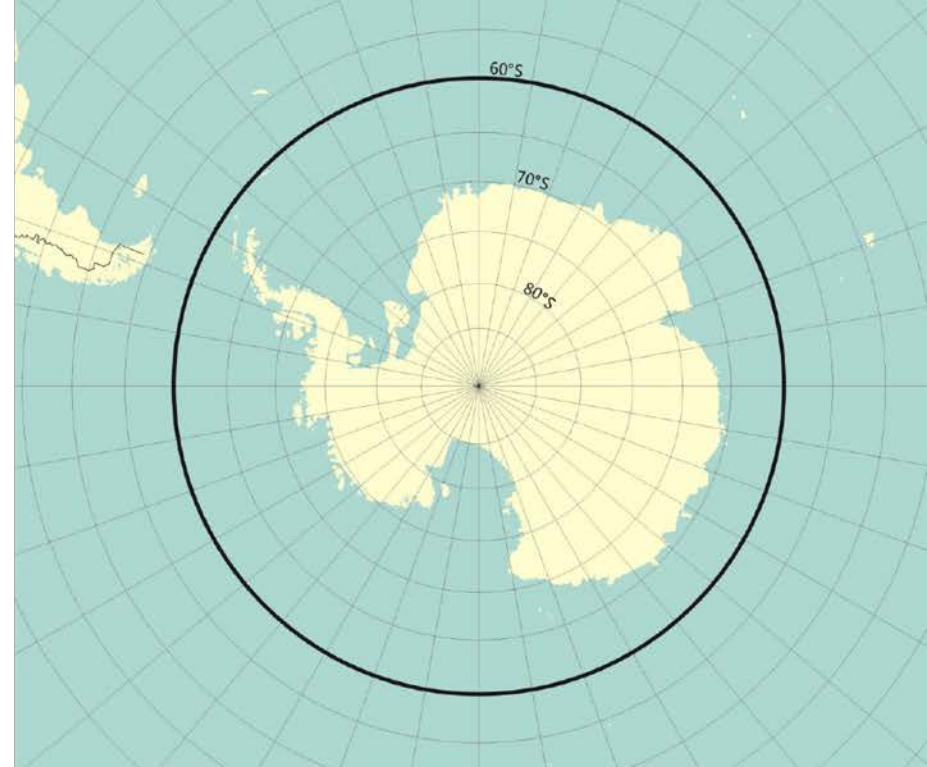
- A Polar Code workshop and a guided tour of the new Norwegian icebreaker «Kronprins Haakon» was arranged in Muggiano, Italy on 26 and 27 April 2017
- Approx 35 participants from USA, Japan, New Zealand, Ireland, UK, France, Germany, the Netherlands, Italy, Denmark, Finland, Spain and Norway
- A very succesful workshop thanks to Ian Sage and his team at the NATO Center for Maritime Research and Experimintation and yard visit and tour of the vessel thanks to Fincantieri and the «Kronprins Haakon» site team



IMO Polar Code

- Implemented from 1 January 2017 for new vessels and 1 January 2018 for existing vessels
- For more info, see <http://www.imo.org/en/MediaCentre/HotTopics/polar/Pages/default.aspx>

Area of application



Maximum extent of Arctic waters application

Maximum extent of Antarctic area application



WHAT DOES THE POLAR CODE MEAN FOR SHIP SAFETY?

EQUIPMENT



WINDOWS ON BRIDGE
Means to clear melted ice, freezing rain, snow, mist, spray and condensation



LIFEBOATS
All lifeboats to be partially or totally enclosed type



CLOTHING I
Adequate thermal protection for all persons on board



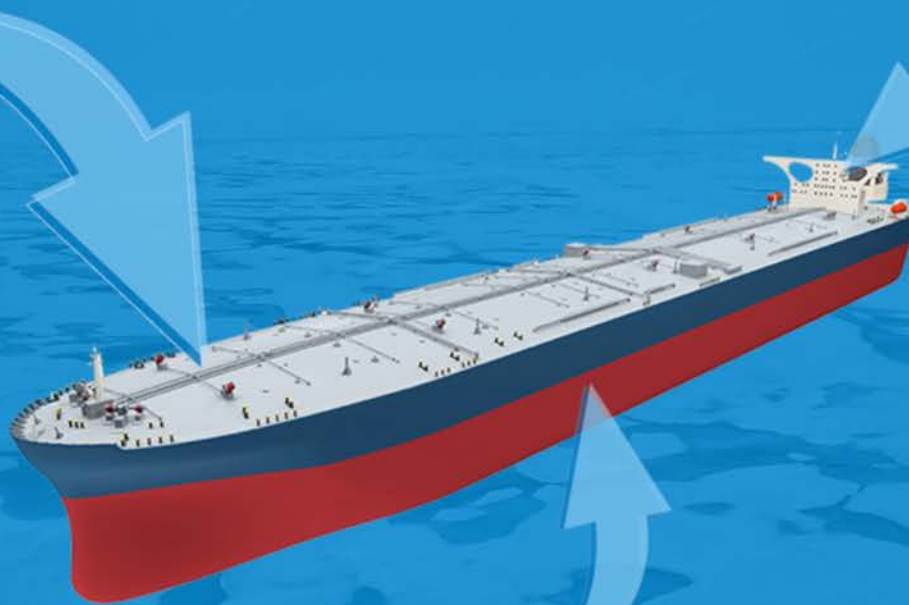
CLOTHING II
On passenger ships, an immersion suit or a thermal protective aid for each person on board



