



CCS Rule Change Notice For:
RULES FOR CLASSIFICATION OF SEA-GOING STEEL
SHIPS

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SHIPS

PART ONE

Brief Introduction

1. Amendment of environmental protection notations and corresponding inspection requirements in accordance with CCS *the Rules for Green ECO-Ships* which newly entry into force.
2. Amendment of intelligent ship notation in accordance with CCS newly revised *Rules for Intelligent Ships*.
3. Clarification of ships provided with permanent diving support system to be assigned class notation DSV-Sat.
4. Amendment of Public Affair Ship notation in accordance with CCS newly revised Ch. 8, Pt. 8 of the Rules.

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ECO-SHIPS](#)

CHAPTER 2 SCOPE AND CONDITIONS OF CLASSIFICATION

Appendix 1 LIST OF CLASS NOTATIONS FOR SEA-GOING SHIPS

Type Notations

Table A

Class notation	Description		Technical requirements ^①
Diving Support Vessel	Diving support vessels	Ships provided with permanent diving support system to be assigned class notations DSV Air (air diving system) and DSV-Sat (saturation diving system)	Ch. 25, Pt. 8 of the Rules

Special Duties Notations

Table C

Class notation	Description		Technical requirements ^①
Traffic Ship ^②	Traffic ships	For transporting personnel, but not as passenger transport service	1. For ships not less than 20 m in length, in accordance with Ch. 2, Pt. 2 of the Rules; for high speed craft, in accordance with Rules for Construction and Classification of Sea-Going High Speed Craft. 2. For ships less than 20 m in length, in accordance with Rules for Construction of Coastal Boats. 3. For ships carrying more than 12 personnel, in accordance with technical requirements for passenger ships, unless specially specified by the Administration^④
Public Affair Ship	Public affair ships	Ships owned or operated by the Government and used only for non-commercial services	1. For ships not less than 20 m in length, in accordance with Ch. 28, Pt. 28 of the Rules; for high speed craft, in accordance with Rules for Construction and Classification of Sea-Going High Speed Craft. 2. For ships less than 20 m in length, in accordance with Rules for Construction of Coastal Boats. 3. For ships carrying more than 12 personnel <u>passengers</u>, in accordance with technical requirements for passenger ships, unless

^① The technical requirements listed in this Table are the basic ones for ships assigned to the notation; in other special cases involving ship types, special consideration is to be given by CCS according to the ship's specific conditions.

^② The notation "Crew Boat" is used for traffic ships flying the flag of Saint Vincent and Grenadines.

			specially specified by the Administration⁴. 4. <u>Where special provisions are specified by the Administration, such provisions are to be implemented for paragraphs 1 to 3 above</u>
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Special Features Notations

表 E

Class notation	Description		Technical requirements
i-Ship(<u>Ai,Ri</u> ,Nx,Hx,Mx,Ex,Cx,I x)	Intelligent ships	“i-Ship” intelligent ship class notation is assigned to ships with functions of intelligent navigation, intelligent hull, intelligent machinery, intelligent energy efficiency management, intelligent cargo management, and intelligent integration platform, <u>remote control and autonomous operation</u>. Each function corresponds to a functional notation as follows: <u>Ai</u> – functional notation for autonomous operation; <u>Ri</u> – functional notation for remote control; <u>Nx</u> – functional notation for intelligent navigation; <u>Hx</u> – functional notation for intelligent hull; <u>Mx</u> – functional notation for intelligent machinery; <u>Ex</u> – functional notation for intelligent energy efficiency management; <u>Cx</u> – functional notation for intelligent cargo management; <u>I</u> – functional notation for intelligent integration platform; <u>i</u> – <u>numbers such as 1, 2, 3, indicating the scope and degree of remote control and autonomous operation. Only one corresponding number can be selected according to the specific functions of the ship. Detailed requirements are given in Chapters 8 to 9 of the Rules for Intelligent Ships.</u> x – additional notation for optional function. One small letter stands for one additional notation for function and a functional notation may have multiple additional notations for function, <u>which shall be separated by comma</u>. Detailed requirements are given in Chapters 2 to 7 of the Rules for Intelligent Ships. <u>If one functional notation has already covered the function of another notation, only one notation is assigned.</u> Note 1: Ships, for which i-Ship (E), i-Ship(Es) and i-Ship (Et) class notations are requested, are also to comply with the relevant requirements of Guidelines for Surveys of Intelligent Energy Efficiency Management of Ships; Note 2: Ships, for which i-Ship (Mx) class notation is requested, are also to comply with the relevant requirements of Guidelines for Surveys of Intelligent Machinery of Ships; Note 3: Ships, for which i-Ship (I) class notation is requested, are also to comply with the relevant requirements of Guidelines for Surveys of Intelligent Integration Platform of Ships	Rules for Intelligent Ships, Guidelines for Surveys of Intelligent Energy Efficiency Management of Ships, Guidelines for Surveys of Intelligent Machinery of Ships, Guidelines for Surveys of Intelligent Integration Platform of Ships
LSDF	Low-sulphur distillate fuel	Ships intended to use low sulphur distillate fuel with sulphur content not exceeding 0.10% (m/m) may be assigned this notation if the requirements of Guidelines for Use of Low Sulphur Distillate Fuels in Ships are complied with	Guidelines for Use of Low Sulphur Distillate Fuels in Ships

Special Equipment and System Notations

Table G

VCS	Vapour control systems	For ships fitted with systems for control of vapour emission from tanks in compliance with the Rules (excluding	Ch. 15, Pt. 3 of the Rules
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		requirements for VCS-T), this notation may be added	
VCS-T	Vapour control systems transfer	For ships fitted with systems for control of vapour emission from tanks in compliance with the Rules, this notation may be added	Ch. 15, Pt. 3 of the Rules
DFD	Dual fuel diesel engine used as power plant	The class notation may be assigned to liquefied gas carriers fitted with dual fuel diesel engines as power plant in compliance with the requirements of the Guidelines	Guidelines for Design and Installation of Gas Fuel Engine Systems of Liquefied Gas Carriers
GF	Gas fuel only engines used as power plant	The class notation may be assigned to liquefied gas carriers fitted with gas fuel only engines as power plant in compliance with the requirements of the Guidelines	Guidelines for Design and Installation of Gas Fuel Engine Systems of Liquefied Gas Carriers
Natural Gas Fuel	Natural gas used as fuel	This notation may be assigned to ships of which main propulsion and/or auxiliary machinery uses natural gas or fuel oil and natural gas as fuel, except for liquefied gas carriers	Rules for Natural Gas Fuelled Ships
DFDR (X1,...,XN)	Natural gas fuel ready system	A ship assigned with the class notation of DFDR may have one or more suffix(es) of XN. The intention of XN is as follows: H: the hull structures have been strengthened in accordance with the relevant requirements of natural gas fuel powered ships T: the natural gas fuel containment system (bunkers/fuel tanks) and its supporting members have been installed M: the main engine installed in ship's construction is a dual fuel engine m: main engine installed in ship's construction may be converted to a dual fuel engine in future A: the auxiliary engine installed in ship's construction is a dual fuel engine a: the auxiliary engine installed in ship's construction may be converted to a dual fuel engine in future B: the boiler installed in ship's construction is a dual fuel boiler P: the arrangement in ship's construction has been considered the approaching installation of natural gas fuel supply system and related to, including the arrangement of piping, bunkering station, compressor room, gas valve unit, fire fighting system, etc. E: the power distribution system has been reserved for the equipment related to natural gas fuel powered system in ship's construction D: the gas dangerous zones have been taken into consideration in ship's construction Note: It must be alternative to the suffixes M or m; it is optional for the other suffixes.	Guidelines for Natural Gas Fuel Ready Ships
SPV	Solar photovoltaic system	For ships fitted with solar photovoltaic system, this notation may be added	Guidelines for Survey of Solar Photovoltaic System and Lithium Iron Phosphate Battery System
EGC Ready (X)	Exhaust gas cleaning systems (EGC) Ready	For EGC Ready (X) class notation, the symbol X stands for the type of the EGC system, including: (1) dry desulfurization system, expressed by the capital letter D; (2) open loop exhaust gas cleaning system, expressed by the capital letter O; (3) closed loop exhaust gas cleaning system, expressed by the capital letter C; (4) open closed hybrid composite system, expressed by the capital letter H. X is to be replaced by one of the four letters above based on the type of the EGC system intended to be installed	Guidelines for Exhaust Gas Cleaning Systems Ready
SCR Ready (X)	Selective catalytic reduction system (SCR) Ready	In assigning class notation SCR Ready(X), X is to be replaced by U or A, the meaning of which are as follows: U: SCR with reductant using aqueous urea solution;	Guidelines for Selective Catalytic Reduction System Ready

		A: SCR with reductant using aqueous ammonia	
FC-FULL	Fuel-cell power-system	This notation may be assigned provided that: the ship is not provided with other power source except the fuel cell power system, and the fuel cell power system provides power to all equipment onboard the ship (propulsion, steering gears and other essential equipment, emergency equipment as well as other equipment)	Pt. 2 of Guidelines for Ships Using Alternative Fuel
FC-POWER-1		This notation may be assigned provided that: the ship is provided with the diesel generating set and the fuel cell power system, and the fuel cell power system provides power to essential equipment of the ship	
FC-POWER-2		This notation may be assigned provided that: the ship is provided with the diesel generating set and the fuel cell power system, and the fuel cell power system provides power to non-essential equipment and non-emergency equipment	
Hybrid	Hybrid system	Ships with various sources of energy (excluding sails) which can serve as main propulsion power simultaneously, this notation may be assigned.	Guidelines for Survey of Hybrid Ships
Battery (Power)	Pure-Battery Powered-Propulsion	When only batteries are used as propulsion power in ship's normal operation and relevant requirements in the Guidelines are met, with shipowner's application, this notation may be assigned.	Guidelines for Survey of Pure Battery Powered-Ships

Environmental Protection Notations

Table I

Class notation	Description		Technical requirements
CLEAN	Clean	This notation may be assigned to ships complying with relevant requirements for pollution preventing structures, equipment and operational procedures in CCS rules, in addition to statutory requirements for pollution prevention	Sec. 2, Ch. 8, Pt. 8 of the Rules
FTP(+)	Fuel tank protection	This notation may be assigned to ships with all fuel tanks provided with double hull protection	Sec. 3, Ch. 8, Pt. 8 of the Rules
FTP	Fuel oil tank protection	This notation may be assigned to ships with double hull protection or equivalent protective measures	
GWC	Gray water control	This notation may be assigned to ships having control of drainage from laundry, bathroom, galley, accommodation and fitted with a grey water holding tank of required capacity, high level alarm and a sewage disposal system with required processing capacity	Sec. 3, Ch. 8, Pt. 8 of the Rules
RSC	Refrigeration system control	This notation may be assigned to ships, of which all refrigerants used are to have an Ozone Depleting Potential (ODP) rating of zero and a Global Warming Potential (GWP) of less than 2,000	Sec. 3, Ch. 8, Pt. 8 of the Rules
SEC(I)	SO _x emission control	Sulphur content of all fuel oils used on board is not to exceed 1.0% (m/m) or equivalent means are used	Sec. 3, Ch. 8, Pt. 8 of the Rules
SEC(II)		Sulphur content of all fuel oils used on board is not to exceed 0.5% (m/m) or equivalent means are used	
SEC(III)		Sulphur content of all fuel oils used on board is not to exceed 0.1% (m/m) or equivalent means are used	
AFS	Anti-fouling system	This notation may be assigned to ships, of which anti-fouling system is not to contain any biocides	Sec. 3, Ch. 8, Pt. 8 of the Rules
BWMP	Ballast water management plan	For ships implementing approved ballast water management plan on board	Guidelines for Development of Ship's Ballast Water Management Plan
COMF (NOISE N)	Comfort (noise N)	This notation may be assigned if the noise levels in related spaces of the ship meet the Rule requirements for comfort of crew and passengers, with N = 1 or 2 or 3 indicating different comfort levels, where 1 represents the highest comfort level	Ch. 16, Pt. 8 of the Rules

