**PAME II-2020 – Shipping Expert Group Pre-Meeting**

**Agenda item 6.7 (a)**

**Interpretations of the Polar Code**

*Co-lead: Norway*

**Implementation of the Polar Code**

**Interpretation of the code by Arctic States and Observer states.**

With reference to the decision by PAME I 2020, please find below a table containing;

* excerpts from the Polar Code on the seven subjects
* a summary of received information on interpretations
* proposals for unified interpretations
* a survey containing questions on the interpretation, experiences and way forward
* submissions received
* a new inclusion is manning and training (chapter 12 of the Polar Code), including interpretation submitted by Russia. All are invited to submit interpretations

1. **The relationship between ship category, ice/polar class, ice conditions and POLARIS as a decision support tool**

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| Excerpt from the Polar Code | | | |  |  |
| No. |  | No. |  | Interpretations- summary and proposals | Survey |
|  | INTRODUCTION |  |  |  |  |
| 2 | Definitions |  |  |  |  |
| 2.1 | *Category A ship* means a ship designed for operation in polar waters in at least medium first-year ice, which may include old ice inclusions. |  |  | There seems to be consensus that the assigned ship category is a result of the ice or polar class assigned to the ship and its compliance with all relevant requirements related to that category. Furthermore, POLARIS or similar acceptable tools shall only be used as a decision support tool on board during operation and is not involved in determining the ships category.  One State informs that they accept a category B ship to be built with ship structure in according with both Baltic ice class 1A and 1A-Super and polar class 6-7.  As the feedback received indicates agreement on the method for assigning ship categories, a common interpretation may be established and possible proposed by member states to IMO in the future, as unified interpretations.  Details on which ice class corresponds to a given ship category differs and should be further discussed by PAME.  Information, such as the background for or assessment done for allowing the ship structure of a category B ship to comply with a Baltic ice class, should be submitted. In addition, States experiences using the method for determining equivalent ice class in accordance with section 4 Additional guidance to chapter 3 (ship structure) of part I-B of the Polar Code should share their experience.  **Proposal for a unified interpretation**:  “The assigned ship category is a result of the ice/polar class assigned to the ship and the compliance with all relevant requirements related to that category. POLARIS or similar acceptable tools should only be used as a decision support tool on board and not be part of considerations in deciding the ships category.” | 1. What is in your opinion the best way forward? 2. Would you be in favour of submitting proposal for unified interpretation to IMO? 3. Do you agree with the proposed interpretation? 4. Which considerations did you do before assigning a ship category B to a ship build to other standards than polar class 6 or 7? 5. Describe experiences using the method for determining equivalent ice class in accordance with section 4 Additional guidance to chapter 3 (ship structure) of the Polar Code part I-B |
| 2.2 | *Category B ship* means a ship not included in category A, designed for operation in polar waters in at least thin first-year ice, which may include old ice inclusions. |  |  |
| 2.3 | *Category C ship* means a ship designed to operate in open water or in ice conditions less severe than those included in categories A and B. |  |  |
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|  | PART I-A SAFETY MEASURES |  |  |
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|  | CHAPTER 1 – GENERAL |  |  |
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| 1.3 | Certificate and survey |  |  |
| 1.3.7 | Where applicable, the certificate shall reference a methodology to assess operational capabilities and limitations in ice to the satisfaction of the Administration, taking into account the guidelines developed by the Organization5. |  |  |
|  | 5 Refer to guidance to be developed by the Organization. |  |  |
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|  | CHAPTER 3 – SHIP STRUCTURE |  |  |
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|  | Goal |  |  |
| 3.1 | The goal of this chapter is to provide that the material and scantlings of the structure retain their structural integrity based on global and local response due to environmental loads and conditions. |  |  |
|  | Functional requirements |  | Regulations |
| 3.2 | In order to achieve the goal set out in paragraph 3.1 above, the following functional requirements are embodied in the regulations of this chapter: |  |  |
| .2 | in ice strengthened ships, the structure of the ship shall be designed to resist both global and local structural loads anticipated under the foreseen ice conditions. | 3.3.2 | In order to comply with the functional requirements of paragraph 3.2.2 above, the following apply: |
|  | .1 | scantlings of category A ships shall be approved by the Administration, or a recognized organization accepted by it, taking into account standards acceptable to the Organization7 or other standards offering an equivalent level of safety; |
|  | .2 | scantlings of category B ships shall be approved by the Administration, or a recognized organization accepted by it, taking into account standards acceptable to the Organization8 or other standards offering an equivalent level of safety; |
|  | .3 | scantlings of ice strengthened category C ships shall be approved by the Administration, or a recognized organization accepted by it, taking into account acceptable standards adequate for the ice types and concentrations encountered in the area of operation; and |
|  | .4 | a category C ship need not be ice strengthened if, in the opinion of the Administration, the ship's structure is adequate for its intended operation. |
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|  | 7 Refer to Polar Class 1-5 of IACS URI Requirements concerning Polar Class (latest version).  8 Refer to Polar Class 6-7 of IACS URI Requirements concerning Polar Class (latest version). | | | |  |
