

Corrigendum-I
RFQ No. RAJBOS0064 Dt. 19.11.2020 (E-tender)

Item- RAJBOS0064 Dt 19-11-2020 for Supply and I&C of 33KV Grade, 3-winding 8.8MVA and 6.4MVA Inverter Transformers for 100MW Raghnesda Phase-2 project for GSECL, Gujarat

Dear Sir/Ma'am,

For the RFQ referenced to above, Bharat Heavy Electricals Limited (BHEL) is issuing a corrigendum

Reasons: Revision of Specifications and extension of due date up to 7/12/20.

The revised technical specification has been uploaded to following websites:

1. <https://eprocurebhel.co.in/nicgep/app>

(look for tender id 2020_BHEL_213_1)

2. http://www.bhel.com/tender/view_tender.php?tenderid=55742

Kindly note that the tender is due on 07.12.2020, 13:00:00 Hrs. (IST) Please submit your offer on <https://eprocurebhel.co.in/nicgep/app>

			PURCHASE SPECIFICATION FOR ONAN TYPE, 3-PHASE, 3-WINDING, 8.8MVA & 6.4MVA, 33KV /690V – 690V INVERTER DUTY TRANSFORMER		PS 439-1355
					REV. No. 01
					PAGE 1 OF 16
COPYRIGHT AND CONFIDENTIAL The information on this document is the property of Bharat Heavy Electricals Limited. It must not be used directly or indirectly in anyway detrimental to the interest of the company.		TECHNICAL SPECIFICATION FOR ONAN TYPE, 3-PHASE, 3-WINDING, 33KV / 690V – 690V INVERTER DUTY TRANSFORMER			
		REVISION: 00	Approved: Prachi Rao V 		
		R01 dtd 30.11.2020 Changes highlighted	Prepared	Issued	Date
			L.Nanda Kishore	SC&PV-Engg	04.11.2020

		बी एच ई एल BHEL	PURCHASE SPECIFICATION FOR		PS 439-1355																																														
			ONAN TYPE, 3-PHASE, 3-WINDING, 8.8MVA & 6.4MVA, 33KV /		REV. No. 01																																														
			690V – 690V INVERTER DUTY TRANSFORMER		PAGE 2 OF 16																																														
1.0 INTRODUCTION This document details the technical specifications, supply conditions, erection and commissioning and post-commissioning requirements for ONAN type, 5-MVA 8.8 MVA & 6.4 MVA, 33kV/ xxxV- 690V-690V, 3-phase, 3-winding, inverter duty transformers for solar PV grid connected power plants.																																																			
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			ONAN TYPE, 3-PHASE, 3-WINDING, 8.8MVA & 6.4MVA, 33KV /		REV. No. 01
			690V – 690V INVERTER DUTY TRANSFORMER		PAGE 3 OF 16
2.3	Installation and commissioning support for the transformers at site: BHEL scope of activities at site for installation and commissioning: (1) Movement and positioning of transformers on their respective foundations. BHEL shall arrange all necessary labour, machinery and tools. (2) Erection / assembly of transformer fittings and accessories. BHEL shall arrange all necessary labour, machinery and tools. (3) Laying of LV/HV cables, erection of HV termination kits and cable terminations at the LV/HV cable boxes. BHEL shall arrange all necessary labour and tools. Supply of cables and accessories (glands, lugs, nuts, washers) in BHEL scope. Vendor scope of activities at site for commissioning: (1) Supervision of erection / assembly of transformer fittings and accessories including marshalling box wiring. This shall include providing technical guidance to BHEL erection team wherever required. (2) Commissioning / service engineer(s) shall be available at site at the time of commissioning of the power plant. All necessary guidance / support in overcoming technical problems (if any) related to the transformers. A single lump-sum price on per-transformer basis shall be offered. The lump-sum price shall include all the costs that will be incurred by the vendor towards the above activities including travel, boarding, lodging and any other contingency expenses.	1 AU per transformer 1 AU (Activity Unit) = I&C Support for 1 No. transformer			
2.5	Service during Warranty Vendor shall enclose, along with technical bid, the complete scope, terms and conditions of the warranty. During the warranty period, whenever a technical problem is encountered with transformers, BHEL will report the same to the vendor. All parts of the transformers shall be covered under warranty. Replacement of all defective material during warranty period shall be in scope of the vendor. Vendor shall ensure that the problem is attended to by their service engineer within two days from the date of reporting.				

