目 录 LIST

1 概况 General

本船为双机、双定桨、电力推进的尾机型甲板运输船。主要装运大型物件与大型设备本船适用于无限航区。

The Vessel shall be a self-propelled Barge Carrier with twin propulsion shafts and fixed pitch propellers suitable for carrying large or very large objects and equipments driven by electric propulsion motor in unlimited areas.

本船设计依据为设计任务书及下列规范和规则及其修改通报：

The vessel shall be in compliance with the owner's requirement and following rules and their amendments:

- 中国船级社《钢质海船入级规范》(2006)
  CCS 《Rules for Building and Classing》(2006).
- 中华人民共和国海事局《船舶与海上设施法定检验规测（国际航行海船法定检验技术规则)》2008.
  the Maritime Bureau Of The People Republic Of China 《Rules of Legal Inspection for Shipping and Sea Equipment（Rules of Legal Inspection and technology for International Trade Sea going)》2008
- 中国船级社《材料与焊接规范》 (2006)
  CCS《 Rules for materials and wildings 》(2006)
- 国际海上人命安全公约（2004综合文本）
  International Convention for the Safety of Life at Sea (Consolidated Edition 2004)
- MARPOL 防污公约（73/78文本）
  International Convention for the Prevention of Pollution from Ships (MARPOL), 1973 with the Protocol of 1978.

主推进装置由推进电机、弹性联轴节、减速齿轮箱、中间轴和尾轴驱动螺旋桨。主机操纵站设在驾驶室和集控室。

Main propulsion are propulsion motor、flexible couplings、reduction gearbox、intermediate shaft and stern shaft to propel the propellers. The positions to control main engines are Nav. room and watch room.

本船轮机入级符号： ★CSM Electrical Propulsion System, BRC

The classification is according ★CSM Electrical Propulsion System, BRC

电站系统包括三台主柴油发电机、一台停泊发电机组和一台应急发电机。主配电板布置在集控室内，应急配电板布置在应急发电机室内。

The electric generating system shall consist of three (3) main generators , one (1) Auxiliary generators and one (1) emergency generator. The main switchboard shall be suitably

arranged in ECR and Emergency switchboard shall be arranged in the emergency generator engine room.

2 主要设备 Main Machinery

2.1 主发电机组 Main Diesel Generator Set

型 号 type: CCFJ2000J
数 量 Quantity: 2
柴油机型号 Diesel type: 8320ZCd-8
柴油机缸数 No. of cylinder: 8
额定功率 MCR: 2206 kW
额定转速 Rotational speed: 525r/min
起 动 形式 S tart method: Com pressed Air
发电机型号 Generator type:
发电机功率 Rated normal output: 2000 kW
电 制 Rated voltage: AC690V ，50Hz

2.2 推进电机 Propulsion Motor

型 号 Diesel type:
数 量 Quantity: 2
额定功率 MCR: 2200 kW
额定转速 Rotational speed: 1000r/m in
电 制 Rated voltage: AC690V ，50Hz

2.3 高弹性联轴节 Flexible Coupling

型 号 T ype: HGT3020IIID
数 量 Quantity: 2
传递能力 Transfer Capability: 31.5kN ·m

2.4 减速箱 Reduction Gearbox

型 号 type: HCJ2200
数 量 Quantity: 2
形 式reduction gearbox： 减速齿轮箱 reduction gearbox
转 速 比 Nominal ratio: 6:1

2.5 轴系 Shaft System

本船为双机双桨推进装置，整套轴系包括：高弹联轴节(联接飞轮与齿轮箱)，减速齿轮箱，中间轴，艉轴，螺旋桨等组成。

The shaft should be integral forging steel machined smoothly and polished in bearing position. The design for shaft、propeller should be in accordance with Classification Societies

requirements. The thrust shaft and thrust bearing shall be incorporated in the main engine. Barred speed shall not occur in the normal operating range from 50 to 100% MCR load of main engine.

艉轴轴承采用高分子合成材料“ 圣龙 ”，润滑采用海水润滑，艉轴前密封采用经船检认可的产品，螺旋桨与艉轴间采用匙形键连结。

Stern tube bush bearing shall be made of ‘SHENLONG’, and shall be water-lubricated. Stern tube seals of lip type shall be provided at fore and aft ends of the stern tube to prevent ingress of sea water. The material of liner shall be designed and manufacture in accordance with the requirements and regulatory of the Classification Society. The propeller shall be fitted to the cone part of the propeller shaft with type key fitting method, and secured by a nut.

2.6 停泊柴油发电机机组 Auxiliary Diesel Generator Set:

型　　号 type: CCFJ300J
数　　量 Quantity: 1
柴油机型号 Diesel type: N8160ZC
柴油机缸数 No. of cylinder: 8
额定功率 MCR: 330 kW
额定转速 Rotational speed: 1000r/m in
起 动 形式 S tart method: Air motor
发电机型号 Generator type:
发电机功率 Rated normal output: 300 kW
电　　制 Rated voltage: AC400V ，50Hz

2.7 应急柴油机发电机组主要参数 Emergency Diesel Generator Set:

型　　号 type: CCFJ100Y
数　　量 Quantity: 1
柴油机型号 Diesel type: TBD226B-6CD
柴油机缸数 No. of cylinder: 6
额定功率 MCR: 120 kW
额定转速 Rotational speed: 1500r/m in
起 动 形式 S tart method: 电马达 Electric motor, DC 24V
气马达 Air motor,
发电机型号 Generator type:
发电机功率 Rated normal output: 100 kW
电　　制 Rated voltage: AC400V ，50Hz

2.8 压缩空气设备 Compressed Air Equipment：

本船发电机舱中设有空气压缩机2台，其中一台主空压机能由应急配电板供电。本船设起动用空气瓶4只，杂用空气瓶2只。另设应急发电机起动空气瓶1只。

Two air compressors in diesel generator room , One of air compressors could be supplied electric by emergency switch boards. There are 2(two) main air bottles , one air bottles for universal use in diesel engine room and one air bottles for universal use in propeller motor room and one emergency air bottles in emergency diesel generator room,

2.9 燃油驳运设备 Fuel Oil Transfer Pumps：

本船发电机舱设4台齿轮式燃油驳运泵，其中2台为柴油驳运、2台重油驳运泵。

There are 4 fuel oil pumps(Two HFO pumps, Two MDO pumps) in the diesel Generator room。

2.10 防污染设备 Pollution-Proof Equipment

(1) 设一台油水分离器型号USH/C-20,处理能力2.0m3/h,排放标准<15ppm。油水分离器上有一套排油自动控制装置。

There is one oil water separator with model of USH/C-20, treatment ability of 2.0m^3/h, exhaust standard will be less than 15ppm. There is one oil monitor、automatic control appliance to exhaust oil.