| **Submissions up to PAME I-2020** | | | | | |
| **Introduction Norway**  Even if the ice/polar class assigned to the ship is part of the decision on the category of the ship, it is not the only parameter.  During the development of the Polar Code, some requirements were specifically linked to the category as defined in the Polar Code.  Although, some capacities of the ship, such as ice strengthening, may permit operation in more severe ice conditions than given in the definitions of the ship category, the ship is not allowed to operate in ice conditions more severe than given by the definition of the ship’s category. The reason for this is that there are not only the separate capacities of the ship that will give the category, but the ship must adhere to all regulations for the category. For example, a category C ship is not allowed to operate in ice conditions defined for a category B ship although the ship is built with a Baltic ice class that allows for operation in ice conditions corresponding to first-year ice up to 1-meter thickness in the Baltic sea.  Further, the result of POLARIS or similar acceptable tools may result in more serve ice conditions than given in the definitions of ship category. POLARIS shall only be used as a decision support tool on board and is not involved in deciding the ship category. The ship category is a result of the ice class assigned to the ship and the compliance with all requirements related to the category.  A category A ship shall be built with IACS polar class 1-5. A category B ship shall be built with IACS polar class 6-7. A category C ship may be built with a lower ice class than IACS polar 7, as a Baltic ice class or without an ice class. Other standards offering an equivalent level of safety may be used on a case-by-case evaluation. Only ships intended to operate exclusively in ice free waters may be built without any ice class.  Do you have any comments to this section? Is this interpretation of the use of POLARIS or similar acceptable tools in line with the proposal? | | | | | |
| **Spain**  Currently Spain only has one certified ship, as a result, the Spanish experience with POLARIS is at an early stage and consequently Spain is not using it as a decision support tool.  However, Spain is basing the ship’s category on the Recognized Organization acceptance. Therefore, the ship is not allowed to operate in ice conditions more severe than given by a RO.  Currently, as Norway indicates in his template: One category A ship shall be built with IACS polar class 1-5. Another category B ship shall be built with IACS polar class 6-7. And a category C ship may be built with a lower ice class than IACS polar 7, as a Baltic ice class or without an ice class. Only ships intended to operate exclusively in ice free waters may be built without any ice class. | | | | | |
| **Spain**  We agree with Norway comments.  Category A: IACS UR I1 PC1-PC5  Category B: IACS UR I1 PC6-PC7  Category C: IACS UR I1 PC6-PC7  Respect to Polar Class (PC), Category C doesn`t have ice class assigned to the ship in the IACS UR I1. We think that only is necessary meet the requirement of a recognized organizations by the Administration.  Respect to POLARIS (MSC.1/Circ.1519) We agree with Norway comments: the result of POLARIS or similar acceptable tools may result in more serve ice conditions than given in the definitions of ship category. POLARIS shall only be used as a decision support tool on board and is not involved in deciding the ship category. | | | | | |
| **Russian Federation**  Even if the ice/polar class assigned to the ship is part of the decision on the category of the ship, it is not the only parameter.  To obtain a category A, ship structure should comply with the requirements for IACS polar class 1-5 or RS ice class Arc6-Arc9 or Icebreaker6-Icebreaker9.  To obtain a category B, ship structure should comply with the requirements for IACS polar class 6-7 or Baltic ice class IA-IASuper or RS ice class Arc4-Arc5.  To obtain an ice strengthened category C, ship structure should comply with the requirements for Baltic ice class IB-IC or RS ice class Ice1-Ice3. | | | | | |
| **United States**  With regards to scantlings of Category A and Category B ships, the Coast Guard accepts the applicable standards of IACS as noted in the Polar Code’s footnotes of Regulation 3.3.2.  The IACS Polar Class of a vessel is a key factor in developing the ship category for the Polar Code but it is not the sole contributor. Even if a ship is assigned an IACS Polar Class which permits operation in more severe ice conditions than those defined in the ship’s Polar Code Category, the ship is not allowed to operate in ice conditions more severe than those given in the ship’s category as established by the Polar Code. A ship must adhere to all requirements assigned to a category in order to operate in the polar waters that correspond to that respective category. The Coast Guard generally accepts the interpretations of those Classification Societies authorized to issue Polar Ship Certificates on behalf of the U.S. Coast Guard.  Owners and operators are encouraged to become familiar with the Polar Operation Limit Assessment Risk Indexing System (POLARIS) in addition to existing national systems if available, such as the Canadian Artic Ices Regime Shipping System known as the AIRSS system. These systems may assist in accurately assessing operational limits; however, a ship’s category designation depends on fulfilling all of the requirements for that specific category. | | | | | |
| **Poland**  When assigning the category of the ship according to the Polar Code, the ice/polar class cannot be the only element taken into account. | | | | | |
| **Canada**  Polar Class/ice class is not the sole variable determining a ships Polar Code category, though a ship is limited in operation based upon this category even if ice class may be ‘higher’. A Category A ship is nominally PC 1-5 and Category B PC 6-7. However, these are only references meaning that Polar Code categories could align with the ice class notations. Indeed, category C ships may not be ice strengthened at all. | | | | | |

