



Specification No.	7206
Item No.	ME-17/2755
Location	BAY-9
Quantity	2 nos.

SPECIFICATION CUM COMPLIANCE CERTIFICATE OF OIL SILO

NOTE:-

1. Vendor must submit complete information against clause no. 17.0 (Qualifying Condition). The offer meeting this clause would only be processed.
2. Vendor to furnish the offer using this standard template of the specification. While furnishing the offer, no change is to be made in the first three columns (i.e. 'S. NO.', 'DESCRIPTION FOR BHEL REQUIREMENT' & 'ACTION BY VENDOR'). Only the 'Offered' column and where applicable, the 'Deviations' & 'Remarks' Column of this format shall be filled in by the Vendor and submitted along with the offer. Inadequate / incomplete, ambiguous, or unsustainable information against any of the clauses of the specifications/requirements shall be treated as non-compliance.
3. The offer and all documents enclosed with offer should be in English language only.
4. Where ever "vendor to specify" or "suitable" is mentioned, suitable backup data or calculation or justification is required for establishing the suitability.
5. Circuit diagram of the system offered is to be enclosed with proper writeup.

NAME & ADDRESS OF THE SUPPLIER :

TELEPHONE NOS. :

FAX NOS. :

E-MAIL ADDRESS :

NAME & ADDRESS OF THE INDIAN AGENT :

TELEPHONE NOS. :

FAX NOS. :

E-MAIL ADDRESS :

SCOPE: DESIGN, SUPPLY, ERECTION & COMMISSIONING OF OIL SILOS COMPLYING WITH SPECIFICATIONS AS BELOW

S. NO.	DESCRIPTION FOR BHEL REQUIREMENT	ACTION BY VENDOR	OFFERED	DAVIATION / REMARK
1.0	PURPOSE & WORKPIECE MATERIAL:			
1.1	Oil Silos are required with the following specification for filtration, heating and storage of raw as well as processed transformer oil under vacuum.			
2.0	SCOPE OF SUPPLY AND SCOPE OF WORK:			
2.1	Scope of supply Design, Manufacturing, Supply of following equipment in line with specification covered under point 3.0 : A. Oil Silos, Capacity: 60 KL, Operating Vacuum: 0.5 Torr -- QTY-02 nos.	Vendor to confirm		
2.2	(Vendor may visit the site before submitting the offer to understand the site requirement) Scope of work Erection & Commissioning and proving of supplied plants/ equipment	Vendor to confirm		
3.0	SPECIFICATION:			
3.1	OIL SILO Capacity-60 KL, STATIONARY --QTY-02 Nos.			
	The specification governs the quality requirement of design, manufacturing, supply, erection and commissioning of 60 KL capacity Oil Silo complete in all respect.	Vendor to confirm		
3.1.1	General Features Design, manufacturing and supply of 60 KL capacity oil storage tanks. This is to be fabricated from tested rolled steel, properly reinforced with steel sections to withstand Stored oil pressure, 0.5 torr vacuum and 80 degC temperature. Oil storage tanks shall comply with the requirements of factory safety act as well as storage vessel safety rules and shall conform to relevant code of practice and BIS standards. Vendor to furnish details about general construction features literature, leaflets, drawings and sketches etc..	Vendor to confirm & Furnish		
3.1.2	Specification			
3.1.2.1	Mounting : Vertical	Vendor to confirm		
3.1.2.2	Construction : Cylindrical having conical/ hemispherical/ dished (torispherical) shape at bottom and top.	Vendor to confirm		
3.1.2.3	Diameter : 3000 to 4000 MM	Vendor to confirm		

