



# 技术协议书

## TECHNICAL AGREEMENT

船 号: DN647-1/2/3  
HULL NO.

船 名: 75米平台供应船(柴油电动, 带电池混合动力)  
SHIP NAME: 75M PLATFORM SUPPLY VESSEL(Diesel-Electric with battery hybrid)

船级社+入级标志: ABS  
CLASS+NOTATION: ABS +A1 (E) Offshore Supply Vessel (Supply-HNLS, FFV1, OSR-C2) +AMS, +ACCU,+DPS-2, SPS, IP, RW, HDC(7.5 T/M2, MAIN DECK), UWILD, BWT, ENVIRO, HAB(WB), HYBRID (LEE, PMT, PBU), CR, +IHM -S

挂 旗(船籍) FLAG (REGISTRY): Qatar

项 目 (SUBJECT): 泥浆搅拌机  
AGITATOR

型 号 (MODEL): 见协议

制造厂/制造国: FLYGT  
MANUFACTURE/COUNTRY:

代 理 商(AGENCY): 海陆(香港)通用设备工程有限公司

数 量 (QUANTITY): 见协议正文 (套/船 SET/SHIP)

买方 BUYER: 福建东南造船有限公司  
Fujian Southeast Shipbuilding Co.,Ltd

联系人 C.P. : 夏槐良

电话 TEL : 13055299065

邮箱 E-MAIL: design@maweiship.com

卖方 SELLER: 海陆(香港)通用设备工程有限公司

联系人 C.P. : 张建森

电话 TEL : 13651897898

邮箱 E-MAIL: fj.sales@sea-land.com.cn

签字: 冯亮 2015.5.18

Sign by:

审核: 林培培 2015.5.28

Checked by 吴春良 2015.5.28

批准:

Approved by 吴春良 2015.5.29

签字:

Sign by: 张建森



## 1. 概述 GENERAL

- 1) 设备和材料应符合船舶建造合同签订时生效的 ABS 船级社规范和 Qatar 挂旗国当局要求, 包括其附录及修正案。

Equipment and material shall comply with the newest rules and regulations of classification society ABS and flag state of Qatar including annexes and amendments at the time when the vessel building contract is executed.

- 2) 车间交付测试前 30 天, 卖方应通知买方和船东参加测试并提交相关的检验或测试项目。

30 days prior to shop delivery test for the equipment, SELLER should inform BUYER and owner to attend the test and at the same time submit the inspection/test items information to them.

- 3) 本协议在设备订货合同生效时同时生效。

This agreement shall become effective on the date when the contract has been duly executed.

- 4) 制造厂商应保证设备符合买方的确认图纸 (包括修改注解)。加工过程中若有必须的修改, 制造厂商应立即联系并获得买方同意, 并且提交修改标记和注解说明。

The manufacture shall guarantee that the equipment they supplied shall comply with the working drawing (including modified according to comments). In case any modification is necessary during the process of manufacture the manufacture shall immediately contact and obtain confirmation from the buyer and send the buyer the marking of modifications and the explanations.

- 5) 所有买方认可的修正, 卖方应在认可注解和认可工作图的封面上做说明, 并且应有明确标识。重要性能的更改应由买方认可。

All revisions agreed by the buyer shall be noted on front cover of the confirmation and working drawing by the seller, and shall be marked clearly in these drawings. The revision on important performance shall be agreed by the buyer.

- 6) 制造厂商应在 5 天内, 确认买方的认可注解或解释自己的未认可原因。

Makers shall give reply about buyer's confirmation comments or give explanation for failure of it within 5 days.

- 7) 完工图应与提供的设备相符。尽可能的使用能长期保存的印刷图纸。

The finished drawing is to coincide with the provided equipment. For long-term conservation printed drawing to be used as far as possible.

- 8) 每套设备应在明显的位置装有铭牌, 包括设备名称, 型号和制造商等等。设备及其控制箱互为备用的, 厂家制作铭牌时应标明 1 号、2 号, 加以区分;

Each set of equipment is to be fitted with a nameplate in notable place with equipment name, model code and the maker's name, etc. Equipment and control boxes which are standby for each other should be marked number one, number two on nameplates for distinguishing.

- 9) 设备的维护, 在交付前由制造商承担。

Maintenance is to be done by the maker before delivery of equipment.

- 10) 所有设备如有必要应提供特殊的安装工具等, 特殊工具应满足大修及安装需要。



Special installation tools etc. should be delivered if necessary. All Special tools necessary for overhauling and assembling of any of the equipment and machinery on board of the ship (as per Makers standard) to be delivered on board of the ship.

- 11) 厂家必须及时提供设计师和船厂要求的设备相关图纸或相关技术文件。如可行，应尽可能将设备的外形尺寸和重量附在本协议中。

The maker must submit the drawings and/or document as required by designer and shipyard in time. The outline drawing and weight of the equipment to be attached to this agreement as far as possible.