1. **Ice conditions for a category C ship to operate in**

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| Excerpt from the Polar Code | | | |  |  |
| No. |  | No. |  | Interpretations- summary and proposals | Survey |
|  | INTRODUCTION |  |  |  |  |
| 2 | Definitions |  |  |  |  |
| 2.1 | *Category A ship* means a ship designed for operation in polar waters in at least medium first-year ice, which may include old ice inclusions. |  |  | In principle there is an agreement that a common interpretation may be useful.  One state pointed out that this is a theoretical exercise and that the capabilities of a ship are described in detailed in the PWOM and there is no requirement for Administrations to approve the document thereby putting the onus on the operator.  One state informs that they generally accept the interpretations of Category C ice conditions by those ROs authorized to issue Polar Ship Certificates on their behalf. The interpretations by the ROs on this matter may be useful.  **Proposals for unified interpretation:**   1. “First-year ice 30-70 cm thick, not including old inclusions”, 2. “First-year ice of less than 30 cm thickness, which may include old ice inclusions”, or 3. “First-year ice of less than 30 cm, not including old ice inclusions.”   Norway: Although this is a theoretical approach, there is a need for the operators to know the ice conditions to plan operation in. As agreed above, if the ice conditions during an actual operation differs from the assumed ice conditions, POLARIS or similar acceptable tools may be used as a decision support tool on board. | 1. What is in your opinion the best way forward? 2. In which ice conditions may a category C ship operate? 3. Do your ROs have any interpretations on which ice conditions a category C ship may operate in? 4. Do you agree with any of the proposed interpretation? 5. Do you have any suggestion for interpretation of which ice conditions a category C ship may operate in? |
| 2.2 | *Category B ship* means a ship not included in category A, designed for operation in polar waters in at least thin first-year ice, which may include old ice inclusions. |  |  |
| 2.3 | *Category C ship* means a ship designed to operate in open water or in ice conditions less severe than those included in categories A and B. |  |  |
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|  | PART I-A SAFETY MEASURES |  |  |
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|  | CHAPTER 1 – GENERAL |  |  |
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| 1.3 | Certificate and survey |  |  |
| 1.3.7 | Where applicable, the certificate shall reference a methodology to assess operational capabilities and limitations in ice to the satisfaction of the Administration, taking into account the guidelines developed by the Organization5. |  |  |
|  | 5 Refer to guidance to be developed by the Organization. |  |  |
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|  | Functional requirements |  | Regulations |
| 3.2 | In order to achieve the goal set out in paragraph 3.1 above, the following functional requirements are embodied in the regulations of this chapter: |  |  |
| .2 | in ice strengthened ships, the structure of the ship shall be designed to resist both global and local structural loads anticipated under the foreseen ice conditions. | 3.3.2 | In order to comply with the functional requirements of paragraph 3.2.2 above, the following apply: |
|  | .1 | scantlings of category A ships shall be approved by the Administration, or a recognized organization accepted by it, taking into account standards acceptable to the Organization7 or other standards offering an equivalent level of safety; |
|  | .2 | scantlings of category B ships shall be approved by the Administration, or a recognized organization accepted by it, taking into account standards acceptable to the Organization8 or other standards offering an equivalent level of safety; |
|  | .3 | scantlings of ice strengthened category C ships shall be approved by the Administration, or a recognized organization accepted by it, taking into account acceptable standards adequate for the ice types and concentrations encountered in the area of operation; and |
|  | .4 | a category C ship need not be ice strengthened if, in the opinion of the Administration, the ship's structure is adequate for its intended operation. |
|  | 7 Refer to Polar Class 1-5 of IACS URI Requirements concerning Polar Class (latest version).  8 Refer to Polar Class 6-7 of IACS URI Requirements concerning Polar Class (latest version). | | | |  |
| **Submissions up to PAME I-2020** | | | | | |
| **Introduction Norway**  We are aware that there are different views about the ice types and ice concentrations a category C ship may operate in.  A category B ship is defined as a ship, not included in category A, designed for operation in polar waters in at least thin first-year ice, which may include old ice inclusions. Further, a category B ship shall be built in accordance with Polar Class 6 or 7 of IACS URI Requirements concerning Polar Class or other standards offering an equivalent level of safety. Thin first-year ice means first-year ice 30 – 70 cm thick.  So far, we may say that a category B ship may operate in at least first-year ice 30 – 70 cm thick which may include old ice inclusions.  A category C ship is defined as a ship designed to operate in open water or in ice conditions less severe than those included in categories A and B.  An ice condition less severe than first-year ice 30 – 70 cm thick, which may include old ice inclusions, may be interpreted as  - First-year ice 30-70 cm thick, not including old inclusions,  - First-year ice of less than 30 cm thickness, which may include old ice inclusions, or  - First-year ice of less than 30 cm, not including old ice inclusions.  Norway would welcome a common interpretation of the ice conditions a category C ship may operate in.  What are your interpretation of the ice condition a category C ship may operate in? | | | | | |
| **Spain**  The Code is kind of ambiguous when defining category C ship, therefore when Spain issued a certification to her only ship as category C, some operational limitations were added to ensure the ship’s safety.  A common interpretation of the ice conditions a category C ship would be really rewarding. | | | | | |
| **Spain**  Respect to category C: We think that the most indicated option is: First-year ice of less than 30 cm thickness, which may include old ice inclusions. | | | | | |
| **Russian Federation**  In the Polar Code conditions for a category C is defined as open water or ice conditions less severe than those included in categories A and B.  So, the range of possible conditions variations is quite wide. We suppose that more detailed description of the allowable conditions will be useful. | | | | | |
| **UK**  None of this is an exact science; if we consider design scenarios in isolation then many ships operating in Polar waters should not be there. Baltic ice is all first-year ice of fairly consistent local thickness except where pressure ridges exist.  Baltic classes are by definition only built/designed to operate in first year ice i.e. no old ice inclusions of sea or of land origin. Additionally, the Baltic classes, with the exception of 1A Super, are designed to operate in fairways of broken ice or with ice breaker escort. This might suggest that most of the Baltic class passenger ships navigating in Polar waters are outside of their design envelope. However, the manner in which they are operated does not suggest that they are unsafe.  A Cat C ship may be ice strengthened or may not be ice strengthened. Even if not ice strengthened, a Cat C ship will have some capability of operating in ice; as does a Cambridge punt. However without knowing the scantlings of the vessel, the diminution as a result of corrosion, the material properties, displacement etc it is not possible to guess what the capabilities in ice will be; the only safe position is that un-strengthened Cat C ships should not navigate in ice unless a ship specific assessment has been performed.  This issue should not be the focus of too much attention since the solutions appear to be too binary to be practical. The capabilities of the ship are detailed in the PWOM and there is no requirement for Administrations to approve the document thereby putting the onus on the operator. | | | | | |
| **United States**  Category A ships are designed (permitted) to operate in polar waters with at least medium first-year ice (0.7m-1.2m) which may include old ice inclusions. Category B ships are designed (permitted) to operate in polar waters with at least thin first year ice (0.3m-0.7m) which may include old ice inclusions. Category C ships are designed (permitted) to operate in polar water or in ice conditions less severe than those included in Category A or B.  This means that any condition that is considered less severe than polar waters with at least thin first year ice (0.3m-0.7m), which may include old ice inclusions, is a condition that Category C ships may operate.  The Coast Guard generally accepts the interpretations of Category C ice conditions by those Classification Societies authorized to issue Polar Ship Certificates on behalf of the U.S. Coast Guard.  Ships that are not assigned a Polar Class notation under IACS UR requirements concerning Polar Class, (Category C Ships), may submit for an equivalency. The process for this equivalency is outlined in Part 1B, Chapter 4 of the Code. | | | | | |
| **Poland**  Ice conditions for category C according to Polar Code are unclear and require clarification | | | | | |
| **Canada**  While Canada has not encounted varying interpretations of the type of ice conditions appropriate for category C ships, Canada is nevertheless supportive of further exploring common interpretations as proposed by Norway. | | | | | |