Class notation	Description		Technical requirements
COMF (VIB-N)	Comfort (vibration-N)	This notation may be assigned if the vibration levels in related spaces of the ship meet the Rule requirements for comfort of crew and passengers, with N = 1 or 2 or 3 indicating different comfort levels, where 1 represents the highest comfort level	Ch. 16, Pt. 8 of the Rules
HAB (VIB)	Habitability (vibration)	This notation may be assigned if the vibration levels in related spaces of the ship meet the habitability requirements regarding crew and passengers in ISO 6954	Ch. 14 & 15 of Guidelines for Shipboard Vibration Control
VIB(S)	Structural vibration	This notation may be assigned if related structures of the ship meet the structural vibration requirements in the Guidelines and no damage will be caused due to structural fatigue	Ch. 14 & 15 of Guidelines for Shipboard Vibration Control
VIB(M)	Machinery vibration	This notation may be assigned if related machineries of the ship meet the mechanical vibration requirements in the Guidelines and no damage due to mechanical fatigue or accelerated wear of moving parts will be caused	Ch. 14 & 15 of Guidelines for Shipboard Vibration Control
VIB	Vibration	This notation may be assigned if the ship meets the requirements for both structural vibration VIB(S) and mechanical vibration VIB(M)	Ch. 14 & 15 of Guidelines for Shipboard Vibration Control
Green Ship I	Green ships ^①	The green elements of the ship in terms of environmental protection, energy efficiency (including design energy efficiency and operation energy efficiency) and working environment comply with all applicable requirements for Green Ship I	Rules for Green Ships
Green Ship II		The green elements of the ship in terms of environmental protection, energy efficiency (including design energy efficiency and operation energy efficiency) and working environment comply with all applicable requirements for Green Ship II	
Green Ship III		The green elements of the ship in terms of environmental protection, energy efficiency (including design energy efficiency and operation energy efficiency) and working environment comply with all applicable requirements for Green Ship III	
Green Ship 1		The green elements of the ship in terms of environmental protection, energy efficiency (including design energy efficiency and operation energy efficiency) and working environment comply with all applicable requirements for Green Ship 1	
Green Ship 2		The green elements of the ship in terms of environmental protection, energy efficiency (including design energy efficiency and operation energy efficiency) and working environment comply with all applicable requirements for Green Ship 2	
Green Ship 3		The green elements of the ship in terms of environmental protection, energy efficiency (including design energy efficiency and operation energy efficiency) and working environment comply with all applicable requirements for Green Ship 3	
EEDI(I)	Energy efficiency in ship design ^②	The ship's attained EEDI value is equivalent to the requirement for EEDI Phase 0 of MARPOL Annex VI	Ch. 2 of Rules for Green Ships
EEDI(II)		The ship's attained EEDI value is equivalent to the requirement for EEDI Phase 1 of MARPOL Annex VI	
EEDI (II+)		The ship's attained EEDI is equivalent to the requirement for EEDI Phase 2 of MARPOL Annex VI	
EEDI(III)		The ship's attained EEDI value is equivalent to the requirement for EEDI Phase 3 of MARPOL Annex VI	
EEDI(1)		The ship's energy efficiency design index value is less than or equal to Class 1 energy efficiency limit standard, and is greater	

① Ships engaged on international voyages are only assigned class notations in Roman numerals.

② Ships engaged on international voyages are only assigned class notations in Roman numerals.

Class notation	Description		Technical requirements
		than Class 2 energy efficiency limit standard	
EEDI(2)		The ship's energy efficiency design index value is less than or equal to Class 2 energy efficiency limit standard, and is greater than Class 3 energy efficiency limit standard	
EEDI(3)		The ship's energy efficiency design index value is less than or equal to Class 3 energy efficiency limit standard	
NEC (II)	NO _x emission control	In compliance with standards of Tier II in MARPOL Annex VI	Sec. 3, Ch. 8, Pt. 8 of the Rules
NEC (III)		In compliance with standards of Tier III in MARPOL Annex VI	
GPR	Green passport	The ship is to carry the Inventory of Hazardous Materials verified by CCS and complying with the requirements of Hong Kong International Convention for the Safe and Environmentally Sound Recycling of Ships, 2009	Sec. 3, Ch. 8, Pt. 8 of the Rules
GPR(EU)		The ship is to carry the Inventory of Hazardous Materials verified by CCS and complying with the requirements of EU Regulation No.1257/2013	
BWMS	Ballast water management system	Ship's ballast water management system must be approved and comply with the requirements for the installation and arrangements of the Rules	Sec. 3, Ch. 8, Pt. 8 of the Rules
SEEMP(I)	Energy efficiency in ship operation ⁽⁴⁾	The ship is to have a Ship Energy Efficiency Management Plan (SEEMP) developed in accordance with the relevant IMO guidelines	Ch. 2 of Rules for Green Ships
SEEMP(II)		For a ship with notation SEEMP(I), where a ship energy efficiency management system is established by the Company or the Operator of the ship and certified by CCS, this notation may be assigned	
SEEMP(III)		For a ship with notation SEEMP(II), where a ship has software for real time monitoring of e.g. route optimization and hull biofouling so as to monitor relevant parameters affecting ship energy efficiency and/or adjust energy efficiency measures at any time, this notation may be assigned	
SEEMP(1)		The ship is to have a Ship Energy Efficiency Management Plan (SEEMP) developed in accordance with the relevant IMO guidelines	
SEEMP(2)		For a ship with notation SEEMP(1), where a ship energy efficiency management system is established by the Company or the Operator of the ship and certified by CCS, this notation may be assigned	
SEEMP(3)		For a ship with notation SEEMP(2), where a ship has software for real time monitoring of e.g. route optimization and hull biofouling so as to monitor relevant parameters affecting ship energy efficiency and/or adjust energy efficiency measures at any time, this notation may be assigned	
AMPS	High voltage shore connection system	The class notation may be assigned to a ship fitted with a high voltage shore connection system having rated alternating voltage above 1 kV and up to and including 15 kV for supplying shore power while in port so as to ensure normal operation of equipment intended to be used when generating sets of the ship are stopped	Ch. 19, Pt. 8 of the Rules
IBTS	Integrated bilge water treatment system	The IBTS notation may be assigned for ships the management and discharge arrangements of the bilge water from machinery spaces complying with the requirements of the integrated bilge water treatment system (IBTS) as specified in MEPC.1/Circ.642, as revised by MEPC.1/Circ.676 and MEPC.1/Circ.760	Ch. 8, Pt. 8 of the Rules
EAL	Environmentally acceptable lubricants	The EAL notation may be assigned for ships the lubricants used for the oil/water interfaces complying with the relevant provisions on environmentally acceptable lubricants as	Ch. 8, Pt. 8 of the Rules

Class notation	Description		Technical requirements
		specified in CCS Guidelines for implementation of the survey of the requirements for environmentally acceptable lubricants by US EPA	
Biofouling C	Biofouling control	The Biofouling C notation may be assigned for ship having a biofouling management plan, which is prepared in accordance with 2011 Guidelines for the control and management of ships' biofouling to minimize the transfer of invasive aquatic species adopted by IMO by resolution MEPC.207(62) and to be approved by CCS	Ch. 8, Pt. 8 of the Rules
SEC (EGCS)	SO _x emission control (Exhaust gas cleaning system)	Ships installed with the EGC systems for reduction of SO _x emission may be assigned this notation	Guidelines for Design and Installation of Exhaust Gas Cleaning Systems
NEC (SCRS)	NO _x emission control (Selective catalytic reduction system)	Ships installed with the SCR systems for reduction of NO _x emission may be assigned this notation	Guidelines for Application of Selective Catalytic Reduction (SCR) System Onboard Ships
Underwater Noise N	Underwater radiation noise of ships	This notation may be assigned if the underwater radiation noise of ships complies with requirements upon measurement, with N = 1 or 2 or 3, where N stands for the level of underwater noise and 1 stands for the highest level	Guidelines for Underwater Radiation Noise of Ships

Class Notations for Green Eco-Ships ^①

Table I-1

<u>Class notation</u>	<u>Description</u>		<u>Technical requirements</u>
<u>G-EP</u>	<u>Environmental protection</u>	The “G-EP” class notation may be assigned to sea-going ships engaged on international voyages in compliance with applicable international conventions and codes only	<u>Rules for Green Eco-Ships</u>
<u>G-EP (X)</u>		Where it is necessary to indicate further the level of environmental protection, “X” is used to represent the sub-elements as follows: <u>OILx-- control of discharge of oil pollutants, where x is 1 or 2;</u> <u>EAL-- environmental acceptable lubricants;</u> <u>IBTS-- integrated bilge water treatment system;</u> <u>NLSx-- control of discharge of noxious liquid substances, where x is 1 or 2;</u> <u>SC-- control of discharge of sewage;</u> <u>GWC-- control of discharge of grey water;</u> <u>RC-- control of discharge of garbage;</u> <u>NECx-- control of NOx emission, where x is 1 or 2;</u> <u>SEC-- control of SOx emission;</u> <u>VCS/VCS-T-- VOC emission control;</u> <u>RSCx-- control of refrigeration system;</u> <u>INC-- emission control of incineration operation on board;</u> <u>BC20, BC70-- emission control of black carbon;</u> <u>AFS/AFS +-- anti-fouling systems;</u> <u>GPR/GPR+-- green passport;</u> <u>GPR (EU) /GPR (EU) + -- green passport (EU)</u>	
<u>G-ECO</u>	<u>Ecological protection</u>	The “G-ECO” class notation may be assigned to sea-going ships engaged on international voyages in compliance with applicable international conventions and codes only	<u>Rules for Green Eco-Ships</u>
<u>G-ECO (X)</u>		Where it is necessary to indicate further the level of ecological protection, “X” is used to represent the sub-elements as follows: <u>CDx-- CO₂ emission design index, where “x” represents the percentage ratio of the ship’s Attained EEDI value lower than the reference line value for that ship;</u> <u>COM-- CO₂ emission operation management;</u> <u>BWM (T) -- ballast water treatment;</u> <u>BWM (Es) -- ballast water exchange-sequential method;</u> <u>BWM (Ef) -- ballast water exchange-flow-through method;</u> <u>BWM (Ed) -- ballast water exchange-dilution method;</u> <u>BWM (O) -- other management method of ballast water;</u> <u>BIO-- biofouling management;</u> <u>VIBx-- comfort onboard (vibration), where x is 1 or 2 or 3;</u> <u>NOIx-- comfort onboard (compartment noise), where x is 1 or 2 or 3;</u> <u>CLx-- comfort onboard (indoor climate), where x is 1 or 2 or 3;</u> <u>UW-- underwater noise;</u> <u>RN-- ambient noise.</u>	

Class Notations for Green Eco-Ships ^②

Table I-2

<u>Class notation</u>	<u>Description</u>		<u>Technical requirements</u>
<u>Gd-EP</u>	<u>Environmental protection</u>	The “Gd-EP” class notation may be assigned to sea-going ships engaged on domestic voyages in compliance with the applicable requirements of the Technical Regulations for Statutory Surveys of Sea-going Ships Engaged on Domestic Voyages of the Maritime Safety Administration of the People’s Republic of China only	<u>Rules for Green Eco-Ships</u>
<u>Gd-EP (X)</u>		Where it is necessary to indicate further the level of	

^① Sea-going ships engaged on international voyages.

^② Sea-going ships engaged on domestic voyages.

		environmental protection, “X” is used to represent the sub-elements as follows: OILx-- control of discharge of oil pollutants, where x is 1 or 2; EAL-- environmental acceptable lubricants; IBTS-- integrated bilge water treatment system; NLSx-- control of discharge of noxious liquid substances, where x is 1 or 2; SC-- control of discharge of sewage; GWC-- control of discharge of grey water; RC-- control of discharge of garbage; NECx-- control of NOx emission, where x is 1 or 2; SEC-- control of SOx emission; VCS/VCS-T-- VOC emission control; RSCx-- control of refrigeration system; INC-- emission control of incineration operation on board; GBEC-- emission control of diesel engine exhaust pollutant; AFS/AFS +-- anti-fouling systems; GPR-- green passport	
Gd-ECO (X)	Ecological protection	The “Gd-ECO(X)” class notation may be assigned to sea-going ships engaged on domestic voyages in compliance with applicable requirements of the Rules for Green Eco-Ships, where “X” represents the sub-elements as follows: CDx-- CO₂ emission design index, where “x” represents the percentage ratio of the ship’s Attained EEDI value lower than the Required EEDI reference line value for that ship; COM-- CO₂ emission operation management; VIBx-- comfort onboard (vibration), where x is 1 or 2 or 3; NOIx-- comfort onboard (compartment noise), where x is 1 or 2 or 3; CLx-- comfort onboard (indoor climate), where x is 1 or 2 or 3; UW-- underwater noise; RN-- ambient noise.	Rules for Green Eco-Ships

