Directorate General of Shipping, Govt. of India, Mumbai		
	TRAINING BRANCH	IS / ISO Clause No. 7.1
Ref : QMS 7.0	Subject-**Guidelines for Advanced Training course for Ships Operating in Polar waters.**	File No. TR/CIR/ 6(2)/2018
	Circular No. : STCW 2010 Training Circular No. 22 of 2018	Dated 17.09.2018

1. The International Code for ships operating in Polar waters. (The Polar Code) entered into force through the new Chapter XIV of SOLAS (i.e. *Safety Measures for ships operating in Polar Waters*).

2. The amendment to the STCW Convention was carried out vide MSC Resolution 416 (97) dated 25.11.2016 and the STCW Code was amended vide MSC Resolution 417(97) dated 25.11.2016. The amendments to the STCW Convention and code introduced new training and certifications requirements for Masters, Chief Mates and Officers in charge of navigational watch on ships operating in Polar waters. The new training requirements introduced as follows:

2.1 Basic training for ships operating in polar waters

2.2 Advanced training for ships operating in polar waters.

3. The *'Manning and Training'* Chapter of Polar Code [Chapter 12, Part I-A] at Para 12.2 requires Masters, Chief Mates and Officers in charge of a navigational watch to have completed training to attain the required abilities that are appropriate to the capacities to be filled and duties and responsibilities to be taken considering the amended provisions of the STCW Convention and the STCW Code.

4. The DGS issued Circular NT/EXAM 02 of 2018 on Transitional provisions for Certification of Masters and deck officers on ships operating in polar waters. The said circular at para 7 specified the requirements for assessment for sea service performed onboard ship operating in polar waters or other equivalent waters towards issuance of certificate of Advanced training for continuing seagoing service onboard ships operating in polar waters.

5. To specify the requirement of Advanced training for ships operating in polar waters, the Directorate General of Shipping has formulated the following guidelines for the conduct of the "Advanced Training for Ships Operating in Polar Waters" course as annexed to this circular.

6. The ID No. assigned for the "Advanced *training for ships operating in Polar waters" Course is 310.* The duration of this course is 30.5 hours (5 days) and the frequency of the course shall not exceed 48 in a calendar year.

7. DGS approved training institute, eligible to conduct this course and complying with the details specified in the annex will be eligible to apply for the conduct of this course along with a prescribed processing fee of Rs.50,000/-.

8. This issues with the approval of Director General of Shipping & Secretary to the Govt. of India.

17 Sept. 18

(Deependra Singh Bisen)
Asstt. Director General of Shipping

To

1. All Maritime Training Institutes. 2. Principal Officers, MMD, Mumbai/Chennai/ Kolkata/ Kochi/ Kandla 3. Shipping Masters, Mumbai/ Kolkata/ Chennai 4. INDOS Cell, DGS, GOI, Nau Bhavan Building, Mumbai- 400 038. 5. Nautical Branch, DGS, GOI 6.Engineering Branch, DGS, GOI 7. Training Branch 8. Hindi Cell (To translate in Hindi and put up in website 9. INSA/ FoSMA/ MASSA/ ICSSA/ MUU IMEI/ CMMI/ NUSI. 10. Computer Cell, DGS, GOI with a request to upload. 11. E-Governance Cell, DGS, GoI. 12. Guard File. 13. Sr. PS to DG(S) for information. 14. Sr. PS to Addl. DG(S) for information.

ANNEX

GUIDELINES FOR ADVANCED TRAINING COURSE FOR SHIPS OPERATING IN POLAR WATERS

1. **AIMS** – This course is intended to provide training to navigation officers to meet the *Mandatory minimum* requirements *for the training and qualifications of masters and deck officers on ships operating in polar waters*, specified in Section A-V/4 and Table A-V/4-2 of the STCW convention. This course is also designed to meet the requirements of IMO Model course 7.12.

2. **OBJECTIVES** – A trainee successfully completing this course will gain:

2.1 understanding of the basic requirements for structure, stability and subdivision, machinery, life-saving appliances, fire protection, voyage planning, ship routing, navigation systems and equipment, radio communication, pollution prevention equipment, liability and safety management systems, as applicable to the different types and sizes of ships which may undertake voyages in polar waters;

2.2 ability to contribute to safe operation of vessels operating in polar waters;

2.3 understanding of ice characteristics and areas where different types of ice can be expected in the area of operation;

2.4 understanding of vessel performance in ice and low air temperature;

2.5 understanding of safe operations and ship maneuverability in ice;

2.6 awareness to monitor and ensure compliance with legislative requirements;

2.7 understanding to apply safe working practices and to respond to emergencies;

2.8 understanding and awareness of correct crew preparation, working conditions and safety;

2.9 understanding the need to ensure compliance with pollution- prevention requirements and prevent environmental hazards; and

2.10 understanding skills to perform manoeuvres in order to safely operate ships in polar waters.

