



			船名 SHIP	24m 供油船 24m FUEL SUPPLY SHIP	技术设计 TECHNICAL DESIGN
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1、总则 General

本船为艉机双推进装置钢质单壳双底燃油供给船,动力装置按新加坡沿海 30 海里及船东要求设计。主要供给柴油或燃料油。轮机部分按闪点>60℃设计。

The vessel is to be a steel Single hull Double bottom fuel supply tanker with stern-drive type and double- propelling plant. The power plant is to be designed in according with the requirements of the ports within 30 sea miles to the coastal waters of Singapore and the ship owner's demand. This vessel supply diesel oil and fuel oil whose flash point >60 °C.

本船续航力 588 n mile (60h), 服务航速 9.8Kn。

The vessel's endurance is 588 n mile and service speed is 9.8 Kn.

本船总吨为: 210。

The gross tonnage of this vessel is 210.

本船轮机部分的设计满足下列规范和法规的要求:

1. 中国船级社《钢质海船入级规范》(2012);
2. 新加坡《商船法》非公约规定
3. 新加坡港务当局(MPA)对港口加油船标准的规定
4. 《国际消防安全系统规则》

1. Rules and Regulations for the Classification of Sea-going Steel ships' issued by China Classification Society in 2012

2. Singapore 《merchant shipping act》(Non convention ship)

3. Standards for port limit bunker tankers, Maritime and Port Authority of Singapore

4. International fire fighting safety system regulations

主机采用 NT855-M 型船用中速柴油机 (261 kW, 1800 r/min) 2 台 (重庆康明斯发动机有限公司)。

The main engine to be marine medium speed diesel engine of NT855-M type (261 kW, 1800 r/min) 2 sets (CCEC Engine CO., LTD.)

驾驶室控制台实现对推进装置的操作, 机器处所有人值班。

Wheelhouse control console may control the propulsion device and engine space is to be watched by people.

驾驶室控制台上设置主机组遥控操纵装置 1 套, 驾驶员在驾驶室可直接使用操纵装置对主机进行调速和减速齿轮箱换向 (正、倒车) 的遥控操作。系主机组遥控操纵装置驾驶室控

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制。

To be provided one set of M/E remote control unit on wheelhouse control console so as to carry out speed adjustment of M/E and reversing of reduction gearbox (ahead and astern) in wheelhouse.

在紧急情况时可在机旁直接操纵主机和齿轮箱。

驾驶室设有主机的滑油压力低、滑油压力过低、高压燃油管泄漏、滑油进机温度高、涡轮增压器滑油进口压力低、淡水进机温度高、柴油机超速等主要报警项目和齿轮箱滑油低压、滑油高温等主要报警项目。

The main engine and the gearbox may be controlled directly beside the engine under emergency conditions.

In the wheel house install: main engine lubricating oil low pressure alarm, high-pressure fuel pipe leak alarm, lubricating oil intake high temperature alarm, turbocharger lubricating oil intake low pressure alarm, fresh water intake high temperature alarm, diesel engine over speed alarm and gearbox lubricating oil low pressure alarm, lubricating oil high temperature alarm.

主柴油机设置超速停车报警，驾驶室集控台显示。

主机采用电动马达启动。

主机湿式油底壳，采用闭式压力润滑并设有巡回检测报警装置和安全保护装置。

驾驶室设电话机 1 部，可与机舱直接电话相联系。

Main diesel engine shall install stop alarm for over speed and indicated on WHC

The main engine starting shall use electric motor.

The main engine is wet crankcase sump with pressure lubrication of closed type and equipped with data logging device and safety devices.

To be equipped one set of telephone in the wheelhouse to connect with the engine room.

本船电站由 3 台发电机组组成。3 台柴油机驱动 32kW 发电机组。船舶航行使用一台 32kW 发电机组，另两台 32kW 发电机组可作为备用。

本船设：污油水柜和生活污水处理装置，另设置污油水手摇泵作为靠岸排放工具。

The power plant shall be consisted of 3 sets of 32kW generator which driven by 2 sets of diesel engine. Two set supply power for ship another is spare.

To be installed slop hand tank and Sewage treatment unit. One set of dirty oil hand pump is also to be installed as discharge tool in shore.

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本船设置水消防灭火系统，对机舱、上甲板及全船各层进行水灭火。

机舱设置手提二氧化碳灭火器(5kg) 2 只、泡沫灭火器(9L) 2 只。

To be provided water fire extinguishing system for the E/M, upper deck and each deck.