(2) OW200C型焚烧炉1台，其处理能力为55L/h。

There is one incinerator with model of OW200C, proper capacity of 55L/h.

(3) SBT/C-25型生活污水处理装置1台，其处理能力满足25人要求。

There is one oil sewage treatment plant with model of SBT/C-25 , treatment ability for 25 persons

(4) 机舱设约34.3m^3生活污水舱和生活污水粉碎泵。

One sludge pump and one sewage tank with capacity of 34.3m^3.

2.11 污油驳运设备 Transfer Pumps：

本船发电机舱设油渣、污油泵1台，油污水泵1台。

There are one sludge pump and one Oily water pump in the diesel generator room。

2.12 保船设备 Ship Saving Equipment：

本船设消防泵2台，应急消防泵1台提供全船消防水；舱底泵2台驳舱底水；应急时2台压载泵可用于抽取发电机舱和推进机舱的舱底水。

There are Two fire pumps and one emergency fire pump supply fire water. Two bilge pumps to transfer discharge bilge discharge directly in emergency only. Emergency bilge connected to ballast pump for diesel generator room and propulsion room each one.

2.13 发电机舱通风设备 Diesel Generator Room Ventilation Equipment：

发电机舱设有4台电动轴流风机，将空气从露天甲板引送到发电机舱，2台风机为可逆的。

There will be four(4) electric axial fans, air will be drawing to engine room from weather deck, Two fans shall be of reversible type.

3 管系概述 Piping Systems General

管系的布置要易于到达及拆卸。因伸缩与变形原因，长管系要有足够的圆弧、弯曲。弯曲半径、连接方法按标准生产。所有管系应固定以防振动而损坏。排气管应有弹性膨胀节。

The pipes shall be easy to reach and dismount. The pipe line shall be flexible enough to prevent stress caused by expansion shrink or hull deforming. Piping bending methods, bending radius, connection shall be according to Builder's standard. All pipes shall be supported firmly to prevent damage by vibration. Exhaust gas pipes shall be supported elastic holder.

热水管及压缩空气管要安装在易于观察及到达的地方。燃油管接口或阀门应尽可能远离热表面和电子设备。主配电板上方及后面禁设油管及水管，若不可避免，须设防泄漏装置。空气瓶远离危险区域，若不可避免，须在空气瓶上设安全阀。

Pipe of hot water and compressed air shall be easy to watch and reach, and deposited there plate. Pipe joints or valves for the pipe carrying fuel oil shall be arranged as far away hot surface and electric equipments as possible. There shall not be oil pipes and water pipes located over and behind the main switchboard. If not avoided, there shall be a leakage-prevented device. Air pocket shall be far away dangerous, if not, there shall be a safety valve on the air pocket.

装船前所有管系须经压缩空气吹清焊渣，清理干净。镀锌管在焊接法兰后酸洗、镀锌。因船上焊接引起的镀锌管镀锌层破坏及自然引起锌层破坏，应涂油漆层保护。

All pipes shall be cleaned with compressed air to blow welding slag off before installation on board. The galvanization pipes shall be galvanized after flanges welded and acid cleaning. If damaged parts of galvanized pipe are accrued for welding onboard, the pipe shall be touched up with zinc solution paint.

为了方便辨认露在外面的管子，应涂不同的颜色。管子的颜色符合相关的标准要求。

Different colors will be painted on the open pipes for better identification. The colors of piping is according with the requirements of applied rules.

当管路穿过水密甲板或舱壁时，用水密通舱管件来保证密封联接。

When the pipes pass through water-tight bulkheads or decks, water-tight bulkhead pipe parts should be connected to them for seamless.

按照船级社的要求，对管路进行液压试验。

The pipes should be hydraulic tests according to the rules of CCS.

当管子表面温度对人体构成危害时，对露在外面人体能接触的到的所有超过60℃包括冷却水管在内的表面均需进行隔热包扎。

If surface temperature of the pipes is too high to danger to people, all the pipes (it is more than 60℃) should be covered insulation.(Including cooling pipes)

3.1 海底阀箱和舷外排出口 Sea chest and discharge

海底阀箱采用钢板焊接结构，海水箱内设防腐装置。吸入海底箱装有可拆卸的镀锌钢格栅，其净面积最小为海底阀截面积的两倍。该格栅用不锈钢螺栓及螺母固定。每个海底阀箱安装一个空气吹洗接头。每个阀箱上提供一个带阀的透气管，引到满载水线以上。

Sea chests will be made of welding steel plates. There is a corrosion-proof appliance in the chests. The net area of galvanic steel grid of suction chest should be twice chest section area. The grid will be fixed by restless steel screw and nuts. There will be one connection to clean by air for each chest. There will be a air-escape pipe (the exit will be above heavy load line) with a valve in each chest.

每只海底阀箱安装一个海底阀。主海底阀的手轮至少应高出花钢板450mm，并应有开闭状态的指示装置。

There will be a sea valve for each chest. The hand wheel of sea valve is to be situated platform 450mm and have a indicator to show whether they are open or shut.

海水舷外排出接头用钢管或厚度适当的钢板制成。每一舷外排出口应装设钢质的截止止回阀，该阀应装有贯通外板的凸肩，如果该阀装在座板上面座板在外板上已构凸肩时，则阀的凸肩可免除。

Outboard connection will be made of steel pipes or enough thick pipe plates. Each discharge valve secured direct to the shell plating of the ship is to be a non-return stop steel valve. The valve is to be fitted with spigots passing the plating but the spigots on the valve may be connected if these fittings are attached to pads or distance pieces which themselves form spigots in way of shell plating.

3.2 阀件和附件 V alve And Fitting

水和油系统中的截止阀有球阀、角阀、闸阀和蝶阀等，这些阀件都是从“ GB ”与“ CB ”中选取的。安装在燃油、滑油日用舱或柜，按船级社要求安装有远距离切断的阀，按制造厂标准选用气动型的。

The types of stop valves in water and oil system will be ball, right-angled, sluice and butterfly etc. These valves types will be selected from “ GB ”与“ CB ” standard.The valves which could cut oil or lubricating oil tanks far away will be air-starting type by maker’s standard.

所有自动控制阀包括浮子操纵阀均提供手动操纵装置。

Each aumatic control valve including swimmer operation valve could be manual control.

法兰型式按中国船级社规范要求确定。

The types of flanges should be satisfied by CCS.

管子接头材料和垫片不可用石棉。

The materials of pipe connection and rings should not be asbestos.