3. **INFRASTRUCTURE AND EQUIPEMENT REQUIREMENT**

3.1 **Class Room** – The lectures shall take place in a classroom of minimum 20 sq. m. with adequate desk and chair seating space for all trainees. Standard classroom facilities must be available such as appropriate projection system for power point presentation, whiteboard/chalkboard, ice charts etc. It should be ensure that the appropriate multimedia equipment is made available.

3.2 **Full Mission Simulator** –

3.2.1 A 'Full Mission Ship Handling Simulator' [FMSHS] complying with the specifications given in DGS training branch Circular No. 06 of 2005 and additional ice specification given in **Appendix - 4** of this guideline. The simulator shall also comply with the performance standards specified in section A-1/12 of the STCW Code and be Type approved from any IACS Member or DG Shipping.

3.2.2 Briefing / Debriefing space shall be provided in instructor's station of the [FMSHS] Instructor station shall be equipped with seating capacity of one instructor and 4 trainees at any given time and with white / black board, overhead / LCD projector and a capability of projecting recording of ship tracks and actions taken during the exercise for the purpose of debriefing. The Specifications of the Briefing / Debriefing room are given in **Appendix – 4**.

3.2.3 The full mission simulator shall replicate ice operations from a navigation bridge perspective and be able to create situations that provide an opportunity to acquire the required ice navigation skills and also be able to evaluate the trainee's grasp of the learning objectives and concepts of polar ice navigation.

4. **ELIGIBILITY FOR MARITIME TRAINING INSTITUTE:** Any DGS approved training institute may apply for obtaining approval for the course

5. **ENTRY STANDARDS** –

5.1 Every candidate for a certificate in advanced training for ships operating in polar waters shall hold a certificate as Master, chief mate or officer in charge of a navigation watch qualified in accordance with regulations II/1, II/2 and II/3 respectively of the STCW Convention, issued or recognised by Government of India,

And

5.2 Should be in possession of Certificate of Proficiency [CoP] of "Basic training for ships in polar waters";

6. **COURSE INTAKE LIMITATIONS** –

6.1 The course intake is limited to a maximum of 8 trainees. [8 for classroom lectures with 4 for simulation exercises in FMSHS during exercises].

6.2 The maximum trainee to faculty ratio shall be 8 to 1 for classroom lectures and 4 to 1 for simulation sessions.

6.3 For simulation session, trainees shall be divided into two bridge teams of maximum 4 trainees each. One team would be carrying out an exercise while the other is being lectured, debriefed or planning the next exercise.

7. **FACULTY REQUIREMENTS** – The following are the minimum qualifications recommended for course in charge and faculty delivering this course, based on the

Knowledge, Understanding and Proficiency (KUP) in Table, set out in section A-V/4-2 of the STCW Code.

7.1 **The qualifications and experience of Course-in-charge & Faculty:**

7.1.1 Certificate of Competency as Master (FG) issued or recognised by Government of India;

7.1.2 At least 5 years sea time as a certificated officer on merchant ships, of which at least 1 year as a management level officer;

7.1.3 has served on a ship in the capacity of a management level officer for a total period of at least 120 days in ice covered waters, of which 60 days should have been served in polar or equivalent waters.

Or

successfully completed a training course for Ships operating in polar waters/ice navigation which includes practical on board training during the course by institutes accepted by Directorate.

7.1.4 Preferably the course-in-charge should have experience of being on a ship in ice conditions that require the ship to be assisted by an icebreaker or to make manoeuvres to avoid concentrations of ice that might have endangered the ship.

7.1.5 undergone and successfully completed an approved "Basic training for ships operating in Polar waters" course and "Advanced training for ships operating in Polar waters" course.

7.1.6 have a detailed knowledge of the requirements of preparation of a vessel for operating in low air temperatures.

7.1.7 have an up-to-date knowledge of the various Ice Class and equipment requirements to navigate in ice.

7.1.8 have an up-to date knowledge of correct crew preparation, working conditions and safety in ice conditions and low air temperatures; and

7.1.9 be fully aware of need to ensure compliance with pollution- prevention requirements;

7.1.10 have successfully completed the DG approved Training for Training and Assessors course.

8. **FACULTY STRENGTH** – Not less than two Master Mariners. A minimum of 50% of the entire portion must be covered by full time faculty.

9. **REQUIRED ATTENDANCE** – 100% attendance is required for successful completion of the course.

10. **COURSE OUTLINE, TIME TABLE AND DETAILED LEARNING OBJECTIVE** –

10.1 Course duration: 33.0 hrs [minimum 5 days]
10.2 Course outline: As per Appendix - 1
10.3 Course Time Table: As per Appendix - 2
10.4 Detailed Learning Objectives - As per IMO model course 7.12.

11. **HOLIDAYS** – Sundays shall be holidays. Independence Day (15th August) and Republic Day (26th January) shall be compulsory holidays. Trainees shall normally enjoy the holidays observed by the Govt. of the State in which the institute is located.

