

## ANNEX

## AMENDMENTS TO THE ANNEX TO THE BWM CONVENTION

(Endorsements of additional surveys on the  
International Ballast Water Management Certificate)

## Section E – Survey and certification requirements for ballast water management

## Regulation E-1 – Surveys

1 In paragraph 1.5, the last sentence "Such surveys shall be endorsed on the Certificate issued under regulation E-2 and E-3" is deleted.

## Regulation E-5 – Duration and validity of the Certificate

2 In the chapeau of paragraph 8, the words "annual survey" are replaced by "annual or intermediate survey".

3 In paragraph 8.3, the words "annual surveys" are replaced by "annual or intermediate surveys".

4 The existing paragraph 9.1 is deleted and the existing paragraphs 9.2 to 9.4 are renumbered as paragraphs 9.1 to 9.3, respectively.

## 第 7/2021 號行政長官公告

國際海事組織的海上安全委員會和海上環境保護委員會分別於二零一四年十一月二十一日和二零一五年五月十五日透過第 MSC.385 (94) 號決議和第 MEPC.264 (68) 號決議，通過了《國際極地水域運作船舶規則》（《極地規則》），該規則於二零一七年一月一日在國際法律秩序上生效，包括對澳門特別行政區生效；

基於此，行政長官根據第3/1999號法律《法規的公佈與格式》第五條（一）項和第六條第一款的規定，命令公佈國際海事組織的海上安全委員會第 MSC.385 (94) 號決議和海上環境保護委員會第 MEPC.264 (68) 號決議及有關協議附件中所載經整理的《國際極地水域運作船舶規則》（《極地規則》）文本的中文和英文正式文本。

二零二一年三月八日發佈。

行政長官 賀一誠

## Aviso do Chefe do Executivo n.º 7/2021

Considerando que o Comité de Segurança Marítima e o Comité de Protecção do Meio Marinho da Organização Marítima Internacional (OMI) adoptaram o Código Internacional para os Navios que Operam em Águas Polares (Código Polar), respectivamente em 21 de Novembro de 2014, através da resolução MSC.385(94), e em 15 de Maio de 2015, através da resolução MEPC.264(68), e que tal Código entrou em vigor na ordem jurídica internacional, incluindo a Região Administrativa Especial de Macau, em 1 de Janeiro de 2017;

O Chefe do Executivo manda publicar, nos termos da alínea 1) do artigo 5.º e do n.º 1 do artigo 6.º da Lei n.º 3/1999 (Publicação e formulário dos diplomas), a resolução MSC.385(94) e a resolução MEPC.264(68), respectivamente, do Comité de Segurança Marítima e do Comité de Protecção do Meio Marinho da OMI, bem como o texto consolidado do Código Internacional para os Navios que Operam em Águas Polares (Código Polar) constante dos anexos das resoluções, nos seus textos autênticos em línguas chinesa e inglesa.

Promulgado em 8 de Março de 2021.

O Chefe do Executivo, *Ho Iat Seng*.

## 第 MSC.385 (94) 號決議

(2014 年 11 月 21 日通過)

### 國際極地水域運作船舶規則 (極地規則)

海上安全委員會，

憶及國際海事組織公約關於本委員會職能的第 28 (b) 條，

認識到由於對極地運作船舶及其系統和運作的額外要求超出經修正的《1974 年國際海上人命安全公約》(安全公約)(該公約)和其他有約束力的相關 IMO 文件的現有要求，因而有必要為這些船舶規定一個強制性框架，

注意到 MSC.386 (94) 號決議，經該決議，委員會特別通過了該公約新的第 XIV 章，

還注意到海上環境保護委員會在其第 67 屆會議上，為在其第 68 屆會議上予以通過，批准了《國際極地水域運作船舶規則》(極地規則)的引言(因其與環境保護相關)，以及 II-A 和 II-B 部分，並還為通過而審議了《經 1978 年議定書修訂的 1973 年國際防止船舶造成污染公約》的相關修正案，

在其第 94 屆會議上審議了《國際極地水域運作船舶規則》草案，

1 通過極地規則引言與安全相關的規定，以及 I-A 和 I-B 部分全文，其文本載於本決議附件；

2 同意有關安全和環境保護的《極地規則》引言修正案須與海上環

境保護委員會協商通過；

3 提請本公約締約國政府注意，《極地規則》將於 2017 年 1 月 1 日公約新的第 XIV 章生效時有效；

4 還提請各締約國政府考慮對《極地規則》未包括的在極地水域運作的船舶盡實際可行地自願應用《極地規則》；

5 要求本組織秘書長為公約第 VIII (b) (v) 條的目的，將本決議及附件中《極地規則》文本的核證無誤副本分發給所有本公約締約國政府；

6 還要求本組織秘書長將本決議及附件中所含該規則文本的副本分發給非該公約締約國的本組織成員；

7 進一步要求秘書長在海上環境保護委員會通過有關環境保護相關的規定後準備出經整理的《極地規則》文本。

## 第 MEPC.264 (68) 號決議

(2015 年 5 月 15 日通過)

### 國際極地水域運作船舶規則（極地規則）

海上環境保護委員會，

憶及國際海事組織公約關於各國際防止和控制船舶造成海洋污染公約賦予海上環境保護委員會職能的第 28 (b) 條，

認識到由於對極地運作船舶的額外海洋環境保護要求超出經 1997 年議定書修正的《經 1978 年議定書修訂的 1973 年國際防止船舶造成污染公約》（防污公約）和其他有約束力的相關 IMO 文件的現有要求，因而有必要為這些船舶規定一個強制性框架，

注意到 MEPC.265 (68) 號決議，經該決議，委員會特別通過了防污公約附則 I、II、IV 和 V 的修正案，以使《國際極地水域運作船舶規則》有關環境的規定的應用為強制性，

還注意到海上安全委員會在其第九十四屆會議上，以第 MSC.385 (94) 號決議，通過了《國際極地水域運作船舶規則》（極地規則）的引言（因其與安全相關），以及 I-A 和 I-B 部分，並以第 MSC.386 (94) 號決議通過了 1974 年安全公約修正案，以使極地規則有關安全的規定的應用為強制性，

在其第六十八屆會議上審議了《國際極地水域運作船舶規則》草案，

1 通過極地規則引言與環境相關的規定，以及 II-A 和 II-B 部分全

文，其文本載於本決議附件；

2 同意有關安全和環境保護的《極地規則》引言修正案須與海上安全委員會協商通過；

3 提請各締約國注意，《極地規則》將於 2017 年 1 月 1 日公約附則 I、II、IV 和 V 的修正案生效時有效；

4 還提請各締約國考慮對《極地規則》未包括的在極地水域運作的船舶盡實際可行地自願應用《極地規則》；

5 要求本組織秘書長為防污公約第 16 (2) (e) 條的目的，將本決議及附件中所含《極地規則》文本的核證無誤副本分發給所有防污公約締約國；

6 還要求本組織秘書長將本決議及附件中所含該規則文本的副本分發給非防污公約締約國的本組織成員；

7 進一步要求秘書長準備出經整理的《極地規則》文本。

# 國際極地水域運作船舶規則（極地規則）

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## 前 言

- 1 為在偏遠、脆弱和潛在惡劣極地水域中提高船舶運作安全並減少對人民和環境的影響，特制定《國際極地水域運作船舶規則》作為現有 IMO 文書的補充。
- 2 本規則認識到，極地水域作業會對船舶、其系統和操作提出超出經修正的《1974 年國際海上人命安全公約》（安全公約）、《經 1978 年議定書修訂的 1973 年國際防止船舶造成污染公約》（防污公約）及其他相關約束性國際海事組織文書現有要求的附加要求。
- 3 本規則認識到，極地水域提出了超出日常所遇到的航行要求的附加要求。在許多區域，海圖的覆蓋目前對沿岸航行會有不足。業已認識到，即便在已有的海圖上，可能會有未曾測繪及未曾標出的淺灘。
- 4 本規則還認識到，北極中的沿岸社區可能、及極地的生態系統易受損於諸如航行作業的人類活動。
- 5 業已認識到附加安全措施和環境保護之間的關係，為減少事故可能性所採取的任何安全措施，將極大地有益於環境。
- 6 南極和北極水域具有相似之處，但也存在很大區別。因此，雖然本規則旨在總體上適用於南北兩極，但對兩個區域在法理和地理上的差異業已做出考慮。
- 7 制定本極地規則的關鍵原則是使用基於風險的方法確定範圍及採用總體性方法減少所識別的風險。

## 引 言

### 1 目 標

本規則的目標是通過解決存在於極地水域中且未曾在本組織其他文書中得到充分處理的風險，為船舶安全運作和保護極地環境做出規定。

### 2 定 義

就本規則而言，所使用的術語具有以下段落中界定的含義。I-A 部分中所用、但未在本節中界定的術語須具有《安全公約》中所界定的相同含義。II-A 部分中所用、但未在本節中界定的術語，須具有《防污公約》中所界定的相同含義。

2.1 **A 類船舶**係指至少為在可包含老冰的當年中冰的極地水域中作業所設計的船舶。

2.2 **B 類船舶**係指不包括在 A 類之內，至少為在可包含老冰的當年薄冰的極地水域中作業所設計的船舶。

2.3 **C 類船舶**係指為在開闊水域或在比 A 或 B 類中所含者更輕的冰況下作業所設計的船舶。

2.4 **當年冰**係指厚度為 0.3-2.0 米的從幼冰發展而來增長不超過一個冬季的海冰。

2.5 **無冰水域**係指沒有冰存在。若有任何種類的冰存在，則不得使用此術語。

2.6 **陸源冰**係指陸地上或在冰架中形成、漂浮於海上的冰。

- 2.7 防污公約係指經修正的《經 1978 年議定書修訂的 1973 年國際防止船舶造成污染公約》。
- 2.8 當年中冰係指厚度為 0.7-1.2 米的當年冰。
- 2.9 陳冰係指經至少一個夏季融化後仍存在的海冰；典型厚度為 3 米或以上。陳冰又分為殘存當年冰、次年冰和多年冰。
- 2.10 開敞水域係指一大片能自由航行的水域，其中的海冰密集度小於 1/10，無陸源冰存在。
- 2.11 本組織係指國際海事組織。
- 2.12 海冰係指海上可見的海水凍結而成的任何形式的冰。
- 2.13 安全公約係指經修正的《1974 年國際海上人命安全公約》。
- 2.14 培訓公約係指經修正的《1978 年國際海員培訓、發證和值班標準公約》。
- 2.15 當年薄冰係指厚度為 0.3 至 0.7 米的當年冰。

### 3 危險源

3.1 極地規則考慮的是因更高發生概率、更嚴重後果或兩者兼具而可能導致風險水平提升的各種危害：

- .1 冰，因其會影響船體結構、穩性特徵、機械系統、航行、室外工作環境、維修和應急防備工作以及安全設備和系統的失效；
- .2 出現可能降低穩性和設備功能的上部結冰；
- .3 低溫，因其影響工作環境和人的工作效率、維護保養和應

急防備工作、材料性能和設備功效、生存時間及安全設備和系統性能；

- .4 黑夜或白天時間的延長，因其會影響航行和人的工作效率；
- .5 高緯度，因其影響航行系統、通信系統和冰況圖像信息的質量；
- .6 偏遠和可能缺乏精確和完整的水文數據和信息，可用助航設備和導航標誌減少導致擱淺的可能性增大、加上偏遠、易於布設的 SAR 設施有限、應急響應延誤和通信能力有限，並可能影響對事件作出響應；
- .7 船員可能缺乏極地運作經驗，並有人為失誤的可能；
- .8 可能缺乏合適的應急響應設備，及可能限制減輕措施的有效性；
- .9 快速變化和惡劣的天氣條件並有可能導致事件升級；和
- .10 環境對有害物質的敏感性和其他環境影響以及環境需要更長時間來恢復。

3.2 極地水域中的風險水平會依據地理位置、一年中有關白晝、冰覆蓋等的時間而有不同。因此，解決上述具體危險所需的緩解措施在極地水域中會有不同並且在北極和南極水域中會有不同。

#### **4 本規則結構**

本規則由引言、第 I 部分和第 II 部分組成。引言包含適用於第 I 部分和第 II 部分的強制性規定。第 I 部分又分為包含安全措施強制性規定

的 I-A 部分和包含安全建議的 I-B 部分。第 II 部分又分為包含防止污染強制性規定的 II-A 部分和包含防止污染建議的 II-B 部分。

分別於安全公約第 XIV/1.2 和 XIV/1.3 條中，和防污公約附則 I 第 11.46.2 條、附則 II 第 10.21.2 條、附則 IV 第 7.17.3 條和附則 V 第 3.13.2 條中界定的南極和北極水域圖示

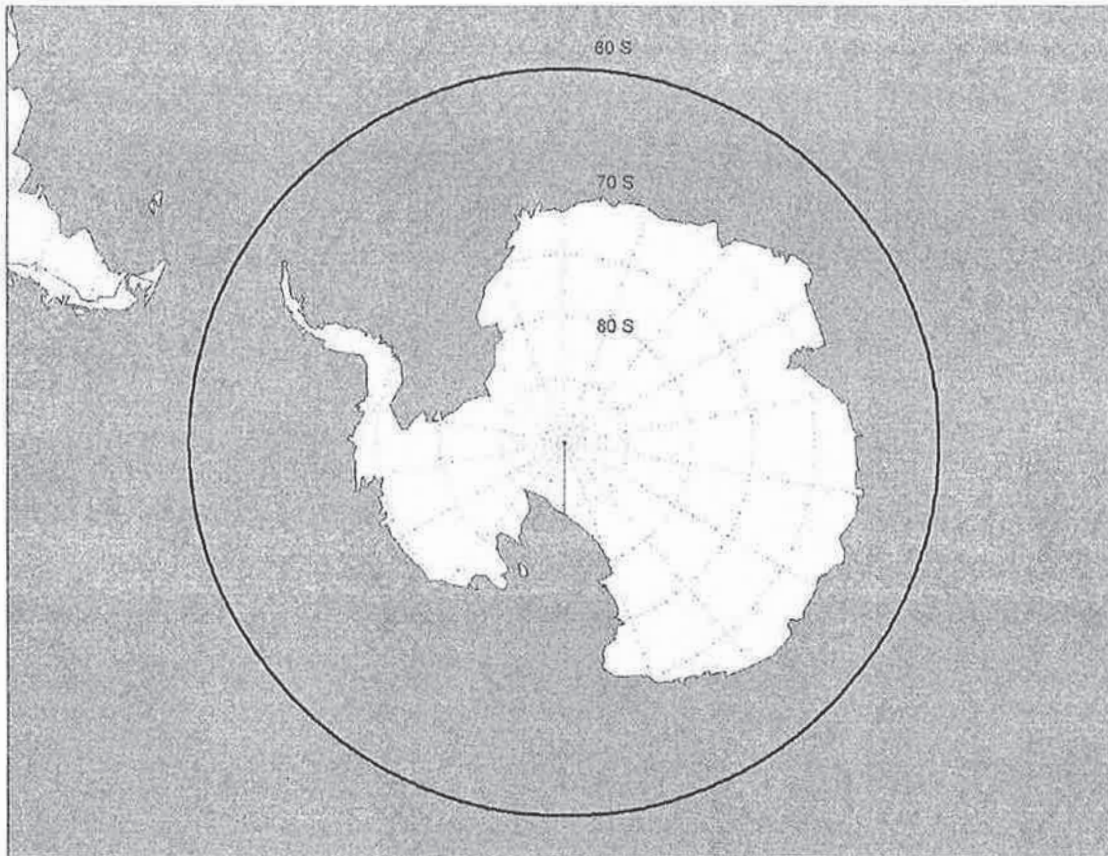


圖 1—南極區域最大適用範圍

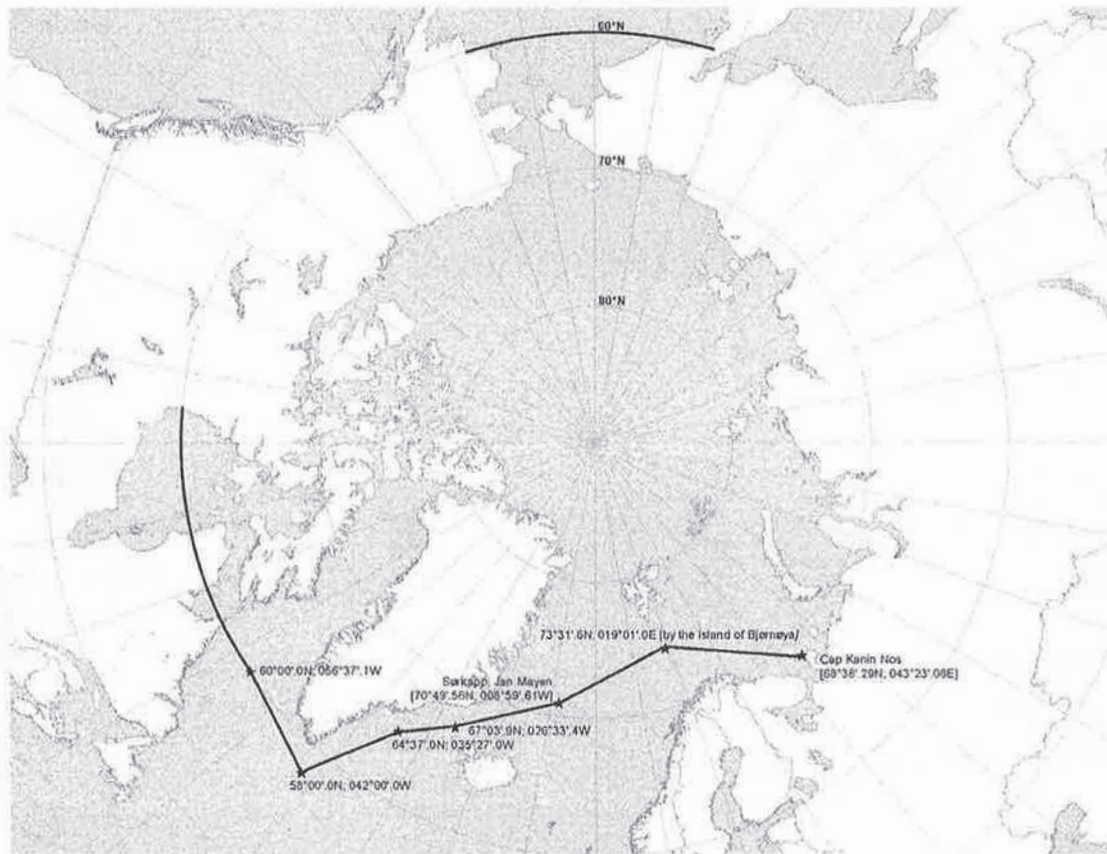


圖 2 – 北極水域最大適用範圍



## I-A 部分

### 安全措施

#### 第 1 章—通則

##### 1.1 本部分結構

本部分各章由各章的總體目標、達到目標的功能性要求、和規則構成。船舶在下列情況下須被視為符合本部分中規定的功能性要求：

- .1 船舶的設計和布置符合與功能要求相關的所有規定；或
- .2 船舶的部分或所有相關設計和布置業經審核並按照《安全公約》第 XIV 章第 4 條獲得認可，且船舶的任何其餘部分均符合相關規則。

##### 1.2 定義

除《安全公約》相關章節中及本規則引言中所含定義外，下列定義對本部分適用。

- 1.2.1 冰山水域係指能自由航行的水域，其中陸源冰密集度小於 1/10。可能有海冰存在，但總密集度不得超過 1/10。
- 1.2.2 護衛係指與其他船舶共行中，任何具有更高破冰能力的船舶。
- 1.2.3 有護衛作業係指船舶運動通過護衛的介入得到便利的任何作業。
- 1.2.4 可居環境係指將具有低體溫防護的有通風環境。
- 1.2.5 破冰船係指其作業範圍可包括護衛或冰管理功能，其動力和尺度使其能夠在冰覆蓋水域中承擔積極行動的任何船舶。

1.2.6 冰級係指主管機關或經主管機關認可的組織授予船舶的標記，表明船舶系為在海冰狀態下航行而設計。

1.2.7 最大預期救助時間係指為設計提供生存支持的設備和系統所採用的時間。這不得少於 5 天。

1.2.8 機械設備係指船舶安全運作所需的設備和機械及相關管系和電纜。

1.2.9 日均低溫 (MDLT) 係指至少 10 年間歷年每日低溫的平均值。如無 10 年數據，可採用主管機關可接受的數據集。

1.2.10 極地級 (PC) 係指主管機關或經主管機關認可的組織根據國際船級社協會統一要求授予船舶的冰級。

1.2.11 極地工作溫度 (PST) 係指為擬在低氣溫下運作的船舶規定的溫度，該溫度應設為低於擬定的極地水域運作區域和季節的最低日均低溫 (MDLT) 至少 10°C。

1.2.12 擬在低氣溫下運作的船舶係指擬駛往或穿越最低日均低溫 (MDLT) 低於-10°C 區域的船舶。

1.2.13 液貨船係指安全公約安全公約第 II-1/2.22 條所定義的油船，按安全公約安全公約第 II-1/3.19 條定義的化學品船，按安全公約第 VII/11.2 條定義的氣體運輸船。

1.2.14 高位冰區水線係指為冰中運作的艙艙最大吃水所界定的水線。

### 1.3 證書和檢驗

1.3.1 本規則所適用的每艘船舶須在船上具備有效的極地船舶證書。

1.3.2 除 1.3.3 所規定者外，極地船舶證書須在初次或換證檢驗之後向滿足本規則相關要求的船舶簽發。

1.3.3 對於 C 類貨船，如果 1.5 中評估結果為：無需額外設備或結構調整以符合極地規則，則可基於該船符合極地規則所有相關要求的書面驗證簽發極地船舶證書。在此情況下，為確保證書持續有效，須在下一計劃檢驗中進行船上檢驗。

1.3.4 本條中所指證書須由主管機關或經主管機關認可的任何個人或組織按照《安全公約》第 XI-1/1 條簽發。在所有情況下，主管機關對該證書負全責。

1.3.5 極地船舶證書須以與本規則附錄 I 中給出的範本相應的格式制定。如所用語言既非英語亦非法語或西班牙語，則文本中須包含這些語言之之一的譯文。

1.3.6 極地船舶證書的有效期、檢驗日期和簽署須按照安全公約公約第 I/14 條的規定與其他相關安全公約證書協調一致。證書須包括一份補頁，記錄本規則所要求的設備。

1.3.7 如適用，證書須考慮到本組織制定的指南，參照某一方法評估冰中運作能力和限制並使主管機關滿意。

## 1.4 性能標準

1.4.1 除另有明文規定者外，本規則中所述船舶系統和設備須至少滿足《安全公約》中所指同等性能標準。

1.4.2 對於在低氣溫下運作的船舶，須規定極地工作溫度（PST），且該溫度應低於擬定的極地水域運作區域和季節的最低日均低溫

(MDLT) 至少 10°C。本規則所要求的系統和設備須在極地工作溫度下全部正常運作。

1.4.3 對於在低氣溫下運作的船舶，救生系統和設備應在極地工作溫度下在最大預期救助時間內全部正常運作。

## 1.5 運作評估

為制定程序或運作限制，須慮及以下所列對船舶及其設備進行評估：

- .1 預期運作和環境條件範圍，諸如：
  - .1 在低氣溫下運作；
  - .2 在冰中運作；
  - .3 在高緯度運作；和
  - .4 棄船而轉移到冰上或陸上的可能性；
- .2 引言第 3 節所列的危險，如適用；和
- .3 其他危險，如識別。

