

ENQUIRY TECHNICAL SPECIFICATION& SCOPE OF SUPPLY OF MCD/ SLIP ON CLUTCH FOR TWO Nos. 50 TONS BOLLARD PULL TUGS FOR KANDALA PORT TRUST VESSEL NOs. : VC 11173 &11174

NOTE : FORWARDING OF COMPLIANCE FOR ENQUIRY TECHNICAL SPECIFICATION PART -A [GENERAL] , PART- B [MACHINERY] AND PART- C [ELECTRICAL] IS A MANDATORY REQUIREMENT BY HSL WITHOUT WHICH OFFERS OF FIRMS SHALL BE CONSIDERED AS INCOMPLETE AND ARE LIABLE TO BE IGNORED.

[A] BIDDING FIRM'S NAME :
[B] BIDDING FIRM'S OFFER NO :
[C] AUTHORIZED SIGNATORY OF THE FIRM :

PART A - GENERAL PART

Clause No.	Description of technical specification	Vendors Reply: Complied & cost included in offer mentioned above At [B]
1.	Requirement: Quantities specified in attached Part A,B &C are for One (1) Vessel. Total requirement is for Two (2) Vessels.	
2	Rules, Inspection and Certification by Class	
2.1	Classification Rule : The Tug shall be built for Classification with Indian Register of Shipping to obtain + SUL + IY TUG [Restricted Service] FIFI AGNI I of I.R.S., i.e. Restricted sea going vessel and machinery built and installed under supervision of the Surveyors of I.R.S. to the Rules of Indian Register of Shipping and has an External Fire Fighting arrangement to IRS AGNI – I standard . The vessel shall comply with latest IMS Rules as applicable to this type of vessel [Class XII] and with the Inland Vessels act.	
2.2	Type approval : The manufacturing and production of complete equipment shall be type approved by Class& relevant certificate shall have validity for 3 to 5 years from the date of issue of Purchase Order.	
2.3	Testing : The complete equipment shall be tested in presence of Class in manufacturer's workshop and test certificate shall be produced.	
2.3.1	Vendor shall ensure that tests during production and tests after assembly are carried out in accordance with Quality Assurance Plan which observes the rules of ISO 9001.	
2.4	Inspection and commissioning : Service engineer assistance for testing and commissioning of complete equipment for dock and sea trials in presence of HSL, surveyors and owners to be indicated in lump sum. The check list confirmation along with the date of requirement of service engineer will be intimated by HSL subsequently. The list of jobs to be completed prior to arrival of service engineer for commissioning is to be furnished along with the offer.	
2.5	Electrical installations to conform to latest classifications / IEC rules.	
2.6	Vendor has to directly contact classification / statutory authorities as required for approval of drawings, testing, inspection certification etc. and arrange the same to fulfill class requirement .	
2.7	Class approved Certificates, drawings and documents in triplicate (one original + 2 Copies)	

Clause No.	Description of technical specification	Vendors Reply: Complied & cost included in offer mentioned above At [B]
3.	Documents to be submitted after order	
3.1	Class approved documents in triplicate (one original + 3 Copies)	
3.2	Torsional, Lateral, Axial vibration calculations, Whirling and Shaft alignment calculations as required within 4 weeks from order. Torsional Vibration Analysis (TVA) of the ship's propulsion system, including SRP and shaft, intermediate shaft, torsional couplings, Engine, clutch, Gearboxes, pumps as required shall be carried out by the Engine manufacturer based on data provided by the respective manufacturers of the machinery and equipment. The TVA calculations shall be submitted to the Classification Society and approval obtained.	
3.3	Shop test data duly signed by class / owners to be furnished for clutch , accessories etc as required immediately after shop trials.	
3.4	Class approval Drawings as applicable within four(4) weeks after contract and the same shall be updated within four(4) weeks after approval.	
3.5	List of Alarm Monitoring Points, controls and instrumentation system details as per class requirements shall be supplied within two (2) weeks to enable HSL to place a separate Purchase Order for Centralized Ship Alarm Monitoring System.	
3.6	Drawings pertaining to Installation and Arrangement, foundation, piping schematics, material lists, level switches, instrumentation and final Electrical schematics , wiring & connection drawings, electrical interface drawings with Propulsion Control system shall be supplied in 3 sets within 4 weeks from order for HSL approval. Final data including list of alarm monitoring points in IPI shall be forwarded within 2 weeks after approval.	
3.7	Heat Balance diagram showing heat dissipation, cooling water requirements of various accessories are to be included in IPI.	
3.8	Final Drawings in IPI shall be supplied in three (3) sets in hard copies and in soft DWG format in one (1) C.D. in AUTOCAD 2004 within 2 weeks after approval from HSL.	
3.9	OEM shall submit the under mentioned certificates and reports in triplicate (1 Original + 2 copies) after shop trial : Shop test data duly signed by class & owners. Classification Type approval, Manufacturer Test Certificate .	
3.10	Six (6) sets of instruction, operation, maintenance, parts list and spare parts manual for Machinery, Electrical and electronic equipment within 12 weeks after order	
3.11	Preservation and maintenance details of each equipment supplied, to be specified.	
4	Tools and fittings required for Installation of equipment :	
4.1	Foundation bolts and nuts, other fasteners, flanges, counter flanges, unions for screwed connections, class approved flexible hoses etc. for inlet and outlet connections of equipment supplied.	