12. **ASSESSMENT AND FEEDBACK** – Assessment through Written Test and Simulator Assessment (as per Trainee's Assessment Checklist in **Appendix - 5**) shall be carried out. Also course feedback to be taken from each participant at the conclusion of the course.

13. **COURSE CERTIFICATE** – Course certificate, the format of which is appended at **Appendix – 3** shall be issued by the DGS approved maritime training institute to all trainees who have successfully completed the DGS approved "Advanced training for ships operating in Polar waters" Course.

14. **QUALITY STANDARDS** – As per DGS Order No. 5 of 2016

15. **INSPECTION** – As per DGS Order No. 5 of 2016

16. **FEES TO GOVERNMENT** – As per DGS Order No. 5 of 2016

17. **COST OF INSPECTIONS** – As per DGS Order No. 5 of 2016

18. **TEACHING AIDS**

A1 Instructor's Manual (Part D of this course)
A2 Projector for power point presentations
A3 White board
A4 Videos
A5 Ice charts
A6 Full mission Ship Handling and Navigation Simulator which can simulate ice operations in polar waters
A7 Nautical Charts (ENCs)

Note: Other equivalent teaching aids may be used as deemed fit by the instructor.

19. **REFERENCE MATERIAL(MANDATORY)**

Note: Textbooks T1 to T6 mentioned below are mandatory. Other textbooks may be used as deemed fit by the faculty.

T1 Ice Navigation in Canadian Waters", Icebreaking Program, Maritime Services, Canadian Coast Guard, Fisheries and Oceans Canada, Ottawa, Ontario (Revised August 2012)

T2 Winter Navigation on the River and Gulf of St. Lawrence *Practical Notebook for Marine Engineers and Deck Officers* November 2011 Edition (TP14335E)

T3 WMO Sea ice nomenclature

T4 "Polar ship operations", The Nautical Institute

T5 "Essentials of Sea Survival" by Michael Tipton ISBN: 0-7360-0215-4

T6 "The Ice Navigation Manual" by Patrick R M Toomey, Michael Lloyd, David J. House, and David Dickins. Witherby Seamanship Publishers

TR4 Guide to Navigating Through the NSR, No. 4151B, 1996

R5 Polar Code, International Code for Ships Operating in polar waters

R6 MSC.1/Circ.1519 on *Guidance on Methodologies for Assessing Operational Capabilities and Limitations in Ice*

R9 IMO Guide to Cold Water Survival (2012)

Note: Other publications deemed relevant depending regional requirements:

20. REFERENCE MATERIAL (NON-MANDATORY)

Antarctica

TA1 Secretariat of the Antarctic Treaty (http://www.ats.aq/index_e.htm) for documents pertaining to Antarctic regulations, annexes and Madrid protocol.

Canada

TC1 Annual Notice to Mariner

TC2 Arctic Ice Regime Shipping Control System

TC3 Arctic Sailing Directions (ARC 400, ARC 401, ARC 402, ARC 403 & ARC 404)

TC4 Arctic Waters Oil Transfer Guidelines

TC5 Equivalent Standards for the Construction of Arctic Class Ships

TC6 Guidelines for the Operation of Passenger Vessels in Canadian Arctic Waters - TP 13670

TC7 Manual of Standard Procedures for Observing and Reporting Ice Conditions (MANICE)

TC8 Ship Safety Bulletins (7 relevant to ice navigation)

Denmark/Greenland

TD1 PUB. 181 Sailing Directions (Enroute) Greenland and Iceland

Russia

TR1 NP23 Bering Sea and Strait Pilot,

TR2 NP43 South and East Coasts of Korea,

TR3 NP72 Southern Barents Sea and Belroy More Pilot.

United States

TUS1 NP23 Bering Sea and Strait Pilot

TUS2 Coast Pilot 9 (Pacific and Arctic Coasts: Alaska to Beaufort Sea)

TUS3 PUB 180 Sailing Directions (Planning Guide) Arctic Ocean

Miscellaneous IMO and REGULATORY REFERENCES (R)

R1 SOLAS 1974, International Convention for the Safety of Life at Sea, 1974 (SOLAS 1974) as amended

R2 International Convention on Standards of Training, Certification and Watch keeping for Seafarers, 1978, as amended

R3 MARPOL, International Convention for the Prevention of Pollution from Ships, Consolidated Edition 2011

R4 MFAG, Medical First Aid Guide

R7 IAMSAR Guidelines for the Development of Shipboard Emergency Plans for Search and Rescue in ice infested waters.

R8 ISM Code, International Safety Management Code (ISM Code)

R9 IMO Guide to Cold Water Survival (2012)

R10 IMO Intact Stability Code (2008)

ELECTRONIC MEDIA

Note: Equivalent videos, CD-ROMs, Computer Based Training (CBT) may be used as deemed fit by the faculty.

