



निविदा पृष्ठताछ
TENDER ENQUIRY

माझगांव डॉक शिपबिल्डर्स लिमिटेड
(भारत सरकार का उपक्रम)
MAZAGON DOCK SHIPBUILDERS LIMITED
(Formerly known as Mazagon Dock Limited)
(A Govt. of India Undertaking)
CIN: L35100MH1934GOI002079
Dockyard Road, Mumbai 400 010
Website- www.mazagondock.in
Certified - ISO 9001: 2008 for Shipbuilding Division
GST ID : 27AAACM8029J1ZA

निविदा सं./Tender No 1700000777
क्रय अधिकारी/Purchase Exec. Sagar U. Shende
सेवा में /To

विभाग/Department MPV COMMERCIAL
क्रय अधिकारी/Purchase Exec. Sagar U. Shende
दूरभाष सं./Telephone No 23762750
फैक्स सं./Fax No 23744709
ई-मेल/E-Mail sushende@mazdock.com

दूरभाष सं./Telephone
फैक्स सं./Fax
ई-मेल/E-Mail

निविदा सं./Tender No 1700000777
निविदा तिथि/ Tender Date 22.09.2026
निविदा बंद की तिथि/Tender Closing Date 29.09.2026
निविदा बंद होने का समय/Tender Closing Time 14:00:00
आरएफक्यू सं./RFQ No 2230000123

निविदा शुल्क/Tender Fee ₹/Rs 0.00
बयाना राशि/EMD Amount ₹/Rs 0.00
पुर्व बिड बैठक तिथि और समय/Pre Bid Meeting Date & Time ,00:00:00
निविदा खोलने की तिथि और समय/Tender Opening Date & Time 29.09.2026,16:00:00
प्रस्ताव वैधता तिथि है/Offer should be valid up to 28.12.2026
सुरक्षा जमा/Security Deposit 0.00 %आदेश मूल्य का/PO value
वरीय बैंक जमानत /Perf. Bank Guarantee 5.00 %आदेश मूल्य का/PO value

(आगे के विवरण हेतु कृपया सम्बंधित नियम शर्तों को पढ़ें। सुनिश्चित करें कि कोटेशन और संबंधित पत्राचार के लिए विभाग का नाम, क्रय अधिकारी का नाम, निविदा संख्या, बंद होने का समय एवं तिथि एवं आरएफक्यू सं. अपने कोटेशनमें लिखें।
Kindly read and refer relevant terms & conditions for further details. Do ensure to Quote Department Name, Purchase Executive's Name, Tender Number, closing date & time and RFQ Number in your Quotation & related correspondence)

प्रिय महोदय/महोदया
Dear Sir / Madam,

विषय /SUB:- PROCUREMENT OF METHANOL DUAL FUEL GENERATOR ALONG WITH LFSS METHANOL FUEL SYSTEM OF PSV

माझगाँव डॉक शिपबिल्डर्स लिमिटेड प्रतिष्ठित/संभावित आपूर्तिकर्ताओं से निम्न हेतु, प्रतियोगितात्मक दो बोली प्रणाली में (भाग -I तकनीकी - वाणिज्य बोली एवं भाग II मूल्य बोली) बोली आमंत्रित करती है।

Mazagon Dock Shipbuilders Limited (MDL) invites Competitive – Bid from reputed Supplier for the following in TWO BID system (Part - I Techno - Commercial Bid & Part - II Price Bid).

क्र.सं. SL.No.	सामग्री / सेवा विवरण Material / Service Details	मात्रा / इकाई Quantity / unit	आपूर्ति तिथि Delivery Date
00100	सामग्री सं./ Material Number :- 150000000000094742 DIESEL GENERATOR SET DUEL FUEL सामग्री वर्णन/Material Description :DESIGN, SUPPLY & COMMISSIONING OF DUAL FUEL	4 SET	31.08.2028

निविदा सं./ Tender No:- 1700000777		निविदा तिथि/ Tender Date:- 22.09.2026		आरएफक्यू सं./RFQ No:- 2230000123	
क्र.सं. SL.No.	सामग्री / सेवा विवरण Material / Service Details	मात्रा / इकाई Quantity / unit	आपूर्ति तिथि Delivery Date		
METHONAL MAIN GENSET 4 x 1440kW, HYUNDAI HIMSEN,6H22CDF-LM.					
00200	सामग्री सं./ Material Number :- 150000000000094743 LFSS SYSTEM FOR DG ENGINE सामग्री वर्णन/Material Description :DESIGN, SUPPLY & COMMISSIONING OF MeOH LFSS FOR 4 x 1440kW, HYUNDAI HIMSEN,6H22CDF-LM.	1 SET	31.08.2028		
00300	सामग्री सं./ Material Number :- 150000000000094744 OBS FOR DIESEL GENERATOR सामग्री वर्णन/Material Description :DELIVERY OF OBS SPARES FOR DUAL FUEL METHONAL MAIN GENSET 4 x 1440kW, HYUNDAI HIMSEN, 6H22CDF-LM.	1 SET	31.08.2028		
00400	सामग्री सं./ Material Number :- 150000000000094745 OBS FOR LFSS SYSTEM सामग्री वर्णन/Material Description :DELIVERY OF OBS SPARES FOR MeOH LFSS FOR 4 x 1440kW, HYUNDAI HIMSEN,6H22CDF-LM.	1 SET	31.08.2028		
00500	सामग्री सं./ Material Number :- 150000000000094747 DOCUMENTATION FOR DIESEL सामग्री वर्णन/Material Description :DOCUMENTATION FOR DUAL FUEL METHONAL MAIN GENSET 4 x 1440kW, HYUNDAI HIMSEN,6H22CDF-LM	3 SET	31.08.2028		
00600	सामग्री सं./ Material Number :- 150000000000094748 DOCUMENTATION FOR LFSS SYSTEM सामग्री वर्णन/Material Description :DOCUMENTATION FOR MeOH LFSS FOR 4 x 1440kW, HYUNDAI HIMSEN,6H22CDF-LM.	3 SET	31.08.2028		
00700	DEPLOYMENT OF SERVICE ENGINEER The Line item 00700 covers the following services	1 Activity unit	31.08.2028		
000000001 0	सेवा सं./Service Number :- संक्षिप्त वर्णन/Short Description :- DEPLOYMENT OF SERVICE ENGINEER सेवा विवरण/Service Details :- DEPLOYMENT OF SERVICE ENGINEER FOR DUAL FUEL METHONAL MAIN GENSET 4 x 1440kW, HYUNDAI HIMSEN,6H22CDF-LM INSTALLATION SUPERVISION, COMMISSIONING AND TRIALS AS PER TSP.	1 Activity unit			
00800	DEPLOYMENT OF SERVICE ENGINEER The Line item 00800 covers the following services	1 Activity unit	31.08.2028		
000000001	सेवा सं./Service Number :-	1 Activity unit			

क्र.सं. SL.No.	सामग्री / सेवा विवरण Material / Service Details	मात्रा / इकाई Quantity / unit	आपूर्ति तिथि Delivery Date
0	संक्षिप्त वर्णन/Short Description :- DEPLOYMENT OF SERVICE ENGINEER सेवा विवरण/Service Details :- DEPLOYMENT OF SERVICE ENGINEER FOR MeOH LFSS FOR 4 x 1440kW, HYUNDAI HIMSEN,6H22CDF-LM SUPPLY SYSTEM, INSTALLATION SUPERVISION, COMMISSIONING AND TRIALS AS PER TSP.		
00900	WARRANTY PERIOD The Line item 00900 covers the following services	1 Activity unit	31.08.2028
000000001 0	सेवा सं./Service Number :- संक्षिप्त वर्णन/Short Description :- WARRANTY PERIOD सेवा विवरण/Service Details :- EXTENSION CHARGES FOR DUAL FUEL METHONAL MAIN GENSET 4 x 1440kW, HYUNDAI HIMSEN,6H22CDF-LM.	1 Activity unit	
01000	WARRANTY PERIOD The Line item 01000 covers the following services	1 Activity unit	31.08.2028
000000001 0	सेवा सं./Service Number :- संक्षिप्त वर्णन/Short Description :- WARRANTY PERIOD सेवा विवरण/Service Details :- EXTENSION CHARGES FOR MeOH LFSS FOR 4 x 1440kW, HYUNDAI HIMSEN,6H22CDF-LM.	1 Activity unit	
01100	OPERATION AND MAINTENANCE TRAINING The Line item 01100 covers the following services	1 Activity unit	31.08.2028
000000001 0	सेवा सं./Service Number :- संक्षिप्त वर्णन/Short Description :- OPERATION AND MAINTENANCE TRAINING सेवा विवरण/Service Details :- OPERATION AND MAINTENANCE TRAINING FOR DUAL FUEL METHONAL MAIN GENSET 4 x 1440kW, HYUNDAI HIMSEN,6H22CDF-LM.	1 Activity unit	
01200	OPERATION AND MAINTENANCE TRAINING The Line item 01200 covers the following services	1 Activity unit	31.08.2028
000000001 0	सेवा सं./Service Number :- संक्षिप्त वर्णन/Short Description :- OPERATION AND	1 Activity unit	

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क्र सं. SL.No.	सामग्री / सेवा विवरण Material / Service Details	मात्रा / इकाई Quantity / unit	आपूर्ति तिथि Delivery Date
MAINTENANCE TRAINING सेवा विवरण/Service Details :- OPERATION AND MAINTENANCE TRAINING FOR MeOH LFSS FOR 4 x 1440kW, HYUNDAI HIMSEN,6H22CDF-LM.			
01300	DEPLOYMENT OF SERVICE ENGINEER	1 Activity unit	31.08.2028
The Line item 01300 covers the following services 000000001 सेवा सं./Service Number :- 1 MANDAYS संक्षिप्त वर्णन/Short Description :- DEPLOYMENT OF SERVICE ENGINEER सेवा विवरण/Service Details :- DEPLOYMENT OF SERVICE ENGINEER (OPTIONAL) FOR DUAL FUEL METHONAL MAIN GENSET 4 x 1440kW, HYUNDAI HIMSEN,6H22CDF-LM INSTALLATION SUPERVISION, COMMISSIONING AND TRIALS AS PER TSP.			
01400	DEPLOYMENT OF SERVICE ENGINEER	1 Activity unit	31.08.2028
The Line item 01400 covers the following services 000000001 सेवा सं./Service Number :- 1 MANDAYS संक्षिप्त वर्णन/Short Description :- DEPLOYMENT OF SERVICE ENGINEER सेवा विवरण/Service Details :- DEPLOYMENT OF SERVICE ENGINEER (OPTIONAL) FOR MeOH LFSS FOR 4 x 1440kW, HYUNDAI HIMSEN,6H22CDF-LM SUUPPLY SYSTEM, INSTALLATION SUPERVISION, COMMISSIONING AND TRIALS AS PER TSP.			
नियम और शर्तें : भाग ए में लिखी हुई और इतर संलग्नपत्रे इस निविदा एक अभिन्न अंग हैं। हमें आशा है की, हमें प्रतियोगित्मिक और उचित प्रस्ताव इस निविदा के लिए प्राप्त होगा। Terms & Conditions as indicated in Part A of this tender and other enclosures / annexures form an integral part of this tender document. We look forward to receive your most competitive and reasonable offer against this Tender.			
माझगाँव डॉक शिपबिल्डर्स लिमिटेड के लिए /For Mazagon Dock Shipbuilders Ltd			

Tender No. 1700000777 (Two Bid Global Tender Enquiry)



Tender Enquiry

Enclosure to Tender Enquiry: Terms and Conditions (Section I & II)
Item: Procurement of Methanol Dual Fuel Generator along with LFSS Methanol Fuel System of PSV
Project: Platform Support Vessel (PSV)

Section I - Notice Inviting Tender (NIT)

- (i) Notice Inviting Tender (NIT): Mazagon Dock Shipbuilders Limited (MDL), Mumbai is India's leading Shipbuilding Company with ISO 9001:2015 accreditation. Mazagon Dock Shipbuilders Limited, invites offers in two bid system i.e. Part-I (Techno Commercial Bid) and Part-II (Price Bid) through password protected email.
- (ii) **The Tender Document:**
- (i) **Bidders must read the complete 'Tender Document'.** Kindly visit MDL website Link : <https://mazagondock.in/English/pages/Tenders> under tab Ship Building(SB)/MPV Project for formats as detailed in enclosure.
- (ii) Bids must be uploaded till the deadline for submission of bids. Request for extension, if at all to be made, shall be forwarded at least 3 working days in advance to the tender closing date / time (excluding tender closing date) with proper reasoning. **However, the extension would be granted by MDL on merit of the case at MDL discretion and would be binding on all bidders.**
- (iii) **Eligibility Criteria for Participation in this Tender:** Subject to provisions in the Tender Document, participation in this Tender Process is limited to nominated bidders who fulfil the 'Eligibility' and Pre-Qualification criteria. Bidder shall be required to declare fulfilment of Eligibility Criteria.
Note: Incase manufacturer has submitted the bid, then bids of its authorised dealer will not be considered.
- (iv) **Submission of Bids:** No manual Bids shall be made available or accepted for submission (except for originals of scanned copies as mentioned in tender). In the case of downloaded documents, Bidder must not make any changes to the contents of the documents while uploading/submission, except for filling in the required information.
- (v) **Disclaimers and Rights of MDL:** The issue of the Tender Document does not imply that MDL is bound to select bid(s), and it reserves the right without assigning any reason to
- reject any or all of the Bids, or
 - cancel the tender process; or
 - abandon the procurement of the Goods/Services in partial or full; or
 - issue another tender for identical or similar Goods/Services.

Note: Please refer to appended complete Tender Document for further details.

Tender Inviting Authority


सागर शेन्डे

SAGAR SHENDE

मुख्य प्रबंधक (वाणिज्य-पी १७ ए)

CHIEF MANAGER (COMMERCIAL-P17A)

माझगांव डॉक शिपबिल्डर्स लिमिटेड

MAZAGON DOCK SHIPBUILDERS LIMITED

Tender No. 1700000777 (Two Bid Global Tender Enquiry)

Section II - Tender Enquiry Form (TEF)

1. **Description & Scope of Supply / Work:** Procurement of Methanol Dual Fuel Generator along with Methanol Associated System of PSV as per TSP DR/E/PSV/3002, Rev 00 dated 04.08.2026.
2. **Validity Period of Offer:**
 - (a) Bid / Offer shall have the validity period of **90 days** from the tender closing date.
 - (b) MDL may request the bidders to extend the validity period for a specified additional period. A bidder may agree to or reject the request. A bidder who has agreed to MDL's request for extension of bid validity, in no case, he shall be permitted to modify his bid. In case techno-commercially accepted bidder/s does not agree to extend the offer validity, the offers of all techno commercially accepted bidder/s including the bidder who has not agreed to extend their offer validity shall be opened and proceed further with valid bids. However, offer of the bidder(s) who have not agreed to extend their offer validity shall not be considered for L1 evaluation purpose.