## 第 2 章 – 極地水域運作手冊（極地水域運作手冊）

### 2.1 目標

本章的目標是向所有人、經營人、船長和船員提供充分的有關船舶作業能力和限制的信息，以支持其決策過程。

### 2.2 功能要求

- 2.2.1 為達到以上 2.1 中規定的目標，本章規定包含下列功能要求。
- 2.2.2 手冊須包括與 1.5 所要求的評估相關的船舶特定能力和限制的資料。
- 2.2.3 手冊須包括或提及在正常操作中以及為避免出現超出船舶能力的工況所需遵循的具體程序。
- 2.2.4 手冊須包括或提及在極地水域發生事件時需遵循的具體程序。
- 2.2.5 手冊須包括或提及遇到超出 2.2.2 中所述船舶特定能力和限制的工況時需遵循的具體程序。
- 2.2.6 手冊須包括或提及使用破冰船協助時需酌情遵循的程序。

### 2.3 規則

- 2.3.1 為符合 2.2 節中的功能要求，手冊須在船上攜帶。
- 2.3.2 為符合 2.2.2 段的功能要求，手冊須酌情包括用於確定冰中能力和限制的方法。
- 2.3.3 為符合 2.2.3 段的功能要求，手冊須為以下所列包括基於風險的程序：
- .1 航次規劃，以避開超出船舶設計能力或限制的冰和（或）溫度；
  - .2 接收環境條件預報的布置；
  - .3 解決任何可用水道測量、氣象和航行信息有限的手段；
  - .4 本規則其他各章所要求的設備運作；和

- .5 在低溫、上部結冰和出現海冰時，酌情實施特殊措施，保持設備和系統的功能。

2.3.4 為符合 2.2.4 段的功能要求，手冊須包含在下列情況下要遵循的基於風險的程序：

- .1 酌情為救撈、搜救、溢漏響應等聯絡應急響應提供者；和
- .2 對於按照第 3 章經冰區加強的船舶，在長時間為冰所困時維持生命支持和船舶完整性的程序。

2.3.5 為符合 2.2.5 段的功能要求，手冊須為在遇到超出船舶設計能力和限制的冰和（或）溫度時要採取的措施，包含需遵循的基於風險的程序。

2.3.6 為符合 2.2.6 段的功能要求，手冊須酌情為冰中運作期間的監控和保持安全，包括任何護航作業或破冰船協助要求，包含基於風險的程序。可依據船舶是否獨立運作或有破冰船護航而應用不同的運作限制。適用時，運作手冊中應對這兩種選擇均做出規定。

### 第 3 章 – 船舶結構

#### 3.1 目標

本章的目標是對結構的材料和尺寸基於對環境載荷和條件的總體和局部響應而保持其結構完整性做出規定。

#### 3.2 功能要求

為達到以上 3.1 中規定的目標，本章規定包含下列功能要求：

- .1 對於擬在低氣溫下運作的船舶，所用材料須適於在船舶極

地工作溫度下的運作；和

- .2 對於經冰區加強的船舶，其結構須為抵禦預見冰況下的預期總體和局部結構載荷而設計。

### 3.3 規則

3.3.1 為符合以上 3.2.1 的功能要求，船上暴露結構的材料須經主管機關或其所接受的經認可組織批准，並考慮到本組織可接受的標準或基於極地工作溫度的具有同等安全水平的其他標準。

3.3.2 為符合以上 3.2.2 的功能要求，以下所列適用：

- .1 A 類船舶的船材尺寸須經主管機關，或其所接受的經認可組織批准，並慮及本組織可接受的標準或其他提供同等安全水平的標準；
- .2 B 類船舶的船材尺寸須經主管機關，或其所接受的經認可組織批准，並慮及本組織可接受的標準或其他提供同等安全水平的標準；
- .3 經冰區加強的 C 類船舶，其船材尺寸須經主管機關或其所接受的經認可組織批准，並慮及適於預計在作業區域中遇到的冰的種類和密度的可接受標準；和
- .4 C 類船舶，如主管機關認為，其構造適合於其預計運作，則無需冰區加強。

## 第 4 章—分艙和穩性

### 4.1 目標

本章的目標是確保完整和破損工況下的足夠的分艙和穩性。

## 4.2 功能要求

為達到以上 4.1 段規定的目標，本章規定包含下列功能要求：

- .1 在遭受積冰時，船舶在完整工況下須具有足夠的穩性；和
- .2 2017 年 1 月 1 日或以後建造的 A 類和 B 類船舶須具有足夠的剩餘穩性以承受與冰相關的破損。

## 4.3 規則

### 4.3.1 完整工況下的穩性

4.3.1.1 為符合 4.2.1 段的功能要求，對於在可能發生積冰的區域和時段內運作的船舶，穩性計算中須有下列結冰餘量：

- .1 暴露的露天甲板和舷梯上  $30\text{kg/m}^2$ ；
- .2 水面以上船舶兩舷的側投影面積  $7.5\text{kg/m}^2$ ；和
- .3 無船帆船舶的欄杆、各種吊杆、桅桁（桅杆除外）和索具的不連續表面的側投影面積以及其他小物件的側投影面積的計算，須將連續表面的總投影面積增加 5% 並將該面積的靜力矩增加 10%。

4.3.1.2 在可能發生積冰的區域和時段內運作的船舶須：

- .1 為儘量減少積冰而設計；和
- .2 配備主管機關可要求的除冰手段；例如，電動和氣動裝置，和（或）諸如斧或木棒等從舷牆、欄杆和架設物上除冰的特殊工具。



4.3.1.3 極地水域運作手冊須給出穩性計算中包括的結冰餘量資料。

4.3.1.4 對積冰須加以監測並採取適當措施確保積冰不超過極地水域運作手冊中給出的數值。

#### 4.3.2 破損工況下的穩性

4.3.2.1 為符合 4.2.2 段的功能要求，2017 年 1 月 1 日或之後建造的 A 類和 B 類船舶須能承受冰撞擊穿透船體導致的進水。冰破損後的剩餘穩性須使安全公約第 II-1/7-2.2 和 II-1/7-2.3 條中定義的係數  $s_i$ ，在為計算安全公約第 II-1/7 條中規定的達到的分艙指數所用的所有裝載工況下，均等於 1。但是，對於符合本組織制定的其他文書的分艙和破損穩定規則的貨船，如安全公約第 II-1/4.1 條的規定，每一裝載工況均須滿足該文書的剩餘穩性衡準。

4.3.2.2 證明符合 4.3.2.1 時假定的冰破損範圍須為：

- .1 如中心位於高位冰區水線上最大寬度之前，縱向範圍為高位冰區水線長度的 4.5%，否則為高位冰區水線長度的 1.5%，且須假定位於沿船長的任何縱向位置；
- .2 對損壞的全範圍垂直於船殼量取的橫向貫穿範圍是 760 毫米；和
- .3 垂向範圍是冰區高位水線吃水的 20%或縱向範圍，取其小者，且須假定位於龍骨與 120%高位冰區水線吃水之間的任何垂向位置。

## 第 5 章—水密和風雨密完整性

### 5.1 目標

本章的目標是為保持水密和風雨密完整性做出規定。

### 5.2 功能要求

為達到以上 5.1 段中規定的目標，船上所有與水密和風雨密完整性相關的關閉裝置和門須均可操作。

### 5.3 規則

為符合以上 5.2 段的功能要求，以下所列適用：

- .1 對於在可能出現積冰的區域和時段內運作的船舶，須提供去除或防止艙蓋和門周圍積冰和積雪的手段；和
- .2 此外，對擬在低氣溫下運作的船舶，以下所列適用：
  - .1 如果艙蓋或門為液壓操作，須採取措施防止液體凍結或黏度過大；和
  - .2 不在可居住環境之內且在海上時需要進出的水密和風雨密門、艙蓋和關閉裝置，須設計為可由穿着厚重冬衣並帶上厚連指手套的人員操作。

## 第 6 章 – 機械設備

### 6.1 目標

本章的目標是確保船舶的機械設備能夠提供船舶安全運作所需的功能。

### 6.2 功能要求

6.2.1 為達到以上 6.1 段中規定的目標，本章規定包含下列功能要求：

6.2.1.1 機械設備須在預期環境條件下發揮功能，並考慮到：

- .1 積冰和/或積雪；
- .2 從海水中攝入冰；
- .3 液體凍結和黏度增加；
- .4 海水進水的溫度；和
- .5 雪攝入。

6.2.1.2 此外，對擬在低氣溫下運作的船舶：

- .1 其機械設備須在預期環境條件下發揮功能，並考慮到：
  - .1 進入的空氣寒冷且密度大；和
  - .2 蓄電池或其他蓄能設備功能損失；和
- .2 所用材料須適於在船舶極地工作溫度下運作。

6.2.1.3 此外，對於按照第3章經冰區加強的船舶，其機械設備須在預期環境條件下發揮功能，並考慮到冰的互動所直接施加的載荷。

### 6.3 規則

6.3.1 為符合以上 6.2.1.1 段的功能要求，並考慮到預期環境條件，以下所列適用：

- .1 對機械設備和相關設備須予保護以防止積冰和/或積雪、從海水攝入冰、液體凍結和黏度增加、海水進入的溫度和雪攝入的影響；

- .2 工作液體的黏度須保持在確保機械運作的範圍內；和
- .3 機械系統的海水供給須為防止冰攝入而設計，或採取其他布置確保其功能性。

6.3.2 此外，對擬在低氣溫下運作的船舶，以下所列適用：

- .1 為符合以上 6.2.1.2 段的功能要求，暴露的機械和電氣裝置和用具須在極地工作溫度下發揮功能；
- .2 為符合以上 6.2.1.2.1 段的功能要求，須採取措施確保將驅動重要機械的內燃機的燃燒氣體保持在符合發動機製造商所規定標準的溫度；和
- .3 為符合以上 6.2.1.2.2 段的功能要求，暴露的機械及其基座的材料須經主管機關或其所接受的經認可組織批准，並考慮到本組織可接受的標準，或基於極地工作溫度提供同等安全水平的其他標準。

6.3.3 此外，對於按照第 3 章經冰區加強的船舶，為符合以上 6.2.1.3 段的功能要求，以下所列適用：

- .1 A 類船舶的螺旋槳槳葉、推進軸線、操舵設備和其他附屬件的用材尺寸須經主管機關或其所接受的經認可組織批准，並考慮到本組織可接受的標準或提供同等安全水平的其他標準；
- .2 B 類船舶的螺旋槳槳葉、推進軸線、操舵設備和其他附屬件的用材尺寸須經主管機關或其所接受的經認可組織批准，並考慮到本組織可接受的標準或提供同等安全水平的

其他標準；和

- .3 經冰區加強的 C 類船舶的螺旋槳葉、推進軸線、操舵設備和其他附屬件的用材尺寸須經主管機關或其所接受的經認可組織批准，並考慮到適於運作區域內所遇冰的類型和密度的可接受標準。

## 第 7 章—消防安全/保護

### 7.1 目標

本章的目標是確保消防安全系統和設備有效運行，脫險通道保持可用以使船上人員能在預期的環境條件下安全和快速地逃離至救生艇和救生筏乘登甲板。

### 7.2 功能要求

7.2.1 為達到以上 7.1 段中規定的目標，本章規定包含下列功能要求：

- .1 消防安全系統和設備的所有部件，如果安裝在暴露位置，須受到保護防止積冰和積雪；
- .2 局部設備和機械控制裝置的布置須避免凍結、積雪和積冰且其位置保持隨時可及；
- .3 消防系統和設備的設計須酌情考慮到穿着厚重防寒裝具者的需要；
- .4 須採取措施去除或防止出入口處積冰和積雪；和
- .5 滅火介質須適於擬定作業。

7.2.2 此外，對擬在低氣溫下運作的船舶，以下所列適用：

- .1 消防安全系統和設備的所有部件，其設計須確保在極地工作溫度下的可用性和有效性；和
- .2 暴露的消防安全系統中所用的材料須適於極地工作溫度下的作業。

### 7.3 規則

7.3.1 為符合 7.2.1.1 段的要求，以下所列適用：

- .1 處於暴露位置的隔離和壓力/真空閥門須受到保護以防止積冰並保持隨時可及；和
- .2 所有的雙向無線電通訊設備須在極地服務溫度下可用。

7.3.2 為符合 7.2.1.2 段的要求，以下所列適用：

- .1 消防泵，包括應急消防泵、水霧泵和噴水泵須位於保持不凍結的艙室內；
- .2 消防總管須布置為暴露管路可以隔離，並須設有暴露管路排空裝置。消防軟管和噴嘴無需隨時與消防總管連接，並可存放在消防龍頭近旁受到保護的位置；
- .3 消防員裝具須存放在船上溫暖的位置；和
- .4 如果固定式水基滅火系統所在處所與主消防泵分離並使用其獨立的海水吸口，該海水吸口也須能夠清除積冰。

7.3.3 此外，對於擬在低氣溫下運作的船舶，以下所列適用：

- .1 為符合 7.2.2.1 段的要求，便攜式和半便攜式滅火器須實際

可行地位於防止凍結溫度的受保護位置。在會凍結的位置配置的滅火器須能夠在極地工作溫度下運作。

2. 為符合以上 7.2.2.2 段的功能要求，暴露的消防安全系統的材料須經主管機關或其所接受的經認可組織批准，並考慮到本組織可接受的標準或基於極地工作溫度的提供同等安全水平的其他標準。

## 第 8 章—救生設備與布置

### 8.1 目標

本章的目標是為安全脫險、撤離和生存做出規定。

### 8.2 功能要求

為達到以上 8.1 段中規定的目標，本章規定包含下列功能要求：

#### 8.2.1 脫險

8.2.1.1 暴露的脫險通道須可及和安全，並考慮到結構可能結冰和積雪。

8.2.1.2 救生艇筏及集合和乘登布置須提供安全棄船，並考慮到緊急情況下可能出現的惡劣環境條件。

#### 8.2.2 撤離

所有救生設備和相關屬具均須提供安全撤離並在最長預期救助時間內可能出現的惡劣環境條件下功能完好。

#### 8.2.3 生存

8.2.3.1 須為船上所有人員提供充分的保溫防護，並酌情慮及預計航次、

預期氣候條件（冷及風），及浸入極地水中的可能性。

8.2.3.2 救生設備和相關屬具須慮及擬定的航次，計及長時間在黑暗中操作的可能性。

8.2.3.3 慮及第 1 章中的評估所認定的任何危險的存在，須為最大預期救助時間提供資源，支持棄船後不論在水中、冰上和陸地上的生存。這些資源須提供：

- .1 可居環境；
- .2 保護人員免受寒冷、大風和日曬影響；
- .3 具備與環境相適的保溫的容納人員的處所；
- .4 保持生計的方法；
- .5 安全進出點；和
- .6 與救助機構通訊的方法。

### 8.3 規則

#### 8.3.1 脫險

為符合以上 8.2.1.1 和 8.2.1.2 段的功能要求，以下所列適用：

- .1 對於暴露於積冰的船舶，須採取措施去除或防止脫險通道、集合站、乘登區、救生艇筏及其降放裝置和至救生艇筏的通道上積冰；
- .2 此外，對於 2017 年 1 月 1 日或以後建造的船舶，暴露的脫險通道的布置須不妨礙穿着適當極地服裝者通過；和



- .3 此外，對於擬在低氣溫下運作的船舶，須充分注意到對穿着附加極地服裝者的任何影響，對乘登布置的適合性進行評估。

### 8.3.2 撤離

為符合以上 8.2.2 段的功能要求，以下所列適用：

- .1 船舶須具備確保人員安全撤離的方法，包括在冰蓋水域運作時安全布放救生設備，或酌情直接撤至冰上；和
- .2 如果本章的規定係通過增加需要電源的裝置而達到，則該電源須能夠獨立於船舶的主電源而運行。

### 8.3.3 生存

8.3.3.1 為符合以上 8.2.3.1 段的功能要求，以下所列適用：

- .1 對於客船，須為船上每人提供一件尺寸合適的浸沒服或保溫服；和
- .2 如要求救生服，則須為保溫型。

8.3.3.2 此外，擬長時間在黑暗中作業的船舶，為符合以上 8.2.3.2 段的功能要求，須為每艘救生艇配備適於連續使用的探照燈以便發現冰。

8.3.3.3 為符合以上 8.2.3.3 段的功能要求，以下所列適用：

- .1 救生艇須僅為部分或全封閉型；
- .2 考慮到第 1 章中所述評估，須針對個體（個人生存設備）和共享（群體生存設備）需求，提供適當生存資源如下：
  - .1 為船上所有人員提供有效風寒保護的救生設備和群體

- 生存設備；
- .2 提供充分保溫的個人生存設備和救生設備或群體生存設備組合，以維持人體核心溫度；和
- .3 提供充分保護防止四肢凍傷的個人生存設備；和
- .3 此外，凡根據 1.5 段所要求的評估認定有可能棄船而登冰或登陸時，以下所列適用：
  - .1 除非船舶的正常救生設備具備同等水平的生存功能，須攜帶群體生存設備；
  - .2 需要時，須將足夠船上 110%人員使用的個人或群體生存設備盡實際可行地存放在靠近集合站或登乘站的易於到達之處；
  - .3 群體生存設備的容器須設計為易於在冰上移動且能漂浮；
  - .4 凡該評估認定需要攜帶個人和群體生存設備時，須確定棄船後確保設備可以獲取的方法；
  - .5 如要在載運人員的救生艇筏上裝載，則救生艇筏和降放裝置須具備足夠的能力容納附加的設備；
  - .6 須向乘客講授個人生存設備的使用方法及在緊急情況下採取的行動；和
  - .7 須培訓船員使用個人生存設備和群體生存設備。

8.3.3.4 為符合以上 8.2.3.3.4 段的功能要求，須按最長預期救助時間配

備充足應急口糧。

## 第 9 章 — 航行安全

### 9.1 目標

本章的目標是為安全航行做出規定。

### 9.2 功能要求

為達到以上 9.1 段中規定的目標，本章規則包含下列功能要求。

#### 9.2.1 航海信息

船舶須具備接收最新安全航行信息，包括冰況信息的能力。

#### 9.2.2 航行設備功能性

9.2.2.1 航行設備和系統的設計、製造和安裝須使其在運作區域的預期環境條件下保持其功能。

9.2.2.2 提供基準首向和定位的系統須適於擬定區域。

#### 9.2.3 附加航行設備

9.2.3.1 船舶須具備在黑暗中運作時目力發現冰的能力。

9.2.3.2 涉及破冰船護航作業的船舶須具備適當手段表明船舶已停止。

### 9.3 規則

#### 9.3.1 航海信息

為符合以上 9.2.1 段的功能要求，船舶須具備接收和顯示運作區域中當前冰況信息的設施。

### 9.3.2 航行設備功能性

9.3.2.1 為符合以上 9.2.2.1 段的功能要求，以下所列適用：

- .1 2017 年 1 月 1 日或以後建造的，按照第 3 章經冰區加強的船舶須有兩台獨立的回聲測深儀或 1 台具有兩個獨立換能器的回聲測深儀；
- .2 船舶不論其建造日期和尺寸，須符合安全公約第 V/22.1.9.4 條的規定，及依據其駕駛台的構型，具備清晰的後方視野；
- .3 對於在可能出現積冰的區域和時段內運作的船舶，須採取措施防止航行和通信所需的天線上積冰；和
- .4 此外，對於按照第 3 章經冰區加強的船舶，以下所列適用：
  - .1 如果安全公約第 V 章或本章所要求的設備具有凸出於船體之下的傳感器，該傳感器須有防冰保護；和
  - .2 在 2017 年 1 月 1 日或以後建造的 A 類和 B 類船舶上，駕駛室翼橋須封閉或為保護航行設備和操作人員而設計。

9.3.2.2 為符合以上 9.2.2.2 段的功能要求，以下所列適用：

- .1 船舶須具備兩台確定和顯示其首向的非磁性裝置。該兩台裝置均須獨立，並須連接至船舶的主電源和應急電源；和
- .2 駛往緯度 80 度以上的船舶須設有至少一台全球導航衛星系統（GNSS）羅經或等效裝置，並須連接至船舶的主電源和應急電源。

### 9.3.3 附加航行設備

9.3.3.1 為符合 9.2.3.1 段的功能要求，除僅在 24 小時白晝區域中運作的船舶外，船舶須配備兩台可在駕駛室控制的提供 360 度弧形照明的遙控旋轉窄束探照燈或裝置以目力發現冰。

9.3.3.2 為符合 9.2.3.2 段的功能要求，涉及破冰船護航作業的船舶須配有一個從後方可見的手動啟動紅色閃光燈，以表明船舶已停止。該閃光燈須具備至少為 2 海里的可見距離，其水平和垂直可見弧度須符合《國際海上避碰規則》所要求的尾燈規範。

## 第 10 章—通信

### 10.1 目標

本章的目標是為船舶和救生艇筏正常運作期間和緊急情況下的有效通信做出規定。

### 10.2 功能要求

為達到以上 10.1 段中規定的目標，本章規定包含下列功能要求：

#### 10.2.1 船舶通信

10.2.1.1 擬定營運航線上的所有位置均須具有船對船和船對岸雙向話語和/或數據通信。

10.2.1.2 如預期會有護航和護送作業，須提供適當通信裝置。

10.2.1.3 須為搜救目的配備雙向現場和搜救協調通信設備，包括航空頻率。

10.2.1.4 需提供合適的通信設備以能在極地區域提供遠程醫療援助。

### **10.2.2 救生艇筏和救助艇的通信能力**

10.2.2.1 對於擬在低氣溫中運作的船舶，所有救助艇和救生艇，無論何時為撤離而釋放，須保持遇險報警、定位和現場通信的能力。

10.2.2.2 對於擬在低氣溫條件下運作的船舶，所有其他救生艇筏，無論何時釋放，須保持發送定位和通信信號的能力。

10.2.2.3 供救生艇筏，包括救生筏和救助艇使用的強制性通信設備須能在最長預期救助時間內運作。

## **10.3 規則**

### **10.3.1 船舶通信**

10.3.1.1 為符合以上 10.2.1.1 段的功能要求，船上通信設備須具備船對船、船對岸通信能力，並考慮到通信系統在高緯度和預期低溫下的限制。

10.3.1.2 為符合以上 10.2.1.2 段的功能要求，擬提供破冰護航的船舶須配備《國際信號規則》中所規定的一個面向船尾的聲響信號系統，用以向跟隨其後的船舶表明其護航和應急操縱。