E1 NAVIGATING IN ICE
E2 COLD AND HEAVY WEATHER FILE
E3 SAFE ESCORT (Canadian Coast Guard)
E4 NAVIGATING IN COLD ENVIRONMENTS
E5 PASSAGE PLANNING IN COLD ENVIRONMENTS
E6 ENGINEERING OPERATIONS IN COLD ENVIRONMENTS
E7 PERSONAL SAFETY IN COLD

APPENDIX – 1

COURSE OUTLINE (L-Lecture, E- Exercise, S – Simulation)

Subject Area with Learning Objectives	L	E	S	TOTAL Time Hours
1. Course Introduction, Regulations, Standards and Shipboard Documentation 1.1 Course Introduction 1.2 National/Regional Regulations and Standards 1.3 Shipboard Documentation Example of Trainee Classroom EXERCISES • Exercise ✓ Identify Types of Ice – Thickness ✓ Estimate Ice Concentrations ✓ Estimate Floe size ✓ Iceberg classification • Reading of Ice chart and the EGG Code	2	1		3.0
2. Vessel Characteristics 2.1 Propulsion 2.2 New and Developing Technologies	1			1.0
3. Manoeuvring in Ice 3.1 Approaching, Turning and Entering Ice 3.2 Backing and Ramming 3.3 Vessel Damage 3.4 Vessel Beset 3.5 Docking and Undocking 3.6 Anchoring in Ice 3.7 Bridge Watchkeeping 1*- CASE STUDIES Example of Trainee SIMULATOR Exercises • *Simulator Familiarisation • Navigating in Ice waters using leads available / thinner ice conditions by observance visually and by Radar • Navigating in ice-infested waters using available leads / thinner ice conditions while in close proximity to land	2	1*	7.0*	10.0
4. Planning 4.1 Challenges Associated with Terrestrial Navigational Aids in polar waters 4.2 Use of Radar for Detecting Ice and Routing 4.3 Passage Planning 4.4 Communications Example of Trainee Classroom EXERCISES • Plan a Passage from Point A to Point B • Calculating Ice Numeral (IN) using AIRSS / Calculating Risk Index Outcome (RIO) using POLARIS	3	1	2	6.0

Example of Trainee SIMULATOR Exercises • Navigating in Iceberg, growlers, bergy bits infested waters with minimal visibility (onset of twilight or onset of daylight)				
5. Icebreaker Operations 5.1 Icebreaker Communication 5.2 Icebreaker Operating Methods 5.3 Icebreaker Towing During Ice Transit 5.4 Convoy Operations in Ice 1*- CASE STUDIES Example of Trainee SIMULATOR Exercises • Berthing a ship in ice infested waters • Navigating in an Ice convoy maintaining safe distance from icebreaker / ship ahead and astern and using engines in emergency situations due vessel ahead stopping / safe distance reducing. • Navigating independently through open water leads until ice conditions bring the own ship to a stop and trainee must request icebreaker assistance. Icebreaker escort communication and procedures demonstrated • Freeing a ship beset in solid ice *(pending trainee's experience)*	**2**	**1***	**6**	**9.0**
6. Crew Preparations, Working Conditions and Safety 6.1 Fire-Fighting Systems, Life-Saving Appliances, and Survival Arrangements 6.2 Contingency Planning and Safety Drills 6.3 Emergency Response in polar waters	**2**			**2.0**
TOTAL	**12**	**4**	**15.0**	**31.0**
7 Evaluation Recommend this evaluation should include some review from the Basic Level course				**2.0**
TOTAL				**33.0**

ADVANCED LEVEL COURSE DELIVERY SUMMARY

Use of Simulators, workshop or other education and training must be done within a controlled setting due to its inherent hazards.

Subject Area	**Recommended Method of Delivery**			**Course Time hours)**
	Lecture (Hours)	**Class Room Exercise (Hours)**	**Simulation (Hours)**	
1.0 Course Introduction, Regulations, Standards &Shipboard Documentation	3.0			**3.0**
2.0 Vessel Characteristics	1.0	--	--	**1.0**
3.0 Manoeuvring in Ice	3.0*(incl. Case studies)*		7.0*	**10.0**
4.0 Passage Planning	4.0		2.0	**6.0**
5.0 Icebreaker Ops	3.0*(incl. Case studies)*		6.0	**9.0**
6.0 Crew Preparation, Working Conditions & Safety	2.0		--	**2.0**
7. Evaluation	--	--	--	**2.0**
TOTAL	**16.0**		**15.0**	**33.0**

*NB: Simulation time includes simulator familiarization.