3. **Delivery Period:** The delivery dates shall be as under:

Yard No.	Equipment delivery date
Y-26801	PO date + 18 months

Delivery schedule given for services is tentative; the exact schedule will be communicated 15 days in advance before respective activity. Refer TSP for terms related to services.

4. **Submission of Offer in Two Bid System:** Offer must be submitted in two parts as follows:
 - a) **Part I (Techno Commercial Bid):** The bidder shall ensure submission of techno-commercial offer as per tender terms.
Note: In any case, prices are not to be mentioned in Part-I bid.
 - b) **Part-II (Price Bid):** Prices for each of the listed items has to be uploaded strictly in the prescribed format provided in the e-procurement portal. Bids received other than this given format will be rejected.
Note:
 - If, in the price structure quoted for the required goods, there is discrepancy between the unit price and total price (which is obtained by multiplying the unit price by the quantity), the unit price shall prevail and the total price corrected accordingly;
 - If there is a discrepancy between words and figures, the amount in words shall prevail.
 - Bidder must quote for all line items being inseparable line items.
5. **Bid Rejection Criteria:**
 - (a) **Categorical rejection criteria:** Any Bids received other than through e-portal (in case of e-tender) shall be summarily rejected.
 - (b) **Liabe rejection criteria:** Non-compliance/non-acceptance to any of the terms and conditions of the tender shall render the bid liable for rejection.
6. **Performance Security Bank Guarantee(PSBG):**
 - (i) Separate Performance Security(PS) for an amount equal to 5% of each order value (excluding taxes, duties) payable in currency of purchase order shall be submitted within 25 days after notification of the award of contract and it should remain valid for a period of 60 (sixty) days beyond the date of completion of all contractual obligations of the supplier, including warranty obligations.
 - (ii) Performance security may be furnished in the form of NEFT /Online (MDL website) Demand Draft / Pay order / Bank Guarantee / Insurance Security Bond / e-Bank Guarantee in favour of Mazagon Dock Shipbuilders Limited, Mumbai from the list of Banks approved by SBI / Canara Bank published on MDL website.
 - (iii) Non submission of PS with in stipulated time period may lead to cancellation of order by MDL at risk and cost of seller. In case cancellation of order is not opted by the buyer and seller has already commenced supply / services, MDL shall withhold 5% of order value from his bills in lieu of PS. In such case, interest is to be recovered for the period starting from 26th day of transmission / notification of order/contract by any mode and amount involved at the relevant rate of interest. For

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foreign supplier, the interest will be EUROBOR/LIBOR plus 2%. For Indian suppliers, the interest will be SBI BPLR plus 2%.

- (iv) In case of foreign bidders, the performance security must conform to Uniform Rules for Demand Guarantees (URDG 758) - an international convention regulating international securities.
- (v) The performance security will be forfeited and credited to MDL's account in the event of a breach of contract by the contractor. It will be refunded to the contractor without interest, after he duly performs and completes the contract in all respects including the warranty under the contract.
- (vi) Where the duration of contract is very long and banks are unwilling to issue BGs for long duration, rolling bank guarantee towards performance security can be submitted where it will be valid for at least one year with claim period of three months within which the same can be extended for further period by amendment.
- (vii) Performance security on reducing balance can be accepted when the contract period extends beyond one year. This will be effective on completion of one year and thereafter on six monthly / yearly basis.
- (viii) In the event of defects due to poor workmanship leading to non-performance of the Equipment/Item and bidder failure to attend the defects within a reasonable period of time, the PSBG will be encashed by MDL. MDL's decision in this regard shall be final and binding on the supplier / contractor.
- (ix) In the event of postponing of delivery of deliverables/services or extension of guarantee desired & sought by MDL, the Performance Security (for 5% of order value) has to be extended and its amendment charges shall be borne by supplier.

7. Warranty/Guarantee: Warranty/Guarantee shall be as per TSP clause No 21.

Note: Bidders have to quote for warranty /guarantee extension charges for one year beyond warranty clause mention in TSP in the price sheet attached with the tender item Sr No 900 & 1000.

8. Optional Tender Items: The tender item Sr No 900, 1000 & 1300 & 1400 are optional service. Bidder should note that these charges are optional and will not be considered for ordering purpose. Bidders shall not claim for these charges in case this service is not being exercised.

9. Currency of Bidding: Bidders are allowed to quote price (and get paid) in RBI's notified basket of foreign currencies - US Dollar or Euro or GBP etc.

10. Pricing:

- (a) Bidder shall quote the prices for the delivery on **Incoterm CIF, Mumbai/JNPT port basis** for delivery at MDL. Order will be placed on **CIF basis** only.
- (b) The prices quoted shall remain firm and fixed during the currency of the order / contract unless agreed otherwise by MDL.

11. Taxes & Duties:

- (i) Bidders must clearly mention the applicable Taxes in the rate sheet enclosed in the tender. The item-wise rates (i.e. Basic + Duties & Cess + Packing, Forwarding, inspection charges, Freight & Insurance) quoted in the Rate sheet should exclude Taxes. Bidder should indicate GST rates as applicable separately under each of the head in the same rate sheet, which will be paid extra based on tax invoice to the extent applicable.
- (ii) Foreign bidder shall submit Tax Residency Certificate (TRC) in Part-I offer. In case of remittances to Foreign Companies for services, as per the Income tax act and DTAA provisions, TDS shall be carried out from the amount payable towards services. As per the extant applicability and existing rates, following cases pertaining to TDS are presented for clarity:
 - a) Case 1 (TRC is made available by foreign bidders): Tax Deduction at Source (TDS) @ 15% of total service payment is applicable or as per applicable TDS rate stipulated by Government of India. If this is not agreed to by the bidder in the bid or during TNC / CNC, then this shall be appropriately loaded as per applicable rates on the price for the purpose of ranking. However, bidders to note that TDS rates / DTAA rates differ from country to country. It varies from 10% to 25%.
 - b) Case 2 (TRC is not made available by foreign bidders): Tax Deduction at Source (TDS) at the rates as mentioned in the table below is applicable. If this is not agreed to by the bidder in the bid or during TNC / CNC, then this shall be appropriately loaded as per applicable rates stipulated by Government of India on the price for the purpose of ranking. These rates are tentatively as under:

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Service Payment slabs (converted in INR)	Rate of TDS applicable on total service payment
Up to Value of INR 1 Cr.	25.75%
Above INR 1 Cr upto INR 10 Cr.	26.26%
Above INR 10 Cr.	27.0375%

(iii) Foreign Bidders shall quote their price on **Incoterm CIF, Mumbai** Basis. Taxes & duties as applicable to be borne by buyer & seller in their own country i.e MDL will bear the taxes & duties applicable within India and for outside India same will be borne by seller/bidder.

(iv) End User Certificate if applicable. Format to be provided by vendor immediately after placement of order.

12. Payment Terms:

- (i) 100 % Payment made through LC for CIF Mumbai/JNPT port delivery against receipt of documents mentioned in payment mode.
If PSBG is not submitted, then the equivalent amount shall be retained
- (ii) **Part Payment:** Part Supply, Part Payment shall be applicable.
- (iii) **Extended Warranty (If applicable):** 100% payment for warranty wherever included in the same order will be admissible for payment will be made within 15 days from date of start of extended warranty period. Supplier shall mandatorily indicate, in the offer, the annual rate of extended warranty period. Refer TSP warranty and extension of warranty clauses while quoting for this tender.

13. Payment Mode & Documents:

- (a) All the payments to foreign bidders shall be through Letter of Credit/Direct Remittance through Bank.
- (b) MDL may opt to make due payment for items having shelf life, services or any miscellaneous payment required as per contract through Direct Remittance from Bank post-delivery & acceptance or completion of services.
Note: Invoices should be submitted at "Receipt Section" adjacent to the ARS Punching Section, South Yard MDL.

(c) Documents for LC Payments for Goods (Foreign Bidders):

Note: LC will be opened 30 days before latest date of shipment. However, Bidders need to inform at least 45 days in advance for readiness of the equipment for shipment for processing the opening of LC.

- (i) Set of Original + 2 Copies of signed Invoice showing item-wise prices as per the order.
- (ii) Set of Original + 2 Copies of signed packing List clearly showing list of items packed.
- (iii) Set of Original + 2 Copies Clean on Board Bill of Lading OR Air Way Bill Made in the name of MDL's Bank and Marked as freight paid.
- (iv) Set of Original + 2 Copies Certificate of approval OR Release Note from Inspection agency.
- (v) Certificate of country of origin in Original + 2 Copies by chamber of commerce.
- (vi) Original + 2 Copies of Warranty/Guarantee Certificate as per contract/order.
- (vii) Original + 2 Copies of all Manufacturer's Test Certificates (MTCs) / Reports, Drawings, Manuals, Procedures etc. as relevant to the ordered item.
- (viii) Certificate Confirming that supplier has couriered / dispatched 4 set of Non Negotiable Documents comprising of all Test reports / MTCs, Technical Documents, Drawings, Manuals, Procedures etc. and of Signed Invoices, Packing Lists, Bill of Lading/AWB marked as Freight Paid, Insurance Policy/Document, Freight Paid Certificate, MDL nominated Inspection Agency's Certificate of approval, Country of Origin Certificate, Guarantee/Warranty Certificate, directly to MDL.
- (ix) Original + 2 Copies of the Certificate issued by the classified society confirming seaworthiness of the vessel and that the shipment is made on vessels of not more than 15 years' vintage. (Applicable in case of CIF contracts / orders)
- (x) Certificate issued by MDL confirming that the delivery is made in time and no liquidated damages / penalty is applicable OR in case of delays, admissible amount of liquidated damages/ penalty will be specified by MDL in this certificate for reduction of equal amount from supplier's invoice and/or deduction of interest applicable towards non submission/delayed submission of PSBG and/or withholding the PSBG amount till

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guarantee/warranty period as applicable. (MDL will issue this certificate generally by E-Mail/FAX immediately on arrival of consignment at port of destination, receipt of signed copy of invoice, packing list, approval certificate of the nominated inspection agency, copies of B/L or AWB marked as Freight Paid, Insurance Policy/Document, Freight Paid Certificate or any other acceptable documents confirming dispatch on CIF basis).

- (xi) Certificate confirming that the shipping instructions (inclusive of packing)/Sea/Air worthiness packing have been followed while packing / shipment and forwarding of details for Freight and insurance to MDL.
- (xii) All the documents should clearly indicate the Purchaser's Order number, Import License Number, Airway Bill / Bill of Lading Number, Insurance Policy number/ Insurance Document reference number.

14. **Consignee:** Material shall be delivered on CIF Mumbai/JNPT Port basis.

15. **Inspection & Testing:** It shall be as per TSP. Inspection agency is TPI of IACS class. **Inspection charges to be borne by vendor/supplier.**

- (a) **Receipt Inspection:** MDL shall carry out necessary inspection of the items on receipt in the MDL on the basis of appropriate MDL Inspection system requirements & the Inspection documents submitted by suppliers. In case joint receipt inspection (JRI) is required to be carry out, same may be carried out along supplier's rep. Any objection raised by MDL inspection team against quality of material or workmanship shall be satisfactorily corrected by the supplier at his expenses including replacement as may be required within shortest possible time within 30 days. Items damaged during transit shall also be rectified or replaced by the supplier within shortest possible time.
- (b) **Rejection of the material:** Any portion of the equipment found defective/rejected, the supplier shall collect the same at his cost from the MDL Yard, all incidental charges being born by supplier, (inclusive of custom duty, if payable), within 30 days from the date of intimation to the supplier of such rejection. The MDL reserves the rights to dispose-off the rejected item at the end of a total period of 90 days in any manner, to the best advantage to the MDL & recover storage charges & any consequential damages, from sale proceeds of such disposal.

16. **Liquidated Damage:** If the contractor fails to deliver any or all of the Goods or fails to perform the incidental Works/ Services (e.g. installation, commissioning or operator training) within the time frame(s) incorporated in the contract, MDL shall, without prejudice to other rights and remedies available to MDL under the contract, deduct from the contract price, as agreed liquidated damages, but not as a penalty, a sum equivalent to the 0.50% percent (excluding taxes) of the delivered price of the delayed Goods and/ or incidental Works/ Services for each week of delay or part thereof until actual delivery or performance, subject to a maximum deduction of the 5% of the delayed Goods' or incidental Works/ Services' contract price(s). Besides liquidated damages during such a delay, the denial clause shall also apply. Any failure or delay by any sub-contractor, though their employment may have been sanctioned shall not be admitted as aground for any extension of time or for exempting the contractor from liability for any such loss or damage as aforesaid.

17. **Integrity Pact (IP):** The Integrity pact essentially envisages the agreement between prospective vendors / bidders & buyers committing the person/officials of both the parties not to exercise any corrupt influence on any aspects of the contract. Only those vendors/bidders who enter into such an integrity pact with the buyer would be competent to participate in the bid. The format of integrity Pact is available on MDL's website, details are at enclosure. IP shall be submitted on plain paper.

The 'Integrity pact' dully filled as per enclosed format to be submitted along with the offer. Bidders to ensure that each page of Integrity pact shall be duly signed by the bidder. Non-submission of Integrity Pact by the bidders duly signed on each page along with Part-I bid is under liable for rejection. Bidders shall send original IP immediately to MDL post submission of bid.

Independent External Monitors (IEM): The following Independent External Monitors (IEMs) will have the power to access the entire project document and examine any complaints received by him. In case of any change in IEMs it will be informed accordingly.

For any administrative enquires and clarification on tender, bidders shall contact Commercial Dealing Executive. In case of issues related to Integrity Pact (IP) please contact Independent External Monitor (IEM) whose details are as below:

Tender No. 1700000777 (Two Bid Global Tender Enquiry)

- i) Shri M.N.Krishnamurthy, IPS (Retd.) Email ID: krishnamurthymn19@gmail.com
- ii) Shri Deepak Kashyap, IRTS (Retd) Email id : deepakkashyapnd02@gmail.com

18. Public Grievance Cell: A public grievance cell headed by Shri R. R. Kumar, ED (EY) has been set up in the company. Members of public having complaints or grievances are advised to contact above Authorities on Wednesday between 10.00 hours and 12.30 hours in his office at 3rd Floor, West Block, Mazagon Dock Shipbuilders Ltd or send their complaints / grievances to him in writing for redressal. Telephone No. is 23762106(MDL).

19. Breach of Obligation: In case of breach of any obligation mentioned under, the bidder shall be disqualified / debarred from the bidding process for a period of one year from the date of notification;

- i) Bidder has withdrawn / modified / amended / impaired / derogated from the tender during the period of bid validity.
- ii) Bidder fails or refuses to execute the contract upon notification of acceptance of bid by MDL during the period of bid validity.

20. Land Border: This is applicable for this tender and details are available on MDL Website. Kindly visit MDL website Link : <https://mazagondock.in/English/pages/Tenders> under tab Ship Building(SB)/MPV Project.