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4.2	All approved water tight cable Glands and terminal boxes as required shall be supplied for electrical installation	
4.3	Hydraulic tightening devices, Hydraulic equipment and Torque - spanner wherever required	
5	Class and manufacturer recommended Spares	
6.	Class and manufacturer recommended tools	
7	Product Support : Supplier should confirm that they will provide product support for a minimum period of 20 Years from the date of delivery of the vessel for complete Machinery and Electrical equipment being supplied by them.	
8	Onboard Training : The manufacturer shall provide training to technical crew onboard regarding operation and maintenance of the equipment supplied for Mechanical, Electrical & Electronic part. Training program will be conducted at HSL. Training shall be imparted by service Engineer at the time of commissioning.	
9	Systems and features not included in the specification, which vendor deem necessary for satisfactory operation of the supplied system, same shall be supplied free of cost even if observed during installation /commissioning.	
10	OEMs of Main engine, SRP Propulsion system, clutch and External fire fighting system (AGNI-1/FIFI-1) shall liaison with each other to ensure correct design and supply of material for satisfactory working, integration of respective equipment and to ensure smooth commissioning.	
11	Enclosures : a) GA Drawing no. 50018 CC. b) Lines Plan dtd 22-6-2011 c) Reference drawing for power drive and scope	
12	Weight criteria : The dry weight of the clutch with all accessories shall not exceed 3600 kgs per ship set. The dry and wet weight of all items supplied shall be included in the weight study and shall be furnished along with the offer.	
13	Documents to be submitted along with the offer:	
13.1	Technical leaflets, catalogues and reference lists of installation for the quoted equipment. Capacities, Technical details, performance curves, dimensions, weights etc. of each equipment being offered (Machinery / Electrical / Electronic).	
13.2	G.A drawing showing SRP, Shafting , clutch / PTO Hydraulic Pump, Engines , PTO Gear Boxes etc including foundation / dimensional details	
13.3	Installation drawing indicating Foundation details and procedure and space constraints for withdrawal of various accessories of all the offered machinery and equipment shall be furnished.	

Clause No.	Description of technical specification	Vendors Reply: Complied & cost included in offer mentioned above At [B]
13.4	Schematic drawing for Piping and Instrumentation diagrams indicating size of the connection pipes, pipe fittings, valves etc., for Air ,L.O, Hydraulic, F.W & S.W cooling , etc.	
13.5	Electrical schematics and cable diagrams of each system and arrangement of control system in Bridge, Engine Room, etc as offered and list of alarm & monitoring points.	
13.6	Project guides for installation and work execution of the equipment offered in 2 sets.	
13.7	List of Lubricants (Brand & Grade) recommended for the equipment offered shall be indicated in the offer. Equivalent lubricants available with Indian Oil companies shall also be indicated in the above list.	
13.8	Firm supplying Main Engine Firm supplying Steerable Rudder Propulsion Firm supplying Clutch Firm supplying External Fire fighting system-Agni-I The above firms shall forward a copy of the mails send other suppliers as mentioned above to HSL for reference. <u>NOTE : TOTAL RESPONSIBILITY OF INTEGRATION OF MAIN ENGINES, SRP, CLUTCH AND EXTERNAL FIRE FIGHTING SYSTEM LIES WITH CLUTCH SUPPLIER.</u>	

THE BIDDER SHALL ENSURE THAT THE OFFERED MACHINERY /EQUIPMENT PERFORM TO UNDER MENTIONED SERVICE CONDITIONS :

MAIN PARTICULARS OF SHIP AS PER GA DRG. NO 50018 CC , PROJECT REF : DP-424	
LOA	: 32.725 M
LBP	: 32.000 M
Breadth [Mld]	: 10.80 M
Depth [Mld] Main hull	: 4.50 M
Draft [Bottom of Appendage]:	3 M
Speed at 90 % MCR	: 12 Knots
Bollard pull at 90 % MCR	: 50T at trial displacement of 50% Load of fuel & fresh water at calm sea
MCR power	: 1875 KW x Two Engines
Propulsion	: Twin Steerable Rudder Propulsion
SERVICE CONDITIONS	
Sea water temperature	: 32 degree C
External temperature	: 40 degree C
Machinery spaces temp.	: 50 degree C
Humidity	: About 60% at 40 degree deg C

