

TD-106-1 Rev No.5 Form No.		PRODUCT STANDARD HYDERABAD		GT54761									
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1. INTRODUCTION This specification stipulates the requirement of Design, Engineering, Manufacturing, Assembling, Inspection, Delivery, proper packing and painting, Erection, Commissioning and testing of Truck Mounted boom Crane [TM Boom Crane] and final handing over to customer, complete with all accessories as specified in the scope of supply and as required for the safe and trouble-free operation of equipment to be installed at site.													
2. PROJECT INFORMATION <table border="1"> <tr> <td>PROJECT</td> <td>1 x FR5PA GTG OPEN CYCLE PLANT, CALABAR</td> </tr> <tr> <td>CUSTOMER</td> <td>GOVERNMENT OF CROSS RIVER STATE, CALABAR</td> </tr> </table> The site is situated in Calabar, Cross River State Nigeria. Nearest City: Calabar, Nigeria Nearest Airport: Calabar Nearest Port: TINCAN/APAPA Nearest Highway: - Source of Water: - Rainy Season: June- September						PROJECT	1 x FR5PA GTG OPEN CYCLE PLANT, CALABAR	CUSTOMER	GOVERNMENT OF CROSS RIVER STATE, CALABAR				
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3. DESIGN PARAMETERS OF CRANE 3.1 Design Parameters of Truck mounted boom crane: <table border="1"> <tr> <td>Description</td> <td>Truck mounted Boom Crane for Gas Turbine/Associated Equipment maintenance</td> </tr> <tr> <td>Quantity (No.)</td> <td>1</td> </tr> <tr> <td>Minimum Lifting Capacity (MLC)</td> <td> 5 Tons @ 10m horizontal distance from lifting point & crane lifting hook at 10m height. Note: Crane should be able to lift load and shift it to unloading point which may be at an angular distance of at least 120° on each side without any limitation on it's load capacity. </td> </tr> <tr> <td>Operation and Access Area</td> <td>The Access Path to the operation area is 6m wide.</td> </tr> </table>						Description	Truck mounted Boom Crane for Gas Turbine/Associated Equipment maintenance	Quantity (No.)	1	Minimum Lifting Capacity (MLC)	5 Tons @ 10m horizontal distance from lifting point & crane lifting hook at 10m height. Note: Crane should be able to lift load and shift it to unloading point which may be at an angular distance of at least 120° on each side without any limitation on it's load capacity.	Operation and Access Area	The Access Path to the operation area is 6m wide.
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COPY RIGHT AND CONFIDENTIAL The information on this document is property of BHARAT HEAVY ELECTRICALS LIMITED It must not be used directly or indirectly in any way detrimental to the interest of the company.		Limitation	The operation area is also 6m wide. The crane should be able to approach the access area with all auxiliaries and operate to it's full capacity with fully extended outriggers in the available space.		
		Derricking Angle Range	Minimum angle: -2° or lesser angle Maximum angle: 60° or higher angle		
		Required Angle of Rotation With Load	240° minimum with MLC		
		Base Boom Length in full closed condition	12 m maximum		
		Fully Extended Boom Length	20 m minimum		
		Jib	Vendor to include in scope and supply in case it is required for above operating range		
		Any other Standard Accessories	To be included and supplied by Bidder		
		Area Classification	Safe area		
		Boom Type	Telescopic		
		Power Transmission	Hydraulic		
		Crane Installation	Truck Mounted		
		Truck Driving	Vendor to specify		
		Truck Engine Capacity	150 bhp minimum		
		Truck Engine Torque	Vendor to specify		
		Truck Movement Top Speed With all lifting equipment and dead weight without the load	60 Kmph minimum		
		Driving & Operator Cabin	Standard cabin with maximum visibility for operation and fitted with lockable doors. Driving and operator Cabins shall be fitted with cabin light and ventilation.		
		Truck Movement speed with above weight and including the load.	Vendor to specify		
		Truck Dimensions	Standard (Vendor to specify and confirm)		
		Overall Weight	Vendor to specify		
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	a. One Number Truck Mounted Mobile boom crane with all standard equipment and accessories. b. Standard and special Tools for crane maintenance. c. Essential Accessories (10 sets of engine filters and hydraulic filters of each size used). d. Document indicating the List for First fill of lubricants, greases, and consumables, etc. The vendor shall provide details indicating the quantity required for first fill and make up, schedule, vendor list, reference priced purchase orders for enabling BHEL/Cross River State, Nigeria customer to source these items and ensure compliance to crane operation and functional requirement. First fill is not in crane supplier scope. e. One set of commissioning spares. f. List for 2 Years O&M spares. scope doesn't include supply of O&M spares. g. List of recommended spares. scope doesn't include supply of recommended spares. h. Lubrication, Load and critical Schedule chart separately in laminated form – 3 copies. i. O&M manual and standard documents – 6 hard copies + 2 soft copies. j. List of contact details for after Sales Service Support. k. Performance Certificate l. Compliance Certificate for meeting all local statutory regulations in Nigeria. m. Factory inspection and Testing n. SONCAP compliance. o. Necessary compliances and certificates to meet Nigeria local statutory and regulatory requirements. p. Factory Performance Test.				
5. SERVICES					
Refer Services specification GT14051 for services scope.					
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		1.	Description: Truck Mounted Boom Crane.		
		2.	Standard:- As per DIN EN/ISO/ANSI/BIS/BS Standard		
		3.	Stability Rating: 75%		
		4.	Critical Load to be handled by offered crane (240°slew minimum) a) Minimum 20 MT with basic boom at minimum radius. b) Minimum 5 MT at minimum 10m radius or above with load hook at 10m height. This requirement should be met with supplied crane and accessories without any additional requirements. c) Minimum length of main boom required: 10m Length of the jib required: As per OEM standard Minimum length of main boom offered where jib shall be fixed must be 20m or more. All the accessories required for jib operation such as Winch, wire rope, fittings and all offsets etc. shall be supplied along with crane. Note: For boom and jib combination, crane must have provision of erecting two hook simultaneously one each at boom and jib respectively whereas work shall be carried out only with one hook block at a time. Load chart for all combinations of boom and jib for this operation shall be provided.		
		5.	Boom hoisting, slewing, main/aux. hoisting, travel drives etc.: All Hydraulic drives		
		6.	Central & Main Ballast: Base Frame for full ballast to meet the offered load chart. Complete set of counterweights available for the offered crane must be supplied.		
		7.	Engine: Turbo charged water cooled diesel engine of adequate power, preferably CUMMINS/CATERPILLAR/DAIMLER CHRYSLER/VOLVO/HINO or of reputed make. (The model number of the offered Engine to be explicitly brought out in the offer)		
		Revision: Refer to record of revisions		Prepared : (T. Abhiram)	Checked : (Sanjay Kumar)