21. Right to Reject any or all Bids: MDL reserves its right to accept or reject any or all Bids, abandon/ cancel the Tender process, and issue another tender for the same or similar Goods/Services at any time before the award of the contract. It would have no liability to the affected Bidder or Bidders or any obligation to inform the affected Bidder or Bidders of the grounds for such action(s).

22. Additional Instructions:

- (a) Bidder shall abide to all tender terms & conditions including General Conditions of Contract (GCC).
- (b) In case of improper on-line filling or non-submission of Acceptance formats for Tender Enquiry Form (TEF), GCC, it shall be presumed that all our tender terms & conditions are acceptable to the bidder. For GCC, kindly visit MDL website Link : <https://mazagondock.in/English/pages/Tenders> under tab Ship Building(SB)/MPV Project.

23. Instructions for submission of bid through email:

- a) Bidder need to submit their technical & financial bid to the dedicated email (i.e. **c-np-email-bid@mazdock.com**) in separate attachment. Offer submitted to any other email or through any other mode shall be summarily rejected.
- b) Bidder can modify their bid before tender closing date. Only the latest offer received from bidder at the time of tender closing shall be considered.
- c) To maintain confidentiality, technical and financial bid should be password protected and password needs to be submitted separately when sought to the specific email address.
- d) After tender closing date & time, MDL will ask bidder to send password of technical bid to specific email ID. Bidder need to send the password to specified email within 24 Hrs of intimation.
- e) Size of attachment should be less than **20 MB**. In case of larger files, bidder can reduce the size by using compressing tools such as WinRAR or dividing file into smaller section so that size of each section is less than **20 MB** and submitting in parts, clearly number each part and provide index document.
- f) Bidder shall submit the financial bid document only through email to dedicated email ID of MDL at the time of bid submission.
- g) For the purpose of opening of price bid, MDL will ask techno-commercially qualified bidder to send password of financial bid to specific email ID. Bidder need to send the password to specified email within 24 Hrs of intimation.
- h) Summary of financial bid shall be disclosed by email to all the qualified bidders of whom the financial bids are opened.

24. Contact Details for Queries: All bidders are requested to get their queries, if any, clarified in advance (i.e. 7 days in advance to tender closing date) to avoid last minute delay. In case of any clarifications regarding tender, bidders are requested to contact the following executives.

Tender No. 1700000777 (Two Bid Global Tender Enquiry)

Department	Name of Executives	Contact No	Email
Technical	Mr. Raghavendra Singh (SB-Design)	022 2376 3373	rsingh@mazdock.com
	Cdr Yogesh Mahani (SB PLG)	022 2376 3214	ymahani@mazdock.com
Commercial	Mr. R G Goilkar DGM/HoS(C-P17A)	022 2376 2747	rggoilkar@mazdock.com
	Mr. Sagar Shende CM (C-P17A)	022 2376 2750	sushende@mazdock.com

25. We look forward to receive your most competitive and reasonable offer against this tender.

Yours faithfully,

For MAZAGON DOCK SHIPBUILDERS LIMITED

Enclosure:

Enclosure-1	General Conditions of Contract (GCC) for Goods and Services
Enclosure-3	Performance Security (PS) Bank Guarantee Format
Enclosure-4	RTGS format
Enclosure-5	Details for remittance towards Performance Security (PS) Bank Guarantee Format
Enclosure-6	Contact Details of the bidder
Enclosure-7	Format for Compliance Certificate w.r.t. Land Border Clause
Enclosure-8	Format for Integrity Pact

Note: All above enclosures are available on MDL Website. Kindly visit MDL website Link : <https://mazagondock.in/English/pages/Tenders> under tab Ship Building(SB)/MPV Project.

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INTEGRITY PACT

Mazagon Dock Shipbuilders Limited (MDL) hereinafter referred to as **"The Principal / Buyer"**

And.....hereinafter referred to as **"The Bidder/ Contractor"**

Preamble

	The Principal/Buyer intends to award, under laid down organizational procedures, contract/s forThe Principal/Buyer values full compliance with all relevant laws of the land rules, regulations, economic use of resources and of fairness / transparency in its relations with its Bidder(s) and /or Contractor(s). In order to achieve these goals, the Principal/Buyer will appoint an Independent External Monitor (IEM), who will monitor the tender process and the execution of the contract for compliance with the principles mentioned above.
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Section 1 - Commitments of the Principal/Buyer:

(1)	The Principal/Buyer commits itself to take all measures necessary to prevent corruption and to observe the following principles:
a)	No employee of the Principal/Buyer, personally or through family members, will in connection with the tender for, or the execution of a contract, demand, take a promise for or accept, for self or third person, any material or immaterial benefit which the person is not legally entitled to.
b)	The Principal/Buyer will during the tender process treat all Bidder(s) with equity and reason. The Principal/Buyer will in particular, before and during the tender process, provide to all Bidder(s) the same information and will not provide to any Bidder(s) confidential/additional information through which the Bidder(s) could obtain an advantage in relation to the tender process or the contract execution.
c)	The Principal/Buyer will exclude from the process all known prejudiced persons.
d)	The Principal/Buyer undertakes to scrupulously follow the tender containing Standard Terms & Conditions (STAC) and General Terms & Conditions (GT&C) in respect of procurement contracts for goods, services and civil works.
(2)	If the Principal/Buyer obtains information on the conduct of any of its employees which is a criminal offence under the relevant Anti Corruption Laws of India, or if there be a substantive suspicion in this regard, the Principal/Buyer will inform the Chief Vigilance Officer, MDL and in addition can initiate disciplinary actions.

Section 2 - Commitments of the Bidder(s)/Contractor(s):

(1)	The Bidder(s)/Contractor(s) commit himself to take all measures necessary to prevent corruption. He commits himself to observe the following principles during his participation in the tender process and during the contract execution.
a)	The Bidder(s)/Contractor(s) will not, directly or through any other persons or firm, offer promise or give to any of the Principal/Buyer's employees involved in the tender process or the execution of the contract or to any third person any material or other benefit which he/she is not legally entitled to, in order to obtain in exchange any advantage or any kind whatsoever during the tender process or during the execution of the contract.
b)	The Bidder(s)/Contractor(s) will not enter with other Bidders into any undisclosed agreement or understanding, whether formal or informal. This applies in particular to prices, specifications, certifications, subsidiary contracts, submission or non submission of bids or any other actions to restrict competitiveness or to introduce cartelization in the bidding process.
c)	The Bidder(s)/Contractor(s) will not commit any offence under the relevant Anti Corruption Laws of India; further the Bidder(s)/Contractor(s) will not use improperly, for purposes of competition or personal gain, or pass on to other, any information or document provided by the Principal/Buyer as part of the business relationship, regarding plans, technical proposals and business details, including information contained or transmitted electronically.

Tender No. 1700000777 (Two Bid Global Tender Enquiry)

	d)	The Bidder(s)/Contractor(s) of foreign origin shall disclose the name and address of the Agents/representatives in India, if any. Similarly, the Bidder(s)/Contractor(s) of Indian Nationality shall furnish the name and address of the foreign principals, if any. All payments made to the Indian Agent/representative have to be in Indian Rupees only. Further details as mentioned in the "Guidelines of Indian Agents of Foreign suppliers" shall be disclosed by the Bidders(s)/Contractor(s). Copy of the "Guidelines on Indian Agents of Foreign Suppliers" as annexed and marked as Annexure-A.
	e)	The Bidder(s)/Contractor(s) will when presenting his bid, disclose any and all payments he has made, is committed to or intends to make to agents, brokers or any other intermediaries in connection with the award of the contract.
	f)	The Bidder (s)/Contractor(s), their agents, representatives shall not do such things so as to interfere with the procedures laid down in the Principal/Buyer's tender containing the Standard Terms and Conditions (STAC) and General Terms and Conditions (GT&C) in respect of procurement contracts for goods, services and civil works.
	g)	The Bidder commits to refrain from giving any complaint directly or through any other manner without supporting it with full and verifiable facts.
(2)		The Bidder(s)/Contractor(s) will not instigate third persons to commit offences outlines above or be an accessory to such offences.

Section 3 - Disqualification from tender process and exclusion from future contracts:

		If the Bidder(s)/Contractor(s) before contract award or during execution of Contract has committed a transgression through a violation of Section 2, above or in any other form such as to put his reliability or credibility as Bidder(s) in question, the Principal/Buyer is entitled to disqualify the Bidder(s)/Contractor(s) from the tender process or to terminate the contract, if already signed for such reason, as per the procedure mentioned in the "Guidelines on Banning of business dealings" Copy of the "Guidelines on Banning of business dealings" is annexed and marked as Annexure-B.
	1)	If the Bidder(s)/Contractor(s) has committed a transgression through a violation of Section 2 such as to put his reliability or credibility into question, the Principal/Buyer is entitled also to exclude the Bidder(s)/Contractor(s) from future contract award processes. The imposition and duration of the exclusion will be determined by the severity of the transgression. The severity will be determined by the circumstances of the case, in particular the number of transgressions, the position of the transgressors within the company hierarchy of the Bidder(s) and the amount of the damage. The exclusion will be imposed for a minimum of six months and maximum of five years, which may be further extended at the discretion of the Principal/Buyer.
	2)	A transgression is considered to have occurred, if the Principal/Buyer after due consideration of the available evidence, concludes that no reasonable doubt is possible.
	3)	The Bidder (s) accepts and undertakes to respect and uphold the Principal/Buyer's absolute right to resort to and impose such exclusion and further accepts and undertakes not to challenge or question such exclusion on any ground, including the lack of any hearing before the decision to resort to such exclusion is taken. This undertaking is given freely and after obtaining legal advice.
	4)	If the Bidder(s)/Contractor(s) can prove that he has restored/ recouped the damage caused by him and has installed a suitable corruption prevention system, the Principal/Buyer may revoke the exclusion prematurely.

Section 4 - Sanctions for Violation:

(1)		Any breach of the aforesaid provisions by the Bidder or any one employed by him or acting on his behalf (whether with or without the knowledge of the Bidder) or the commission of any offence by the Bidder or any one employed by him or acting on his behalf, as defined in Chapter IX of the Indian Penal Code, 1860 or the Prevention of Corruption Act 1988 or any other Act enacted for the prevention of corruption shall entitle the Principal/Buyer to take all or any one of the following actions, wherever required -
	a)	To immediately call off the pre-contract negotiations without assigning any reason or giving any compensation to the Bidder. However, the proceedings with the other Bidder (s) would continue.
	b)	The Earnest Money Deposit/Security Deposit/Performance Bond shall stand forfeited either fully or partially, as decided by the Principal/Buyer, and the Principal/Buyer

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		shall not be required to assign any reason there for.
	c)	To immediately cancel the contract, if already signed, without giving any compensation to the Bidder.
	d)	To recover all sums already paid by the Principal/Buyer, in case of an Indian Bidder with interest thereon at 2% higher than the prevailing Base Rate of SBI, and in case of a Bidder from a country other than India with interest thereon at 2% higher than the LIBOR. If any outstanding payment is due to the Bidder from the Buyer in connection with any other contract for any other Defence stores, such outstanding payment could also be utilized to recover the aforesaid sum and interest.
	e)	To en-cash the advance Bank Guarantee and Performance Bond/Warranty bond, if furnished by the Bidder, in order to recover the payments, already made by the Principal/Buyer, along with interest.
	f)	To cancel all or any other contracts with the Bidder.
	g)	To debar the Bidder from entering into any bid from Principal/Buyer for a minimum period of five years, which may be further extended at the discretion of the Principal/Buyer.
	h)	To recover all sums paid in violation of this Pact by Bidder(s) to any middleman or agent or broker with a view to securing the contract.
	i)	If the Bidder or any employee of the Bidder or any person acting on behalf of the Bidder, either directly or indirectly, is closely related to any of the officers of the Buyer, or alternatively, if any close relative of an officer of the Buyer has financial interest/stake in the Bidder's firm, the same shall be disclosed by the Bidder at the time of filing of tender. Any failure to disclose the interest involved shall entitle the Buyer to rescind the contract without payment of any compensation to the Bidder.
		The term 'close relative' for this purpose would mean spouse whether residing with the Principal/Buyer's employee/employees or not, but not include a spouse separated from the Principal/Buyer's employee/employees by a decree or order of a competent court; son or daughter or step son or step daughter and wholly dependent upon Principal/Buyer's employee/employees, but does not include a child or step child who is no longer in any way dependent upon the Principal/Buyer's employee/employees or of whose custody the Principal/Buyer's employee/employees has been deprived of by or under any law; any other person related, whether by blood or marriage, to the Principal/Buyer's employee/employees or to the Principal/Buyer's employee/employees wife or husband and wholly dependent upon Principal/Buyer's employee/employees.
	j)	The Bidder shall not lend to or borrow any money from or enter into any monetary dealings or transactions, directly or indirectly, with any employee of the Principal/Buyer, and if he does so, the Principal/Buyer shall be entitled forthwith to rescind the contract and all other contracts with the Bidder. The Bidder shall be liable to pay compensation for any loss or damage to the Principal/Buyer resulting from such rescission and the Principal/Buyer shall be entitled to deduct the amount so payable from the money(s) due to the Bidder.
	k)	In cases where Irrevocable Letters of Credit have been received in respect of any contract signed by the Principal/Buyer with the Bidder, the same shall not be opened.
(2)		The decision of the Principal/Buyer to the effect that a breach of the provisions of this Integrity Pact has been committed by the Bidder shall be final and binding on the Bidder, however, the same Bidder can approach the Monitor(s) appointed for the purposes of this Pact.

Section 5 - Integrity Pact Bank Guarantee (IPBG): Not Applicable

(1)		Every Bidder, while submitting commercial bid, shall submit an Integrity Pact Bank Guarantee for an amount of * _____ in favour of the Principal/Buyer in Indian Rupees/Foreign Currency.
	a)	Guarantee will be from an Indian Nationalized Bank/Scheduled Bank in case of Indigenous Bidders. For Foreign Bidders, Bank Guarantee shall be from a Bank of International repute as updated by SBI from time to time, promising payment of the guaranteed sum to Mazagon Dock Shipbuilders Limited (MDL/GRSE/Principal/Buyer), on demand within three working days without any demur whatsoever and without seeking any reasons whatsoever. The demand for payment by the Principal/ Buyer shall be treated as conclusive proof for payment. A Model Bank Guarantee format is enclosed.

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(2)	The Integrity Pact Bank Guarantee (IPBG) shall be valid upto and including 45 days after the validity of commercial offer. However, bidders will be required to extend the Integrity Pact Bank Guarantee, as and when required by the Principal/Buyer. In the case of the successful bidder, validity of the Integrity Pact Bank Guarantee will be extended upto the satisfactory completion of the contract, Integrity Pact Bank Guarantee shall be returned promptly in case of unsuccessful bidders.
(3)	In the case of successful bidder a clause would also be incorporated in the Article pertaining to Performance Bond in the Purchase Contract that the provisions of Sanctions for Violation shall be applicable for forfeiture of Performance Bond in case of a decision by the Principal/Buyer to forfeit the same without assigning any reason for imposing sanction for violation of this Pact.
(4)	The provisions regarding Sanctions for violation of Integrity Pact include forfeiture of Performance Bond in case of a decision by the Principal/Buyer to forfeit the same without assigning any reason for imposing sanction for violation of Integrity Pact.
(5)	No interest shall be payable by the Principal/Buyer to the Bidder(s) on Earnest Money/Security Deposit for the period of its currency.