Class Notations for Green Eco-Technologies

Table I-3

Class notation	Description		Technical requirements
DFD	Dual fuel diesel engine used as power plant	The class notation may be assigned to liquefied gas carriers fitted with dual fuel diesel engines as power plant in compliance with the requirements of the Rules for Green Eco-Ships	Rules for Green Eco-Ships
GF	Gas fuel only engines used as power plant	The class notation may be assigned to liquefied gas carriers fitted with gas fuel only engines as power plant in compliance with the requirements of the Rules for Green Eco-Ships	Rules for Green Eco-Ships
Natural Gas Fuel	Natural gas used as fuel	This notation may be assigned to ships of which main propulsion and/or auxiliary machinery uses natural gas or fuel oil and natural gas as fuel, except for liquefied gas carriers	Rules for Green Eco-Ships

<u>DFDR</u>	<u>Natural gas fuel ready system</u>	<u>A ship assigned with the class notation of DFDR may have one or more suffix(es) of X_N. The intention of X_N is as follows:</u> <u>H: the hull structures have been strengthened in accordance with the relevant requirements of natural gas fuel powered ships</u> <u>T: the natural gas fuel containment system (bunkers/fuel tanks) and its supporting members have been installed</u> <u>M: the main engine installed in ship's construction is a dual fuel engine</u> <u>m: main engine installed in ship's construction may be converted to a dual fuel engine in future</u> <u>A: the auxiliary engine installed in ship's construction is a dual fuel engine</u> <u>a: the auxiliary engine installed in ship's construction may be converted to a dual fuel engine in future</u> <u>B: the boiler installed in ship's construction is a dual fuel boiler</u> <u>P: the arrangement in ship's construction has been considered the approaching installation of natural gas fuel supply system and related to, including the arrangement of piping, bunkering station, compressor room, gas valve unit, fire-fighting system, etc.</u> <u>E: the power distribution system has been reserved for the equipment related to natural gas fuel powered system in ship's construction</u> <u>D: the gas dangerous zones have been taken into consideration in ship's construction</u> <u>Note: It must be alternative to the suffixes M or m; it is optional for the other suffixes.</u>	<u>Rules for Green Eco-Ships</u>
<u>SEC (EGCS)</u>	<u>SO_x emission control (Exhaust gas cleaning system)</u>	<u>Ships installed with the EGC systems for reduction of SO_x emission may be assigned this notation</u>	<u>Rules for Green Eco-Ships</u>
<u>EGC Ready (X)</u>	<u>Exhaust gas cleaning systems (EGC) Ready</u>	<u>For EGC Ready (X) class notation, the symbol X stands for the type of the EGC system, including:</u> <u>(1) dry desulfurization system, expressed by the capital letter D;</u> <u>(2) open loop exhaust gas cleaning system, expressed by the capital letter O;</u> <u>(3) closed loop exhaust gas cleaning system, expressed by the capital letter C;</u> <u>(4) open-closed hybrid composite system, expressed by the capital letter H.</u> <u>X is to be replaced by one of the four letters above based on the type of the EGC system intended to be installed</u>	<u>Rules for Green Eco-Ships</u>
<u>LSDF</u>	<u>Low sulphur distillate fuel</u>	<u>Ships intended to use low sulphur distillate fuel with sulphur content not exceeding 0.10% (m/m) may be assigned this notation if the requirements of the Rules for Green Eco-Ships are complied with</u>	<u>Rules for Green Eco-Ships</u>
<u>NEC (SCRS)</u>	<u>NO_x emission control (Selective catalytic reduction system)</u>	<u>Ships installed with the SCR systems for reduction of NO_x emission may be assigned this notation</u>	<u>Rules for Green Eco-Ships</u>
<u>SCR Ready (X)</u>	<u>Selective catalytic reduction system (SCR) Ready</u>	<u>In assigning class notation SCR Ready(X), X is to be replaced by U or A, the meaning of which are as follows:</u> <u>U: SCR with reductant using aqueous urea solution;</u> <u>A: SCR with reductant using aqueous ammonia</u>	<u>Rules for Green Eco-Ships</u>
<u>AMPS</u>	<u>Alternating current shore</u>	<u>The class notation may be assigned to a ship fitted with a shore connection system having rated alternating voltage up</u>	<u>Rules for Green Eco-Ships</u>

	connection system	to and including 15 kV for supplying shore power while in port so as to ensure normal operation of equipment intended to be used when generating sets of the ship are stopped. Load transfer between the shore supply and the ships is executed via blackout and temporary parallel running.	
SPV	Solar photovoltaic system	For ships fitted with solar photovoltaic system, this notation may be added	Rules for Green Eco-Ships
Battery(Power)	Pure Battery-Powered Propulsion	When only batteries are used as propulsion power in ship's normal operation and relevant requirements in the Rules for Green Eco-Ships are met, with shipowner's application, this notation maybe assigned.	Rules for Green Eco-Ships
Hybrid	Hybrid system	Ships with various sources of energy (excluding sails) which can serve as main propulsion power simultaneously, this notation may be assigned.	Rules for Green Eco-Ships
FC-FULL	Fuel cell power system	This notation may be assigned provided that: the ship is not provided with other power source except the fuel cell power system, and the fuel cell power system provides power to all equipment onboard the ship (propulsion, steering gears and other essential equipment, emergency equipment as well as other equipment)	Rules for Green Eco-Ships
FC-POWER 1		This notation may be assigned provided that: the ship is provided with the diesel generating set and the fuel cell power system, and the fuel cell power system provides power to essential equipment of the ship	
FC-POWER 2		This notation may be assigned provided that: the ship is provided with the diesel generating set and the fuel cell power system, and the fuel cell power system provides power to non-essential equipment and non-emergency equipment	
WAP (RWS)	Propulsion system with sail assistance	This notation may be assigned upon request by the shipowner, where relevant requirements of the Rules for Green Eco-Ships are satisfied	Rules for Green Eco-Ships
ALDR	Air lubrication drag reduction system	This notation may be assigned upon request by the shipowner, where relevant requirements of the Rules for Green Eco-Ships are satisfied	Rules for Green Eco-Ships

CHAPTER 5 SURVEYS AFTER CONSTRUCTION

Appendix 8

PROCEDURAL REQUIREMENTS FOR SERVICE SUPPLIERS

5. Procedure for approval and certification

5.1 Submission of documents

5.1.1 The following documents are to be submitted to CCS for review. General requirements concerning suppliers are given in 5.2, and specific requirements as relevant, in Annex 1:

- For categories of service suppliers that require authorization from manufacturers, manufacturer's documentary evidence that the service supplier has been authorized or licensed to service the particular makes and models of equipment for which approval is sought are to be provided;

Annex 1

Special Requirements for Various Categories of Service Suppliers

5. Firms engaged in servicing inflatable liferafts, inflatable lifejackets, hydrostatic release units, inflatable rescue boats and marine evacuation systems

5.4 The supplier is to provide evidence that it has been authorized or licensed to service the particular makes and models of equipment for which approval is sought by the equipment's manufacturer.

9. Firms engaged in annual performance testing of voyage data recorders (VDRs) and simplified voyage data recorders (S-VDRs)

9.2 Extent of approval

9.2.1 The supplier is to provide evidence that he has been authorized or licensed by the equipment's manufacturer to service the particular makes and models of equipment for which approval is sought.

13. Firms engaged in maintenance, thorough examination, operational testing, overhaul and repair of lifeboats and rescue boats, launching appliances and release gear

13.2 Extent of approval

13.2.2 Any service supplier engaged in maintenance, thorough examination, operational testing, overhaul and repair of lifeboats and rescue boats, launching appliances and release gear carried out in accordance with SOLAS regulation III/20 shall be approved for these operations for each make and type of equipment for which they provide the service in accordance with IMO Resolution MSC.402(96)/Corr.1 (annex, section 7).

Such approval shall include, as a minimum:

- employment and documentation of personnel certified in accordance with a recognized national, international or industry standard as applicable, or an equipment manufacturer's established certification program. In either case, the certification program shall be based on the paragraph 13.3 for each make and type of equipment for which service is to be provided; and,

- compliance with provisions of paragraphs 13.4, 13.5 and 13.6.

13.3 Certification of personnel

13.3.1 Personnel for the work specified in 13.1 shall be certified by the manufacturer or the Service Supplier for each make and type of the equipment to be worked on. Approved Service Supplier is allowed to certify its own personnel (i.e. employed by the same service supplier) only.

13.3.5 Upon completion of training and competency assessment, a certificate shall be issued defining the level of qualification and the scope of the certification (i.e. makes and types of equipment and specifically state which activities (annual thorough examination and operational tests; 5-year thorough examination, overhaul; overload operational tests; repairs) are covered by the certification). The expiry date shall clearly be written on the certificate and shall be three years from the date of issue. The validity of any certificate shall be suspended in the event of any shortfall in performance and only revalidated after a further competency assessment.

CHAPTER 6 SURVEYS RELATED TO CLASS NOTATIONS

Section 3 SURVEYS RELATED TO CLASS NOTATIONS FOR SPECIAL EQUIPMENT

6.3.1 Environmental protection sub-elements VCS for green eco-ships ^①~~notation~~

6.3.1.1 Application

(1) This paragraph applies to green eco-ships~~ships~~ which have been assigned one of the following environmental protection sub-elements~~class notations~~ for vapor control systems:

- ① VCS;
- ② VCS – T.

6.3.1.2 Initial classification

(1) For a ship intended for the ~~notation~~ VCS sub-elements, the plans and documents required by 15.1.4 of Chapter 15, PART THREE of the Rules are to be submitted for approval.

6.3.1.3 Annual surveys

(1) The vapor control system of the ship having a VCS ~~notation~~ sub-elements is to be generally examined in so far as can be seen, at each annual survey, to confirm that the system is in satisfactory condition. At least the following items are to be included:

- ① external examination of all components and piping, including isolating/relief valves, means of collecting and draining condensate, means for separation of vapors from non-compatible cargoes and electrical continuity/bonding arrangements;
- ② confirmation of the proper operation of the vapor manifold isolating valve, including manual operation and valve position indication;
- ③ confirmation of the continuing effectiveness of the “lug and hole” construction of the vapor connection flange(s);
- ④ confirmation that any hoses used for the conveyance of vapor are in accordance with 15.2.3 of Chapter 15 of PART THREE of the Rules;
- ⑤ where inert gas distribution piping on deck is used for vapor collection, confirmation of the continuing effectiveness of the inert gas main isolating valve(s);
- ⑥ confirming normal operation of the closed cargo gauging system for each tank which is connected to the vapor collection system;
- ⑦ examination of the cargo tank venting system, including flame screens, where fitted;
- ⑧ verification of the satisfactory operation of the following alarms and safety devices using simulated conditions:
 - a. high vapor pressure in main vapor collection line(s);
 - b. low vapor pressure in main vapor collection line(s);
 - c. cargo tank high liquid level;
 - d. cargo tank overflow (high-high liquid level);
 - e. loss of power to alarm system or, alternatively, failure of tank level sensor circuitry;
 - f. automatic shutdown system (where fitted);
- ⑨ the Surveyor is to examine the permanent records on board to verify the operation and maintenance of the system.

(2) The vapor control system of the ship having a VCS – T ~~notation~~ sub-elements is to be generally examined in so far as can be seen, at each annual survey, to confirm that the system is in satisfactory condition. At least the following items are to be included:

- ① the items required by (1) above;
- ② confirmation that the detonation flame arrester (where fitted) is in satisfactory condition;
- ③ confirmation that a means of electrical insulation (insulating flange or non-conductive hose, etc.) is provided for the vapor manifold connection;
- ④ confirmation of the accuracy of the fixed oxygen analyzer (required to be fitted within 3 m of the ship’s vapor manifold connection) by means of a calibration gas.

^① See also CCS Rules for Green Eco-Ships.

6.3.1.4 Special surveys

(2) The vapor control system of the ship having a VCS – T notation sub-elements is to be generally examined in so far as can be seen, at each special survey, to confirm that the system is in satisfactory condition. At least the following items are to be included:

- ① the items required by (1) above;
- ② confirmation that the detonation flame arrester (where fitted) is in satisfactory condition.

Section 5 SURVEYS RELATED TO CLASS NOTATIONS FOR ENVIRONMENTAL PROTECTION GREEN ECO-SHIPS

6.5.1—~~CLEAN~~ notation

6.5.1.1—General requirements

(1) This paragraph applies to ships which have been assigned one of the following class notations related to environmental protection:

- ① ~~CLEAN~~—with the following special notations:
 - a. FTP (Fuel Tank Protection);
—FTP(+) (Fuel Tank Protection);
 - b. GWC (Grey Water Control);
 - c. NEC(II) (NO_x Emission Control);
NEC(III) (NO_x Emission Control);
 - d. SEC(I) (SO_x Emission Control);—
SEC(II) (SO_x Emission Control);
——SEC(III) (SO_x Emission Control);
 - e. RSC (Refrigeration System Control);
 - f. AFS (Anti-Fouling System);
 - g. GPR (Green Passport for Recycling)[⊕];
GPR (EU)[⊕];
 - h. BWMS (Ballast Water Management System);
 - i. IBTS (Integrated Bilge Water Treatment System);
 - j. EAL (Environmentally Acceptable Lubricants);
 - k. Biofouling C (Biofouling Control).

