

BHARAT HEAVY ELECTRICAL LIMITED, JHANSI			
	Specification No.		7182/R2
	Item No.		ME-1/5/2639
	Location		BAY-6
	Quantity		ONE NO.
NOTE :			
1	VENDOR must submit complete information against clause No. 10.0 ( Qualifying condition). The offer meeting this clause would only be processed.		
2	The " SPECIFIED / TO BE CONFIRMED BY" Column and where applicable, the " DEVIATIONS" Column of this format shall be filled in by the Vender and submitted along with the offer. Technical details also submitted with the offer. Inadequate / incomplete, ambiguous, or unsustainable information against any of the clauses of the specification / requirements shall be treated as non - compliance.		
3	The offer and all documents enclosed with offer should be in English language only.		
SCOPE :			
DESIGN, MANUFACTURING, SUPPLY, ERECTION & COMMISSIONING OF 4 KL OIL FILTRATION PLANT AS PER SPECIFICATION BELOW			
SPECIFICATION CUM COMPLIANCE CERTIFICATE OF 4 KL OIL FILTRATION PLANT			
S.NO.	DESCRIPTION FOR BHEL REQUIREMENT	SPECIFIED / TO BE CONFIRMED	DEVIATIONS
1.0	PURPOSE & WORK PIECE MATERIAL:		
1.1	This plant is to be suitable for processing / conditioning of Shell Diala transformer insulating oil having specification as per IEC 296 (class II A) & VDE 0370 (Class A) for 3 phase ACEMU (freight Loco) transformers. The properties of shell diala oil will be as given below:	VENDER TO CONFIRM	
a	Appearance : Not cloudy, free of solid and water	VENDER TO CONFIRM	
b	Density @15°C : 0.877 Kg/L	VENDER TO CONFIRM	
c	Kinematic Viscosity : 800 mm <sup>2</sup> /S (-15°C)	VENDER TO CONFIRM	
d	: 25 mm <sup>2</sup> /S (20°C)	VENDER TO CONFIRM	
e	: 11 mm <sup>2</sup> /S (40°C)	VENDER TO CONFIRM	
f	Flash point (PMCC) : 136°C)	VENDER TO CONFIRM	
g	Pour point : Less than (-60°C)		
h	Dielectric strength (BDV) : More than 60KV	VENDER TO CONFIRM	
i	Dielectric dissipation factor : 0.001 (at 90°C)	VENDER TO CONFIRM	
2.0	CONSTRUCTION		
2.1	The palnt shall be rubust in design & suitable for continuous operation in an ambient temperature of 48degree C.	VENDER TO CONFIRM	
2.2	Required oil filtration plant shall be package type mounted on the common frame with necessary lifting lugs for easy portability.	VENDER TO CONFIRM	
2.3	Plant shall be capable of processing the transformer oil at 4000 Liters per hour.	VENDER TO CONFIRM	
2.4	The control range of inflow/outflow shall be variable from 2000 Liters per hour to 4000 Liters per hour.	VENDER TO CONFIRM	
3.0	The oil filtration plant shall be designed for high vacuum & low temperature of oil for achieving required results.The equipment is to be guaranteed for the following condition of oil after treatment.	VENDER TO CONFIRM	
A	Moisture removal		
	Maximum initial moisture content - 100 ppm	VENDER TO SPECIFY	
	Moisture content after one pass - Less than 5 ppm	VENDER TO SPECIFY	
B	Gas Content	VENDER TO SPECIFY	