1. **The Polar Water Operation Manual (PWOM)**

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| Excerpt from the Polar Code | | | |  |  |
| No. |  | No. |  | Interpretations- summary and proposals | Survey |
|  | CHAPTER 2 – POLAR WATER OPERATIONAL MANUAL (PWOM) |  |  |  |  |
| 2.1 | Goal |  |  |  |  |
|  | The goal of this chapter is to provide the owner, operator, master and crew with sufficient information regarding the ship's operational capabilities and limitations in order to support their decision-making process. |  |  | There is consensus that the Polar Water Operation Manual should be a living document used on board and updated as necessary. The PWOM is considered to be part of the ISM system and should be approved and audited accordingly. The PWOM should be reviewed in connection with the issuance of a Polar Ship Certificate and contain the ship’s limitations. Further, using “Model table of contents for the Polar Water Operational Manual (PWOM)” in Appendix 2 of the Polar Code is highly recommended. The PWOM should be user friendly for the crew and contain only necessary information and reflect the outcome of the operational assessment.  One state draws our attention to another issue, the language of PWOM. Chapter 2 of Part I-A of the Polar Code, and additional guidance of Part I-B and Appendix 2 do not provide any provisions on languages to be used in PWOM, an interpretation might be given through SOLAS Regulation V/14.3 and 14.4.  **Proposal for a unified interpretation:**  “The Polar Water Operation Manual should be a living document used on board and updated as necessary. The PWOM should be handled by the Administration and ROs in the same way as the rest of the ISM system is approved and audited. The PWOM should be reviewed in connection with the issuance of a Polar Ship Certificate and contain the ships limitations.  Further, using “Model table of contents for the Polar Water Operational Manual (PWOM)” in Appendix 2 of the Polar Code is highly recommended. The PWOM should be user friendly for the crew and neither too long nor too short and reflect the outcome of the operational assessment.  PWOM should be available, at least, in the working language of the ship. In addition to working language, English should be used for PWOM procedures related to bridge-to-bridge and bridge-to-shore safety communications as well as communication on board between pilot and bridge watch keeping personnel.” | 1. Do you agree with the proposed unified interpretation? 2. What is in your opinion the best way forward? 3. Are you in favour of a unified interpretation to be sent to IMO? 4. When would be the best timing for a submission? |
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| 2.2 | Functional requirements | 2.3 | Regulations |
| 2.2.1 | In order to achieve the goal set out in paragraph 2.1 above, the following functional requirements are embodied in the regulations of this chapter. | 2.3.1 | In order to comply with the functional requirements of paragraphs 2.2.1 to 2.2.6, the Manual shall be carried on board. |
| 2.2.2 | The Manual shall include information on the ship-specific capabilities and limitations in relation to the assessment required under paragraph 1.5. | 2.3.2 | In order to comply with the functional requirements of paragraph 2.2.2, the Manual shall contain, where applicable, the methodology used to determine capabilities and limitations in ice |
| 2.2.3 | The Manual shall include or refer to specific procedures to be followed in normal operations and in order to avoid encountering conditions that exceed the ship's capabilities. | 2.3.3 | In order to comply with the functional requirements of paragraph 2.2.3, the Manual shall include risk-based procedures for the following: |
|  | .1 | voyage planning to avoid ice and/or temperatures that exceed the ship's design capabilities or limitations; |
|  | .2 | arrangements for receiving forecasts of the environmental conditions; |
|  | .3 | means of addressing any limitations of the hydrographic, meteorological and navigational information available; |
|  | .4 | operation of equipment required under other chapters of this Code; and |
|  | .5 | implementation of special measures to maintain equipment and system functionality under low temperatures, topside icing and the presence of sea ice, as applicable. |
| 2.2.4 | The Manual shall include or refer to specific procedures to be followed in the event of incidents in polar waters. | 2.3.4 | In order to comply with the functional requirements of paragraph 2.2.4, the Manual shall include risk-based procedures to be followed for: |
|  |  | .1 | contacting emergency response providers for salvage, search and rescue (SAR), spill response, etc., as applicable; and |
|  |  | .2 | in the case of ships ice strengthened in accordance with chapter 3, procedures for maintaining life support and ship integrity in the event of prolonged entrapment by ice. |
| 2.2.5 | The Manual shall include or refer to specific procedures to be followed in the event that conditions are encountered which exceed the ship's specific capabilities and limitations in paragraph 2.2.2. | 2.3.5 | In order to comply with the functional requirements of paragraph 2.2.5, the Manual shall include risk-based procedures to be followed for measures to be taken in the event of encountering ice and/or temperatures which exceed the ship's design capabilities or limitations. |