ICE REMOVAL
Special equipment for ice removal: such as electrical and pneumatic devices, special tools such as axes or wooden clubs



FIRE SAFETY
Extinguishing equipment operable in cold temperatures; protect from ice; suitable for persons wearing bulky and cumbersome cold weather gear



OPERATIONS & MANNING



NAVIGATION
Receive information about ice conditions



CERTIFICATE & MANUAL
Required to have on board a Polar Ship Certificate and the ship's Polar Water Operational Manual



TRAINING
Masters, chief mates and officers in charge of a navigational watch must have completed appropriate basic training (for open-water operations), and advanced training for other waters, including ice

DESIGN & CONSTRUCTION



SHIP CATEGORIES
Three categories of ship which may operate in Polar Waters, based on:
A) medium first-year ice
B) thin first-year ice
C) open waters/ice conditions less severe than A and B



MATERIALS
Ships intended to operate in low air temperature must be constructed with materials suitable for operation at the ships polar service temperature



INTACT STABILITY
Sufficient stability in intact condition when subject to ice accretion and the stability calculations must take into account the icing allowance



STRUCTURE
In ice strengthened ships, the structure of the ship must be able to resist both global and local structural loads

BACKGROUND INFO

THE INTERNATIONAL CODE FOR SHIPS OPERATING IN POLAR WATERS WAS ADOPTED NOVEMBER 2014 BY THE IMO MARITIME SAFETY COMMITTEE

IT APPLIES TO SHIPS OPERATING IN ARCTIC AND ANTARCTIC WATERS

THE AIM IS TO PROVIDE FOR SAFE SHIP OPERATION AND THE PROTECTION OF THE POLAR ENVIRONMENT BY ADDRESSING RISKS PRESENT IN POLAR WATERS AND NOT ADEQUATELY MITIGATED BY OTHER INSTRUMENTS

HOW THE **POLAR** CODE PROTECTS THE ENVIRONMENT

OIL



DISCHARGES

Discharge into the sea of oil or oily mixtures from any ship is prohibited



STRUCTURE

Double hull and double bottom required for all oil tankers, including those less than 5,000dwt (A/B ships constructed on or after 1 January 2017)



HEAVY FUEL OIL

Heavy fuel oil is banned in the Antarctic (under MARPOL). Ships are encouraged not to use or carry heavy fuel oil in the Arctic



LUBRICANTS

Consider using non-toxic biodegradable lubricants or water-based systems in lubricated components outside the underwater hull with direct seawater interfaces

INVASIVE SPECIES



INVASIVE AQUATIC SPECIES

Measures to be taken to minimize the risk of invasive aquatic species through ships' ballast water and biofouling



SEWAGE



DISCHARGES I

No discharge of sewage in polar waters allowed (except under specific circumstances)



TREATMENT PLANTS

Discharge is permitted if ship has an approved sewage treatment plant, and discharges treated sewage as far as practicable from the nearest land, any fast ice, ice shelf, or areas of specified ice concentration



DISCHARGES II

= Sewage not comminuted or disinfected can be discharged at a distance of more than 12nm from any ice shelf or fast ice
= Comminuted and disinfected sewage can be discharged more than 3nm from any ice shelf or fast ice

GARBAGE



PLASTICS

All disposal of plastics prohibited (under MARPOL)



FOOD WASTES I

Discharge of food wastes onto the ice is prohibited



FOOD WASTES II

Food wastes which have been comminuted or ground (no greater than 25mm) can be discharged only when ship is not less than 12nm from the nearest land, nearest ice shelf, or nearest fast ice



ANIMAL CARCASSES

Discharge of animal carcasses is prohibited



CARGO RESIDUES

Cargo residues, cleaning agents or additives in hold washing water may only be discharged if they are not harmful to the marine environment; both departure and destination ports are within Arctic waters; and there are no adequate reception facilities at those ports. The same requirements apply to Antarctic area under MARPOL

BACKGROUND INFO

THE INTERNATIONAL CODE FOR SHIPS OPERATING IN POLAR WATERS WILL ENTER INTO FORCE ON 1 JANUARY 2017

IT APPLIES TO SHIPS OPERATING IN ARCTIC AND ANTARCTIC WATERS: ADDITIONAL TO EXISTING MARPOL REQUIREMENTS

IT PROVIDES FOR SAFE SHIP OPERATION AND PROTECTS THE ENVIRONMENT BY ADDRESSING THE UNIQUE RISKS PRESENT IN POLAR WATERS BUT NOT COVERED BY OTHER INSTRUMENTS