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	Initial gas content before filtration - 10% by volume	VENDER TO SPECIFY	
	Initial gas content after one pass of filtration - 0.1% by volume	VENDER TO SPECIFY	
C	<b>Filtration Fineness - 0.5 micron after filtration</b>	VENDER TO SPECIFY	
D	<b>Processing temperature - 40-70 degree Celcius</b>	VENDER TO SPECIFY	
E	<b>Improvement of dielectric strength (BDV) - More than 70 KV in one pass</b>	VENDER TO SPECIFY	
4.0	<b>CONFIRGATION OF PLANT</b>		
	The plant shall consist of the following major components:	VENDER TO CONFIRM	
4.1	<b>OIL INLET GEAR PUMP</b> : Highly reputed make like M/S Maag with flow control valve & pressure safety valve.	VENDER TO CONFIRM	
4.2	<b>PRE FILTER</b> : For protection of gear pump, having system of easily replacement of element.	VENDER TO CONFIRM	
4.3	<b>HEATING SYSTEM</b> : The plant shall be Electrically heated type suitable for raising temp. upto 90 degree celcius in one pass.	VENDER TO CONFIRM	
4.3.1	Heaters shall be provided in protection tubes to avoid localised over heating, hot spot & breaking of oil.	VENDER TO CONFIRM	
4.3.2	Heater shall be divided in 3 groups.	VENDER TO CONFIRM	
4.3.3	Heater element shall be Nicrome/Kanthhal wire elements inserted in suitable arrangement which are located in protection tubes.	VENDER TO CONFIRM	
4.3.4	Construction of heat exchanger shall be such that the replacement of heaer shall be easy & shall not require any special tools.	VENDER TO CONFIRM	
4.3.5	Heater shall be interlock with gear pump & shall not be ON position unless the inlet pump is working.	VENDER TO CONFIRM	
4.3.6	Each group of heaters shall be controlled by individually thermostate. A safety thermostate shall be provided to take care of any accidental rise of temperature of oil & shall be put OFF the heater in that eventuality.	VENDER TO CONFIRM	
4.3.7	The heater & condensate line to be suitably laggaed as to maintain the surface temperature within 5 degree celcous above ambient temp.	VENDER TO CONFIRM	
4.3.8	Details of heaters shall be given.	VENDER TO SPECIFY	
4.4	<b>FILTRATION SYSTEM</b>		
4.4.1	A cartridge type filter to be provided to filter 4000 LPH of oil to 0.5 Micron filter fineness.	VENDER TO CONFIRM	
4.4.2	The filter is to be suitably designed for easy replacement of cartridge.	VENDER TO CONFIRM	
4.5	<b>DEGASSING COLUMN</b>		
4.5.1	The degassing chamber shall be two stage type of adequate capacity for dehydration/ deaeration of the transformer oil at specified rate.	VENDER TO CONFIRM	
4.5.2	The degassing column shall be of totally welded construction in two halves.	VENDER TO CONFIRM	
4.5.3	Illumination lamp, sight glass along with low level and high level switches shall be provided in the degassing column.	VENDER TO CONFIRM	
4.5.4	The low level switch shall be connected to make off centrifugal pump & high level switch is for make off inlet gear pump.	VENDER TO CONFIRM	
4.6	<b>VACUUM SYSTEM</b>		
4.6.1	A suitable roots- rotary Vacuum pump combination system shall be provided to obtain vacuum level of less than 0.15 mbar in the second stage of degasser.	VENDER TO CONFIRM	
4.6.2	The vacuum pump shall be of reputed make like Pfeiffer/ Leybold only.	VENDER TO CONFIRM	
4.6.3	The capacity of the pumps & make should be given in the offer	VENDER TO SUBMIT	
4.6.4	Necessary condenser shall be provided (if required)	VENDER TO SUBMIT	

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4.6.5	Capacity of condenser shall be given	VENDER TO SUBMIT	
4.6.6	Suitable arrangement shall be provided for cooling vacuum pumps.	VENDER TO SUBMIT	
4.6.7	Details of cooling water arrangement should be given in the offer	VENDER TO SUBMIT	
<b>4.7</b>	<b>DISCHARGE PUMP</b>		
4.7.1	Centrifugal mono block (glandless type) pump of reputed make shall be provided for sucking oil under vacuum in the degassing of capacity 4000 LPH and 10 meter head discharge.	VENDER TO CONFIRM	
<b>4.7.2</b>	Make & capacity of pump should be given	VENDER TO CONFIRM	
<b>4.8</b>	<b>ELECTRICAL CONTROL PANEL</b>		
4.8.1	Base mounted electrical control panel shall be provided.	VENDER TO CONFIRM	
4.8.2	The panel shall consist of all necessary switches, lamps, contactors, overload protection for motors, HRC fuses, relays etc.	VENDER TO CONFIRM	
4.8.3	Necessary instrumentation shall be installed in the panel.	VENDER TO CONFIRM	
4.8.4	A mimic diagram is to be provided on the panel.	VENDER TO CONFIRM	
4.8.5	The system shall be complete with all interlocking devices.	VENDER TO CONFIRM	
4.8.6	The system is to be so designed to stop the plant if there is any trouble during the operation for safety of the plant.	VENDER TO CONFIRM	
4.8.7	The switch panel shall be mounted on the plant.	VENDER TO CONFIRM	
<b>5.0</b>	The system is also to be fitted with the following:		
5.1	A magnetic filter before outlet point	VENDER TO CONFIRM	
5.2	All necessary devices such as manometer at inlet, manometer to measure oil pressure before and after cartridge filter.	VENDER TO CONFIRM	
5.3	The vacuum gauge on degassing column	VENDER TO CONFIRM	
5.4	Vacuum gauge (McLeod type) range 10Torr to 0.01 Torr	VENDER TO CONFIRM	
5.5	A pirani vacuum gauge on control panel	VENDER TO CONFIRM	
5.6	Thermostat to switch OFF vacuum pump incase of cooling water supply failure.	VENDER TO CONFIRM	
5.7	A sucbac valve on vacuum pump.	VENDER TO CONFIRM	
5.8	Airing Vslve	VENDER TO CONFIRM	
5.9	Automatic by pass valve for root pump.	VENDER TO CONFIRM	
5.10	A flow meter with totalizer.	VENDER TO CONFIRM	
5.11	Dial thermometer, one at heater inlet and at heater outlet.	VENDER TO CONFIRM	
5.12	Necessary oil and vacuum valve will be Ball type only.	VENDER TO CONFIRM	
5.13	Oil sampling valve at plant inlet and outlet to be provided.	VENDER TO CONFIRM	
5.14	Isolation valve at plant inlet outlet.	VENDER TO CONFIRM	
5.15	A temperature and vacuum recorder to be provided.	VENDER TO CONFIRM	
5.16	Fool proof temperature controlling system for oil to be provided in the circuit so that oil temperature should not increase more than 70C	VENDER TO CONFIRM	
5.17	First fill of hydraulic oil/gear oil /etc to be supplied by vender	VENDER TO CONFIRM	
5.18	Cooling water system	VENDER TO CONFIRM	
<b>6.0</b>	<b>Vender to submit following along with their offer</b>		
6.1	Total weight of the equipment.	VENDER TO CONFIRM	
6.2	Total electrical load.	VENDER TO CONFIRM	
6.3	Quantity of chilled water & normal temperature water required for cooling of condensers and vacuum system.	VENDER TO CONFIRM	
6.4	Floor area required (Length, Width, Height) for complete machine & accessories shall be mentioned.	VENDER TO CONFIRM	

