

**BHARAT HEAVY ELECTRICAL LIMITED****UNIT'S ADDRESS:**

Enquiry No. :

Due Date :

CONTACT PERSON'S NAME/DESIGN./PHONE NO./E-MAIL (FROM PURCHASE DEPTT.)

Supplier Qtn. No.:

Spec No.: BCM / OIL FIL PLANT 01, Dt.: 22/07/2008**Rev:00****SPECIFICATION CUM COMPLIANCE CERTIFICATE OF OIL FILTRATION PLANT****NOTE:-**

1. Vendor must submit complete information against clause no. 23 (Qualifying Condition). The offer meeting this clause would only be processed.
2. 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.

NAME & ADDRESS OF THE SUPPLIER :	NAME & ADDRESS OF THE INDIAN AGENT :
TELEPHONE NOS.:	TELEPHONE NOS.:
FAX NOS.:	FAX NOS.:
E-MAIL ADDRESS :	E-MAIL ADDRESS :

SCOPE: SUPPLY, ERECTION & COMMISSIONING OF 12 KL OIL FILTRATION PLANT, STORAGE TANKS AND PIPELINE FACILITY COMPLYING WITH SPECIFICATIONS AS BELOW

SNO	DESCRIPTION FOR BHEL REQUIREMENT 12KL OIL FILTRATION PLANT WITH STORAGE TANK	SPECIFIED / TO BE CONFIRMED BY	OFFERED	DEVIATIONS
1.0	PURPOSE:			
1.1	Oil filtration plant of 12 KLPH capacity with necessary oil pipe line & storage tanks is required to process & handle low sulphur content transformer oil .The facility shall consist of the following .	VENDOR TO CONFIRM		
1.1.1	Transformer oil filtration plant of 12 KLPH capacity with 1No 10KL De-Aeration Vessel along with Vacuum Pumping System.	VENDOR TO CONFIRM		
1.1.2	Interconnection of oil pipelines, valves and control system shall be provided. The control system should be placed near to the filtration plant	VENDOR TO CONFIRM		
2	SPECIFICATION:			
2.1	PLANT CONFIGURATION :- Oil filtration plant shall consist of a filtration system, degassing chamber, vacuum pumping system, oil feed , return oil pump, discharge pump and a control panel with necessary instrumentation,PC / PLC based system etc. Filtration plant except de-aeration vessel shall be mounted on a steel frame which can be shifted to any location .Suitable lifting /slinging arrangement for same shall be provided. The filtration plant requirement is to achieve following parameters .	VENDOR TO CONFIRM		
2.1.1	Break down voltage of Transformer Oil. :- 80 KV	VENDOR TO CONFIRM		
2.1.2	Moisture content of oil. :- Less then 5 PPM	VENDOR TO CONFIRM		
2.1.3	Gas content of oil. :- 0.1 % by volume	VENDOR TO CONFIRM		
2.1.4	Suspended particles :- 1 micron	VENDOR TO CONFIRM		
2.1.5	Vacuum level during processing :- (finer than) 0.01 m bar (Required vacuum should be achieved within 2 hrs with oil in tanks and with circulation of oil)	VENDOR TO CONFIRM		