DEFINITIONS



SHIP CATEGORIES

Three categories of ship designed to operate in polar waters in:

- A) at least medium first-year ice
- B) at least thin first-year ice
- C) open water/ice conditions less severe than A and B



FAST ICE: Sea ice which forms and remains fast along the coast, where it is attached to the shore, to an ice wall, to an ice front, between shoals or grounded icebergs

ICE SHELF: A floating ice sheet of considerable thickness showing 2 to 50m or more above sea-level, attached to the coast

CHEMICALS



DISCHARGES

Discharge of noxious liquid substances (NLS) or mixtures containing NLS is prohibited in polar waters

Sources of hazards

1. Ice, as it may affect hull structure, stability characteristics, machinery systems, navigation, the outdoor working environment, maintenance and emergency preparedness tasks and malfunction of safety equipment and systems.
2. Topside icing, with potential reduction of stability and equipment functioning.
3. Low temperature, as it affects the working environment and emergency preparedness tasks, material properties and equipment efficiency, survival time and performance of safety equipment and systems.
4. Extended periods of darkness or daylight as it may affect navigation and human performance.
5. High latitude, as it affects navigation systems, communication systems and the quality of ice imagery information.
6. Remoteness and possible lack of accurate and complete hydrographic data and information, reduced availability of navigational aids and seamarks with increased potential for groundings compounded by remoteness, limited readily deployable SAR facilities, delays in emergency response and limited communications capability, with potential to affect incident response.
7. Potential lack of ship crew experience in polar operations, with potential for human error.
8. Potential lack of suitable emergency response equipment, with the potential for limiting the effectiveness of mitigation measures.
9. Rapidly changing and severe weather conditions, with the potential for escalation of incidents.
10. The environment with respect to sensitivity to harmful substances and other environmental impacts and its need for longer restoration.

The risk level within polar waters may differ depending on the geographic allocation, time of year with respect to daylight, ice-coverage etc. Thus the mitigating measures required to address the above specific hazards may vary within polar waters and may be different in Arctic and Antarctic waters.



General findings

- For Category C (open water) vessels, the main preparations are:
 - Assessment of vessel equipment and instruments exposed to low temperatures, ice and snow, and make necessary preventive arrangements
 - Develop and implement a Polar Water Operations Manual (PWOM) for each vessel.
 - For Cat C vessels the Polar Code is basically covering all relevant aspects for operation in open waters in the polar regions (Arctic and Antarctica)
Ifremer Cat C vessels already certified!



- For Category A and B (ice going) vessels the Polar Code code does not cover the research activities that is typically performed by Category A and B research vessels. See next slide for more details.
- It is of course a lot of common issues to be solved and work to be done for all research vessel operators concerning implementation of the Polar Code, so to avoid duplicating efforts sharing of information and documents can save a lot of time and resources!
- Maybe a second Polar Code workshop in early 2018 is a good idea?

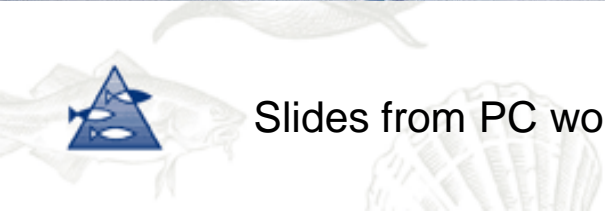


Some areas not covered by the PC which should be considered for Polar RVs

1. Personnel on the ice
 - Personal protection/behaviour regarding frost bites etc.
 - Handling Polar bear threats.
 - Responsibilities for personnel on the ice. Captain and/or cruise leader?
 - «Command and control» over personnel on the ice far from the vessel using snowscooters, deployed by helicopter, out cross country skiing etc.
2. Helicopter operations
 - Handling of organic helicopters.
 - Handling of «visiting» helicopters for crew change, Med evac, refueling, SAR operations etc.
3. Trawling and towing of scientific equipment in ice covered waters.
4. Deploying and recovering scientific equipment over the side in ice covered waters and/or extreme low temperatures.
5. Deploying and recovering instruments and equipment through a moonpool in ice covered waters.
6. Use of moonpool and dropkeels in ice covered waters.
7. Use of «arctic tanks» and «ice windows» for hydroacoustic equipment.
8. Scientific diving in ice covered waters.
9. Use and «command and control» over workboats operating from the RV.
10. Deployment and recovery of equipment on the ice in the vicinity of the RV.
11. Support to vessels (in particular cruise ships) «Not under command» due to grounding, fire onboard, stuck in the ice etc (emergency towing, fire fighting support, evacuation of passengers etc).
12. Oil spill prevention actions.
13. Cooperation with RVs with lower or no ice-class at the ice edge.
14. «Habitat building» on the ice if abandoned ship far in to the ice, for example using rafts and lifeboats as «inner cover» in an «igloo».



Questions?



Slides from PC workshop available from Per W. Nieuwejaar, email pern@imr.no