- 12) 所有备件及工具(包括所有设备在船上修理和拆装的特殊工具)应该按规范要求及制造厂标准提供。特殊型式泵浦需有机械轴封、轴心与轮叶等备品。

Spare parts and tools (including all Special tools necessary for overhauling and assembling of any of the equipment and machinery on board.) for all machinery and equipment to be furnished in accordance with the requirements and recommendations of Class and maker's standard and attached the list in this agreement. The spare parts for special type pumps should including mechanical shaft seals, impellers, shafts and so on.

- 13) 主要机械设备按厂家的专门品牌。应急和报警设备的颜色为：Munsell code 5R4/13(红色)。电气设备内部颜色以厂家标准颜色为准。特殊设备，如航行设备、无线电设备、内部通信设备等，以厂家标准颜色为准。

To follow the maker trademark color for all major machinery. The emergency and alarm device with Munsell code 5R4/13 (Red) Interior metal surfaces of electric equipment should be painted with manufacturer's standard colors. The special equipment, such as nautical equipment, radio equipment, inter communication equipment etc. should be painted with manufacturer's standard colors.

- 14) 厂家须提供设备无石棉证书或声明书,满足规范要求。证书或盖公章声明书原件随认可图发船厂。

Supplier should supply the asbestos free Certificate or the asbestos free statement for the equipment to fill the class rules. And the certificate or the sign official sealed original statement should be submitted to shipyard with approval drawing.

- 15) 厂家需根据“国际安全与环境无害化拆船公约”的要求，填写并提供“供应商的一致性声明表格--(S Doc)”和材料声明表格--(MD)。该声明表格随认可图发船厂。

The seller must fill and provide" Supplier Declaration of Conformity form-- (S Doc) and "Material Declaration form—(MD)"according to International Convention for the Safe And Environmentally Sound Recycling of Ships. Supply the declaration form with approval drawings.

- 16) 所有设备须列出主要部件的型号和厂家(品牌)。

The main components of all equipment should list the type and maker (brand).

- 17) 所有设备的管子进、出口连接位置须便于船厂外部接管，且设备本体管子固定整齐。

All equipment pipes inlet/outlet position should be arranged convenient for yard piping connecting, and pipes attached on equipment to be fixed properly.

- 18) 所有设备电缆填料函进线位置须便于船厂外部接线，且设备本体电缆用扁铁或托架固定整齐。



All equipment cable glands inlet position should be arranged convenient for yard.

Cables connecting, and the cables attached on equipment to be fixed properly by cable tray or flat bar.

19) 厂家应保证设备送审的所有 ABS 船级社退审意见要关闭。

Vendor must take responsibility for closing all the ABS Classification society comments which drawings are submitted by the vendor.

20) 本技术协议采用中英文对照形式，若两者有矛盾，须以英文为准。

This agreement is written in Chinese and English languages, and it must be according to English language if contradictions occur.

## 2. 基本技术参数 Basic technical specification

1) 如无另外说明，设备须满足以下工作环境：

If not otherwise stated, the design and the equipment and machinery to be installed and operated in accordance with following ambient conditions:

● 环境温度(遵照 IACS UR-M2 及规格书要求) Ambient temperature(Comply with IACS UR-M2 and the technical specification):

封闭处所 In enclosed spaces: 0°C~+50°C  
露天甲板 On the open deck: -25°C~+50°C

● 机械处所 Machinery spaces temperature: 50°C  
● 相对湿度 Relative Humidity: 0~100%  
● 海水温度 Sea water temperature: 15°C~36°C  
● 淡水温度 Fresh water temperature: 0°C~38°C

运营工作条件 Operational working conditions

● 大气压力 Barometric pressure: 0.1 Mpa  
● 风速 Wind velocity: 18 m/sec (35 knots) approx.  
● 有效波高 Significant Wave Height: 2.5 m (8.2ft) approx.  
● 海水流速 Current Velocity: 1.0 m/sec (2 knots) approx.  
● 波浪周期 Wave Period: 10 sec approx.