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7.0	<b>GENERAL CONDITIONS</b>		
7.1	Hydraulic, pneumatic and oil piping should be preferably metallic except places where flexible piping are essential. All the pipes required for the same shall be included in the standrad scope of the machine.	VENDER TO CONFIRM	
7.2	Detailed catalogues, sketch/ photograph of the machine and accessories/attachments should be submitted with the offer.	VENDER TO CONFIRM	
7.3	The plant will be inspected at supplier's work and performance as per parameter shall be cheked. Training for operation shall be given by supplier's at BHEL works.	VENDER TO CONFIRM	
7.4	The supplier shall commission the plant at BHEL Jhansi. Erection and commissioning charges to be quoted separately in price bid. Necessary civil work shall be done by BHEL based on	VENDER TO CONFIRM	
7.5	The plant shall be guaranteed for trouble free performance for a period of 24 month from the date of commissioning.	VENDER TO CONFIRM	
7.6	Details of all brought out items along with their specifications, technical literature, leaflets along with complete address of supply source shall be submitted.	VENDER TO CONFIRM	
7.7	A detaisled manual containing all technical details, circuit diagram, operation and maintenance procedure and spare part list shall be given by supplier in three copies with the equipment. Tool kit shall be provided by supplier.	VENDER TO CONFIRM	
7.8	Painting of machine/electrical panels: RAL 6011 Apple green (Polyurethane paint.)	VENDER TO CONFIRM	
8.0	<b>ERECTION &amp; COMMISSIONING</b>		
8.1	Vender to take full responsibility for carring out the erection, start up, .testing of system, its control system & all type of other supplied equipement.	VENDER TO CONFIRM	
9.0	<b>TEST TO BE CARRIED OUT AT BHEL, JHANSI</b>		
9.1	Test to be carried out at BHEL works while commissioning the equipment. Oil conditions shall be obtained as mentioned in our specification.	VENDER TO CONFIRM	
10.0	<b>QUALIFYING CONDITION</b>		
10.1	Only those venders, who have supplied and commissioned at least Two Numbers Oil filtration and degassing plant of similar or higher capacity for similar application in the past ten years and such plant is presently working satisfactrily for more than one year after commissioning should quote. The following information is to be submitted by the vender about the companies to whom similar plants have been supplied. This is required from all the venders for qualification of their offers.	VENDER TO SUBMIT	
	1 . Name of the customer / company where similar door is installed. (copy of purchase order to be furnished)	VENDER TO SUBMIT	
	2 . Complete postal address of the customer.	VENDER TO SUBMIT	
	3. Year of suppling / commissioning.	VENDER TO SUBMIT	
	4 . Name and designation of the contact person of the customer.	VENDER TO SUBMIT	
	5. Phone. FAX, no and E-mail address of the contact person of the customer.	VENDER TO SUBMIT	
	7. Performance certificate (if posible) from the customer regarding satisfactory performance of door supplied to them.	VENDER TO SUBMIT	
11.0	<b>BHEL reserves the right to verify information submitted by vender. In case the information is found to be false/ incorrect, the offer shall be rejected.</b>	Vender to confirm	

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S.NO.	DESCRIPTION FOR BHEL REQUIREMENT	SPECIFIED / TO BE CONFIRMED	DEVIATIONS
	Inder Mathur	H.V.Bhatia	S.J.Chakraborty
	SR. Manager (WE&S)	Sr. Manager (TRM)	Sr. DGM (WE&S)