10.3.1.3 為符合以上 10.2.1.3 段的功能要求，船上雙向現場和 SAR 協調通信能力須包括：

- .1 與相關救助協調中心的話語和/或數據通信；和
- .2 在 121.5 和 123.1 MHz 頻率上與飛機話語通信的設備。

10.3.1.4 為符合以上 10.2.1.4 段的功能要求，通信設備須提供與遠程醫

療服務（TMAS）的雙向話語和數據通信。

### 10.3.2 救生艇筏和救助艇的通信能力

10.3.2.1 對於擬在低氣溫下運作的船舶，為符合以上 10.2.2.1 段的功能要求，所有救助艇和救生艇，無論何時為撤離而釋放，須：

- .1 為遇險報警而攜帶一台發送船對岸報警的裝置；
- .2 為定位而攜帶一台發送定位信號的裝置；和
- .3 為現場通信而攜帶一台收發現場通信的裝置。

10.3.2.2 對於擬在低氣溫下運作的船舶，為符合以上 10.2.2.2 段的功能要求，所有救生艇筏須：

- .1 為定位而攜帶一台發送定位信號的裝置；和
- .2 為現場通信而攜帶一台收發現場通信的裝置。

10.3.2.3 為符合以上 10.2.2.3 段的功能要求，認識到電池壽命所帶來的限制，須制定並執行使救生艇筏，包括救生筏和救助艇內所用強制性通信設備在最長預期救助時間內可供運作的程序。

## 第 11 章—航次計劃

### 11.1 目標

本章的目標是確保向船公司、船長和船員提供足夠的信息，使其能夠充分考慮到船舶和船上人員的安全並酌情慮及環境保護而進行運作。

### 11.2 功能要求

為達到以上 11.1 段中規定的目標，航次計劃須考慮擬定航次的潛在危險。

### 11.3 規則

為符合以上 11.2 段的功能要求，船長須計及以下所列考慮穿越極地水域的航線：

- .1 《極地水域運作手冊》要求的程序；
- .2 對水文資料的任何限制和可用的助航設備；
- .3 預期航線附近的冰和冰山的範圍和類型的現有資料；
- .4 往年冰和溫度的統計資料；
- .5 避難地；
- .6 有關已知區域，包括季節性遷徙區域的海洋哺乳動物密度的當前信息及遭遇海洋哺乳動物時要採取的措施；
- .7 有關已知區域，包括季節性遷徙區域的海洋哺乳動物密度的相關船舶航線劃定系統、航速建議和船舶交通服務的當前資料；
- .8 航線上國家和國際劃定的保護區；和
- .9 在遠離搜救設施的區域中運作。

## 第 12 章 – 配員和培訓

### 12.1 目標

本章的目標是確保極地運作船舶適當配有具備適當資格、受過



培訓且有經驗的人員。

## 12.2 功能要求

為達到以上 12.1 段中規定的目標，公司須確保在極地水域運作船舶上的船長、大副和負責航行值班的高級船員須已完成培訓，獲得與其擬擔任的職務和擬承擔的職責和責任相稱的能力，並考慮到經修正的培訓公約和培訓規則的規定。

## 12.3 規則

12.3.1 為在極地水域運作時滿足以上 12.2 段的功能要求，船長、大副和負責航行值班的高級船員須按照經修正的培訓公約和培訓規則第 V 章的規定具備如下資質：

| 冰況   | 液貨船                               | 客船                               | 其他                               |
|------|-----------------------------------|----------------------------------|----------------------------------|
| 無冰   | 不適用                               | 不適用                              | 不適用                              |
| 開敞水域 | 對船長、大副和負責航行值班的高級船員的基本培訓           | 對船長、大副和負責航行值班的高級船員的基本培訓          | 不適用                              |
| 其他水域 | 對船長和大副的高級培訓。<br>對負責航行值班的高級船員的基本培訓 | 對船長和大副的高級培訓<br>對負責航行值班的高級船員的基本培訓 | 對船長和大副的高級培訓<br>對負責航行值班的高級船員的基本培訓 |

12.3.2 主管機關可允許除船長、大副或負責航行值班的高級船員以外的人員滿足 12.3.1 段規定的培訓要求，條件是：

- .1 該人員須按照培訓公約第 II/2 條和培訓規則第 A-II/2 節具備資質並獲發證，及滿足 12.3.1 段的列表中列明的高級培

訓要求；

- .2 在極地運作中，船舶載有足夠數量的滿足適當極地水域培訓要求的人員以覆蓋所有值班；
- .3 此等人員始終滿足主管機關的最低休息時間要求；
- .4 在開敞水域或冰山水域外的水域中運作時，客船和液貨船上的船長、大副和負責航行值班的高級船員須滿足 12.3.1 段的列表中列明的適用基本培訓要求；和
- .5 在冰密集度超過 2/10 的水域中運作時，除液貨船以外的貨船上的船長、大副和負責航行值班的高級船員須滿足 12.3.1 段的列表中列明的適用基本培訓要求。

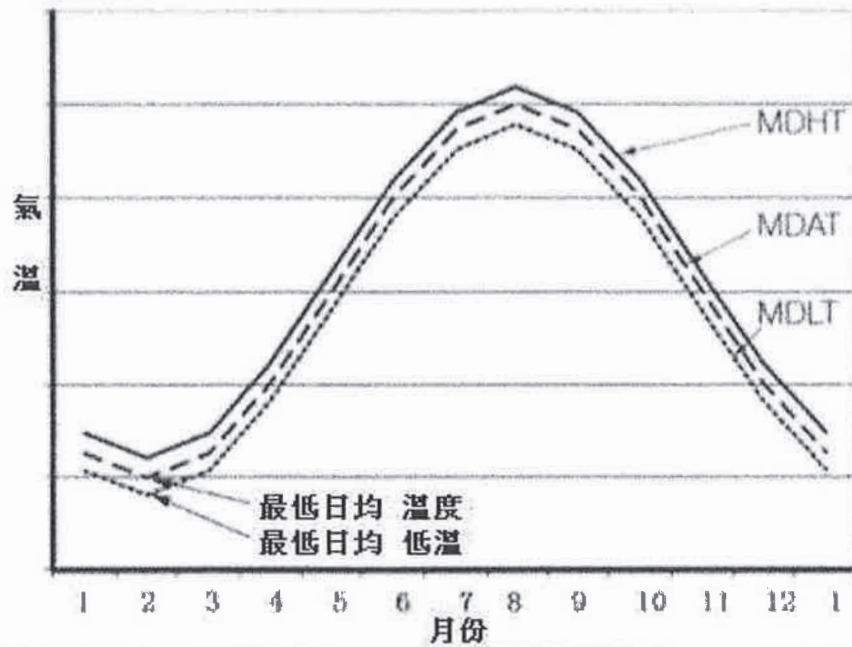
12.3.3 使用除航行值班高級船員以外的人員滿足培訓要求並不解除船長或航行值班高級船員的船舶安全責任和義務。

12.3.4 須使每位船員熟悉《極地水域運作手冊》中包含或提及的與其指定職責相關的程序和設備。

## I-B 部分

### 關於引言和 I-A 部分規定的補充指南

#### 1 引言第 2 節（定義）補充指南



上圖內使用的定義

MDHT-日均高溫

MDAT-日均溫度

MDLT-日均低溫

確定日均低溫指導說明：

- 1 確定 10 年的每日低溫。
- 2 確定 10 年的每日低溫值的平均值。
- 3 繪出一年的日平均值。

4 取運作季節平均值的最低值。

## 2 第 1 章（通則）補充指南

### 2.1 冰中運作限制

2.1.1 冰中運作的限制可使用評估預期冰狀況對船舶構成的風險的系統、工具或分析予以確定，並考慮到諸如船舶冰級、冰強度的季節變化，破冰船支持、冰的類型、厚度和密度等因素。對船舶抵禦冰負荷的結構能力和船舶的計劃運作應予以考慮。限制應納入冰區運作決策支持系統。

2.1.2 確定冰中運作限制應使用適當方法，如此等方法存在，該方法應業經多年使用並經服務經驗的驗證。現有方法和其他系統主管機關可能可以接受。

2.1.3 冰中運作應考慮到任何船舶運作限制、極地水域運作手冊中包括的有關冰中運作方法的擴展信息、船舶和船舶系統狀況，預計運作區域的歷史氣候/冰數據和氣候/冰預報，當前狀況，包括目力冰況觀察、海況、能見度以及合格人員的判斷。

### 2.2 運作評估

2.1 本指南擬用於支持船東執行、和主管機關審核 I-A 部分第 1.5 節所要求的對極地證書運作限制和程序的評估。

2.2.2 運作評估步驟：

- .1 基於對預期運作的審核，識別引言第 3 節中的相關危險和其他危險；

- .2 制定風險分析模型\*，考慮：
  - .1 制定事故場景；
  - .2 每一事故場景的事件可能性；和
  - .3 每一場景最終狀態的結果；
- .3 評估風險並確定可接受性：
  - .1 根據選定的建模方法評估風險水平；和
  - .2 評估風險水平是否可接受；和
- .4 如果認為步驟 1 至 3 中確定的風險水平過高，查明現有的或制定新的旨在達到下列一項或多項目標的風險控制選擇：
  - .1 通過更好的設計、程序、培訓等減少故障頻率；
  - .2 減輕故障影響以防止事故；
  - .3 限制可能發生故障的狀況；或
  - .4 減輕事故後果；和
  - .5 酌情為設計、程序、培訓和限制納入風險控制選擇。

## 2.2 性能標準

以前根據生產商認證、船級社認證和/或現有系統的滿意使用所接受的系統，如無本組織所接受的性能或試驗標準，可接受在新船和現

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\* 參閱《經修訂的 IMO 規則制定過程中綜合安全評估應用導則》（MSC-MEPC.2/Circ.12 通函）附錄 3 和 IEC/ISO 31010 標準“風險管理-風險評估技術”中的技術。

有船舶上安裝。

### 3 第 2 章（極地水域運作手冊）補充指南

#### 3.1 對極地水域運作手冊內容的建議

3.1.1 極地水域運作手冊擬述及 I-A 部分第 2 章所述運作的各個方面。如相關信息、程序或計劃出現在船舶文件中的其他部分，則無需在極地水域運作手冊中重複這些信息，僅交互引用相關參照文件即可。

3.1.2 目錄範本載於附錄 2 中。

3.1.3 該範本沿循第 2 章的總體結構。並非以下概述的各節將對各個極地船舶適用。許多偶爾或有限從事極地航行的 C 類船舶，將無需對發生概率極低的情況具備程序。但仍建議保留極地水域運作手冊的通用框架作為提醒，如果情況變化，手冊內容可能也要更新。將某一方面標註為“不適用”也向主管機關表明對該方面已進行了考慮並非僅予忽略。

#### 3.2 破冰船協助下航行指南

關於在破冰船協助下航行，對以下所列應做考慮：

- .1 當船舶接近冰區護送編隊的出發點以跟隨一艘/多艘破冰船時或由破冰船將船舶護航至與破冰船的會合點時，船舶應在 VHF16 頻道上建立無線電通信並按照破冰船的指示行動；
- .2 對船舶的冰區護送編隊提供破冰協助的破冰船應指揮編隊中的船舶；
- .3 船舶在冰區護送編隊中的位置應由提供協助的破冰船確定；

- .4 冰區護送編隊中的船舶應按照提供破冰協助的破冰船的指示，在破冰船指定的 VHF 頻道上與破冰船建立通信；
- .5 船舶在冰區護送編隊中航行時應確保遵守破冰船的指示；
- .6 應按破冰船的指示保持冰區護送編隊中的船位、航速及與前船的距離；
- .7 船舶如難以保持編隊中的船位、距離、航速和/或與編隊中任何他船的距離，應立即通知破冰船；和
- .8 船舶如有任何破損應立即報告破冰船。

### 3.3 應急計劃編制指南

在制定船舶應急計劃時，船舶應對救助作業中緊急轉移液體和進入各液艙和處所的破損控制措施布置做出考慮（另見第 9 章補充指南）。

## 4 第 3 章（船舶結構）補充指南

### 確定等效冰級的方法

4.1 以下指南擬協助確定與本規則第 3 章和第 6 章所述本組織可接受標準的等效。此方法與本組織所制定的指南\*一致，並允許採用簡化方法。

4.2 審議 A 和 B 類船舶的等效，其基本方法對新和現有船舶可以相同。它涉及到將其他冰級與國際船級社協會的冰級相比較。對於 C 類之下的冰級，已有可用的關於加強水平比較的補充信息供船東和主管機關\*作

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\* 參見《各海事組織文書中規定的替代和等效批准導則》（MSC.1/Circ.1455 通函）。

\* 參閱 HELCOM 25/7 號建議的附件，波羅的海區域冬季航行安全，可在 [www.helcom.fi](http://www.helcom.fi) 獲取。

為指南。提出等效申請和所需支持信息的責任由船東/經營人承擔。審核/認可任何等效申請將由船旗國主管機關，或按照《經認可組織規則》的規定代其行事的經認可組織承擔。多個船級社，以及一些主管機關和其他第三方，業已為確定符合國際船級社協會極地級的結構要求制定出易於使用的工具。

4.3 簡化等效評估（參閱以下第 6.1 至 6.3 段）的範圍，擬限於材料選擇、船殼結構強度和推進機械。

4.4 如並非全部和直接相符，則可按照本組織提供的指南接受等效風險水平。某一事件發生概率的增加，可通過減少其後果加以制衡。或者，概率的降低可潛在地允許接受更嚴重的後果。以船殼區域為例，如果內部艙室為空艙，其局部損壞將不會危及船舶的整體安全或導致任何污染物的釋放，則可以接受局部強度水平或材料等級的不足。

4.5 對於現有船舶，服務經歷可有助於風險評估。例如，對於有極地冰區作業記錄的現有船舶，如有缺陷區域沒有受損記錄則可以接受（船殼區域）冰帶範圍的不足；即，一艘總體上將滿足 PC5 要求、但在有限區域僅滿足 PC7 要求的船舶，仍可被視為 A 類、PC5 船舶。在所有此類情況下，船舶文件應列明任何缺陷的性質和範圍。

4.6 該過程包括下列評估階段：

- .1 為等效選擇目標極地級；
- .2 比較設計中使用的材料和國際船級社協會統一級要求下的最低要求；查明任何不足；和
- .3 比較船殼和機械部件的設計強度和國際船級社協會極地級統一要求下的要求；量化符合水平。



若在步驟 1 至 3 中，發現符合上的不足，則需要以下所概述的補充步驟證明等效：

- .4 列明船舶設計中所包括的（超出和高於本規則和國際船級社協會統一要求的）任何風險緩解措施；
- .5 適用時，提供現有船舶在與等效目標冰級相關的條件下的服務經歷文件；和
- .6 酌情慮及步驟 1 至 5 的信息，和以上 4.2 至 4.6 段中概述的原則進行評估。

4.7 與等效申請一同提交的文件應列明所採取的每一步驟，和充分的支持信息以證實評估的有效性。

4.8 A 類或 B 類船舶如具有其船旗國提供的等效冰級，應在極地船舶證書中註明。

#### **5 第 4 章（分艙和穩性）補充指南**

無補充指南。

#### **6 第 5 章（水密和風雨密完整性）補充指南**

無補充指南。

#### **7 第 6 章（機械設備）補充指南**

參閱第 3 章補充指南。

#### **8 第 7 章（消防安全/保護）補充指南**

無補充指南。

## 9 第 8 章（救生設備與布置）補充指南

### 9.1 個人生存設備示例

在權衡應納入個人救生設備的器具時，應考慮下列物品：

| 建議設備                   |
|------------------------|
| 防護服（帽子、手套、襪子、面部和頭頸護具等） |
| 護膚霜                    |
| 保溫用具                   |
| 太陽鏡                    |
| 哨子                     |
| 飲水杯                    |
| 小刀                     |
| 極地生存指南                 |
| 應急食品                   |
| 攜物袋                    |

### 9.2 群體生存設備示例

在權衡應納入群體生存設備的器具時，應考慮下列物品：

| 建議設備                         |
|------------------------------|
| 遮護－帳篷或風暴遮護或等效物－足供最大人員數量      |
| 保溫用具或類似裝備－足供最大人員數量           |
| 睡袋－至少足供兩人一個                  |
| 泡沫睡墊或類似物－至少足供兩人一個            |
| 鏟子－至少 2 把                    |
| 衛生用品（如廁紙）                    |
| 爐子及燃料－足以供給最大數量的登岸人員和最大預期救助時間 |
| 應急食品－足以供給最大數量的登岸人員和最大預期救助時間  |
| 手電筒－每一遮護所一個                  |
| 防水和防風火柴－每一遮護所兩盒              |
| 哨子                           |
| 信號鏡                          |
| 儲水容器和水淨化片劑                   |
| 後備個人生存設備（套）                  |
| 群體生存設備容器（防水並可漂浮）             |

## 10 第 9 章（航行安全）補充指南

10.1 應推廣使用配備增強冰況探測能力的雷達，特別是在淺水中。

10.2 由於極地水域中許多區域的海圖覆蓋對於沿岸航行目前可能不足，航行駕駛員應：

- .1 審慎規劃並相應地監督其航行，並適當慮及合適的航海出版物中的信息和指南；
- .2 熟悉擬作業區域的水道測量現狀及海圖信息的可用性及質量；
- .3 了解海圖基準與全球衛星導航系統的潛在差異；及
- .4 以規劃穿越已有海圖區域為目標並遠離已知淺灘，但有可能，遵循已確立的航路。

10.3 任何對規劃航路的偏離應審慎進行。例如，並在大陸架上運作時：

- .1 回聲測深儀應工作並對其加以監測以發現任何意外的水深變化跡象，特別是當海圖並非基於對海底的全面勘察時；  
和
- .2 應利用一切機會對定位信息（如視覺和雷達定位及全球衛導定位 GNSS）進行獨立交互核查。航海者應確保向有關海圖當局（水道測量辦公室）報告可能有助於改善海圖和出版物的任何信息。

10.4 船舶應裝有：

- .1 適當裝置為指揮位置的玻璃窗充分除冰，使指揮位置上的前後視野不受阻礙；和
- .2 有效裝置清除外部融冰、凍雨、雪、水氣和濺水及內部積聚冷凝。清除玻璃窗外表面水氣的機械裝置，其運作機構應受到保護以防凍結或積冰妨礙其有效運作。

## **11 第 10 章（通信）補充指南**

### **11.1 高緯度通信系統的限制**

11.1.1 目前的海事數字通信系統並非為覆蓋極地水域所設計。

11.1.2 海上通信仍大量使用甚高頻，但僅覆蓋短距離（視線）且通常僅用於話語通信。在緊急情況下也使用高頻和中頻。數字甚高頻，移動電話系統和其他類型的無線電技術為許多海事應用提供足夠的數字能力，但僅限於在岸基台站視線範圍內的船舶，並因此，一般在極地水域不可用。自動識別系統（AIS）也可用於低數字率的通訊，但基站很少，及基於衛星的自動識別系統僅為數據接收而設計。

11.1.3 地球同步軌道衛星系統（GEO）的理論覆蓋範圍極限是北或南 81.3 度，但在某些情況下，在低至北或南緯度 70 度就會發生不穩定和信號斷線。許多因素影響到地球同步軌道衛星系統（GEO）提供的服務質量，且因系統設計的不同產生不同的影響。

11.1.4 可能有非全球海事遇險與安全系統可供在極地水域中使用並可有效用於通信。

### **11.2 對事故中多個報警和通信裝置運作的建議**

11.2.1 應制定程序確保當救生艇筏非常接近時同時啟動的報警或定位

裝置不超過 2 個（如第 10.3.2 條的要求），這是要：

- .1 維持電池壽命；
- .2 延長發送報警或定位信號的持續時間；和
- .3 避免潛在的干擾。

11.2.2 對於衛星遇險信標，雖然衛星系統可成功發現多個信標發射，但由於會對測向設備造成干擾，除非運作信標的救生艇筏廣泛分佈，不建議開啟多個信標。

### 11.3 關於救助艇和救生艇筏要攜帶的定位和通信設備的建議

在確定要攜帶的用於發送定位信號的設備時，應考慮到可能做出響應的搜救資源的能力。響應船舶和飛機也許不能用 406/121.5MHz 頻段搜尋目標，在此情況下應考慮其他定位裝置（如：自動識別系統 AIS—搜救應答器 SART）。

## 12 第 11 章（航次計劃）補充指南

在制定和實施航次計劃時，船舶應考慮下列事項：

- .1 如與海洋哺乳動物相遇，應考慮任何現有最佳方法以盡力減少不必要的干擾；和
- .2 如船舶在文化遺產和具有文化意義的地區附近航行，制定計劃盡力減少船舶航行的影響。

（另見第 9 章補充指南）

## 13 第 12 章（配員和培訓）補充指南

無補充指南。

## II-A 部分

### 防止污染措施

#### 第 1 章 – 防止油類污染

##### 1.1 操作要求

1.1.1 北極水域中禁止任何船舶排放油或油性混合物入海。

1.1.2 1.1.1 的規定不適用於清潔或專用壓載水排放。

1.1.3 經主管機關批准，2017 年 1 月 1 日以前建造的、機艙的油和油性混合物無法符合 1.1.1 段並在北極水域持續運作 30 天以上的 A 類船舶，須不遲於 2017 年 1 月 1 日之後一年的第一次中間或換證檢驗，（取較早者）符合 1.1.1 段的要求。在此日期之前，此類船舶須符合防污公約附則 I 第 15.3 條的排放要求。

1.1.4 在防污公約附則 I 所要求的油類記錄簿、手冊和船上油污應急計劃或船上海洋污染應急計劃中須酌情對極地水域中的運作予以考慮。

##### 1.2 結構要求

1.2.1 對於 2017 年 1 月 1 日或以後建造的，總燃油裝載容量小於 600m<sup>3</sup> 的 A 類和 B 類船舶，所有燃油艙均須以不小於 0.76m 的距離與船體外殼隔離。此規定不適用於最大單個容量不大於 30m<sup>3</sup> 的小燃油艙。

1.2.2 對於 2017 年 1 月 1 日或以後建造的並非油船的 A 類和 B 類船舶，所有為載運油類所建造和使用的貨艙均須以不小於 0.76m 的距離與船體外殼隔離。

1.2.3 對於 2017 年 1 月 1 日或以後建造的小於 5000 載重噸的 A 類和

B 類油船，貨艙全長須由以下所列予以保護：

- .1 雙層底艙或符合防污公約附則 I 規則第 19.6.1 條適用要求的處所；和
- .2 邊倉或按照防污公約附則 I 規則第 19.3.1 條布置並符合防污公約附則 I 規則第 19.6.2 條中所述適用距離要求的處所。

1.2.4 對於 2017 年 1 月 1 日或以後建造的 A 類和 B 類船舶，所有殘油（油泥）艙和含油艙底水儲存櫃均須以不小於 0.76m 的距離與船體外殼隔離。此規定不適用於最大單個容量不大於 30m<sup>3</sup> 的小液艙。