2) 证书要求(所有证书应提供 1 正 2 副):

Certificates required (all certificates to be delivered in 1 original and 2 copies):

厂家需提供满足法规、挂旗国及船级社要求的相关证书，包括但不限于以下：

**Maker should provide relevant certifications of regular, administrator and Class required, including but not limited to below certifications.**

(□: 不包括 excluded; ■: 包括 included; ○: 可选项 option)

挂旗当局证书

Administrator Certificate

ABS 产品证书

ABS Product Certificate

ABS 图纸认可

ABS Plan Review



<u>ABS 型式认可证书</u>	<input type="checkbox"/>
ABS TA Certificate	
<u>工厂证书</u>	<input checked="" type="checkbox"/>
Manufacture Certificate	
<u>MED 型式认可证书</u>	<input type="checkbox"/>
MED TA Certificate	
<u>SDoc 及 MD 声明文件</u>	<input checked="" type="checkbox"/>
SDoc & MD Declaration Document	
网络安全证书 (遵照 IACS UR E26/27 要求)	<input type="checkbox"/>
Network Security Certificate	

(In accordance with IACS UR E26/27 requirements)

- 3) 标准 Standard: 本船设计建造应遵照 ISO/GB/CB/CBM/DIN/JIS 等相关行业标准。本船的建造质量应符合《中国造船质量标准 CSQS》及经船东认可的建造方标准或惯例。建造方的质量管理体系、环境保护体系等应符合相关标准, 并经专门机构认证。当规范、规则、标准和公约的要求和规格书的要求矛盾时, 除非规格书的要求高于规范、规则、标准和公约的要求, 否则应优先考虑规范、规则、标准和公约的要求。The vessel should be designed and constructed in accordance with ISO, GB, CB, CBM, DIN, JIS and other relevant industry standards. The vessel should be built in accordance with China Shipbuilding Quality Standard CSQS and Builder's standards or practices approved by the owner. The quality management system and environmental protection system of builder shall conform to relevant standards and be certified by specialized organizations. Where the requirements of rules, regulations, standards and conventions are in conflict with technical specifications, priority shall be given to the requirements of rules, regulations, standards and conventions unless the requirements of technical specifications are superior to those of rules, regulations, standards and conventions.
- 4) 尺寸单位: 公制单位  
Measuring unit: Metric system
- 5) 铭牌/操作说明牌 Nameplate/instruction plate:  
本全船各舱室、所有设备、电气控制箱、各阀门和附属设施等, 均用中英文或英文做成黄铜质或不锈钢铭牌。  
All cabins, equipment, electrical control boxes, valves and auxiliary facilities of ship are to be provided with brass or stainless nameplates in Chinese/English or English.
- 6) 电制 Power source: AC: 690V/415V / 220V 50 Hz; DC: 24V
- 7) 厂家需提供设备管路接口配对法兰或接头。若无特殊说明, 法兰标准 GB/CB/DIN。  
All the counter flanges or counter connections should be supplied by maker, if no other special note, flange should be according to GB/CB/DIN standards.
- 8) 所有热工仪表的精度应不低于 1.5 级, 并且在最大额定工作位置需用红线标记。使用在压力容器上的热工仪表需有法定检验机构签发的检验证书。所有泵进出口提供压力表/真空压力表。所有压力表都要配考克, 温度计要有保护罩;  
The tolerance on thermal instruments shall be within the accuracy of 1.5%. The



maximum rated parameter on instruments shall be marked with a red line. All thermal instruments used on pressure vessels should with inspection certificates issued by statutory inspection organs. All pump need Provide the pressure gauge and vacuum pressure gauge All pressure gauge should be with cock, thermometer should be with safeguard.

- 9) 规格书中提到的不锈钢材料均为 316 不锈钢，露天甲板处法兰连接螺栓采用不锈钢材料 316。

The stainless steel materials mentioned in the specification are stainless steel 316, and the flanges connecting bolts at the open deck are stainless steel 316.

- 10) 所有泵进出口提供压力表/真空压力表

All pumps need to be provided with pressure gauge and vacuum pressure gauge at outlet and inlet.

- 11) 设备本体上的传感器由厂家接至统一的接线盒或控制箱内，设备本体上由厂家预装好合适的电缆固定件如扁铁或托架；

Junction boxes to be supplied and mounted on sets for all sensors on sets if any. And cable trays or flat bar to be installed on sets for secured yard's cables connection

散供的传感器由厂家配合合适的填料函（钢质或铜质），填料函大小认可图阶段确认；

Loose supplied sensors should be provided with proper cable glands, the glands material should be steel or brass, the size of glands to be confirmed by shipyard.

控制箱内部接线需有明确标识。

Inner connection of control boxes should be clear labeled.

设备电控箱内需配有限位卡扣。

The control box of equipment needs a door stopper.

所有控制箱上需要带标有 IP 等级和电制的铭牌。

All control box should have nameplate with IP class and Power source

配电板，变频器，推进电机，发电机等需要将电缆直接连接在铜排上的设备，厂家需提供配套的螺栓、螺母、垫片。

The suitable bolts, nuts and washers should be supplied by the maker for the connection between copper bus bar and yard's cable, such as switchboard, drive, propulsion motor, generator.