SNO	DESCRIPTION FOR BHEL REQUIREMENT 12KL OIL FILTRATION PLANT WITH STORAGE TANK	SPECIFIED / TO BE CONFIRMED BY	OFFERED	DEVIATIONS
2.1.6	Pre filter flow capacity :- 12000 LPH	VENDOR TO CONFIRM		
2.1.7	Rating of Pre filter :- 1 mm	VENDOR TO CONFIRM		
2.1.8	Oil Inlet pump- 2Nos.- Positive displacement gear type make VIKING ,USA/Equivalent :- 12000 LPH	VENDOR TO CONFIRM		
2.1.9	Oil pump operating pressure :- 2 bar	VENDOR TO CONFIRM		
2.1.10	Oil pump suction head :- 4 - 5 Meters./ suitable	VENDOR TO CONFIRM		
2.2	Electrical Heating System - indirect with Sealed Tubular type Electrical Heating element(Escort/Elpro Make)-Total Heating Load Of 200KW(min)/Suitable, divided in 6 groups, complete with PID Cotroller,Thermostat,Temp.Sensors,Pressure safety valves, Flow Switch, Themometer, Pressure Gauges etc. for oil heating.. ,	VENDOR TO CONFIRM		
2.2.1	Control of electrical heater :-PID controller	VENDOR TO CONFIRM		
2.2.3	Temprature of Oil :-60 deg C	VENDOR TO CONFIRM		
2.2.4	Required temprature should be achieved with in 60 minutes with full capacity of oil	VENDOR TO CONFIRM		
2.3	Filtration system			
2.3.1	Capacity of Press filter placed in steel housing. 2NOS :-6000 LPH EACH (make:-Kuno / Equivalent)	VENDOR TO CONFIRM		
2.3.2	Rating of press filter :- 50 micron	--- do ---		
2.3.3	Flow capacity of fine filters cartridge type placed in steel housing. 2 NOS:- 6000 LPH EACH (make:-Kuno / Equivalent)	---do ---		
2.3.4	Rating of fine filter (cartridge type) :-0.5 micron	----do---		
2.4	DEGASSING CHAMBER			
2.4.1	Two stage degassing chamber packed with rasching ring made of stainless steel ,with Low Level & High Level Float switches, Sight Glasses with Lamp etc. :- 1 set	VENDOR TO CONFIRM		
2.4.2	Vacuum of degassing chamber with oil in tanks :- (more than) 0.01 mbar	----- do -----		
2.4.3	Low level & high level float switches :- 1 set	----- do -----		
2.5	VACUUM PUMPING SYSTEM FOR DE-GASSING CHAMBER			
2.5.1	Mechanical Booster Pump : 1200 M ³ / Hr Or Suitable. To achieve desired vacuum parameters as mentioned above. (Make:- Balzer/ Edward / Ley bold)	VENDOR TO CONFIRM		
2.5.2	Oil sealed Rotary vacuum pump : - 220 M3/Hr or Suitable to achieve desired vacuum parameters as mentioned above.	VENDOR TO CONFIRM		
2.5.3	Make of Oil sealed Rotary vacuum Pump:- Balzer/ Edward / Ley bold	VENDOR TO SPECIFY		
2.5.4	Exhaust Vapour Condensor to trap oil vapours. :- 1 NO.	VENDOR TO CONFIRM		
2.5.5	Mcleod Vacuum Gauge - 1 No. :- 0 to 0.001mbar . Reputed make :-Edward	VENDOR TO CONFIRM		
2.5.6	Bourdon Vacuum Gauge - 1 No. :- 0 to 0.01 mbar	VENDOR TO CONFIRM		
2.5.7	Vacuum required :- (more than) 0.01mbar	VENDOR TO CONFIRM		
2.5.8	Cooling of vacuum pump:Self contained cooling water system for cooling of vaccum pumps /1st stage & 2nd stage vapour traps/Exhaust condenser with radiator, cooling fan and water circulation pump.	VENDOR TO CONFIRM		
2.5.9	The oil filtration plant shall be tested for a vacuum leak rate of 1 torr ltr per second.	VENDOR TO CONFIRM		
2.5.10	Airing valve :- Suitable to fulfill the requirement	VENDOR TO SPECIFY		