## 第 2 章—控制散裝有毒液體物質污染

### 2.1 操作要求

2.1.1 北極水域中禁止排放有毒液體物質或含有這些物質的混合物入海。

2.1.2 防污公約附則 II 所要求的貨物記錄簿、手冊和船上有毒液體物質海洋污染應急計劃或船上海洋污染應急計劃中須酌情對極地水域中的運作予以考慮。

2.1.3 對於 2017 年 1 月 1 日或以後建造的 A 類和 B 類船舶，作為船型 3 載運《國際散裝運輸危險化學品船舶構造和設備規則》第 17 章 e 欄中列明的有毒液體物質（NLS）或在船型 3 的液貨艙中載運第 18 章中列明的有毒液體物質，須經主管機關批准。結果應在國際防止散裝運輸有毒液體物質污染證書中或列明極地水域運作的適裝證書中註明。

### 第 3 章 – 防止海運有包裝有害物質污染

特意留白。

### 第 4 章 – 防止船舶生活污水污染

#### 4.1 定義

4.1.1 *建造*的係指處於安放龍骨或類似建造階段的船舶。

4.1.2 *冰架*係指具有相當厚度，露出海平面 2 至 50m 或以上，與海岸連接的浮動冰層。

4.1.3 *固定冰*係指沿海岸形成並並沿海岸固定，與岸、冰牆、冰崖相連，在淺灘或接地冰山之間的海冰。

#### 4.2 操作要求

4.2.1 在極地水域內禁止排放生活污水，但按照防污公約附則 IV 和遵循下列要求排放除外：

- .1 船舶在距任何冰架或固定冰 3 海里之外按防污公約附則 IV 第 11.1.1 條排放業經粉碎和消毒的生活污水，且須盡實際可行地遠離冰密集度超過 1/10 的區域；或
- .2 船舶在距任何冰架或固定冰 12 海里之外按防污公約附則 IV 第 11.1.1 條排放未經粉碎或消毒的生活污水，且須盡實際可行地遠離冰密集度超過 1/10 的區域；或
- .3 船舶運行着經主管機關發證符合防污公約附則 IV 第 9.1.1 或 9.2.1 條的操作要求的生活污水處理裝置，並按照防污公約附則 IV 第 11.1.2 條排放生活污水，且須盡實際可行地遠



離最近陸地、任何冰架、固定冰或冰密集度超過 1/10 的區域。

4.2.2 禁止 2017 年 1 月 1 日或以後建造的 A 類和 B 類船舶，及 2017 年 1 月 1 日或以後建造的所有客船排放生活污水入海，但此種排放符合本章 4.2.1.3 段時除外。

4.2.3 雖有 4.2.1 段的要求，長時間在冰密集度超過 1/10 的區域內運作的 A 類和 B 類船舶，僅可使用經主管機關發證符合防污公約附則 IV 第 9.1.1 或 9.2.1 條的操作要求的生活污水處理裝置排放生活污水。此種排放須經主管機關批准。

## 第 5 章—防止船舶垃圾污染

### 5.1 定義

5.1.1 冰架係指具有相當厚度，露出海平面 2 至 50m 或以上，與海岸連接的浮動冰層。

5.1.2 固定冰係指沿海岸形成並沿海岸固定，與岸、冰牆、冰崖相連，在淺灘或接地冰山之間的海冰。

### 5.2 操作要求

5.2.1 在北極水域，按照防污公約附則 V 第 4 條所允許的垃圾排放入海須滿足下列附加要求：

- 1 船舶僅在盡實際可行地遠離冰密集度超過 1/10 的區域時，方允許排放食品廢棄物，但在任何情況下距最近陸地、最近冰架或最近的固定冰不得少於 12 海里；

- .2 食品廢棄物須經粉碎或磨碎並須能通過網眼不大於 25mm 的粗篩。食品廢棄物不得被其他類型的垃圾污染；
- .3 食品廢棄物不得排放到冰上；
- .4 禁止排放動物屍體；和
- .5 卸載時使用普通方法無法回收的貨物殘餘物，須僅在船舶航行途中並滿足下列所有條件時，方允許排放：
  - .1 慮及本組織制定的導則，貨艙清洗水中所含貨物殘餘物、清潔劑或添加劑中不包括任何被列為有害海洋環境的物質；
  - .2 出發港和下一目標港均在北極水域內，且在這些港口之間，船舶將不會駛出北極水域；
  - .3 慮及本組織制定的導則，這些港口沒有足夠的接收設備；和
  - .4 如已滿足 5.2.1.5.1、5.2.1.5.2 和 5.2.1.5.3 分段的條件，含有殘餘物的貨艙清洗水的排放須盡實際可行地遠離冰密集度超過 1/10 的區域，但在任何情況下距最近陸地、最近冰架或最近的固定冰不得少於 12 海里。

5.2.2 在南極區域，按照防污公約附則 V 第 6 條所允許的垃圾排放入海須滿足下列附加要求：

- .1 按照防污公約附則 V 第 6.1 條進行的排放須盡實際可行地遠離冰密集度超過 1/10 的區域，但在任何情況下距最近的固定冰不得少於 12 海里；和
- .2 食品廢物不得排放到冰上。

5.2.3 防污公約附則 V 所要求的垃圾記錄簿、垃圾管理計劃和告示中須酌情對極地水域中的運作予以考慮。

## II-B 部分

### 關於引言和 II-A 部分規定的補充指南

#### 1 第 1 章補充指南

1.1 鼓勵船舶在北極水域運作時應用防污公約附則 I 第 43 條。

1.2 在位於水下船體以外有直接海水接觸面的需潤滑的部件中，例如軸封和回轉密封，應考慮無毒可生物降解潤滑劑或水基系統。

#### 2 第 2 章補充指南

鼓勵 2017 年 1 月 1 日或以後建造的、經發證載運有毒液體物質（NLS）的 A 類和 B 類船舶，在距與船體外殼隔離不小於 760mm 的液艙中，作為船型 3 載運《國際散裝運輸危險化學品船舶構造和設備規則》第 17 章 e 欄中列明的有毒液體物質（NLS）或載運第 18 章中列明的有毒液體物質。

#### 3 第 5 章補充指南

為盡力減少與動物貨物死亡率相關的風險，應考慮載運此類貨物的船舶在極地水域中運作時將如何在船上管理、處理和存放動物屍體。特別要參照《2012 年防污公約附則 V 實施導則》（MEPC.219（63）號決議）和《2012 年垃圾管理計劃制定導則》（MEPC.220（63）號決議）。

#### 4 其他環境公約和導則補充指南

4.1 在《國際船舶壓載水和沉積物控制和管理公約》生效前，應酌情對該公約 D-1 條所載壓載水置換標準或 D-2 條所載壓載水性能標準的壓載水管理規定予以考慮。還應對《南極條約區域壓載水置換導則》

(MEPC.163 (56) 號決議) 的規定，連同本組織制定的其他相關導則予以考慮。

4.2 選用壓載水處理系統中，應注意型式認可證書附錄中規定的限制條件以及系統測試的溫度以確保其在極地水域中的適合性和有效性。

4.3 為儘量減少入侵水生物種經生物污底轉移的風險，應考慮採取措施儘量減少與極地冰區作業相關的防污底塗層加速降解風險。特別要參照《2011 年盡力減少入侵水生物種轉移的船舶生物污底控制和管理導則》(MEPC.207 (62) 號決議)。

表：一些冰區航行船舶所考慮的防污底系統相關事項示例

(本表為某些冰區航行船舶的經營者所用)

|              | 船體   | 海水吸入箱  |
|--------------|--|--|
| 全年在冰蓋極地水域運作  |  | <ul style="list-style-type: none"> <li>• 耐磨塗層</li> <li>• 符合防污底公約要求。防污底系統的厚度由船東確定。</li> </ul> |
| 間歇性在冰蓋極地水域運作 | <ul style="list-style-type: none"> <li>• 耐磨損低摩擦冰塗層</li> <li>• 在舳龍骨以上的舷側防污底系統的最大厚度為 75µm，以在應用防污底系統和下次預期冰蓋水域航行之間的時期內保護船體。船底區域厚度由船東確定。防污底系統的成分也應由船東確定。</li> </ul> | <ul style="list-style-type: none"> <li>• 符合防污底公約要求。防污底系統的厚度由船東確定。</li> </ul>                 |
| B 類和 C 類船舶   | <ul style="list-style-type: none"> <li>• 符合防污底公約要求。防污底系統的厚度由船東確定</li> </ul>  | <ul style="list-style-type: none"> <li>• 符合污底公約要求。防污底系統的厚度由船東確定。</li> </ul>                  |

### 附錄 1

## 極地水域運作船舶證書格式

### 極地船舶證書

本證書須以極地船舶證書設備記錄為補充

(公章)

(國家)

本證書經.....政府授權

(國名)

由.....

(經授權的個人或組織)

按經修正的《1974 年國際海上人命安全公約》的規定簽發

#### 船舶資料\*

船名 .....

船舶編號或呼號 .....

船籍港 .....

總噸位.....

IMO 編號.....

\* 船舶資料也可在表格中橫向排列。

茲證明：

1 該船業已按照國際極地水域運作船舶規則中與安全相關的適用規定接受檢驗。

2 檢驗表明該船的結構、設備、舾裝、無線電台布置和材料及其狀況的各方面均符合要求及該船符合極地規則的相關規定。

A/B/C\*類船舶如下：

#### 冰級和經冰區加強的吃水範圍

| 冰級 | 最大吃水 |   | 最小吃水 |   |
|----|------|---|------|---|
|    | 艙    | 艙 | 艙    | 艙 |
|    |      |   |      |   |
|    |      |   |      |   |

2.1 船舶類型：液貨船/客船/其他\*

2.2 船舶僅限在無冰水域/開敞水域/其他冰況中運作\*

2.3 船舶擬在低氣溫下運作： 是/否\*

2.3.1 極地工作溫度： .....°C/不適用\*

2.4 最長預期救助時間 .....天

3 該船設有/未設\*符合經修正的《1974年海上人命安全公約》第XIV/4條規定的替代設計和佈置。

4 結構、機電設備/消防/救生設備和布置\*的替代設計和布置的認可文件附於/未附於\*本證書之後。

5 運作限制

\* 酌情刪除。

船舶在極地水域的運作限制確定如下：

- 5.1 冰況.....
- 5.2 溫度.....
- 5.3 高緯度.....

本證書有效期限至.....，但須按照極地規則第 1.3 節接受年度/定期/中間檢驗。

本證書所依據檢驗的完成日期：.....

(年/月/日)

簽發於.....

(證書簽發地點)

.....

.....

(簽發日期)

(經授權發證書的官員簽字)

(發證主管當局酌情蓋章或鋼印)

年度、定期和中間檢驗的簽註\*

茲證明業已按照極地規則第 1.3 條對該船進行檢驗，查明該船符合該規則的相關要求。

年度檢驗：

簽字：.....

\* 酌情刪除。

(經授權官員簽字)

地點： .....

日期： .....

(主管當局酌情蓋章或鋼印)

年度/定期/中間檢驗\*：

簽字： .....

(經授權官員簽字)

地點： .....

日期： .....

(主管當局酌情蓋章或鋼印)

年度/定期/中間檢驗\*：

簽字： .....

(經授權官員簽字)

地點： .....

日期： .....

(主管當局酌情蓋章或鋼印)

年度檢驗：

簽字： .....

(經授權官員簽字)

地點： .....

日期： .....

(主管當局酌情蓋章或鋼印)



**公約第 I/14 (c) 條適用時，證書有效期不足 5 年的展期簽註\***

該船符合公約的有關要求，按照公約第 I/14 (c) 條本證書須視為有效至.....。

簽字：.....

(經授權官員簽字)

地點：.....

日期：.....

(主管當局酌情蓋章或鋼印)

**公約第 I/14 (d) 條適用並已完成換證檢驗時的簽註\***

該船符合公約的有關要求，按照公約第 I/14 (d) 條本證書須視為有效至.....。

簽字：.....

(經授權官員簽字)

地點：.....

日期：.....

(主管當局酌情蓋章或鋼印)

**公約第 I/14 (e) 條或第 I/14 (f) 條適用時，將證書有效期展期至****駛抵檢驗港口或給予寬限期的簽註\***

按照公約第 I/14 (e) /I/14 (f) 條本證書須視為有效至.....。

\* 酌情刪除。

\* 酌情刪除。

簽字： .....

(經授權官員簽字)

地點： .....

日期： .....

(主管當局酌情蓋章或鋼印)

**公約第 I/14 (h) 條適用時，提前周年日的簽註\***

按照公約第 I/14 (h) 條，新的周年日為.....。

簽字： .....

(經授權官員簽字)

地點： .....

日期： .....

(主管當局酌情蓋章或鋼印)

按照公約第 I/14 (h) 條，新的周年日為.....。

簽字： .....

(經授權官員簽字)

地點： .....

日期： .....

(主管當局酌情蓋章或鋼印)

## 極地證書設備記錄

本記錄須永久附於極地船舶證書之後

符合《國際極地水域運作船舶規則》的設備記錄

### 1 船舶資料

船名：.....

船舶編號或呼號：.....

### 2 設備記錄

#### 2.1 救生設備

|     |                       |       |
|-----|-----------------------|-------|
| 1   | 保溫救生服總數               | ..... |
| 1.1 | 船員用                   | ..... |
| 1.2 | 乘客用                   | ..... |
| 2   | 保溫服具總數                | ..... |
| 3   | 個人和群體生存設備             | ..... |
| 3.1 | 個人生存設備-供使用人員數         | ..... |
| 3.2 | 群體生存設備-供使用人員數         | ..... |
| 3.3 | 符合極地規則第 8 章要求的救生筏的總容量 | ..... |
| 3.4 | 符合極地規則第 8 章要求的救生艇的總容量 | ..... |

#### 2.2 航行設備

|   |                                   |       |
|---|-----------------------------------|-------|
| 1 | 兩台獨立的回聲測深儀或 1 台具有兩個分離的獨立換能器的回聲測深儀 | ..... |
| 2 | 可在駕駛室控制的旋轉窄束探照燈或裝置以目力發現冰          | ..... |

|   |       |
|---|-------|
| 3 (涉及破冰船護航作業的船舶) 從後方可見的手動啟動紅色閃光燈            | ..... |
| 4 兩台或以上確定和顯示首向的非磁性獨立裝置                      | ..... |
| 5 (駛往緯度超過 80 度地區的船舶) 全球衛導系統 (GNSS) 羅經或等效的羅經 | ..... |

**2.3 通信設備**

|  |       |
|--|-------|
| 1 《國際信號規則》所述的面向船尾的特殊聲響信號系統，用以向跟隨其後的船舶表明其護航和應急操縱（擬提供破冰護航的船舶）。 | ..... |
| 2 與相關救助協調中心的話語和/或數據通信。                                       | ..... |
| 3 用 121.5 和 123.1MHz 頻率與飛機進行話語通信的設備。                         | ..... |
| 4 與遠程醫療服務 (TMAS) 的雙向話語和數據通信                                  | ..... |
| 5 所有救助艇和救生艇，一旦被釋放用於撤離，均具備裝置（對於經發證在低氣溫下運作的船舶）：                | ..... |
| 5.1 發送船對岸報警  | ..... |
| 5.2 發送定位信號   | ..... |
| 5.3 收發現場通信   | ..... |
| 6 所有其他救生艇筏均具備裝置：   | ..... |
| 6.1 發送定位信號   | ..... |
| 6.2 收發現場通信   | ..... |

茲證明該記錄在各方面均正確無誤。

簽發於 .....

(記錄簽發地點)

.....

(簽發日期)

(經授權簽發記錄官員簽字)

(發證主管當局酌情蓋章或鋼印)

## 附錄 2

### 極地水域運作手冊（極地水域運作手冊）目錄範本

#### 安全措施

#### 1 操作能力和限制

##### 第 1 章 冰中操作

##### 1.1 操作者安全操作指導

**指導：**極地水域運作手冊應慮及極地船舶證書中的操作限制，確立一種能確定冰況是否超出船舶設計極限的方法。可以使用適當的決策輔助系統，例如：加拿大北極冰機制航行系統和/或北部海域航路水域航行規則中所述的俄羅斯冰區證書……。駕駛台人員應經培訓能正確使用擬用系統。對於將僅在無冰水域運作的船舶，應建立確保避免船舶與冰遭遇的程序。

##### 1.2 破冰能力

**指導：**極地水域運作手冊應提供預期能使船舶進行持續航行的冰況信息。可以從諸如數值分析、模型試驗或冰中試航中得出。還可包括初期冰或融冰以及雪覆蓋對冰強度影響的信息。

##### 1.3 冰中操縱

##### 1.4 特點

**指導：**如適用，極地水域運作手冊應包括為確定極地船舶類別/冰級所做任何等效分析的結果。手冊還應提供為輔助冰區操作而配備的任何專門系統的信息。

## 第 2 章 低氣溫下操作

### 系統設計

**指導：**極地水域運作手冊應列出所有暴露於低溫下時功能性易於受損或喪失的船上系統，以及為避免故障應採取的措施。

## 第 3 章 高緯度中的通信和航行能力

**指導：**極地水域運作手冊應列明在高緯度中運作可導致的對通信和航行設備操作有效性的任何限制。

## 第 4 章 航行期限

**指導：**極地水域運作手冊應就任何對船舶續航能力的限制提供信息，諸如燃料容量、淡水容量、物料儲備等。這通常將僅對較小的船舶，或對計劃在冰中長時間逗留的船舶有顯著影響。

## 2 船舶運作

### 第 1 章 戰略規劃

下列分析中使用的假設應納入手冊。

#### 1.1 避開危冰

**指導：**對於經常在極地水域中作業的船舶，極地水域運作手冊應就船舶應能夠在預計作業水域中作業的時段提供信息。對會造成特殊問題的區域，諸如阻塞點、冰皺、以及所記錄的最劣冰況，應予註明。若可用信息有限或信息質量不確定，應在航次規劃中作為風險予以認定和註明。

#### 1.2 避開危險氣溫

**指導：**對於經常在極地水域中作業的船舶，極地水域運作手冊應提供預

計作業時段的日均低溫以及每日最低記錄溫度的信息。若可用信息有限或信息質量不確定，應在航次規劃中作為風險予以認定。

### 1.3 航行期限和續航能力

**指導：**確定供給要求的程序應予以確立，並慮及各種情況，諸如航行慢於預期、航線改變、不利冰況、避難地和供給的獲得等，確定適當的安全水平和安全係數。燃料類型的資源和可獲得性應慮及交付所需的長預定期予以確定。

### 1.4 人力資源管理

**指導：**極地水域運作手冊應慮及預期的冰況和對冰區航行、增加值班水平、休息時間、疲勞的要求和確保這些要求將得到滿足的程序，對人力資源管理提供指導。

## 第2章 接收環境狀況預報的布置

**指導：**極地水域運作手冊應對提供冰和氣象信息的手段和頻率做出規定。若船舶擬在冰中或有冰時作業，手冊應就何時需要天氣和冰況信息和信息的格式做出規定。

在可獲得時，信息應包括將列明可使船舶暴露於不利條件下的天氣和冰態/機制的全球和局部預報。

更新的頻率應提供足夠的預先通知，使船舶能夠在預報的條件超出船舶的能力時，脫離困境或使用其他方法避開危險。

極地水域運作手冊可包括使用陸基支持信息提供者作為一種檢索可用信息，因而僅向船舶提供相關信息的有效方法，以減少對船舶通訊系統的壓力。手冊還可表明應獲得並分析補充圖像的具體情況，以及

此等補充信息可從何處獲得。

## 2.1 冰信息

**指導：**極地水域運作手冊應包括或提及關於應如何使用雷達識別冰川、如何對雷達做最有效調定的指導，和關於如何詮釋雷達圖像等的說明。如要使用其他技術提供冰信息，對其使用也應予以闡述。

## 2.2 氣象信息

### 第 3 章 水文、氣象和航行資料的驗證

**指導：**極地水域運作手冊應對第 10 章補充指南中進一步描述的水道測量信息的應用，提供指導。

### 第 4 章 特殊設備的運作

#### 4.1 航行系統

#### 4.2 通信系統

### 第 5 章 設備和系統功能維護程序

#### 5.1 防冰和除冰

**指導：**極地水域運作手冊應就如何通過操作性措施防止或減少結冰、如何監控和評估積冰、如何使用船上現有設備除冰、和在進行上述所有操作時如何保證船舶和船員安全提供指導。

#### 5.2 海水系統的運作

**指導：**極地水域運作手冊應就在冰中或低水溫中運作時如何監控、防止或減少冰進入海水系統提供指導。這可包括再循環、使用低位吸入而非高位吸入等。



### 5.3 低溫運作程序

**指導：**極地水域運作手冊應對諸如通過追蹤加熱或工作液體的持續循環，維護和監測任何需保持有效以確保功能完好的系統和設備提供指導。

## 3 風險管理

### 第1章 在限制性環境條件中緩解風險

#### 1.1 惡劣冰況下應考慮的措施

**指導：**極地水域運作手冊應含有在出現危冰時使用低速的指導。還應為諸如接近冰山、夜間作業、和其他低能見度的高冰況風險情況下，加強值班和瞭望配員規定程序。當存在與危冰接觸的可能性時，各程序應對諸如各艙室及水線下各倉的水深測量/檢查等的定期監測，做出規定。

#### 1.2 惡劣溫度條件下應考慮的措施

**指導：**極地水域運作手冊應含有對遇到或預報溫度低於船舶極地服務溫度時的作業限制的指導。這可包括船舶延期、推遲進行某些類型的作業、使用臨時加熱、及其他風險緩解措施。

### 第2章 應急響應

**指導：**總體而言，如存在遭遇低氣溫、海冰和其他風險的可能性，極地水域運作手冊應對將增加應急響應措施效率的程序提供指導。

#### 2.1 破損控制

**指導：**極地水域運作手冊應考慮救助作業時應急液體轉移和進入液艙和處所的破損控制措施和布置。

## 2.2 消防

## 2.3 逃生和撤離

**指導：**如針對救助前時間過長、棄船至冰上或附近陸地上的可能性、或極地作業的其他方面而載有輔助或專用救生設備時，極地水域運作手冊應含有使用該設備的指導和正確培訓和演習的規定。

## 第 3 章 與應急響應服務的協調

### 3.1 船舶應急響應

**指導：**極地水域運作手冊應包括航次準備中和事件發生時應遵循的程序。

### 3.2 救撈

**指導：**極地水域運作手冊應包括航次準備中和事件發生時應遵循的程序。

### 3.3 搜救

**指導：**極地水域運作手冊應含有關於識別任何預計航路的有關救助協調中心的信息，並應要求作為任何航次規劃的一部分，對聯絡信息和程序進行驗證並在需要時加以更新。

## 第 4 章 長期被冰所困時維持生命支持和船舶完整性的程序

**指導：**任何船舶若具備緩解因長期被冰所困的安全和環境風險的特性，其極地水域運作手冊應提供如何設立和運作這些特性的信息。這可包括諸如增加從應急配電板供電的補充設備、排空有凍損風險的系統、隔離部分 HVAC 系統等。

4.1 系統配置

4.2 系統運作

4 協同作業

## 第 1 章 護航作業

**指導：**極地水域運作手冊應包含或提及關於要求或提供破冰護航服務的沿海國所制定的規則和程序的信息。手冊還應強調船長在同意護航作業時需要考慮到船舶限制。

## 第 2 章 護送作業

**RESOLUTION MSC.385(94)**  
**(adopted on 21 November 2014)**

**INTERNATIONAL CODE FOR SHIPS OPERATING IN POLAR WATERS**  
**(POLAR CODE)**

THE MARITIME SAFETY COMMITTEE,

RECALLING article 28(b) of the Convention on the International Maritime Organization concerning the function of the Committee,

RECOGNIZING the need to provide a mandatory framework for ships operating in polar waters due to the additional demands on ships, their systems and operation, which go beyond the existing requirements of the International Convention for the Safety of Life at Sea (SOLAS), 1974, as amended ("the Convention"), and other relevant binding IMO instruments,

NOTING resolution MSC.386(94), by which it adopted, inter alia, the new chapter XIV of the Convention,

NOTING ALSO that the Marine Environment Protection Committee, at its sixty-seventh session, approved with a view to adoption, at its sixty-eighth session, the Introduction, as it relates to environmental protection, and parts II-A and II-B of the International Code for Ships Operating in Polar Waters (Polar Code), and also considered for adoption relevant amendments to the International Convention for the Prevention of Pollution from Ships, 1973, as modified by the 1978 Protocol,

HAVING CONSIDERED, at its ninety-fourth session, the draft International Code for Ships Operating in Polar Waters,

1 ADOPTS the safety-related provisions of the Introduction, and the whole of parts I-A and I-B of the Polar Code, the text of which is set out in the annex to the present resolution;

2 AGREES that amendments to the Introduction of the Polar Code that address both safety and environmental protection shall be adopted in consultation with the Marine Environment Protection Committee;

3 INVITES Contracting Governments to the Convention to note that the Polar Code will take effect on 1 January 2017 upon entry into force of the new chapter XIV of the Convention;

4 INVITES ALSO Contracting Governments to consider the voluntary application of the Polar Code, as far as practicable, also to ships not covered by the Polar Code and operating in polar waters;

5 REQUESTS the Secretary-General of the Organization, for the purposes of article VIII(b)(v) of the Convention, to transmit certified copies of the present resolution and the text of the Polar Code, contained in the annex, to all Contracting Governments to the Convention;

6 REQUESTS ALSO the Secretary-General of the Organization to transmit copies of the present resolution and the text of the Code contained in the annex to all Members of the Organization which are not Contracting Governments to the Convention;

7 REQUESTS FURTHER the Secretary-General to prepare a consolidated text of the Polar Code upon adoption of the environmental protection related provisions by the Marine Environment Protection Committee.