设备启动箱、控制箱、分电箱宽度大于 600mm 的需要做双开门。所有电气控制箱内必须附带工作图纸。

If the widths of starters, control cabinets, distribution boxes are more than 600mm, double doors to be installed on the cabinets. All electric control panels should c/w as built control diagram drawings.

驾控台上安装设备如有指示灯或者显示屏，必须带有调光装置。

Dimmers to be supplied for all equipment that installed on the bridge control console which are fitted with indicators or displays.

- 12) 所有控制设备箱体均须有耐久而清晰的电气原理图和接线图

All electric control panels should c/w long and clear electrical principle diagram and wiring diagram.



- 13) 所有设备防护等级为 IP44 或以上者必须带有电缆金属填料函。电机证书的配备根据船级社的要求。除非特别说明, 所有电机均为符合 IEC/ISO 标准的船用全封闭、防滴, 鼠笼式感应式。

All electrical equipment with protection class IP44 or above to be provided with cable metal cable glands. Certificates of E-motor to be provided according to the demand of classification society. If no other specified, all E-motor to be complied with IEC/ISO standard and to be totally enclosed and drip-proof and shall be of squirrel cage induction type.

- 14) 一般采用鼠笼式异步电动机, AC415V、50Hz、F 级绝缘、连续工作(除特别说明外), 所有电机的防护等级为 IP44, 露天甲板等潮湿环境为 IP56。所有暴露在敞开甲板/潮湿/寒冷区域的电机需要配置加热元件 (220V) ;

原则上, 所有 15kw 及以下的电机可采用直接在线起动机进行保护。15kW 至 55kW 的电机应配备星形起动机, 55kW 以上的电机应采用变频起动机进行保护, 除非设备制造商另有规定。发电机和 20KW 以上的大型电机应安装防冷凝加热器。任何发电机和电机的加热器分别在启动发电机或电机时应自动关闭。

主推进电机等大容量电动机须带有绕组温度传感器。

Squirrel cage induction motor is generally adopted, AC415V, 50Hz, F class insulation, continuous operation (unless otherwise specified), and the protection class is IP44; Wet environment such as open deck is IP56. Heating element (220V) to be fitted in motors exposed to weather decks or to wet or cold environment.

In principal, all motors 15kw and under to be protected by direct-on-line starter. Motors between 15kW and 55kW to have Star-Delta starters, and motors over 55kW to be protected by Frequency Controlled starters unless otherwise specified by equipment manufacturers. The generators and large motors over 20KW shall be fitted with anti-condensation heaters. The heaters of any generators and motors shall be switched off automatically when starting generators or the motor respectively.

Large capacity motors such as the main propulsion motor must be equipped with winding temperature sensors.

- 15) 机舱各个重要电机的故障和运行指示需送到监测报警系统 (根据规范要求) 。

Failure and running indication of all-important motors in the engine room shall be sent to the monitoring and alarm system (according to the rules' requirements).

- 16) 电气设备和电缆满足 ABS 船级社的要求。所有电器元件质量良好, 适合于环境温度为 50°C 的热带和海洋环境。

Electrical apparatus and wiring system are to comply generally with American Bureau of Shipping requirements. All electrical fittings used to be of good quality and suitable for tropical and marine environment at an ambient temperature of 50 deg.C.

### 3. 供图范围 Scope of drawing to be supplied

- 1) 认可图纸: 3 份和电子文件 (用电子邮件提交, 图纸格式为 AutoCAD2000, 文件格式为 PDF 或 Excel) 以及 1 份支持 AM 设计软件的设备外形 3D 模型, 卖方如果是用 AM 软件建模, 需提供 DB LIST 数据文件; 卖方如果用其他软件建模, 需提供以



下三种扩展名之一的3D模型文件:.DGN/.SAT/.STP。卖方提供的模型比例必须是1:1。  
(卖方如果是用CAD软件三维功能建的模型,也可以给扩展名.DXF的文件,但需要买方成功将其导入AM生产设计软件才行,如不能成功导入,仍需提供.DGN/.SAT/.STP三种文件中的一种。)

Approval drawing: 3 copies and also to be submitted by E-mail in form of AutoCAD 2000 for drawings, PDF or Excel for documents, as well as 3D model of equipment appearance supporting AM production and design software. If AM software is used for modeling, the Seller shall provide DB List data file; If Seller is modeling with other software, the 3D model file shall be provided with one of the following three extensions. DGN/. SAT /.STP. The model provided by the seller must be 1:1. (If the model is built with CAD software's 3D function, you can also give the extension name .DXF file, but only if the buyer has successfully imported it into AM production design software. If not, it still needs to be provided one of the following three extensions. DGN/. SAT/.STP.)

- 2) 工作图纸(根据注解修改的图纸): 3份, 1份电子文件。

Working drawing (drawing modified according to comments): 3 copies 1 copy of Electronic format documents.