SCOPE OF SUPPLY, ERECTION & COMMISSIONING OF OIL SILOS COMPLYING WITH SPECIFICATIONS AS BELOW

S. NO.	DESCRIPTION FOR BHEL REQUIREMENT	ACTION BY VENDOR	OFFERED	DEVIATION/ REMARK
3.1.2.4	Shell Thickness : 8 MM (Min.)	Vendor to confirm		
3.1.2.5	Dish end Thickness : 10 MM (Min)	Vendor to specify		
3.1.2.6	Capacity : 60 KL	Vendor to specify		
3.1.2.7	Operating Vacuum : 0.5 Torr	Vendor to note		
3.1.2.8	Storage condition : Silo shall be stored in ambient atmospheric condition (open yard) and oil inside the silo shall be stored @ 20 torr vacuum and 70 degC temperature.	Vendor to note & confirm		
3.1.2.9	The vessel shall be provided with a sump and 80 NB drain pipe at the lowest depth of vessel with necessary ball valves at the bottom for draining the residual oil.	Vendor to confirm		
3.1.2.10	Air Cooled vacuum pumping system (Common for both Oil silos with automatic actuated isolating valves shall be provided to achieve and maintain 20 Torr vacuum in 2X60 KL capacity transformer oil storage tank with permissible leak rate 2 torr-ltr/sec. Vacuum pump unloading provision using suitable vacuum measuring and control system shall be provided to maintain desired vacuum.	Vendor to confirm & Specify		
3.1.2.11	Steam heating system including steam heating coils, manual steam valves, automatic temperature control valve, safety valves, traps, pressure gauges, temperature sensor with controller and all other required accessories for steam supply and steam condensate line in both the tanks shall be provided to achieve and maintain the temperature of oil inside Oil silo between 60 degC to 70 degC (Max). BHEL will provide Steam at single point at a pressure ranging from 5 Kg/cm2 to 7 kg/cm2. Supplier to design and supply the system considering minimum available steam pressure i.e. 5 Kg/cm2.	Vendor to confirm & Specify		
3.1.2.9	The vessel shall be mounted on a base / footing with four legs at such a height to provide sufficient clearance for access between sump drain connection and ground/ pit.	Vendor to confirm		
3.1.2.10	The vessel shall be provided with 2 numbers 500 m. diameter, vacuum sealed manholes, one each located along the height on top & bottom and shall be effectively sealed by hinged covers and their design be such that ingress of air / water / moisture is not possible. The vessel shall be provided with an access ladder permanently located inside and outside near the manholes to facilitate maintenance and cleaning.	Vendor to confirm		
3.1.2.11	The vessel shall be provided with well protected level tube gauge, capacitive type level sensor with indicator having low and high level alarm. Temperature gauge, PRV with overflow line upto silo drain point and a dry air breathing unit containing drying agent such as silica gel with isolation valve. Gauges should be installed at visible height.	Vendor to confirm		
3.1.2.12	The high and low level alarm should be integrated with pump motors.	Vendor to confirm		
3.1.2.13	A control cabinet (enclosed in cubicle) shall be provided for operation and control of Vacuum pumping system.	Vendor to confirm		
3.1.2.14	80 NB oil inlet and out let pipes with interconnection and isolation provision between both silos shall be provided with necessary valves. Line with isolating valve shall be provided for sample collection. All the lines from the oil silo shall be with flange connection.	Vendor to confirm		
3.1.2.15	Flange connection with isolation valve shall be provided on tank for connection of vacuum pumping unit.	Vendor to confirm		
3.1.2.16	All other Valves and accessories such as Non Return Valve, Silo Drain Valve etc. shall be in the scope of vendor.	Vendor to confirm		
3.1.2.17	Complete vessel shall be provided with necessary insulation and cladding with G.I. Sheet so that out side surface temperature shall not be more than 55 degC in any condition. BHEL shall provide insulation material only and cladding G.I. sheet and other anchoring material etc. shall be supplied by vendor.	Vendor to confirm and specify		
3.1.2.18	All steel surfaces exposed to weather to be given a primary coat of zinc chromate. Second coat of oil, heat and weather resistant paint. Final two coats of glossy oil and weather resistant light gray paint. DFT of paint surface of final coating of paint shall not be less than 150 microns.	Vendor to confirm		
3.1.2.19	Drawing of the offered oil silo shall be submitted to BHEL for approval before start of fabrication.	Vendor to confirm		
4.0 ELECTRICAL SYSTEM :-				
4.1	415V +/- 10%, 50 HZ +/- 3%, 3 phase AC (3 wire system without neutral) Power Supply Source will be provided by BHEL at a single point near the Silos as per layout recommended by VENDOR. All step down transformers, rectifiers & regulators shall also be supplied by the vendor. All types of cables, connections, circuit breakers etc. required for connecting BHEL's power supply point to different parts of the control cabinets, shall be the responsibility of VENDOR. Requirement of grounding/earthing with required material details is to be informed by VENDOR well in advance so that same could be incorporated during construction of foundation.	Vendor to Confirm		
4.2	All electrical components in the cabinets should be mounted on DIN Rail.	Vendor to Confirm		
4.3	VENDOR should ensure the proper earthing for the Silos and its peripherals.	Vendor to Confirm		
4.4	All electrical equipments shall be suitably protected by HRC fuses/ MCBs/ Overload relays & single phase preventives.	Vendor to Confirm		