Section 6 - Previous Transgression:

(1)	The Bidder declares that no previous transgressions occurred in the last three years with any other company in any country conforming to the anti corruption approach or with any other public sector enterprise in India that could justify his exclusion from the tender process.
(2)	If the bidder makes incorrect statement on this subject, he can be disqualified from the tender process or further action can be taken.

Section 7 - Equal treatment of all Bidders/Contractor(s)/Subcontractors:

(1)	The Bidder(s)/Contractor(s) undertake(s) to demand from all subcontractors a commitment in conformity with this Integrity Pact, and to submit it to the Principal before contract signing.
2)	The Principal/Buyer will enter into agreements with identical conditions as this one with all bidders, contractors and subcontractors.
(3)	The Principal/Buyer will disqualify from the tender process all bidders who do not sign this Pact or violate its provisions.

Section 8 - Criminal charges against violation Bidder(s)/Contractor(s)/ Subcontractor(s):

(1)	If the Principal/Buyer obtains knowledge of conduct of a Bidder, Contractor or subcontractor, or of an employee or a representative or an associate of a Bidder, Contractor or subcontractor which constitutes corruption or if the Principal has substantive suspicion in this regard, the Principal/Buyer will inform the same to the Chief Vigilance Officer, MDL.
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Section 9 - Independent External Monitor/Monitors:

(1)	The Principal/Buyer appoints competent and credible independent External Monitor for this Pact. The task of the Monitor is to review independently and objectively whether and to what extent the parties comply with the obligations under this agreement.
(2)	The Monitor is not subject to instructions by the representatives of the parties and performs his functions neutrally and independently. He reports to the Chairman & Managing Director of the Principal/Buyer.
(3)	The Bidder(s)/Contractor(s) accepts that the Monitor has the right to access without restriction to all project documentation of the Principal/Buyer including that provided by the Contractor. The Contractor will also grant the Monitor, upon his request and demonstration of a valid interest, unrestricted and unconditional access to his project documentation. The same is applicable to Subcontractors. The Monitor is under contractual obligation to treat the information and documents of the Bidder(s)/Contractor(s)/Subcontractor(s) with confidentiality.
(4)	The Principal/Buyer will provide to the Monitor sufficient information about all meetings among the parties related to the Project provided such meetings could have an impact on the contractual relations, between the Principal/Buyer and the Contractor. The parties offer to the Monitor the option to participate in such meetings.
(5)	As soon as the Monitor notices, or believes to notice, a violation of this agreement, he will so inform the Management of the Principal/Buyer and request the Management to discontinue or take corrective action, or to take other relevant action. The Monitor can in

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	this regard submit non-binding recommendations. Beyond this, the Monitor has no right to demand from the parties that they act in a specific manner, refrain from action or tolerate action. However, the Monitor shall give an opportunity to the Bidder(s)/Contractor(s) to present its case before making its recommendation to the Principal/Buyer.
(6)	The Monitor will submit a written report to the Chairman & Managing Director of the Principal within 8 to 10 weeks from the date of reference or intimation to him by the Principal/Buyer and, should the occasion arise, submit proposals for correcting problematic situations.
(7)	Monitor shall be entitled to compensation on the same terms as being extended to / provided to Independent Directors on the Board of Principal/Buyer.
(8)	If the Monitor has reported to the Chairman & Managing Director of the Principal, a substantiated suspicion of an offence under relevant Anti Corruption Laws of India and the Chairman & Managing Director of the Principal/Buyer has not, within the reasonable time taken visible action to proceed against such offence or reported it to the Chief Vigilance Officer, the Monitor may also transmit this information directly to the Central Vigilance Commissioner, Government of India.
(9)	The word 'Monitor' would include both singular and plural.

Section 10 - Pact Duration:

	This pact begins when both parties have legally signed it. It expires for the Contractor 12 months after the last payment under the contract and for all other Bidders 06 months after the contract has been awarded. If any claim is made / lodged during this time, the same shall be binding and continue to be valid despite the lapse of this pact as specified above unless it is discharged / determined by Chairman & Managing Director of the Principal/Buyer.
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Section 11 - Other provisions:

(1)	This agreement is subject to Indian Law, place of performance and jurisdiction is the Registered Office of the Principal/Buyer, i.e. Mumbai/Kolkata (For MDL respectively). The Arbitration clauses provided in the main tender document/ contract shall not be applicable for any issue/dispute arising under this Integrity pact.
(2)	Changes and supplements as well as termination notices need to be made in writing. Side agreements have not been made.
(3)	If the Contractor is a partnership or a consortium, this agreement must be signed by all partners or consortium members.
(4)	Should one or several provisions of this agreement turn out to be invalid, the remainder of this agreement remains valid. In this case, the parties will strive to come to an agreement to their original intentions.

Section 12 - Fall Clause: #

"The Bidder undertakes that it has not supplied/is not supplying similar products/ systems or subsystems at a price lower than that offered in the present bid in respect of any other Ministry/Department of the Government of India or PSU and if it is found at any stage that similar product/systems or sub systems was supplied by the Bidder to any other Ministry/Department of the Government of India or a PSU at a lower price, then that very price, with due allowance of elapsed time, will be applicable to the present case and the difference in the cost would be refunded by the Bidder to the Principal/Buyer, if the contract has already been concluded."

For & on behalf of
MAZAGON DOCKSHIPBUILDERS LIMITED
(Office Seal)
Place _____
Date _____

Witness 1:
(Name & Address)

For & on behalf of
Bidder/Contractor
(Office Seal)

Witness 2:
(Name & Address)



MAZAGON DOCK SHIPBUILDERS LIMITED

(A Govt. Of India Undertaking)

**SHIPBUILDING DESIGN ENGINEERING
DOCKYARD ROAD, MUMBAI - 400 010**

**TECHNICAL SPECIFICATION FOR PROCUREMENT
FOR
DIESEL ENGINES AND LFSS**

(QUANTITY : AS PER P.R.)

PROJECT	:	PSV
YARD NOS MDL	:	Y- 26801
CLIENT	:	SCI
DOCUMENT NO	:	DR/E/PSV/3002
	:	
	:	

0	First Issue	04-08-26	
REV	DESCRIPTION	DATE	AUTHORISED BY
Prepared By	Checked By	Approved By	

राघवेन्द्र सिंह
RAGHVENDRA SINGH
मुख्य प्रबंधक (ज.नि.-रूपांकन अभियंत्रण)
CHIEF MANAGER (SB-DESIGN ENGG)
माझगांव डॉक शिपबिल्डर्स लिमिटेड
MAZAGON DOCK SHIPBUILDERS LIMITED

कमांडर योगेश महानी भानी, (निवृत्त)
COMMANDER YOGESH MAHANI IN, (Retd.)
उप महाप्रबंधक (एस. डी. एवं. डी)
DY. GENERAL MANAGER (Oic SD&DY
माझगांव डॉक शिपबिल्डर्स लिमिटेड
MAZAGON DOCK SHIPBUILDERS LIMITED

SAPNA
अपर महाप्रबंधक / अनुभाग प्रमुख (पी.एस.डी.)
वी आई सी (पी.एस.डी.)
AGM/HoS (P-Shop)/PIC (PSD)
माझगांव डॉक शिपबिल्डर्स लिमिटेड
MAZAGON DOCK SHIPBUILDERS LIMITED

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SECTION I - GENERAL CONDITIONS AND REQUIREMENTS

The general conditions and requirements specified in this Section are intended to meet the functional requirements of the Equipment/ System elaborated in Section II and its associated auxiliaries/support systems; for meeting the overall requirements of the Vessel.

- 1) **General:** The Vessel shall be Platform supply vessel with capability to provide various services required in the offshore operations. The vessel shall be all welded steel hull of round bilge construction with bulbous bow and transom stern.

Main machinery space and accommodation shall be arranged forward of midship.

The vessel shall be propelled by two numbers variable speed Electric Motor driven fixed pitch propellers in azimuth nozzles. Two tunnel bow thrusters shall be installed to achieve high degree of maneuverability and for station keeping.

The vessel shall have Four (4) main diesel alternators in engine room and one (1) emergency generator shall be installed above main deck.

The main diesel generators shall be capable of dual fuel driven (Diesel & Methanol).

The vessel is designed and arranged according to Clean Design class requirements.

Clear Cargo deck area totally approx. 650 m², arranged for four lengths of pipe (12,2 m each) and strengthened for a uniform load of approx. 5.5 t/m².

One (1) pair of passive roll reduction tanks, shall be provided aft of the superstructure.

Well-appointed air-conditioned accommodation for 60 men shall be provided on board.

Vessel shall be SPS 2008 code compliant for carrying not more than 60 persons as per Indian Flag Administration.

- 2) **Class, Rules and Regulations:**

Classification and Port of Registry

Vessel shall be classed with IRS with class notation as given below:

Swastika, SUL, MULTIPURPOSE OFFSHORE SUPPORT VESSEL (SUPPLY, OCC, STS, SSR, AGNI 1), SPECIAL PURPOSE SHIP, LPPF (ML), CMF (C3-c-l), IY, IBS, SYJ, DP2, EP, Cys-E, , IN-WATER SUVEY

The ship shall be built according regulations for international trade, and all relevant Indian Merchant Shipping Rules applicable for this type of vessel.

Flag of Registry

Flag: India

Rules and regulations

The vessel shall be classified, as a "IMS Class VIII" cargo vessel and registered under the Indian Merchant Shipping Act, as amended.

All Indian Merchant Shipping Rules applicable to an IMS Class VIII vessel and Indian Dock Labour board requirements to be complied with.



The Vessel and its equipment shall be designed and built in accordance with International Shipbuilding Standards in respect of general hull, marine engineering and electrical equipment and International Rules and Regulations which are in force at signing of Contract. Rules which may come into force after signing of contract shall be treated as modification:

The vessel shall comply with prevailing IMO Conventions & Codes, M.S. Act, M.S. Rules including orders/instructions/circulars of the GOI, but not limited to SOLAS, MARPOL, ICLL, Tonnage Convention, Prevention of Collision at Sea, OSV Chemical Code, COLREG, HKC, AFS and noise code, depending on the date of Keel lay / delivery, as applicable. The vessel shall comply with all applicable IRS Main Rules and Regulations for the Construction and Classification of Steel Ships.

The vessel to be designed and built in compliance with the following but not limited to:

General

- a. Classification society rules for Multipurpose Offshore Support vessel
- b. Marine laws and regulations of the government of India, ship's flag.

IMO Convention

- a. International Convention on Load Lines, 1966 and amendments
- b. International Convention on Tonnage Measurement of Ships, 1969 as amended
- c. International Convention for the Safety of Life at Sea, (SOLAS 74/78) including all amendments.
- d. International Convention for Preventing Collision at Sea 1972 and subsequent amendments
- e. International Convention for the Prevention of Pollution from Ships (MARPOL 73/78) including all subsequent amendments. (MARPOL Annex I, II, III, IV, V, VI)
- f. AFS, International convention the control of Harmful Anti fouling system on ships 2001.
- g. International Convention on Standards of Training, Certification and Watch keeping (STCW) 1995
- h. International Convention for the Safe and Environmentally Sound Recycling of Ships

IMO Circulars/Resolution:

- a. IMO MSC/Circ 1053- "Explanatory notes to the standards for ship maneuverability
- b. IMO Resolution MSC.215 (82) Performance Standard for protective coatings for Dedicated Seawater ballast tanks in all types of ships
- c. IMO Resolution A1021(26) Code on Alarms and Indicators
- d. IMO Resolution A708 (17) Navigation Bridge Visibility and Functions
- e. IMO Resolution MSC.337(91) Code on noise levels on board ship
- f. Resolution MEPC. 227 (64) – 2012 Guidelines on Implementation of Effluent Standards and Performance Tests for Sewage Treatment Plants.
- g. Resolution MEPC.282 (70) – 2016 Guidelines for the Development of a Ship Energy Efficiency Management Plan (SEEMP)
- h. Resolution MEPC.245 (66) – 2014 Guidelines on the Method of Calculation of the Attained Energy Efficiency Design Index (EEDI) for New Ships
- i. Resolution MEPC.254 (67) – 2014 Guidelines on Survey and Certification of The Energy Efficiency Design Index (EEDI)
- j. Resolution MSC.128 (75) - Performance Standards for a Bridge Navigational Watch Alarm System (BNWAS)
- k. IMO Res A673 (16) Guidelines for the Transport and Handling of Limited Amounts of Hazardous and Noxious substance in Bulk on offshore supply vessels as amended by IMO Resolutions MSC 236 (18), and MEPC 158 (55).
- l. IMO MSC Circular 1097 Guidance relating to the Implementation of SOLAS Chapter XI-2 and the ISPS Code, the application of ISPS to be limited to below:



- m. Automatic Identification System (AIS)
- n. Ship Security Alert System (SSAS)
- o. IMO Number
- p. Resolution MSC.263 (84) – Revised Performance Standards and Functional Requirements for the Long-Range Identification and Tracking of Ships.
- q. MSC Resolution 191 (79) Performance standards for the presentation of Navigation Related Information on ship borne Navigational Displays
- r. IMO Resolution A.952(23) - Graphical Symbols for Shipboard Fire Control Plans
- s. IMO Resolution A.760(18) - Symbols Related to Life-Saving Appliances and Arrangements
- t. IMO Resolution A 237 (82) - Code of Safe Practice for the Carriage of Cargoes and Persons by Offshore Supply Vessels (OSV Code)
- u. MSC Resolution MSC 235(82) “Guidelines for the design and construction of Offshore Supply Vessels” (Replacing IMO 469 (XII).
- v. ISO 20283-5:2016, Guidelines for measurement, evaluation and reporting of vibration with regard to habitability on passenger and merchant ships
- w. MSC.1/Cir.1586- List of Certificates and documents required to be carried onboard ships
- x. MSC1 Cir.1621 interim guidelines for safety of ships using methanol as fuel

IMO Codes:

- a. SPS Code 2008, IMO MSC.266(84) Code of Safety for Special Purpose Ships
- b. FSS Code - Fire Safety Systems – Resolution MSC.98(73)
- c. 2010 FTP Code – International Code for Application of Fire Test Procedures, 2010
- d. 2008 IS Code – International Code on Intact Stability, 2008
- e. ISPS Code - International Code for the Security of Ships and of Port Facilities
- f. Code of Noise level on board ships – Resolution MSC 337 (91)
- g. NO(x) technical code 2008
- h. Offshore Chemical code (OSV)
- i. OSV code 2006

ISO Standards:

- a. ISO 20283-5:2016– “Mechanical vibration” Guidelines for the measurement, reporting and evaluation of vibration with regard to habitability on merchant ships.
- b. ISO 7547: Air-conditioning and ventilation of accommodation spaces and other enclosed compartments on board ships
- c. ISO 8861: Engine-room ventilation in diesel-engine ships
- d. International Electro technical Commission (IEC) Publication 92 - Electrical Installations in Ships.
- e. ISO 15016:2015- Guidelines for the assessment of speed and power performance by analysis of speed trial data.
- f. IEC 60092 Electrical installation in ships.
- g. IEC 60533 Electrical and electronic installations in ships- Electromagnetic compatibility (EMC) – Ships with metallic hull.
- h. IEC 60950 – Safety of information technology equipment
- i. IEC 60945 – Maritime navigation and radio communication equipment and systems – General requirements - Methods of testing and required test results
- j. IEC 61508: Functional Safety of Electrical/Electronic/Programmable Electronic Safety-related Systems.
- k. ITU Radio Regulations - International Telecommunication Union (ITU) - Radio Regulations, 1974, 1982 and Amendments (GMDSS)

3) Ship's Support Systems Supplies:

Following ship's support supplies shall be available for the equipment system. For electrical supplies, in case of different requirements (voltage/frequency, etc.), the equipment supplier shall provide suitable provision (transformer/converter/UPS, etc.).