SNO	DESCRIPTION FOR BHEL REQUIREMENT 12KL OIL FILTRATION PLANT WITH STORAGE TANK	SPECIFIED / TO BE CONFIRMED BY	OFFERED	DEVIATIONS
2.5.11	Isolation valve :- Suitable to fulfill the requirement	VENDOR TO SPECIFY		
2.5.12	Non return valve :- Suitable to fulfill the requirement	VENDOR TO SPECIFY		
2.5.13	Oil sampling and airing valves: Suitable to fulfill the requirement	VENDOR TO SPECIFY		
2.5.14	Type of oil control and vacuum valves :- Ball/Butterfly, make EDWRD/ AUDCO /KLINGER	VENDOR TO SPECIFY		
2.5.15	Operation of oil and vacuum valves :- Electro-pneumatic operated	VENDOR TO CONFIRM		
2.6	DISCHARGE PUMP			
2.6.1	Centrifugal mono block (glandless) type discharge pump duly modified for glandless operation for suction & discharge of oil under vacuum . Make: Jyoti / Equivalent reputed make :- 2 Nos. (parallel operation)	VENDOR TO CONFIRM		
2.6.2	Capacity of each discharge pump :- 12000 LPH	VENDOR TO CONFIRM		
2.6.3	Head of discharge pump :- 15 mtrs.	VENDOR TO CONFIRM		
2.7	INSTRUMENTATION FOR OIL FILTRATION SYSTEM			
2.7.1	Dial thermometer in oil pipe line of WIKA, Germany make :- 1 No	VENDOR TO SPECIFY		
2.7.2	Pressure guage at inlet of press/ catridge filter of Wika, Germany make :- 1 No	VENDOR TO SPECIFY		
2.7.3	Compuond gauge (for measurement of pressure & vacuum) at the outlet of catridge filter of Wika , Germany make :- 1 No	VENDOR TO SPECIFY		
2.7.4	Oil flow meter with totaliser, make -Teltech/Aqua metro with veeder root counter :- 1 No	VENDOR TO SPECIFY		
3.0	DE-AERATION VESSEL:- One no. De-aeration vessels of 10KL capacity is required for storage of transformer oil under vacuum . Vessel shall be vertically mounted on ground floor with suitable heating & thermal insulation . Provision shall be made for creating vaccum inside the vessel with suitable pumping system & connecting pipe lines. Pipe line with suitable control valve shall be provided for filling & draining of oil. De-gassing/oil spray chamber shall be mounted on TOP of Vessel and shall be rated for a flow rate of 1200Ltrs/Hr. Sealed Tubular Type Electrical Heater (Escort/Elpro make) of 36KW/suitable rating to be placed in a oil jacket located in bottom dish of Vessel. Total electrical load to be grouped in 3 banks, so as to keep the oil temp. at 60degree C. A common Grill Type Platform to be provided with ladder for all the vessels. All the vessels to be insulated with Pre-formed resin bonded mineral wool blanket of 100 mm thickness and cladded with 24 SWG Aluminium sheet. Bottom of vessel should have accessibility for easy maintenance of oil drainage pipe.	VENDOR TO CONFIRM		
3.1	No of de-aeration vessel required - 10 KL Capacity :- 1 No	VENDOR TO CONFIRM		
3.2	Storage capacity of vessel :- 10 KL	VENDOR TO CONFIRM		
3.3	Diameter of vessel :- 2 mtr (Approx.)	VENDOR TO SPECIFY		