Page - 2

28/3/19

Signature

Signature

Signature

Signature

SCOPE: DESIGN, SUPPLY, ERECTION & COMMISSIONING OF OIL SILOS COMPLYING WITH SPECIFICATIONS AS BELOW

S. NO.	DESCRIPTION FOR BHEL REQUIREMENT	ACTION BY VENDOR	OFFERED	DEVIATION / REMARK
5.0	SAFETY ARRANGEMENTS:			
5.1	Following safety features in addition to other standard safety features should be provided on plants.	Vendor to Confirm		
5.2	Slips should have adequate and reliable safety interlocks / devices to avoid damage to the workpiece and the operator due to the malfunctioning or mistakes.	Vendor to Confirm		
5.3	All the pipes, cables etc. on the Plant should be well supported and protected.	Vendor to Confirm		
5.4	All the rotating parts used with Silos should be statically & dynamically balanced to avoid undue vibrations.	Vendor to Confirm		
5.5	Emergency switch at suitable location as per International Norms are to be provided.	Vendor to Confirm		
6.0	ENVIRONMENTAL PERFORMANCE :			
6.1	If any safety / environmental protection enclosure is required, it should be built in the plant by the VENDOR and certification of conformance to the pertinent act/rule shall be furnished.	Vendor to Confirm		
7.0	TOOLS FOR ERECTION, OPERATION & MAINTENANCE:			
7.1	Special tools and equipment required for erection of the Silos shall be brought by the VENDOR on returnable basis.	Vendor to Confirm		
8.0	SPARES:			
8.1	Complete list of spares for Oil Silos and accessories, along with specification / type / model, and name & address of the spare supplier shall be furnished along with documentation to be supplied with the Oil Silos.	Vendor to Confirm		
9.0	DOCUMENTATION: Four sets of following documents (Soft copy in CD as well as Hard copies) in English language should be supplied along with the plant.	Vendor to Confirm		
9.1	Operating manuals of Plant with handbook for operation.	Vendor to Confirm		
9.2	Detailed Maintenance manual of Plants with all drawings of assemblies/ sub- assemblies/ parts including Electrical / Pneumatic / Heating circuit diagrams. All Assembly / sub assembly Drawings as commissioned shall be supplied with the part list also.	Vendor to Confirm		
9.3	Catalogues, O & M Manuals of all bought out items including drawings, wherever applicable.	Vendor to Confirm		
9.4	Detailed Specification of all rubber items & Fittings.	Vendor to Confirm		
9.5	Soft copy of O & M Manual alongwith drawings to be provided.	Vendor to Confirm		
10.0	TRAINING:			
10.1	BHEL Persons shall be trained at BHEL Works in the field of Operation and Mechanical & Electrical maintenance of Oil Silos & other supplied equipment.	Vendor to Confirm		
11.0	FOUNDATION:			
11.1	VENDOR shall submit the preliminary layout drawing for getting BHEL's approval within one month from the date of Letter of Intent (LOI) / P.O. Foundation work will be executed by BHEL. However, detailed foundation drawing with reinforcement details needs to be given by vendor within 4 weeks from the date of approval of lay-out drawing. All fixators, insert plates, supports & brackets shall be supplied by the vendor.	Vendor to Confirm		
12.0	ERECTION & COMMISSIONING			
12.1	Supplier to take full responsibility for carrying out the erection & commissioning, start up, testing of plants. Service requirement like power, steam & air shall be provided by BHEL at only one point (to be indicated by supplier in their foundation / layout drawings). Other requirements like crane, trolley shall be arranged by the vendor. Details of the requirements should be informed by VENDOR in advance (one month prior to the scheduled date of start of erection activities).	Vendor to Confirm		
12.2	Successful proving of BHEL components by the supplier shall be considered as part of commissioning. All tests, as mentioned at clause 14.0 (Plant Acceptance) shall form the part of commissioning activity.	Vendor to Confirm		
12.3	Tools, Tackles, Test Material, Instruments and other necessary equipment including Laser Equipment, if any, required to carry out all above activities should be brought by the supplier on returnable basis.	Vendor to Confirm		
12.4	Commissioning spares, required for commissioning of the Plants within stipulated time, shall be brought by the supplier.	Vendor to Confirm		
12.5	All Cover Plates, Platforms (Grill Type), Railing etc. required for the Plants and its peripherals if any, shall be supplied and installed by the vendor.	Vendor to Confirm		
12.6	Portion, if any, of the Plants, accessories and other supplied items where paint has rubbed off or peeled off during transit or erection, should be repainted and merged with the original surrounding paint by the VENDOR. For this purpose, the VENDOR should supply sufficient quantity of touch-up paint of various colours of paints used.	Vendor to Confirm		
12.7	Vendor may note that the E & C charges in this case have been mandatorily fixed at 10% of the total cost. This apportioned price has to be Compulsorily agreed by all vendors & no deviation shall be acceptable for this.	Vendor to Confirm		
13.0	AMBIENT CONDITIONS & THERMAL STABILITY:			