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	9.	Safety devices: The crane shall be equipped with all the following safety devices: a) Cut off devices when exceeding the permissible load moments. Electronic control to stop all dangerous operation in case of instability. Safe load indicator with visual display in operator's cabin for load chart, maximum allowed load, gross loads, net load on hook, operating radius and single boom/jib length, boom/jib sheave height etc., and fault display b) Safety valve against pipe and hose rupture c) Hoist & boom hoist limit switches d) Display arrangement for self-error detection system e) Anemometer f) Self-Diagnostic System g) Electronic inclinometer			
	10.	Hook Block: Suitable main Hook block to handle maximum crane capacity and auxiliary hook block to handle 50% of the main capacity or 10MT (whichever is maximum) capacities and a ball hook block of suitable capacity to be provided. Modular hook block will also be acceptable. Parent material of the hook should be inspected/certified by reputed agency e.g. Lloyds etc, acceptable to BHEL/TPI.			
	11.	Crane cabin: Spacious cabin, swiveling with operating and control/ monitoring instrument.			
	12.	Crane Operation: Multiple movements simultaneously.			
	13.	Electrical System: - 24 V DC/Vendor to specify.			
	14.	Aviation Light: 24 VDC/appropriate double flash light mounted on lattice boom or jib head with battery charger suitable for 220VAC/24 VDC type of equivalent intensity.			
	15.	Tool Box: Vendor shall supply OEM standard and special tool kit including Standard Hydraulic Test kit.			
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		17.	Self Erection System: The crane should have self erection system for assembly and dismantling of Truck Mounted Boom Crane, car body and operator cabin. For erection /take-down of boom/jib without the assistance of an external crane, suitable mechanical outriggers if required for the crane shall be provided with the crane.		
		18.	Overall TM Boom Crane end to end outer dimensions of the crane:- Vendor to specify the same in extended and closed conditions of crane.		
		19.	Wire rope: Crane shall be supplied with sufficient length of wire ropes suitable for the total length of Main boom and total length of jib so that the respective hook blocks reach the ground level with highest boom/jib top elevation.		
		20.	Essential Accessories: 10 sets of Engine Filters and Hydraulic filters of each size used.		
		21.	Factory Performance Test: Vendor to submit factory test procedure for BHEL approval.		
		22.	Commissioning: Supervision of assembly and commissioning of crane at Calabar Nigeria, if required as per OEM standard shall be included if applicable. For the offered model, if onsite assembly and commissioning is mandatory as per OEM, Vendor to specifically indicate the number of man days considered in scope.		
		23.	After Sales Service Facility: The bidder must arrange for man power, spares, transportation and any other items or services required during the warranty period of the crane for rectifying and restoring the crane to its normal full functional condition during the warranty period at it's own cost.		
		24.	Inspection: The ordered Crane shall be inspected and load tested at manufacturer's works as per international norms and mutually accepted quality plan as per Annexure-III, according to the load charts supplied along with the offer. During inspection at OEM works documentation and correlation of all the major component		
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	25.	Training: Necessary training for operation & maintenance shall be given to two end customer personnel (GOVERNMENT OF CROSS RIVER STATE, CALABAR) free of charge for 2 man weeks at manufacturer's works. Training modules should necessarily cover complete activity of operation and maintenance including the changes proposed to be done while increasing/decreasing the boom/jib length.			
	26.	Drawing/Documentation: 6 hard copies + 2 soft copies of operation and maintenance manual along with equipment part list, shop manual (for bought out items) boom repair manuals f the same are to be submitted to BHEL during the time of delivery of the equipment. As built drawing with details of all the bought out items with make and model/part number also to be submitted along with the O&M manual.			
	27.	SONCAP: The Supplier must meet all statutory, regulatory, documentation, packaging and inspection requirement with respect to SONCAP requirement by Nigeria. Vendor must confirm that he is aware of SONCAP certification requirement for exporting his equipment to Nigeria and will comply to all such requirements. Fr5 GT, Calabar being a Nigerian project has got a statutory requirement for pre-shipment verification of all the goods that enter into the country and are assessed through a program named "SONCAP". May refer to the link: http://son.gov.ng/soncap_service for further information on SONCAP.			
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IMPORTANT NOTE: - - FOR MAKE OF ALL MAJOR COMPONENTS OF THE CRANE, BIDDERS MUST FILL THE <u>ANNEXURE-IV</u> AND SUBMIT ALONG WITH THE BID, FAILING WHICH THEIR BID WILL NOT BE CONSIDERED FOR FURTHER PROCESSING. - THE MAKE OF MAJOR COMPONENTS AS COMMITTED BY THE BIDDER SHALL FORM PART OF PURCHASE ORDER WHICH WILL BE PLACED ON THE SUCCESSFUL BIDDER. - DURING INSPECTION OF THE CRANE, THE MAKE OF THE COMPONENTS, RELEVANT TEST CERTIFICATE FROM THE RESPECTIVE COMPONENT MANUFACTURER AND CO-RELATION WITH THE ACTUAL COMPONENTS USED IN THE CRANE SHALL BE CHECKED BY BHEL ENGINEER. - BIDDER MAY ALSO NOTE THAT, DURING INSPECTION NDT TEST RECORDS FOR WELDING OF BOOM, JIB, BODY OF THE CRANE ETC. VETTED BY THIRD PARTY AGENCY OF INTERNATIONAL REPUTE SHALL BE VERIFIED. 100% ULTRASONIC TESTING IS REQUIRED FOR WELDING OF MAIN FRAME OF BOOM & JIB ETC. AND ITS RECORD ALONGWITH NDT RECORD WILL BE VERIFIED. - BIDDER MAY ALSO PROVIDE DOCUMENTARY EVIDENCE WHEREVER APPLICABLE.					