- 3) 完工图纸/使用维修手册:3份白图/船+3份CD/船+3份U盘/船(图纸为.DWG和.DXF, 文件为.PDF格式)

Final drawing/Manuals 3copies per ship+3CD folds &+3folds of U-disc of per ship (in .DWG format for drawings, in .PDF format for documents).

- 4) 设备厂家及品牌经采购中心确认(详见商务合同条款)后,卖方应在2周内提供认可图纸。完工资料和证书必须在到货后30天内提供给买方。如果不能按期提供,罚款率为每周按货款总额的1%,不足一周者,按一周计算,罚款最多不得超过本合同总价的5%。

After the equipment manufacturer and brand is confirmed by the purchases center (Refers to the terms of business contract), seller should submit the approval drawing to buyer within 2 weeks. Final drawing and certificate delivery to buyer within 30 days after the goods arrive, if the seller fails to delivery to the buyer on time, penalty shall be charged at the rate of 1% of the total value for every week, odd days less than 1 week should be counted as 1 week. The total penalty shall not exceed 5% of the total value of the goods involved.

- 5) 在收到认可图后,买方应回复认可意见,若在4周内,买方未回复认可意见,则视为买方没有意见。卖方需对买方的认可意见在5个工作日内做出回复,如不回复,则视为卖方同意买方的所有认可意见。

After receiving the approval drawing, Buyer should return approval comments within 30 days, if Buyer has not returned the comments within 4 weeks, that means Buyer has no comments on the approval drawing. Seller should give reply to Buyer's approval comments or give explanation within 5 working days, if not reply, that means Seller has accepted all of Buyer's approval comments.

- 6) 图纸及文件应为: 英文或中英文对照版

The drawings and documents shall be in English or Chinese/English



- 7) 卖方应在交货时或买方要求的更早时间提交设备的船上交验程序(英文或中英文)。  
Seller should submit the on-board commissioning procedure (in Chinese/English or English) delivery of the equipment or more early as required by the buyer.
- 8) 备件和工具清单应另外提供。  
Spare parts and tool list to be delivered.
- 9) 前述的相关 1~8 条款也作为供货范围一部分。  
The maker supply should be satisfied item 1~8 as above.

**4. 图纸内容 Detail of the drawings as following**

序号 No.	图纸名称 Drawing name	认可图 Appr. draw.	工作图 Work. Draw.	完工图 Final draw.	备注 Remarks
1	结构使用及维修说明书 Description instruction & maintenance manuals		√	√	
2	外型图 (包括传感器布置) Outline drawing (incl. sensor arrangement)	√	√	√	包括电子版 (CAD,DXF,DWG) 比例 1:1
3	管系图 Piping diagram	√	√	√	
4	控制系统图 Control system diagram	√	√	√	
5	电气原理及接线图 Electric wiring & connection diagram	√	√	√	
6	运行参数表 Operation data sheet	√	√	√	
7	放样小样 1:1 Lofting scale 1:1	√	√	√	包括电子版 (CAD,DXF,DWG)
8	附件清单 Accessory list	√	√	√	
9	备件清单 (带示意图) Spare list & tool list (with diagrams)	√	√	√	
10	试验程序及方法 Test procedure & method	√	√	√	
11	安装说明书 Installation manual	√	√	√	
12	安装图 Installation drawing	√	√	√	
13	与外部管路联接的法兰坐标图 Coordinate drawing of connection flanges for external piping	√	√	√	
14	提供 3D 模型, 须提供 .wrl 文件 Providing 3D models, , file type should be .wrl	√	√	√	

附注 Remark:

- 认可图、工作图需注明每一部件的重量, 实际来货的重量与图纸的重量有变化的



需要通知船厂，设备来货实际重量与提供的协议（认可图）重量的误差需在3%之内。

Approval and working drawing should show the weight for each main part, any weight change in delivery must be recorded and informed to yard, the error weight of the equipment delivered should be within 3% .

- 认可图，工作图，完工图均应装订成册，并有封面及目录；

Approval, working and final drawings should be bound up into one volume respectively with covers and contents

- 电缆应标明截面或通过电流.电气接线图内标明系统/设备的额定功率及电流。

For the cable, please also mark the cross-sectional area or the current (ampere)

- 如实际来货与船厂确认的认可图不一致，设备厂商需免费派遣服务工程师来船厂依据认可图纸整改并且船厂保留索赔的权利。

If the actual delivery is inconsistent with the approved drawing confirmed by the shipyard, the equipment manufacturer should send the service engineer to rectify according to the approved drawing free of charge and shipyard reserves the right to claim.

### 5. 油漆要求 The requirement of paint:

- 1) 设备内外表都需做油漆，表面处理等级要求 Sa2.5/ST3。

The inner and outer surfaces of the equipment shall be painted, and the surface treatment grade shall be Sa2.5/ST3.