Roger S

26/5/19

[Signature]

[Signature]

[Signature]

[Signature]

[Signature]

SCOPE: DESIGN, SUPPLY, ERECTION & COMMISSIONING OF OIL SILOS COMPLYING WITH SPECIFICATIONS AS BELOW

S. NO.	DESCRIPTION FOR BHEL REQUIREMENT	ACTION BY VENDOR	OFFERED	DEVIATION / REMARK
13.1	Oil Silos and all supplied items should work troublefree and efficiently under following operating conditions and should give specified accuracies. POWER SUPPLY: Voltage : 415 V -10%, +10%. Frequency : 50 Hz +1.5Hz, -1.5Hz No. of phases : 3, no neutral Ambient Conditions : Temperature = 5 to 50 degree celsius, Relative Humidity : 95 % <i>(Vendor to confirm that Plants suitable for above)</i>	Vendor to Confirm		
13.2	Weather conditions are tropical. Atmosphere may be dust laden during some part of the year. Oil silo shall be installed in open to sky condition. Max. temperature variation is up to 25 deg Celsius in 24 hours. (VENDOR to confirm that Plants are suitable for above)	Vendor to Confirm		
13.3	Thermal Stability of the complete Plant keeping in view specified Ambient Conditions and accuracy requirements of BHEL components and trouble free operation of the Plant should be ensured by VENDOR. (VENDOR to confirm that Plants are suitable for above)	Vendor to Confirm		
14.0	PLANT ACCEPTANCE : (Tests / Activities To be Performed by VENDOR)	Vendor to Confirm		
14.1.1	Tests / Activities to be carried out at supplier's works in presence of BHEL Representative on the plant before despatch :	Vendor to Confirm		
14.2	Tests to be carried out at BHEL Works while commissioning the Oil Silos:	Vendor to Confirm		
14.2.1	Demonstration of all features of the Oil Silo and all Accessories to the satisfaction of BHEL for their efficient and effective use.	Vendor to Confirm		
14.2.2	Welding Joint NDT test report shall be submitted by vendor.	Vendor to Confirm		
14.2.3	Inspection & Testing of oil silo shall be done as per "IS: 803, Point 9.3.5: Circularity & Shape & Point 12.0: Testing of tanks"	Vendor to Confirm		
15.0	GUARANTEE:	Vendor to Confirm		
15.1	24 months from the date of commissioning of the all three plants	Vendor to Confirm		
16.0	GENERAL : The VENDOR should submit the following information for Oil Treatment Plant and Vacuum Pumping Unit Separately :	Vendor to Confirm		
16.1	Vacuum Pump Make and Model	Vendor to Confirm		
16.2	Total connected load (KVA)	Vendor to Confirm		
16.3	Floor area required (Length, Width, Height) for individual Plant & accessories	Vendor to Confirm		
16.4	Painting of Plant / Electrical Panels : Polyurethane paint (Preferably Apple Green). All the pipeline should be painted in line with 'IS 2379-1990- Pipelines- identification- color code'.	Vendor to Confirm		
16.5	Total Weight of the Plant	Vendor to Confirm		
17.0	QUALIFYING CONDITION :	Vendor to Confirm		