To be equipped with 2 sets of portable carbon dioxide fire extinguisher (5kg) and 2 sets of foam fire extinguisher (9L).

2、机舱布置 Engine room arrangement

2.1 机舱布置 Engine room arrangement

本船为艉机型供油船，机舱位于#2—#13 肋位间，机舱总长度为 6.6m。

机舱设一层花钢板平台，距基线 1150mm。

The vessel is a stern-drive type fuel supply tanker. The E/R is to be arranged at # 2 ~ # 13 and length overall of E/R is 6.6 m.

To be installed a checker plate platform in engine room above the baseline 1150mm.

2.2 主机布置 M/E arrangement

主机水平布置，位于#6—#10 肋位之间，轴线距基线 850mm，左、右舷主机距船舳 2750mm。

主机前端上侧设置主机滑油低压、冷却水高温等仪表和辅报警装置（箱）及备用车钟等。

The M/E shall be installed in # 6 ~ # 10 horizontally. The shaft line from B.L 850mm and P/S from amidships 2750mm.

To be equipped with the instrument and auxiliary alarm unit (box) for M/E lubricating oil low pressure, cooling water high temperature and spare bell on the top side of the M/E front-end.

2.3 付机布置 A/E arrangement

3 台柴油发电机组置于机舱#7—#11 肋位间左、右舷距舳 850mm 对称布置。

Three sets of diesel generating set shall be symmetrically (P/S) installed in #7-#11 from amidships 850mm.

2.4 主要机械设备布置 Main machine equipment arrangement

机舱主要机械设备布置，详见机舱布置图(WUT543A-400-02)。

The specific arrangement please refers to the 'Engine room arrangement (WUT543A-400-02)' in detail.

3、轴系 Shafting

本船为双机双桨推进，单推进轴系由一根艉轴、短轴和轴系附件组成，轴系中心线距基线高度为 850mm，主机距船舳 2750mm。艉轴基本轴径为 $\Phi 120\text{mm}$ ，艉轴承采用水冷却型式，

艉管前端设密封装置。

The ship is to be driven by twin engine and twin screws. Single-shaft shall be consisted of stern shaft, minor axis and the shafting accessory. Shafting centerline from the baseline is 850mm, the main engine from center-plane to be 2750mm. The basic diameter of stern shaft is $\Phi 120$ mm. The stern bearing shall use water cooling and the front-end of stern tube shall install sealing arrangement.

螺旋桨与艉轴采用平键连接。

轴系拆卸时，螺旋桨轴从船尾抽出。

螺旋桨轴和短轴均采用优质 35# 优质钢制而成。力学性能和化学成份应分别符合《规范》要求。

艉管轴承座部分采用 ZG200-450 铸钢件，与船体艉柱之间采用环氧树脂浇注。

Propeller connected to the tail shaft by flat key.

The propeller shaft may be removed from the stern.

The propeller shaft and minor axis shall be made of 35 # high-quality steel. Mechanical properties and chemical composition shall conform to the requirements of "Rules".

The stern tube bearing is ZG200-450 steel casting and connect to the stern post use epoxy resin.

4、动力管系 Power system

4.1 燃油管系 Fuel system

本系统设有柴油输送泵 1 台、柴油输送手摇泵 1 只、柴油舱二只、柴油日用柜二只。

主、付机正常工作时由各机带柴油供给泵从柴油日用柜吸油供给主机、付机。柴油舱设有单独的注入管。

柴油输送泵和柴油输送手摇泵从柴油舱向柴油日用柜驳油。

柴油舱，柴油日用柜的柴油出口设快关阀，以备万一机舱内发生火警时可在机舱外快速切断柴油。

This system is to be equipped with one set of diesel transfer pump and one set of diesel transfer hand pump and two diesel tanks and two daily diesel tanks.

The M/E and A/E shall be fed by the diesel oil from daily diesel tanks through the supply pump when the M/E and A/E are working. The diesel tanks shall have separate filling pipe.

Diesel is to be transported from diesel tank to diesel daily tank by diesel transfer pump and

diesel transfer hand pump.

Quick closing valve shall be provided for the exit of diesel tank and daily diesel tank. It may be emergency closed outside the E.R. when fire is happened in engine room.