- 2) 设备外部油漆配套如下 The external paint of the equipment is matched as follows:

注：\*\*面漆颜色遵照船东/规格书的要求，如无要求，则遵照制造厂标准；

Note: The marking" \*\*" in below table means that the colour code of final paint should be comply with the requirement of owner/specification, if no required, it should follow the manufacturer's standard;

设备名称 Equipment	表面处理 Surfaces treatment	涂层度数 Layers of coating	产品 Paint type	颜色 Colour	干膜厚度(μm) Dry file thickness	备注 Remark
	Sa2.5/ST3	Primer (底漆)	环氧底漆 epoxy primer	铝红 aluminum red	1*125	
		Primer (底漆)	环氧底漆 epoxy primer	灰色 Grey	1*125	
		Final (完工漆)	聚氨酯面漆 polyurethane top-coat	**	2*50	

- 3) 设备内部冲砂 Sa2.5，并喷涂一度环氧底漆铝红 1\*125 μm。

The inner surfaces of the equipment shall be painted by epoxy primer aluminum red 1\*125 μm, and the surface treatment grade shall be Sa 2.5.

注：以上内外表面油漆技术要求仅限普通外观装饰油漆及内部封闭的基本防腐要求，如设备特殊性能指标要求，应以厂家标准进行。油漆的总膜厚不得低于以上要



求的总膜厚，设备交货时需提供油漆完工验收报告（附油漆产品资料）；

Note: the above technical requirements for internal and external surface paint are limited to the basic anti-corrosion requirements for ordinary exterior decoration paint and internal sealing. If the special performance index of equipment is required, it shall be carried out according to the manufacturer's standard. The total film thickness of the paint shall not be lower than the total film thickness as required above. When the equipment is delivered, the paint completion acceptance report (with paint product data) shall be provided.

**6. 卖方提供的材料和设备应满足但不局限于下列规则和规范的要求 The materials and equipment provided by Seller shall meet but not be limited to the requirements of following rules and regulation:**

本船按照 ABS 船级社规范、规则及以下公约进行设计、建造:

The design and build of vessel are according to ABS Rules and below regulations:

- 1) Rules and regulations of the Classification Society.
- 2) International Load line Convention, 1996 (Type "B" Freeboard)
- 3) International Convention for the Safety of Life at Sea, 1974 including amendment of 1981, 1983, 1991 (herein called "SOLAS")
- 4) International Regulations for Preventing Collisions at Sea 1972 including amendment of 1981.
- 5) IMO Resolution MSC 235(82) for stability.
- 6) MARPOL 1973/78 Annex I, IV, V & VI
- 7) International Telecommunication Regulations
- 8) International Tonnage Regulation 1969
- 9) The vessel shall be registered under Qatar Flag, and all flag requirements to be complied with.
- 10) IMO Res. MSC 226(84) Code of Safety for Special Purpose Ships (2008) for less than 60 special personnel
- 11) International Convention for the Control and Management of Ships' Ballast Water and Sediments
- 12) IMO Resolution A1120(30) Code for the Transport and Handling of Hazardous and
- 13) Noxious Liquid Substances in Bulk on Offshore Support Vessels (OSV Chemical Code) Carriage of Dangerous Goods (IMDG Code)
- 14) MSC 337 (91) Code of Noise Levels on board Ship
- 15) IACS UR E26, Cyber resilience of ship
- 16) IACS UR E27, Cyber resilience of on-board systems and equipment

**7. 其它 Others**

本技术规格书未尽事宜，各方友好协商解决。

For the unstated items in this technical specification, both of two parties shall friendly discuss and agree to resolve.



8. 售后服务: 见商务合同 After-sales service: see business contract;

9. 技术规格书要求 Requirement of technical specification

### SECTION 8 – MACHINERY

#### General Requirement

All machinery is to be designed and installed for normal operation with an unmanned engine room and classed to ABS Rules and Regulations for the Classification of Ships and the requirements of the Administration Authority.

The power generation for propulsion is to be by four (4), high-speed, marine diesel generator engines, each flexibly coupled to a 690 volt, 3 ph, 50Hz alternator.

An integrated control system enabling control of propulsion machinery, and thruster units to be provided in the bridge with the propulsion generator engines arranged for local starting and stopping at the engines.

Harbour electric power shall be provided by one Auxiliary generator set.

The automatic control equipment and alarm systems is to be designed and constructed to ABS ACCU requirements, to ensure that the various items of machinery can operate satisfactorily for a period of at least sixteen hours under normal "full away at sea" conditions without engine room personnel in attendance.

All machinery is to be capable of operating under the following conditions:

Seawater Temperature	15°C/+36°C
Ambient Engine Room Temperature	10°C/+50°C.