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<u>PART – C: ADDITIONAL REQUIREMENTS</u>											
1. BIDDER SHALL FURNISH THE LATEST DETAILED TECHNICAL LITERATURE AND CATALOGUE OF THE OEM FOR THE CRANE OFFERED. BHEL RESERVES THE RIGHT TO TALLY THE SAME FROM THE OFFICIAL WEB SITE OF THE OEM & IF ANY DISCREPANCY IS FOUND IN TERMS OF BASIC CAPACITY ETC. THEN BIDDERS OFFER SHALL BE REJECTED OUTRIGHT. 2. BIDDER SHALL FURNISH CRANE LOAD CHART AND CRANE RANGE DIAGRAM FOR ALL OPERATING CONDITIONS OF THE CRANE. 3. CRANE SHALL BE INSPECTED AND LOAD TESTED AT MANUFACTURER'S WORKS AS PER APPLICABLE STANDARD/NORMS AND AS PER QUALITY PLAN ATTACHED AS <u>ANNEXURE-III</u>. BIDDER IS REQUESTED TO FILL UP THE QUALITY PLAN AND SUBMIT WITH THE OFFER. THE BIDDER SHALL ALSO CONDUCT LOAD TEST AND OVERLOAD TEST OF THE CRANE AT MANUFACTURER'S WORKS IN PRESENCE OF BHEL/TPI INSPECTION ENGINEER. EXPENSES OF BHEL INSPECTION ENGINEER TOWARDS TO & FRO TRAVEL BETWEEN INDIA AND MANUFACTURER'S LOCATION, STAY AND LOCAL CONVEYANCE IN MANUFACTURER'S PLACE WILL BE BORNE BY BHEL. FOR INSPECTION OF CRANE AT MANUFACTURER'S WORKS ADVANCE INTIMATION SHALL BE GIVEN BY THE VENDOR TO BHEL WHICH SHALL NOT BE LESS THAN 15 DAYS PRIOR TO THE DATE OF INSPECTION. 4. MANUFACTURER SHALL provide TRAINING for PERSONS OF GOVERNMENT OF CROSS RIVER STATE, CALABAR, NIGERIA FOR THE ORDERED CRANE ON OPERATION AND MAINTENANCE FOR 2 MAN WEEK DURATION AT MANUFACTURER'S PLACE. THIS TRAINING SHALL											
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BE IMPARTED BEFORE INSPECTION OF THE CRANE. TRAINING TO BE IMPARTED ON CONSTRUCTIONAL FEATURES, ASSEMBLY, PREVENTIVE MAINTENANCE, and TROUBLE SHOOTING, ELECTRICAL & CONTROL SYSTEMS AND HYDRAULIC SYSTEM ETC. THE SAME GOVERNMENT OF CROSS RIVER STATE, CALABAR OR BHEL ENGINEERS OR TPI MAY CARRY OUT THE INSPECTION OF THE CRANE AS STATED IN POINT NO. 3 ABOVE.					
5. INSTALLATION AND COMMISSIONING (IF APPLICABLE FOR THE OFFERED MODEL) OF CRANE AT CALABAR, NIGERIA WILL BE DONE UNDER SUPERVISION OF COMPETENT ENGINEER OF THE CRANE MANUFACTURER. LOAD AND ACCEPTANCE TEST SHALL BE CARRIED OUT AFTER ASSEMBLY AND COMMISSIONING OF CRANE IN THE PRESENCE OF ENGINEERS FROM SUPPLIER and BHEL/CROSS RIVER STATE, CALABAR, NIGERIA. AT CALABAR NIGERIA, LOAD TEST SHALL BE CARRIED OUT WITH MAXIMUM AVAILABLE LOAD/LOADS ACCORDING TO THE CRANE CAPACITY CHART SUBMITTED WITH THE TECHNICAL BID. BHEL/GOVERNMENT OF CROSS RIVER STATE, CALABAR WILL TAKE OVER THE CRANE AFTER SUCCESSFUL COMPLETION OF SUCH TESTS WITH SIGNING OF COMMISSIONING PROTOCOL.					
6. ESSENTIAL ACCESSORIES: SUPPLIER SHALL SUPPLY TEN SETS OF ALL THE FILTERS, WITH 2 YEARS OF SHELF LIFE AT THE POINT OF DESPATCH, FOR VARIOUS SYSTEM OF THE CRANE. THESE TEN SETS SHALL BE IN ADDITION TO ONE SET ASSEMBLED AS PART OF THE CRANE. BIDDER SHALL FURNISH THE LIST OF SUCH ITEMS INDICATING DESCRIPTION, MAKE ALONGWITH PART NUMBER, AND QUANTITY OF THESE ESSENTIAL ACCESSORIES IN THEIR TECHNICAL BID. BIDDERS TO NOTE THAT THE TOTAL COST FOR PRICE COMPARISON BETWEEN DIFFERENT BIDDERS WILL INCLUDE THIS ALSO.					
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7. SUPPLIER SHALL DELIVER A BRAND NEW PRODUCT WITH LATEST AND IMPROVED FEATURES. SUPPLIER SHALL SUBMIT AS A PART OF THE DELIVERY/DISPATCH DOCUMENT A CERTIFICATE CONFIRMING THAT THE SUPPLIED GOODS ARE NEW. 8. SERVICE SUPPORT OF THE EQUIPMENT UNDER PURCHASE IS OF UTMOST CONCERN. BIDDER SHALL ELABORATE ON THE SERVICE NETWORKS AND SPARE PARTS AVAILABILITY, WHICH SHALL ENSURE MAINTENANCE OF THE EQUIPMENT AFTER INITIAL COMMISSIONING AND COMPLETION OF WARRANTY PERIOD. IN CASE SPARE PARTS STOCKING FACILITIES ARE NOT AVAILABLE IN NIGERIA, BIDDER SHALL INDICATE THE MAXIMUM TURNAROUND TIME IN MAKING SUCH SERVICES AVAILABLE AT CALABAR, NIGERIA. 9. THE EQUIPMENT TO BE OFFERED SHOULD BE OF ROBUST DESIGN AND SUITABLE FOR OPERATIONS IN CALABAR, NIGERIA (TROPICAL CLIMATE), COASTAL SALINE ATMOSPHERE, AMBIENT TEMPERATURE OF UP TO FIFTY DEGREE CELSIUS (50 °C) AND DUSTY ATMOSPHERIC CONDITION. THE ELECTRICAL, CONTROL SYSTEM AND PAINTING SHALL BE SUITABLE TO WITHSTAND SUCH ADVERSE TROPICAL CLIMATIC CONDITIONS. 10. WITH THE CRANE, THE SUPPLIER SHALL DELIVER ONE SET OF TOOL BOX CONTAINING TOOLS & TACKLES LIKE SPANNERS, SCREW DRIVERS, ALLEN KEY AND ANY SPECIAL PURPOSE TOOL(S) THAT ARE ESSENTIAL FOR ASSEMBLY/ERECTION/DISMANTLING OF THE CRANE IN A METALLIC TOOL BOX.					
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COPY RIGHT AND CONFIDENTIAL The information on this document is property of BHARAT HEAVY ELECTRICALS LIMITED It must not be used directly or indirectly in any way detrimental to the interest of the company.		11.VENDOR TO INDICATE THE DETAILS OF SUITABLE CRAINE AND MANPOWER IF REQUIRED FOR UNLOADING AND ASSEMBLY OF THE NEWLY SUPPLIED CRANE AT CALABAR, NIGERIA FOR, INTAIL ERECTION & COMMISSIONING AS APPLICABLE.			