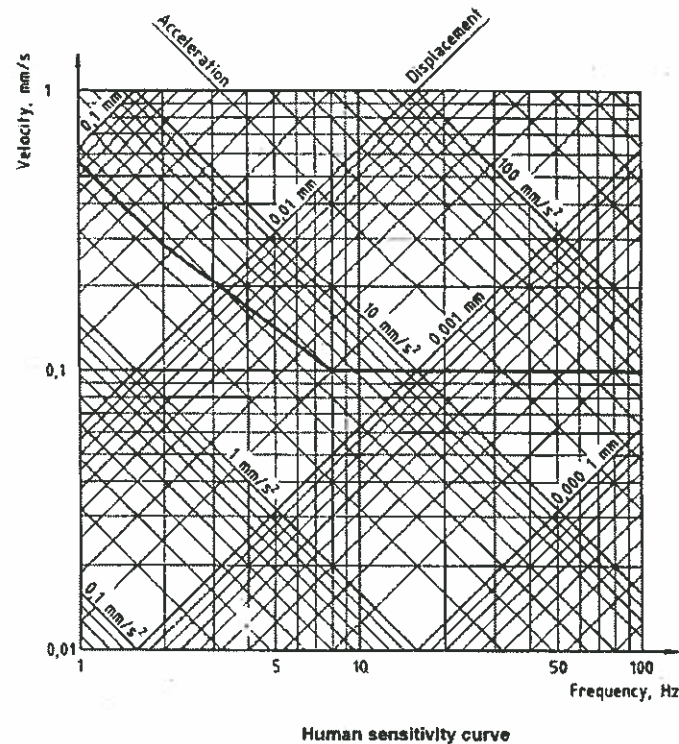
4) Vibration:

The operation of all equipment shall be satisfactory under the condition of vibration and shock as would arise in normal practice.

Special attention is to be paid in design and manufacture of the equipment to prevent undue vibration. Vibration limits, evaluation and measurement shall follow the provisions of ISO 20283-5:2016, Mechanical Vibration – Guidelines for the measurement, reporting and evaluation of vibration with regard to habitability on passenger and merchant ships.

Vibration velocity limits are not applicable near equipment seatings.

The vibration measurement is to be made at sea trial condition and when the Vessel is running ahead steadily at the continuous service output of the main engine.



If Vibration level exceeds the limit of the above defined criteria, vendor to make necessary improvement to a practical extent. Vendor shall submit the vibration analysis (prediction) report for MDL's reference.

5) Noise Level:

Vendor shall ensure that the noise level for equipment in the accommodation space, working space and engine room is to be within the limits specified in IMO.MSC 337(91), Code on Noise Level on board ships.

Noise level shall be measured by the Builder in accordance with above Resolution. A report on noise measurement by third party inspectors shall be submitted.

If the measured noise levels exceed 3 dB than the recommended value, the Builder shall make necessary improvement agreed between the Buyer and the Builder as far as practicable.

In order to reduce the sound and vibration levels in the accommodation and engine rooms, the Builder shall take the following preventive measures into account, this includes, but not limited to:

- (a) Ventilation units, fans, auxiliaries, etc. shall be fitted with elastic mountings and noise traps

- (b) Ventilation and air -conditioning ducts shall be sound insulated
- (c) Machinery control room shall be sound insulated
- (d) Silencers for the generators

6) Manning Policy:

- i. The machinery spaces are envisaged for unmanned continuous operation. The spaces will be attended for starting/shutdown procedures and for routine checks.
- ii. Controls and surveillance on board the ship will be through Remote controls.
- iii. Each vital machinery shall be capable of control at the equipment level and need to be monitored from specified control station as recommended by the vendor and as per the class rules.

7) Documentation:

Various documents will be submitted by the equipment supplier as per the scope of supply and responsibility. Quality documentation is to be submitted in comprehensive and time bound manner for meeting ship's detailed design and production targets as well as equipment production and delivery schedule. Documentation to be submitted by the equipment supplier is broadly indicated below:-

Table 1

SNo	Documentation	Remarks	Timeline (In Weeks)
(a)	i) Binding design documentation ii) (QAP) Quality Assurance Plan	i) For progressing with detailed design. ii) Equipment quality assurance during production	PO + 02
(b)	FATs procedure.	Equipment quality assurance during FATs.	PO + 06
(c)	Equipment STW/HATs/SATs documentation	For preparing installation inspection/Test and Trials documentation	PO + 12
(d)	Technical Manuals for equipment operation, maintenance, logistics, etc.	For ship's crew, training and repair organizations.	PO + 14

All documentation (including documents, drawings, data, reports, manuals, etc.) should be in English language. Dimensional details in the drawings should be as per scale. Technical data and parameters should be in metric units (SI Units). Orthographic drawings & 3D model of equipment (associated components), in soft copies are to be submitted. Following file/formats would be acceptable:-

- a. Documents, data & reports in MS-WORD / EXCEL/ PDF, as applicable
- b. ACCESS for data base files
- c. Orthographic drawings (2D) in .DXF / .DWG format.
- d. 3D model of equipment (associated components) in .STP/ .IGES format.

Note: Above drawings/data are to be submitted in soft copies in latest software version.

Overall documentation must be of high quality in terms of contents, clarity and completeness; for meeting the requirements of detailed design, integration, manufacturing, quality assurance, installation, trials and operation/maintenance of the equipment.

All documents shall be sent electronically in PDF format without encryption and password. Printing of PDF provided by vendor shall be possible.

Vendor shall supply electronic copies (2 sets) of all finished plans and manuals to MDL including Class approved drawings duly stamped together with associated Class approval letter without delay.

f

All finished plans and manuals shall be in printable PDF format without password or encryption. All instruction books shall be provided in printable electronic format.

Vendor shall supply electronic copies (2 sets) and two (2) hard copy of drawings, manuals and instruction books for main and auxiliary machinery and all other major components such as motors, pumps, navigation & communication equipment, etc. to MDL. The instruction books from suppliers shall be provided only for the first Vessel if there are no change for the Vessel series.

The drawings and documents which need approval by the Classification society are to be submitted to the society directly by the Vendor with information to MDL. The responsibility of getting the drawings and document approved from the classification society lies with the Vendor. The final approved drawings and documents are to be submitted to MDL.

Approval by the Classification society and / or other regulatory authorities shall in no way be interpreted as approved by MDL, and MDL shall be entitled to make further requests provided they do not conflict with the requirements of specification of the PO.

Two (2) sets of instruction books and manuals of all equipment and systems to be furnished to MDL in electronic format (USB type storage device) in PDF or other agreed format; one each to the Vessels and to MDL. USB type storage device shall contain finished manuals and instruction booklets of all equipment as far as practical. Vendor is to supply two (2) hard copies of the finished drawings (as built) to MDL.

DOCUMENTATION:

4 Sets of Approval Drawing in total contract (with PDF file by e-mail)

4 Sets of Working Drawing in total contract (with PDF file by e-mail)

Three(3) Sets of Instruction Manual & Final Drawing per each shipset

2 / 1 Sets of Electronic Instruction Manual on USB for the 1st / 2nd-series ship

Factory Acceptance Test Reports :

Engine shop test records included in Final Drawing service

Torsional Vibration Calculation

Calculation of torsional vibration for GenSet

Language & Unit:

Drawing and Instruction Manual written in English

Language in Plates :

Name Plates and Caution Plates written in English

Unit Description of Instrument :

°C for temperature and bar for pressure

10 Quality Assurance And Testing:

As per the class requirement.

Test, Trial and Inspection:

Tests and trials shall be carried out, in general, according to the usual standard Engineering practice and normal international shipbuilding practice in the presence of the surveyor of the Classification Society and the Buyer's and the Builder's representatives.

The Supplier shall submit the procedure and schedule of test and trial for the Buyer's approval. All results to be recorded and presented to the Buyer.

Following notice to be given for tests and inspections in shipyard and outside shipyard:

- Two (2) working day for shipyard test and inspections in general
- Four (5) working days for outside shipyard tests and inspections in country of shipyard
- Twenty five (25) days for outside shipyard tests and inspections in country other than the one of shipyard.
- Four (4) weeks for Factory Acceptance Tests

a. Shop Test and Inspection

2

Shop tests and / or inspection of machinery and equipment shall be carried out in accordance with the Builder's and / or Manufacturer's standard practice, except specially mentioned in Section II of this Specification.

Detailed description of shop tests except for minor equipment shall be referred to respective clauses of the Specification.

b. FATs-(Factory Acceptance Trials) (Acceptance Test Procedure) ATP(OAP document)

Documentation on equipment FATs procedure is to be submitted by equipment supplier in time bound manner, well in advance for approval by the designated inspection organization.

c. Harbour Acceptance Trials/Sea Acceptance Trials: -

During equipment setting to work and HATs/SATs, equipment suppliers shall assist and offer the respective equipment trials for successful completion of trials phase. Equipment testing, tuning and any defect rectification during on-board trials shall be undertaken by the equipment supplier in efficient and effective manner.

The HATs/SATs document is to be submitted by the supplier. HATs/SATs shall be carried out to the satisfaction of Inspection agencies.

11 Spares:

Spares, are to be recommended by equipment supplier, considering operational and maintenance requirements of the equipment. Equipment supplier shall submit comprehensive list of all types of spares & tools along with the technical offer. The list of spares to be supplied should comply with class requirements and those listed in Section II of this document.

12 Installation & Commissioning Consumables:

a. Installation Tool: Special tools, jigs and fixtures & test equipment required for Installation, flushing, setting to work, testing & tuning, on-board trials (HATs/SATs) and post Sea Trials inspection of critical internal parts and reassembly of the equipment and its auxiliary systems shall be supplied.

b. Commissioning Consumable: The Commissioning consumables (first charge like coolants, greases, special oil, filters, gaskets, refrigerant etc.) shall be included in the scope of supply. Commissioning consumables shall be delivered before STW of the main equipment, tentative schedule of which shall be indicated in the Tender Enquiry.

13 Interchangeability:

Equipment design is to ensure that components and parts having same dimensions and characteristics should be inter-changeable between different units of similar kind, without affecting the specified equipment performance.

14 Tally and Diagram Plates:

All major components, including fittings such as valves, cocks, levers, gauges, switches, etc., should be provided with suitable identification tallies for appropriate identification. Tally plates shall be in English language and in SI units. All tallies and diagrammatic plates shall be of brass or aluminium as per manufacturer standard. They are to be fixed with screws firmly. Tallies for safety, caution & warning considerations should be in bold black letters on a fluorescent orange background. Diagrammatic plates indicating details of connections are to be provided / affixed near the terminal box of the motor.

Additional details required are as follows:

- a. Motor details such as HP (kW), Starting Current, Full Load Current, rpm, Insulation, Weight, Maker's Name, Sr. No. of Machine, Year of Manufacturing, Weight of Equipment, IP Rating of the equipment etc. shall be given in the motor tally plate.

- b. Danger labels in Red colour with white lettering are to be provided on all electrical equipment operating on 150Volts or higher
- c. Motor winding terminals ending at Connection Box shall have engraved tally number.
- d. The diagram plate, which is fixed on the rear side of the front door, shall have complete wiring diagram of the starter with sub-component identification number. The same identification number shall be engraved on the components fitted on the starter.
- e. Internal Cable-Cores terminating at the connection terminal strip shall have the same corresponding terminal ferrule no. Fixed / fitted on it.
- f. Tally of JB/Panel and other equipment internal diagram plate to be prepared by OEM.
- g. Cable Tallies as per approved system drawing to be prepared by OEM.
- h. Cable tallies should be supply for both the ends.

15 Instruction Plates:

Instruction plates listing the starting/shut-down procedure and precautions in brief are to be prominently displayed on the equipment. The Instruction plates shall be of brass or aluminium as per manufacturer standard. Equipment is to be supplied with a set of instruction plates duly mounted on equipment or supplied loose.

16 Painting:

Standard painting procedure shall be applicable for suitability for marine environment.

PAINTING COLOUR

Engine finally painted in colour of Munsell no. 5 PB 4/4 (Navy Blue)

Alternator finally painted in colour of Munsell no. 5 PB 4/4 (Navy Blue)

Electric Panel Paint Colour(Loose Supply Panel Only)

* Final painted in color of RAL 7032 (Pebble grey)

17 Lifting Arrangement:

Equipment components weighing more than 25 kilograms are to be provided with eyebolts, for ease of handling/lifting on board the ship or ashore. During transportation/transit of equipment, adequate provisions (such as supports, locking arrangement, jacking, etc.) are to be made for preventing any damage to the equipment & its associated components. Any component requiring special handling shall be clearly marked and appropriate handling instructions shall be provided by equipment supplier. One set of lifting gear shall be supplied to MDL.

18 Preservation / Conditioning:

Equipment supplier is to provide high quality packing for the complete scope of supply along with handling arrangements. The package/container should display clear instructions for stowage, handling, care and accessibility for inspection of equipment preservation condition.

Equipment shall be supplied with Initial preservation for a period of 24 months for tropical conditions and protected against high humidity. The equipment is to be preserved on delivery as per the standard marine engineering practice. Closing plates/plugs/caps are to be provided on all openings.

Equipment supplier shall provide procedure & list of preservatives/consumables for re-preservation requirements, at shipyard or on board ship beyond initial preservation period.

19 Packing & Shipping:

All equipment shall be adequately packed and protected with supports to ensure adequate protection during all methods of transportation. Each unit within a package/container shall be clearly marked in English for identification. The container shall clearly indicate the commodity description with caution marks, weight, size, etc.

A separate document giving complete details & instruction for storage, preservation, handling & transportation after delivery shall be supplied & a copy must be included with the shipping document. The supplier should indicate the delivery schedule port of embarkation, transport, packing, preservation, insurance etc.