Manager[EDM]

Dy Manager[MEM]

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PART B - MACHINERY PART

Clause No.	Description of technical specification	Vendors Reply: Complied & cost included in offer mentioned above At [B]
1	<p>MCD / SLIP ON CLUTCH WITH ACCESSORIES</p> <p>QTY : TWO NOS.</p> <p>Two (2) numbers MCD/Slip on clutch units of suitable capacity with all accessories shall be connected to Port and Starboard Main Engines out put shafts to transmit driving power to SRP gear box . Each clutch shall be driven by a four stroke marine high speed diesel engine . The units shall be remote controlled from Bridge.</p>	
2	<u>MCD / Slip On Clutch</u> :	
2.1	Make : To be indicated	
2.2	Type : To be indicated	
2.2	Speed modulation : 0-100% Engine RPM	
2.2	PTO for hydraulic pump : Details to be indicated	
2.2	Lube oil Cooler : Details to be indicated	
2.2	Lube Oil Pump : Details to be indicated	
2.2	Electronic Control Module : Details to be indicated	
2.2	Clutch control integrated in Lipstronic control system / lever unit : Details to be indicated	
3	Spare Parts as per build specification Annexure -III inclusive of class recommended spares are as below :	
3.1	Inner and outer plates for clutch : Two complete sets	
3.2	Solenoid Switches for clutch & air whistle : Four complete sets	
4	Following rigid flange couplings of hydraulic fitting type are to be included :[Reference drawing of power drive and scope is enclosed] [a] To connect with output end of flexible coupling of Main engine [b] To connect with flange rigid coupling of SRP shafting.	
5	NOTE: Under mentioned couplings are in Main engine supplier 's scope : [a] Flexible coupling between Main engine PTO output & clutch [b] Flexible coupling between Main engine PTO output&FiFi Gear Box	
6	NOTE: Rigid flange couplings of hydraulic type of SRP Shafting is included in SRP supplier's scope.	

Dy Manager [MEM]

**ENQUIRY TECHNICAL SPECIFICATION & SCOPE OF SUPPLY OF MCD / SLIP ON CLUTCH FOR 2 Nos. 50T BOLLARD PULL TUGS FOR KANDALA PORT TRUST HSL
YARD NOS. 11173 -74
PART C - ELECTRICAL PART**

Clause No.	<u>Description of technical specification</u>	<u>Vendor Reply: Complied & Cost included in offer mentioned above at [B]</u>
1	<u>POWER SUPPLIES AVAILABLE ON BOARD:</u> 415 V, 3phase, 50Hz, 3wires system (Neutral insulated). 220 V, 1 phase 50Hz, 2wire system, 24V DC (with battery backup)	
1.1	In case of any power supply requirement other than the above; suitable conversion unit operating on above power supplies shall be included in the scope of supply.	
1.2	All the equipment / instrumentation / Alarms / indicators shall perform satisfactorily within the ambient conditions and the supply variations as per the class requirements.	
1.3	All the Electrical equipments shall operate efficiently under voltage fluctuations and under frequency fluctuations as per the Rules and Regulations of class specified in PART A- General part.	
1.4	The electric cables to be provided by HSL shall be of copper conductor, XLPE insulation, copper wire braided, Halogen Free flame retardant type sheathed cable, with certain standard sizes. In case the offered systems required any other type / sizes of electric cables, special type cables with end connectors, the same shall be supplied, as per the requirement. Per meter cost of Special Cables shall be quoted in the Price - Bid.	
1.5	MCD / Slip on Clutch suppliers shall coordinate with SRP supplier, Main Engine suppliers and also the Ship's Central Alarm Monitoring System suppliers for Interface drawings and for Integration of these systems for satisfactory functioning.	
1.6	All Electric Panels / DB's shall be provided with diagram plates, clearly showing connections with terminal markings as on the equipment and they shall be secured on the underside of the cover of the panel / DB's.	
1.7	Suitable W.T cable entry glands and connectors shall be provided for all the starters / control panels, Electronic controller and Motors.	
1.8	Power (approx. KW) / no. of feeders required for each system shall be indicated in the offer.	
2	<u>MOTORS:</u> The motors shall be of marine type and reputed make and shall conform to the latest requirements of Classification Societies and I.E.C. Standards. The motors driving the pumps shall have sufficient power rating to drive the pump without over loading under any condition.	
2.1	Squirrel cage Induction high torque smooth acceleration type, totally enclosed self ventilated type, minimum Class 'F' tropicalised insulation.	