		12.THE SUPPLIED CRANE SHALL BE PAINTED WITH AT LEAST ONE COAT OF PRIMER AND TWO COATS OF FINISH PAINT AFTER DUE SURFACE PREPARATION. MAIN BOOM AND JIB SHALL BE PAINTED WITH EPOXY PRIMER AND EPOXY PAINT SUITABLE FOR SALINE ATMOSPHERE . BIDDER SHALL FURNISH THE PAINTING SCHEDULE FOR THE VARIOUS PART OF THE CRANE TO TAKE CARE OF THE OCEAN VOYAGE AND THE TROPICAL WEATHER CONDITION IN NIGERIA (APPLICABLE FOR ALL MANUFACTURERS). COLOUR SHADE OF FINISH COAT OF PAINTING SHALL BE DONE WITH THE APPROVAL OF BUYER.			
		13.SUPPLIER SHALL DELIVER THE REQUIRED SET OF COUNTERWEIGHTS ESSENTIALLY COVERING TOTAL OPERATIONAL RANGE OF THE OFFERED CRANE.			
		14.THE BIDDER SHALL FURNISH PACKING DETAILS FOR TRANSPORTATION OF THE KNOCKED DOWN/ASSEMBLED CRANE. DIMENSION AND WEIGHT DETAILS FOR EACH AND EVERY PACKAGE MUST BE FURNISHED ALONG WITH THE TECHNICAL BID IN TABULAR FORM. <u>BIDDERS MAY NOTE THAT FOR ALL BOOMS AND JIBS, WOODEN CRATE PACKING WHEREVER APPLICABLE, EXPORT SHIPPING (FOR PROTECTION AGAINST DAMAGE) MUST BE GIVEN BEFORE SHIPPING OF THE CONSIGNMENT.</u>			
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BIDDER MUST PROVIDE THREE LAYER PACKING WITH PROVISION FOR CUSTOMS INSPECTION. Layer 1 - Polythene sheet of 100 GSM. Layer 2 - Two layers of stretch film sheet of 70 GSM (each). Layer 3 - HDPE Tarpaulin sheet of 150 GSM. 15.SUPPLIER SHALL ENSURE COMPLIANCE OF SALIENT POINTS OF HSE (HEALTH SAFETY & ENVIRONMENT) WITH REGARD TO THE OFFERED CRANE. 15.1 Consumption benchmarks related to output shall be provided wherever applicable for key input resources (energy/fuel/chemicals) 15.2 Competency requirements for operation, maintenance and calibration, if any shall be communicated. 15.3 If any hazardous chemicals as per MSIHC (Manufacturing, Storage and Import of Hazardous Chemicals) Rules 1989/94/2000 are used, the MSDS shall be provided, along with on-site & off-site emergency plan as applicable. 15.4 The maximum noise level at the operator's cabin shall be within 90Dba at 1 meter distance from equipment. In case local Nigerian environmental regulations require noise compliance to a lower value, the bidder shall comply with same. 15.5 OH&S (Occupational Health & Safety) control measures for safe working of machine as applicable shall be specified. 15.6 The machine/equipment shall be fitted with protective guards for rolling and moving parts and shall comply with applicable OH&S legislations and Factories Act 1948. 15.7 The supplier shall submit the layout drawing of operating controls, displays etc. and operating instructions to enable ergonomics evaluation and approval. 15.8 The recommended PPE (Personal Protective Equipment) for the equipment shall be furnished. 15.9 Alarm system (both visual and audible) and automatic switch-off mechanism for the equipment shall be provided for any intrusion, overloading, short-circuiting or any malfunctioning of the equipment. 15.10 Details of all hazardous/harmful substances discharged as by-products/ waste during operation of the machine / equipment, such as fumes, gases, dust particles, aerosols UV/IR (ultra violet / infra-red) radiations, etc. Shall be furnished, along					
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with their concentrations and their TLV (Threshold Limit Value). 15.11 Appropriate pollution control measures shall be proposed to keep the emissions from the machinery /within the prescribed limit as stated in Environment Protection Rules 1986 and Local Nigerian government statutory and regulatory requirements. 15.12 The engine with fuels with Sulphur content less than 0.05% shall be used in the crane. (will have max of 350 mg/Kg of Total Sulphur as tested as per ASTM D:4294) 16. BIDDER SHALL SUBMIT MANUFACTURING QUALITY PLAN, PAINTING PROCEDURE AND COLOR CODING SCHEME FOR HYDRAULIC, AIR & FUEL SYSTEM AND REPAIR PROCEDURE OF BOOM & JIB. 17. THE BIDDER SHALL RENDER ALL NECESSARY ASSISTANCE/SUPPORT INCLUDING TIMELY FURNISHING OF REQUIRED DOCUMENTS FOR PORT, EXPORT, CUSTOMS CLEARANCE, ETC. 18. BIDDER SHALL INDICATE THE DETAILS OF ROUTINE AS WELL AS BREAK DOWN SERVICE FACILITY DURING WARRANTY PERIOD. 19. WARRANTY: WARRANTY WILL BE FOR WORKMANSHIP, MATERIALS USED, DESIGN AND STIPULATED PERFORMANCE OF THE CRANE AND WILL REMAIN VALID FOR A PERIOD OF 18 MONTHS FROM THE DATE OF DESPATCH FOR FOREIGN SUPPLIERS, DATE OF TAX INVOICE FOR INDIAN SUPPLIERS, OR 12 MONTHS FROM THE DATE OF COMMISSIONING/COMMERCIAL OPERATION OF THE CRANE AT CALABAR, NIGERIA, WHICHEVER IS EARLIER. BIDDER SHALL SUPPLY ALL THE SPARES REQUIRED DURING WARRANTY PERIOD FREE OF COST. A TENTATIVE UN-PRICED LIST OF SUCH WARRANTY SPARES SHOULD BE ENCLOSED WITH TECHNO-COMMERCIAL OFFER. THE WARRANTY ON SUB SYSTEMS LIKE PRIME MOVER, HYDRAULIC PUMPS ETC ARE TO BE CARRIED FORWARD BY CRANE MANUFACTURER FOR THE PERIOD OF WARRANTY OFFERED BY THE RESPECTIVE SUB SUPPLIERS OR FOR CRANE WARRANTY PERIOD WHICHEVER IS LATER. (THE LIST OF SUCH ITEMS					
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AND THE RESPECTIVE EXTENDED WARRANTY PERIOD OFFERED BY SUB SUPPLIERS NEEDS TO BE BROUGHT OUT IN THE OFFER EXPLICITLY)											