| 2.2.6 | The Manual shall include or refer to procedures to be followed when using icebreaker assistance, as applicable. | 2.3.6 | In order to comply with the functional requirements of paragraph 2.2.6, the Manual shall include risk-based procedures for monitoring and maintaining safety during operations in ice, as applicable, including any requirements for escort operations or icebreaker assistance. Different operational limitations may apply depending on whether the ship is operating independently or with icebreaker escort. Where appropriate, the PWOM should specify both options. |
| **Submissions up to PAME I-2020** | | | | | |
| **Introduction Norway**  The polar code does not require the polar water operational manual to be approved. The manual should be a living document used on board and updated as necessary.  The manual is essential for the certification process, in addition to be user friendly for the crew on board. The manual shall contain capacities and limitations found in the operational assessment, it shall be ship-specific and the “Model table of contents for the Polar Water Operational Manual (PWOM)” in Appendix 2 of the Polar Code is recommended to be used.  Comments? | | | | | |
| **Denmark**  Denmark agree with Norway that the PWOM should be a living document used on board and updated as necessary. It should be handled by the Administration and ROs similar to how the rest of the ISM system is approved and audited. | | | | | |
| **Spain**  Even if the Code does not require that the Administration approves the polar water operational manual, the manual is an essential document that should be carefully read during the certification process. Also, the manual should be used on board and updated as necessary.  Spain highly recommends using “Model table of contents for the Polar Water Operational Manual (PWOM)” in Appendix 2 of the Polar Code. | | | | | |
| **Spain**  We agree with Norway comments. | | | | | |
| **Russian Federation**  There are numerous regulations in Polar Code Part I-A that imply prerequisites (criteria) in their application to the ship depending on results of operational assessment required by paragraph 1.5 of Part I-A. Since all of these criteria could not be reflected in Polar Ship Certificate (Part I-A, para 1.3.5) as operational restrictions and limitations of the ship, PWOM is the only on-board document, which shall contain essential information on all specific criteria applied in relation to establishment of the ship’s compliance with the regulations of Part I-A of the Code (e.g. operating in areas and during periods where ice accretion is likely to occur, potential for abandonment onto ice or land, operation in extended periods of darkness, escorted or escort ship, etc). It is supposed that in such matter some improvement and/or additional interpretations is needed for Chapter 2 of Part I-A or Appendix 2 (model table of PWOM contents).  Another issue is a language of PWOM. As the Chapter 2 of Part I-A and additional guidance of Part I-B and Appendix 2 do not provide any provisions on what language should be used in PWOM, a common interpretation might be given through SOLAS Reg.V/14.3 and 14.4, as follows: PWOM shall be made, at least, in working language of the ship; in addition to working language, English are to be used for PWOM procedures related to bridge-to-bridge and bridge-to-shore safety communications as well as to communications on board between pilot and bridge watchkeeping personnel.  The manual should be a living document used on board and updated as necessary. It should not be neither too long or too short and always easy to understand for the crew. | | | | | |
| **UK**  This is the safety backbone of the Code detailing the capabilities and limitations of the ship and should ideally follow the guidance in appendix II of the Code. | | | | | |
| **United States**  The Polar Water Operation Manual (PWOM) should be developed taking into account the operational assessment. The PWOM may be reviewed by the Authorized Classification Society and/or by the Administration but it is not required to be approved. The PWOM is, however, required to be followed by the vessel. | | | | | |
| **Poland**  With reference to the PWOM manual (although it does not require approval), we believe that it is an important element of the ship equipment and its content should be subject to verification by RO for compliance with the guidelines | | | | | |
| **Canada**  Canada has delegated the issuance of Polar Ship Certificate’s (PSC) to Recognized Organizations. Polar Water Operational Manuals (PWOM), on the other hand, are not explicitly approved by an Administration or a RO acting on its behalf. Instead, Canada views PWOMs as similar in many respects to a ships Safety Management System (per the ISM Code) and are therefore to be developed and maintained by the ship owner or authorized representative. SDC 1 WP.4 states:  “With regard to possible approval of a PWOM by an Administration, the group generally agreed that [the] PWOM need not be approved by Administrations, however, any operational limitations will have to be approved by the Administration.”  Accordingly, while the PWOM need not necessarily be approved, certain components of it (e.g. info on ship-specific capabilities and limitations (per the operational assessment), methodology for determining operational limits in ice, etc.) will nevertheless need to be reviewed by an RO given its relationship to the issuance of a Polar Ship Certificate. | | | | | |