6.5.1.2—Surveys during construction

(1) Following review or confirmation of the plans and documents listed in 8.1.4 of Chapter 8 of PART EIGHT, the Surveyor is to examine the ship's hull and equipment for confirming that the structures, materials, equipment, devices, systems, installation and workmanship as required for the ~~CLEAN~~ class notation or other class notations are in compliance with approved plans, diagrams and tables, specifications, calculations and other technical documents, and that relevant products certificates have been issued.

(2) For ships to which CCS is not authorized to carry out statutory services, the Surveyor is to confirm that the ship has all relevant valid statutory certificates or documents, perform a general assessment of the items related to the statutory certificates, and verify compliance of the ship with the requirements of this Chapter for class notations so as to confirm compliance with all relevant requirements of this Chapter.

(3) Following the successful completion of the initial survey, a ~~CLEAN~~ class notation may be assigned to the ship.

6.5.1.3—Annual surveys

(1) For the purpose of maintaining the assigned ~~CLEAN~~ class notation and other notations, in addition to compliance with the requirements of Chapter 8 of PART EIGHT, the annual surveys applicable to the ship as specified in the following conventions and codes are to be completed:

- ① applicable regulations of Annexes to MARPOL;
- ② regulations of Load Line Convention;
- ③ regulations of AFS Convention;
- ④ other international codes, standards, guidelines or recommendations specified in Chapter 8 of PART

[⊕] Refer to Guidelines for Development and Survey of the Inventory of Hazardous Materials of Ships.

EIGHT.

(2) Confirming that the ship has valid certificates or documents of compliance, record books and approved procedural documents as required by Chapter 8 of PART EIGHT.

6.5.1.4 —Intermediate surveys

(1) The intermediate surveys applicable to the ship as specified in the conventions, codes, standards, guidelines or recommendations listed in 6.5.1.3 above are to be completed, and the requirements of Chapter 8 of PART EIGHT are to be complied with.

(2) Confirming that the ship has valid certificates or documents of compliance, record books and approved procedural documents as required by Chapter 8 of PART EIGHT.

6.5.1.5 —Special surveys

(1) The special surveys applicable to the ship as specified in the conventions, codes, standards, guidelines or recommendations listed in 6.5.1.4 above are to be completed, and the requirements of Chapter 8 of PART EIGHT are to be complied with.

(2) Confirming that the ship has valid certificates or documents of compliance, record books and approved procedural documents as required by Chapter 8 of PART EIGHT.

6.5.1 Class notations for environmental protection of green eco-ships

6.5.1.1 This paragraph applies to ships assigned the following class notations related to environmental protection:

(1) G-EP/Gd-EP—environmental protection

(2) G-EP(X), environmental protection, where X represents one or more of the following sub-elements:

- ① OILx—control of discharge of oil pollutants, where x is 1 or 2;
- ② EAL—environmental acceptable lubricants;
- ③ IBTS—integrated bilge water treatment system;
- ④ NLSx—control of discharge of noxious liquid substances, where x is 1 or 2;
- ⑤ SC—control of discharge of sewage;
- ⑥ GWC—control of discharge of grey water;
- ⑦ RC—control of discharge of garbage;
- ⑧ NECx—control of NOx emission, where x is 1 or 2;
- ⑨ SEC—control of SOx emission;
- ⑩ VCS/VCS-T—VOC emission control;
- ⑪ RSCx—control of refrigeration system;
- ⑫ INC—emission control of incineration operation on board;
- ⑬ BC20/BC 70—emission control of black carbon;
- ⑭ AFS/AFS+—anti-fouling systems;
- ⑮ GPR/GPR+—green passport;

GPR(EU)/GPR(EU)+—green passport (EU).

(3) Gd-EP(X), environmental protection, where X represents one or more of the following sub-elements:

- ① OILx—control of discharge of oil pollutants, where x is 1 or 2;
- ② EAL—environmental acceptable lubricants;
- ③ IBTS—integrated bilge water treatment system;
- ④ NLSx—control of discharge of noxious liquid substances, where x is 1 or 2;

- ⑤ SC——control of discharge of sewage;
- ⑥ GWC——control of discharge of grey water;
- ⑦ RC——control of discharge of garbage;
- ⑧ NEC_x——control of NO_x emission, where x is 1 or 2;
- ⑨ SEC——control of SO_x emission;
- ⑩ VCS/VCS-T——VOC emission control;
- ⑪ RSC_x——control of refrigeration system;
- ⑫ INC——emission control of incineration operation on board;
- ⑬ GBEC——emission control of diesel engine exhaust pollutant;
- ⑭ AFS/AFS+——anti-fouling systems;
- ⑮ GPR——green passport.

6.5.1.2 Initial classification

(1) Plans and information

- ① For ships intended to apply for the G-EP class notation, plans and information are to be submitted in accordance with the provisions of 3.2.2, Chapter 3 of CCS Rules for Green Eco-Ships.
- ② For ships intended to apply for the G-EP(X) class notation, plans and information required by the corresponding X sub-element are to be submitted in accordance with the provisions of 3.3.6, 3.4.7 and 3.5.3, Chapter 3 of CCS Rules for Green Eco-Ships.
- ③ For ships intended to apply for the Gd-EP class notation, plans and information are to be submitted in accordance with the provisions of 5.2.2, Chapter 5 of CCS Rules for Green Eco-Ships.
- ④ For ships intended to apply for the Gd-EP(X) class notation, plans and information required by the corresponding X sub-element are to be submitted in accordance with the provisions of 5.3.6, 5.4.6 and 5.5.3, Chapter 5 of CCS Rules for Green Eco-Ships.

(2) The initial classification survey is to cover the following:

- ① For assignment of the G-EP class notation, initial surveys applicable to the ship as specified in the following conventions and codes are to be completed and the requirements of 3.2.1, Chapter 3 of CCS Rules for Green Eco-Ships are to be satisfied:
 - a. MARPOL Convention;
 - b. AFS Convention;
 - c. other international codes or guidelines referred to in 3.2.1, Chapter 3 of CCS Rules for Green Eco-Ships.
- ② For assignment of the Gd-EP class notation, initial surveys referred to in PART ONE of Regulations for Statutory Surveys of Ships and Offshore Installations (Technical Regulations for Statutory Surveys of Sea-going Ships Engaged on Domestic Voyages) (hereinafter referred to as Regulations for Domestic Ships) of the Maritime Safety Administration of the People's Republic of China are to be completed and the requirements of chapters and sections corresponding to PART FIVE of Regulations for Domestic

Ships are to be satisfied.

③ For assignment of the G-EP(X)/ Gd-EP(X) class notation, surveys mentioned in 6.5.1.2(2) ① or ② of this Chapter are to be completed and the compliance with technical requirements corresponding to a specific X sub-element is to be verified.

④ For assignment of the G-EP (BC20/BC70) class notation, it is to be confirmed that applicable engines use or are fitted with black carbon emission reduction technology/equipment, they are subject to emission comparative test required in 3.4.3, Chapter 3 of CCS Rules for Green Eco-Ships and approved by CCS (engine components, setting or operating values, fuel oil specification and their limits are to be indicated in the test report). Onboard verification survey is to be carried out in accordance with 6.2, Chapter 6 of CCS Guidelines for Testing and Survey of Emission of Nitrogen Oxides from Marine Diesel Engines.

⑤ For assignment of the G-EP (VCS/VCS-T)/ Gd-EP (VCS/VCS-T) class notation, surveys mentioned in 6.3.1.2 of this Chapter are to be completed.

6.5.1.3 Annual surveys

(1) For the G-EP class notation, annual surveys applicable to the ship as specified in the following conventions and codes are to be completed and the requirements of 3.2.1, Chapter 3 of CCS Rules for Green Eco-Ships are to be satisfied:

① MARPOL Convention;

② other international codes or guidelines referred to in 3.2.1, Chapter 3 of CCS Rules for Green Eco-Ships.

(2) For the Gd-EP class notation, annual surveys referred to in PART ONE of Regulations for Domestic Ships are to be completed and the requirements of chapters and sections corresponding to PART FIVE of Regulations for Domestic Ships are to be satisfied.

(3) For the G-EP(X)/ Gd-EP(X) class notation, surveys mentioned in 6.5.1.3(1) or (2) of this Chapter are to be completed and the compliance with technical requirements corresponding to a specific X sub-element is to be verified.

(4) For the G-EP (BC20/BC70) class notation, it is to be confirmed that applicable engines are not subject to any major modification in the intervening period; the engine parameter record book and bunker delivery notes are to be checked to confirm that the engines have not undergone any modification or adjustment outside the options and ranges permitted in the test report approved by CCS, or non-compliant fuel oil has not been used, since the last survey.

(5) For the G-EP (VCS/VCS-T)/ Gd-EP (VCS/VCS-T) class notation, surveys mentioned in 6.3.1.3 of this Chapter are to be completed.

(6) It is to be confirmed that the ship has valid certificates or documents of compliance, record books and approved procedural documents required in Chapter 3 or 5 of CCS Rules for Green Eco-Ships.

6.5.1.4 Intermediate surveys

(1) For the G-EP/Gd-EP class notation, intermediate surveys applicable to the ship as specified in conventions

and codes or Regulations for Domestic Ships mentioned in 6.5.1.3 above are to be completed.

(2) For the G-EP(X)/ Gd-EP(X) class notation, surveys mentioned in 6.5.1.4(1) of this Chapter are to be completed and the compliance with technical requirements corresponding to a specific X sub-element is to be verified.

(3) For the G-EP (BC20/BC70) class notation, the provisions of 6.5.1.3(4) of this Chapter are to be implemented.

(4) For the G-EP (VCS/VCS-T)/ Gd-EP (VCS/VCS-T) class notation, surveys mentioned in 6.3.1.3 of this Chapter are to be completed.

(5) It is to be confirmed that the ship has valid certificates or documents of compliance, record books and approved procedural documents required in Chapter 3 or 5 of CCS Rules for Green Eco-Ships.

6.5.1.5 Special surveys

(1) For the G-EP/Gd-EP class notation, special surveys applicable to the ship as specified in conventions and codes or Regulations for Domestic Ships mentioned in 6.5.1.4 above are to be completed.

(2) For the G-EP(X)/ Gd-EP(X) class notation, surveys mentioned in 6.5.1.5(1) of this Chapter are to be completed and the compliance with technical requirements corresponding to a specific X sub-element is to be verified.

(3) For the G-EP (BC20/BC70) class notation, the provisions of 6.5.1.3(4) of this Chapter are to be implemented.

(4) For the G-EP (VCS/VCS-T)/ Gd-EP (VCS/VCS-T) class notation, surveys mentioned in 6.3.1.4 of this Chapter are to be completed.

(5) It is to be confirmed that the ship has valid certificates or documents of compliance, record books and approved procedural documents required in Chapter 3 or 5 of CCS Rules for Green Eco-Ships.

6.5.1.6 For ships to which CCS is not authorized to carry out statutory services, it is to confirm that the ship has all relevant valid statutory certificates or documents, a general assessment of the items related to the statutory certificates is to be conducted, and verification of compliance of the ship with the requirements of this Chapter for class notations is to be carried out so as to confirm the compliance with all relevant requirements of this Chapter.

6.5.2 Class notations for ecological protection of green eco-ships

6.5.2.1 This paragraph applies to ships assigned the following class notations related to ecological protection:

(1) G-ECO——ecological protection

(2) G-ECO(X)——ecological protection, where X represents one or more of the following sub-elements:

- ① CD_x——CO₂ emission design index, where “x” represents the percentage ratio of the ship’s Attained EEDI value lower than the reference line value for that ship;
- ② COM——CO₂ emission operation management;
- ③ BWM(T) ——ballast water treatment;
- ④ BWM (Es) ——ballast water exchange-sequential method;

- ⑤ BWM (Ef) —ballast water exchange-flow-through method;
- ⑥ BWM (Ed) —ballast water exchange-dilution method;
- ⑦ BWM (O) — other management method of ballast water;
- ⑧ BIO —biofouling management;
- ⑨ VIBx—comfort onboard (vibration), where x is 1 or 2 or 3;
- ⑩ NOIx —comfort onboard (compartment noise), where x is 1 or 2 or 3;
- ⑪ CLx —comfort onboard (indoor climate), where x is 1 or 2 or 3;
- ⑫ UW —underwater noise;
- ⑬ RN —ambient noise.