4.2 滑油管系 Lubricating oil system

本船主、机均采用湿式油底壳自循环系统。

主机滑油系统采用压力润滑方式，由机带滑油泵从油底壳吸油，经滑油冷却器进主机润滑各部件。付机也相同。

齿轮箱工作时由机带泵对其进行滑油润滑。

主、付机滑油系统补充油采用人工补充方式。

The lubricating oil system of M/E and A/E shall be wet oil sump self-circulating system.

The lubricating oil system of M/E shall use pressure lubrication. The lubricating oil pump shall suck lubricating oil from oil sump into M/E through lubricating-oil filter. A/E is same as M/E.

Gearbox shall be lubricated by lubricating oil through the oil lubrication pump that matched with it.

The lubricating oil system of M/E and A/E shall use manual supplement.

4.3 冷却水系统 Cooling water system

主机采用闭式水冷却方式。

海水系统中，机舱左、右舷各设一只海底阀箱，相应的装有闸阀、吸入粗水过滤器和闸阀，再由海水总管相连。主机冷却海水泵从海水总管中吸水，经主机中冷器、滑油冷却器、淡水冷却器（自带淡水箱）至出水总管后排出舷外。主机淡水由机带的淡水泵将淡水冷却器中经海水冷却的淡水压入机内，供机内冷却后进行下次循环。

Main engine shall use closed water cooling system.

In sea water system, suction box shall be installed in the port and starboard with gate valve and suction water filter and to be connected by the sea water pipe. The main engine cooling sea water pump suck from the sea water pipe through intercooler, lubricating-oil filter, fresh water cooler (with fresh water tank) to the water exit pipe then discharge the overboard. The fresh water of main engine shall be sucked into engine by fresh water pump from the fresh water cooler which has been cooled by sea water. It may carry out the next circulation after cooling.

齿轮箱冷却海水由主机冷却海水泵供水。

付机为闭式冷却系统，海、淡水冷却均由自带泵承担工作，海水泵还供离合器冷却用水。

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付机淡水由机带的淡水泵将淡水冷却器中经海水冷却的淡水泵送至滑油冷却器后压入机内，供机内冷却后进行下次循环。

Cooling sea water of gearbox may be fed by the main engine cooling sea water pump.

A/E shall use closed water cooling system. The cooling of sea water and fresh water shall be carried out by the pump that matched with A/E. Sea water pump is also supply cooling water to the clutch. The fresh water of A/E shall be sucked into lubricating-oil filter by fresh water pump from the fresh water cooler which has been cooled by sea water then into engine. It may carry out the next circulation after cooling.

4.4 排气系统 Exhaust system

主机、付机的排气管各自通过膨胀接头、消音器和排气管排至大气，排气管汇于驾驶甲板上的烟囱内，外层作绝热包扎，绝热材料表层温度不得超过 60℃。烟囱外设防火星金属网罩。

The off-gas of M/E and A/E shall be discharged through expansion compensator and silencer and exhaust pipe. The exhaust pipe shall collect in the funnel on navigation deck. The external layer shall be heat insulation packed and surface temperature shall not be more than 60℃. Spark-proof metal net shall be installed outside the funnel.

4.5 机泵舱通风 Engine/pump room ventilation system

本船机舱采用机械送风方式。

在上甲板上设 2 台轴流式机舱通风机，风机总容量可满足机舱换气的需要。

风管布置以满足主、付机工作充足的气源和达到机舱换气顺利和充分的原则。

驾驶室下两侧设置机舱透气百叶窗。

The Engine room shall use machinery ventilation.

To be installed 2 set of axial engine room fan on upper deck. The total capacity may meet the demand of engine room ventilation.

The arrangement of wind pipe shall meet the requirements of obtaining enough air and successful and sufficient ventilation for M/E and the A/E.

Under the wheel house on both sides set engine room ventilation shutters

5、船舶系统 Hull system

5.1 舱底水系统 Bilge water system

本船按规范要求设 2 台自吸式总用泵。

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机舱舱底水不应直接排至舷外，但在应急状态下可由上述泵直接排至舷外。

机舱内设 1 只污油水柜。污油水柜收集机舱油污水和油渣，靠岸时由污油手摇泵排至港口接收设备。

According to the code for the ship provide 2 Set Self- Priming General Pump.

The bilge water in the E/M should not discharge into the over-side directly except in the case of emergency.

To be installed one set of dirty oil tank in the engine room. The oil residue tank shall collect oily water and discharge it into the reception facilities by hand pump when ship arrive the dock.