20. Quality Assurance Provisions a. <u>General</u> The equipment specified herein shall be designed and supplied by the manufacturer to meet the conditions of sound engineering, economy of manufacture and procurements of spare parts. The entire assembly shall be guaranteed to be free of all defect in design, materials and workmanship. b. <u>Responsibility for Test and Inspections</u> The vendor is responsible for the performance of all test and inspection requirements. The supplier may utilize his own facilities or any commercial laboratory acceptable to BHEL. BHEL, in addition, reserves the right to perform any of the required inspections and tests where such inspections and tests are considered necessary to assure that the items supplied conform to the requirements of this specifications. All tests and inspections shall be conducted in accordance with ANSI/ASME B31.3 or applicable national/international standard and shall record pertinent data reliably and accurately, so as to permit proper evaluation of inspection and test results by BHEL. c. <u>Quality Assurance Plan</u> Within 3 weeks of LOI, vendor shall submit detailed QA plan along with design documentation indicating all the inspection and testing requirements of the unit for BHEL approval.											
21. Testing and inspection i. <u>Performance test and inspection requirements</u> In order to indicate conformity with this specification and to qualify the system for acceptance by BHEL, the system shall be tested as follows: ii. <u>Inspection</u> Functional check of all instruments. Verify the assembled equipment, wiring confirms to the approved schematic and electrical drawings. Verification of test certificates, CCOE certificates of all components. Calibration of all the flow, temperature and pressure gauges, switches as applicable shall be checked. All pressure and temperature switches shall be set and verified for the settings specified in the ordering spec / approved drawings. All the equipment assembled on the skid shall be checked and verified with the nameplate & approved drawings/datasheets. iii. <u>Factory test</u> Before the mobile crane unit is shipped, the vendor shall perform whatever test necessary to demonstrate that the system has been properly assembled and that all											
<table border="1"> <tr> <td> Revision: Refer to record of revisions </td> <td> Prepared : (T. Abhiram) </td> <td> Checked : (Sanjay Kumar) </td> <td> Approved : (E. Chandrasekhar) </td> <td colspan="2"> Date : 09-05-2019 </td> </tr> </table>						Revision: Refer to record of revisions	Prepared : (T. Abhiram)	Checked : (Sanjay Kumar)	Approved : (E. Chandrasekhar)	Date : 09-05-2019	
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COPY RIGHT AND CONFIDENTIAL The information on this document is property of BHARAT HEAVY ELECTRICALS LIMITED It must not be used directly or indirectly in any way detrimental to the interest of the company.	components are functioning correctly. The vendor shall furnish to BHEL, a factory test procedure for the system for BHEL approval. The factory test procedure shall include a description of the tests to be run and the results expected. The vendor to notify BHEL at least 10 days in advance of the date the tests are to start so that the tests will be witnessed by BHEL / BHEL TPI. iv. <u>Hydrostatic test</u> The pressurized components in the crane shall be hydro tested. The piping/hose system shall be pressurized to 150% of the design pressure for a 30-minute period after closing all gauge valves. While under pressure, carefully inspect all piping, connection and joints for leakage and note any drop of pressure during the period. Hydrostatic test shall be conducted in accordance with ANSI B31.3. v. <u>Flushing</u> The equipment shall be completely inspected and if necessary cleaned prior to flushing. The crane shall be flushed to verify it is clean, both up-stream and downstream of any filters. The crane shall be flushed and cleaned dry before dispatch of equipment. vi. <u>Mechanical Run & Load Test</u> Mechanical run test to be performed as per BHEL approved test procedure and BHEL approved quality plan to check the operation of the crane and associated equipment/devices. 22. DOCUMENTATION SUBMISSION & INFORMATION BY VENDOR: 22.1 Along with offer, the following documentation essential for technical review and acceptance. The technical offer is likely to be considered inadequate if the data provided is not in compliance with the below. In such cases, at the discretion of BHEL, the offer may be disqualified. Schematic drawing for total system; BOM with makes, model numbers a) General arrangement drawing of Mobile Crane b) Technical details & data (with catalogues & drawings) for Mobile crane and its' major components, instrumentation etc. c) The vendors shall submit the proposed makes of all critical items in the scope of supply. This will be subjected to acceptance by BHEL. BHEL's approval will not relieve vendor of the responsibility of proper functioning of these parts and the entire system. d) Deviation list, if any (with alternative proposal and complete technical details of the alternative proposed), shall be brought out with respect to the proposed supply.				
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23. PREPARATION FOR DELIVERY:					
23.1 Preservation: The supplier shall ship the equipment prepared for storage for up to 2 years. If there are any requirements for the equipment to be stored for this period of time, the requirements shall be documented and provided on the exterior of the crane/shipping crate as applicable. The equipment may be stored outside in the same ambient conditions listed in this functional specification.					
23.2 Packing:					
23.2.1 The shipping containers are expected to be put in open environment at site for 2 years before taken for erection. Packing to be done accordingly to avoid any damage/malfunctioning of the components in the shipping containers.					