(3) Gd-ECO(X), ecological protection, where X represents one or more of the following sub-elements:

- ① CDx—CO₂ emission design index, where “x” represents the percentage ratio of the ship’s Attained EEDI value lower than the Required EEDI value for that ship;
- ② COM—CO₂ emission operation management;
- ③ VIBx—comfort onboard (vibration), where x is 1 or 2 or 3;
- ④ NOIx—comfort onboard (compartment noise), where x is 1 or 2 or 3;
- ⑤ CLx—comfort onboard (indoor climate), where x is 1 or 2 or 3;
- ⑥ UW—underwater noise;
- ⑦ RN—ambient noise.

6.5.2.2 Initial classification

(1) Plans and information

- ① For ships intended to apply for the G-ECO class notation, plans and information are to be submitted in accordance with the provisions of 2.2.2, Chapter 2 of CCS Rules for Green Eco-Ships.
- ② For ships intended to apply for the G- ECO (X) class notation, plans and information required by the corresponding X sub-element are to be submitted in accordance with the provisions of 2.3.4, 2.4.3 and 2.5.6, Chapter 2 of CCS Rules for Green Eco-Ships.
- ③ For ships intended to apply for the Gd- ECO (X) class notation, plans and information required by the corresponding X sub-element are to be submitted in accordance with the provisions of 4.2.4 and 4.3.6, Chapter 4 of CCS Rules for Green Eco-Ships.

(2) The initial classification survey is to cover the following:

- ① For assignment of the G-ECO class notation, initial surveys applicable to the ship as specified in the following conventions and codes are to be completed and the requirements of 2.2.1, Chapter 2 of CCS Rules for Green Eco-Ships are to be satisfied:
 - a. regulations on energy efficiency for ships in MARPOL Annex VI;
 - b. BWM convention;
 - c. other international codes or guidelines referred to in 2.2.1, Chapter 2 of CCS Rules for Green Eco-Ships.

② For assignment of the G-ECO(X) class notation, surveys required for the following specific X sub-elements are to be completed and the compliance with corresponding technical requirements is to be verified:

- a. CDx: CCS guidelines mentioned in 2.3.2, Chapter 2 of CCS Rules for Green Eco-Ships;
- b. COM: IMO guidelines and CCS rules mentioned in 2.3.3, Chapter 2 of CCS Rules for Green Eco-Ships;
- c. BWM(T/Ex/O): initial surveys specified in the BWM convention;
- d. BIO: IMO guidelines mentioned in 2.4.2, Chapter 2 of CCS Rules for Green Eco-Ships;
- e. VIBx: 2.5.1.2, Chapter 2 of CCS Rules for Green Eco-Ships;
- f. NOIx: 2.5.2.2, Chapter 2 of CCS Rules for Green Eco-Ships;
- g. CLx: 2.5.3.3, Chapter 2 of CCS Rules for Green Eco-Ships;
- h. UW: 2.5.4.2, Chapter 2 of CCS Rules for Green Eco-Ships;
- i. RN: 2.5.5.2, Chapter 2 of CCS Rules for Green Eco-Ships.

③ For assignment of the Gd-ECO(X) class notation, surveys required for the following specific X sub-elements are to be completed and the compliance with corresponding technical requirements is to be verified:

- a. CDx: 4.2.2, Chapter 4 of CCS Rules for Green Eco-Ships;
- b. COM: 4.2.3, Chapter 4 of CCS Rules for Green Eco-Ships;
- c. VIBx: 4.3.1, Chapter 4 of CCS Rules for Green Eco-Ships;
- d. NOIx: 4.3.2, Chapter 4 of CCS Rules for Green Eco-Ships;
- e. CLx: 4.3.3, Chapter 4 of CCS Rules for Green Eco-Ships;
- f. UW: 4.3.4, Chapter 4 of CCS Rules for Green Eco-Ships;
- g. RN: 4.3.5, Chapter 4 of CCS Rules for Green Eco-Ships.

6.5.2.3 Annual surveys

(1) For the G-ECO and G-ECO (BWM (T/Ex/O)) class notations, annual surveys applicable to the ship as specified in the BWM convention are to be completed and the requirements of 2.2.1 or 2.4.1, Chapter 2 of CCS Rules for Green Eco-Ships are to be satisfied.

(2) It is to be confirmed that the ship has valid certificates or documents of compliance, record books and approved procedural documents in Chapter 2 or 4 of CCS Rules for Green Eco-Ships.

6.5.2.4 Intermediate surveys

(1) For the G-ECO and G-ECO (BWM (T/Ex/O)) class notations, intermediate surveys applicable to the ship as specified in the BWM convention are to be completed.

(2) It is to be confirmed that the ship has valid certificates or documents of compliance, record books and approved procedural documents in Chapter 2 or 4 of CCS Rules for Green Eco-Ships.

6.5.2.5 Special surveys

(1) For the G-ECO and G-ECO (BWM (T/Ex/O)) class notations, renewal surveys applicable to the ship as specified in the BWM convention are to be completed.

(2) It is to be confirmed that the ship has valid certificates or documents of compliance, record books and approved procedural documents in Chapter 2 or 4 of CCS Rules for Green Eco-Ships.

6.5.2.6 For ships to which CCS is not authorized to carry out statutory services, it is to confirm that the ship has all relevant valid statutory certificates or documents, a general assessment of the items related to the statutory certificates is to be conducted, and verification of compliance of the ship with the requirements of this Chapter for class notations is to be carried out so as to confirm the compliance with all relevant requirements of this Chapter.

CCS Rule Change Notice For:
RULES FOR CLASSIFICATION OF SEA-GOING STEEL
SHIPS

PART TWO

Brief Introduction

1. Incorporation of URM79 (Rev.1 Feb 2020), will be implemented on ships contracted for construction on or after 1 July 2021.

CONTENTS

CHAPTER 10 TUGS

Section 6 TOWING WINCH EMERGENCY RELEASE SYSTEMS

CHAPTER 10 TUGS

Section 6 TOWING WINCH EMERGENCY RELEASE SYSTEMS^①

10.6.1 Scope and definitions

10.6.1.1 This Section defines minimum safety standards for winch emergency release systems provided on towing winches that are used on towing ships within close quarters, ports or terminals, including those ships normally not intended for towing operation in transverse direction.

10.6.1.4 The purpose of this section is to provide requirements to prevent the capsize of a tug when in the act of towage as a result of the towline force acting transversely to the tug (in beam direction) as a consequence of an unexpected event (could be loss of propulsion/steering or otherwise), whereby the resulting couple generated by offset and opposing transverse forces (towline force is opposed by thrust or hull resistance force) causes the tug to heel and, ultimately, to capsize, see Figure 10.6.1.4.

10.6.1.4⁵ For the purposes of this Section, definitions are as follows:

(1) Emergency release system refers to the mechanism and associated control arrangements that are used to release the load on the towline in a controlled manner under both normal and ~~dead ship~~ black out conditions.

(2) Maximum design load is the maximum load that can be held by the winch as defined by the manufacturer (the manufacturer's rating).

~~(3) Girting means the capsize of a tug when in the act of towage as a result of the towline force acting transversely to the tug (in beam direction) as a consequence of an unexpected event (could be loss of propulsion/steering or otherwise), whereby the resulting couple generated by offset and opposing transverse forces (towline force is opposed by thrust or hull resistance force) causes the tug to heel and, ultimately, to capsize. See Figure 10.6.1.4(3).~~

(4³) Fleet angle is the angle between the applied load (towline force) and the towline as it is wound onto the winch drum, see Figure 10.6.1.4(4³).

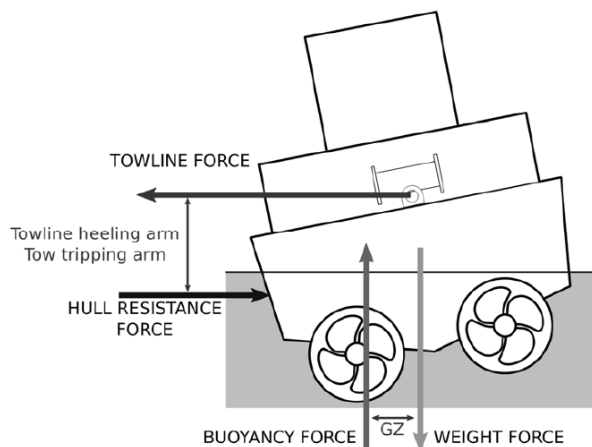


Figure 10.6.1.4(3) Forces during towing

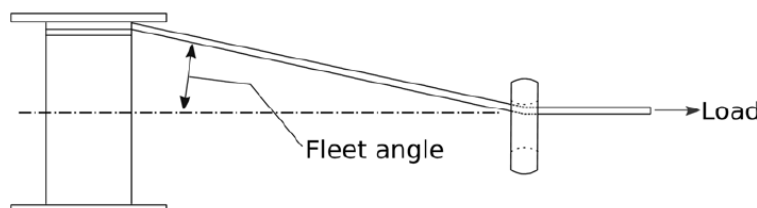


Figure 10.6.1.4(4³) Towline 'fleet angle'

10.6.3 Performance requirements for emergency release system

^① This revision is to be uniformly implemented on and after 1 July 2021.

10.6.3.6 ~~An alternative source of energy is to be provided such that normal operation of the emergency release system can be sustained under dead ship conditions.~~ Emergency release of the towline is to be possible in the event of a blackout. For this purpose, where additional sources of energy are required, such sources are to comply with 10.6.3.7.

10.6.3.7 The alternative source of energy required by 10.6.3.6 of this Section is to be sufficient to achieve the most onerous of the following conditions (as applicable):

(1) sufficient for at least three attempts to release the towline (i.e. three activations of the emergency release system). Where the system provides energy for more than one winch it is to be sufficient for three activations of the most demanding winch connected to it.

(2) Where the winch design is such that the drum release mechanism requires continuous application of power (e.g. where the brake is applied by spring tension and released using hydraulic or pneumatic power) sufficient power is to be provided to operate the emergency release system (e.g. hold the brake open and allow release of the towline) ~~in a dead ship situation~~ the event of a blackout for a minimum of five minutes. This may be reduced to the time required for the full length of the towline to feed off the winch drum at the load specified in 10.6.3.5 if this is less than five minutes.

10.6.4 Operational requirements for emergency release system

10.6.4.1 Emergency release operation must be possible from the bridge and from the winch control station on deck. The winch control station on deck is to be in a safe location. A position in close proximity to the winch is not regarded as safe location, unless it is documented that the position is at least protected against towline break or winch failure.

10.6.4.2 The emergency release control is to be located ~~in close proximity to the~~ an emergency stop button for winch operation, if provided, and ~~both should~~ shall be clearly identifiable, clearly visible, easily accessible and positioned to allow safe operability.

~~10.6.4.10 The method for annual survey of the winch is to be documented.~~

~~10.6.4.11 Where necessary for conducting the annual survey of the winch, adequately sized strong points are to be provided on deck.~~

10.6.5 Test requirements for emergency release system

10.6.5.1 General requirements

(1) All testing defined within this Section is to be witnessed by a CCS surveyor.

(2) For each emergency release system or type thereof, the performance requirements of 10.6.3 of this Section are to be verified either at the manufacturer's works or as part of the commissioning of the towing winch when it is installed on board. Where verification solely through testing is impracticable (e.g. due to health and safety), testing may be combined with inspection, analysis or demonstration in agreement with CCS.

(3) The performance capabilities ~~and for operating instructions~~, as well as instructions for operation of the emergency release system are to be documented by the manufacturer and made available on board the ship on which the winch has been installed.

(4) Instructions for surveys of the emergency release system are to be documented by the manufacturer, when agreed, and made available on board the ship on which the winch has been installed.

(5) Where necessary for conducting the annual and special surveys of the winch, adequately sized strong points are to be provided on deck.

CCS Rule Change Notice For:
RULES FOR CLASSIFICATION OF SEA-GOING
STEEL SHIPS

PART THREE

Brief Introduction

1. Incorporation of URE25 (Rev.1, Dec 2019), will be implemented on ships contracted for construction on or after 1 January 2021.
2. According to the RULES FOR GREEN ECO-SHIPS 2020, the additional notations VCS and VCS-T in Chapter 15 of Part Three of the Rules for Classification of Seagoing steel Ships are revised to sub-elements VCS and VCS-T.