SNO	DESCRIPTION FOR BHEL REQUIREMENT 12KL OIL FILTRATION PLANT WITH STORAGE TANK	SPECIFIED / TO BE CONFIRMED BY	OFFERED	DEVIATIONS
3.4	Operating vacuum with oil in vessel :- (more than) 0.01 m bar	VENDOR TO CONFIRM		
3.5	Operating pressure :- Atmospheric	VENDOR TO CONFIRM		
3.6	Vessel mounting on floor :- Vertical supported on skirting	VENDOR TO CONFIRM		
3.7	Material of construction of vessel :-Structural steel of 12 mm thick(min) / as per design of vendor.	VENDOR TO CONFIRM		
3.8	High and low level oil indicator:Each vessel should be provided with digital oil level indicator to display oil level in %/ltrs on panel.Suitable inter locks for High/Low level to be provided in the system	VENDOR TO SPECIFY		
3.9	Degassing/oil spray chamber mounted on top of vessel.	VENDOR TO CONFIRM		
3.10	Electrical heaters placed in an oil jacket located in bottom dish	VENDOR TO CONFIRM		
3.11	Thermal insulation on outer periphery of vessel with 100 mm thick preformed resin bonded blankets and cladding with AL sheet of 24 SWG.	VENDOR TO CONFIRM		
3.12	Oil inlet, outlet and drain connection .Digital oil flow meter shall be provided at in let and out let of de-aeration vessel	VENDOR TO CONFIRM		
3.13	Man holes at top and bottom of vessel with sealing blanking plates	VENDOR TO CONFIRM		
3.14	Internal and external ladder	VENDOR TO CONFIRM		
3.15	Vacuum pumping system for the de-aeration vessel with necessary piping and valves	VENDOR TO CONFIRM		
3.16	Mechanical Booster Pump Pumping speed: 500 m3/hr/suitable-1No. Make Balzer/ Edward / Ley bold	VENDOR TO SPECIFY		
3.17	Oil sealed Rotary vacuum pump Pumping speed:-220 m3/hr/suitable-1No. Make Balzer/ Edward / Ley bold	VENDOR TO SPECIFY		
3.18	Exhaust Vapour Condensor to trap oil vapours. :- 1 NO.	VENDOR TO CONFIRM		
3.19	Cooling of vacuum pump:Self contained cooling water system for cooling of vacuum pumps /1st stage & Intermediate stage vapour traps/Exhaust condenser with radiator, cooling fan and water circulation pump.	VENDOR TO CONFIRM		
3.20	Make of vacuum pump Lebold /Balzer/ EDWARD	VENDOR TO SPECIFY		
3.21	Set of Valves manual/electro-pneumatically operated(Audco/Klinger make),Vacuum Gauges & vacuum connections. One Set. Leak Rate Of Vessel: Each vessel shall be tested for Leak Rate of 1 torr ltrs/sec or less	VENDOR TO CONFIRM		
4.0	INTER CONNECTING OIL PIPE LINE			
4.1	Supply fabrication and laying of seamless pipe line 80 NB size running from New Oil Filtration Plant to various Station (Supply & Drain line each) as per BHEL SKETCH & connected to oil filtration plant para 2.0 AND ALSO TO EXISTING OIL FILTRATION PLANT WITH NECESSARY VALVES AND INTERLOCKS . APPROXIMATE LENGTH OF PIPE LINE APPROXIMATLY 700 MTRS	VENDOR TO CONFIRM		
4.2	Electro- pneumatically operated remote controlled vacuum proof ball valves fitted in oil pipe line and Valves shall be of Klinger/Audco make, C.S. body & S.S. Ball	VENDOR TO SPECIFY		
4.3	Set of grooved steel flanges with viton 'O' rings, Quantity as required for laying of pipe line	VENDOR TO CONFIRM		
4.4	Provision of oil intake point with valve /pump and oil measuring flow meter of M/s Teltech with veeder root counter for unloading of oil from oil tanker. :- 1 Set.	VENDOR TO CONFIRM		

SNO	DESCRIPTION FOR BHEL REQUIREMENT 12KL OIL FILTRATION PLANT WITH STORAGE TANK	SPECIFIED / TO BE CONFIRMED BY	OFFERED	DEVIATIONS
4.5	Oil transfer gear pumps of 12000 LPH capacity, head :- 15 meter / suitable with magnetic filter. 2 Nos. of these pumps (to be put in parallel operation) for pumping spilled over oil from 2 Nos. New plants & 5 Nos. existing plant for refiltration of oil. Both the pumps should be put in parallel operation. Necessary oil isolation and selection valves to be provided.	VENDOR TO CONFIRM		
4.6	Provision of tap point with electrically operated ball valves for connecting to existing 5 Nos. plants and 2 Nos. New plants.	VENDOR TO CONFIRM		
4.7	Suitable arrangement shall be made to provide adequate pressure head to facilitate filling of oil in bushings inside plant by gravity. It should also be possible to flood bushing by gravity filling from both oil deaeration vessel & filtration plant.	VENDOR TO CONFIRM		
5	ELECTRICAL SYSTEM:			
5.1	415V +/-10%, 50 HZ +/-1.5 HZ, 3 Phase AC (3 wire system with out neutral). All types of cables, connections, circuit breakers etc. required for connecting BHEL's power supply points to different parts of the plant / 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		
5.2	CONTROL PANEL:- A frame mounted sheet metal control panel to be provided complete with MCCB for incoming Power Supply, PLC control for operation, all contactors, relays, starters, timer, single phasing preventer, MCCB & HRC fuses, step down transformer for control voltage etc. The front side of the panel should be provided with temp. & vacuum measuring recorder, digital, temp. & vacuum indicator, Pirani 6 point vacuum Gauge, Dial type vacuum manometer, mimic diagram with indicating LED bulbs, emergency stop switch, suitable switches for automatic / manual and inching operation for different process system e.g. for Vacuum, Heating, Oil filtration & transfer etc, indicating lamps for Power Supply, Status monitoring and fault enunciation with alarm etc, with desired inter locks and electrical safety provisions, indication and operation of all electro-pneumatic/electrical valves. AC shall be provided.	VENDOR TO CONFIRM		
5.3	Provision of electrical control panel with PLC/PC based control system for operation of oil piping & filtration system. PLC shall be of Siemens/Allen Bradley make with WIN CC/R view MMI/MMI for the system to be displayed via a PC screen to enable route selection. Each station to have a ON/OFF switch for the valves located locally so that in case of emergency, the oil supply can be stopped. Vendor to provide ladder diagrams and programming software to BHEL. The PC shall be of Compaq/IBM/HP make with screen of 17" LCD Type. One No. PC shall be provided as stand-by duly configured with all software loaded. In case of break down it shall be possible to immediately connect the stand-by PC.	VENDOR TO CONFIRM		
5.4	AUTOMATION WITH PLC			
5.4.1	The Process of oil filtration should be automated through a PLC and digitally displayed. However in case of PLC failure manual controls and indications should be available on the side of the plant.	VENDOR TO CONFIRM		
5.4.2	PLC make -Siemens/Allen Bradley	---do---		
5.5	Tropicalisation: All electrical / electronic equipment shall be tropicalized	VENDOR TO CONFIRM		
5.5.1	All electrical & electronic control cabinets & panels should be dust and vermin proof	VENDOR TO CONFIRM		
5.5.2	Motors shall conform to relevant IEC or Indian Standards	VENDOR TO CONFIRM		
5.5.3	Vendor should ensure the proper earthing for the machine and its peripherals.	VENDOR TO CONFIRM		