23.2.2 The supplier shall make shipment using minimum number of shipping containers consistent with the requirements of safe transit, available modes of transportation and routing. It shall be the vendor's responsibility to determine that packing as done is adequate to assure that all equipment shall arrive at destination in an undamaged condition and ready for its intended use.					
23.2.3 Packing shall be done as per BHEL specification GT14024. Vendor shall submit packing details for all equipment for BHEL approval.					
23.2.4 Lifting points shall be clearly marked on each of the containers.					
23.2.5 When more than one shipping container is required, the vendor shall provide suitable container markings for recognition of parts of one unit. Complete assembly instructions shall be included with each such shipment.					
23.2.6 All shipping containers shall be identified in accordance with the purchaser's instructions furnished by the purchasing office at the time of shipment.					
23.2.7 All the packing shall be made in such a way that it can be opened from top without damage of the packing for inspection inside, by the customs authority at ports. It shall be possible to replace and close the opening to its original condition.					
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23.2.8 For packing requirements of control system, refer to BHEL specification GT55438. 23.3 <u>Marking:</u> 23.3.1 All despatchable loose parts/assemblies, shipping packets & containers etc. shall be individually, permanently and legibly marked/tagged for part number identification as per the BOM, so as to store, locate and identify the items conveniently, easily and quickly at site. 23.3.2 Each of the shipping containers shall be identified with the details listed be-low. a) "GAS TURBINE ITEMS – MOBILE CRANE FOR CALABAR, NIGERIA" b) WorkOrder No: c) BHEL Purchase Order No: d) Description: e) Gross weight: _____ f) Packing dimensions (LXWXH): _____ g) Center of gravity marking h) Upright position marking 23.3.3 Each shipping container shall have two packing lists – one inside the container in a waterproof envelope and the second outside the container in a metallic pocket in a secure manner, listing all contents of the particular container. Each part will be identified and keyed to the packing list. Packing list for each of the dispatchable container/box shall contain the following minimum number of columns but not limited to the same. <table border="1" data-bbox="293 1388 1382 1682"> <thead> <tr> <th rowspan="2">Sl. No.</th> <th rowspan="2">Description</th> <th rowspan="2">Quantity</th> <th rowspan="2">Unit</th> <th rowspan="2">Assembly drawing no.</th> <th rowspan="2">Package No.</th> <th rowspan="2">Total weight (in KGs)</th> <th colspan="3">Package size (in meters)</th> </tr> <tr> <th>L</th> <th>W</th> <th>H</th> </tr> </thead> <tbody> <tr> <td>1</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>2</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>3</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table> 23.4 <u>Shipment:</u>										Sl. No.	Description	Quantity	Unit	Assembly drawing no.	Package No.	Total weight (in KGs)	Package size (in meters)			L	W	H	1										2										3									
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		demand. These records shall be so organized to allow easy identification of component part numbers and serial numbers for each individual module manufactured by that supplier correlated against the BHEL part numbers and the supplier's serial number for that module; and the BHEL PO number and the BHEL turbine number associated with that PO. 24.3 Guarantee: 24.3.1 Vendor shall furnish a guarantee certificate indicating guaranteed performance of the equipment at site for a period of 18 months from the date of delivery or for a period of 12 months from the date of commissioning at site, whichever is earlier. 24.3.2 Review/approval of documents & data by BHEL shall not relieve the vendor from its responsibilities of compliance with all applicable codes, regulation standards and good engineering practices for the system supplied. 24.4 Intent: In order to comply with the intent and spirit of this specification, any item not specifically referred to, but considered to be necessary to fulfill the requirements of this specification shall be included in the vendor's design. 24.5 Installation: Supplier shall provide instructions on removal of packaging/preservation equipment. These instructions shall be placed with the packing list on the exterior of the shipping container/crate. 24.6 Special tools: The vendor shall provide a complete set of special tools that may be required for installation, normal maintenance and complete overhaul of the equipment. Same shall be enlisted in the BOM and part number given in the drawing.				
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NOTE: The following information shall be part of tender enquiry: - The tenderers shall also submit following information along with the technical bid: - Gross/Nett Weight of Equipment in Kgs - Volume of Cargo in packed conditions in CBM/Freight-Tons - No. of packages and their individual weight/Vol.in MKS system, along with tentative shipping list. - BHEL RESERVES THE RIGHT TO PLACE PURCHASE ORDER FOR OPTIONAL ITEMS AT VENDOR'S QUOTED RATES (IF ACCEPTABLE TO BHEL) WITHIN THE VALIDITY PERIOD.																													
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DOC NO: GT54761-PQR, REV:00