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3.0 Technical specification					
#	Technical parameter	BHEL specification			
1	Transformer type	Outdoor, oil-immersion type ONAN, Inverter Duty. Inverter Transformer shall be designed for at least 5% total harmonic distortion (THD)			
2	IP class	Transformer, including the cable box and marshalling box shall be of IP55.			
3	Application	Grid-connected solar photovoltaic power plant.			
4	Governing Standards	Power Transformer	IS: 2026, IS: 6600, IEC:60076, CBIP		
		Fittings and Accessories	IS: 3639		
		Insulating Oil	IS:335 , IEC: 60296		
		Bushings	IS: 2099, IEC: 60137		
		Bushing CTs	IS:2705		
		Degree of protection	IS: 2147		
		Tests and tolerance of guaranteed particulars	IS: 2147		
		Buchholz relay	IS: 3637		
		Electrical insulation classified by thermal stability	IS: 1271		
		Climate proofing	IS: 3202		
		Indian Electricity Act 2003 & CEA regulations/notifications			
5	Rating in KVA	As per Clause 2.1			
6	No. of phases	3			
7	Frequency	50 Hz, +/- 3%			
8	HV winding	One 3-phase winding with Star connection. HV voltage: 33KV			
9	LV windings	Two independent 3-phase windings, each with Delta connection. LV voltage: as defined at Cl. 2.1.			
		Each winding shall have an identical and equal rating MVA rating as defined at Cl 2.1 (each winding shall be rated at 50% of overall transformer rated kVA).			
		Design shall be such that transformer shall have identical performance for both the LV windings. Even when one LV winding is not fed from solar generation side, performance of the other (operational) LV winding shall remain unaffected.			
10	Winding material	Electrolytic grade copper for both HV and LV windings.			
11	Winding Insulation	Class A			
12	Neutral on HV side	Neutral terminals of HV windings shall be brought out separately through bushings.			

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COPYRIGHT AND CONFIDENTIAL The information on this document is the property of Bharat Heavy Electricals Limited. It must not be used directly or indirectly in anyway detrimental to the interest of the company.		13	Vector Group	YNd11d11	
		14	Rated Thermal Short time current withstand time	25kA for 2 sec	
		15	% Impedance on principal tap (& MVA base of 50% MVA rating of LV winding as defined at Cl-2.1 transformer rating) at 75deg C and 50 deg C	HV - (LV1 + LV2): 8 % (min) HV - LV1 / LV2 : 8 % (min) LV1 - LV2 : 12 % (min) Tolerance shall be as per IS 2026 Note: MVA base for above impedance shall be considered as equal to rated MVA of transformer. is 4.4MVA & 3.2MVA (i.e 50% of the rated MVA of the two ratings under scope of supply against this tender)	
		16	Termination HV/LV/Orientation	Air insulated cable box with disconnecting chamber, for both HV and LV sides. Cable box / Cable box / 180°.	
		17	Cable entry on HV side	- Bottom entry of cables. - Cable size: 1 run per phase of 1Cx 185 sq-mm, 33kV grade, aluminum conductor, armoured, XLPE insulation, PVC sheath as per IS: 7098. - Cables, lugs, glands, termination kits etc shall be in BHEL scope. - Vendor shall provide hole on the bottom-side gland-plate of HV side cable box for cable entry. - Cable OD will be intimated to the vendor at the time of manufacturing.	
		18	Cable entry on LV side	- Three wire system. - Bottom entry of cables - Cable size: 7 runs per phase of 1CX630 sqmm, aluminum conductor, armoured, XLPE insulation, PVC sheath as per IS: 7098. - Cables, lugs, glands etc shall be in BHEL scope. - Vendor shall provide holes in the busbars and on the bottom-side gland-plate of LV side cable box for placement of glands. - Cable O.D shall be informed to vendor during drawings approval by BHEL. Cables shall enter the cable box straight upwards and get connected to the bus bars. After entry into cable box, cables shall not undergo any bends or turns.	
		19	Tapping on HV winding	Off circuit tap changer (OCTC) switch with tap positions range from -10% to +10% in steps of 2.5%.	
		20	Loading Capability	Continuous operation at rated MVA on any tap with voltage variation of +/-10%. Transformer shall be capable of being loaded in accordance with IS: 6600 / IEC 60076-7 upto a load of 150%. There shall be no limitation imposed by bushings etc. or any other associated equipment.	