APPENDIX – 2

SAMPLE TIMETABLE

TIME	SUBJECT	TIME	SUBJECT
	Group A		**Group B**
DAY 1			
30 Min.	Course Entry formalities.	30 Min.	Course Entry formalities.
1.5 Hrs.	1.1 Course Introduction 1.2 National/Regional Regulations and Standards 1.3 Shipboard Documentation (Lecture)	1.5 Hrs.	11.1 Course Introduction 1.2 National/Regional Regulations and Standards 1.3 Shipboard Documentation (Lecture)
15 Min.	***Tea Break***	***15 Min.***	***Tea Break***
1 Hrs.	Example of Trainee Classroom EXERCISES • Match the Columns Exercise ✓ Types of Ice – Thickness ✓ Ice Concentrations ✓ Floe size ✓ Iceberg classification • Reading the EGG Code	1 Hrs.	Example of Trainee Classroom EXERCISES • Match the Columns Exercise ✓ Types of Ice – Thickness ✓ Ice Concentrations ✓ Floe size ✓ Iceberg classification • Reading the EGG Code
1 Hrs.	2.1 Propulsion 2.2 New and Developing Technologies(Lecture)	1 Hrs.	2.1 Propulsion 2.2 New and Developing Technologies(Lecture)
1 Hrs.	***Lunch Break***	1 Hrs.	***Lunch Break***
1.5 Hrs.	3.1 Approaching, Turning and Entering Ice 3.2 Backing and Ramming 3.3 Vessel Damage 3.4 Vessel Beset (Lecture) CASE STUDIES (0.5hrs)	1.5 Hrs.	3.1 Approaching, Turning and Entering Ice 3.2 Backing and Ramming 3.3 Vessel Damage 3.4 Vessel Beset (Lecture)
15 Min.	***Tea Break***	***15 Min.***	***Tea Break***
30 Min.	Exercise 1 - Familiarisation(Simulator)	30 Min.	Exercise 1 - Familiarisation(Simulator)
		3 Hrs.	Exercise 2 - Navigating in Ice waters using leads available / thinner ice conditions by observance visually and by Radar (Simulator)
DAY 2			

TIME	SUBJECT	TIME	SUBJECT
	Group A		**Group B**
3 Hrs.	Exercise 2 - Navigating in Ice waters using leads available / thinner ice conditions by observance visually and by Radar (Simulator)		
15 Min.	***Tea Break***	***15 Min.***	***Tea Break***
2.5 Hrs.	3.5 Docking and Undocking 3.6 Anchoring in Ice 3.7 Bridge Watch-keeping (Lecture) CASE STUDIES (0.5 hrs)	2.5 Hrs.	3.5 Docking and Undocking 3.6 Anchoring in Ice 3.7 Bridge Watch-keeping (Lecture)
1 Hrs.	4.1 Challenges Associated with Terrestrial Navigational Aids inpolar waters(Lecture)	1 Hrs.	4.1 Challenges Associated with Terrestrial Navigational Aids in polar waters(Lecture)
1 Hrs.	***Lunch Break***	1 Hrs.	***Lunch Break***
1 Hrs.	4.2 Use of Radar for Detecting Ice and Routing(Lecture)	1 Hrs.	4.2 Use of Radar for Detecting Ice and Routing(Lecture)
15 Min.	***Tea Break***	***15 Min.***	***Tea Break***
		2 Hrs.	Exercise 3 - Navigating in ice infested waters using available leads / thinner ice conditions while in close proximity to land (Simulator)
		2.5 Hrs.	Exercise 4 - Navigating in Iceberg, growlers, bergy bits infested waters with minimal visibility (onset of twilight or onset of daylight) (Simulator)

TIME	SUBJECT	TIME	SUBJECT
	Group A		**Group B**
DAY 3			
2.5 Hrs.	Exercise 3 - Navigating in ice infested waters using available leads / thinner ice conditions while in close proximity to land (Simulator)		
15 Min	***Tea Break***	***15 Min.***	***Tea Break***
2 Hrs.	Exercise 4 - Navigating in Iceberg, growlers, bergy bits infested waters with minimal visibility (onset of twilight or onset of daylight) (Simulator)		
1 Hrs.	4.3 Passage Planning 4.4 Communications (Lecture)	1 Hrs.	4.3 Passage Planning 4.4 Communications (Lecture)
1 Hrs.	***Lunch Break***	1 Hrs.	***Lunch Break***
1 Hrs.	<u>Example of Trainee Classroom EXERCISES</u> • Plan a Passage from Point A to Point B • Calculating Ice Numeral (IN) using AIRSS / Calculating Risk Index Outcome (RIO) using POLARIS	1 Hrs.	<u>Example of Trainee Classroom EXERCISES</u> • Plan a Passage from Point A to Point B • Calculating Ice Numeral (IN) using AIRSS / Calculating Risk Index Outcome (RIO) using POLARIS
15 Min.	***Tea Break***	***15 Min.***	***Tea Break***
		2 Hrs.	Exercise 5 - Berthing a ship in ice infested waters(Simulator)
		2 Hrs.	Exercise 6- Navigating in an Ice convoy maintaining safe distance from icebreaker / ship ahead and astern and using engines in emergency situations due vessel ahead stopping / safe distance reducing. (Simulator)