PART – A : PRE-QUALIFICATION CRITERIA (PQR) FOR PARTICIPATING IN THE TENDER

- 1) a) Bidder must be a manufacturer of **Truck Mounted Boom cranes** of quoted capacity or higher for at least Five years period preceding the date of submission of tender.
OR
b) Bidder must be **an authorized representative of the original equipment manufacturer (OEM)** for selling the TM Boom crane – such OEM must fulfill the Q.R. as in “1.a” above.
- 2) Minimum Five units of TM Boom cranes of ‘**quoted capacity**’ as per specification in this enquiry or higher capacity manufactured by the OEM should have been supplied and working anywhere in the world during last five years, (Supply detail has to be furnished as per Annexure – I). Performance certificates of at least three cranes from three different customers, located anywhere in the world, are to be furnished by Bidder.
- 3) **Performance certificate** shall be in English duly signed and stamped by the concerned customer. (Performance Certificate to be furnished as per Annexure-II). **Performance Certificates should have been issued by the customer after completion of at least two years of operation of the supplied Crane. (Number of hours successfully operated to be explicitly indicated)**
- 4) The offered crane as per specification shall be in the current manufacturing range of OEM and of operationally proven, successfully working for minimum period of 12 months operation prior to the date of Technical Bid opening.

Note: All the above (four) documents should be in English only and to be submitted along with the offer.

DOC NO: GT54761-ANNEXURE-I, REV:00, (PART OF PREQUALIFICATION CRITERIA)

DETAILS OF SUPPLIES MADE FOR THE LAST FIVE YEAR PERIOD

Sl.No	Make of Crane	Model	Capacity (MT)	Purchaser's Details			Purchase Order No. & date	Date of Commissioning	Present location	Complete supporting documents (attached)
				Name	Address	Phone, Fax & email				
1										Yes/No
2										Yes/No
3										Yes/No
4										Yes/No
5										Yes/No

Note:

1. Contact details of Purchaser shall be furnished correctly by the bidder. If it is found that contact details furnished is not correct, then BHEL reserves the right to reject the submitted bid.
2. Supporting documents to be attached are Purchase Order and Commissioning Certificate/ Performance certificates
3. All the documents should be in English only

SIGNATURE & STAMP OF MANUFACTURER

DOC NO: GT54761-ANNEXURE-II, REV:00
(PART OF PREQUALIFICATION CRITERIA)
PERFORMANCE CERTIFICATE

The Performance certificate issued by the customer, necessarily should contain the following:

Sl. No	Criteria		Customer's Observation	Remarks
1	Customer Details	Name & brief address		
2	OEM name of the Crane & Country of Manufacture			
3	Year of Purchase			
4	Type/Model/Basic Capacity of the crane (MT)			
5	Overall performance of the crane			