17.1	Only Original Equipment Manufacturers (OEMs) or their Authorized Dealers/Partners meeting the following conditions are eligible to participate in the tender. (a) The vendors, submitting the quotation, should have supplied and commissioned at least 5 nos. 60 KL capacity or higher capacity oil silos in the past seven years for transformer industry can participate. Or Indian Vendors who have a running Collaboration/ Joint Working arrangement with Foreign Manufacturer [meeting above specified qualifying conditions mentioned in 17.1 (a)] can also participate. Such Indian Vendors (OEMs) shall have to submit a back to back guarantee from their foreign partner for satisfactory performance of the offered plants and collaboration certificate/ joint venture documents to be submitted alongwith offer.	Vendor to Confirm & furnish		
17.2	The following information is to be submitted by the VENDOR about the companies where such plants have been supplied. This is required from all the VENDORS for qualification of their offer.	Vendor to Confirm		
17.2.1	Name of the customer / company where such Oil Silos are installed. (unpriced copy of purchase order to be furnished in line with point no. 17.1)	Vendor to Confirm		
17.2.2	Name, designation, complete postal address, Phone no. and E-mail address of the contact person of the customer.	Vendor to furnish		
17.2.3	Year of commissioning.	Vendor to furnish		
17.2.4	Application for which plants have been supplied.	Vendor to furnish		
17.2.5	Performance certificate from the customer regarding satisfactory performance for minimum one years after commissioning of at least 3 nos. oil silo supplied in line with point no. 17.1.	Vendor to furnish		
17.3	BHEL reserves the right to verify information or visit the place of installation of customer as indicated by VENDOR. In case the information is found to be false / incorrect, the offer shall be rejected.	Vendor to note & confirm		
18.0	TERMS & CONDITIONS			

Page 4

26/3/19

[Signature]

[Signature]

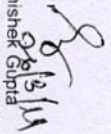
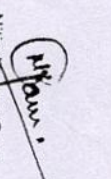
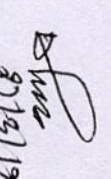
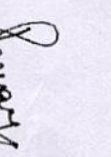
[Signature]

[Signature]

[Signature]

[Signature]

SCOPE: DESIGN, SUPPLY, ERECTION & COMMISSIONING OF OIL SILOS COMPLYING WITH SPECIFICATIONS AS BELOW

S. NO.	DESCRIPTION FOR BHEL REQUIREMENT	ACTION BY VENDOR	OFFERED	DAVIATION / REMARK
18.1	Time of Project Completion including material supply, E&C and prove-out (within 24 Weeks from date of LOI)	Vendor to Confirm		
18.2	Schedule of Supply and Erection & Commissioning shall be submitted with the offer.	Vendor to Confirm		
 Abhishek Gupta Sr. Engineer/ FCX  Prabhakar Kalyar Dy. Mgr./TRM  D. K. Sharma Dy. Mgr./TRM  Nitendra Kumar Gaur Manager/WEX  Dharendra Kumar Manager/TRM  Pawan Kumar Sr. Manager/WEX				