2.2	Rating / duty of operation to suit the requirement.	
2.3	Degree of protection of each motor shall be suitable for respective application and indicated in the offer.	
2.4	Motors shall be provided with water proof terminal box as per suppliers standard with all the wires brought into the box and terminated in standard connecting terminals. All connecting terminals shall be complete with Nuts, Spring Washers, etc. Which shall be treated against corrosion. The terminal box shall also be provided with removable cover.	
3	<u>STARTERS:</u>	
3.1	Local start / stop control and a hand reset for the over load are to be provided on each starter for motors, with adjustable over current trips, built in single phase protection and running light indicators shall be provided for all vital auxiliaries / motors.	
3.2	Starters for all motors above 1KW shall be provided with an ammeter.	
3.3	Direct on line starter for motors below 10HP.	
3.4	Star delta starters for motors 10HP and above.	
3.5	Auto transformer / SOFT start type starter for motors above 30HP.	
3.6	Degree of protection shall be suitable for respective application and indicated in the offer.	
3.7	All starters shall have provision for remote Start / Stop / Run indication.	
3.8	All starters / control panels shall be of standard make and suitable for marine application. Makes to be specified in the offer.	
3.9	All the equipments, control / starter panels shall be provided with Anti-vibration mounts.	
3.10	Fuses employed for backup protection shall be of high rupturing capacity (H.R.C. Type) and shall be carefully selected in each case in relation to the starting currents and acceleration time of the motors and to give short circuit protection to the cable and motor circuit.	
3.11	Motor starters shall be in sheet steel enclosure with isolating switch on the door. All working parts shall be accessible within this door.	
4	<u>ALARM / MONITORING / INSTRUMENTATION:</u>	
4.1	The automation and instrumentation shall be provided so as to satisfy the requirements of the class, statutory authorities and to that of the specifications.	
4.2	The instrument gauges and alarms shall be arranged in good order for safe operation and easy maintenance.	
4.3	Alarm blocking and time-delay of channels shall be provided where necessary to avoid false alarms.	
4.4	All the necessary sensors / switches required for analogue and binary output alarms shall be supplied , calibrated , mounted and wired to respective terminal boxes	
4.5	The Alarm display panel shall be flush mounting type suitable for mounting in the ECR Console.	
	Note: HSL shall provide centralized ships Alarm Plant and all necessary Signal feeds shall be extended. The MCD / Slip on Clutch Supplier shall Co-ordinate with Ships Alarm Plant Supplier for	

	Integration of System.	
5	ELECTRONIC CONTROLLER:	
5.1	Necessary interfaces as required for integration with SRP Controls and Main Engine RPM shall be supplied. The clutch control shall be integrated in SRP Control system / lever unit. Electronic Module of bulkhead mounting shall be supplied which shall be located in the ECR.	
5.2	UPS SYSTEM : Necessary UPS system will be provided by HSL for 24V DC consumers of M.E, SRP, MCD / Slip on Clutch and Alarm Monitoring System. Hence, the 24V DC load requirement for the MCD / Slip on Clutch Control system shall be indicated in the Technical Offer.	
5.3	SPARES: Spares shall be supplied as per the following basis for all the electrical items taking into account the total number of identical parts fitted. All the spares shall be stowed in suitable metallic or wooden cases and each part shall be labelled in English furnishing the part number, etc. Spares shall be supplied separately furnishing the list of spare parts , indicating total quantity .	
5.3.1	Spares shall be supplied according to the classification Societies requirements. Over and above the Classification Societies requirements, if any other spares and tools are necessary for the proper and efficient maintenance of the equipment as per Maker's recommendations, the same shall be included in the supply.	
5.3.2	The list of spares included in the scope of supply shall be enclosed to the Technical Offer.	
5.3.3	The following spare parts shall necessarily be included in scope of supply. Separate Unit Price for the spare parts shall be indicated in the price bid.	
	<ul style="list-style-type: none"> a) Solenoid switches for clutch - 2 set each b) Indicator lamps for MCR and Wheel House control consoles, MCD / Slip on Clutch control panels - 24 Nos. of each type & size. c) Fuses for MCR and Wheel House control consoles, MCD / Slip on Clutch control panels - 24 Nos. of each type & size. d) Contactors, Overload relays and Timers of various capacity fitted on MCD / Slip on Clutch - 3 each of type (Make of relays' - siemens) e) Miniature circuit breaker of various capacity fitted on board - 3 each of type (Make: Siemens). f) Fuse base, HRC fuses and bottle type fuses of various capacity fitted on MCD / Slip on Clutch - 12 each of type. g) Potentio meter of each type fitted - 2 each 	

5.4	TEST CERTIFICATES	
5.4.1	Works / Classification Test Certificates shall be supplied as per Part A - General part.	
5.4.2	Maker's detailed workshop test certificates for all motors shall also be supplied in triplicate along with type approval certificate of motors.	
5.4.3	Other Electrical items shall also be tested to Classification Society wherever applicable per Part B- Machinery Part.	

Manager
(Electrical Designs Materials)

Manager
(Electrical Designs)