All strum boxes to be fitted in normal reachable positions for operation, service and cleaning.

All machinery to be installed in such a way to permit safe operation and maintenance and equipment positioned wherever possible so the crew can work standing upright.

Engine control/switchboard room is to be arranged with an adequate number of bookcases and cupboards for instruction manuals, box files etc.



28. Liquid Mud/Rec oil Tanks

Suitably constructed for cargo with specific gravity of 2.8 and fitted with pumps, piping system (including cleaning) and electric agitators.

All liquid Mud tanks to be fitted with rotating Tank cleaning nozzle for good cleaning of the tank without entering the tanks.

10. Machinery for Cargo System

10.1 Mud Pump for Liquid Mud (S.G. 2.8)

Two (2) mud (liquid mud) discharge pumps of 80 m<sup>3</sup>/hr @ minimum 80m head pressure. Either pump can be used as circulation pump. Pump to be centrifugal type or equivalent.

Two (2) remote control emergency stop switches shall be provided, one in the wheelhouse and the other on main deck.

Electric Agitator with necessary power and capacity for internal liquid mud circulation to be provided for each tank.

One observation tube with screw cap, 100mm diameter is to be provided on the man cover

MUD(SpGr:2.500) / BRINE(SpGr:0.870) / RECOVERY OIL(SpGr:0.870) TANKS \*

Tank Name	Location (Fr.)	Spgr	Load (%)	Capacity (m3)	Weight (MT)	LCG (m)	TCG (m)	VCG (m)	Max FSM (MT-m)
NO.1 MUD BRINE R.O. TK(P) *	44-54	2.500	98%	177.47	443.67	29.400f	5.447p	4.507	126.21
NO.1 MUD BRINE R.O. TK(S) *	44-54	2.500	98%	177.47	443.67	29.400f	5.447e	4.507	126.21
NO.2 MUD BRINE R.O. TK(P) *	34-44	2.500	98%	162.92	407.30	22.875f	5.403p	4.779	126.21
NO.2 MUD BRINE R.O. TK(S) *	34-44	2.500	98%	162.92	407.30	22.875f	5.403e	4.779	126.21
NO.3 MUD BRINE R.O. TK(P) *	24-34	2.500	98%	129.93	324.83	16.301f	5.362p	5.423	126.21
NO.3 MUD BRINE R.O. TK(S) *	24-34	2.500	98%	129.93	324.83	16.301f	5.362e	5.423	126.21
Subtotals:		2.500	98%	940.64	2351.60				



## Scope Of Supply And Technical Specification

Maker: Flygt/ Sweden

1. 型号 TYPE : SR4660, Qty: 2pcs/ship

转速 SPEED: 475 rpm

功率 Power absorbed: 10 KW

油室: 乙烯基酯 SMC

Oil housing, Vinyl ester based SMC

螺旋桨: 580mm, ASTM316L

Propeller diameter: ASTM316L

轴封: 机械密封, 双机封, 内机封 (耐腐蚀烧结碳化钨 WCCR/WCCR), 内机封 (耐腐蚀烧结碳化钨 WCCR/WCCR) Mechanical seal: WCCR/WCCR

电机 electrical machine:

额定功率 power rating: 13KW

电源 power: 415v~3Ph~50HZ

电流 current: 32A

起动方式 Starting method: Y/D starting

防护等级 Protection grade: IP68

绝缘等级 class of insulation: H 级(180度) H grade 180 deg C.

热敏开关保护:

Heat sensitive switch protection

浮动泄漏传感器, 探测泄漏到定子室中的水, 指示何时需要排空

FLS float leak protection

(Both TSC and FLS System to be connected to starter cabinet for alarm /stop signal)

螺纹法兰电缆入口 ISOG1

thread flange cable inlet ISOG1

10米 SUBCAB 潜水专用电缆(适用于泥浆):

10M SUBCAB black chlorinated polyethylene rubber (CPE type: 5GM5)(Used for liquid mud)



2.型号 TYPE : SR4680, Qty:4pcs/ship

转速 SPEED: 360 rpm

功率 Power absorbed: 25 KW

油室: 乙烯基酯 SMC

Oil housing, Vinyl ester based SMC

螺旋桨: 770mm,ASTM316L

Propeller diameter: ASTM316L

轴封: 机械密封, 双机封, 内机封 (耐腐蚀烧结碳化钨 WCCR/WCCR), 内机封 (耐腐蚀烧结碳化钨 WCCR/WCCR)

Mechanical seal: WCCR/WCCR

电机 electrical machine:

额定功率 power rating:30KW

电源 power: 415v~3Ph~50HZ

电流 current: 77A

起动方式 Starting method: variable-voltage soft-start

防护等级 Protection grade: IP68

绝缘等级 class of insulation: H 级(180度) H grade 180 deg C.