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COPYRIGHT AND CONFIDENTIAL The information on this document is the property of Bharat Heavy Electricals Limited. It must not be used directly or indirectly in anyway detrimental to the interest of the company.			21	Ambient temperature	Max 50 deg C
			22	Temperature rise	For top oil: Max.50 deg C by thermometer method. For winding: Max. 55 deg C by resistance method. Both rises shall be over an ambient temperature of 50 deg C irrespective of tap position.
			23	Flux density	Not to exceed 1.9 Wb/sq.m at any tap position with +/-10% voltage variation from voltage corresponding to the tap. Transformer shall also withstand following over-fluxing conditions due to combined voltage and frequency fluctuations: a) 110% for continuous rating b) 125% for at least one minute c) 140% for at least five seconds Vendor shall furnish over-fluxing characteristics upto 150% during detailed engg. The transformer shall also be capable of withstanding without damage during the time, for a duration of at least two seconds the stresses caused by short circuit limited only by the transformer impedance with 110% rated voltage maintained at source end.
			24	Air Clearances	As per CBIP
			25	Harmonics	Shall be designed to suppress harmonics especially 3rd & 5th. Inverter Transformer shall be designed for at least 5% total harmonic distortion (THD)
			26	Noise level	As per NEMA TR-1 standard
			27	Highest system voltage	LV side: 1.1kV HV side: 36 kV
			28	Insulation Class (Winding and bushing)	As per relevant IS / IEC standard LV side winding and bushing insulation class shall be of at least 1.1kV
			29	Insulation levels Rated Lightning Impulse withstand voltage / Short duration power frequency withstand voltage	As per relevant IS / IEC
			30	Painting	Shall be finalized during drawing approval.
			31	Constructional features	As per clause 4.0 of this specification
			32	Fittings and accessories	As per clause 5.0 of this specification
			33	Provision of shield	Shield winding shall be provided between LV & HV windings. Each LV winding must be capable of handling non-sinusoidal

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COPYRIGHT AND CONFIDENTIAL The information on this document is the property of Bharat Heavy Electricals Limited. It must not be used directly or indirectly in anyway detrimental to the interest of the company.		voltage with voltage gradient as per applicable standards. Also, shield winding shall be taken out from tank with separate connection for each LV with shield bushing and same shall be brought down along with support insulator from tank & copper flat upto the bottom of the tank for grounding. Shield bushing shall be rated for 1.1kV.		
	34	No load current at rated voltage and frequency	Vendor to indicate value (%)	
	35	Efficiency at 75°C at UPF	Minimum 98.5% at full load Vendor to indicate value	
	36	Maximum Efficiency (%) and load at which it occurs (kVA)	Vendor to indicate value	
	37	Overall dimension in mm Length x Breadth x Height	This shall be provided by vendor.	
	38	Oil capacity (in Litres)	Vendor to mention Oil capacity	
	39	Weight of transformer (kg)	This shall be provided by vendor.	
	40	Minimum creepage distance	31 mm/ kV	
	4.0 Constructional features and details of transformer components			
4.0	Governing standard	IS: 2026, IEC 60076 and IS: 3639 or equivalent international standard.		
4.1 Tank				
4.1.1	The transformer tank and cover shall be fabricated from high grade low carbon plate steel of tested quality. The tank and cover shall be of welded construction and there should be provision for lifting by crane.			
4.1.2	At least two adequately sized inspection hole(s) with welded flange(s) and bolted cover(s) shall be provided, one at each end of the tank. The inspection hole(s) shall be sufficient size to afford easy access to the lower ends of the bushings, terminals etc.			
4.1.3	The exterior of tank and other steel surfaces exposed to the weather shall be thoroughly cleaned and have a priming coat of zinc chromate applied. The second coat shall be of an oil and weather-resistant nature, preferably of distinct colour from the prime and finish coats. The final coat shall be of with 2 coats of glossy, oil and weather resistant non-fading epoxy based paint of colour shade RAL 7032.			
4.1.4	The interior of the tank shall be cleaned by sand blasting and painted with two coats of			