2

Following items shall be packed in separate containers/boxes with proper colour coding (with description) & list of their contents in English for their easy identification and traceability:

- a) Deliverables related to Main Equipment (to be marked in green colour).
- b) Deliverables related to Auxiliary Equipment (to be marked in green colour).
- c) Deliverables related to Installation material and Tools related to Main & Auxiliary Equipment (to be marked in green colour).
- d) Commissioning consumables and Tools (to be marked in green colour).
- e) Spares and Tools (to be marked in red colour).
- f) Documentation (to be marked in blue colour).

The list of actual deliverables against each of the above serials shall be forwarded to shipyards in soft copy (MS Excel format) with required part nos. within one week of finalization of PNC in order to detail them in the purchase order.

Packing list should give further breakup of items, wherever particular item is quantified by set.

20 Security of Information:

The information contained in this document is not to be divulged to any other firm/third party without the prior permission of MDL. Adequate measures are to be taken to ensure safe custody of this document.

21 Warranty:

The equipment along with associated auxiliaries/components shall be warranted by the equipment supplier for the stipulated performance for a period of twelve (12) months after planned delivery date (D) (Refer table 4. below) of the ship by MDL to the Owner.

During the said period, the equipment supplied shall be warranted against any malfunction, defects, material failure, and non-compliance to ordered specifications, sub-optimal performance, design deficiency, poor workmanship and quality. Any expense on account of equipment malfunction, repair or supply of spares against guarantee defects is to be borne by the equipment supplier. In case, warranty extension is required the same is to be catered for by the equipment supplier. If any defective part to be taken back to OEM's factory (i.e. importing and re-exporting from Country of origin), for service purpose the liability of the same shall be borne by the supplier.

Extension to Warranty: Supplier shall mandatorily indicate, in the offer, the annual rate for extended warranty period, along with the commercial terms and conditions if any.

The rates are to be indicated for the equipment in preserved state as well as for the equipment having been de-preserved and in operation.

22 Planned Ship Delivery Details(D):

The planned dates for delivery of the Ships to the Owner by MDL is tabulated below:

Table 2

Ship no.	Planned Delivery date
PSV-1	Dec 2028

23 Weight Recording / Weight Certificate:

Weights of all components are to be recorded and a suitable certificate shall be submitted, by the equipment supplier. The designated inspection authorities shall countersign such certificates. Format for weight control data sheet, is placed at Annexure 2 of this document.

Net weight of each component is to be recorded in presence of designated inspection authority and the weight certificate is to be submitted by the equipment supplier, along with equipment supply. Format for weight certificate, is placed at Annexure 3 of this document.

24 Technical Assistance:

The Supplier shall provide the necessary representative(s) to assist, as and when required, in carrying out inspection and supervise the work that is done on the equipment, during the following phases:

- a. Preparation for installation of equipment by shipyard.
- b. Monitoring of proper equipment preservation during storage.
- c. Setting to Work (including fitment of latest calibrated instrumentation).
- d. Assistance during Harbour trials (till clearance by Shipyard & Class)
- e. Assistance during Sea trials
- f. Assistance in trouble shooting / attending equipment operational problem till warrantee period
- g. Post CST equipment Inspections.

The supplier shall indicate total cost for executing all technical assistance activities mentioned above, in the price bid.

Shipyard has to progress on ship construction activities, simultaneously on ships of the same Class/Project or on ships of different projects. View this; there shall be every likelihood of clash of requirement of technical assistance. In such eventuality, in order to avoid delays on one ship due to similar work requirement on other ship, supplier shall depute their dedicated separate/independent team of supervisors/specialists for required technical assistance, on the required ships. Rotation of supervisors/specialist amongst the various ships/projects shall be avoided.

The supplier shall provide checklist for installation, setting to work, HATs & SATs to the shipyards to ensure the completeness of the activities by shipyards in order to avoid waiting period of the supplier specialists.

25 Compliance Matrix and Deviation:

Para-wise compliance matrix, including Para which are not applicable, as per the technical specifications (contained in this document) shall be submitted by the equipment supplier along with the technical offer, in the format at Annexure-1.

↑

SECTION-II

TECHNICAL REQUIREMENT

26 General

All equipment, machinery, instruments, and installations shall be of the latest design and construction and as per best shipbuilding practice. They shall be of the reputed make and suitable for tropical, humid marine climate. Similar machinery, equipment etc. shall be so selected as to have maximum inter-changeability of their parts wherever possible.

All machinery will be first class marine type with all normal outfitting and accessories. Machinery in this group to fulfil Class rules and ISO 3046/1 for capacity or effect under the following ambient reference conditions:

- a. Total barometric pressure: 1 bar
- b. Ambient outside air temperature: 0 °C to 45 °C
- c. Relative humidity of air: 70 %
- d. Sea water temperature: 32 °C

Components and systems in this group covered by the Classification will be designed to operate under the following environmental conditions according to Class rules but with reduced power in conditions with air temperature over 45 °C:

- a. Air temperature in the machinery space between 0°C and 55 °C.
- b. Relative humidity of air in the machinery space up to 95%.
- c. Sea water temperature up to 32 °C.
- d. List rolling, trim and pitch according to limits for the Classification notes.

Diesel generator sets will be resiliently mounted.

Where applicable for machinery, equipment or components international standards shall be followed. Modern systems, machinery, equipment shall be provided for fuel and energy efficiency and shall have adequate controls, gauges, alarms and safety measures.

The vessel shall be equipped with modern remote-control arrangements so that the manoeuvring with the propulsion machinery can be controlled from the Bridge Deck.

The vessel shall be designed and constructed to have minimum noise and vibration levels.

Necessary torsional vibration calculations shall be carried out to the approval of classification society.

The exhaust emissions of the diesel engines shall meet the MARPOL 73/78 Annexe VI requirements.

Flexible anti-vibration mounts shall be used for auxiliary engines/generating sets, exhaust system, etc., for isolation of noise and vibration.

4

27 Diesel Generator Set Scope of Supply:**Table 3**

Sr.No.	Description	Quantity/ Ship sets
1	Diesel Generator Set mainly consisting of Diesel Engine coupled to the Alternator Common base frame with resilient rubber mountings Jack screw bolts for GenSet levelling GenSet Damping Device	4 sets
2	Diesel Generator Lube Oil Cooler (mounted on engine)	4 sets
3	Diesel Generator Fresh Water Expansion Tank with low level & very low level switch/sensor & level indicator.	4 sets
4	Diesel Generator Compressed air module for starting stopping and over speed (inside the enclosure)	4 sets
5	Diesel Generator Intake silencers (stainless steel) & stainless steel bellows. SS grade BS EN 10095 can be used as per Def Stan 313	4 sets
6	Diesel Generator two or three stage marine Air intake moisture filter with stainless steel bellows & Ventilation Air Filter for Enclosure. (depending on ventilation configuration and air quality requirements)	4 sets
7	Diesel Generator local control & monitoring system (with required shock mount & fasteners.) Mainly consisting of: 01 in no. LCP for DA Interface with IPMS as required. It should also include Sensors & instrumentation for ship systems related to engine (starting air, F.O., L.O., S.W., F.W. etc)	4 sets
8	Independent Electric Driven Lub. Oil Priming Pump mounted on the engine along with the starter to be provided. Suitable shock mounts for pump and starters, if necessary, to be provided.	4Sets
9	Lube oil manual priming pumps with non-return valve & required shock mount & fasteners.	4 Sets
10	Alignment Tools and Test Equipments if required.	1 Set
11	Flexible hoses, bellows, Counter flanges/Fittings, joints, fasteners, electrical connectors, etc. required for all ship's system interface.	4 Sets
12	Handling & lifting gear (including jigs & fixtures), as applicable	One set / Ship yard
13	Lube oil, preservative, cleaning solutions etc. and any other required consumables for first charge.	1 Set
14	Fresh water Pre-Heater	4 Sets
15	Flexible coupling x 2sets (for front PTO)	2 Sets
16	PTO shaft x 2sets	2 Sets
17	Flexible connecting hoses including T/C outlet expansion joint Flexible connecting hose for double-walled gas pipe Flexible connecting hose for ventilation air inlet External connection flanges in accordance with JIS-Standards External flanges sealed without counter-flanges Counter-flange of double-walled gas pipe O-rings, bolts & nut, washers for double-walled gas pipe flexible hose.	4 Sets



28 LFSS Scope of Supply:

No.	Item	Material Supply	Quantity	Remarks
1	MeOH LFSS			
	- P&ID			KSOE will provide P & ID
	- MeOH pump (Vertical, magnetic sealing type)	KSOE	2 set	1 main and 1 stand by (KSOE to integrate both the pump in control panel)
	- MeOH heat exchanger (Semi-welded plate)	KSOE	1 set	
	- Duplex filter (with DBB)	KSOE	1 set	
	- Flowmeter (Colioris)	KSOE	1 set	
	- Valves, Cable, Instruments, Insulation, Piping within LFSS unit	KSOE	1 set	
	- Valves, Cable, Instruments, Insulation, Piping outside LFSS unit	Yard/ KSOE		Manual valve will be provided by MDL. Remote controlled valve for automatic operation of system as mentioned in TSP shall be provided by KSOE
	- Starter (LP Pump) & JB	KSOE	1 set	Capable to operate main and stand by pump
	- Glycol Water Pump	KSOE	1 set	
	- Glycol Exchanger (Plate)	KSOE	1 set	
	- Skid fabrication	KSOE	1 set	
2	LFSS Control System			
	- LFSS control cabinet	KSOE	1 set	
	- I/O module for LFSS	KSOE	1 set	
	- Work station and monitor for LFSS	KSOE	1 set	
3	Emergency shut-down system			Philosophy shall be provided by KSOE for implementation by yard
	- Cause & Effect chart	KSOE		
4	Valve Remote Control System for LFSS			
	- Actuators (Pneumatic) within LFSS skid	KSOE	1 set	Interacting provision with IPMS for remote operation shall be provided.
5	MeOH Bunkering Station			Provision of Discharging of methanol tanks shall be provided.
	- P&ID	-		KSOE will provide P & ID
	- MeOH fuel bunker station (incl. loading (spill coaming) platform)	KSOE		
	- Valves, Cable, Instruments, Insulation, Piping within bunker station	KSOE		Overflow control mechanism shall be implemented as per TSP.

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	- Valves, Cable, Instruments, Insulation, Piping outside bunker station	Yard/ KSOE		Manual valve will be provided by MDL. Remote controlled valve for automatic operation of system as mentioned in TSP shall be provided by KSOE.
	- Water curtain for hull structure	Yard		
	- Water spray nozzle for bunker station	Yard		
	- Fire fighting system	Yard		
	- QC/DC	Yard		
	- MeOH bunkering hose	Yard		
	- MeOH bunkering saddle	Yard		
	- MeOH bunkering handling davit	Yard		
6	Ship Shore Link System (Port & Stbd)			
	- Main control cabinet	KSOE		
	- Ship shore connection box (Port & St'bd)	KSOE		
	- Hand carry reel	KSOE		
	- Cable	KSOE		
	- Loop back test unit	KSOE		
7	MeOH Transfer Pump (2 Nos)			
	- MeOH transfer pump with hydraulic power unit	KSOE	2 + 1 stand by	2 Nos submersible pump and 1 nos stand by pump with starter and control system
	- Hydraulic oil tank	KSOE		KSOE shall provide control system for automatic filling of both service tank to maintain pre-defined level.
	- Starter	KSOE		
	- Valve & Instrument	KSOE		
8	N2 Generator System			
	- P&ID			KSOE will provide P & ID
	- N2 generator (Membrane)	KSOE		
	- Feed air compressor	KSOE		
	- N2 buffer tank	KSOE		
	- O2 analyzer for N2 gas and N2 room	KSOE		
	- DBB & Check valve for N2 gen. discharge line	KSOE		
9	Gas Detection System			
	- Sensing point	Yard		
	- Control panel	Yard		
	- Repeater panel	Yard		
	- Cable, Piping, Tube	Yard		
	- Portable gas detector	Yard		
	- Audible and visual alarm	Yard		
	- Continuous sampling panel	Yard		
	- Liquid leakage detector (Level switch)	KSOE		

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10	Venting System			
	- P&ID	-		KSOE will provide P & ID
	- Vent mast	Yard		
	- Cable, Piping for vent mast	Yard		
	- Valves, Instruments, Insulation for vent	Yard		
	- Vent cowl & flame arrestor	Yard		
	- Ventilation fan	Yard		
	- Silencer	Yard		

29 Main Propulsion & Main Diesel Generating Sets:

Main Diesel Generating Sets

- a) Four (4) identical generating sets are required, each suitable rated capacity 690V, 50 Hz / 3Ph shall be installed in engine room.
- b) Main diesel engines are to be of medium speed, four strokes, turbocharged and shall be as follows:

Make/Model	: HYUNDAI (HHI-EMD) / 6H22CDF-LM, IMO Tier II
MCR	: 1440 kW
RPM	: 1000
Fuel type	: Methanol & MDO
SFOC at 85% MCR	: Methanol 346.8gm/kwh, 25.8gm/kwh
PTO	: 2 no's gen. sets to have PTO for external Fi-Fi
Type	: 4 stroke Fuel Engine for Marine Genset
Alternator rating	: 1368 kWe

- c) Bearings shall be provided at drive end and non-drive ends of the alternator.
- d) Engine & alternator coupling: Direct disc coupling with lamination disc plates on alternator shaft.
- e) Voltage drop regulation and transients (voltage & frequency) shall be as per class requirements
- f) Common base frame with resilient rubber mountings for complete DG set

Basic Design Characteristics: -

- Heat exchanger cooled
- Air start
 - 4 stroke
 - Engine mounted L.O, fresh water, fuel oil and
 - Engine mounted L.O. and fresh water coolers
 - Remote start from Engine Control Room
 - Resilient mounting
 - Brushless type
 - Insulation Class F with temperature rise "B"

The diesel generators shall also be suitable for operating with bio-fuels.

The DGs will be equipped with electronic remote control from bridge, and instruments according to DG manufacturer's standard and class requirements. All attached pumps shall have electric motor driven standby units having same capacity.

Generators shall be designed for continuous parallel operation in any combinations. Provisions for auto start, auto load sharing and auto synchronization shall be provided. The cooling of engines shall be done by individual heat exchangers cooled by sea water.

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The engines shall be complete with accessories for efficient running of the engines, control, monitoring and alarms in commensurate with the design of the engines and meeting CLASSIFICATION SOCIETY and statutory requirements.

Two (2) engines shall be provided with one (1) each P.T.O at one end to drive a fire pump via a step-up gear box with clutch (if required) to match the RPM complete with isolation switch.

The engine shall comply with latest IMO Tier II regulations for SOx and NOx emissions with EIAPP certificate.