3.3 管子尺寸 Pipe Dimensions

3.1.1 无缝钢管 Seamless Steel Pipe

通径 Nominal (mm)	外径 Outside diameter(mm)	壁 厚 Thickness (m m)		
		A 类 A class	B 类 B class	C 类 C class
6 10		2.0	2.0	/
8 14		2.0	2.5	/
10 17		2.5	3.0	/
15 22		2.5	3.5	4
20 27		2.5	3.5	4
25 34		2.5	4.0	4.5
32 42		3.0	4.5	6.5
40 48		3.0	4.5	6.5
50 60		3.0	4.5	6.5
65 76		3.0	4.5	6.5
80 89		3.5	4.5	7.0
100 1	14	4.5	5.0	8.0
125 140		4.5	5.5	8.0
150 168		5.0	6.0	9.0
200 219		6.0	7.0	9.0
250 273		6.5	8.0	9.0
300 325		6.5	9.0	10.0
350 355		6.5	11	12

3.1.2 无缝紫铜管和壁厚 Copper Pipe

通 径 N ominal (mm)	外 径 Outside diameter(mm)	壁 厚 Thickness (mm)
4 6		1
6 8		1
8 10		1.5
10 14		1.5
15 18		1.5
20 24		1.5
25 28		1.5
32 38		1.5

3.4 管子材料 Pipes Materials List

序号 No	系统名称 Systen	材料 Materials	备　　注 Remark
1	压缩空气 Compressed air	无缝钢管 Seamless steel pipes	
2	冷却海水 Cooling sea water	热镀锌无缝钢管 Seamless steel pipes, hot galvanize	
3	冷却淡水 Cooling fresh water	无缝钢管 Seamless steel pipes	按柴油机制造厂要求 Manufacturer’s standard
4	滑油 Lubrication oil	无缝钢管 Seamless steel pipes	
5	压载和舱底水 Ballast & bilge	热镀锌无缝钢管 Seamless steel pipes, hot galvanize	
6	消防水 Fire water	热镀锌无缝钢管 Seamless steel pipes, hot galvanize	
7	CO2灭火 CO2 fire Extinguishing	无缝钢管 Seamless steel pipes	
8	热水 Domestic hot water	无缝钢管 Seamless steel pipes	
9	生活用淡水 Domestic fresh water	热镀锌无缝钢管 Seamless steel pipes, hot galvanize	
10	排气 Exhaust gas	钢板卷制或无缝钢管 Welded steel plate or Seamless steel	
11	疏排水 Scupper soil	热镀锌无缝钢管 Seamless steel pipes, hot galvanize	
12	油舱测深管 Sound, air for oil tank	无缝钢管 Seamless steel pipes	
13	水舱测深管 Sound, air for water tank	热镀锌无缝钢管 Seamless steel pipes, hot galvanize	
14	液压油管 Hy	无缝钢管 Seamless steel pipes	
15	粪便污水管 Sanitary	热镀锌无缝钢管 Seamless steel pipes, hot galvanize	

4 动力系统 Power System:

4.1 燃油系统 Fuel Oil System:

本船的主发电机组采用IF-180(180cSt/50℃)燃料油，、燃油锅炉、辅机均采用柴油（MDO）作燃料，全船共设燃料油舱4只、柴油舱2只，燃油驳运泵4只（燃料油、柴油各1台），燃油分离机2台。上甲板两舷均设有燃料油及柴油的加油站。

The ship main diesel Generator burn IF-180(180cSt/50℃) HFO, auxiliary engine and fired fuel oil steam boiler burn MDO. There are 4 HFO tanks, 2 MDO tanks, 4 fuel oil pumps(Two HFO pumps, Two MDO pumps), 2 HFO separators. Both ship side on deck shall be installed HFO and MDO charging stations.

燃料油系统：燃油泵将燃料油从燃料油舱驳至燃料油沉淀舱中沉淀颗粒杂质，沉淀舱中的燃油再经燃油分离机分离后进入燃料油日用柜，供主机正常航行使用，杂质至油渣柜。

HFO system: HFO pump pumped the HFO from HFO tank to HFO setting tank to precipitate particles. HFO inside the HFO setting tank is separated by HFO separator, then it goes into HFO server tank, to supply main diesel Generator during normal cursing, impurity comes to waste oil tank.

柴油系统：柴油泵将柴油从柴油舱驳至柴油日用柜，供主机进出港，以及锅炉、辅机和焚烧炉使用。

MDO system: MDO pump pumped the MDO from MDO tank into MDO server tank, to supply main engine during entering and leaving port, and to supply boiler, auxiliary engine and .

4.2 滑油系统 Lubricating Oil System:

4.2.1 主柴油机滑油供给系统 Lubricating Oil Supply System Of Main Diesel：

本系统是独立的滑油供给系统，每台主机带有滑油压力泵，滑油冷却器、滑油自清滤器、滑油压力调节阀，另设置滑油备用泵和预供润滑油泵。

The system is independent lubricating oil supply system. There will be lubricating oil pressure pumps, coolers, self-filters, pressure adjusting valves in main engines. Lubricating oil standby pumps and pre-lubricating L.O. pump will be located for main engines.

本机为干式油底壳，主机油底壳后端有一个滑油出口，流至主机下方的主机滑油循环柜。机带滑油泵从滑油循环柜吸油，经滑油自清滤器、机带滑油冷却器（带恒温阀），进至主机各需润滑和冷却的部件处，最后流回主机滑油循环柜。

Each engine will be with one dry sump. Lubricating oil will be out from outlet behind the sump, then to Lubricating oil circulating tank. Lubricating oil pumps absorb oil from the Lubricating oil circulating tank, through self-filters and cooler with thermostat, then transfer to the parts need to lubricate or cool, last go back to the Lubricating oil circulating tanks.

4.2.2 发电机润滑系统 Reduction Gearboxes Lubricating Oil System：

主发电机润滑系统自成体系，主发电机润滑由齿轮泵从滑油循环柜抽出油，供主发电机润滑。主发电机润滑系统的流程：滑油循环柜→滑油泵→滑油冷却器→滑油循环柜。主台发电机均设有一台备用滑油泵。

Main generators lubricating oil system will be independent. The gear pumps in boxes will absorb oil from Lubricating oil circulating tanks, at meantime; they transport oil to lubricate。The progress of Main generators lubricating oil system is: the Lubricating oil circulating tanks to L.O. pumps to L.O. cooler to the Lubricating oil circulating tanks. Lubricating oil standby pumps will be located for each main generator.