SIGNATURE & STAMP OF CUSTOMER

DOC NO: GT54761-ANNEXURE-III, REV:00

QUALITY PLAN FOR TM BOOM CRANE

SL NO.	CHARACTERISTICS/ITEM	TYPE OF CHECK	INSTRUMENT	QUANTUM/ FREQUENCY OF CHECK	REFERENCE DOCUMENT/ACCEPTANCE STANDARD	FORMAT OF RECORD	REMARKS
01	Manufacturing Standard	Verification	NIL	100%	Manufacturers Standard Ref. No. & Records maintained during various stages of manufacturing.	Copy of the Standard	Certificate of compliance of standard to be given by the manufacturer.
02	Bill of Material	Verification	NIL	100%	Purchase Order	Purchase Order	
03	Safety Devices:						
	(a) Cut off devices with alarms when exceeding permissible load moments.	Functional Check	NIL	100%	Purchase Order	Joint Protocol to be signed by the vendor & BHEL inspector or BHEL authorized third party inspection agency.	To be inspected depending upon the list of devices included in the PO/relevant standard.
	(b) Safe load indicator with visual display in operator's cabin indication all operating parameters.						
	(c) Safety valve in the event of pipe/hose rupture.						
	(d) Protection against boom over hoisting & over lowering, and over hoisting of hoist. (hoist & boom limit switches to be provided).						
	(e) Drum limit switch for retaining minimum 3 layers of rope on drum.						
	(f) Self check/error detection system						
	(g) Anemometer with wind velocity indicator.						
	(h) Two Nos. of Mechanical gradient indicator - Inclinator (One inside the cabin and other outside the car body).						
	(i) Rope attachment in boom (socket/eye provision).	Physical checking					
	(j) Swing lock.	Functional Check					
	(k) Guards for rotating parts.	Physical checking					
04	Inspection at no load						
	(a) All crane functions - travelling, steering, hoisting, derricking/luffing, slewing, all horns & lights, oil pressure gauge, etc., ammeter and water temperature gauge, etc.	Functional Check	NIL	100%	Purchase Order	Joint Protocol to be signed by the vendor & BHEL inspector or BHEL authorized third party inspection agency.	
	(b) All Lubrication points.						
	(c) Hook Latch provision.						
	(d) Brakes & Clutches	Functional Check	NIL	100%			

ANNEXURE – III (contd.)

SL NO.	CHARACTERISTICS/ITEM	TYPE OF CHECK	INSTRUMENT	QUANTUM/ FREQUENCY OF CHECK	REFERENCE DOCUMENT/ACCEPTANCE STANDARD	FORMAT OF RECORD	REMARKS
05	Load & Over Load Testing						
	(a) Load test to be carried out at 10% over & above the rated capacity. All crane functions-travelling, steering, hoisting, derricking/luffing, slewing, self-erection system to be checked.	Functional Check	Required load-to be arranged by manufacturer	100%	Purchase Order	Joint Protocol to be signed by the vendor & BHEL inspector or BHEL authorised third party inspection agency.	
	(b) Over-load test to be carried out at 25% over & above the rated capacity.						
06	Bought out items						
	(a) Engine	Verification	NIL	100%	Purchase Order	Manufacturer's test certificates and correlation with crane serial number.	
	(b) Hook Blocks						
	(c) Wire ropes						
	(d) Hydraulic Pumps & Motors						
	(e) Track Shoes						
07	Boom & Jib						
	(a) Material Specifications	Verification	NIL	100%	Vendor's records		
	(b) Welding Procedure	Verification	NIL	100%	Vendor's records		
	(c) Record of non-destructive testing of welding i.e. Dye penetrant testing, MPI/UT, etc.	Verification of NDT records	NIL	100%	Vendor's records		
	(d) Checking of alignment w.r.t. tolerance limits	Verification of records	NIL	100%	Vendor's records		
08	Crane documentation i.e. O&M manual, spare parts manual, bought out items manuals, etc.	Verification	NIL	100%	Purchase Order		

Note: Vendor to submit Quality plan during detail engineering stage including the above points for BHEL approval.

DOC NO: GT54761-ANNEXURE-IV, REV:00

MAKE OF MAJOR COMPONENTS OF THE QUOTED CRANE

Crane Capacity & Model: _____ (pls specify)

Sl. No.	Name of the Component	BHEL preferred Make of Components (For Sl.nos. 02 to 10)	Bidder's Offer - Specifically mention the name of the supplier with detail address.	Remarks if any
1	ENGINE	Cummins / Caterpillar/ Volvo/ Daimler Chrysler / HINO (MANDATORY MAKES)		AUTHORISED SERVICE AGENCY OF ENGINE MANUFACTURER IN INDIA MAY BE INDICATED.
2	MAIN PUMP OF HYDRAULIC SYSTEM.	From supplier of repute.		
3	ALL OTHER PUMPS IN THE HYDRAULIC SYSTEM.	From supplier of repute.		
4	ALL MOTORS USED IN HYDRAULIC SYSTEM (TRAVEL MOTOR / SWING MOTOR)	From supplier of repute.		
5	BEARINGS INCLUDING SLEW BEARING.	From supplier of repute.		
6	WINCH MOTOR	From supplier of repute.		
7	WINCH	From supplier of repute.		
8	WIRE ROPES.	From supplier of repute.		
9	MAIN BOOM AND LACING PIPES.	From supplier of repute.		
10	STEEL OF BASIC BODY OF THE CRANE (i.e. CARBODY, CABIN, Boom, Jib ETC.)	From supplier of repute.		