1. **Ice accretion and damage stability calculations**

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| Excerpt from the Polar Code | | | |  |  |
| No. |  | No. |  | Interpretations- summary and proposals | Survey |
|  | CHAPTER 4 –SUBDIVISION AND STABILITY |  |  |  |  |
|  | Goal |  |  |  |  |
| 4.1 | The goal of this chapter is to ensure adequate subdivision and stability in both intact and damaged conditions. |  |  | There are two different views on this highly complex technical issue. Some states are of the opinion that loading conditions subject to ice accretion shall comply with both applicable intact- and damage stability requirements. While others are of the opinion that only intact stability requirements shall be adhered to.  One state question that the polar code is using the same extents of ice accretion as are applied for fishing vessels, implying that fishing vessels are much smaller.  Several states are of the opinion that the IMOs subcommittee SDC should reopen the discussion and clarify if ice accretion is to be included in the damage stability limiting curves.  This is technically and partly legally a complex question. Given the distance between the parties it is proposed that this issue should be discussed and concluded among stability experts in IMOs subcommittee Ship Design and Construction.  Norway: Our experience is that the weight of the ice accretion given in the intact code is not conservative and that class societies rules have larger amount of ice accretion in their regulation. In addition, fishing vessels operating where icing is likely to occur may be quite large. | 1. What is in your opinion the best way forward? 2. Could you agree to work towards a new IMO agenda item in the subcommittee Ship Design and Construction? |
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| 4.2 | Functional requirements | 4.3 | Regulations |
|  | In order to achieve the goal set out in paragraph 4.1 above, the following functional requirements are embodied in the regulations of this chapter: |  |  |
|  |  | 4.3.1 | Stability in intact conditions |
| .1 | ships shall have sufficient stability in intact conditions when subject to ice accretion; and | 4.3.1.1 | In order to comply with the functional requirement of paragraph 4.2.1, for ships operating in areas and during periods where ice accretion is likely to occur, the following icing allowance shall be made in the stability calculations: |
|  |  | .1 | 30 kg/m2 on exposed weather decks and gangways; |
|  |  | .2 | 7.5 kg/m2 for the projected lateral area of each side of the ship above the water plane; and |
|  |  | .3 | the projected lateral area of discontinuous surfaces of rail, sundry booms, spars (except masts) and rigging of ships having no sails and the projected lateral area of other small objects shall be computed by increasing the total projected area of continuous surfaces by 5% and the static moments of this area by 10%. |
| **Submissions up to PAME I-2020** | | | | | |
| **Introduction Norway**  The Polar Code chapter 4 introduces the weight of a theoretical ice accretion to all types of ships operating in polar waters. The ice accretion is added to compensate for the added weight on the ship and the adverse effect to the ship’s stability caused by icing the ship may suffer from in some weather conditions. This ice accretion is also used in the 2008 Intact Stability Code, mainly for fishing vessels and offshore support vessels. The weight of ice is calculated by the same method by the two instruments, but the text in the two instruments differs slightly.  This difference in wording between the polar code and the 2008 intact code has led to questions if the ice accretion have to be considered in both intact stability and calculation of the damage stability limiting curves when calculating stability according to the polar code. The 2008 intact stability code includes the ice accretion in both intact stability and damage stability limiting curves.  The SDC1 discussed the matter and concluded that consensus was not reached to include ice accretion in both intact and damage stability calculations. During the preparation of the polar code, it was not intended to deviate from the way of treating ice accretion outside polar areas.  Interpretation  IMO and SDC should once again look into this issue to clarify whether the ice accretion is to be included in the damage stability limiting curves. In the meantime, the “intact conditions” in 4.2.1 should be read as “condition of loading”. | | | | | |
| **Denmark**  Denmark agree with Norway that IMO and SDC should once again look into this issue to clarify whether the ice accretion is to be included in the damage stability limiting curves. | | | | | |
| **Spain**  At this moment, Spain interprets that ice accretion is applicable to intact stability. However, if IMO and SDC look into this issue and resolve to include it in damage stability, Spain l accept it. | | | | | |
| **Spain**  We agree with Norway comments regarding that the 2008 IS CODE / Part B / Chapter 6 is equivalent to POLAR Code / PART I-A / 4.3.1, but we remember that 2008 IS CODE / Part B is not mandatory and POLAR Code is mandatory.  Both are applied only to stability in intact conditions.  POLAR Code / PART I-A / 4.2.1 says: ships shall have sufficient stability in intact conditions when subject to ice accretion, and POLAR Code / PART I-A / 4.3.1 is required only to 4.2.1.  We think that comply with 2008 IS CODE / Part B / Chapter 6 is sufficient to comply with the functional requirement required in POLAR Code / PART I-A / 4.3.1 regarding Ice accretion.  Respect to damage stability calculations, Polar Code doesn´t say anything about that the ships should have sufficient residual stability following ice damage and ice accretion. However, we think that ice accretion should be considered in the damage stability calculations, since this is a factor that can significantly influence in the residual stability following ice damage. | | | | | |
| **Russian Federation**  Regulation 4.3.1 of the Polar Code «Stability in intact conditions» contains the icing allowance values which should be considered in intact conditions.  Item 6.3.1 Part B of Code on Intact Stability which states allowance for ice accretion also does not contain any references to damage stability calculations.  So icing allowance applied to intact stability calculations only. | | | | | |
| **UK**  It has been argued that consideration of both ice accretion and damage at the same time is applying two misfortunes concurrently; a principle not applied in SOLAS.  UK do not see ice accretion as a misfortune; it is a foreseeable loading condition which may occur repeatedly and therefore should apply to both intact and damage stability calculations of all ships operating in areas where ice accretion may occur. This principle is established in the Intact Stability Code and it is not for the Polar Code to overturn. If the application to damage stability calculations is to be challenged, then it should be done from within the Intact Stability Code.  There is however some conjecture as to whether the same extents of accretion for FV should apply to much larger ships. | | | | | |
| **United States**  The Polar Code functional requirements for the calculation of ice accretion was taken from the 2008 Intact Stability Code section 1B which are guidelines for fishing vessels and offshore support vessels. The Intact Stability Code does not require ice accretion to be included in the calculation of the damage stability limiting curves as Norway states.  Further, in order for ice accretion to occur there have to be environmental conditions which simultaneously exist such as sea spray, wind, air temperature considerably lower than the water temperature, etc. These conditions, particularly sea spray, do not normally occur when operating in areas with moderate ice coverage. Damage stability curves are based on hull breaches/flooding which would be more likely to occur when a vessel is operating in ice covered waters. Applying ice accretion to damage stability curves would be subjecting vessels to meet damage stability requirements (one for flooding/hull breaches and one for ice accretion) that do not occur together in the same operating conditions and could be particularly difficult for vessels to comply with.  The wording of the Polar Code should stay as is. | | | | | |
| **Poland**  The matter of considering ice accretion of the ship when assessing the ship's stability both in intact and emergency conditions requires clarification and appropriate decision by the IMO. | | | | | |
| **Canada**  Canada is of the view that the Polar Code is clear in that it does not introduce new requirements for ice accretion calculations under damaged conditions.  Pursuant to Polar Code regulation 1.1.1, a ship shall be considered to meet a functional requirement when the ship’s design and arrangements comply with all the regulations associated with that functional requirement.  Accordingly, paragraph 4.3.1 indicates the regulatory requirements to meet the functional requirements of 4.2.1 in intact conditions. Whereas paragraph 4.3.2 indicates the regulatory requirements to meet the functional requirements of 4.2.2 in damaged conditions.  Therefore, considering that there is no cross-reference between the requirements in 4.2.1/4.3.1 for ice accretion, and 4.2.2/4.3.2 for damage stability, and considering the language in 1.1.1 which clearly states that functional requirements can be considered met only though compliance with the associated regulations, it remains Canada’s interpretation that the Polar Code’s ice accretion criteria does not apply under damaged conditions and is not a prerequisite for issuance of a Polar Ship Certificate. | | | | | |