CONTENTS

CHAPTER 13 **STEERING GEAR AND WINDLASSES**
Section 1 STEERING GEAR

CHAPTER 15 **VAPOUR CONTROL SYSTEM**
Section 1 GENERAL PROVISIONS

CHAPTER 13 STEERING GEAR AND WINDLASSES

Section 1 STEERING GEAR

13.1.9 Monitoring and alarms^①

13.1.9.1 The alarm and monitoring requirements for the steering gear are to be in accordance with Table 13.1.9.1 and comply with the relevant requirements of Section 4, Chapter 2, PART SEVEN of the Rules. The failures likely to cause uncontrolled movements of rudder as indicated in the Table below are to be clearly identified. In the event of detection of such failure, the rudder is to stop in the current position without manual intervention or is to return to the midship/neutral position.

^① This revision is to be implemented on ships contracted for construction on or after 1 January 2021.

CHAPTER 15 VAPOUR CONTROL SYSTEM

Section 1 GENERAL PROVISIONS

15.1.1 Application

15.1.1.1 The requirements of this Chapter are applicable to ships fitted with systems for control of vapour emission from tanks and requesting ~~additional notation~~ [sub-elements](#)^① as defined in 15.1.2, such as oil tankers and chemical tankers, etc.

15.1.1.2 In addition to the requirements of this Chapter, attention is to be given to any relevant regulations (if any) of the Administration of the flag States in which the ship is to be registered.

15.1.2 ~~Additional notation~~ [sub-elements](#)

15.1.2.1 Ships fitted with systems for control of vapour emission from cargo tanks complying with all requirements of this Chapter (other than Section 4) may be assigned to the following ~~additional notation~~ [sub-elements](#):

VCS (~~Vapour Control System~~).

15.1.2.2 Ships fitted with systems for control of vapour emission from cargo tanks complying with all requirements of this Chapter may be assigned to the following ~~additional notation~~ [sub-elements](#):

VCS-T (~~Vapour Control System – Transfer~~).

15.1.4 Plans and documents

15.1.4.1 The following plans and documents are to be submitted for approval by ships for which the ~~additional notation~~ [sub-elements](#) of VCS or VCS-T is requested:

- (1) Diagrammatic plan of the vapour piping system, indicating material specifications, scantlings, ratings, joining details and fittings;
- (2) Diagrammatic plan of the gauging system and overfill protection, indicating manufacturer and type of the equipment or instruments, hazardous area locations, location of electrical equipment in gas–dangerous spaces and safe certificates of the electrical instruments intended to be used in hazardous locations, electrical schemes concerning the alarm system supply, electrical schemes concerning the intrinsically safe circuits;
- (3) Diagrammatic plan of the venting system, indicating necessary data for verifying the venting capacity of the pressure/vacuum valves;
- (4) Pressure drop calculation comparing cargo transfer rates versus pressure drops from the farthest tanks to the vapour connection, including any possible hoses;
- (5) Calculations showing the time available between alarm setting and overfill at maximum loading rate for each tank;
- (6) Instruction manual.

15.1.4.2 The following additional plans and documents are also to be submitted for reference by ships for which the ~~additional notation~~ [sub-elements](#) of VCS-T is requested:

Information on the anti-detonation devices, including manufacturer and type of the device employed as well as documentation on any acceptance tests carried out.

^① [sub-elements: Refer to the table 1.3.3.1 of Chapter 1 of RULES FOR GREEN ECO-SHIPS.](#)

CCS Rule Change Notice For:
RULES FOR CLASSIFICATION OF SEA-GOING
STEEL SHIPS

PART EIGHT

Brief Introduction

1. CCS RULES FOR GREEN ECO-SHIPS will enter into force on 1 July 2020, and it has covered the content of Chapter 8 of PART EIGHT of CCS Rules for Classification of Sea-going Steel Ships. So this chapter is deleted.
2. Chapter 8 of PART EIGHT is revised into the Supplementary Provisions for Public Service Ships. The structural requirements are applicable to public service ships of 20m or over.
3. Incorporation of UR I2 (Rev.4 Dec 2019), will be implemented on ships contracted for construction on or after 1 January 2021.
4. Clarification of ships provided with permanent diving support system to be assigned class notation DSV-Sat.
5. According to the issue of RULES FOR GREEN ECO-SHIPS(2020), Sections 1 to 4 of Chapter 16 are to be adjusted.

CONTENTS

CHAPTER 8 ~~ADDITIONAL REQUIREMENTS FOR SHIPS WITH REGARD TO ENVIRONMENTAL PROTECTION~~

CHAPTER 8 ADDITIONAL REQUIREMENTS FOR PUBLIC AFFAIR SHIPS

CHAPTER 13 ADDITIONAL REQUIREMENTS FOR POLAR CLASS SHIPS

Section 2 STRUCTURAL REQUIREMENTS

CHAPTER 16 ~~COMFORT ON BOARD~~ MEASUREMENT OF VIBRATION AND NOISE

Section 1 GENERAL PROVISIONS

Section 2 NOISE

Section 3 VIBRATION

Section 4 MEASUREMENTS AND REPORTS

CHAPTER 25 ADDITIONAL REQUIREMENTS FOR DIVING SUPPORT VESSELS

Section 1 GENERAL PROVISIONS

~~CHAPTER 8 ADDITIONAL REQUIREMENTS FOR SHIPS WITH REGARD TO ENVIRONMENTAL PROTECTION~~

Delete.

CHAPTER 8 ADDITIONAL REQUIREMENTS FOR PUBLIC AFFAIR SHIPS

Section 1 GENERAL PROVISIONS

8.1.1 General requirements

8.1.1.1 This Chapter applies to ships owned or operated by the Government and used only for non-commercial services (hereinafter referred to as public affair ships).

8.1.1.2 Public affair ships are, in addition to provisions of this Chapter, to comply with applicable provisions of other PARTs and Chapters of the Rules.

8.1.1.3 Where special provisions for public affair ships are specified by the Administration of the flag State, such provisions are to be implemented.

8.1.2 Class notation

8.1.2.1 Public affair ships complying with requirements of this Chapter are to be assigned the following class notation:

Public Affair Ship

8.1.3 Hull structures

8.1.3.1 In addition to provisions of 8.1.3.2, hull structures of public affair ships are to satisfy the requirements of Chapter 2, PART TWO of the Rules.

8.1.3.2 Hull structures of patrol ships^① are to satisfy the requirements of CCS Guidelines for Hull Structures of Public Affair Ships.

① Public affair ships engaged in inspection, on-site supervision, evidence collection, anti-smuggling and other services, e.g. as maritime patrol ships, fishery supervision and law enforcement ships.

CHAPTER 13 ADDITIONAL REQUIREMENTS FOR POLAR CLASS SHIPS^②

Section 2 STRUCTURAL REQUIREMENTS

13.2.1 Application and Definitions

13.2.1.1 This Section applies to Polar Class ships as specified in Section 1 of this Chapter.

13.2.1.2 The length L_{UI} is the distance, in m, measured horizontally from the fore side of the stem at the intersection with the upper ice waterline (UIWL) to the after side of the rudder post, or the centre of the rudder stock if there is no rudder post. L_{UI} is not to be less than 96%, and need not be greater than 97%, of the extreme length of the upper ice waterline (UIWL) measured horizontally from the fore side of the stem. In ships with unusual stern and bow arrangement the length L_{UI} will be specially considered.

13.2.1.3 The ship displacement D_{UI} is the displacement, in kt, of the ship corresponding to the upper ice waterline (UIWL). Where multiple waterlines are used for determining the UIWL, the displacement is to be determined from the waterline corresponding to the greatest displacement.

13.2.2 Hull areas

13.2.2.1 The hull of all Polar Class ships is divided into areas reflecting the magnitude of the loads that are expected to act upon them. In the longitudinal direction, there are four regions: bow, bow intermediate, midbody and stern. The bow intermediate, midbody and stern regions are further divided vertically into the bottom, lower and ice belt regions. The extent of each hull area is illustrated in Figure 13.2.2.1.

^② This revision is to be uniformly implemented on and after 1 January 2021.

13.2.2.4 Figure 13.2.2.1 notwithstanding, the aft boundary of the bow region need not be more than $0.45 L_{UL}$ aft of the fore side of the stem at the intersection with the upper ice waterline (UIWL) forward perpendicular (FP).

13.2.2.5 The boundary between the bottom and lower regions is to be taken at the point where the shell is inclined 7° from horizontal.

13.2.2.6 If a ship is intended to operate astern in ice regions, the aft section of the ship is to be designed using the bow and bow intermediate hull area requirements.

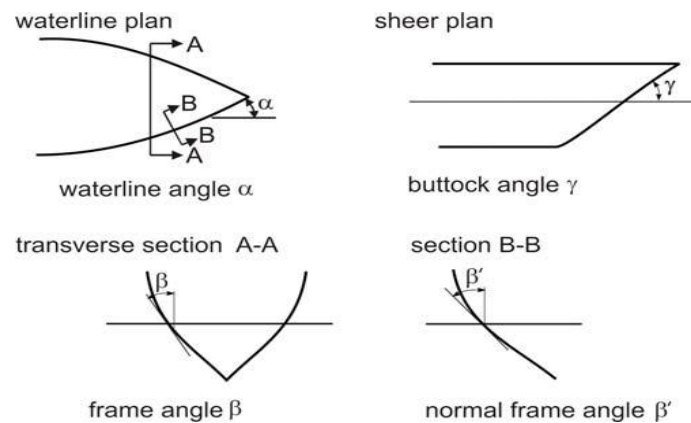
13.2.2.7 Figure 13.2.2.1 notwithstanding, for ships assigned the additional notation “Icebreaker”, the forward boundary of the stern region is to be at least $0.04L_{UL}$ forward of the section where the parallel ship side at the upper ice waterline (UIWL) ends.

13.2.3 Design ice loads

13.2.3.2 Glancing impact load characteristics

(1) Bow area

- ① In the Bow area, the force (F), line load (Q), pressure (P) and load patch aspect ratio (AR) associated with the glancing impact load scenario are functions of the hull angles measured at the upper ice waterline (UIWL). The influence of the hull angles is captured through calculation of a bow shape coefficient (fa). The hull angles are defined in Figure 13.2.3.2.



Notes: β' — normal frame angle at upper ice waterline [$^\circ$];

α — upper ice waterline angle [$^\circ$];

γ — buttock angle at upper ice waterline (angle of buttock line measured from horizontal) [$^\circ$];

$\tan(\beta) = \tan(\alpha)/\tan(\gamma)$;

$\tan(\beta') = \tan(\beta) \cos(\alpha)$.

Figure 13.2.3.2 Definition of Hull Angles

- ② The waterline length of the bow region is generally to be divided into 4 sub-regions of

equal length. The force (F), line load (Q), pressure (P) and load patch aspect ratio (AR) are to be calculated with respect to the mid-length position of each sub-region (each maximum of F , Q and P is to be used in the calculation of the ice load parameters P_{avg} , b and w).

③ The bow area load characteristics for bow forms defined in 13.2.3.1(5) are determined as follows:

(a) Shape coefficient, fa_i , is to be taken as:

$$fa_i = \min(fa_{i,1}, fa_{i,2}, fa_{i,3})$$

where:
$$fa_{i,1} = \frac{\left[0.097 - 0.68\left(\frac{x}{L_{UI}} - 0.15\right)^2\right] \alpha_i}{(\beta'_i)^{0.5}};$$

$$fa_{i,2} = \frac{1.2CF_F}{[\sin(\beta'_i) \cdot CF_C \cdot D_{UI}^{0.64}]};$$

$$fa_{i,3} = 0.60;$$

(b) Force, F :

$$F_i = fa_i \cdot CF_C \cdot D_{UI}^{0.64} \quad \text{MN}$$

(c) Load patch aspect ratio, AR :

$$AR_i = 7.46 \sin(\beta'_i) \geq 1.3$$

(d) Line load, Q :

$$Q_i = F_i^{0.61} \cdot CF_D / AR_i^{0.35} \quad \text{MN/m}$$

(e) Pressure, P :

$$P_i = F_i^{0.22} \cdot CF_D^2 \cdot AR_i^{0.3} \quad \text{MPa}$$

where: i — sub-region considered;

L_{UI} — ship's length as defined in 13.2.1.2 in m; ~~as given in Section 1, Chapter 1 of PART TWO of the Rules, but measured at the upper ice waterline (UIWL);~~

x — distance from the fore side of the stem at the intersection with the upper ice waterline (UIWL) ~~forward perpendicular (FP)~~ to station under consideration, in m;

α — waterline angle [°], see Figure 13.2.3.2;

β' — normal frame angle [°], Figure 13.2.3.2;

D_{UI} — ship displacement as defined in 13.2.1.3, in kt, not to be taken less than 5 kt;

CF_C — crushing failure class factor from Table 13.2.3.2(1);

CF_F — flexural failure class factor from Table 13.2.3.2(1).