**RESOLUTION MEPC.264(68)**  
**(adopted on 15 May 2015)**

**INTERNATIONAL CODE FOR SHIPS OPERATING IN POLAR WATERS**  
**(POLAR CODE)**

THE MARINE ENVIRONMENT PROTECTION COMMITTEE,

RECALLING Article 38(a) of the Convention on the International Maritime Organization concerning the functions of the Marine Environment Protection Committee conferred upon it by international conventions for the prevention and control of marine pollution from ships,

RECOGNIZING the need to provide a mandatory framework for ships operating in polar waters due to the additional demands for the protection of the marine environment, which go beyond the existing requirements contained in the International Convention for the Prevention of Pollution from Ships, 1973, as modified by the Protocol of 1978 relating thereto as amended by the 1997 Protocol (MARPOL) and other relevant binding IMO instruments,

NOTING resolution MEPC.265(68), by which it adopted, inter alia, amendments to MARPOL Annexes I, II, IV and V to make use of the environment-related provisions of the International Code for Ships Operating in Polar Waters (Polar Code) mandatory,

NOTING ALSO that the Maritime Safety Committee, at its ninety-fourth session, adopted, by resolution MSC.385(94), the Introduction, as it relates to safety, and parts I-A and I-B of the Polar Code and, by resolution MSC.386(94), amendments to the 1974 SOLAS Convention to make use of the safety-related provisions of the Polar Code mandatory,

HAVING CONSIDERED, at its sixty-eighth session, the draft International Code for Ships Operating in Polar Waters,

- 1 ADOPTS the environment-related provisions of the Introduction, and the whole of parts II-A and II-B of the Polar Code, the text of which is set out in the annex to the present resolution;
- 2 AGREES that amendments to the Introduction of the Polar Code that address both safety and environmental protection shall be adopted in consultation with the Maritime Safety Committee;
- 3 INVITES Parties to note that the Polar Code will take effect on 1 January 2017 upon entry into force of the associated amendments to MARPOL Annexes I, II, IV and V;
- 4 INVITES ALSO Parties to consider the voluntary application of the Polar Code, as far as practicable, to ships not covered by the Polar Code and operating in polar waters;
- 5 REQUESTS the Secretary-General, for the purposes of article 16(2)(e) of MARPOL, to transmit certified copies of the present resolution and the text of the Polar Code, contained in the annex, to all Parties to MARPOL;
- 6 REQUESTS ALSO the Secretary-General to transmit copies of the present resolution and the text of the Polar Code contained in the annex to Members of the Organization which are not Parties to MARPOL;
- 7 REQUESTS FURTHER the Secretary-General to prepare a consolidated certified text of the Polar Code.

**ANNEX****INTERNATIONAL CODE FOR SHIPS OPERATING IN POLAR WATERS  
(POLAR CODE)****Contents****PREAMBLE****INTRODUCTION**

- 1 Goal
- 2 Definitions
- 3 Sources of hazards
- 4 Structure of the Code

**PART I-A – SAFETY MEASURES****CHAPTER 1 – GENERAL**

- 1.1 Structure of this part
- 1.2 Definitions
- 1.3 Certificate and survey
- 1.4 Performance standards
- 1.5 Operational assessment

**CHAPTER 2 – POLAR WATER OPERATIONAL MANUAL (PWOM)**

- 2.1 Goal
- 2.2 Functional requirements
- 2.3 Regulations

**CHAPTER 3 – SHIP STRUCTURE**

- 3.1 Goal
- 3.2 Functional requirements
- 3.3 Regulations

**CHAPTER 4 – SUBDIVISION AND STABILITY**

- 4.1 Goal
- 4.2 Functional requirements
- 4.3 Regulations

**CHAPTER 5 – WATERTIGHT AND WEATHERTIGHT INTEGRITY**

- 5.1 Goal
- 5.2 Functional requirements
- 5.3 Regulations

**CHAPTER 6 – MACHINERY INSTALLATIONS**

- 6.1 Goal
- 6.2 Functional requirements
- 6.3 Regulations

**CHAPTER 7 – FIRE SAFETY/PROTECTION**

- 7.1 Goal
- 7.2 Functional requirements
- 7.3 Regulations

**CHAPTER 8 – LIFE-SAVING APPLIANCES AND ARRANGEMENTS**

- 8.1 Goal
- 8.2 Functional requirements
- 8.3 Regulations

**CHAPTER 9 – SAFETY OF NAVIGATION**

- 9.1 Goal
- 9.2 Functional requirements
- 9.3 Regulations

**CHAPTER 10 – COMMUNICATION**

- 10.1 Goal
- 10.2 Functional requirements
- 10.3 Regulations

**CHAPTER 11 – VOYAGE PLANNING**

- 11.1 Goal
- 11.2 Functional requirements
- 11.3 Requirements

**CHAPTER 12 – MANNING AND TRAINING**

- 12.1 Goal
- 12.2 Functional requirements
- 12.3 Regulations

**PART I-B — ADDITIONAL GUIDANCE REGARDING THE PROVISIONS OF THE INTRODUCTION AND PART I-A**

- 1 Additional guidance to section 2 (definitions) of the introduction
- 2 Additional guidance to chapter 1 (General)
- 3 Additional guidance to chapter 2 (Polar Water Operational Manual (PWOM))
- 4 Additional guidance to chapter 3 (Ship structure)
- 5 Additional guidance to chapter 4 (Subdivision and stability)
- 6 Additional guidance to chapter 5 (Watertight and weathertight integrity)
- 7 Additional guidance to chapter 6 (Machinery installations)
- 8 Additional guidance to chapter 7 (Fire safety/protection)
- 9 Additional guidance to chapter 8 (Life-saving appliances and arrangements)
- 10 Additional guidance to chapter 9 (Safety of navigation)
- 11 Additional guidance to chapter 10 (Communication)
- 12 Additional guidance to chapter 11 (Voyage planning)

**PART II-A — POLLUTION PREVENTION MEASURES****CHAPTER 1 – PREVENTION OF POLLUTION BY OIL**

- 1.1 Operational requirements
- 1.2 Structural requirements

**CHAPTER 2 – CONTROL OF POLLUTION BY NOXIOUS LIQUID SUBSTANCES IN BULK**

- 2.1 Operational requirements

**CHAPTER 3 – PREVENTION OF POLLUTION BY HARMFUL SUBSTANCES CARRIED BY SEA IN PACKAGED FORM****CHAPTER 4 – PREVENTION OF POLLUTION BY SEWAGE FROM SHIPS**

- 4.1 Definitions
- 4.2 Operational requirements

**CHAPTER 5 – PREVENTION OF POLLUTION BY GARBAGE FROM SHIPS**

- 5.1 Definitions
- 5.2 Operational requirements

**PART II-B – ADDITIONAL GUIDANCE REGARDING THE PROVISIONS OF THE INTRODUCTION AND PART II-A**

- 1 Additional guidance to chapter 1
- 2 Additional guidance to chapter 2
- 3 Additional guidance to chapter 5
- 4 Additional guidance under other environmental conventions and guidelines

**APPENDIX I**

- Form of Certificate for Ships operating in Polar Waters (Polar Ship Certificate)
- Record of Equipment for the Polar Ship Certificate

**APPENDIX II**

- Model table of contents for the Polar Water Operational Manual (PWOM)



## PREAMBLE

1 The International Code for Ships Operating in Polar Waters has been developed to supplement existing IMO instruments in order to increase the safety of ships' operation and mitigate the impact on the people and environment in the remote, vulnerable and potentially harsh polar waters.

2 The Code acknowledges that polar water operation may impose additional demands on ships, their systems and operation beyond the existing requirements of the International Convention for the Safety of Life at Sea (SOLAS), 1974, the International Convention for the Prevention of Pollution from Ships, 1973, as modified by the Protocol of 1978 relating thereto as amended by the 1997 Protocol (MARPOL), and other relevant binding IMO instruments.

3 The Code acknowledges that the polar waters impose additional navigational demands beyond those normally encountered. In many areas, the chart coverage may not currently be adequate for coastal navigation. It is recognized even existing charts may be subject to unsurveyed and uncharted shoals.

4 The Code also acknowledges that coastal communities in the Arctic could be, and that polar ecosystems are, vulnerable to human activities, such as ship operation.

5 The relationship between the additional safety measures and the protection of the environment is acknowledged as any safety measure taken to reduce the probability of an accident will largely benefit the environment.

6 While Arctic and Antarctic waters have similarities, there are also significant differences. Hence, although the Code is intended to apply as a whole to both Arctic and Antarctic, the legal and geographical differences between the two areas have been taken into account.

7 The key principles for developing the Polar Code have been to use a risk-based approach in determining scope and to adopt a holistic approach in reducing identified risks.

## INTRODUCTION

### 1 Goal

The goal of this Code 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 of the Organization.

### 2 Definitions

For the purpose of this Code, the terms used have the meanings defined in the following paragraphs. Terms used in part I-A but not defined in this section shall have the same meaning as defined in SOLAS. Terms used in part II-A but not defined in this section shall have the same meaning as defined in Article 2 of MARPOL and the relevant MARPOL Annexes.

- 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.
- 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.
- 2.4 *First-year ice* means sea ice of not more than one winter growth developing from young ice with thickness from 0.3 m to 2.0 m.
- 2.5 *Ice free waters* means no ice present. If ice of any kind is present this term shall not be used.
- 2.6 *Ice of land origin* means ice formed on land or in an ice shelf, found floating in water.
- 2.7 *MARPOL* means the International Convention for the Prevention of Pollution from Ships, 1973, as modified by the Protocol of 1978 relating thereto as amended by the 1997 Protocol.
- 2.8 *Medium first-year ice* means first-year ice of 0.7 m to 1.2 m thickness.
- 2.9 *Old ice* means sea ice which has survived at least one summer's melt; typical thickness up to 3 m or more. It is subdivided into residual first-year ice, second-year ice and multi-year ice.
- 2.10 *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.
- 2.11 *Organization* means the International Maritime Organization.
- 2.12 *Sea ice* means any form of ice found at sea which has originated from the freezing of sea water.
- 2.13 *SOLAS* means the International Convention for the Safety of Life at Sea, 1974, as amended.
- 2.14 *STCW Convention* means the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers, 1978, as amended.

2.15 *Thin first-year ice* means first-year ice of 0.3 m to 0.7 m thickness.

### 3 Sources of hazards

3.1 The Polar Code considers hazards which may lead to elevated levels of risk due to increased probability of occurrence, more severe consequences, or both:

- .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 experiencing topside icing, with potential reduction of stability and equipment functionality;
- .3 low temperature, as it affects the working environment and human performance, maintenance 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 the 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; and
- .10 the environment with respect to sensitivity to harmful substances and other environmental impacts and its need for longer restoration.

3.2 The risk level within polar waters may differ depending on the geographical location, time of the 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.

### 4 Structure of the Code

This Code consists of Introduction, parts I and II. The Introduction contains mandatory provisions applicable to both parts I and II. Part I is subdivided into part I-A, which contains mandatory provisions on safety measures, and part I-B containing recommendations on safety. Part II is subdivided into part II-A, which contains mandatory provisions on pollution prevention, and part II-B containing recommendations on pollution prevention.

Figures illustrating the Antarctic area and Arctic waters, as defined in SOLAS regulations XIV/1.2 and XIV/1.3, respectively, and MARPOL Annex I, regulations 1.11.7 and 46.2; Annex II, regulations 13.8.1 and 21.2; Annex IV, regulations 17.2 and 17.3; and Annex V, regulations 1.14.7 and 13.2

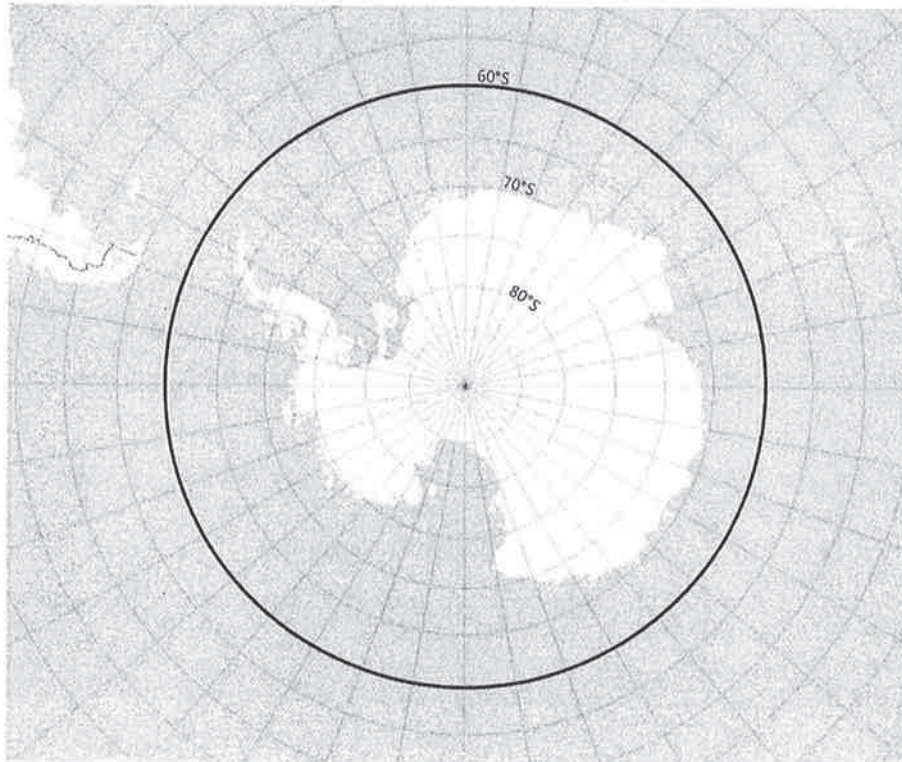


Figure 1 – Maximum extent of Antarctic area application

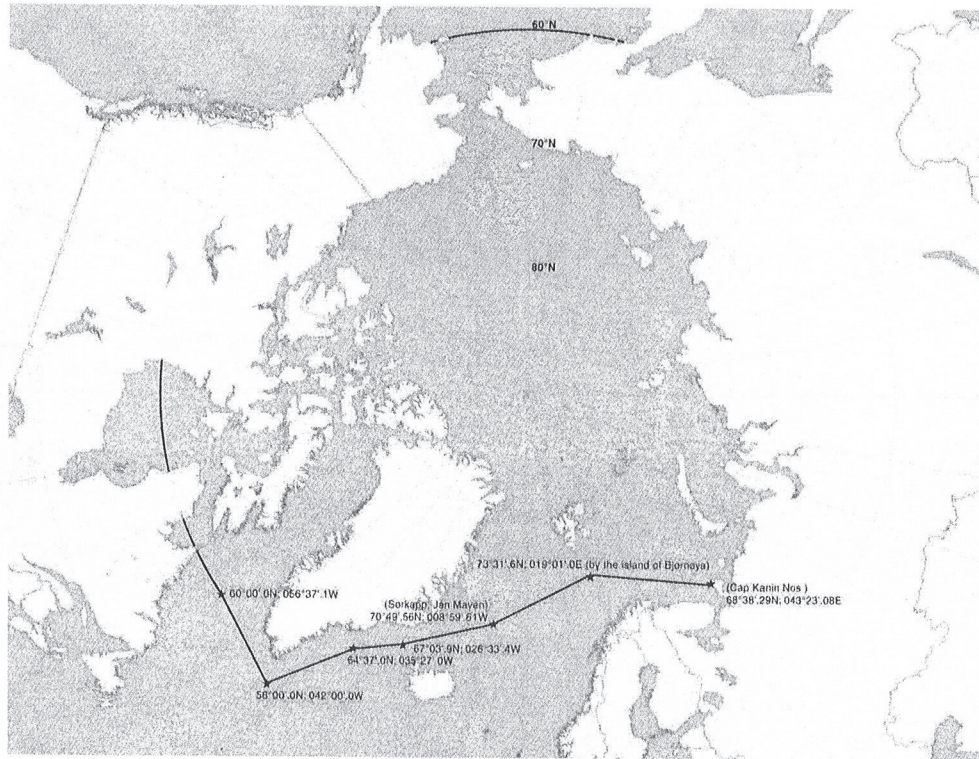


Figure 2 – Maximum extent of Arctic waters application

**PART I-A****SAFETY MEASURES****CHAPTER 1 – GENERAL****1.1 Structure of this part**

Each chapter in this part consists of the overall goal of the chapter, functional requirements to fulfil the goal, and regulations. A ship shall be considered to meet a functional requirement set out in this part when either:

- .1 the ship's design and arrangements comply with all the regulations associated with that functional requirement; or
- .2 part(s) or all of the ship's relevant design and arrangements have been reviewed and approved in accordance with regulation 4 of SOLAS chapter XIV, and any remaining parts of the ship comply with the relevant regulations.

**1.2 Definitions**

In addition to the definitions included in the relevant SOLAS chapters and the Introduction of this Code, the following definitions are applicable to this part.

1.2.1 *Bergy waters* mean an area of freely navigable water in which ice of land origin is present in concentrations less than 1/10. There may be sea ice present, although the total concentration of all ice shall not exceed 1/10.

1.2.2 *Escort* means any ship with superior ice capability in transit with another ship.

1.2.3 *Escorted operation* means any operation in which a ship's movement is facilitated through the intervention of an escort.

1.2.4 *Habitable environment* means a ventilated environment that will protect against hypothermia.

1.2.5 *Icebreaker* means any ship whose operational profile may include escort or ice management functions, whose powering and dimensions allow it to undertake aggressive operations in ice-covered waters.

1.2.6 *Ice Class* means the notation assigned to the ship by the Administration or by an organization recognized by the Administration showing that the ship has been designed for navigation in sea-ice conditions.

1.2.7 *Maximum expected time of rescue* means the time adopted for the design of equipment and system that provide survival support. It shall never be less than 5 days.

1.2.8 *Machinery installations* means equipment and machinery and associated piping and cabling, which is necessary for the safe operation of the ship.

1.2.9 *Mean Daily Low Temperature (MDLT)* means the mean value of the daily low temperature for each day of the year over a minimum 10 year period. A data set acceptable to the Administration may be used if 10 years of data is not available.

1.2.10 *Polar Class (PC)* means the ice class assigned to the ship by the Administration or by an organization recognized by the Administration based upon IACS Unified Requirements.

1.2.11 *Polar Service Temperature (PST)* means a temperature specified for a ship which is intended to operate in low air temperature, which shall be set at least 10°C below the lowest MDLT for the intended area and season of operation in polar waters.

1.2.12 *Ship intended to operate in low air temperature* means a ship which is intended to undertake voyages to or through areas where the lowest Mean Daily Low Temperature (MDLT) is below -10°C.

1.2.13 *Tankers* mean oil tankers as defined in SOLAS regulation II-1/2.22, chemical tankers as defined in SOLAS regulation II-1/3.19 and gas carriers as defined in SOLAS regulation VII/11.2.

1.2.14 *Upper ice waterline* means the waterline defined by the maximum draughts forward and aft for operation in ice.

### 1.3 Certificate and survey

1.3.1 Every ship to which this Code applies shall have on board a valid Polar Ship Certificate.

1.3.2 Except as provided for in paragraph 1.3.3, the Polar Ship Certificate shall be issued after an initial or renewal survey to a ship which complies with the relevant requirements of this Code.

1.3.3 For category C cargo ships, if the result of the assessment in paragraph 1.5 is that no additional equipment or structural modification is required to comply with the Polar Code, the Polar Ship Certificate may be issued based upon documented verification that the ship complies with all relevant requirements of the Polar Code. In this case, for continued validity of the certificate, an on board survey should be undertaken at the next scheduled survey.

1.3.4 The certificate referred to in this regulation shall be issued either by the Administration or by any person or organization recognized by it in accordance with SOLAS regulation XI-1/1. In every case, the Administration assumes full responsibility for the certificate.

1.3.5 The Polar Ship Certificate shall be drawn up in a form corresponding to the model given in appendix I to this Code. If the language used is neither English, nor French or Spanish, the text shall include a translation into one of these languages.

1.3.6 Polar Ship Certificate validity, survey dates and endorsements shall be harmonized with the relevant SOLAS certificates in accordance with the provisions of SOLAS regulation I/14. The certificate shall include a supplement, recording equipment required by the Code.

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 Organization.

#### 1.4 Performance standards

1.4.1 Unless expressly provided otherwise, ship systems and equipment addressed in this Code shall satisfy at least the same performance standards referred to in SOLAS.