TIME	SUBJECT	TIME	SUBJECT
	Group A		**Group B**
DAY 4			
2 Hrs.	Exercise 5 - Berthing a ship in ice infested waters(Simulator)		
15 Min.	***Tea Break***	***15 Min.***	***Tea Break***
2 Hrs.	Exercise 6- Navigating in an Ice convoy maintaining safe distance from icebreaker / ship ahead and astern and using engines in emergency situations due vessel ahead stopping / safe distance reducing. (Simulator)		
1 Hrs.	5.1 Icebreaker Communication 5.2 Icebreaker Operating Methods (Lecture) CASE STUDIES (0.25hrs)	1 Hrs.	5.1 Icebreaker Communication 5.2 Icebreaker Operating Methods (Lecture)
1 Hrs.	***Lunch Break***	1 Hrs.	***Lunch Break***
1 Hrs.	5.3 Icebreaker Towing During Ice Transit (Lecture) CASE STUDIES (0.25 hrs)	1 Hrs.	5.3 Icebreaker Towing During Ice Transit (Lecture)
15 Min.	***Tea Break***	***15 Min.***	***Tea Break***
1 Hrs.	5.4 Convoy Operations in Ice (Lecture) CASE STUDIES (0.5 hrs)	1 Hrs.	5.4 Convoy Operations in Ice (Lecture)
		2 Hrs.	Exercise 7 - Navigating independently through open water leads until ice conditions bring the own ship to a stop and [illegible] must request icebreaker assistance, icebreaker escort communication and procedures demonstrated **including** Freeing a ship beset in solid ice (Simulator)

TIME	SUBJECT	TIME	SUBJECT
	Group A		**Group B**
DAY 5			
2 Hrs.	Exercise 7- Navigating independently through open water leads until ice conditions bring the own ship to a stop and trainee must request icebreaker assistance. Icebreaker escort communication and procedures demonstrated including Freeing a ship beset in solid ice (Simulator)		
15 Min.	***Tea Break***	***15 Min.***	***Tea Break***
1 Hrs.	6.1 Fire-Fighting Systems, Life-Saving Appliances, and Survival Arrangements (Lecture)	1 Hrs.	6.1 Fire-Fighting Systems, Life-Saving Appliances, and Survival Arrangements (Lecture)
1 Hrs.	6.2 Contingency Planning and Safety Drills 6.3 Emergency Response in polar waters (Lecture)	1 Hrs.	6.2 Contingency Planning and Safety Drills 6.3 Emergency Response in polar waters (Lecture)
1 Hrs.	***Lunch Break***	1 Hrs.	***Lunch Break***
2 Hrs.	Assessment	2 Hrs.	Assessment
15 Min.	Feedback & Certificates	15 Min.	Feedback & Certificates
15 Min.	***Tea Break***	15 Min.	***Tea Break***

Note: 1. If two simulator stations are available, then the simulator exercise for the two groups can be conducted simultaneously two separate faculties.
2. Relevant videos may be shown to the trainees as applicable.

APPENDIX – 3

CERTIFICATE (SAMPLE)

Institute's LOGO

NAME and ADDRESS of the D. G. Approved Training Institution

MTI No: **Tel:** **Fax:** **E-mail:**

Certificate No: _____

THIS IS TO CERTIFY THAT *[full name of candidate]*

Indian National Database of Seafarers (INDoS No.) .....

Date of Birth ..... (dd/mm/yyyy)

Holder of C.D.C. No. .....

Certificate of Competency / Proficiency, (if any) Grade: ..... No. .....

ADVANCED TRAINING FOR SHIPS OPERATING IN POLAR WATERS

held from .....to ..... .

The course is approved by the Directorate General of Shipping and meets the minimum mandatory STCW requirements for the training and qualifications of masters and deck officers on ships operating in polar waters, STCW Chapter V/4, Section A-V/4-2 and Table A-V/4-2 "Specification of minimum standard of competence in advanced training for ships operating in polar waters".

The candidate has also met the additional criteria specified in the STCW Convention, applicable to the issue of the certificate. This certificate is issued under the authority of the Directorate General of Shipping Ministry of Shipping, Government of India.

_____ Signature of Candidate

_____ Name, Indos No. and Signature of Course In-charge

Date of Issue: _____

Date of Expiry: UNLIMITED

Colour Photograph (35 mm x 35 mm)

Official Seal

_____ Name and Signature of Dean / Principal

Note :

1. This is not a Certificate of Proficiency in Advanced Training for Ships operating in Polar waters. This Course Certificate along with relevant sea experience and other requisite documents must be submitted to the Administration to obtain the Certificate of Proficiency.
2. 2. All enquiries regarding this certificate should be addressed to the issuing authority at the address given above.