热敏开关保护 Heat sensitive switch protection :

浮动泄漏传感器, 探测泄漏到定子室中的水, 指示何时需要排空

FLS float leak protection

(Both TSC and FLS System to be connected to starter cabinet for alarm /stop signal)

螺纹法兰电缆入口 ISOG1

thread flange cable inlet ISOG1

10米 SUBCAB 潜水专用电缆(适用于泥浆): 长度以资料确认。 28

10M SUBCAB black chlorinated polyethylene rubber (CPE type: 5GM5)(Used for liquid mud)

3. 1pc/ship control boxes 415V/50Hz, IP 44, included main switch, local remote selecting, start/stop of each agitator, manual test, high temp. alarm/stop, leakage alarm/stop, Amp. Meter, Control 4pcs type4680 agitator and 2 pcs type 4660 agitator (Maker: The factory is accepted by Flygt/ITT company ) (Sensors for above mentioned temperature/leakage alarm function to be included in the scope of supply.) Local/External remote control function switching and related interfaces ( To be confirmed on approval drawing)

4. Supply each agitator with one support equipment

5. Bulkhead Penetration Unit for electrical cable agitator, total 6pcs/ship



## Scope Of Supply And Technical Specification

Maker: Flygt/ Sweden

1. 型号 TYPE : SR4660, Qty: 2 pcs/ship

转速 SPEED: 475 rpm

功率 Power absorbed: 10 KW

油室: 乙烯基酯 SMC

Oil housing, Vinyl ester based SMC

螺旋桨: 580mm, ASTM316L

Propeller diameter: ASTM316L

轴封: 机械密封, 双机封, 内机封 (耐腐蚀烧结碳化钨 WCCR/WCCR), 内机封 (耐腐蚀烧结碳化钨 WCCR/WCCR) Mechanical seal: WCCR/WCCR

电机 electrical machine:

额定功率 power rating: 13KW

电源 power: 415v~3Ph~50HZ

电流 current: 32A

起动方式 Starting method: Y/D starting

防护等级 Protection grade: IP68

绝缘等级 class of insulation: H 级(180度) H grade 180 deg C.

热敏开关保护:

Heat sensitive switch protection

浮动泄漏传感器, 探测泄漏到定子室中的水, 指示何时需要排空

FLS float leak protection

(Both TSC and FLS System to be connected to starter cabinet for alarm /stop signal)

螺纹法兰电缆入口 ISOG1

thread flange cable inlet ISOG1

10米 SUBCAB 潜水专用电缆(适用于泥浆):

10M SUBCAB black chlorinated polyethylene rubber (CPE type: 5GM5)(Used for liquid mud)

2. 型号 TYPE : SR4680, Qty: 4 pcs/ship

转速 SPEED: 360 rpm

功率 Power absorbed: 25 KW



油室: 乙烯基酯 SMC  
Oil housing, Vinyl ester based SMC

螺旋桨: 770mm, ASTM316L  
Propeller diameter: ASTM316L

轴封: 机械密封, 双机封, 内机封 (耐腐蚀烧结碳化钨 WCCR/WCCR), 内机封 (耐腐蚀烧结碳化钨 WCCR/WCCR)  
Mechanical seal: WCCR/WCCR

电机 electrical machine:  
额定功率 power rating: 30KW  
电源 power: 415V~3Ph~50HZ  
电流 current: 77A  
起动方式 Starting method: variable-voltage soft-start  
防护等级 Protection grade: IP68  
绝缘等级 class of insulation: H 级(180度) H grade 180 deg C.

热敏开关保护 Heat sensitive switch protection :  
浮动泄漏传感器, 探测泄漏到定子室中的水, 指示何时需要排空  
FLS float leak protection  
(Both TSC and FLS System to be connected to starter cabinet for alarm /stop signal)

螺纹法兰电缆入口 ISOG1  
thread flange cable inlet ISOG1

10米 SUBCAB 潜水专用电缆(适用于泥浆):  
10M SUBCAB black chlorinated polyethylene rubber (CPE type: 5GM5)(Used for liquid mud)

3. 1pc/ship control boxes 415V/50Hz, IP 44, included main switch, local remote selecting, start/stop of each agitator, manual test, high temp. alarm/stop, leakage alarm/stop, Amp. Meter, Control 4pcs type 4680 agitator and 2 pcs type 4660 agitator (Maker: The factory is accepted by Flygt/ITT company ) (Sensors for above mentioned temperature/leakage alarm function to be included in the scope of supply.) Local/External remote control function switching and related interfaces ( To be confirmed on approval drawing)

4. Supply each agitator with one support equipment

5. Bulkhead Penetration Unit for electrical cable agitator, total 6pcs/ship