4.2.3 辅柴油机润滑系统 Lubricating Oil System For Auxiliary Diesel

辅助发电柴油机、应急发电柴油机润滑系统自成体系。辅助柴油机为湿式油底壳。机带的滑油泵从油底壳将滑油抽出，经机带的滑油滤器和精滤器到柴油机各需要冷却与润滑的点。

Lubricating oil system for auxiliary diesel is independent. Auxiliary diesel engines of generators will be wet sump. Lubricating oil pumps absorb oil from sumps, through self-filters and finishing-filters, then transfer to the parts of diesel engines need to lubricate or cool.

4.2.4 减速齿轮箱润滑系统 Generators Lubricating Oil System：

减速齿轮箱润滑系统自成体系，减速齿轮箱润滑由自带的齿轮泵从油底壳吸油，同时输出油，供齿轮箱润滑。减速齿轮箱箱润滑系统的流程：油底壳→滑油泵→齿轮箱滑油冷却器→油底壳。减速齿轮箱设有一台备用滑油泵。由齿轮箱厂提供。

Reduction gearboxes lubricating oil system will be independent. The gear pumps in boxes will absorb oil from sump, at meantime; they transport oil to lubricate。The progress of gearboxes lubricating oil system is: sumps to L.O. pumps to L.O. cooler to sumps. Each gearbox factory will supply one standby lubricating oil pump.

4.2.5 滑油净化系统 Lube Oil Purifying System

本系统设置三台主机滑油分油机，可分别对主柴油机滑油循环柜之滑油进行分离净化。

Lube oil purifier to be connected so that batch purification on the main diesel engine system for lubricating oil circulating tanks.

主柴油机旁通分离：滑油循环柜→分油机吸入泵→加热器→分油机→分油机排出泵→滑油循环柜。

Main diesel engine by-pass separating: lubricating oil circulating tanks to suction pumps to heaters to exhaust pumps to lubricating oil circulating tanks.

4.3 冷却系统 Water Cool System:

本船采用冷却系统由发电机舱和推进机舱两个中央冷却系统组成。

This ship cooling system is made up of two central cool systems: main diesel generator room cool system and propulsion room cool system.

4.3.1 发电机舱冷却系统 Main Diesel Generator Room Cool System：

4.3.1.1 海水冷却系统 Sea-Water Cool System:

本船发电机舱左右舷各设置高、低位通海阀箱一只；左舷设左舷设主海水泵2台，港用海水泵1台，中央冷却器一台；左舷设左舷设主海水泵2台，中央冷却器一台；

There are two sea chests located each port and starboard in diesel generator room. There are two main seawater pump, one harbour seawater pump and one central cooler in port. There are two main seawater pump and one central cooler in starboard.

海水泵从海底门吸入海水经中央冷却器后排至舷外。

Seawater pump suction water from sea chest to cool low fresh water by central cooler then discharge overboard.

中央空调机组、冷库压缩机组和驾驶室的独立空调的冷却水亦由左舷海水泵提供。

Following equipment are also cooled by the seawater from port seawater pump include: Center air condition device, provision refrigerator and Nav. Room air condition device .

4.3.1.2 低温淡水冷却系统 Low Fresh-Water Cool System：

左舷低温淡水在低温淡水冷却器接受冷却后分四路，一路由N01主发电机柴油机低温淡水泵泵经柴油机空冷器、喷油器冷却器、高温淡水冷却器、滑油冷却器分别冷却柴油机的增压空气、喷油器冷却油、高温淡水、滑油后至低温淡水冷却器完成循环；一路由N01主发电机组冷却水泵泵经发电机、发电机滑油冷却器后至低温淡水冷却器完成循环；一路由停泊发电机组淡水泵泵经发电机组冷却后至低温淡水冷却器完成循环；一路经总用低温淡水泵后分别经锅炉大气冷凝器、集控室空调、空气压缩机组后至低温淡水冷却器完成循环，另总用低温淡水泵出口另设有一路作为停泊发电机组的备用。

Low freshwater (port) will be cooled in the central cooler (port), and then one branch will be pumped by two fresh water pump (one derived by diesel and the other as standby) to N01 generator set diesel’s air cooler, nozzle specialty cooler, high freshwater cooler and Lubricating oil cooler. One branch will be pumped by two fresh water pump (one operating and the other as standby) to N01 generator. One branch will be to auxiliary diesel by self-derive pump. One branch will be pumped by two general server fresh water pump (one operating and the other as standby) to atmosphere condenser, control room air condition, air compressor and auxiliary diesel standby.

右舷低温淡水在低温淡水冷却器接受冷却后分四路，一路由N02主发电机柴油机低温淡水泵泵经柴油机空冷器、喷油器冷却器、高温淡水冷却器、滑油冷却器分别冷却柴油机的增压空气、喷油器冷却油、高温淡水、滑油后至低温淡水冷却器完成循环；一路由N02主发电机组冷却水泵泵经发电机冷却后至低温淡水冷却器完成循环；一路由N03主发电机柴油机低温淡水泵泵经柴油机空冷器、喷油器冷却器、高温淡水冷却器、滑油

冷却器分别冷却柴油机的增压空气、喷油器冷却油、高温淡水、滑油后至低温淡水冷却器完成循环；一路由N03主发电机组冷却水泵泵经发电机冷却后至低温淡水冷却器完成循环。

Low freshwater (starboard) will be cooled in the central cooler (starboard), and then one branch will be pumped by two fresh water pump (one derived by diesel and the other as standby) to N02 generator set diesel's air cooler, nozzle specialty cooler, high freshwater cooler and Lubricating oil cooler. One branch will be pumped by two fresh water pump (one operating and the other as standby) to N02 generator. One branch will be pumped by two fresh water pump (one derived by diesel and the other as standby) to N03 generator set diesel's air cooler, nozzle specialty cooler, high freshwater cooler and Lubricating oil cooler. One branch will be pumped by two fresh water pump (one operating and the other as standby) to N03 generator.

低温淡水的消耗由低温淡水膨胀水箱补充， 空气及水蒸汽经低温淡水膨胀水箱逸出。低温淡水膨胀水箱的淡水由淡水压力柜供给。

Low fresh water could be supplied automatically by low water expansion tank and exchange air. Low water expansion tank's water will be supplied by fresh water hydrophore tank.

4.3.1.3 高温淡水冷却系统 High Fresh-Water Cool System

本船主发电机组自带高温淡水泵1台，船上为每台主发电机组另设主机高温淡水备用泵1台，高温淡水预热器1台，高温淡水预热泵1台。每台主发电机组的高温淡水在各自高温淡水冷却器接受冷却后经高温淡水泵泵给机体冷却机体后回到高温淡水冷却器完成循环。

There are one self-derived high water pump, one standby hot water pump, one preheat pump& heater, one hot fresh water cooler for each main diesel. Hot water will be cooled in hoe water cooler, and then will be pumped to cool diesel.