- a) The DG sets shall be continuous duty type, four-stroke, trunk type, turbocharged, Medium speed (up to 1000 RPM), 50 Hz and non-reversible type marine diesel engines directly coupled to generator and Tier II compliant.
- b) The enclosure shall be IP 44.
- c) Temperature rise B and insulation class F.
- d) The generators shall be 3 phase synchronous brush less, self-excited type, self-regulated and to be installed including all associated systems and accessories.
- e) 2 out of 4 Gen sets to be provided with PTO for driving External Firefighting pumps.
- f) Main generator sets shall be suitable for continuous parallel operation.
- g) Each main generator set shall be supplied as a complete unit on a common skid.
- h) Engines equipped with all necessary devices including all temp. and pressure gauges, oil mist detection on the engine and electronic governors (speed drop 3-5%, 0-100% load), all according to the latest maker's standard.
- i) The automatic voltage regulator shall have the voltage adjustment from the main switchboard.
- j) There need to be performed a full torsional vibration analysis for engine, PTO and Fi-Fi pump.
- k) The safety and alarm system of the main generator engines will be connected to
- l) Vessel's automation system.
- m) Pre-lube pumps and fuel feed pumps have to run before start-up of diesel engines, each
- n) Pre-lube pump and fuel feed pump shall be fed from both main switchboard and emergency switchboard (automatic change-over) for sufficient black-out recovery.
- o) Each engine shall be fitted with local operation console with Tachometer, lube. Oil pressure gauge, cooling water thermometer, oil temp gauge, hour Counter and start/stop button.
- p) The automation, alarm and safety system and accessories and other details are to be elaborated in this section once the Generator engine OEM is finalized.
- q) The generator to be equipped with:
 - Anti-condensation heaters, 230V
 - Excitation equipment (AVR to be mounted in a switchboard) incl. Over-voltage/Excitation fault detection system according to Class
 - Winding temperature sensors (2 sets)
 - Bearings temperature sensors
 - Cooler leakage detector
 - Control and monitoring system shall be interfaced with IAS
 - Transformers for differential protection
 - Single Sleeve bearings (natural cooling)

The design, construction, materials, spares and accessories shall be of manufacturer's standard except specially mentioned herein, in accordance with the requirements of the Classification Society, under the inspection of the Classification Society as required.

The engine shall be properly designed and constructed for operation with low sulphur marine gas oil in accordance with manufacturer's standard.

The engines shall be directly coupled to the alternators on a common bed and shall be mounted resiliently. All connections to the engines and alternator are to be of flexible type.

At shop test, generator engine shall be coupled with generator on test bed.

Shop trials for the engine shall be carried out as follows at manufacturer's shop, according to the engine manufacturer's standard practice.

Starting test at no load

Load test coupled with the relevant generator, by means of water-resistance loading

25% load 20 minutes

50% load 20 minutes

75% load 20 minutes

Full load 60 min

10% over load 20 min

Governor test

Parallel operation test

Emergency trip confirmation test

Fuel oil consumption measuring

Bearing temperature measurement

Overspeed to be tested for Gensets as per Class requirement and engine maker recommendation

After shop trial, one cylinder and one main bearing are to be inspected.

31 Accessories:

The following accessories, but not limiting to, shall be supplied for each engine.

Fuel oil system:

Normal operation with Distillate Fuel Oil in accordance with ISO8217 (2017) DMA/DFA/DMZ/DFZ/DMB/DFB or equivalent except some properties.

- Fuel injection pump on each cylinder
- Combined fuel injection valve on each cylinder
- High pressure injection pipe or block on each cylinder
- Fuel oil leakage tank
- Level switch for leakage alarm
- Fuel oil filter, Duplex manual cleaning with fineness 50 micron

N2 system – For purging and inerting

- N2 Generator
- Feed Air Compressor
- N2 buffer tank
- O2 analyzer for N2 gas and N2 room
- DBB & Check valve for N2 gen. discharge line
- Lubricating oil temperature control valve, Wax-thermostat type

Lubricating oil system:

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- Lubricating oil viscosity, SAE 40
- Wet oil sump incorporated in common base frame
- Engine driven lubricating oil pump, Gear type
- Electric motor driven pre-lubricating pump
- Lubricating oil cooler, Plate type in stainless steel plates
- Lubricating oil temperature control valve, Wax-thermostat type
- Lubricating oil filter, Duplex paper cartridge with fineness 15 micron
- Lubricating oil centrifugal by-pass filter

Cooling water system:

- HT-Cooling water for cooling;
 - . Cylinder jackets
 - . Cylinder heads
 - . Exhaust valve seats
 - . Charge air cooler
- LT-Cooling water for cooling;
 - . Lubricating oil cooler
 - . Charge air cooler
- Coolant for both HT-circuit and LT-circuit as fresh water only
- LT-Cooling water inlet temperature based on 36°C
- 2-String connection as HT & LT-circuit separated
- Steel pipe treated Parkerizing for both HT & LT-water piping
- Engine driven LT circulating pump, Centrifugal type
- Engine driven HT circulating pump, Centrifugal type
- Temperature control valve, Wax-thermostat type
- Hot water from running engine via venting connection
- Electric element type preheater built on engine

Compressed air system:

Engine started by compressed air with injected directly into the cylinders

- Main starting valve
- Pilot starting valves in starting order
- Starting valves on cylinder heads
- Air pressure of 30 bar to be applied as starting air for the main generator engines.

Air Intake & Exhaust System:

- 1-Stage charge air cooler designed LT & HT-water cooling stack
- Turbocharger equipped with dry air filter.
- Turbocharger located at Free-end side (Opposite to flywheel)
- Exhaust gas outlet, Vertical direction
- Water-cleaning provision for both compressor and turbine side
- Water container for compressor side, built-on engine
- One (1) /ship loose delivered water hose with reducing valve for turbine cleaning

Spare pumps:

Spare pumps as below (per ship set) shall be provided for redundancy as per class rules / OEM standard.

- 01 x LT cooling pump
- 01 x HT cooling pump
- 01 x LO pump

Cooling Water Preheater:

One (1) electric cooling water FW pre-heater shall be provided for the Main engines in accordance with Maker's recommendations.

Fuel Supply System for DG Engines

Normal operation with Methanol in accordance with engine manufacturer's standard.

There shall be two (2) methanol fuel storage tanks and two service tanks, integral type shall be provided. Cofferdams around the tanks as per Class requirements shall be provided.

Submersible/Deepwell pumps shall be provided for each storage tank for transferring the methanol from storage tanks to service tanks. A backup arrangement shall be provided for transfer of Methanol from storage tank to service tank in case of failure of dedicated pump. The Methanol transfer pump shall start automatically once the level of service tank is reached below certain level and the automatic sequence of start/stop shall be decided at later stage.

Two (2) bunker stations for filling the methanol storage tanks shall be arranged on main deck aft Port and starboard side.

One (1) LFSS (Low Flashpoint Fuel Supply System) for four (4) Main Generator Engines (One (1) per ship) with one (1) Glycol-water (G/W) Heating / cooling unit for LFSS (One (1) per ship) shall be installed in pump room. One (1) LFSS pump shall be provided as standby.

Four (4) Fuel Valve train (FVT) (one per engine) shall be installed in pump room.

a) LFSS system for DG Engines:

- Supply pump (1 x 100%) equipped with electric motor (VFD)
- One (1) set of Heat Exchanger (shell & plate heat exchanger or equivalent)
- Duplex Filter (metal mesh, absolute fineness 10 µm)
- One (1) set of mass flow meter
- Control valves, on-off valves
- Throttling discharge isolation valve at LFSS outlet lines

b) Common G/W system

- Glycol expansion tank
- G/W circulating pump (1 x 100%)
- G/W-F/W Heat Exchanger

c) Purging & Drain System

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- Permanently connected N2 purging lines in LFSS skid
- Permanently connected drain lines
- One (1) set of air-driven drain pump (transferring or draining to the fuel service tank)

d) Instrumentation

- Pressure transmitters, Temperature transmitters, Level Switches
- Starters
- MeOH Pump, Glycol W. pump starter
- Control cabinet
- LFSS Controller
- LFSS I/O Module

Four (4) Fuel Valve train (FVT) (one per engine) shall be installed in pump room.

FVT including following equipment

- Manual shut-off valve
- Auto double block & bleed valves on main methanol supply line
- Auto double block & bleed valves on inert gas line for purge
- Necessary pressure & temperature transmitters and gauges.
- Inert gas filter etc.

e) Methanol supply equipment for engines:

- Combined fuel injection valve on each cylinder
- Double-walled methanol supply pipe in ER (high pressure)
- Pressure transmitter (high pressure)
- Safety valve
- Control & Sealing LO line
- L.O. HP pump
- E-HBU (Electro-Hydraulic Boosting Unit) for H22CDF-LM

When LFSS system fails, the DG engines will continue to operate with MDO fuel and suitable automatic change-over arrangements.

The following equipment shall also be installed:

One (1) set inert gas system (N2 generator system) of 60m³/h capacity x 97% -65 deg C 13barg x Compressor/Reservoir included). The capacity shall be verified at detailed design stage. No. of compressors shall be as per class requirement.

Permanently connected N2 purging line shall be provided for the fuel lines as recommended by OEM.

32 Ship's Fuel Oil System:

Diesel mode

Main engines fuel oil system shall be divided into two independent systems and to have fuel supply from either of the service tanks.



- a) Velocity in FO pipes shall generally not exceed 1.5 m/s.
- b) A complete FO overflow system with dedicated overflow tank shall be provided.
- c) Two (2) Day Tank and Two (2) Settling Tank in Engine Room (Automatic Start/Stop for filling of settling tank)
- d) One (1) Fuel oil drain tank
- e) One (1) no FO separator, self-cleaning type, Automatic with capacity according to engine make.
- f) Two (2) nos fuel oil transfer pump of adequate capacity.
- g) One (1) no FO service tank for emergency generator
- h) One (1) FO Transfer Pump, remote operated, w/ filling line to Day Tank for
- i) Emergency. generator and for filling of rescue boats.
- j) Remote quick closing arrangements for fuel valves, emergency shut down for fuel pumps, etc. shall be provided as required by SOLAS regulations.
- k) Mass Flow meters shall be provided at inlet and outlet for MDGs.

Methanol Mode (Low Flash Point Fuel Supply System)

Develop philosophy to integrate engine fuel supply system with external fuel supply and control system for Low flashpoint fuels, as necessary.

The bunkering, storage, fuel supply for gensets, cargo discharge of Methanol and the fire, ventilation and safety requirements shall be arranged in accordance with IMO interim guidelines as per circular MSC.1 / 1621 to the approval of IRS.

33 DG Monitoring and Alarms:

Engine automation equipment:

- Main control panel, mounted on engine
- Complete engine control, alarm & safety function
- Driving of injections (methanol, pilot oil and main fuel oil), mounted on engine LCP.
- Monitoring and operation of engine, mounted on engine
- All monitoring, complete engine operation & alarm
- Push buttons for start/stop/reset/emc'y stop
- Switches for Local/Remote, Inc/Dec speed or load, Diesel/Methanol fuel mode
- Independent and redundant engine shutdown
- Auxiliary Operation Panel

The Slave monitoring and control panels for each DG set shall be provided in ECR and Wheelhouse (only monitoring) also which serves all functions stated above.

An integrated control, monitoring and alarm system shall be provided meeting periodically unmanned machinery space requirements.

Monitoring instrument panel in engine control rooms and in Bridge Deck consoles shall be fitted. Group repeater alarm in engineer's cabins, mess room shall be provided as per CLASSIFICATION SOCIETY.

Monitoring and alarms as per CLASSIFICATION SOCIETY and SOLAS requirements. Alarms and safety shut downs for the diesel engines according to the engine manufacturer's standards and Classification requirement.

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ENGINE AUTOMATION EQUIPMENT

- Main control panel, mounted on engine
 - Complete engine control, alarm & safety function
- Injection Control Module
 - Driving of injections(methanol, pilot oil and main fuel oil), mounted on engine
- Local Operating Panel
 - Monitoring and operation of engine, mounted on engine
 - All monitoring, complete engine operation & alarm
 - Push buttons for start/stop/reset/emergency stop
 - Switches for Local/Remote, Inc/Dec speed or load, Diesel/Methanol fuel mode
 - Independent and redundant engine shutdown
- Auxiliary Operation Panel
 - Control of auxiliaries, interfaced with vessel system, panel
 - Indicating lamps for engine operation status
 - Push button for engine stop
 - Control of FVT, CW control valve
- Electric Wiring on Engine
 - Engine delivered with wiring to terminal box
- Cable Type
 - Flame retardant cable with common shield

SENSOR

- Sensor scope for engine complies with classification rules.
- Fuel Oil System
 - Pressure transmitter, Fuel oil filter inlet
 - Pressure transmitter, Fuel oil engine inlet
 - Temperature sensor, Fuel oil engine inlet
 - Level switch, Clean fuel oil leakage tank
 - Temperature sensor, Nozzle cooling oil engine outlet (Only for HFO)
- Methanol System
 - Pressure transmitter, Methanol on engine inlet
 - Pressure transmitter, Methanol supply filter inlet on FVT
 - Temperature sensor, Methanol supply filter inlet on FVT
 - Pressure transmitter, Methanol supply filter outlet on FVT
 - Pressure transmitter, Control air on FVT
 - Pressure transmitter, Inert gas on FVT
- Lubricating Oil System
 - Pressure transmitter, Lub oil filter inlet
 - Pressure transmitter, Lub oil engine inlet
 - Pressure transmitter, Lub oil engine inlet (for safety)
 - Temperature sensor, Lub oil engine inlet
 - Pressure transmitter, Lub oil turbocharger inlet
 - Temperature sensor, Lub oil turbocharger outlet
 - Level switch, Lub oil sump tank / level low and high
- Crankcase Explosion Protection Equipment :
 - Oil mist detector

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- Temperature sensor, Main bearing
- Cooling Water System
 - Pressure transmitter, LT water air cooler inlet
 - Temperature sensor, LT water air cooler inlet
 - Temperature sensor, LT water air cooler outlet
 - Pressure transmitter, HT water engine inlet
 - Temperature sensor, HT water engine inlet
 - Temperature sensor, HT water engine outlet
 - Temperature sensor, HT water engine outlet (for safety)
- Combustion Air & Exhaust Gas System
 - Pressure transmitter, Charger air cooler outlet
 - Temperature sensor, Charge air cooler outlet
 - Temperature sensor, Exhaust gas cylinder outlet
 - Temperature sensor, Exhaust gas turbocharger inlet
 - Temperature sensor, Exhaust gas turbocharger outlet
 - Temperature sensor, Intake air before turbocharger compressor
- Compressed Air System
 - Pressure transmitter, Starting air engine inlet
 - Pressure transmitter, Control air engine inlet
- Miscellaneous
 - Limit switch, Turning gear engaged
 - Pick-up sensors, Engine speed & Position
 - Pick-up sensor, Turbocharger speed
- Pre-lubricating oil pump starter with J.W. preheater starter
 - * Direct on-line starting, IP44, Wall mounting

34 Tank Arrangement:

Two separate storage tanks for Methanol cargo and two storage tanks for Fuel supply are arranged at the aft. The tanks are of integral type.