CF_D — load patch dimensions class factor from Table 13.2.3.2(1);

④ The bow area load characteristics for bow forms defined in 13.2.3.1(6) are determined as follows:

(a) Shape coefficient, fa_i , is to be taken as:

$$fa_i = \alpha_i / 30$$

(b) Force, F_i :

$$F_i = \frac{fa_i \cdot CF_{CV} \cdot D_{UI}^{0.47}}{1} \quad [\text{MN}]$$

(c) Line load, Q_i :

$$Q_i = F_i^{0.22} \cdot CF_{QV} \quad [\text{MN/m}]$$

(d) Pressure, P_i :

$$P_i = F_i^{0.56} \cdot CF_{PV} \quad [\text{MPa}]$$

where: i — sub-region considered;

α — waterline angle [°], see Figure 13.2.3.2;

β' — normal frame angle [°], Figure 13.2.3.2;

D_{UI} — ~~ship~~ displacement [as defined in 13.2.1.3](#), in kt, not to be taken less than 5 kt;

CF_{CV} — crushing failure class factor from Table 13.2.3.2(2);

CF_{QV} — line load class factor from Table 13.2.3.2(2).

CF_{PV} — pressure class factor from Table 13.2.3.2(2);

(2) Hull areas other than the bow

- ① In the hull areas other than the bow, the force (F_{NonBow}) and line load (Q_{NonBow}) used in the determination of the load patch dimensions (b_{NonBow} , w_{NonBow}) and design pressure (P_{avg}) are calculated as follows:

(a) Force, F_{NonBow} :

$$F_{\text{NonBow}} = 0.36 CF_C \cdot DF \quad \text{MN}$$

(b) Line load, Q_{NonBow} :

$$Q_{\text{NonBow}} = 0.639 (F_{\text{NonBow}})^{0.61} CF_D \quad \text{MN/m}$$

where: CF_C — crushing force class factor from Table 13.2.3.2(1);

DF — ship displacement factor, taken as follows:

$$D_{UI}^{0.64} \quad \text{if } D_{UI} \leq CF_{DIS}$$

$$\frac{CF_{DIS}^{0.64}}{1} + 0.10(D_{UI} - CF_{DIS}) \quad \text{if } D_{UI} > CF_{DIS}$$

D_{UI} — ~~ship~~ displacement [as defined in 13.2.1.3](#), in kt, not to be taken less than 5 kt;

CF_{DIS} — displacement class factor from Table 13.2.3.2(1);

CF_D — load patch dimensions class factor from Table 13.2.3.2(1).

13.2.12 Materials

13.2.12.1 Steel grades of plating for hull structures are to be not less than those given in Table

13.2.12.4 based on the as-built thickness, the Polar Class and the material class of structural members according to 13.2.12.2.

Material Classes for Structural Members

Table 13.2.12.1

Structural Members	Material Class
Shell plating within the bow and bow intermediate ice belt hull areas (B, BI_i)	II
All weather and sea exposed SECONDARY and PRIMARY, as defined in Table 1.3.2.2(1) of PART TWO of the Rules, structural members outside $0.4 L_{UL}$ amidships	I
Plating materials for stem and stern frames, rudder horn, rudder, propeller nozzle, shaft brackets, ice skeg, ice knife and other appendages subject to ice impact loads	II
All inboard framing members attached to the weather and sea-exposed plating including any contiguous inboard member within 600 mm of the shell plating	I
Weather-exposed plating and attached framing in cargo holds of ships which by nature of their trade have their cargo hold hatches open during cold weather operations	I
All weather and sea exposed SPECIAL, as defined in Table 1.3.2.2(1) of PART TWO of the Rules, structural members within $0.2 L_{UL}$ from FP	II

13.2.13 Longitudinal strength

13.2.13.1 Application

(1) A ramming impact on the bow is the design scenario for the evaluation of the longitudinal strength of the hull.

(2) Intentional ramming is not considered as a design scenario for ships which are designed with vertical or bulbous bows, see 13.1.1.6. Hence the longitudinal strength requirements given in 13.2.13 are not to be considered for ships with stem angle γ_{stem} equal to or larger than 80° .

(3) Ice loads are only to be combined with still water loads. The combined stresses are to be compared against permissible bending and shear stresses at different locations along the ship's length. In addition, sufficient local buckling strength is also to be verified.

13.2.13.2 Design vertical ice force at the bow

(1) The design vertical ice force at the bow, F_{IB} , is to be taken as:

$$F_{IB} = \min(F_{IB,1}, F_{IB,2}) \quad \text{MN}$$

where: $F_{IB,1} = 0.534 K_I^{0.15} [\sin(\gamma_{stem})]^{0.2} (D_{UL} \cdot K_h)^{0.5} C F_L$ MN;

$$F_{IB,2} = 1.20 C F_F \quad \text{MN};$$

where: K_I — indentation parameter, $= K_f / K_h$;

(a) for the case of a blunt bow form:

$$K_f = \left[2CB_{UI}^{1-e_b} / (1 + e_b) \right]^{0.9} \tan(\gamma_{stem})^{-0.9(1+e_b)}$$

(b) for the case of wedge bow form ($\alpha_{stem} < 80^\circ$), $e_b = 1$ and the above simplifies to:

$$K_f = \left\{ \tan(\alpha_{stem}) / [\tan(\gamma_{stem})]^2 \right\}^{0.9};$$

$$K_h = 0.01A_{wp} \quad \text{MN/m;}$$

CF_L — longitudinal strength class factor from Table 13.2.3.2;

e_b — bow shape exponent which best describes the waterplane (see Figures 13.2.13.2(1) and 13.2.13.2(2))

= 1.0 for a simple wedge bow form

= 0.4 to 0.6 for a spoon bow form

= 0 for a landing craft bow form;

An approximate e_b determined by a simple fit is acceptable;

γ_{stem} — stem angle, [°], to be measured between the horizontal axis and the stem tangent at the upper ice waterline (buttock angle as per Figure 13.2.3.2 measured on the centerline);

α_{stem} — waterline angle measured in way of the stem at the upper ice waterline (UIWL) (°) (see Figure 13.2.3.2(1));

$$C = 1 / [2(L_B / B_{UI})^{e_b}]$$

where: B_{UI} — ~~ship~~ moulded breadth [corresponding to the upper ice waterline \(UIWL\)](#), in m;

L_B — bow length used in the equation $y = (B_{UI} / 2) (x / L_B)^{e_b}$, in m, (see Figures 13.2.13.2(1) and 13.2.13.2(2));

D_{UI} — ~~ship~~ displacement [as defined in 13.2.1.3](#), in kt, not to be taken less than 5 kt;

A_{wp} — ~~ship~~ waterplane area [corresponding to the upper ice waterline \(UIWL\)](#), in m²;

CF_F — flexural failure class factor from Table 13.2.3.2(1).

~~Where applicable, draught dependent quantities are to be determined at the waterline corresponding to the loading condition under consideration.~~

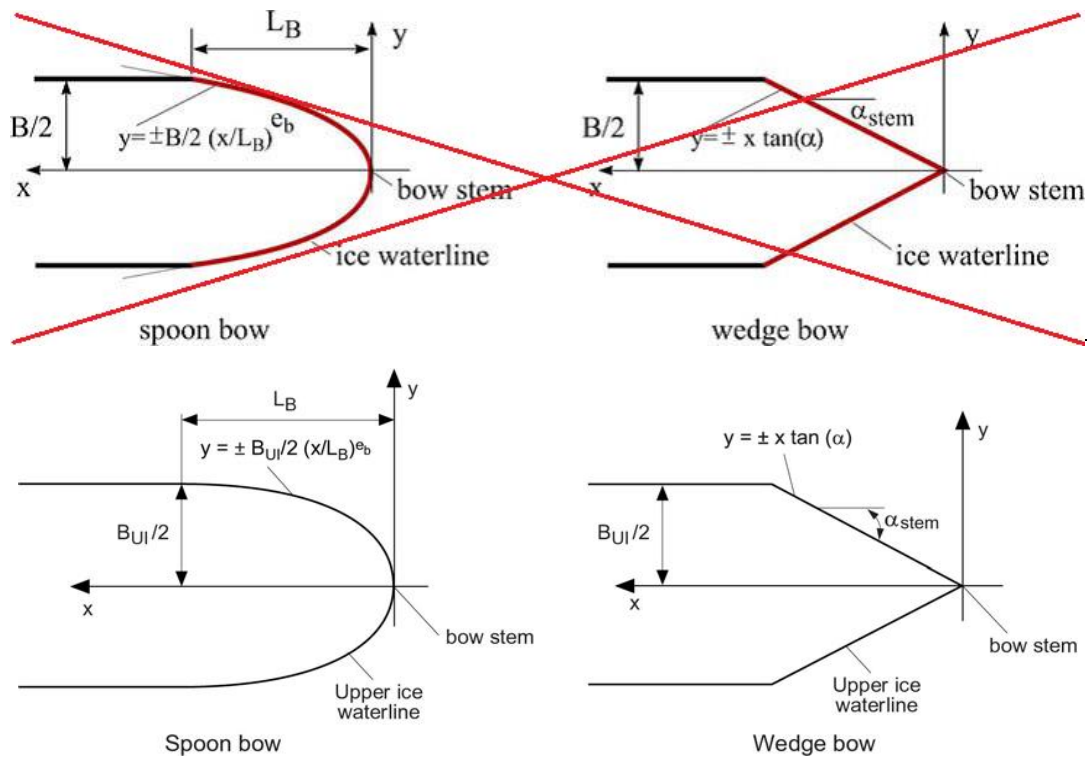
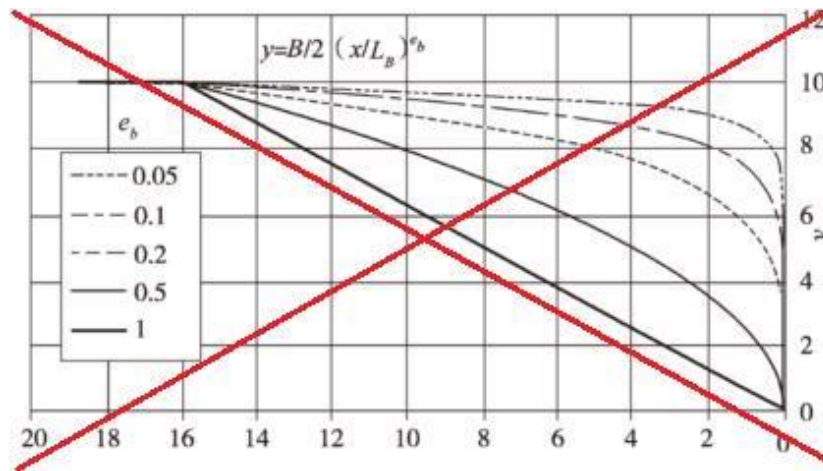


Figure 13.2.13.2(1) Bow Shape Definition



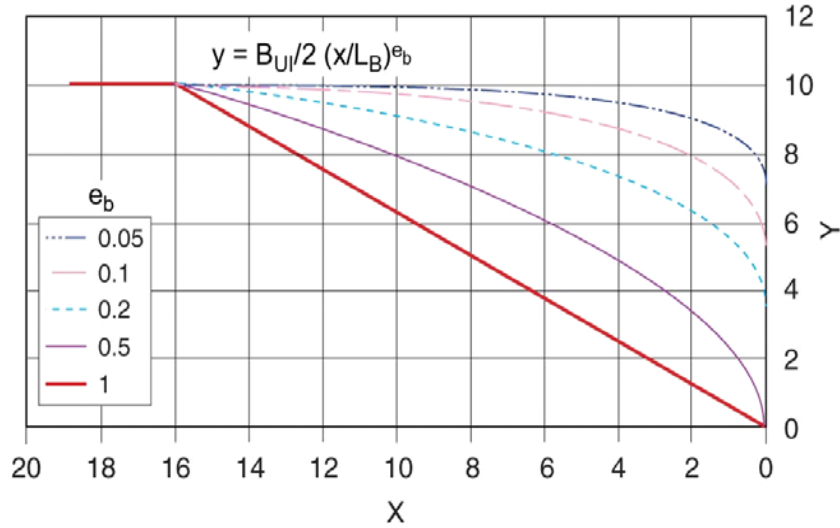


Figure 13.2.13.2 (2) Illustration of e_b Effect on the Bow Shape for $B_{Ul} = 20$ and $L_B = 16$

13.2.13.3 Design vertical shear force

(1) The design vertical ice shear force, F_I , along the hull girder is to be taken as:

$$F_I = C_f F_{IB} \quad \text{MN}$$

where: C_f — longitudinal distribution factor to be taken as follows:

(a) positive shear force

$C_f = 0.0$ between the aft end of L_{Ul} and $0.6L_{Ul}$ from aft;

$C_f = 1.0$ between $0.9L_{Ul}$ from aft and the forward end of L_{Ul} ;

(b) negative shear force

$C_f = 0.0$ at the aft end of L_{Ul} ;

$C_f = -0.5$ between $0.2L_{Ul}$ and $0.6L_{Ul}$ from aft;

$C_f = 0.0$ between $0.8L_{Ul}$ from aft and the forward end of L_{Ul} ;

intermediate values are to be determined by linear interpolation.