SNO	DESCRIPTION FOR BHEL REQUIREMENT 12KL OIL FILTRATION PLANT WITH STORAGE TANK	SPECIFIED / TO BE CONFIRMED BY	OFFERED	DEVIATIONS
6	SAFETY ARRANGEMENTS: Following safety features in addition to other standard safety features should be provided on the machine/ Plant:	VENDOR TO CONFIRM		
	1.Plant should have adequate and reliable safety interlocks / devices to avoid damage to the plant, workpiece and the operator due to the malfunctioning or mistakes. Plant functions should be continuously monitored and alarm / warning indications through lights/ alarm number with messages (on panels) should be available.	VENDOR TO CONFIRM		
	2. A detailed list of all alarms / indications provided on plant should be submitted by the supplier.	VENDOR TO CONFIRM		
	3. All the pipes, cables etc. on the plant should be well supported and protected.	VENDOR TO CONFIRM		
	4. All the rotating parts used on plant should be statically & dynamically balanced to avoid undue vibrations.	VENDOR TO CONFIRM		
	5. Emergency Switches at suitable locations as per International Norms are to be provided.	VENDOR TO CONFIRM		
	6. Oil & water pipe lines should not run with electrical cable in the same tray / trench.	VENDOR TO CONFIRM		
7.00	ENVIRONMENTAL PERFORMANCE OF THE MACHINE/ PLANT : The Machine/Plant shall conform to following factors related to environment :	VENDOR TO CONFIRM		
	(1) Maximum noise level shall be 85 dB(A) at normal load condition, 1 mtr away from the plant with correction factor for back ground noise, if necessary.	VENDOR TO CONFIRM		
	(2) All safety / environmental protection enclosure should be provided .	VENDOR TO CONFIRM		
8	PNEUMATIC SYSTEM:			
8.1	Portable Air Compressor			
8.2	Stand by air compressor unit of Elgi/Ingersol Rand/reputed make with refrigerated drier to be supplied to meet the compressed air supply requirement for the plant.This compressor should be connected with shop supply with necessary valves,non return valve etc.	VENDOR TO CONFIRM		
8.3	Capacity of Compressor & Drier (Flow, Pressure & KW)	VENDOR TO SPECIFY		
8.4	Compressed Air Point with manual ON/ OFF Valve and flexible pipe of suitable length for work piece cleaning if required..	VENDOR TO CONFIRM		
9	ANCHORING SYSTEM			
9.1	Complete anchoring system including foundation bolts, anchoring materials, fixators, anti damping pad etc shall be supplied .	VENDOR TO CONFIRM		
10	TOOLS FOR ERECTION, OPERATION & MAINTENANCE :			
10.1	Special tools and equipment required for erection of the plant shall be brought by the vendor. Necessary tools like Torque Wrench, Spanners, Keys, grease guns etc.for operation and maintenance of the plant should be supplied. List of such tools should be submitted with offer	VENDOR TO CONFIRM		