高温淡水的消耗由高温淡水膨胀水箱补充，空气及水蒸汽经高温淡水膨胀水箱逸出。高温淡水膨胀水箱的淡水由热水柜供给。

High fresh water could be supplied automatically by high water expansion tank and exchange air. High water expansion tank's water supplied by hot water hydrophore tank

4.3.1.4 喷油器冷却系统 Cool System For Nozzle Specialty

本船主发电机组柴油机自带喷油器冷却泵1台，船上为每台主发电机柴油机另设喷油器冷却泵1台。每台主发电机组的喷油器冷却油在各自喷油器冷却器接受冷却后经喷油器冷却泵泵给喷油器冷却后回到喷油器冷却器完成循环。

There are one self-derived nozzle-cooling pump, one standby nozzle-cooling pump for each main diesel. nozzle-cooling oil will be cooled in nozzle-cooler, and then will be pumped to cool diesel nozzle.

冷却油的消耗由膨胀油柜补充，膨胀油柜的滑油由主机滑油储存舱补充供给。

System's cooling oil could be supplied by oil expansion tank.The oil expansion tank could be supplied by main diesel lubricating oil strange tank.

4.3.2 推进机舱冷却系统 Propulsion Room Cool System：

4.3.2.1 海水冷却系统 Sea-Water Cool System:

本船推进机舱左右舷各设置高、低位通海阀箱一只；左舷设左舷设主海水泵2台，港用海水泵1台，中央冷却器一台；左舷设左舷设主海水泵2台，中央冷却器一台；

There are two sea chests located each port and starboard in propeller motor room. There are two main seawater pump and one central cooler in port. There are two main seawater pump and one central cooler in starboard.

海水泵从海底门吸入海水经中央冷却器后排至舷外，海水泵出口分一路用于冷却艉轴。

Seawater pump suction water from sea chest to cool low fresh water by central cooler then discharge overboard, and one branch cooling stern shafts.

4.3.2.2 低温淡水冷却系统 Low Fresh-Water Cool System：

左舷低温淡水在低温淡水冷却器接受冷却由低温淡水泵后分四路：一路至N01推进变压器冷却后至低温淡水冷却器完成循环，一路至N01推进变频器冷却后至低温淡水冷却器完成循环，一路至N01主推进电机冷却后至低温淡水冷却器完成循环，一路至N01减速箱冷却后至低温淡水冷却器完成循环；

Low freshwater (port) will be cooled in the central cooler (port), and then will be pumped by two fresh water pump (one derived by diesel and the other as standby) to N01 propulsion transformer, N01 propulsion converter, N01 propulsion motor, N01 gearbox.

右舷低温淡水在低温淡水冷却器接受冷却由低温淡水泵后分四路：一路至N02推进变压器冷却后至低温淡水冷却器完成循环，一路至N02推进变频器冷却后至低温淡水冷却器完成循环，一路至N02主推进电机冷却后至低温淡水冷却器完成循环，一路至N02减速箱冷却后至低温淡水冷却器完成循环。

Low freshwater (starboard) will be cooled in the central cooler (starboard), and then will be pumped by two fresh water pump (one derived by diesel and the other as standby) to N02 propulsion transformer, N02 propulsion converter, N02 propulsion motor, N02 gearbox.

低温淡水的消耗由低温淡水膨胀水箱补充，低温淡水膨胀水箱的淡水由淡水压力柜供给，低温淡水系统中的空气及水蒸汽经低温淡水膨胀水箱逸出。

Low fresh water could be supplied automatically by low water expansion tank and exchange air. Low water expansion tank's water supplied by fresh water hydrophore tank

4.4 压缩空气系统 Compressed Air System:

舱空气系统包括起动空气，杂用空气部份，系统在发电机舱设置二台空压机，四只主机起动空气瓶，一只杂用气瓶，推进机舱设置一只杂用气瓶；应急发电机舱设置一只

应急起动空气瓶。其一台主空压机除了能由主配电板供电以外，在瘫船情况下能由应急配电板供电。二台主空气压缩机通过压力继电器可自动起、停。

The compressed air system includes starting air, mess air. There are two air compressors, four starting air bottles, one mess air bottle in diesel Generator Room, one mess air bottle in propulsion room and one starting air bottle in emergency generator Room. One of air compressor will be supplied by main and emergency switchboard. Two main compressors could start or stop by pressure relay.

系统将起动瓶内的空气减压到1.0MPa， 后进入发电机舱和推进机舱的杂用气瓶，各处需要0.7MPa空气的地方使用，再经减压至0.4MPa供各需要0.4MPa的用气设备使用。

The system reduces air pressure of 1.0MPa into mess air bottles & mess air bottles in other related appliances, then reduce again to air pressure of 0.4Mpa for other related appliances.

应急柴油发电机的启动气瓶由主起动空气瓶充气。

The starting bottle of emergency generator is filled for starting air bottles in diesel engine room.

4.5 排气系统 Exhaust Gas System:

所有主、辅机、锅炉排气管系的设计布置均考虑尽量减少对主、辅机的排气背压。排气管表面绝热层为岩棉＋0.50㎜白铁皮，其表面温度不超过60度，保证轮机人员的安全及降低机舱幅射热。

Exhaust pipe system design for main, auxiliary engines, boiler should satisfy as less force pressures as possible to main and auxiliary engines. The pipes should be covered heat-insulation with rock wool and 0.5mm thick steel sheet for the surface temperature will not be more than 60℃ to protect the workers safe and to reduce heat in engine room.

主机排气管由于锅炉有消音功能无需再安装消音器，排气管出烟囱处采用防雨弯头及假烟囱顶板采用可伸缩结构。

Main engine exhaust pipes needn’t silencer because the boiler will have this. The outlet pipes out of chimney should be with rain-proof bending head. Top plates of chimney will be flexible.

应急发电机的废气经排气消音器在上甲板以上大于4500㎜ 处排入大气。

Emergency diesel exhaust to air above upper deck 4500mm after silencer

4.6 发电机舱通风管系 Ventilation In Diesel Engine Room

发电机舱设有四台电动轴流风机，将空气从露天甲板引送到发电机舱，2台风机为可逆的。其容量满足主柴油机、锅炉分别在100%负荷时运行及满足船上常规的要求。

There will be four(4) electric axial fans, air will be drawing to engine room from weather deck, Two fans shall be of reversible type. The capacity will be satisfied the normal and 100% load requests when main diesel engines、boiler work.