(2) The applied vertical shear stress, τ_a , is to be determined along the hull girder in a similar manner as in 2.2.6 of Section 2, Chapter 2 of PART TWO of the Rules by substituting the design vertical ice shear force for the design vertical wave shear force.

13.2.13.4 Design vertical ice bending moment

(1) The design vertical ice bending moment, M_I , along the hull girder is to be taken as:

$$M_I = 0.1 C_m L_{Ul} [\sin(\gamma_{stem})]^{-0.2} F_{IB} \quad \text{MN m}$$

where: L_{Ul} — ship's length, as defined in 13.2.1.2 in m; in m, as given in Section 1, Chapter 1 of PART TWO of the Rules, but measured at the upper ice waterline (UIWL);

γ_{stem} — as given in 13.2.13.2(1);ⁱ

F_{IB} — design vertical ice force at the bow, in MN;

C_m — longitudinal distribution factor for design vertical ice bending moment to be taken as follows:

$C_m = 0.0$ at the aft end of L_{UL} ;

$C_m = 1.0$ between $0.5L_{\text{UL}}$ and $0.7L_{\text{UL}}$ from aft;

$C_m = 0.3$ at $0.95L_{\text{UL}}$ from aft;

$C_m = 0.0$ at the forward end of L_{UL} ;

intermediate values are to be determined by linear interpolation.

~~Where applicable, draught dependent quantities are to be determined at the waterline corresponding to the loading condition under consideration.~~

(2) The applied vertical bending stress, σ_a , is to be determined along the hull girder in a similar manner as in 2.2.5 of Section 2, Chapter 2 of PART TWO of the Rules, by substituting the design vertical ice bending moment for the design vertical wave bending moment. The ship still water bending moment is to be taken as the ~~maximum sagging moment~~ permissible still water bending moment in sagging condition.

CHAPTER 16 ~~COMFORT ON BOARD~~MEASUREMENT OF VIBRATION AND NOISE

Section 1 GENERAL PROVISIONS

16.1.1 General requirements

16.1.1.1 This Chapter applies to ships of 65 m or over in length applying for the class notations G-ECO, G-ECO VIBx and Gd-ECO NOIx specified in ~~16.1.3~~ CCS RULES FOR GREEN ECO-SHIPS.

~~16.1.1.2 This Chapter sets down the comfort criteria for the assessment of the noise and vibration on ships as well as the procedural requirements for measurements.~~

~~16.1.1.3 Where a ship has undergone repairs or alterations that may affect comfort, the comfort class notations are to be re-confirmed according to the requirements of this Chapter.~~

~~16.1.1.4 In the design and construction of ships, the vibration and noise on board ships are to be controlled in accordance with CCS Guidelines for Shipboard Vibration Control and Guidelines for Control and Measurement of Noises for Ships and Marine Products.~~

~~16.1.2 Definitions~~

~~16.1.2.1 Passenger spaces are defined as all areas intended for passenger use, and include passenger cabins, public spaces (e.g. restaurants, hospital, gymnasiums, shops, open deck recreation areas, etc.).~~

~~16.1.2.2 Crew spaces are defined as all areas intended for crew use only, and include crew cabins, public spaces (e.g. mess rooms, conference rooms, offices, etc.), and work areas (e.g. wheelhouse, engine control room and workshops, etc.)~~

~~16.1.2.3 Noise level is defined as the A-weighted equivalent continuous sound pressure level measured in accordance with ISO 2923(1996).~~

~~16.1.2.4 Vibration level is defined as the overall frequency weighted r.m.s. value of vibration over the frequency range 1 to 80 Hz in accordance with ISO 6954(2000).~~

~~16.1.3 Class notations~~

~~16.1.3.1 Ships which have been found to comply with the relevant requirements of this Chapter upon measurement may be assigned the following comfort class notations:~~

~~COMF (NOISE *N*), comfort notation with regard to noise, for which the requirements of Section 2 of this Chapter are to be complied with;~~

~~COMF (VIB *N*), comfort notation with regard to vibration, for which the requirements of Section 3 of this Chapter are to be complied with.~~

~~N represents the comfort grades 1, 2, 3, where 1 means the highest grade and 3 an acceptable grade.~~

16.1.4 Documents

~~16.1.4.1 The following documents are to be submitted to CCS for approval:~~

- ~~(1) Measurement procedures, including arrangement of measuring points, loading conditions, machine operating conditions, weather conditions, measuring instruments, etc.;~~
- ~~(2) Measurement reports, including noise and vibration measurement results, etc.~~

~~16.1.4.2 A general arrangement plan in which measuring points are indicated is to be submitted for information.~~

Section 2 NOISE

16.2.1 General requirements

~~16.2.1.1 [Noise is to meet the requirements of Chapter 2, 2.2.1.1 \(3\), 2.5.2 and Chapter 4, 4.3.2 of CCS RULES FOR GREEN ECO-SHIPS.](#) Noise measurements are to be carried out in accordance with the requirements of Section 4.~~

~~16.2.1.2 If, for all the compartments or spaces, noise levels are lower than or equal to those corresponding to a given comfort grade, then the granted grade is that grade.~~

~~16.2.1.3 Measured noise levels slightly greater than those specified in the comfort criteria may be accepted. Not more than 20 percent of the passenger cabins, 30 percent of the public spaces and 20 percent of the crew cabins are to exceed the relevant noise criteria by more than 1.5 dB(A).~~

16.2.2 Passenger spaces

~~16.2.2.1 The maximum allowable noise levels for different ships, locations and comfort grades are given in Table 16.2.2.1.~~

~~Passenger Ships — Maximum Allowable Noise Levels in dB(A) of Passenger Spaces~~

Table 16.2.2.1

Location	Comfort grade (noise)		
	1	2	3
Passenger cabins, superior	45	47	50
Passenger cabins, standard	49	52	55
Passenger public spaces	55	58	62
Hospital	49	52	55
Theatre	53	55	60
Open deck recreation areas ⁽¹⁾⁽²⁾⁽³⁾	65	69	73

Notes:

- ① The levels may be exceeded by 5 dB(A) in sports areas.
- ② The levels may be exceeded by 5 dB(A) within 3 m of a ventilation inlet/outlet.
- ③ The levels for open deck recreation areas refer to ship-generated noise only, and the noise generated from the effects of wind and waves are not considered.

16.2.2.2 The bulkhead and deck air borne sound insulation indices for passenger spaces, $R_{e,w}$, calculated in accordance with ISO R717/1, are to be in compliance with Table 16.2.2.2.

Passenger ships — Minimum Airborne Sound Insulation Indices, $R_{e,w}$ — Table 16.2.2.2

Location	Comfort grade (noise)		
	1	2	3
Passenger cabins, superior	45	42	40
Passenger cabins, standard	40	38	36
Superior passenger cabin to corridor	42	40	37
Standard passenger cabin to corridor	38	36	34
Superior passenger cabin to stairwell	50	47	45
Standard passenger cabin to stairwell	47	45	43
Superior passenger cabin to passenger/crew public space	55	50	50
Standard passenger cabin to passenger/crew public space	52	48	48
Passenger cabins to discotheques	60	60	60
Passenger cabins to machinery spaces	55	53	50
Discotheques to stairwells and passenger/crew public spaces	52	52	52

16.2.2.3 Not more than 20 percent of the interfaces tested of bulkheads and decks may have airborne sound insulation indices 3 dB(A) lower than the minimum specified values in Table 16.2.2.2.

16.2.3 Crew spaces

16.2.3.1 The maximum allowable noise levels and the comfort grades for crew cabins and public spaces are given in Table 16.2.3.1.

Crew Cabins and Public Spaces — Maximum Allowable Noise Levels in dB(A) Table 16.2.3.1

Location	Comfort grade (noise)		
	1	2	3
Sleeping cabins	49	52	55
Hospital	49	52	55
Conference rooms, offices, mess rooms	55	57	60
Crew public spaces	57	60	65

Galleys, changing rooms, laundries, bathrooms	70	73	75
Open deck recreation areas ^①	70	73	75

Note:

① The levels may be exceeded by 5 dB(A) within 3 m of a ventilation inlet/outlet.

16.2.3.2 The maximum allowable noise levels and the comfort grades for crew work areas are given in Table 16.2.3.2.

— Crew Work Areas — Maximum Allowable Noise Levels in dB(A) — Table 16.2.3.2

Location	Comfort grade (noise)		
	1	2	3
Engine control room	70	73	75
Wheelhouse	60	63	65
Radio room	55	57	60
Workshops	85	85	85
Machinery spaces	110	110	110

16.2.3.3 The bulkhead and deck air borne sound insulation indices for crew spaces, R_{w5} , calculated in accordance with ISO R717/1, are to be in compliance with Table 16.2.3.3.

— Crew Spaces — Minimum Airborne Sound Insulation Indices, R_w — Table 16.2.3.3

Location	Comfort grade (noise)		
	1	2	3
Crew cabins	40	38	35
Crew cabin to corridor	35	32	30
Crew cabin to stairwell	35	32	30
Crew cabin to passenger/crew public spaces	45	45	45

16.2.3.4 Not more than 20 percent of the interfaces tested of bulkheads and decks may have airborne sound insulation indices 3 dB(A) lower than the minimum specified values in Table 16.2.3.3.

Section 3 VIBRATION

16.3.1 General requirements

16.3.1.1 [Vibration is to meet the requirements of Chapter 2.2.5.1 and Chapter 4, 4.3.1 of CCS RULES FOR GREEN ECO-SHIPS.](#) Vibration measurements are to be carried out in accordance with the requirements of Section 4.

16.3.1.2 If, for all the compartments or spaces, vibration levels are lower than or equal to those corresponding to a given comfort grade, then the granted grade is that grade.

~~16.3.1.3 Measured vibration levels slightly greater than those specified in the comfort criteria may be accepted. Not more than 20 percent of measuring points may exceed the relevant vibration criteria by more than 0.3 mm/s.~~

16.3.2 Passenger spaces

~~16.3.2.1 The maximum allowable vibration levels for passenger spaces are given in Table 16.3.2.1.~~

~~Passenger Spaces Maximum Allowable Vibration Levels in mm/s Table 16.3.2.1~~

Location	Comfort grade (vibration)		
	1	2	3
Passenger cabins, superior	1.7	2.0	2.2
Passenger cabins, standard	2.0	2.5	3.0
Passenger public spaces	3.0	3.5	4.0
Open deck recreation areas	3.0	3.5	4.0

16.3.3 Crew spaces

~~16.3.3.1 The maximum allowable vibration levels for crew spaces are given in Table 16.3.3.1.~~

~~Crew Spaces Maximum Allowable Vibration Levels in mm/s Table 16.3.3.1~~

Location	Comfort grade (vibration)		
	1	2	3
Crew cabins	2.8	3.0	3.2
Wheel house, radio room	3.0	3.5	4.0
Crew public spaces, mess rooms	3.0	3.5	4.0
Hospital	2.8	3.0	3.2
Offices	3.0	3.5	4.0
Workshops	5.0	6.0	6.5
Engine control room	4.0	5.0	6.0

Section 4 MEASUREMENTS AND REPORTS

16.4.1 General requirements

~~16.4.1.2 The measurement of noise on board ships is to be undertaken in accordance with CCS Guidelines for Control and Measurement of Noises for Ships and Marine Products. The measurement of vibration on board ships is to be undertaken in accordance with 16.4.2 to 16.4.4 below.~~

CHAPTER 25 ADDITIONAL REQUIREMENTS FOR DIVING SUPPORT VESSELS

Section 1 GENERAL PROVISIONS

25.1.2 Notations

25.1.2.1 The following notations may be assigned to vessels complying with the requirements of this Chapter^①:

Diving Support Vessel^② is assigned to vessels permanently supporting diving system and complying with the relevant requirements of this Chapter.

DSV-Air is assigned to vessels supporting conventional air diving systems and complying with the relevant requirements of this Chapter.

DSV-Sat is assigned to vessels supporting saturation diving systems and complying with the relevant requirements of this Chapter.

^② ~~The prerequisite for assigning the notation Diving Support Vessel is obtaining the notations DSV-Air and DSV-Sat.~~ [The DSV-Sat notation must be obtained for granting the Diving Support Vessel notation.](#)