APPENDIX – 4

SPECIFICATIONS FOR THE FULL MISSION NAVIGATION SIMULATOR

The Full mission Navigation simulator shall conform to the requirements of STCW as amended in 2010, Regulation I/12 (use of simulators), Section A — I/12 Part 1 and 2 "Perform Standards for the simulator and Simulator training Objectives" and section B — I/12, 68,69,70 (guidance regarding the use of simulators). It should also be capable of being used for training and demonstrating competence for Masters and Mates on ship of 500 GRT or more as per STCW Code A-V/4-1 and A-V/4-2.

The Radar, ARPA and ECDIS shall conform to the latest IMO Specifications, The performance standards for radar equipment are given in resolutions A. 222(VII), A. 278(VIII), A. 477(XII), A. 823(19), MSC.64 (67) and MSC.192 (79).The Performance Standards for ECDIS are :A 817 (19) , MSC 232(82) and Circular MSC.1/Circ.1503 as amended, with Edition 4.0 of the IHO ECDIS Presentation Library.

ENC charts shall be provided for the geographical areas mentioned in Section F. In case ENC charts are not available for that area, then paper chart may be used, in lieu thereof.

The Simulator Specifications shall be as given in Training Circular No. 06 of 2005, Annexure 1 - **SPECIFICATIONS FOR SHIP MANOEUVRING SIMULATOR**

In Addition the simulator shall also have the capability to depict Ice Navigation features. These are detailed below:

DETAILED SPECIFICATIONS

A. Visualization

The visual screen size for each channel for projected display shall not be less than 6' x 4'. The visual system shall present all navigational marks as displayed on ECDIS and paper charts for that area.

Or flat screen displays (instead of projected image), could be used, where each panel shall be a minimum of 65" on the diagonal.

Ice Visualisation:

The simulator shall be able to provide :

- Visual presentation of different ice zones: Ice field, Broken ice, Brash ice, Pancake ice, Small floe, Nilas ice as an object.
- Visual presentation of brash ice around the ship's hull while it is moving through the ice zone;
- Concentration of the broken ice in the channel is visually represented by means of dynamic texture changing (including uneven obliteration);
- Visual presentation of different thickness of Ice field.
- Dynamic reproduction of ice breaking sounds and noises produced by the ice friction against the ship hull.

B. Simulator Capabilities

Ice Functionality :

Ship motion modelling:

- Forces and moments of the hull from the movement in broken ice of various solidarity and thickness taken into account;
- Mechanical interaction with the edge of the solid ice of various thickness, ice breaking;
- Effects related to the ship's interaction with ice: increased resistance to the ship's motion; limited manoeuvrability; dangerous impacts against ice;
- Ice Class Properties:
  - Safety of ice navigation provided by hull strength and propulsion / steering unit for the models is regulated by assigning of appropriate ice category (ice class).

Areas of application:

Simulation training in navigating in ice conditions:

- When proceeding in broken ice;
- When proceeding along the solid ice edge, bumping against the edge;
- When proceeding in open pack ice, and in patches of ice free water.
- When collision with single ice floes.

C. Faculty

The faculty should be able to set :

ICE FEATURE CONTROLS

Channel Formation:

- Concentration of the broken ice in the channel increases linearly from an initial value (specified in the properties) to the maximum 100%;
- Thickness of the broken ice in the channel is equal to the thickness of an initial ice field;

History:

- "Freezing" parameter specifies the time (in minutes) that takes broken ice to get maximum concentration (become solid) in the channel;
- "Compacting" parameter specifies the speed (cm/sec) of the ice channel closing from its edges.

Radar Echo:

- "Detection range" parameter specifies maximum distance of the ice field edge detection by the radar;

Additional features:

- Setting of exercise ice zones as polygon zones with planar boundaries: Ice field, Broken ice, Brash ice, Pancake ice, Small floe, Nilas ice;
- Setting of drifting ice fields following the route, drifting as per weather settings, moving with predefined speed and course;
- Setting of exercise ice zones thickness and concentration;
- Setting of exercise Ice field channel parameters;
- Setting of exercise Hummocks parameters;
- Possibility to increase ice repulsion in order to speed up vessels' stopping in the ice field;

Exercise objects:

- Ice zone object
- Icebreaker as a Target Vessel

D Recommended Geographical Areas:-

The geographical areas mentioned in Trg Circular 06 of 2005, Annexure 1 to be replaced by :

At least five international Polar waters (as defined by the Polar Code) geographical areas for exercises.

Recommended Polar waters geographical Areas:

1) Barents Sea
2) Kara Sea
3) Bering Straits
4) Chukchi Sea
5) Beaufort Sea
6) Davis Straits
7) Greenland Sea
8) Laptev Sea
9) Baffin Bay
10) East Siberian Sea

A briefing / debriefing room capable of seating 4 trainees + instructor as per 1.2 sq.m. per trainee size requirement, with a briefing table. The briefing room shall be equipped with a white / black board, overhead / LCD projector and a capability of projecting recording of ship tracks and actions taken during the exercise for the purpose of debriefing.