5.2 生活污水处理系统 Sewage treatment system

本船卫生间便器黑水和浴室及厕所冲洗污水，盥洗水分别排至 WCMBR6 船用生活污水处理装置，经生化方法处理后，符合标准的水排舷外，固体渣泥经过粉碎后在非防污染管制海区直接排出舷外或定期向岸上排放。污泥的排放一般为每三个月一次。

粪便黑水管采用较厚无缝钢管加工后镀锌。

污水处理装置透气管应升至开敞甲板以上一定高度，末端并设置防火网。

在开敞甲板左舷设 1 只生活污水国际标准排放接头。

The black water of toilet and flushing sewage of bathroom shall charge into marine sewage processing plant of WCMBR6 type. If it is up to standard after treated by biologic-chemistry method, it may be discharged. Solid sludge may be discharged after crashed by crash pump within the non-antipollution area or discharge into shore regularly. Sludge discharging is about once every three months.

The black water pipe is to be thicker seamless steel tube and galvanized.

The vent pipe of sewage processing plant shall up to certain height above open deck. The tail end of vent pipe shall install flame screen.

To be installed 1 set of sewage international standard discharge connection on open deck (port).

5.3 全船消防系统 Fire system

本船消防系统包括水消防系统。

The vessel is to be equipped with the water fire extinguishing system.

5.3.1 水消防系统 Water fire extinguishing system

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本船机舱内设 2 台独立动力驱动的总用泵。

水灭火系统主要用于机舱和全船消防，机舱设置一只 DN50 消火栓。上甲板消防水在上层建筑左右侧均设置消防栓。消防水均由上述泵供给。

水灭火管路连接洗舱水管路，提供货油舱洗舱用水。

The vessel is to be equipped with one set of independent driven general service pump.

The fire extinguishing system is mainly used for the engine room and whole ship. To be installed one set of DN50 hydrant in engine room. Deck fire water in the superstructure of left right side are set fire hydrant. Fire water is supplied by the pump that mentioned above.

The water fire-extinguishing piping connected to the tank washings piping to provide washing water for cargo oil tank.

5.4 全船疏排水系统 Drain system

各层甲板在合适地方设甲板漏水口，居住甲板以上各层甲板漏水管逐层下排至上甲板层，然后通过疏水口直接排至舷外。

厨房、卫生间的地面排水及面盆、洗池疏水均汇入总管，由舷侧防浪阀直接排至舷外。厕所地面排水和便器的排水均引至污水总管，然后引入生活污水处理装置，经处理后排至舷外。

货舱区域甲板面上的甲板漏水口需配置木塞。

Each deck shall install scupper in suitable position. Draining pipe of each deck above the accommodation deck connects to the upper deck and discharge the water into the outside directly.

The waste water from the ground of galley and toilet as well as the basin and washing pool shall discharge into general pipe then discharge it into the outside by the storm valve directly.

The toilet drainage shall discharge into the sewage general pipe then flow into the sewage treatment plant. It shall be discharged into the outside after treating.

The wood stopper shall be provided for the deck scuppers within the cargo tank area.

5.5 全船生活水系统 Live water system

日用淡水系统由在机舱内的日用淡水泵直接从淡水舱抽吸淡水泵入生活处所水龙头。

Fresh water may be transported from fresh water tank to life space faucet.

5.6 空气、测深、注入管 Air, measurement, injection system

所有舱柜，空舱除有液位计的油、水舱柜外，均设有测深管，测深管引至舱底，在下端开口的船底板上焊有防击板，终端在舱内的设测深自闭阀，其它均引至开敞甲板，并设螺纹盖。

All cabinets, void tanks except the oil and water tank that have liquid-meter shall install sounding pipe. The sounding pipe shall extend to the bottom. The anti-strike plate shall be welded on the opening bottom plating. If the endpoint located in the cabin then shall install self-closing valves. The other shall extend to the open deck and install thread cap.

每一淡水舱均设有注水管，注入头位于上甲板，每舱各一只；各柴油舱分别设注入管，注入头分别设在上甲板左、右舷；滑油柜也设有注入管，注入头设在上甲板。

所有油水舱柜、空舱均设有透气管，海底门的透气管也均引至救生甲板，干舷甲板以上空气管的高度满足《规范》要求。油舱柜透气管终端设金属防火网。

One set of flooding duct shall be provided for each fresh water tank and the injector locate on the upper deck. Flooding duct shall be provided for each diesel oil tank and the injector install in the port and starboard on upper deck. Flooding duct is also to be provided for the L.O tank and the injector locate on the upper deck.