SNO	DESCRIPTION FOR BHEL REQUIREMENT 12KL OIL FILTRATION PLANT WITH STORAGE TANK	SPECIFIED / TO BE CONFIRMED BY	OFFERED	DEVIATIONS
11	SPARES:			
11.1	Item wise breakup of mechanical, electrical and electronic spares used on the plant in sufficient quantity as per recommendation of Vendor for 2 years of trouble free operation on three shifts continuous running basis should be offered by vendor. (Unit Price of each item of spares should be offered seperately)	VENDOR TO CONFIRM		
11.2	All types of spares for total machine and accessories should be available for atleast ten years after supply of the machine. If machine or control is likely to become obsolete in this period, the vendor should inform BHEL sufficiently in advance and provide drawings of parts / details of spares & suppliers to enable BHEL to procure these in advance, if required	VENDOR TO CONFIRM		
11.3	Vendor to confirm that complete list of spares for machine 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 machine .Recommended set of spares for all attachments are to be offered with details.	VENDOR TO CONFIRM		
12	DOCUMENTATION : Five sets of following documents (Hard copies) in English language should be supplied along with the plant.			
12.1	Operating manuals of Machine/Plant system	VENDOR TO CONFIRM		
12.2	Programming Manuals of Machine/ Plant system.	VENDOR TO CONFIRM		
12.3	Detailed Maintenance manual of machine/plant with all drawings of plant assemblies/sub-assemblies/parts including Electrical / Pneumatic circuit diagrams. All Assembly/ Sub Assembly Drawings shall be supplied with the part list also	VENDOR TO CONFIRM		
12.4	Catalogues, O&M Manuals of all bought out items including drawings, wherever applicable.	VENDOR TO CONFIRM		
12.5	Detailed specification of all rubber items and consumable items	VENDOR TO CONFIRM		
12.6	Operating Manuals, Maintenance Manuals & Catalogues for supplied equipments Voltage Stabilizer, Isolation Transformer and all supplied Accessories.	VENDOR TO CONFIRM		
13	TRAINING:			
13.1	4 BHEL Persons should be trained at supplier's Works in the areas of plant operation, Mechanical ,Electrical & Electronics maintenance for 5 working days	VENDOR TO CONFIRM		
14	FOUNDATION:			
14.1	Vendor shall submit the preliminary layout drawing for getting BHEL's approval within one month from the date of Letter of Intent (LOI).	VENDOR TO CONFIRM		
15	ERECTION & COMMISSIONING			
15.1	Supplier to take full responsibility for carrying out the erection, start up, testing of plant, it's control system & all types of other supplied equipment etc. Service requirement like power, air & water shall be provided by BHEL at only one point to be indicated by supplier in their foundation/layout drawings. Other requirements like crane shall also be provided by BHEL. Details of these requirements should be informed by vendor in advance.	VENDOR TO CONFIRM		
15.2	Successful proving of plant by the supplier shall be considered as part of commissioning. All tests, shall be carried out as per BHEL specification	VENDOR TO CONFIRM		
15.3	Commissioning spares, required for commissioning of the plant within stipulated time, shall be brought by the supplier on returnable basis.	VENDOR TO CONFIRM		