The briefing / debriefing room may be connected to the instructor room, whereby the recording of ship's tracks and the actions taken could be directly seen on the instructor monitors instead of separate projection on overhead LCD projector.

APPENDIX – 5

Advanced Training for Ships Operating in Polar waters

TRAINEE'S PROFICIENCY CHECKLIST

These tasks are most effectively mastered by:

- Practicing them in navigational contexts (Simulator Exercises when underway)

	Simulator Exercises – Basic Tasks	**Day**	**SIM Exercise**	**Tick**
1	**Simulator Familiarisation**	D1	SIM EX-1	
2	**Navigating in Ice waters using leads available / thinner ice conditions by observance visually and by Radar**	D2	SIM EX-2	
a	Aware that TSS rules may not apply during winter season.			
b	Aware of vessels Ice capability as per its Class notation			
c	Engines are ready for immediate manoeuvre			
d	Ice should not be entered if an alternative, although longer, route is available			
e	Before deciding to enter the ice the following factors were considered: • Type of ice; • Time of year, weather and temperature; • Area of operation; • Availability of icebreakers; • Vessel's ice class in relation to the type of ice expected; • State of hull, machinery and equipment, and quantity of bunkers and stores left; • Vessel maintained within Ice belt • Draught and depth of water over the propeller tips and the rudder; • Ice experience of the person in charge on the bridge.			
f	Frequent use of the rudder, especially in the hard-over position, has the effect of slowing down the vessel's passage through ice.			
g	Too much rudder, when pushing through ice, may bring the vessel to a complete stop			
h	Astern movements should be used with caution and always with the rudder amidships as these astern movements can draw chunks of heavy ice back into the propeller blades causing damage to the tips			

	Simulator Exercises – Basic Tasks	Day	SIM Exercise	Tick
i	Turning Circle will increase in Ice			
j	Danger of the stern swinging into ice when passing through patches of open water or in leads with risk of damage to propeller or rudder			
k	Reliability of Navigational Buoy's position			
3	**Navigating in ice-infested waters using available leads / thinner ice conditions while in close proximity to land**	D3	SIM EX-3	
a	Consider above points Ex. 2a to 2k			
b	Watch for any changes in wind direction and in ice conditions as with a change of wind the vessel may become trapped in Ice with the risk of being driven ashore			
c	Ridging of ice towards leeward side was anticipated			
4	**Navigating in Iceberg, growlers, bergy bits infested waters with minimal visibility (onset of twilight or onset of daylight)**	D3	SIM EX-4	
a	Able to differentiate between a Growler, Bergy bit and an Iceberg			
b	Icebergs shall be given as wide berth as is possible, and passed on the windward side.			
c	Used Radar (X-band) effectively to locate ice / ice floes. Permanent trails switched "ON" to spot growlers in poor visibility / at night			
5	**Berthing a ship in ice infested waters**	D4	SIM EX-5	
a	Check that the Berth and its approach is clear of Ice			
b	Tugs used to clear Ice at Berth prior ship's approach			
c	Know the procedure to clear Ice by making fast a spring line and using the Ahead engines to flush off the ice near the dock wall.			
6	**Navigating in an Ice convoy maintaining safe distance from icebreaker / ship ahead and astern and using engines in emergency situations due vessel ahead stopping / safe distance reducing.**	D4	SIM EX-6	
a	Maintained standard reporting procedure with the Icebreaker. Followed the Icebreaker's Master's orders			
b	Maintained distance between the vessel ahead and was ready to immediately go astern if vessel ahead stopped / beset / distance closing in.			
c	Monitor the vessel astern of own vessel and warn her if approaching closer than agreed distance			
d	Reported to Icebreaker if Own ship unable to maintain distance			

7	**Navigating independently through open water leads until ice conditions bring the own ship to a stop and trainee must request icebreaker assistance. Icebreaker escort communication and procedures demonstrated including Freeing a ship beset in solid ice**	D5	SIM EX-7	
a	Consider above points Ex. 2a to 2k			
b	When approaching ice, speed was immediately reduced or engine stopped.			
c	When entering ice, vessel wasslowed down or barely moving.			
d	Entry into Ice field made at right angle to the ice edge.			
e	When Beset – NUC lights / Shapes exhibited.			
f	Ice breaker called to free vessel when beset in Ice			
g	Knowledge that Ice breaker's priority is to free vessels on / near the recommended ice route.			
h	Aware of procedure to free the beset vessel by Listing / Trimming the vessel.			
i	Knows the backing off and ramming technique to break free, if possible			
j	When backing, rudder was kept at amidships.			
k	Keeps engines running ahead at regular intervals to keep Ice free of rudder and propeller when the vessel is beset.			

Candidate Name: _____ Faculty Name: _____

Signature and Date: _____ Signature and date: _____