Vent pipe shall be provided for all oil and water tanks, void tanks and sea bottom gate. The vent pipe shall extend to the life-saving deck. The height of vent pipe on freeboard deck shall meet the requirements of Rules. Gauze diaphragm shall be installed in the endpoint of vent pipe in oil tank.

6、油船系统 Oil tanker systems

6.1 货油系统 Cargo oil system

本船设 2 台货油泵，由货油泵实现货油装卸。每台货油泵均可以驳运闪点 60℃ 以上的成品油。每一货油舱设有液位测量装置。

货油系统在货油舱内设货油总管，货油舱左、右每一分舱内分别设一只吸口，上甲板也设货油总管。油船向受油船舶输送货油时，货油经吸口、闸阀和滤器后由货油泵吸入，再经上甲板货油管与受油船舶油管连接驳入油舱。

The vessel is to be equipped with two set of cargo oil pump for the cargo oil loading and unloading. Each cargo oil pump can transport the product oil of which flash point more than

60°C. Each cargo tank is to be equipped with liquid level measuring device.

To be installed cargo oil general pipe in cargo oil tank. To be installed one set of suction in each cargo oil tank at port and starboard. The upper deck is also install cargo oil general pipe .Cargo oil is to be sucked by cargo oil pump through the suction, gate valve and filter then flow into other ship's oil tank through cargo oil pipe on upper deck.

岸上输油管接船上货油接头，经货油总管选择打开各舱阀门，由货油管加入货油。

上甲板设 1 只（船中）装卸接头。

为防止船舶变形而引起管子破坏，本船货油舱内和上甲板货油总管上适当位置均作管路减胀弯曲安装。

货油泵可在机舱操纵，也可在驾控台内的货油泵控制板操纵，由手动按钮来实现离合器的离合，进而控制货油泵的工作。为防止货油泵出口管压力过高，货油泵上设有安全阀。

Ship's cargo oil adapter shall connect to the shore oil delivery pipe. The cargo oil shall inject into oil tank through cargo oil pipe after each tank's valve is opened by cargo oil general pipe.

Four sets of handling adapter shall be arranged on the upper deck (two port and two starboard).

To prevent tube damage caused by ship's deformation, the pipe shall use U type installation (reduction inflation bending installation) on the suitable position of cargo oil general pipe in cargo oil tank and upper deck.

Cargo pumps shall be controlled in the engine room as well as by the cargo oil pumps control board in the WHC through manual button to control the clutch. To prevent the high export pressure of cargo pumps, cargo oil pump is equipped with safety valve.

6.2 排油监控及油水界面 Oil drainage monitoring and oil water interface

本船免去置排油监控和油水界面仪，但应符合如下要求。

- 1、本船所有油性混合物留存船上，而后排至污油接收设备（港口接收设备或污油回收船等）。
- 2、本船停靠的港口或污油回收船等应有足够的接收设备。
- 3、证书上注明本船仅限于在规定的航区航行。
- 4.本船油性混合物排入接收设备的数量、时间和港口应记入油类记录簿。

5、本船单程航行时间不超过 72 小时。

The oil drainage monitoring and oil water interface meter may not be provided for this ship, but should meet the following requirements:

1、 The oily mixtures shall keep in the ship then discharge into the waste oil reception facilities (port reception facilities or waste oil recovery vessels, etc.).

2、 The port or waste oil recovery vessels should have adequate reception facilities.

3、 Certificate shall indicate the ship's navigation area.

4、 The number, time, and the port of oily mixture discharge into the receiving device should be credited to the record.

5、 One-way sailing time of this ship shall not be more than 72 hours.

6.3 货油舱透气 Cargo oil tank venting system

货油舱透气是一个独立的透气系统。每个货油舱都设透气支管。透气支管接透气总管，透气总管装设重力式呼吸阀，呼吸阀能保证货油舱内的压力与真空不会超过货油舱设计要求。并足以使在任何情况下，由于液货舱内温度变化所产生的少量蒸汽、空气流经压力/真空阀由设在艉楼甲板上的防火型透气管头排出。

The cargo oil tank venting system is an independent ventilation system. Each cargo oil tank shall equip with ventilation branch that connect to the venting general pipe. The venting general pipe shall install gravity breather valve to ensure the pressure and vacuum in cargo oil tanks shall not exceed the design requirements. In any ease, a small quantity of steam and air course generated by temperature fluctuation in the cargo tank shall be discharged by fire proof vent pipe that installed in poop deck through the pressure / vacuum valve.