1.4.2 For ships operating in low air temperature, a Polar Service Temperature (PST) shall be specified and shall be at least 10°C below the lowest MDLT for the intended area and season of operation in polar waters. Systems and equipment required by this Code shall be fully functional at the PST.

1.4.3 For ships operating in low air temperature, survival systems and equipment shall be fully operational at the PST during the maximum expected rescue time.

#### 1.5 Operational assessment

In order to establish procedures or operational limitations, an assessment of the ship and its equipment shall be carried out, taking into consideration the following:

- .1 the anticipated range of operating and environmental conditions, such as:
  - .1 operation in low air temperature;
  - .2 operation in ice;
  - .3 operation in high latitude; and
  - .4 potential for abandonment onto ice or land;
- .2 hazards, as listed in section 3 of the Introduction, as applicable; and
- .3 additional hazards, if identified.

### 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.

#### 2.2 Functional requirements

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.

2.2.2 The Manual shall include information on the ship-specific capabilities and limitations in relation to the assessment required under paragraph 1.5.

2.2.3 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.

2.2.4 The Manual shall include or refer to specific procedures to be followed in the event of incidents in polar waters.



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.

2.2.6 The Manual shall include or refer to procedures to be followed when using icebreaker assistance, as applicable.

### 2.3 Regulations

2.3.1 In order to comply with the functional requirements in section 2.2, the Manual shall be carried on board.

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.

2.3.3 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.

2.3.4 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.

2.3.5 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.

2.3.6 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.

## CHAPTER 3 – SHIP STRUCTURE

### 3.1 Goal

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.

### 3.2 Functional requirements

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:

- .1 for ships intended to operate in low air temperature, materials used shall be suitable for operation at the ships' PST; and
- .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 Regulations

3.3.1 In order to comply with the functional requirements of paragraph 3.2.1 above, materials of exposed structures in ships shall be approved by the Administration, or a recognized organization accepted by it, taking into account standards acceptable to the Organization or other standards offering an equivalent level of safety based on the polar service temperature.

3.3.2 In order to comply with the functional requirements of paragraph 3.2.2 above, the following applies:

- .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 Organization 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 Organization 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.

## CHAPTER 4 – SUBDIVISION AND STABILITY

### 4.1 Goal

The goal of this chapter is to ensure adequate subdivision and stability in both intact and damaged conditions.

### 4.2 Functional requirements

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:

- .1 ships shall have sufficient stability in intact conditions when subject to ice accretion; and
- .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 Regulations

#### 4.3.1 *Stability in intact conditions*

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/m<sup>2</sup> on exposed weather decks and gangways;
- .2 7.5 kg/m<sup>2</sup> 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%.

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.

#### 4.3.2 Stability in damaged conditions

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  $s_i$ , 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.

4.3.2.2 The ice damage extents to be assumed when demonstrating compliance with paragraph 4.3.2.1 shall be such that:

- .1 the longitudinal extent is 4.5% of the upper ice waterline length if centred forward of the maximum breadth on the upper ice waterline, and 1.5% of upper ice waterline length otherwise, and shall be assumed at any longitudinal position along the ship's length;
- .2 the transverse penetration extent is 760 mm, measured normal to the shell over the full extent of the damage; and
- .3 the vertical extent is the lesser of 20% of the upper ice waterline draught or the longitudinal extent, and shall be assumed at any vertical position between the keel and 120% of the upper ice waterline draught.

### CHAPTER 5 – WATERTIGHT AND WEATHERTIGHT INTEGRITY

#### 5.1 Goal

The goal of this chapter is to provide measures to maintain watertight and weathertight integrity.

#### 5.2 Functional requirements

In order to achieve the goal set out in paragraph 5.1 above, all closing appliances and doors relevant to watertight and weathertight integrity of the ship shall be operable.

#### 5.3 Regulations

In order to comply with the functional requirements of paragraph 5.2 above, the following applies:

- .1 for ships operating in areas and during periods where ice accretion is likely to occur, means shall be provided to remove or prevent ice and snow accretion around hatches and doors; and
- .2 in addition, for ships intended to operate in low air temperature the following apply:
  - .1 if the hatches or doors are hydraulically operated, means shall be provided to prevent freezing or excessive viscosity of liquids; and

- .2 watertight and weathertight doors, hatches and closing devices which are not within an habitable environment and require access while at sea shall be designed to be operated by personnel wearing heavy winter clothing including thick mittens.

## CHAPTER 6 – MACHINERY INSTALLATIONS

### 6.1 Goal

The goal of this chapter is to ensure that machinery installations are capable of delivering the required functionality necessary for safe operation of ships.

### 6.2 Functional requirements

6.2.1 In order to achieve the goal set out in paragraph 6.1 above, the following functional requirements are embodied in the regulations of this chapter.

6.2.1.1 Machinery installations shall provide functionality under the anticipated environmental conditions, taking into account:

- .1 ice accretion and/or snow accumulation;
- .2 ice ingestion from seawater;
- .3 freezing and increased viscosity of liquids;
- .4 seawater intake temperature; and
- .5 snow ingestion.

6.2.1.2 In addition, for ships intended to operate in low air temperatures:

- .1 machinery installations shall provide functionality under the anticipated environmental conditions, also taking into account:
  - .1 cold and dense inlet air; and
  - .2 loss of performance of battery or other stored energy device; and
- .2 materials used shall be suitable for operation at the ships' PST.

6.2.1.3 In addition, for ships ice strengthened in accordance with chapter 3, machinery installations shall provide functionality under the anticipated environmental conditions, taking into account loads imposed directly by ice interaction.

### 6.3 Regulations

6.3.1 In order to comply with the functional requirement of paragraph 6.2.1.1 above, taking into account the anticipated environmental conditions, the following applies:

- .1 machinery installations and associated equipment shall be protected against the effect of ice accretion and/or snow accumulation, ice ingestion from sea water, freezing and increased viscosity of liquids, seawater intake temperature and snow ingestion;

- .2 working liquids shall be maintained in a viscosity range that ensures operation of the machinery; and
- .3 seawater supplies for machinery systems shall be designed to prevent ingestion of ice, or otherwise arranged to ensure functionality.

6.3.2 In addition, for ships intended to operate in low air temperatures, the following applies:

- .1 in order to comply with the functional requirement of paragraph 6.2.1.2 above, exposed machinery and electrical installation and appliances shall function at the PST;
- .2 in order to comply with the functional requirement of paragraph 6.2.1.2.1 above, means shall be provided to ensure that combustion air for internal combustion engines driving essential machinery is maintained at a temperature in compliance with the criteria provided by the engine manufacturer; and
- .3 in order to comply with the functional requirements of paragraph 6.2.1.2.2 above, materials of exposed machinery and foundations shall be approved by the Administration, or a recognized organization accepted by it, taking into account standards acceptable to the Organization or other standards offering an equivalent level of safety based on the PST.

6.3.3 In addition, for ships ice strengthened in accordance with chapter 3, in order to comply with the functional requirements of paragraph 6.2.1.3 above, the following applies:

- .1 scantlings of propeller blades, propulsion line, steering equipment and other appendages of category A ships shall be approved by the Administration, or a recognized organization accepted by it, taking into account standards acceptable to the Organization or other standards offering an equivalent level of safety;
- .2 scantlings of propeller blades, propulsion line, steering equipment and other appendages of category B ships shall be approved by the Administration, or a recognized organization accepted by it, taking into account standards acceptable to the Organization or other standards offering an equivalent level of safety; and
- .3 scantlings of propeller blades, propulsion line, steering equipment and other appendages 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 with the ice types and concentration encountered in the area of operation.

## CHAPTER 7 – FIRE SAFETY/PROTECTION

### 7.1 Goal

The goal of this chapter is to ensure that fire safety systems and appliances are effective and operable, and that means of escape remain available so that persons on board can safely and swiftly escape to the lifeboat and liferaft embarkation deck under the expected environmental conditions.

## 7.2 Functional requirements

7.2.1 In order to achieve the goal set out in paragraph 7.1 above, the following functional requirements are embodied in the regulations of this chapter:

- .1 all components of fire safety systems and appliances if installed in exposed positions shall be protected from ice accretion and snow accumulation;
- .2 local equipment and machinery controls shall be arranged so as to avoid freezing, snow accumulation and ice accretion and their location to remain accessible at all time;
- .3 the design of fire safety systems and appliances shall take into consideration the need for persons to wear bulky and cumbersome cold weather gear, where appropriate;
- .4 means shall be provided to remove or prevent ice and snow accretion from accesses; and
- .5 extinguishing media shall be suitable for intended operation.

7.2.2 In addition, for ships intended to operate in low air temperature, the following applies:

- .1 all components of fire safety systems and appliances shall be designed to ensure availability and effectiveness at the PST; and
- .2 materials used in exposed fire safety systems shall be suitable for operation at the PST.

## 7.3 Regulations

7.3.1 In order to comply with the requirement of paragraph 7.2.1.1, the following applies:

- .1 isolating and pressure/vacuum valves in exposed locations shall be protected from ice accretion and remain accessible at all times; and
- .2 all two-way portable radio communication equipment shall be operable at the PST.

7.3.2 In order to comply with the requirement of paragraph 7.2.1.2, the following applies:

- .1 fire pumps, including emergency fire pumps, water mist and water spray pumps, shall be located in compartments maintained above freezing;
- .2 the fire main is to be arranged so that exposed sections can be isolated and means of draining of exposed sections shall be provided. Fire hoses and nozzles need not be connected to the fire main at all times, and may be stored in protected locations near the hydrants;
- .3 firefighter's outfits shall be stored in warm locations on the ship; and
- .4 where fixed water-based firefighting systems are located in a space separate from the main fire pumps and use their own independent sea suction, this sea suction shall also be capable of being cleared of ice accumulation.

7.3.3 In addition, for ships intended to operate in low air temperature, the following applies:

- .1 in order to comply with the requirement of paragraph 7.2.2.1, portable and semi-portable extinguishers shall be located in positions protected from freezing temperatures, as far as practical. Locations subject to freezing are to be provided with extinguishers capable of operation at the PST; and
- .2 in order to comply with the functional requirements of paragraph 7.2.2.2 above, materials of exposed fire safety systems shall be approved by the Administration, or a recognized organization accepted by it, taking into account standards acceptable to the Organization or other standards offering an equivalent level of safety based on the PST.

## CHAPTER 8 – LIFE-SAVING APPLIANCES AND ARRANGEMENTS

### 8.1 Goal

The goal of this chapter is to provide for safe escape, evacuation and survival.

### 8.2 Functional requirements

In order to achieve the goal set out in paragraph 8.1 above, the following functional requirements are embodied in the regulations of this chapter:

#### 8.2.1 *Escape*

8.2.1.1 Exposed escape routes shall remain accessible and safe, taking into consideration the potential icing of structures and snow accumulation.

8.2.1.2 Survival craft and muster and embarkation arrangements shall provide safe abandonment of ship, taking into consideration the possible adverse environmental conditions during an emergency.

#### 8.2.2 *Evacuation*

All life-saving appliances and associated equipment shall provide safe evacuation and be functional under the possible adverse environmental conditions during the maximum expected time of rescue.

#### 8.2.3 *Survival*

8.2.3.1 Adequate thermal protection shall be provided for all persons on board, taking into account the intended voyage, the anticipated weather conditions (cold and wind) and the potential for immersion in polar water, where applicable.

8.2.3.2 Life-saving appliances and associated equipment shall take account of the potential of operation in long periods of darkness, taking into consideration the intended voyage.

8.2.3.3 Taking into account the presence of any hazards, as identified in the assessment in chapter 1, resources shall be provided to support survival following abandoning ship, whether to the water, to ice or to land, for the maximum expected time of rescue. These resources shall provide:

- .1 a habitable environment;



- .2 protection of persons from the effects of cold, wind and sun;
- .3 space to accommodate persons equipped with thermal protection adequate for the environment;
- .4 means to provide sustenance;
- .5 safe access and exit points; and
- .6 means to communicate with rescue assets.

### **8.3 Regulations**

#### **8.3.1 Escape**

In order to comply with the functional requirements of paragraphs 8.2.1.1 and 8.2.1.2 above, the following applies:

- .1 for ships exposed to ice accretion, means shall be provided to remove or prevent ice and snow accretion from escape routes, muster stations, embarkation areas, survival craft, their launching appliances and access to survival craft;
- .2 in addition, for ships constructed on or after 1 January 2017, exposed escape routes shall be arranged so as not to hinder passage by persons wearing suitable polar clothing; and
- .3 in addition, for ships intended to operate in low air temperatures, adequacy of embarkation arrangements shall be assessed, having full regard to any effect of persons wearing additional polar clothing.

#### **8.3.2 Evacuation**

In order to comply with the functional requirement of paragraph 8.2.2 above, the following applies:

- .1 ships shall have means to ensure safe evacuation of persons, including safe deployment of survival equipment, when operating in ice-covered waters, or directly onto the ice, as applicable; and
- .2 where the regulations of this chapter are achieved by means of adding devices requiring a source of power, this source shall be able to operate independently of the ship's main source of power.

#### **8.3.3 Survival**

8.3.3.1 In order to comply with the functional requirement of paragraph 8.2.3.1 above, the following applies:

- .1 for passenger ships, a proper sized immersion suit or a thermal protective aid shall be provided for each person on board; and
- .2 where immersion suits are required, they shall be of the insulated type.

8.3.3.2 In addition, for ships intended to operate in extended periods of darkness, in order to comply with the functional requirements of paragraph 8.2.3.2 above, searchlights suitable for continuous use to facilitate identification of ice shall be provided for each lifeboat.

8.3.3.3 In order to comply with the functional requirement of paragraph 8.2.3.3 above, the following applies:

- .1 no lifeboat shall be of any type other than partially or totally enclosed;
- .2 taking into account the assessment referred to in chapter 1, appropriate survival resources, which address both individual (personal survival equipment) and shared (group survival equipment) needs, shall be provided, as follows:
  - .1 life-saving appliances and group survival equipment that provide effective protection against direct wind chill for all persons on board;
  - .2 personal survival equipment in combination with life-saving appliances or group survival equipment that provide sufficient thermal insulation to maintain the core temperature of persons; and
  - .3 personal survival equipment that provide sufficient protection to prevent frostbite of all extremities; and
- .3 in addition, whenever the assessment required under paragraph 1.5 identifies a potential of abandonment onto ice or land, the following applies:
  - .1 group survival equipment shall be carried, unless an equivalent level of functionality for survival is provided by the ship's normal life-saving appliances;
  - .2 when required, personal and group survival equipment sufficient for 110% of the persons on board shall be stowed in easily accessible locations, as close as practical to the muster or embarkation stations;
  - .3 containers for group survival equipment shall be designed to be easily movable over the ice and be floatable;
  - .4 whenever the assessment identifies the need to carry personal and group survival equipment, means shall be identified of ensuring that this equipment is accessible following abandonment;
  - .5 if carried in addition to persons, in the survival craft, the survival craft and launching appliances shall have sufficient capacity to accommodate the additional equipment;
  - .6 passengers shall be instructed in the use of the personal survival equipment and the action to take in an emergency; and
  - .7 the crew shall be trained in the use of the personal survival equipment and group survival equipment.

8.3.3.4 In order to comply with the functional requirement of paragraph 8.2.3.3.4 above, adequate emergency rations shall be provided, for the maximum expected time of rescue.

**CHAPTER 9 – SAFETY OF NAVIGATION****9.1 Goal**

The goal of this chapter is to provide for safe navigation.

**9.2 Functional requirements**

In order to achieve the goal set out in paragraph 9.1 above, the following functional requirements are embodied in the regulations of this chapter.

**9.2.1 Nautical information**

Ships shall have the ability to receive up-to-date information including ice information for safe navigation.

**9.2.2 Navigational equipment functionality**

9.2.2.1 The navigational equipment and systems shall be designed, constructed, and installed to retain their functionality under the expected environmental conditions in the area of operation.

9.2.2.2 Systems for providing reference headings and position fixing shall be suitable for the intended areas.

**9.2.3 Additional navigational equipment**

9.2.3.1 Ships shall have the ability to visually detect ice when operating in darkness.

9.2.3.2 Ships involved in operations with an icebreaker escort shall have suitable means to indicate when the ship is stopped.

**9.3 Regulations****9.3.1 Nautical information**

In order to comply with the functional requirement of paragraph 9.2.1 above, ships shall have means of receiving and displaying current information on ice conditions in the area of operation.

**9.3.2 Navigational equipment functionality**

9.3.2.1 In order to comply with the functional requirement of paragraph 9.2.2.1 above, the following applies:

- .1 ships constructed on or after 1 January 2017, ice strengthened in accordance with chapter 3, shall have either two independent echo-sounding devices or one echo-sounding device with two separate independent transducers;
- .2 ships shall comply with SOLAS regulation V/22.1.9.4, irrespective of the date of construction and the size and, depending on the bridge configuration, have a clear view astern;

- .3 for ships operating in areas and during periods where ice accretion is likely to occur, means to prevent the accumulation of ice on antennas required for navigation and communication shall be provided; and
- .4 in addition, for ships ice strengthened in accordance with chapter 3, the following applies:
  - .1 where equipment required by SOLAS chapter V or this chapter has sensors that project below the hull, such sensors shall be protected against ice; and
  - .2 in category A and B ships constructed on or after 1 January 2017, the bridge wings shall be enclosed or designed to protect navigational equipment and operating personnel.

9.3.2.2 In order to comply with the functional requirement of paragraph 9.2.2.2 above, the following applies:

- .1 ships shall have two non-magnetic means to determine and display their heading. Both means shall be independent and shall be connected to the ship's main and emergency source of power; and
- .2 ships proceeding to latitudes over 80° shall be fitted with at least one GNSS compass or equivalent, which shall be connected to the ship's main and emergency source of power.

### 9.3.3 *Additional navigational equipment*

9.3.3.1 In order to comply with the functional requirement of paragraph 9.2.3.1, ships, with the exception of those solely operating in areas with 24 h daylight, shall be equipped with two remotely rotatable, narrow-beam search lights controllable from the bridge to provide lighting over an arc of 360°, or other means to visually detect ice.

9.3.3.2 In order to comply with the functional requirement of paragraph 9.2.3.2, ships involved in operations with an icebreaker escort shall be equipped with a manually initiated flashing red light visible from astern to indicate when the ship is stopped. This light shall have a range of visibility of at least two nautical miles, and the horizontal and vertical arcs of visibility shall conform to the stern light specifications required by the *International Regulations for Preventing Collisions at Sea*.

## CHAPTER 10 – COMMUNICATION

### 10.1 Goal

The goal of this chapter is to provide for effective communication for ships and survival craft during normal operation and in emergency situations.

### 10.2 Functional requirements

In order to achieve the goal set out in paragraph 10.1 above, the following functional requirements are embodied in the regulations of this chapter.

### **10.2.1 Ship communication**

10.2.1.1 Two-way voice and/or data communications ship-to-ship and ship-to-shore shall be available at all points along the intended operating routes.

10.2.1.2 Suitable means of communications shall be provided where escort and convoy operations are expected.

10.2.1.3 Means for two-way on-scene and SAR coordination communications for search and rescue purposes including aeronautical frequencies shall be provided.

10.2.1.4 Appropriate communication equipment to enable telemedical assistance in polar areas shall be provided.

### **10.2.2 Survival craft and rescue boat communications capabilities**

10.2.2.1 For ships intended to operate in low air temperature, all rescue boats and lifeboats, whenever released for evacuation, shall maintain capability for distress alerting, locating and on-scene communications.

10.2.2.2 For ships intended to operate in low air temperature, all other survival craft, whenever released, shall maintain capability for transmitting signals for location and for communication.

10.2.2.3 Mandatory communication equipment for use in survival craft, including liferafts and rescue boats, shall be capable of operation during the maximum expected time of rescue.

## **10.3 Regulations**

### **10.3.1 Ship communication**

10.3.1.1 In order to comply with the functional requirements of paragraph 10.2.1.1 above, communication equipment on board shall have the capabilities for ship-to-ship and ship-to-shore communication, taking into account the limitations of communications systems in high latitudes and the anticipated low temperature.

10.3.1.2 In order to comply with the functional requirements of paragraph 10.2.1.2 above, ships intended to provide icebreaking escort shall be equipped with a sound signaling system mounted to face astern to indicate escort and emergency manoeuvres to following ships as described in the *International Code of Signals*.

10.3.1.3 In order to comply with the functional requirements of paragraph 10.2.1.3 above, two-way on-scene and SAR coordination communication capability in ships shall include:

- .1 voice and/or data communications with relevant rescue coordination centres; and
- .2 equipment for voice communications with aircraft on 121.5 and 123.1 MHz.

10.3.1.4 In order to comply with the functional requirements of paragraph 10.2.1.4 above, the communication equipment shall provide for two-way voice and data communication with a Telemedical Assistance Service (TMAS).

### **10.3.2 Survival craft and rescue boat communications capabilities**

10.3.2.1 For ships intended to operate in low air temperature, in order to comply with the functional requirements of paragraph 10.2.2.1 above, all rescue boats and lifeboats, whenever released for evacuation, shall:

- .1 for distress alerting, carry one device for transmitting ship-to-shore alerts;
- .2 in order to be located, carry one device for transmitting signals for location; and
- .3 for on-scene communications, carry one device for transmitting and receiving on-scene communications.

10.3.2.2 For ships intended to operate in low air temperature, in order to comply with the functional requirements of paragraph 10.2.2.2 above, all other survival craft shall:

- .1 in order to be located, carry one device for transmitting signals for location; and
- .2 for on-scene communications, carry one device for transmitting and receiving on-scene communications.

10.3.2.3 In order to comply with the functional requirements of paragraph 10.2.2.3 above, recognizing the limitations arising from battery life, procedures shall be developed and implemented such that mandatory communication equipment for use in survival craft, including liferafts and rescue boats, are available for operation during the maximum expected time of rescue.

## **CHAPTER 11 – VOYAGE PLANNING**

### **11.1 Goal**

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 Functional requirements**

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 Requirements**

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 SAR capabilities.

## 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

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 Regulations

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.<br>Basic training for officers in charge of a navigational watch. | Advanced training for master and chief mate.<br>Basic training for officers in charge of a navigational watch. | Advanced training for master and chief mate.<br>Basic training for officers in charge of a navigational watch. |

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:

- .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 meet the advance training requirements set out in the table in paragraph 12.3.1;
- .2 while operating in polar waters the ship carries a 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 set out in the table in paragraph 12.3.1; and
- .5 when operating in waters with an 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 set out in the table in paragraph 12.3.1.

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.