SNO	DESCRIPTION FOR BHEL REQUIREMENT 12KL OIL FILTRATION PLANT WITH STORAGE TANK	SPECIFIED / TO BE CONFIRMED BY	OFFERED	DEVIATIONS
15.4	All Cover Plates required for the plant and its peripherals including pits, if any, shall be supplied and installed by the vendor. The plates should be sourced from India	VENDOR TO CONFIRM		
15.5	Portion, if any, of the plant, accessories and other supplied items where paint has rubbed off or peeled 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 paint used.	VENDOR TO CONFIRM		
15.6	Schedule of Erection and Commissioning shall be submitted with the offer.	VENDOR TO CONFIRM		
15.7	Charges, duration, terms & conditions for E&C should be furnished in detail separately by vendor along with offer.	VENDOR TO CONFIRM		
16	ACCURACY TESTS:			
16.1	Complete demonstration for accuracy in operation & measurement of various parameter as per BHEL specification shall be done by vendor before despatch at supplier's work in presence of BHEL's representative and at BHEL after commissioning	VENDOR TO CONFIRM		
17	AMBIENT CONDITIONS & THERMAL STABILITY :			
17.1	Complete plant including PLC system and all supplied items should work trouble free and efficiently under following operating conditions and should give specified accuracies. Power Supply: Voltage: 415 V +/- 10% , Frequency: 50 Hz +/- 1.5 HZ, No. of phases = 3 Ambient Conditions: Temperature = 5 to 50 degree celsius Relative Humidity = 95% max.	VENDOR TO CONFIRM		
17.2	Weather conditions are tropical, Atmosphere may be dust laden during some part of the year. Plant shall be kept in the normal shop floor condition. Max. temperature variation is up to 25 deg Celsius in 24 hours.	VENDOR TO CONFIRM		
17.3	Thermal Stability of the complete plant keeping in view specified Ambient Conditions and accuracy requirements of BHEL components and trouble free operation of the machine should be ensured by vendor.	VENDOR TO CONFIRM		
17.4	The plant, including attachments and accessories, should be suitable for 24 hrs. continuous operation to its full capacity for 7 days a week throughout. Vendor to ensure and confirm the same.	VENDOR TO CONFIRM		
18	PROVEOUT :			
18.1	Complete prove out of plant shall be done by Vendor at BHEL works to the specified accuracy as per para 16. Material for the proveout of plant shall be provided by BHEL.	VENDOR TO CONFIRM		
18.2	Vendor shall be responsible for any deviation/rejection in proveout of plant due to wrong operation or malfunctioning of the plant during proveout and also for the delay in operation . The cost of such deviation / rejection, if any, shall be refunded by the vendor to BHEL.	VENDOR TO CONFIRM		
19	PLANT ACCEPTANCE: (Tests/Activities TO be Performed by Vendor)			
19.1	Tests/Activities shall be carried out at supplier's works on the plant before dispatch in presence of BHEL's representative :	VENDOR TO CONFIRM		
19.1.1	The plant should be tested for continuous running of 48 hrs. If any break down occurs during this test, the test should be repeated for 48 hrs from that time.	VENDOR TO CONFIRM		
19.1.2	Demonstration of all features of the plant and all Accessories as BHEL specification	VENDOR TO CONFIRM		

