

**ANNEXURE-1 PRODUCT PURCHASING SPECIFICATION
TRANSFORMER ENGINEERING DEPARTMENT
BHEL, JHANSI**

PURCHASE SPECIFICATION
NO. JS 22303 REV.00
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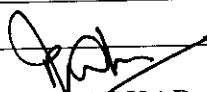
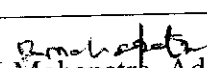
**SPECIFICATION FOR FIBER OPTIC DIRECT HOT SPOT TEMPERATURE
MEASUREMENT SYSTEM**

A. SYSTEM DETAILS-

The system shall have fiber optic based probes for monitoring of direct hot-spot temperature in windings, oil, core & other important areas along with a monitoring/control unit. Fiber optic temperature monitoring system shall be of proven quality and rugged technology. The probes shall be suitable to be directly installed in each winding/core of transformers to measure the winding hot spot, top oil and core temperature etc.

B. TECHNICAL PARAMETERS & BILL OF QUANTITY:-

	<u>ITEM-1</u>	<u>ITEM-2</u>	<u>ITEM-3</u>	<u>ITEM-4</u>	Bidder Acceptance (Tick Appropriate Answer)
Style no.	JS9006281360	JS9006281370	JS9006281380	JS9006281390	
Application	Real-time Hot spot temperature monitoring of transformer oil, winding & core upto 400kV class Transformer				
No. of channels	<u>08 nos.</u>	<u>08 nos.</u>	<u>08 nos.</u>	<u>08 nos.</u>	<input type="checkbox"/> Accepted/ <input type="checkbox"/> Not Accepted
Details of optical sensors	Probes shall be 200µ all silica, double PFA Teflon jacketed, Kevlar cabled fiber with perforated outer jacket to allow complete oil filling and white Teflon protective Helix wrap having improved visibility and mechanical strength. The fiber with Teflon jacket	Probes shall be all Silica, double Teflon jacketed fiber with perforations/slits in the outer jacket to allow complete oil filling. The fiber with Teflon jacket shall be strong enough to withstand the severe conditions prevailing inside an EHV Transformer.	Probes shall be all silica, Teflon jacketed fiber with perforation/slits in outer jackets to allow complete oil filling. The fiber with Teflon jacket shall be strong enough to withstand the severe conditions prevailing inside an EHV Transformer.	Probes shall be 200µ all silica, double PFA Teflon jacketed, Kevlar cabled fiber with perforated outer jacket to allow complete oil filling and white Teflon protective Helix wrap having improved visibility and mechanical strength. The fiber with	ITEM-1 <input type="checkbox"/> Offered/ <input type="checkbox"/> Not Offered ITEM-2 <input type="checkbox"/> Offered/ <input type="checkbox"/> Not Offered ITEM-3 <input type="checkbox"/> Offered/ <input type="checkbox"/> Not Offered ITEM-4 <input type="checkbox"/> Offered/ <input type="checkbox"/> Not Offered

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REV.00	08.06.2016	P. PARADKAR Prepared by	R K Mohapatra, Addl. GM Approved by

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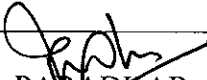
	shall be strong enough to withstand the severe conditions prevailing inside an EHV Transformer.			Teflon jacket shall be strong enough to withstand the severe conditions prevailing inside an EHV Transformer.	
No. of optical sensors	system shall be provided with 08 nos. optical temperature sensors	system shall be provided with 08 nos. optical temperature sensors	System shall be provided with 14 nos. optical temperature sensors.	System shall be provided with 14 nos. optical temperature sensors.	<input type="checkbox"/> Accepted/ <input type="checkbox"/> Not Accepted
No. of Internal FO sensor cable	08 Nos.	08 Nos.	14 Nos.	14 Nos.	<input type="checkbox"/> Accepted/ <input type="checkbox"/> Not Accepted
No. External Cables	Specify if one external cable for 1/ 2/ 4/ 8 feed through, as the case may be (to be brought out clearly in bid)				<input type="checkbox"/> Specified/ <input type="checkbox"/> Not Specified
Internal FO sensor cable length	5 mtrs	5 mtrs	5 mtrs	5 mtrs	<input type="checkbox"/> Accepted/ <input type="checkbox"/> Not Accepted
External FO sensor cable length	6 mtrs	6 mtrs	6 mtrs	6 mtrs	<input type="checkbox"/> Accepted/ <input type="checkbox"/> Not Accepted
No. of feed throughs	08 nos.	08 nos.	14 nos.	14 nos.	<input type="checkbox"/> Accepted/ <input type="checkbox"/> Not Accepted
Feed through plate (Stainless Steel)	01 no.	01 no.	01 no.	01 no.	<input type="checkbox"/> Accepted/ <input type="checkbox"/> Not Accepted
Protective cover for feed through plate	01 no.	01 no.	01 no.	01 no.	<input type="checkbox"/> Accepted/ <input type="checkbox"/> Not Accepted
'O' ring gasket for feed through plate	01 no.	01 no.	01 no.	01 no.	<input type="checkbox"/> Accepted/ <input type="checkbox"/> Not Accepted
MS Ring for mounting of feed through	01 no.	01 no.	01 no.	01 no.	<input type="checkbox"/> Accepted/ <input type="checkbox"/> Not Accepted