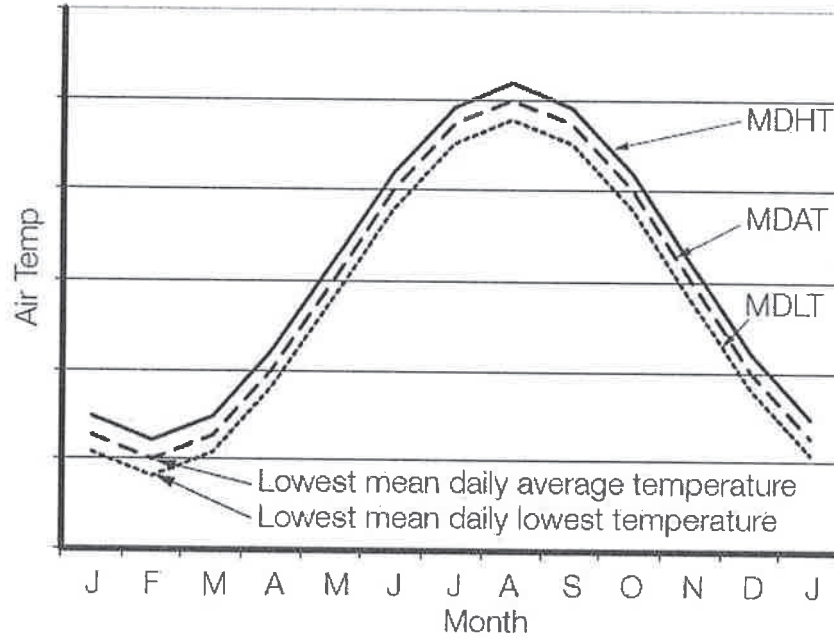
12.3.4 Every crew member shall be made familiar with the procedures and equipment contained or referenced in the PWOM relevant to their assigned duties.



## PART I-B

ADDITIONAL GUIDANCE REGARDING THE PROVISIONS  
OF THE INTRODUCTION AND PART I-A

## 1 Additional guidance to section 2 (definitions) of the Introduction

**Definitions used in the figure above**

MDHT – Mean Daily High Temperature

MDAT – Mean Daily Average Temperature

MDLT – Mean Daily Low Temperature

**Guidance instructions for determining MDLT:**

- 1 Determine the daily low temperature for each day for a 10 year period.
- 2 Determine the average of the values over the 10 year period for each day.
- 3 Plot the daily averages over the year.
- 4 Take the lowest of the averages for the season of operation.

## 2 Additional guidance to chapter 1 (General)

### 2.1 Limitations for operating in ice

2.1.1 Limitations for operation in ice can be determined using systems, tools or analysis that evaluate the risks posed by the anticipated ice conditions to the ship, taking into account factors such as its ice class, seasonal changing of ice strength, icebreaker support, ice type, thickness and concentration. The ship's structural capacity to resist ice load and the ship's planned operations should be considered. The limitations should be incorporated into an ice operational decision support system.

2.1.2 Limitations for operating in ice should be determined using an appropriate methodology, if such methodologies exist, have been in use for a number of years and have been validated with service experience. Existing methodologies and other systems may be acceptable to the Administration.

2.1.3 Operation in ice should take into account any operational limitations of the ship, extended information on the ice operational methodology contained in the PWOM, the condition of the ship and ship's systems, historical weather/ice data and weather/ice forecasts for the intended area of operation, current conditions including visual ice observations, sea state, visibility and the judgment of qualified personnel.

### 2.2 Operational assessment

2.2.1 This guidance is intended to support shipowners carrying out, and Administrations reviewing, the assessment required in part I-A, section 1.5, for operational limitations and procedures for the Polar Ship Certificate.

2.2.2 Steps for an operational assessment:

- .1 identify relevant hazards from section 3 of the Introduction and other hazards based on a review of the intended operations;
- .2 develop a model\* to analyse risks considering:
  - .1 development of accident scenarios;
  - .2 probability of events in each accident scenario; and
  - .3 consequence of end states in each scenario;
- .3 assess risks and determine acceptability:
  - .1 estimate risk levels in accordance with the selected modelling approach;
  - .2 assess whether risk levels are acceptable; and

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\* Reference is made to the techniques in appendix 3 of the *Revised guidelines for Formal Safety Assessment (FSA) for use in the IMO rule-making process* (MSC-MEPC.2/Circ.12) and standard IEC/ISO 31010 "Risk management – Risk assessment techniques".

- .4 in the event that risk levels determined in steps 1 to 3 are considered to be too high, identify current or develop new risk control options that aim to achieve one or more of the following:
  - .1 reduce the frequency of failures through better design, procedures, training, etc.;
  - .2 mitigate the effect of failures in order to prevent accidents;
  - .3 limit the circumstances in which failures may occur; or
  - .4 mitigate consequences of accidents; and
  - .5 incorporate risk control options for design, procedures, training and limitations, as applicable.

### **2.3 Performance standards**

A system previously accepted based on manufacturer certifications, classification society certifications and/or satisfactory service of existing systems may be acceptable for installation on new and existing ships if no performance or testing standards are accepted by the Organization.

## **3 Additional guidance to chapter 2 (Polar Water Operational Manual (PWOM))**

### **3.1 Recommendation on the content of the PWOM**

3.1.1 The PWOM is intended to address all aspects of operations addressed by chapter 2 of part I-A. When appropriate information, procedures or plans exist elsewhere in a ship's documentation, the PWOM itself does not need to replicate this material, but may instead cross-reference the relevant reference document.

3.1.2 A model table of contents is set out in appendix II.

3.1.3 The model follows the general structure of chapter 2. Not every section outlined below will be applicable to every polar ship. Many category C ships that undertake occasional or limit polar voyages will not need to have procedures for situations with a very low probability of occurrence. However, it may still be advisable to retain a common structure for the PWOM as a reminder that if assumptions change then the contents of the manual may also need to be updated. Noting an aspect as "not applicable" also indicates to the Administration that this aspect has been considered and not merely omitted.

### **3.2 Guidance on navigation with icebreaker assistance**

With respect to navigation with icebreaker assistance, the following should be considered:

- .1 while approaching the starting point of the ice convoy to follow an icebreaker/icebreakers or in the case of escorting by icebreaker of one ship to the point of meeting with the icebreaker, ships should establish radio communication on the VHF channel 16 and act in compliance with the icebreaker's instructions;
- .2 the icebreaker rendering the icebreaker assistance of ship ice convoy should command ships in the ice convoy;

- .3 position of a ship in the ice convoy should be determined by the icebreaker rendering the assistance;
- .4 ship within the ice convoy, in accordance with the instructions of the icebreaker rendering the assistance, should establish communication with the icebreaker by VHF channel indicated by the icebreaker;
- .5 the ship, while navigating in the ice convoy, should ensure compliance with the instructions of the icebreaker;
- .6 position in the ice convoy, speed and distance to a ship ahead should be as instructed by the icebreaker;
- .7 the ship should immediately notify the icebreaker of any difficulties to maintain the position within the ice convoy, speed and/or distance to any other ship in the ice convoy; and
- .8 the ship should immediately report to the icebreaker of any damage.

### 3.3 *Guidance on the development of contingency plans*

In developing the ship's contingency plans ships should consider damage control measures arrangements for emergency transfer of liquids and access to tanks and spaces during salvage operations (see also additional guidance to chapter 9).

## 4 **Additional guidance to chapter 3 (Ship structure)**

### *Method for determining equivalent ice class*

4.1 The guidance presented below is intended to assist in determining equivalency with standards acceptable to the Organization, as referenced in chapters 3 and 6 of the Code. The methodology is consistent with guidance developed by the Organization\* while allowing for the use of a simplified approach.

4.2 The basic approach for considering equivalency for categories A and B ships can be the same for both new and existing ships. It involves comparing other ice classes to the IACS Polar Classes. For ice classes under category C, additional information on comparisons of strengthening levels is available for the guidance of owners and Administrations†. The responsibility for generating the equivalency request and supporting information required should rest with the owner/operator. Review/approval of any equivalency request should be undertaken by the flag State Administration, or by a recognized organization acting on its behalf under the provisions of the Code for Recognized Organizations (RO Code). Several classification societies have developed easy-to-use tools for determination of compliance with the IACS Polar Class structural requirements, as have some Administrations and other third parties.

4.3 The scope of a simplified equivalency assessment (see paragraph 4.6 below) is expected to be limited to materials selection, structural strength of the hull and propulsion machinery.

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\* Refer to the *Guidelines for the approval of alternatives and equivalents as provided for in various IMO instruments* (MSC.1/Circ.1455).

† Refer to the annex to HELCOM Recommendation 25/7, Safety of Winter Navigation in the Baltic Sea Area, available at [www.helcom.fi](http://www.helcom.fi)

4.4 If there is not full and direct compliance, then an equivalent level of risk can be accepted in accordance with guidance provided by the Organization. An increase in the probability of an event can be balanced by a reduction in its consequences. Alternatively, a reduction in probability could potentially allow acceptance of more serious consequences. Using a hull area example, a local shortfall in strength level or material grade could be accepted if the internal compartment is a void space, for which local damage will not put the overall safety of the ship at risk or lead to any release of pollutants.

4.5 For existing ships, service experience can assist in risk assessment. As an example, for an existing ship with a record of polar ice operations a shortfall in the extent of the ice belt (hull areas) may be acceptable if there is no record of damage to the deficient area; i.e. a ship that would generally meet PC 5 requirements but in limited areas is only PC 7 could still be considered as a category A, PC 5 ship. In all such cases, the ship's documentation should make clear the nature and scope of any deficiencies.

4.6 The process includes the following stages of assessment:

- .1 select the target Polar Class for equivalency;
- .2 compare materials used in the design with minimum requirements under the IACS Polar Class URs; identify any shortfalls; and
- .3 compare strength levels of hull and machinery components design with requirements under the IACS Polar Class URs; quantify levels of compliance.

Where gaps in compliance are identified in steps 1 to 3, additional steps should be necessary to demonstrate equivalency, as outlined below:

- .4 identify any risk mitigation measures incorporated in the design of the ship (over and above the requirements of the Code and IACS URs);
- .5 where applicable, provide documentation of service experience of existing ships, in conditions relevant to the target ice class for equivalency; and
- .6 undertake an assessment, taking into account information from steps 1 to 5, as applicable, and the principles outlined in paragraphs 4.2 to 4.6 above.

4.7 Documentation provided with an application for equivalency should identify each stage that has been undertaken, and sufficient supporting information to validate assessments.

4.8 Where a ship in categories A or B is provided with an equivalency for ice class by its flag State, this should be noted in its Polar Ship Certificate.

#### **5 Additional guidance to chapter 4 (Subdivision and stability)**

No additional guidance

#### **6 Additional guidance to chapter 5 (Watertight and weathertight integrity)**

No additional guidance.

#### **7 Additional guidance to chapter 6 (Machinery installations)**

Refer to additional guidance to chapter 3.

**8 Additional guidance to chapter 7 (Fire safety/protection)**

No additional guidance.

**9 Additional guidance to chapter 8 (Life-saving appliances and arrangements)****9.1 Sample personal survival equipment**

When considering resources to be included with the personal survival equipment, the following should be taken into account:

| Suggested equipment  |
|--|
| Protective clothing (hat, gloves, socks, face and neck protection, etc.) |
| Skin protection cream  |
| Thermal protective aid   |
| Sunglasses   |
| Whistle  |
| Drinking mug   |
| Penknife   |
| Polar survival guidance  |
| Emergency food   |
| Carrying bag   |

**9.2 Sample group survival equipment**

When considering resources to be included in the group survival equipment, the following should be taken into account:

| Suggested equipment   |
|---|
| Shelter – tents or storm shelters or equivalent – sufficient for maximum number of persons              |
| Thermal protective aids or similar – sufficient for maximum number of persons                           |
| Sleeping bags – sufficient for at least one between two persons   |
| Foam sleeping mats or similar – sufficient for at least one between two persons                         |
| Shovels – at least 2  |
| Sanitation (e.g. toilet paper)  |
| Stove and fuel – sufficient for maximum number of persons ashore and maximum anticipated time of rescue |
| Emergency food – sufficient for maximum number of persons ashore and maximum anticipated time of rescue |
| Flashlights – one per shelter   |
| Waterproof and windproof matches – two boxes per shelter  |

| <b>Suggested equipment</b>                                    |
|---|
| Whistle   |
| Signal mirror   |
| Water containers & water purification tablets                 |
| Spare set of personal survival equipment                      |
| Group survival equipment container (waterproof and floatable) |

## **10 Additional guidance to chapter 9 (Safety of navigation)**

10.1 Radars equipped with enhanced ice detection capability should be promoted to be used, in particular in shallow waters.

10.2 As the chart coverage of polar waters in many areas may not currently be adequate for coastal navigation, navigational officers should:

- .1 exercise care to plan and monitor their voyage accordingly, taking due account of the information and guidance in the appropriate nautical publications;
- .2 be familiar with the status of hydrographic surveys and the availability and quality of chart information for the areas in which they intend to operate;
- .3 be aware of potential chart datum discrepancies with GNSS positioning; and
- .4 aim to plan their route through charted areas and well clear of known shoal depths, following established routes whenever possible.

10.3 Any deviations from the planned route should be undertaken with particular caution. For example, and when operating on the continental shelf:

- .1 the echo-sounder should be working and monitored to detect any sign of unexpected depth variation, especially when the chart is not based on a full search of the sea floor; and
- .2 independent cross-checking of positioning information (e.g. visual and radar fixing and GNSS) should be undertaken at every opportunity. Mariners should ensure to report to the relevant charting authority (Hydrographic Office) any information that might contribute to improving the nautical charts and publications.

10.4 Ships should be fitted with:

- .1 a suitable means to de-ice sufficient conning position windows to provide unimpaired forward and astern vision from conning positions; and

- .2 an efficient means of clearing melted ice, freezing rain, snow, mist and spray from outside and accumulated condensation from inside. A mechanical means to clear moisture from the outside face of a window should have operating mechanisms protected from freezing or the accumulation of ice that would impair effective operation.

## **11 Additional guidance to chapter 10 (Communication)**

### **11.1 Limitations of communication systems in high latitude**

11.1.1 Current maritime digital communication systems were not designed to cover polar waters.

11.1.2 VHF is still largely used for communication at sea, but only over short distances (line of sight) and normally only for voice communication. HF and MF are also used for emergency situations. Digital VHF, mobile phone systems and other types of wireless technology offer enough digital capacity for many maritime applications, but only to ships within sight of shore-based stations, and are, therefore, not generally available in polar waters. AIS could also be used for low data-rate communication, but there are very few base stations, and the satellite-based AIS system is designed for data reception only.

11.1.3 The theoretical limit of coverage for GEO systems is 81.3° North or South, but instability and signal dropouts can occur at latitudes as low as 70° North or South under certain conditions. Many factors influence the quality of service offered by GEO systems, and they have different effects depending on the system design.

11.1.4 Non-GMDSS systems may be available and may be effective for communication in polar waters.

### **11.2 Advice for the operation of multiple alerting and communication devices in the event of an incident**

11.2.1 A procedure should be developed to ensure that when survival craft are in close proximity, not more than two alerting or locating devices are activated (as required by regulation 10.3.2) at the same time. This is to:

- .1 preserve battery life;
- .2 enable extended periods of time for the transmission of alerting or locating signals; and
- .3 avoid potential interference.

11.2.2 For satellite distress beacons, although multiple beacon transmissions can be detected successfully by the satellite system, it is not recommended to activate multiple beacons, unless the survival craft operating the beacons are widely dispersed, as this can cause interference on direction-finding equipment.



**11.3 Advice on location and communication equipment to be carried by rescue boats and survival craft**

In determining the equipment to be carried for transmitting signals for location, the capabilities of the search and rescue resources likely to respond should be borne in mind. Responding ships and aircraft may not be able to home to 406/121.5 MHz, in which case other locating devices (e.g. AIS-SART) should be considered.

**12 Additional guidance to chapter 11 (Voyage planning)**

In developing and executing a voyage plan ships should consider the following:

- .1 in the event that marine mammals are encountered, any existing best practices should be considered to minimize unnecessary disturbance; and
- .2 planning to minimize the impact of the ship's voyage where ships are trafficking near areas of cultural heritage and cultural significance.

(see also additional guidance to chapter 9)

**13 Additional guidance to chapter 12 (Manning and training)**

No additional guidance.

**PART II-A  
POLLUTION PREVENTION MEASURES**

**CHAPTER 1 – PREVENTION OF POLLUTION BY OIL**

**1.1 Operational requirements**

1.1.1 In Arctic waters any discharge into the sea of oil or oily mixtures from any ship shall be prohibited.

1.1.2 The provisions of paragraph 1.1.1 shall not apply to the discharge of clean or segregated ballast.

1.1.3 Subject to the approval of the Administration, a category A ship constructed before 1 January 2017 that cannot comply with paragraph 1.1.1 for oil or oily mixtures from machinery spaces and is operating continuously in Arctic waters for more than 30 days shall comply with paragraph 1.1.1 not later than the first intermediate or renewal survey, whichever comes first, one year after 1 January 2017. Until that date such ships shall comply with the discharge requirements of regulation 15.3 of MARPOL Annex I.

1.1.4 Operation in polar waters shall be taken into account, as appropriate, in the Oil Record Books, manuals and the shipboard oil pollution emergency plan or the shipboard marine pollution emergency plan as required by MARPOL Annex I.

**1.2 Structural requirements**

1.2.1 For category A and B ships constructed on or after 1 January 2017 with an aggregate oil fuel capacity of less than 600 m<sup>3</sup>, all oil fuel tanks shall be separated from the outer shell by a distance of not less than 0.76 m. This provision does not apply to small oil fuel tanks with a maximum individual capacity not greater than 30 m<sup>3</sup>.

1.2.2 For category A and B ships other than oil tankers constructed on or after 1 January 2017, all cargo tanks constructed and utilized to carry oil shall be separated from the outer shell by a distance of not less than 0.76 m.

1.2.3 For category A and B oil tankers of less than 5,000 tonnes deadweight constructed on or after 1 January 2017, the entire cargo tank length shall be protected with:

- .1 double bottom tanks or spaces complying with the applicable requirements of regulation 19.6.1 of MARPOL Annex I; and
- .2 wing tanks or spaces arranged in accordance with regulation 19.3.1 of MARPOL Annex I and complying with the applicable requirements for distance referred to in regulation 19.6.2 of MARPOL Annex I.

1.2.4 For category A and B ships constructed on or after 1 January 2017 all oil residue (sludge) tanks and oily bilge water holding tanks shall be separated from the outer shell by a distance of not less than 0.76 m. This provision does not apply to small tanks with a maximum individual capacity not greater than 30 m<sup>3</sup>.

## CHAPTER 2 – CONTROL OF POLLUTION BY NOXIOUS LIQUID SUBSTANCES IN BULK

### 2.1 Operational requirements

2.1.1 In Arctic waters any discharge into the sea of noxious liquid substances (NLS), or mixtures containing such substances, shall be prohibited.

2.1.2 Operation in polar waters shall be taken into account, as appropriate, in the Cargo Record Book, the Manual and the shipboard marine pollution emergency plan for noxious liquid substances or the shipboard marine pollution emergency plan as required by MARPOL Annex II.

2.1.3 For category A and B ships constructed on or after 1 January 2017, the carriage of NLS identified in chapter 17, column e, as ship type 3 or identified as NLS in chapter 18 of the *International Code for the Construction and Equipment of Ships Carrying Dangerous Chemicals in Bulk*, in cargo tanks of type 3 ships shall be subject to the approval of the Administration. The results shall be reflected on the International Pollution Prevention Certificate for the Carriage of Noxious Liquid Substances in Bulk or Certificate of Fitness identifying the operation in polar waters.

## CHAPTER 3 – PREVENTION OF POLLUTION BY HARMFUL SUBSTANCES CARRIED BY SEA IN PACKAGED FORM

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## CHAPTER 4 – PREVENTION OF POLLUTION BY SEWAGE FROM SHIPS

### 4.1 Definitions

4.1.1 *Constructed* means a ship the keel of which is laid or which is at a similar stage of construction.

4.1.2 *Ice-shelf* means a floating ice sheet of considerable thickness, showing 2 to 50 m or more above sea-level, attached to the coast.

4.1.3 *Fast ice* means 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.

### 4.2 Operational requirements

4.2.1 Discharges of sewage within polar waters are prohibited except when performed in accordance with MARPOL Annex IV and the following requirements:

- .1 the ship is discharging comminuted and disinfected sewage in accordance with regulation 11.1.1 of MARPOL Annex IV at a distance of more than three nautical miles from any ice-shelf or fast ice and shall be as far as practicable from areas of ice concentration exceeding 1/10; or
- .2 the ship is discharging sewage that is not comminuted or disinfected in accordance with regulation 11.1.1 of MARPOL Annex IV and at a distance of more than 12 nautical miles from any ice-shelf or fast ice and shall be as far as practicable from areas of ice concentration exceeding 1/10; or

- .3 the ship has in operation an approved sewage treatment plant certified by the Administration to meet the operational requirements in either regulation 9.1.1 or 9.2.1 of MARPOL Annex IV, and discharges sewage in accordance with regulation 11.1.2 of Annex IV and shall be as far as practicable from the nearest land, any ice-shelf, fast ice or areas of ice concentration exceeding 1/10.

4.2.2 Discharge of sewage into the sea from category A and B ships constructed on or after 1 January 2017 and all passenger ships constructed on or after 1 January 2017 is prohibited, except when such discharges are in compliance with paragraph 4.2.1.3 of this chapter.

4.2.3 Notwithstanding the requirements of paragraph 4.2.1, category A and B ships that operate in areas of ice concentrations exceeding 1/10 for extended periods of time, may only discharge sewage using an approved sewage treatment plant certified by the Administration to meet the operational requirements in regulation 9.1.1 or 9.2.1 of MARPOL Annex IV. Such discharges shall be subject to approval by the Administration.

## CHAPTER 5 – PREVENTION OF POLLUTION BY GARBAGE FROM SHIPS

### 5.1 Definitions

5.1.1 *Ice-shelf* means a floating ice sheet of considerable thickness, showing 2 to 50 m or more above sea-level, attached to the coast.

5.1.2 *Fast ice* means 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

### 5.2 Operational requirements

5.2.1 In Arctic waters, discharge of garbage into the sea permitted in accordance with regulation 4 of MARPOL Annex V shall meet the following additional requirements:

- .1 discharge into the sea of food wastes is only permitted when the ship is as far as practicable from areas of ice concentration exceeding 1/10, but in any case not less than 12 nautical miles from the nearest land, nearest ice-shelf, or nearest fast ice;
- .2 food wastes shall be comminuted or ground and shall be capable of passing through a screen with openings no greater than 25 mm. Food wastes shall not be contaminated by any other garbage type;
- .3 food wastes shall not be discharged onto the ice;
- .4 discharge of animal carcasses is prohibited; and
- .5 discharge of cargo residues that cannot be recovered using commonly available methods for unloading shall only be permitted while the ship is en route and where all of the following conditions are satisfied:
  - .1 cargo residues, cleaning agents or additives, contained in hold washing water do not include any substances classified as harmful to the marine environment, taking into account guidelines developed by the Organization;

- .2 both the port of departure and the next port of destination are within Arctic waters and the ship will not transit outside Arctic waters between those ports;
- .3 no adequate reception facilities are available at those ports, taking into account guidelines developed by the Organization; and
- .4 where the conditions of subparagraphs 5.2.1.5.1, 5.2.1.5.2 and 5.2.1.5.3 of this paragraph have been fulfilled, discharge of cargo hold washing water containing residues shall be made as far as practicable from areas of ice concentration exceeding 1/10, but in any case not less than 12 nautical miles from the nearest land, nearest ice shelf, or nearest fast ice.