1. **Removal of ice accretion**

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| Excerpt from the Polar Code | | | | Interpretations- summary and proposals | Survey |
| .1 | ships shall have sufficient stability in intact conditions when subject to ice accretion; and | 4.3.1 | Stability in intact conditions | Some of the responses emphasizes that prescribing means of ice monitoring and removing may reduce operational flexibility for the vessel and crew as well as resisting implementation and development of new technologies.  Others were in favour of the suggested interpretation.  **Proposal for a unified interpretation:**  “Means for removal of ice should be effective and ensure minimal risk exposure of personnel in relation to falling ice, working in an unsafe environment and exposure to environmental conditions. Ship’s design and available crew should govern the dimension of ice removal equipment and may include but not be limited to axes, wooden clubs, spades, salt, glycol etc.  Procedures for removal of ice should be included in the PWOM.”  Norway: According to the Polar code Administration may require equipment for removing ice. An interpretation may be useful, still, less prescriptive. | 1. What is in your opinion the best way forward? 2. Do you agree with the proposed unified interpretation? |
|  |  | 4.3.1.2 | Ships operating in areas and during periods where ice accretion is likely to occur shall be: |
|  |  | .1 | designed to minimize the accretion of ice; and |
|  |  | .2 | equipped with such means for removing ice as the Administration may require; for example, electrical and pneumatic devices, and/or special tools such as axes or wooden clubs for removing ice from bulwarks, rails and erections. |
|  |  | 4.3.1.3 | Information on the icing allowance included in the stability calculations shall be given in the PWOM. |
|  |  | 4.3.1.4 | Ice accretion shall be monitored and appropriate measures taken to ensure that the ice accretion does not exceed the values given in the PWOM. |
| **Submissions up to PAME I-2020** | | | | | |
| **Introduction Norway**  Ice removal equipment must be dimensioned in relation to the ship's design and available crew.  Accumulated ice must not fall down and destroy other structures. Available personnel with regard to manual ice removal must be sufficient to keep ice accretion at an acceptable level over time.  Exposed areas should be covered / shielded to prevent accumulation of ice. In general, surfaces should be smoot to reduce the risk of icing. Where this design point is not possible or appropriate, systems should be provided to ensure that the ice and snow does not accumulate (heating, etc.). An analysis to identify the equipment needed based on the size, design and operation of the ship should be carried out. The equipment shall be effective and ensure minimal risk exposure of personnel in relation to falling ice, working in an unsafe environment and exposure to environmental conditions. Equipment like axes, wooden clubs, spades, salt, glycol etc. shall also be available on board. Comments? | | | | | |
| **Spain**  Spain thinks that ice removal equipment must be dimensioned in relation to the ship's design and available crew. This operation must be done carefully in order to not damaging other structures or people. Also, systems should be provided to ensure that the ice and snow do not accumulate in points of the structure where the removing is not possible. | | | | | |
| **Spain**  We agree with Norway comments. | | | | | |
| **Russian Federation**  Icing prevention systems (heating, tents, covers) and icing removal systems (pneumatic systems, anti-icing liquids, mechanical devices) should be available onboard. A vessel bow shape should be preferably designed to ensure effective water drain to prevent icing accumulation. | | | | | |
| **United States**  This allows vessel owners and operators to establish their ship specific means to monitor and remove ice from the vessel surfaces. Creating rules that prescribe how ice is monitored or removed reduces operational flexibility for the vessel and crew as well as restricts implementation and development of new technologies. How ice accretion will be monitored and how ice will be removed would be an appropriate inclusion in the PWOM. | | | | | |
| **Poland**  The ship's structure should be such as to limit or prevent ice accretion; nevertheless, means for mechanical or chemical removal of ice should always be available on the ship depending on the size / capacity of the crew, size of the ship and way of operation | | | | | |
| **Canada**  In the spirt of the Polar Code’s goal-based structure and the latitude it affords to ships, Canada is supportive of leaving the text concerning ice accretion as is, rather than introducing or substituting with prescriptive language. | | | | | |

1. **Smom, probability to survive heeling moments**

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| Excerpt from the Polar Code | | | | Interpretations- summary and proposals | Survey |
| 4.2 |  | 4.3.2 | Stability in damaged conditions | We have received few replies. One state proposes to discuss this technically subject further in IMO. | 1. What is in your opinion the best way forward? 2. Would you agree to work towards a new IMO agenda item, so the stability expert in the subcommittee Ship Design and Construction may discuss and conclude on this technical issue? |
| .2 | ships of category A and B, constructed on or after 1 January 2017, shall have sufficient residual stability to sustain ice-related damages. | 4.3.2.1 | In order to comply with the functional requirements of paragraph 4.2.2, ships of categories A and B, constructed on or after 1 January 2017, shall be able to withstand flooding resulting from hull penetration due to ice impact. The residual stability following ice damage shall be such that the factor si, as defined in SOLAS regulations II-1/7-2.2 and II-1/7-2.3, is equal to one for all loading conditions used to calculate the attained subdivision index in SOLAS regulation II-1/7. However, for cargo ships that comply with subdivision and damage stability regulations in another instrument developed by the Organization, as provided by SOLAS regulation II-1/4.1, the residual stability criteria of that instrument shall be met for each loading condition. |
| **Submissions up to PAME I-2020** | | | | | |
| **Introduction Norway**  The polar code 4.3.2.1 specifies that si, as defined in SOLAS regulations II-1/7-2.2 and II-1/7-2.3, shall be equal to one (1). This implies that the factor Smom of SOLAS regulation II-1/7-2.4 shall not be applied for a passenger ship when calculating residual stability after ice damage.  Comments? | | | | | |
| **Spain**  As indicated by the Code. | | | | | |
| **Spain**  We don´t agree with Norway comments.  The Polar Code is clear, only the factor si, as defined in SOLAS regulations II-1/7-2.2 and II-1/7-2.3, is equal to one, regardless of the type of ship, passenger or cargo ship.  To apply SOLAS regulations II-1/7-2.4, the factor smom, i must be calculated to passenger ships and only for cargo ships smom, i shall be taken as unity. | | | | | |
| **Russian Federation**  Regulation 4.3.2.1 of Part I-A Polar Code states that si factor should be calculated without consideration of Smom (SOLAS regulation II-1/7-2.4).  We suppose that MSC should once again look into this item because according to Resolution A.1024(26) which was foregoing to Polar Code states that si should be calculated without exclusion of any exceptions. | | | | | |
| **United States**  The United States does not have enough experience in calculating the residual stability after ice damage on passenger ships as we have very few U.S. flagged International Passenger ships with this issue. We therefore cannot support or oppose the claims made by Norway in regard to calculating the residual stability after ice damage on passenger ships. | | | | | |