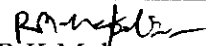
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plate					
Stainless Steel conduit for external cable	6 mtrs	6 mtrs	6 mtrs	6 mtrs	<input type="checkbox"/> Accepted/ <input type="checkbox"/> Not Accepted
Controller unit	01 set	01 set	01 set	01 set	<input type="checkbox"/> Accepted/ <input type="checkbox"/> Not Accepted
Enclosure for controller unit	01 nos. (drawing to be furnished along with offer)				<input type="checkbox"/> Accepted/ <input type="checkbox"/> Not Accepted
AC cable Adapter for DC input	1 set	1 set	1 set	1 set	<input type="checkbox"/> Accepted/ <input type="checkbox"/> Not Accepted
Provision for Remote Indication 1. 4-20 mA analog output 2. RS 232/ RS 485	1 set	1 set	1 set	1 set	<input type="checkbox"/> Accepted/ <input type="checkbox"/> Not Accepted <input type="checkbox"/> Accepted/ <input type="checkbox"/> Not Accepted
Any other accessories, which is not listed in all above clauses but may be required for satisfactory operation of fiber optic system is deemed to be included in scope and also such item shall be clearly brought out in the bid.	As may be required because of OEM design	As may be required because of OEM design	As may be required because of OEM design	As may be required because of OEM design	<input type="checkbox"/> Accepted/ <input type="checkbox"/> Not Accepted
Instruction Manual	01 compact disc containing all relevant details	01 compact disc containing all relevant details	01 compact disc containing all	01 compact disc containing	<input type="checkbox"/> Accepted/ <input type="checkbox"/> Not Accepted

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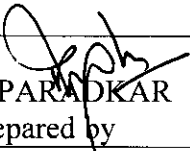
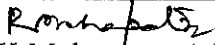
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			relevant details	all relevant details	
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C. INSTRUCTIONS TO BIDDERS (ITB)-

- Bidders should note that they are required to submit the techno-commercial offer for all the Variants. In case, any Bidder is not quoting for any variant, reason towards non- quoting of such variant shall be clearly brought out in its bid.
- Bidder shall be given 1 week time to reply in case of any query from BHEL. Bidder shall note that reply to technical queries must reach us within stipulated time else their offer is liable to be rejected.
- Bidder shall be fully responsible for any problem arising in FO sensor/cable during the assembly of the equipment. In case any problem is faced at works, Bidder shall immediately attend the problem and if need be, system/probe shall be replaced by him at his cost.
- Similarly, if any problem is faced at site, bidder shall immediately attend the problem and if need be, system/probe shall be replaced by him for which item wise break-up cost shall be indicated separately in the bid.
- The Bidders are required to quote for following tentative quantity of each variants.
15 sets for ITEM.01
60 sets for ITEM.02
10 sets for ITEM 03
10 sets for ITEM 03
The above quantity is tentative only and there is a possible variation of $\pm 30\%$ for all items.
- If during the tenure of the rate agreement, OEM makes any changes in the equipment or the equipment is superseded by some other advanced equipment, Bidder is deemed to supply the updated equipment/advanced equipment without any price implication to BHEL. An undertaking for the same shall be furnished by the Bidder in its bid.
- It is found that Bidders offers main equipment from OEM and some part from India because of which delays have been observed in final installation and commissioning of the system. Bidder shall note that he makes all necessary arrangements before so that no such delays are observed.
- The above specification is issued without any prejudice to BHEL's standard terms & Conditions. The specification doesn't absolve the Bidder from his basic responsibility of supplying a quality material to BHEL.