5.2.2 In the Antarctic area, discharge of garbage into the sea permitted in accordance with regulation 6 of MARPOL Annex V shall meet the following additional requirements:

- .1 discharges under regulation 6.1 of MARPOL Annex V shall be as far as practicable from areas of ice concentration exceeding 1/10, but in any case not less than 12 nautical miles from the nearest fast ice; and
- .2 food waste shall not be discharged onto ice.

5.2.3 Operation in polar waters shall be taken into account, as appropriate, in the Garbage Record Book, Garbage Management Plan and the placards as required by MARPOL Annex V.

**PART II-B****ADDITIONAL GUIDANCE REGARDING THE PROVISIONS OF THE INTRODUCTION  
AND PART II-A****1 Additional guidance to chapter 1**

1.1 Ships are encouraged to apply regulation 43 of MARPOL Annex I when operating in Arctic waters.

1.2 Non-toxic biodegradable lubricants or water-based systems should be considered in lubricated components located outside the underwater hull with direct seawater interfaces, like shaft seals and slewing seals.

**2 Additional guidance to chapter 2**

Category A and B ships, constructed on or after 1 January 2017 and certified to carry noxious liquid substances (NLS), are encouraged to carry NLS identified in chapter 17, column e, as ship type 3 or identified as NLS in chapter 18 of the *International Code for the Construction and Equipment of Ships Carrying Dangerous Chemicals in Bulk*, in tanks separated from the outer shell by a distance of not less than 760 mm.

**3 Additional guidance to chapter 5**

In order to minimize the risks associated with animal cargo mortalities, consideration should be given to how animal carcasses will be managed, treated and stored on board when ships carrying such cargo are operating in polar waters. Reference is made in particular to the *2012 Guidelines for the implementation of MARPOL Annex V* (resolution MEPC.219(63), as amended by resolution MEPC.239(65)) and the *2012 Guidelines for the development of garbage management plans* (resolution MEPC.220(63)).

**4 Additional guidance under other environmental conventions and guidelines**

4.1 Until the *International Convention for the Control and Management of Ships' Ballast Water and Sediments* enters into force, the ballast water management provisions of the ballast water exchange standard, set out in regulation D-1, or the ballast water performance standard, set out in regulation D-2 of the Convention should be considered as appropriate. The provisions of the *Guidelines for ballast water exchange in the Antarctic treaty area* (resolution MEPC.163(56)) should be taken into consideration, along with other relevant guidelines developed by the Organization.

4.2 In selecting the ballast water management system, attention should be paid to limiting conditions specified in the appendix of the Type Approval Certificate and the temperature under which the system has been tested, in order to ensure its suitability and effectiveness in polar waters.

4.3 In order to minimize the risk of invasive aquatic species transfers via biofouling, measures should be considered to minimize the risk of more rapid degradation of anti-fouling coatings associated with polar ice operations. Reference is made in particular to the *2011 Guidelines for the control and management of ships' biofouling to minimize the transfer of invasive aquatic species* (resolution MEPC.207(62)).

**Table: Example of matters related to anti-fouling systems taken into consideration by some ice-going ships**  
(this table is used by some operators of ice-going ships)

|  | Hull   | Sea chest  |
|--|--|--|
| Year round operation in ice-covered polar waters   |  | <ul style="list-style-type: none"> <li>• Abrasion resistant coating.</li> <li>• Compliant with the AFS Convention. Thickness of anti-fouling system to be decided by shipowner.</li> </ul> |
| Intermittent operation in ice-covered polar waters | <ul style="list-style-type: none"> <li>• Abrasion resistant low friction ice coating.</li> <li>• In sides, above bilge keel, max thickness of anti-fouling system 75 µm, to protect hull between application of anti-fouling system and next anticipated voyage to ice-covered waters. In bottom area thickness to be decided by shipowner. Composition of anti-fouling system should also be decided by the shipowner.</li> </ul> | <ul style="list-style-type: none"> <li>• Compliant with the AFS Convention. Thickness of anti-fouling system to be decided by shipowner.</li> </ul>  |
| Category B and C ships                             | <ul style="list-style-type: none"> <li>• Compliant with the AFS Convention. Thickness of anti-fouling system to be decided by shipowner.</li> </ul>  | <ul style="list-style-type: none"> <li>• Compliant with the AFS Convention. Thickness of anti-fouling system to be decided by shipowner.</li> </ul>  |

**APPENDIX I**

**Form of Certificate for Ships operating in Polar Waters**

**POLAR SHIP CERTIFICATE**

This Certificate shall be supplemented by a Record of Equipment for the Polar Ship Certificate

(Official seal)

(State)

Issued under the provisions of the

International Convention for the Safety of Life at Sea, 1974, as amended

under the authority of the Government of

(name of the State)

by \_\_\_\_\_  
(person or organization authorized)

**Particulars of ship\***

Name of ship.....  
Distinctive number or letters.....  
Port of registry.....  
Gross tonnage.....  
IMO number.....

\* Alternatively, the particulars of the ship may be placed horizontally in boxes.



## THIS IS TO CERTIFY:

- 1 That the ship has been surveyed in accordance with the applicable safety-related provisions of the International Code for Ships Operating in Polar Waters.
- 2 That the survey showed that the structure, equipment, fittings, radio station arrangements, and materials of the ship and the condition thereof are in all respects satisfactory and that the ship complies with the relevant provisions of the Code.

## Category A/B/C\* ship as follows:

## Ice Class and ice strengthened draught range

| Ice Class | Maximum draught |     | Minimum draught |     |
|-----------|-----------------|-----|-----------------|-----|
|           | Aft             | Fwd | Aft             | Fwd |
|           |                 |     |                 |     |
|           |                 |     |                 |     |

- 2.1 Ship type: tanker/passenger ship/other\*
- 2.2 Ship restricted to operate in ice free waters/open waters/other ice conditions\*
- 2.3 Ship intended to operate in low air temperature: Yes/No\*
- 2.3.1 Polar Service Temperature: .....°C/not applicable\*
- 2.4 Maximum expected time of rescue .....days
- 3 The ship was/was not\* subject to alternative design and arrangements in pursuance of regulation XIV/4 of the Convention.
- 4 A Document of approval of alternative design and arrangements for structure, machinery and electrical installations/fire protection/life-saving appliances and arrangements\* is/is not\* appended to this Certificate.
- 5 Operational limitations  
The ship has been assigned the following limitations for operation in polar waters:
  - 5.1 Ice conditions: .....
  - 5.2 Temperature: .....
  - 5.3 High latitudes: .....

---

\* Delete as appropriate.

This certificate is valid until ..... subject to the annual/periodical/intermediate\* surveys in accordance with section 1.3 of the Code.

Completion date of the survey on which this certificate is based: .....  
(dd/mm/yyyy)

Issued at .....  
(Place of issue of certificate)

.....  
(Date of issue)

.....  
(Signature of authorized official issuing the certificate)

(Seal or stamp of the issuing authority, as appropriate)

**Endorsement for annual, periodical and intermediate surveys\***

THIS IS TO CERTIFY that, at a survey required by regulation 1.3 of the Code, the ship was found to comply with the relevant requirements of the Code.

Annual survey: Signed: .....  
(Signature of authorized official)

Place: .....

Date: .....  
(Seal or stamp of the authority, as appropriate)

Annual/Periodical/Intermediate\* survey: Signed: .....  
(Signature of authorized official)

Place: .....

Date: .....  
(Seal or stamp of the authority, as appropriate)

Annual/Periodical/Intermediate\* survey: Signed: .....  
(Signature of authorized official)

Place: .....

Date: .....  
(Seal or stamp of the authority, as appropriate)

---

\* Delete as appropriate.

Annual survey:

Signed: .....  
(Signature of authorized official)

Place: .....

Date: .....  
(Seal or stamp of the authority, as appropriate)

**Endorsement to extend the certificate if valid for less than 5 years where regulation I/14(c) of the Convention applies\***

The ship complies with the relevant requirements of the Convention, and this certificate shall, in accordance with regulation I/14(c) of the Convention, be accepted as valid until.....

Signed: .....  
(Signature of authorized official)

Place: .....

Date: .....  
(Seal or stamp of the authority, as appropriate)

**Endorsement where the renewal survey has been completed and regulation I/14(d) of the Convention applies\***

The ship complies with the relevant requirements of the Convention, and this certificate shall, in accordance with regulation I/14(d) of the Convention, be accepted as valid until.....

Signed: .....  
(Signature of authorized official)

Place: .....

Date: .....  
(Seal or stamp of the authority, as appropriate)

**Endorsement to extend the validity of the certificate until reaching the port of survey or for a period of grace where regulation I/14(e) or I/14(f) of the Convention applies\***

This certificate shall, in accordance with regulation I/14(e)/I/14(f)\* of the Convention, be accepted as valid until .....

Signed: .....  
(Signature of authorized official)

Place: .....

Date: .....  
(Seal or stamp of the authority, as appropriate)

\* Delete as appropriate.

**Endorsement for advancement of anniversary date where regulation I/14(h) of the Convention applies\***

In accordance with regulation I/14(h) of the Convention, the new anniversary date is .....

Signed: .....  
(Signature of authorized official)

Place: .....

Date: .....  
(Seal or stamp of the authority, as appropriate)

In accordance with regulation I/14(h) of the Convention, the new anniversary date is .....

Signed: .....  
(Signature of authorized official)

Place: .....

Date: .....  
(Seal or stamp of the authority, as appropriate)

---

\* Delete as appropriate.

**Record of Equipment for the Polar Ship Certificate**

This record shall be permanently attached to the Polar Ship Certificate

**RECORD OF EQUIPMENT FOR COMPLIANCE WITH  
THE INTERNATIONAL CODE FOR SHIPS OPERATING IN POLAR WATERS**

**1 Particulars of ship**

Name of ship:.....  
Distinctive number or letters:.....

**2 Record of equipment**

**2.1 Life-saving appliances**

|     |  |       |
|-----|--|-------|
| 1   | Total number of immersion suits with insulation:                           | ..... |
| 1.1 | for crew   | ..... |
| 1.2 | for passengers   | ..... |
| 2   | Total number of thermal protective aids                                    | ..... |
| 3   | Personal and Group Survival Equipment                                      | ..... |
| 3.1 | Personal survival equipment – for number of persons                        | ..... |
| 3.2 | Group survival equipment – for number persons                              | ..... |
| 3.3 | Total capacity of liferafts in compliance with chapter 8 of the Polar Code | ..... |
| 3.4 | Total capacity of lifeboats in compliance with chapter 8 of the Polar Code | ..... |

**2.2 Navigation equipment**

|   |  |       |
|---|--|-------|
| 1 | Two independent echo-sounding devices or a device with two separate independent transducers                      | ..... |
| 2 | Remotely rotatable, narrow-beam search lights controllable from the bridge or other means to visually detect ice | ..... |
| 3 | Manually initiated flashing red light visible from astern (for ships involved in icebreaking operations)         | ..... |
| 4 | Two or more non-magnetic independent means to determine and display heading                                      | ..... |
| 5 | GNSS compass or equivalent (for ships proceeding to latitudes over 80 degrees)                                   | ..... |

**2.3 Communication equipment**

|     |  |       |
|-----|--|-------|
| 1   | Sound signaling system mounted to face astern to indicate escort and emergency manoeuvres to following ships as described in the International Code of Signals (for ships intended to provide ice breaking escort) | ..... |
| 2   | Voice and/or data communications with relevant rescue coordination centres   | ..... |
| 3   | Equipment for voice communications with aircraft on 121.5 and 123.1 MHz  | ..... |
| 4   | Two-way voice and data communication with a Telemedical Assistance Service (TMAS)  | ..... |
| 5   | All rescue boats and lifeboats, whenever released for evacuation, have a device (for ships certified to operate in low air temperature):   |       |
| 5.1 | for transmitting vessel to shore alerts  | ..... |
| 5.2 | for transmitting signals for location  | ..... |
| 5.3 | for transmitting and receiving on-scene communications   | ..... |
| 6   | All other survival craft have a device:  |       |
| 6.1 | for transmitting signals for location  | ..... |
| 6.2 | for transmitting and receiving on-scene communications   | ..... |

THIS IS TO CERTIFY that this Record is correct in all respects.

Issued at.....  
 (Place of issue of the Record)

.....  
 (Date of issue)      (Signature of duly authorized official issuing the Record)

(Seal or stamp of the issuing authority, as appropriate)

## APPENDIX II

## Model table of contents for the Polar Water Operational Manual (PWOM)

## SAFETY MEASURES

## 1 OPERATIONAL CAPABILITIES AND LIMITATIONS

## Chapter 1 Operation in ice

## 1.1 Operator guidance for safe operation

**Guidance:** The PWOM should establish the means by which decisions as to whether ice conditions exceed the ship's design limits should be made, taking into account the operational limitations on the Polar Ship Certificate. An appropriate decision support system, such as the Canada's Arctic Ice Regime Shipping System, and/or the Russian Ice Certificate as described in the Rules of Navigation on the water area of the Northern Sea Route, can be used... Bridge personnel should be trained in the proper use of the system to be utilized. For ships that will operate only in ice-free waters, procedures to ensure that will keep the ship from encountering ice should be established.

## 1.2 Icebreaking capabilities

**Guidance:** The PWOM should provide information on the ice conditions in which the ship can be expected to make continuous progress. This may be drawn, for example from numerical analysis, model test or from ice trials. Information on the influence of ice strength for new or decayed ice and of snow cover may be included.

## 1.3 Manoeuvring in ice

## 1.4 Special features

**Guidance:** Where applicable, the PWOM should include the results of any equivalency analyses made to determine polar ship category/ice class. The Manual should also provide information on the use of any specialized systems fitted to assist in ice operations.

## Chapter 2 Operation in low air temperatures

*System design*

**Guidance:** The PWOM should list all ship systems susceptible to damage or loss of functionality by exposure to low temperatures, and the measures to be adopted to avoid malfunction.

## Chapter 3 Communication and navigation capabilities in high latitudes

**Guidance:** The PWOM should identify any restrictions to operational effectiveness of communications and navigational equipment that may result from operating in high latitudes.

## Chapter 4 Voyage duration

**Guidance:** The PWOM should provide information on any limitations on ship endurance such as fuel tankage, fresh water capacity, provision stores, etc. This will normally only be a significant consideration for smaller ships, or for ships planning to spend extended periods in ice.

## **2 SHIP OPERATIONS**

### **Chapter 1 Strategic planning**

Assumptions used in conducting the analyses referred to below should be included in the Manual.

#### **1.1 Avoidance of hazardous ice**

**Guidance:** For ships operating frequently in polar waters, the PWOM should provide information with respect to periods during which the ship should be able to operate for intended areas of operation. Areas that pose particular problems, e.g. chokepoints, ridging, as well as worst recorded ice conditions should be noted. Where the available information is limited or of uncertain quality, this should be recognized and noted as a risk for voyage planning.

#### **1.2 Avoidance of hazardous temperatures**

**Guidance:** For ships operating frequently in polar waters, the PWOM should provide information with respect to, the daily mean daily low temperature as well as the minimum recorded temperature for each of the days during the intended operating period. Where the available information is limited or of uncertain quality, this should be recognized as a risk for voyage planning.

#### **1.3 Voyage duration and endurance**

**Guidance:** Procedures to establish requirements for supplies should be established, and appropriate safety levels for safety margins determined taking into account various scenarios, e.g. slower than expected steaming, course alterations, adverse ice conditions, places of refuge and access to provisions. Sources for and availability of fuel types should be established, taking into account long lead times required for deliveries.

#### **1.4 Human resources management**

**Guidance:** The PWOM should provide guidance for the human resources management, taking into account the anticipated ice conditions and requirements for ice navigation, increased levels of watch keeping, hours of rest, fatigue and a process that ensures that these requirements will be met.

### **Chapter 2 Arrangements for receiving forecasts of environmental conditions**

**Guidance:** The PWOM should set out the means and frequency for provision of ice and weather information. Where a ship is intended to operate in or in the presence of ice, the manual should set out when weather and ice information is required and the format for the information.

When available, the information should include both global and localized forecasts that will identify weather and ice patterns/regimes that could expose the ship to adverse conditions.

The frequency of updates should provide enough advance notice that the ship can take refuge or use other methods of avoiding the hazard if the conditions are forecast to exceed its capabilities.



The PWOM may include use of a land-based support information provider an effective method of sorting through available information, thereby providing the ship only with information that is relevant, reducing demands on the ship's communications systems. The manual may also indicate instances in which additional images should be obtained and analysed, as well as where such additional information may be obtained.

#### 2.1 *Ice information*

**Guidance:** The PWOM should include or refer to guidance on how radar should be used to identify ice floes, how to tune the radar to be most effective, instructions on how to interpret radar images, etc. If other technologies are to be used to provide ice information, their use should also be described.

#### 2.2 *Meteorological information*

### Chapter 3 **Verification of hydrographic, meteorological and navigational information**

**Guidance:** The PWOM should provide guidance on the use of hydrographic information as further described in the additional guidance to chapter 10.

### Chapter 4 **Operation of special equipment**

#### 4.1 *Navigation systems*

#### 4.2 *Communications systems*

### Chapter 5 **Procedures to maintain equipment and system functionality**

#### 5.1 *Icing prevention and de-icing*

**Guidance:** The PWOM should provide guidance on how to prevent or mitigate icing by operational means, how to monitor and assess ice accretion, how to conduct de-icing using equipment available on the ship, and how to maintain the safety of the ship and its crew during all of these aspects of the operation.

#### 5.2 *Operation of seawater systems*

**Guidance:** The PWOM should provide guidance on how to monitor, prevent or mitigate ice ingestion by seawater systems when operating in ice or in low water temperatures. This may include recirculation, use of low rather than high suctions, etc.

#### 5.3 *Procedures for low temperature operations*

**Guidance:** The PWOM should provide guidance on maintaining and monitoring any systems and equipment that are required to be kept active in order to ensure functionality; e.g. by trace heating or continuous working fluid circulation.

## 3 **RISK MANAGEMENT**

### Chapter 1 **Risk mitigation in limiting environmental condition**

#### 1.1 *Measures to be considered in adverse ice conditions*

**Guidance:** The PWOM should contain guidance for the use of low speeds in the presence of hazardous ice. Procedures should also be set for enhanced watchkeeping and lookout manning in situations with high risks from ice, e.g. in proximity to icebergs, operation at night, and other situations of low visibility. When possibilities for contact with hazardous ice exist, procedures should address regular monitoring, e.g. soundings/inspections of compartments and tanks below the waterline.

## **1.2 Measures to be considered in adverse temperature conditions**

**Guidance:** The PWOM should contain guidance on operational restrictions in the event that temperatures below the ships polar service temperature are encountered or forecast. These may include delaying the ship, postponing the conduct of certain types of operation, using temporary heating, and other risk mitigation measures.

## **Chapter 2 Emergency response**

**Guidance:** In general, where the possibility of encountering low air temperatures, sea ice, and other hazards is present, the PWOM should provide guidance on procedures that will increase the effectiveness of emergency response measures.

### **2.1 Damage control**

**Guidance:** The PWOM should consider damage control measures arrangements for emergency transfer of liquids and access to tanks and spaces during salvage operations.

### **2.2 Firefighting**

### **2.3 Escape and evacuation**

**Guidance:** Where supplementary or specialized life-saving equipment is carried to address the possibilities of prolonged durations prior to rescue, abandonment onto ice or adjacent land, or other aspects specific to polar operations, the PWOM should contain guidance on the use of the equipment and provision for appropriate training and drills.

## **Chapter 3 Coordination with emergency response services**

### **3.1 Ship emergency response**

**Guidance:** The PWOM should include procedures to be followed in preparing for a voyage and in the event of an incident arising.

### **3.2 Salvage**

**Guidance:** The PWOM should include procedures to be followed in preparing for a voyage and in the event of an incident arising.

### **3.3 Search and rescue**

**Guidance:** The PWOM should contain information on identifying relevant Rescue Coordination Centres for any intended routes, and should require that contact information and procedures be verified and updated as required as part of any voyage plan.

## **Chapter 4 Procedures for maintaining life support and ship integrity in the event of prolonged entrapment by ice**

**Guidance:** Where any ship incorporates special features to mitigate safety or environmental risks due to prolonged entrapment by ice, the PWOM should provide information on how these are to be set up and operated. This may include, for example, adding additional equipment to be run from emergency switchboards, draining systems at risk of damage through freezing, isolating parts of HVAC systems, etc.

### **4.1 System configuration**

### **4.2 System operation**

## 4 JOINT OPERATIONS

### Chapter 1 Escorted operations

**Guidance:** The PWOM should contain or reference information on the rules and procedures set out by coastal States who require or offer icebreaking escort services. The Manual should also emphasize the need for the master to take account of the ship's limitations in agreeing on the conduct of escort operations.

### Chapter 2 Convoy operations

#### 第 8/2021 號行政長官公告

國際海事組織海上安全委員會於二零一四年十一月二十一日透過第MSC.386(94)號決議，通過了經修正的《1974年國際海上人命安全公約》的修正案，在新增的第XIV章引入有關極地水域營運船舶安全措施的規定，並使適用《國際極地水域運作船舶規則》（《極地規則》）的安全條款具有強制性。該修正案於二零一七年一月一日在國際法律秩序上生效，包括對澳門特別行政區生效；

基於此，行政長官根據第3/1999號法律《法規的公佈與格式》第五條（一）項和第六條第一款的規定，命令公佈包含上指修正案的國際海事組織海上安全委員會第MSC.386(94)號決議的中文和英文正式文本。

二零二一年三月八日發佈。

行政長官 賀一誠

#### Aviso do Chefe do Executivo n.º 8/2021

Considerando que, em 21 de Novembro de 2014, o Comité de Segurança Marítima da Organização Marítima Internacional (OMI), através da resolução MSC.386(94), adoptou emendas à Convenção Internacional para a Salvaguarda da Vida Humana no Mar, 1974, tal como emendada, que introduziram num novo Capítulo XIV as disposições relativas às medidas de segurança para os navios que operam em águas polares e tornaram obrigatória a aplicação das disposições de segurança previstas no Código Internacional para os Navios que Operam em Águas Polares (Código Polar), e que tais emendas entraram em vigor na ordem jurídica internacional, incluindo a Região Administrativa Especial de Macau, em 1 de Janeiro de 2017;

O Chefe do Executivo manda publicar, nos termos da alínea 1) do artigo 5.º e do n.º 1 do artigo 6.º da Lei n.º 3/1999 (Publicação e formulário dos diplomas), a resolução MSC.386(94) do Comité de Segurança Marítima da OMI, que contém as referidas emendas, nos seus textos autênticos em línguas chinesa e inglesa.

Promulgado em 8 de Março de 2021.

O Chefe do Executivo, *Ho Iat Seng*.