Two-day tanks are arranged for supply of fuel to genset engines. The capacity of each day tank is sufficient for 8 hours operating DG engines during sailing.

Cofferdams/void spaces are arranged around the tanks as per Regulation. Integral fuel tanks shall be surrounded by protective cofferdams, except on those surfaces bound by shell plating below the lowest possible waterline, other fuel tanks containing methyl alcohol, or fuel preparation space.

Overflow tanks, drain tanks shall be provided as necessary.

Direct access from main deck shall be provided to the tanks and the cofferdams. The fuel preparation space will have direct access and when this is not possible, access through airlock with two gas tight doors shall be provided.

The airlock space shall be mechanically ventilated with overpressure compared to the adjacent space.

An audible and visual alarm system to give a warning on both sides of the airlock shall be provided to indicate if more than one door is moved from the closed position.

Bunkering

Two (2) bunker stations for filling the methanol storage tanks shall be arranged on main deck aft Port and starboard side for filling and discharging methanol tanks having Liquid line and vapour line sizes as per bunkering rate of the vessel".

The bunkering manifold shall be designed to withstand the external loads during bunkering. The bunkering rate shall be approx 100 cubic meter/hr.

The connections at the bunkering station shall be of dry-disconnect type equipped with additional safety dry break-away coupling/self-sealing quick release. The couplings shall be of a standard type

Means shall be provided for draining any fuel from the bunkering lines upon completion of operation.

Bunkering lines shall be arranged for inerting and gas freeing. When not engaged in bunkering, the bunkering lines shall be free of gas,

A ship-shore link (SSL) or an equivalent means for automatic and manual ESD communication to the bunkering source shall be fitted. In the bunkering line, as close to the connection point as possible, there shall be a manually operated stop valve and a remotely operated shutdown valve arranged in series. It shall be possible to operate this remotely operated valve from the bunkering control station.

Bunkering lines are arranged with a cross-over and suitable isolation arrangements are provided to ensure that fuel cannot be transferred inadvertently to the ship side not in use for bunkering.

For Fuel preparation spaces

Fuel preparation spaces shall be provided with an effective mechanical forced ventilation system of extraction type. During normal operation the ventilation shall be at least 30 air changes per hour.

The number and power of the ventilation fans shall be such that the capacity is not reduced by more than 50% if a fan with a separate circuit from the main switchboard or emergency switchboard or a group of fans with common circuit from the main switchboard or emergency switchboard is inoperable.

Control, monitoring and safety systems

Following guidelines are to provide for the arrangement of control, monitoring and safety systems that support an efficient and safe operation of the fuel installations:

- (a) The Control system for engine fuel supply system and external fuel supply system (such as system valves, tank valves, tank alarms, transfer pumps, ship shore link, etc) shall be interfaced and also with ships Alarm monitoring system.
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- (b) the control, monitoring and safety systems of the methanol installations shall be arranged such that there is not an unacceptable loss of power in the event of a single failure;
- (c) a fuel safety system shall be arranged to close down the fuel supply system automatically, upon failure in systems as described in table 1 and upon other fault conditions which may develop too fast for manual intervention;
- (d) the safety functions shall be arranged in a dedicated fuel safety system that is independent of the fuel control system in order to avoid possible common cause failures; this includes power supplies and input and output signal;
- (e) the safety systems including the field instrumentation shall be arranged to avoid spurious shutdown, e.g. as a result of a faulty vapour detector or a wire break in a sensor loop; and
- (f) All valves in methanol fuel supply and transfer system shall be remotely operated from separate Control station in ECR. Actuation of valves of methanol system (Pneumatic type/Hydraulic type) shall be indicated. For methanol cargo, the transfer system shall be provided in WH along with local control system.
- (g) Suitable instrumentation devices shall be fitted to allow a local and a remote reading of essential parameters to ensure safe management of the whole fuel equipment including bunkering.
- (h) Liquid leakage detection shall be installed in the protective cofferdams surrounding the fuel tanks, in all ducts around fuel pipes, in fuel preparation spaces, and in other enclosed spaces containing single walled fuel piping or other fuel equipment.
- (i) The annular space in a double walled piping system shall be monitored for leakages and the monitoring system shall be connected to an alarm system. Any leakage detected shall lead to shutdown of the affected fuel supply line in accordance with table 1.
- (j) At least one bilge well with a level indicator shall be provided for each enclosed space, where an independent storage tank without a protective cofferdam is located.
- (k) A high-level bilge alarm shall be provided. The leakage detection system shall trigger an alarm and the safety functions in accordance with Table 1.

Provisions for bunkering and fuel tank monitoring

(a) Level indicators for fuel tanks

Each fuel tank shall be fitted with closed level gauging devices (Radar type), arranged to ensure a level reading is always obtainable and unless any necessary maintenance can be carried out while the fuel tank is in service, two devices shall be installed.

(b) Overflow control

Each fuel tank shall be fitted with a visual and audible high-level alarm. This shall be able to be function tested from the outside of the tank and will be common with the level gauging system (configured as an alarm on the gauging transmitter), but shall be independent of the high-high-level alarm.

An additional sensor (high-high-level) operating independently of the high liquid level alarm shall automatically actuate a shut-off valve to avoid excessive liquid pressure in the bunkering line and prevent the tank from becoming liquid full.

(c) Provisions for bunkering control

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Bunkering control shall be from a safe remote location. At this safe remote location:

- (i) tank level shall be capable of being monitored;
- (ii) the remote-control valves shall be capable of being operated from this location; closing of the bunkering shutdown valve shall be possible from the control location for bunkering and from another safe location; and
- (iii) overfill alarms and automatic shutdown shall also be indicated at this location.

If the ventilation in the ducting enclosure or annular spaces of the double walled bunkering lines stops, an audible and visual alarm shall be activated at the bunkering control location.

If fuel leakage is detected in ducting enclosure or the annular spaces of the double walled bunkering lines, an audible and visual alarm and emergency shutdown of the bunkering valve shall automatically be activated.

(d) Provisions for gas detection

Permanently installed gas detectors shall be fitted in:

- (i) all ventilated annular spaces of the double walled fuel pipes;
- (ii) machinery spaces containing fuel equipment or consumers;
- (iii) fuel preparation spaces;
- (iv) other enclosed spaces containing fuel piping or other fuel equipment without ducting;
- (v) other enclosed or semi-enclosed spaces where fuel vapours may
- (vi) accumulate;
- (vii) cofferdams and fuel storage hold spaces surrounding fuel tanks;
- (viii) airlocks; and
- (ix) Ventilation inlets to accommodation and machinery spaces, if required, based on the risk assessment.

An audible and visible alarm shall be activated at a fuel vapour concentration of 20% of the lower explosion limit (LEL). The safety system shall be activated at 40% of LEL at two detectors.

For ventilated ducts and annular spaces around fuel pipes in the machinery spaces containing methyl alcohol-fuelled engines, the alarm limit shall be set to 20% of LEL.

The safety system shall be activated at 40% of LEL at two detectors.

Audible and visible alarms from the fuel vapour detection equipment shall be located on the navigation bridge, in the continuously manned central control station, safety centre and at the control location for bunkering as well as locally.

(e) Provisions for fire detection

Fire detection in machinery space containing methyl alcohol engines and fuel storage hold spaces shall give audible and visual alarms on the navigation bridge and in a continuously manned central control station or safety centre as well as locally.

(f) Provisions for ventilation

Any loss of the required ventilating capacity shall give an audible and visual alarm on the navigation bridge, and in a continuously manned central control station or safety centre as well as locally.

(g) Provisions on safety functions of fuel supply systems

If the fuel supply is shut off due to activation of an automatic valve, the fuel supply shall not be opened until the reason for the disconnection is ascertained and the necessary precautions taken. A readily visible notice giving instruction to this effect shall be placed at

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the operating station for the shut-off valves in the fuel supply lines. If there is shutdown of fuel supply system due to an alarm the engine shall not be stopped and there should be immediate switch to LSHFHS as fuel.

If a fuel leak leading to a fuel supply shutdown occurs, the fuel supply shall not be operated until the leak has been found and dealt with. Instructions to this effect shall be placed in a prominent position in the machinery space.

A caution placard or signboard shall be permanently fitted in the machinery space containing methyl/ethyl-fueled engines stating that heavy lifting, implying danger of damage to the fuel pipes, shall not be done when the engine(s) is running on methanol.

Pumps and fuel supply shall be arranged for manual remote emergency stop from the following locations as applicable:

- (i) navigation bridge;
- (ii) cargo control room;
- (iii) onboard safety centre;
- (iv) engine control room;
- (v) fire control station; and
- (vi) adjacent to the exit of fuel preparation spaces.

Monitoring of methyl alcohol supply system to engines

Parameter	Alarm	Automatic shutdown of tank (valve(s) referred to in 9.6.2 MSC.1/Circ.1621	Automatic shutdown of master fuel valve (valve(s) referred to in 9.6.3 MSC.1/Circ.1621	Automatic shutdown of bunkering valve	Comments
High level fuel tank	X			X	
High level fuel tank	X			X	
Loss of ventilation in the annular space in the bunkering line	X			X	
Gas detection in the annular space in the bunkering line	X			X	
Loss of ventilation in ventilated areas	X				
Manual shutdown				X	
Liquid methyl/ethyl alcohol detection in the annular space of the double walled bunkering line	X			X	
Vapour detection in ducts around fuel pipes	X				
Vapour detection in cofferdams surrounding fuel tanks. One detector giving 20% of LEL	X				
Vapour detection in airlocks	X				

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Parameter	Alarm	Automatic shutdown of tank (valve(s) referred to in 9.6.2 MSC.1/Circ.1621	Automatic shutdown of master fuel valve (valve(s) referred to in 9.6.3 MSC.1/Circ.1621	Automatic shutdown of bunkering valve	Comments
Vapour detection in cofferdams surrounding fuel tanks. Two detectors giving 40% of LEL, 1)	X	X		X	
Vapour detection in ducts around double walled pipes, 20% of LEL	X				
Vapour detection in ducts around double walled pipes, 40% of LEL, 1)	X	X	X		Two gas detectors to give min.40% of LEL before shutdown
Liquid leak detection in annular space of double walled pipes	X	X	X		
Liquid leak detection in engine-room	X	X			
Liquid leak detection in fuel preparation space	X	X			
Liquid leakage detection in protective cofferdams surrounding fuel tanks	X				

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Annexure No.1- Compliance and Deviation List

(To be filled in by the SUPPLIER & submitted as part of the Offer)

COMPLIANCE MATRIX AND DEVIATION

With reference to the subject Requisition received along with the MDL Inquiry and our QUOTATION No. _____ Dated _____ we hereby confirm / clarify the following :

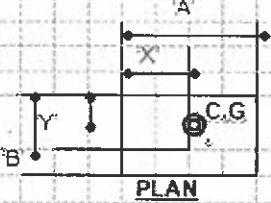
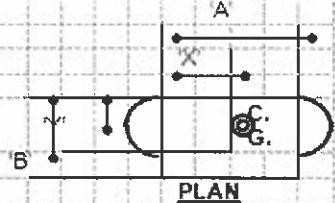
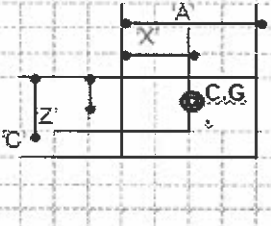
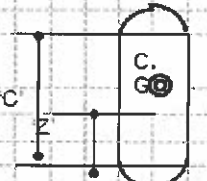
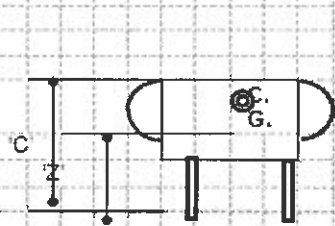
TSP Para No	Complied / Not Complied	Offer Reference (Page & Para No.)	Deviations with reasons (if any)

The Bidder should fill in this form for the deviations of his bid from the requirements as stated in the TSP. If no deviation is required, bidder should fill in "NIL" in the deviation column. Deviation listed other than deviation form shall not be considered.

BIDDER'S COMPANY SEAL

BIDDER'S SIGNATURE & DATE

Annexure No.2- Weight Control Data Sheet

WEIGHT CONTROL DATA SHEET					
EQUIPMENT DESCRIPTION			EQUIPMENT NO.		
COMPARTMENT			LOCATION		
SWBD:					
☐ TOLERANCE CODE	☐ PRELIMINARY EST.	☐ DESIGN EST.	☐ M.T.O (CALC)	☐ WEIGHED	☐ TOLERANCE $\pm$ %
1. WEIGHT (Kg.)					
(a) DRY		Kg $\pm$		%	
(b) FLUID		Kg $\pm$		%	
(c) OPERATING		Kg $\pm$		%	
(d) TEST		Kg $\pm$		%	
(e) TOTAL		Kg $\pm$		%	
2. EQUIPMENT DIMENSIONAL DATA (mm) & Co-ordinates of CoG					
 PLAN	 PLAN	 PLAN			
 ELEVATION	 ELEVATION	 ELEVATION			
OVERALL SIZE		CENTRE OF GRAVITY			
A		X			
B		Y			
C		Z			
NOTE:					
- ALL OFFERS SHALL INCLUDE THIS DATA SHEET DULY FILLED IN BY THE SUPPLIER (SIGNED, DATED & SEAL AFFIXED). - ALL FINISHED ITEMS SHALL BE WEIGHED & A CERTIFICATE SHALL BE PROVIDED AS PER ATTACHED SHEET. - SEPARATE SHEETS SHALL BE COMPLETED FOR EACH INSTALLED EQUIPMENT. - ORIGIN OF 'X', 'Y' AND 'Z' TO BE INDICATED.					
SUPPLIER'S SEAL			SUPPLIER'S SIGNATURE & DATE		

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Annexure No.3- Weight Certificate

WEIGHT CERTIFICATE			
EQUIPMENT DESCRIPTION:		EQUIPMENT NO. :	
The form shall be completed by Supplier & shall be supplied along with the equipment.			
SUPPLIER'S NAME		Ref. Drg. No.	
ADDRESS		Part No.	
TELEPHONE NO.		EQPT. NO.	
ORDER NO.			
METHOD OF WEIGHING: Supplier shall prescribe Method & Equipment Used:			
	DATE OF CALIBRATION	LAST	SPECIFIED REQUIREMENT
	ACCURACY		
	NOTE :-		
RESULT OF WEIGHING TOTAL EQUIPMENT DRY WEIGHT			
(Excluding packing, temporary protection etc.)			
ALLOCATED WEIGHT			
(Weight estimate agreed by purchaser and supplier based on order specs).			
REASONS FOR VARIATION BETWEEN ALLOCATED WEIGHT AND CERTIFIED WEIGHT:			
WEIGHING ADDRESS:	WITNESSED BY		FOR PURCHASER
	FOR SUPPLIER		
	Representative		Representative
Date:	Signature / Date & Seal		Signature/Date & Seal

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