1. **Manning and training**

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| Excerpt from the Polar Code | | | | Interpretation- summary and proposals | Survey |
|  | CHAPTER 12 – MANNING AND TRAINING |  |  |  |  |
| 12.1 | Goal |  |  |  |  |
|  | The goal of this chapter is to ensure that ships operating in polar waters are appropriately manned by adequately qualified, trained and experienced personnel. |  |  |  |  |
| 12.2 | Functional requirements | 12.3 | Regulations |  |  |
|  | In order to achieve the goal set out in paragraph 12.1 above, companies shall ensure that masters, chief mates and officers in charge of a navigational watch on board ships operating in polar waters shall have completed training to attain the abilities that are appropriate to the capacity to be filled and duties and responsibilities to be taken up, taking into account the provisions of the STCW Convention and the STCW Code, as amended. | 12.3.1 | In order to meet the functional requirement of paragraph 12.2 above while operating in polar waters, masters, chief mates and officers in charge of a navigational watch shall be qualified in accordance with chapter V of the STCW Convention and the STCW Code, as amended, as follows:   |  |  |  |  | | --- | --- | --- | --- | | Ice conditions | Tankers | Passenger ships | Other | | Ice free | Not applicable | Not applicable | Not applicable | | Open waters | Basic training for master, chief mate and officers in charge of a navigational watch. | Basic training for master, chief mate and officers in charge of a navigational watch. | Not applicable | | Other waters | Advanced training for master and chief mate. Basic training for officers in charge of a navigational watch. | Advanced training for master and chief mate. Basic training for officers in charge of a navigational watch. | Advanced training for master and chief mate. Basic training for officers in charge of a navigational watch. | | Russian Federation:  If you are operating in Polar waters chances that you may enter areas with ice concentration higher than 1/10 are relatively high, so to be ready for that Master and Chief Mates should have polar water advanced training, while other deck officers would suffice Polar water basic training.  To obtain Certificate in Advanced Training for ships operating in polar waters Master and Chief mate should meet the requirements for certification in Basic Training, complete approved seagoing service on board a ship operating in polar waters **or equivalent seagoing service,** in the deck department at the management level or while performing watchkeeping duties in an operational level, and for a period of **at least 2 months**, and complete an approved advanced training course which meet the standard of competence in the STCW Code, § A-V/4, paragraph 2.  The following areas are being discussed now to become equivalent for getting required seagoing service on Russian Flagged vessels in addition to polar waters in case of navigation during ice season: Baltic sea, Barents sea, Sea of Okhotsk, Japanese sea. | 1. Do you have an interpretation of chapter 12? 2. Do you have any comments on the proposed interpretations by the Russian Federation? 3. What is in your opinion the best way forward? |
|  |  | 12.3.2 | The Administration may allow the use of a person(s) other than the master, chief mate or officers of the navigational watch to satisfy the requirements for training, as required by paragraph 12.3.1, provided that: | Russian Federation:  To agree with item 12.3.3 - the Master is always responsible for the safety of ship, so even if the person under 12.3.2 is available Master, Chief mate and officers in charge of a navigational watch should always have at least Polar water basic training certificate. |
|  |  | .1 | this person(s) shall be qualified and certified in accordance with regulation II/2 of the STCW Convention and section A-II/2 of the STCW Code, and meets the advance training requirements noted in the above table; |
|  |  | .2 | while operating in polar waters the ship has sufficient number of persons meeting the appropriate training requirements for polar waters to cover all watches; |
|  |  | .3 | this person(s) is subject to the Administration's minimum hours of rest requirements at all times; |
|  |  | .4 | when operating in waters other than open waters or bergy waters, the master, chief mate and officers in charge of a navigational watch on passenger ships and tankers shall meet the applicable basic training requirements noted in the above table; and |
|  |  | .5 | when operating in waters with ice concentration of more than 2/10, the master, chief mate and officers in charge of a navigational watch on cargo ships other than tankers shall meet the applicable basic training requirements noted in the above table. |
|  |  | 12.3.3 | The use of a person other than the officer of the navigational watch to satisfy the requirements for training does not relieve the master or officer of the navigational watch from their duties and obligations for the safety of the ship. |  |
|  |  | 12.3.4 | Every crew member shall be made familiar with the procedures and equipment contained or referenced in the PWOM relevant to their assigned duties. | Russian Federation:  The Polar Code/PWOM provisions require that the crew shall be trained in the use of the personal and group survival equipment provided to support survival for the maximum expected time of rescue. As a result of this requirement if the ship is operating in ice with concentration higher than 1/10 all crew is highly recommended to have Polar water survival training attended. |