SNO	DESCRIPTION FOR BHEL REQUIREMENT 12KL OIL FILTRATION PLANT WITH STORAGE TANK	SPECIFIED / TO BE CONFIRMED BY	OFFERED	DEVIATIONS
19.2	Test to be carried out at BHEL works while commissioning the plant :	VENDOR TO CONFIRM		
19.2.1	Full load test to demonstrate the maximum power & capacity of the plant	VENDOR TO CONFIRM		
19.2.2	The plant should be tested for continuous running of 48 hrs. If any break down occurs during this test, the test should be repeated for 48 hrs from that time.	VENDOR TO CONFIRM		
19.2.3	Demonstration by actual use of all supplied attachments and accessories to their full capacity.	VENDOR TO CONFIRM		
19.3	Two weeks independent operation of plant by BHEL under supplier's supervision after proveout.	VENDOR TO CONFIRM		
20	PACKING:			
20.1	Standard & rigid packing for all items of complete plant, control System, all Accessories and other supplied items to avoid any damage/loss in transit. When plant is despatched in containers, all small loose items shall be suitably packed in boxes	VENDOR TO CONFIRM		
21	GUARANTEE :			
21.1	12 months from the date of successful commissioning & acceptance of the plant.	VENDOR TO CONFIRM		
22	GENERAL : The vendor should submit the following information:			
22.1	Plant Model	VENDOR TO SPECIFY		
22.2	Total connected load (KVA):	VENDOR TO SPECIFY		
22.3	Floor area required (Length, Width, Height) for complete plant & accessories	VENDOR TO SPECIFY		
22.4	Painting of Machine/Plant/ Electrical Panels: RAL 6011 Apple Green	VENDOR TO SPECIFY		
22.4.1	All steel structure and piping work shall be suitably painted over two coats of antirust paint conforming to I.S. standards.	VENDOR TO CONFIRM		
22.4.2	Painting of plant / vessel (out-side) :- Alluminum colour (Polyurethane Paint)	VENDOR TO CONFIRM		
22.4.3	Painting of Machine/ Electrical Panels: RAL 6011 Apple Green (Polyurethane Paint)	VENDOR TO CONFIRM		
22.4.4	All the pipe work shall be painted with (Polyurethane Paint) as per color code given below	VENDOR TO CONFIRM		
22.4.5	Vacuum pipe line :- Orange	VENDOR TO CONFIRM		
22.4.6	Oil pipe line :- Yellow	VENDOR TO CONFIRM		
22.4.7	Air pipe line for pneumatic valves :- White	VENDOR TO CONFIRM		
22.4.8	Water pipe line:- Blue	VENDOR TO CONFIRM		
22.5	Total weight of the machine/plant	VENDOR TO SPECIFY		
22.6	Weight of heaviest part of machine/plant	VENDOR TO SPECIFY		
22.7	Weight of the heaviest assembly/ subassembly of the Machine/plant	VENDOR TO SPECIFY		
22.8	Dimensions of largest part/ subassembly/ assembly of the machine/plant	VENDOR TO SPECIFY		
22.9	Vendor to submit, along with offer, the reference list of customers where similar plant have been supplied mentioning the customer, Plant Model, major specifications of the supplied plant, Year of Supply etc.	VENDOR TO SPECIFY		
22.10	Detailed catalogues , sketch/ photographs of the plant and accessories/ attachments should be submitted with the offer.	VENDOR TO SPECIFY		

SNO	DESCRIPTION FOR BHEL REQUIREMENT 12KL OIL FILTRATION PLANT WITH STORAGE TANK	SPECIFIED / TO BE CONFIRMED BY	OFFERED	DEVIATIONS
22.11	Pneumatic & oil pipings should be preferably metallic except places where flexible pipings are essential. All the pipes required for the same shall be included in the standard scope of the machine/plant.	VENDOR TO SPECIFY		
22.12	Exhaust from vacuum pumps shall be taken out of the factory shed through suitable size GI ducting / pipe . Approx. length shall be 100 feet.	VENDOR TO SPECIFY		
23	QUALIFYING CONDITIONS :			
23.1	Only those vendors, who have supplied and commissioned at least one Oil filtration plant of 10 KLPH capacity or higher size for transformer or bushing application in the past ten years and such plant is presently working satisfactorily for more than one year (more than six months if supplied to BHEL) after commissioning , should quote. The following information is to be submitted by the vendor about the companies where similar plant have been supplied. This is required from all the vendors for qualification of their offer.	VENDOR TO CONFIRM		
23.1.1	Name of the customer / company where similar plant is installed.	VENDOR TO SPECIFY		
23.1.2	Complete postal address of the customer.	VENDOR TO SPECIFY		
23.1.3	Year of commissioning.	VENDOR TO SPECIFY		
23.1.4	Application for which the plant is supplied with details of accuracies achieved on the job.	VENDOR TO SPECIFY		
23.1.5	Name and designation of the contact person of the customer.	VENDOR TO SPECIFY		
23.1.6	Phone, FAX no. and email address of the contact person of the customer.	VENDOR TO SPECIFY		
23.1.7	Performance certificate from the customers regarding satisfactory performance of plant supplied to them by vendor that the commissioned item is working satisfactorily along with e-mail/telephone no/address of concerned person where the item is supplied shall be	VENDOR TO SPECIFY		
23.1.8	BHEL reserves the right to verify information submitted by vendor. In case information is found to be false /incorrect , the offer shall be rejected.	VENDOR TO SPECIFY		