风机材料按照制造厂标准。通风管道制成矩形断面，主管用3㎜钢板，分支管用0.7～1㎜厚钢板。

The fan materials will be according to maker's standard. The section of vent pipeline will be made of steel plate with the thickness of 3mm, and the branches will be steel plate with the thickness of 0.7~1mm.

机舱的废气能通过在尾部的烟囱开口排到大气里。排气口安装有能在机舱外面控制的手动式应急关闭装置。

Exhaust air from engine room shall be led to the atmosphere through the openings at the aft wall of funnel. Exhaust air opening shall be fitted with emergency shut-off device of wire pulled type which is operated manually from the outside of engine room.

4.7 蒸汽加热管系 Engine Room Steam Heating System：

本船设有1台废汽蒸汽锅炉和1台燃油废气组合锅炉，位于机舱棚。该处所设有200mm高围板。

There are one exhaust gas boiler and one exhaust gas boiler located engine room casting. The boiler located desk are to be provided with coamings at least 200mm in height.

蒸汽经分配器送至需加热的舱柜及分油机加热器，各舱柜加热管进口均设有截止阀，并配有相应的温度计。

Steam heated by exhaust gas is transferred to heat cabins and fuel oil separator heater after distributor, every cabin heater entrance has cut-off heater with correspondent thermometer.

5 船舶系统 Ship's Piping System:

5.1 舱底、压载、水消防管系 Bilge、Ballast、Water-Fire System

本系统按规范要求配置有：according to the rules, the system will have:

(1) 舱底泵2台 Two bilge pump
(2) 消防泵2台 Two fire pumps
(3) 艏部舱底喷射泵1台 One projected pump in bow
(4) 专用压载泵4台 Two special ballast pumps
(5) 应急消防泵1台 One emergency fire pump
(6) 舱底水油水分离器1台 One oily bilge separator

上述各泵的排量、压力经计算均满足规范的要求。

The above pump capacities and pressures should be satisfied by the rules request.

舱底泵直接和舱底水总管连接，可单独工作，亦可同时工作。机舱内设置三个舱底水吸口；其中二只设在机舱艉部两艉轴处各一只，另一只设在机舱前部船舯底处。另在机舱中纵剖面最底处设一个直通吸口。再设一应急吸口，直通一台主机海水泵。

Bilge pump will connect to bilge water general pipe directly. They could work separately

and work together. There are three suctions for bilge water. Two of them will be near two stern shafts, another will be in center bottom of fore engine room. There will be one direct suction in loweat place of longitudinal section of engine room and one emergency one to seawater pumps for main engines.

舱底水油水分离器可直接从发电机舱底水舱或舱底水舱吸水，经分离后，达到排放标准<15ppm后排出舷外，分离出的污油存入污油舱、油渣舱。

The oily bilge separator takes suction from bilge wells in diesel engine room and bilge holding tank, the oil in the bilge water will be separated from the bilge water. The separated bilge water (<15ppm) will be discharged overboard. In case of the high oil content effluent will be automatically directed back to bilge holding tank and oil sludge tank.

油污水泵能从舱底污油水舱吸水通过油污水排放接头排到岸上。污油泵能从污油舱吸水通过污油排放接头排到岸上。

Oily water transfer pump shall take suction from bilge water holding tank, and discharge to shore connection of oily water. sludge transfer pump shall take suction from sludge tank, and discharge to shore connection of sludge.

压载水由专用压载泵排出，压载系统设阀门遥控系统，液位遥测系统。

Ballast water will discharge by special ballast pumps. There will be vlave remote system、hydraulic-level remote system.

两台消防泵供机舱及全船消防水用，应急时用应急消防泵提供消防水，其排量压力满足要求。根据规则安装有2个国际通用接口。

The two fire pumps will connect with the fire main or hydrants. A emergency fire pump will be done in emergency. Their capacity and pressure should be satisfied by the rules request. Two(2) international shore connections shall be provided in accordance with the requirements of applied rules.

锚链舱及艏舱底设置喷射泵（锚链舱内），通过排水管排出舷侧。动力水由消防及甲板清洗管系供应。消防及甲板清洗管系还供应锚链清洗。

Chain locker and its bilge to be served by ejector which provided in Chain locker and the bilge water is discharged to override through hawse pipe. The drive water is supplied by fire/deck-wash line. The fire/deck-wash line also to be washed Chain.

5.2 全船测深、注入、透气系统 Venting and Sounding System

5.2.1 空气管Venting Pipe

压载水舱、首尾尖舱、燃油舱、隔离舱和空舱根据船级社要求都安装有空气管。海水箱设有空气管。除机舱内可移动的柜子外，空气管的内径不小于50mm。

The venting pipe shall be fitted to the water ballast tanks, peak tanks, fuel oil tanks, cofferdams and void spaces in accordance with the requirements of the Classification Society. The sea chest shall have air venting. The venting pipe from the tanks except portable tanks in engine room shall be dimensioned not less than 50 mm.

空气管安装在舱的最高处，并且尽可能的远离注入管。空气管在正常情况下应该能自我排泄。空气管截面积，空气管壁厚和延伸高度根据船级社的要求决定。

The venting pipe shall be placed at the highest part of the tank and as far away as possible from the filling pipes. The venting pipe shall be self-drained under normal trim conditions. The total sectional area, wall thickness and extending height of venting pipe shall be in accordance with the requirements of the Classification Society.

压载水舱、淡水舱和燃舱的空气管出口为自闭式（浮盘式）。燃油舱和压载水舱的透气出口在主甲板上，燃油舱的透气出口处有防火网，淡水舱的透气出口安装有不锈钢防虫网。油舱空气管的出气口的位置避免污染到空调系统的进气口。

The venting pipe from the water ballast tanks, fresh water tanks and fuel oil tanks shall be fitted with the vent head of automatic closed type (float disc type). Air vent heads for fuel oil tanks and water ballast tanks in cargo tank area and cofferdams adjacent to cargo oil tank shall be fitted with fire-proof screen and those for fresh water tanks shall be fitted with insect-proof stainless steel wire net. The venting pipe with air vent heads from the fuel oil bunker tanks shall be located to avoid contaminated air intake to air-conditioning system.

空气管尽可能的靠近舱壁和扶强材料旁边。当空气管通过甲板时应有管套或双面法兰式连接。所有透气管要避开缆桩、导缆钳、缆绳及甲板舾装设备。

The venting pipe shall be placed as near the bulkheads and behind the stiffeners as possible. Sleeve joint or deck mounting type joint shall be used for the venting pipe passing through the deck. All air escapes shall be arranged clear of bitts, chocks, mooring lines and other deck fittings.