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ANNEXURE-I QUESTIONNAIRE

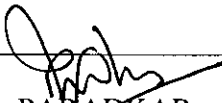
Sl. No.	Essential features	YES to all is mandatory (In case of any answer is NO, Bids are liable for rejection)
1	Probes are suitable for hot transformer oil. Probes are able to withstand exposure to hot kerosene vapor during the transformer insulation drying process. There shall be no partial discharges from the probes even if the probes are placed in the high electrical stress are inside the transformer.	<input type="checkbox"/> Yes <input type="checkbox"/> No
2	Temperature range of the offered system should be -30°C to +200°C.	<input type="checkbox"/> Yes <input type="checkbox"/> No
3	Accuracy of the system should be ± 1 °C with no recalibration required.	<input type="checkbox"/> Yes <input type="checkbox"/> No
4	System shall have a microprocessor based monitoring and recording unit.	<input type="checkbox"/> Yes <input type="checkbox"/> No
5	Analog output with temperature resolution of ± 0.1 °C for each channel provided.	<input type="checkbox"/> Yes <input type="checkbox"/> No
6	The system shall offer user programmable temperature alarm outputs with minimum 6 relays.	Specify no. of relays offered
7	Alarm lights and controller system status indicators are provided.	<input type="checkbox"/> Yes <input type="checkbox"/> No
8	system meets the requirements of surge test of 4000V when applied to all the inputs and outputs without permanent damage to the instrument as per IEEE C37.90.1	<input type="checkbox"/> Yes <input type="checkbox"/> No
9	Data storage capability of the offered system shall be minimum 90 days at an interval of one (01) reading/minute.	<input type="checkbox"/> Yes <input type="checkbox"/> No
10	Retention capability of maximum temperature for each channel is provided.	<input type="checkbox"/> Yes <input type="checkbox"/> No
11	The controller shall be housed in a separate enclosure having degree of protection IP56 class.	<input type="checkbox"/> Yes <input type="checkbox"/> No
12	For indication on Remote panel, output of 4-20mA shall be made available for all provided channels.	<input type="checkbox"/> Yes <input type="checkbox"/> No

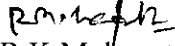
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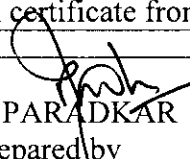
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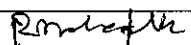
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13	Optional price for remote indicator, cables, conduits etc. (required for connection & laying from Transformer to Control room) shall be in supplier's scope. (Distance from remote panel to transformer shall be informed later and prices to be paid on per mtr basis on actuals).	<input type="checkbox"/> Yes <input type="checkbox"/> No
14	Following communication protocols to be necessarily available in system 1. RS-232/RS485 2. 4-20mA analog output for SCADA	<input type="checkbox"/> Yes <input type="checkbox"/> No
15	Optional price for following protocol and its cable laying quoted 1. IEC-61850 2. USB	<input type="checkbox"/> Yes <input type="checkbox"/> No
16	Operating voltage shall be 230V, 50Hz single phase AC / 24V DC.	<input type="checkbox"/> Yes <input type="checkbox"/> No
17	If operating voltage in (14) above is DC, suitable adapter is included	<input type="checkbox"/> Yes <input type="checkbox"/> No
18	Following drawings enclosed with bid- 1. Complete schematic showing the connections of power supply to the display/ control unit, terminal marking and wiring termination of alarm & trip contacts. 2. Mounting drawing of FO sensor in winding 3. Outline and fixing drawings for display/ control unit, tank feed through plate. 4. Drawing of protection cover of feed through plate and enclosure for controller unit showing mounting details	<input type="checkbox"/> Enclosed <input type="checkbox"/> Not Enclosed <input type="checkbox"/> Enclosed <input type="checkbox"/> Not Enclosed <input type="checkbox"/> Enclosed <input type="checkbox"/> Not Enclosed <input type="checkbox"/> Enclosed <input type="checkbox"/> Not Enclosed
19	All the items being supplied with the system are compatible with each other and shall work coherently as a complete system	<input type="checkbox"/> Yes <input type="checkbox"/> No
20	3 sets of inspection, routine, acceptance and calibration test reports, operation and maintenance manual, descriptive catalogue/ leaflets shall be sent along with each supply set along with compact disc containing above.	<input type="checkbox"/> Yes <input type="checkbox"/> No
21	The Bidder shall furnish a list of all fittings and components in the dispatch details giving description, quantity and weight of each item (Quantity of each item shall be mentioned). All items shall be properly packed in wooden boxes/ jerk-free packing so as to avoid scratches/damage during the transit	<input type="checkbox"/> Yes <input type="checkbox"/> No
22	Bidder shall arrange demonstration of system & training at BHEL as and when required by BHEL.	<input type="checkbox"/> Yes <input type="checkbox"/> No
23	Bidder shall arrange installation & commissioning the system and provide training for operation and maintenance to our End customer at site on intimation by BHEL and obtain certificate from the customer for the same.	<input type="checkbox"/> Yes <input type="checkbox"/> No

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