5.2.2 测量管Sounding Pipe

压载水舱，尖舱，燃油舱，空舱，隔离舱和锚链舱根据船级社要求安装带有螺帽的测量管。

The water ballast tanks, peak tanks, fuel oil tanks, void spaces, cofferdams and chain lockers shall be fitted with sounding pipes with screw cap in accordance with the requirements of the Classification Society.

测量管要尽可能直的延伸到甲板上，安装有铜制的螺帽。在需要测量的舱，测量管口在舱最高的部位。每根测量管的末端安装有防撞板，以保护船体钢板。

Sounding pipes shall be led as straight as possible, extended above deck, and fitted with brass screw caps. The equalizing holes shall be provided at the uppermost part of the sounding pipe in tank for which shall be sounded. One (1) striking plate shall be fitted at bottom of each sounding pipe to protect the steel plate.

5.3 CO2 灭火系统 CO_2 Fire Extinguishing System

CO2灭火系统在CO2室，用于发电机舱及油漆间灭火。该系统由CO2存储瓶、释放箱、CO2释放管、喷头和CO2释放报警箱等组成。暴露在太阳下的CO2室的舱壁装有隔

热材料。

CO2 fire extinguishing system shall be located in CO2 room and serve Engine room and print room. The system is consisted of CO2 bottles、release box、CO2 release pipe、some nozzles and CO2 release alarm etc. The heat insulation material should be arranged on the wall which exposed under the sun of CO2 room.

CO2灭火系统的管子为无缝钢管。壁厚根据规范要求。CO2管根据船级社要求进行测试。CO2的操作系统的说明牌设在合适的地方。

Piping material of CO2 fire extinguishing system is seamless steel. The thickness of piping is according with the requirements of applied rules. CO2 piping shall be tested according to the requirements of the Classification Society. Instruction for manual operation of CO2 shall be displayed at suitable position.

5.4 固定局部水基灭火系统 Water-Based Local Fire-Fighting System

根据SOLAS公约Ⅱ-2/8条规定，系统主要保护在A类机器处所的高危设备和区域，本系统分为以下7个分区：

According to item Ⅱ-2/8 of SOLAS convention, the system is mainly used to protect equipment and area which set A type machine. The system is divided into 7 parts:

区域 Parts1 ： 1#主发电机组柴油机 N01 diesel of main generator set

区域 Parts 2： 2#主发电机组柴油机 N02 diesel of main generator set

区域 Parts 3： 3#主发电机组柴油机 N03 diesel of main generator set

区域 Parts 4： 4#停泊发电机组柴油机 Diesel of main generator set

区域 Parts 5： 焚烧炉 Incinerator

区域 Parts 6： 燃油分油机 HFO Separator

区域 Parts 7： 燃油锅炉燃烧器 Fuel steam boiler

该系统能手动和自动控制，不需要关闭被保护设备、撤离人员或对该处所进行封舱。

The system can be controlled manually and automatically, and no need to shutdown protected device, evacuate person or batten down the hatch.

5.5 日用淡水系统 Fresh Water System:

本船在生活水泵舱设淡水压力柜（饮用水）1 只、淡水压力柜（洗涤水）1 只、热水柜各 1 只提供全船生活水。

There are one freshwater hydrophore tank (drink water), one freshwater hydrophore tank(wash water) and one hot water hydrophore tank to serve the consumers.

淡水系统的组装式淡水压力柜，带有两个淡水泵（一用一备），淡水压力柜设用液位继电器，控制泵的自动起停。

A freshwater server system, consisting of two pumps (one operating and the other as standby) and a pressure tank shall be provided. The pump shall be started and stooped automatically controlled by the pressure of the hydrophore tank.

热水柜可有电加热和蒸汽加热，并带有热水循环泵两台。

The water will be heated by a electric and steam, hot water calorifier and continuously circulated by a circulating pump to serve the consumers.

5.6 生活污水系统 Sanitary Discharge System

本船设一台生化法生活污水处理装置，污水包括生活污水和生活灰水，使用人数为25 人。主要指厕所大小便器的冲洗水、厕所地面排水、室内的洗脸盆、洗池、洗衣机的排水、厨房洗漕及厨房地面排水以及医务室的所有排水。

A standard type sewage system, gravity type to be provided. The sewage treatment unit comply all regulatory bodied. The sewage treatment plant shall be sized for 25 persons. Discharge of waste water from wash basins, showers, sinks, wash tubs and drain from internal cuppers to be collected in sewage unit.

冲厕所排出的粪便水直接排到总管上，并连接到污水处理系统上。厕所的下水连到总管后要避免回流到别的厕所。粪便排放系统排水口安装有水密装置。

Soil drain from all water closets to be directly gathered into main line and be led to the sewage treatment system. Discharge from each water closet to be so connected to the main lines to avoid back flow from the other water closets. Scuppers of water seal type to be fitted in soil system.

生活污水排放系统的管子的材料为镀锌无缝加厚钢管。在突变的地方安装清洁塞子，生活污水管系倾斜安装及避免过多弯曲。

The material of soil piping is seamless steel with thicker thickness and galvanized inside and outside after machining. The soil piping are raked arrangement. Blind plate or cleaning plug is arranged at swerve place. The soil piping are avoided to twisty arrangement as possible.

生活污水处理装置的通气管开口安装在甲板上。管末端装有防火罩。

Air vent pipes to be provided for sewage treatment unit and led to open deck. The flame screen is arranged at the end of the pipe.

敞开甲板上每边各有一个通岸接头，可将生活污水排向岸上。

One(1) shore connection shall be provided for each side for discharging ashore on open deck.

5.7 全船疏水系统 Drain Water System at Deck

本船的上层建筑的积水通过分布在四周的排水口经排水管排至主甲板，主甲板上的积水通过设在舷墙上的栅格排至舷外。

Deposit water comes at upside buildings pass through displaced surroundings drought holes and drain water pipes to main deck, The water on main deck is draught out ship through grid on ship side wall.

5.8 全船空调及通风系统 Ventilation and Air conditioning system

5.9.1 中央空调.Center air conditioning

本船所有船员住舱、会议室、医务室、驾驶室、餐厅等处均由一套船用组装式空调

装置提供制冷采暖空调，设计参数如下：

There is a marine assembling air conditioner to provide cooling and heating air-condition to all crew rooms, meeting room, clinic, wheelhouse, dinning room, etc, the following are the main technical parameters:

	舱外空气 Outside air		舱内空气 Inside air		海水温度℃
	温度 ℃ Temperature	相对湿度% Relative humidity	温度℃ Temperature	相对湿度 % Comparatively humidity	Seawater temperature
夏季 Summer	35 70 28			50	32
冬季 Winter	-12 50		20	40	/
（厨房、驾驶室仅局部供冷热风，不作考核）Kitchen，Wheelhouse are just provided cooling and heating wind, not to be calculated into condition.					

在不需要制冷或采暖的中间季节，船用组装式空调装置的送风段可用来为以上空调舱室机械通风。用作机械通风时，应关闭所有回风管道而保证全部送新风。

During these days when cooling and heating air-condition is not needed, the sending air area could be use as ventilation to upper commendation, and back air pipes should be closed to assure every place is new air.

空调送风管采用预热圆螺旋风管，各空调舱室内均设有静压箱的顶式布器，以便按实际需要手动调节各空调舱室内的送风量和降低噪声。

Sending air pipes are warm-up circle helical windpipes. In every room, there is a top unit within static pressure box to control send air quantity and noise-reduction by manual.

5.9.2 集控室视室空调 Air condition of Control Room

本船机舱监视室另设置船用立柜式空调机一台，为水冷型。

There is a marine standing self-contained air conditioner with water-cooling,.

5.9.3 舱室通风 Ventilation：

舱室通风形式及换气次数、选用风机见下表：

The following are types of ventilation, number of air changing and their fans:

舱 室 名 称 Names of cabin	空调 Air conditionre	机械送风 Machine Supply	机械抽风 Machine Exhaust	自然通风 Natural
公共舱室 public space	10			
船员舱室 Crew Room	8			
驾驶室 Wheelhouse	定点			
卫、浴室 BATH R.			20	

舱 室 名 称 Names of cabin	空调 Air conditionre	机械送风 Machine Supply	机械抽风 Machine Exhaust	自然通风 Natural
空调机室Air Condi RM			30	√
CO_2 室 CO_2Room			10	√
厨房 Kitchen	定点 30		50	
应急消防泵舱 Emergency Fire Pump Room	10			√
油漆间 Paint Store				√
应急发电机室 E.G. Room		10		√
舵机舱 Steering Gear Room			6	√
推进机舱 Propulsion Room			6	√
更衣室、洗衣房 Wash room			20	√
医务室 Infirmary 8			10	
储物间 Store				√
蓄电池室 Battery Room				√

6 机修设备及其它 Repairing Tools And Other:

6.1 机修设备 Repairing Tools:

机修间内设有一个钢质钳桌，一只台钳，一个工具柜,一台钻床和一台电动砂轮机。大型的泵轴或阀杆，大泵的叶轮可在机修间修理。喷油嘴试验泵设在工作间内。

There are one table、one table-vice、one tool cabinet、one drill press and electric grinder. Pump shafts、valve stocks、impellers could be repaired. Nuzzle test pumps will be located.

6.2 起重机 cranes:

主机用 for main diesel

数量number： 3

型式type： 单轨、手动小车、手拉葫芦起升装置

single truck, manual trolley, manual lifting equipment

一手动移动轨道小车，和一台手拉葫芦，安装在起升工字梁上。

There are one manual movable truck trolley and a manual stalled at lifting beams.

机舱里重量超过100kg的其他机械的检修必要时也装有吊梁吊环或其他设备。根据有关机械设备的重量确定相应起重设备安全工作负荷并加注明。

Elevator-link or other equipments, if necessary, should be installed in engine room when the machine weight is over 100kg and instructed safe work load.

6.3 备件 Spares

备件根据各设备技术、供货协议提供，由造船厂提供并安装在船上。

Spare parts for all machinery and equipment will be furnished by Builder in accordance with the Class Rules and the manufacture's recommendation.

使用的箱子是钢板制造的或木制的，备件项目单在箱子里面。

Spares List will store in the steel or wood boxes where spares store.

6.4 铭牌 Name Plates

对于机器名称、应急警告及阀件手轮等铭牌用中英文书写。数量按照相应管系图中的数量。

The nameplates with names of machines、emergency warning and valve handwheels and so on should be written by Chinese and English. The number of them see on the drawing.

铭牌用黄铜板或铝板制成，并用铆钉或螺钉固定。

The nameplates will be made form brass and screw down on supporting plates and made of copper. The marks will be marked by.

7 花甲板、网板和梯子 Floor, Gratings and Ladders

7.1 概要 General

根据建造厂标准设花甲板、网板和梯子，便于操作或使用机器设备。

Platforms, gratings and ladders shall be provided for operation of and access to the machinery and equipment in accordance with the Builder's standards.

花甲板、栏杆和扶手的结构和材料根据制造厂标准。

The construction and material of platforms, gratings and handrails are fitted on the according to the manufacturer's standards.

7.2 机舱花甲板，机座和网板 Engine Room Floor, Platforms and Gratings

机舱的花甲板设在主机周围和通到其他机器设备的走道上。机舱花甲板、网板和机座用钢板制造，并角钢架支撑。机舱花甲板在阀、滤器和人孔的部分要能够移动。当用钢板会影响视线或通风时用网板。

The engine room floor shall be laid around the main engine and on the walkway to other machinery and equipment. The engine room floor, gratings and operating platforms shall be of checkered steel plate, and supported by the steel angle frames. The engine room floor shall be movable at the area for access to valves, strainers and manholes. Open gratings shall be used in general where floor plates would interfere with visibility and ventilation.

7.3 梯子 Ladders

机舱的梯子尽量要从船头向船尾的方向布置。梯子坡度不超过60°，宽不少于600㎜。

Engine room ladders shall be provided at each platform deck in engine room, and shall be arranged in fore and aft direction as far as practicable. The slope shall not exceed 60°, and the width shall be not less than 600 mm.

主入口楼梯为防滑的花铁板，边上有扶手支撑，为了保护机器或人员不受尘土的污染，在需要的地方设挡尘板。

Main access ladder shall be of steel construction with non-slip steps and handrails supported by stanchions, and shall be fitted with back plate (dust pan) where required for protection of equipment or personnel from dirt.

7.4 扶手护栏 Handrails

为了必要的安全,在平台、网板和机器周围安装有扶护栏。

Handrails shall be fitted at the platforms, gratings and the area around the machinery where they are indispensable for the safety.

在机器检修和搬运东西的地方，护栏应该是可移动的。

Handrails shall be portable in where heed machinery overhauling or transporting the heavy spare parts.

8 轮机工具和配件 Engineer’s Tools and Outfitting

在船上的轮机工具和配件应当根据制造商标准提供。

Engineer’s tools and outfitting shall be furnished on board in accordance with Builder’s standard.