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COPYRIGHT AND CONFIDENTIAL The information on this document is the property of Bharat Heavy Electricals Limited. It must not be used directly or indirectly in anyway detrimental to the interest of the company.			heat resistant and oil insoluble insulating varnish of white shade.	
		4.1.5	All bolts and nuts exposed to atmosphere shall be galvanized. All bolted connections to the tank shall be fitted with suitable oil-tight gaskets that shall give satisfactory service under the operating conditions for complete life of the transformer, if not opened for maintenance at site.	
		4.1.6	Transformer tank shall be mounted on bi-directional rollers for rail gauge suitable as per IS / CBIP. Suitable locking arrangement shall be provided to prevent accidental movement of transformer. Tank shall also be provided with lifting lugs and minimum four jacking pad.	
		4.1.7	The tank together with radiators, conservator, bushings and other fittings shall be designed to withstand the following conditions without permanent distortion: (i) Full vacuum (mm of Hg – value as per latest CBIP Manual), for filling with oil by vacuum. Internal gas pressure of 0.35 Kg/cm² (5 lbs/sq.in) with oil as at operating level. (ii) The transformer shall have conservator tank of adequate capacity to accommodate oil preservation system and volumetric expansion of total transformer oil. The conservator shall be bolted into position so that it can be removed for cleaning purposes. (iii) The conservator shall be of single compartment type. The top of the conservator shall be connected to the atmosphere through indicating type cobalt free silica gel breather (in transparent enclosure). Silica gel shall be isolated from atmosphere by an oil seal. (iv) The tank cover shall be suitably sloped so that it does not retain rain water. The material used for gaskets shall be cork, neoprene or approved equivalent.	
		4.2 Core		
		4.2.1	The magnetic circuit shall be of core type. The core shall be constructed from high grade, non-ageing, cold rolled, super grain oriented silicon steel laminations (CRGOS) equivalent to M4 grade steels or better.	
		4.2.2	The insulation structure of the core to clamp plates shall be such that it withstands a voltage of 2kV (rms) for one minute in air.	
		4.2.3	Adequate lifting lugs will be provided to enable the core & windings to be lifted.	
		4.3 Windings		
		4.3.1	Windings shall be of electrolytic grade copper free from scales and burrs.	
		4.3.2	Windings shall have uniform insulation.	
		4.3.3	Tapping shall be so arranged as to preserve the magnetic balance of the transformer at all voltage ratios.	
		4.3.4	The completed core and coil assembly shall be dried in vacuum and shall be immediately impregnated with oil after the drying process to ensure elimination of air and moisture within the insulation.	
		4.3.5	Windings shall be made in dust proof and conditioned atmosphere.	
		4.4 Internal earthing		
		4.4.1	The frame work and clamping arrangements of core and coil shall be securely earthed inside the tank by copper strip connection to the tank.	

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4.5 Bushings <table><tr><td>4.5.1</td><td>Bushings shall be designed and tested to comply with the applicable standards. If type test certificates are not available, these tests shall also be carried out in addition to the routine tests. Bushings rated for 400A and above shall have non-ferrous flanges and hardware. Bushings shall be supplied with terminal connector clamp suitable for connecting the cables. 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Cable boxes / disconnecting chambers shall be provided with necessary arrangements to prevent entry of rain water into the same.</td></tr><tr><td>4.6.6</td><td>Disconnecting chambers: (1) Disconnecting chambers shall be provided to enable the transformer to be removed without unsealing the cables or draining oil from the main tank. (2) Disconnecting chamber shall be air insulated and complete with seal-off bushings, removable flexible connectors / links and removable covers. (3) Phase-to-phase and Phase-to-ground clearances within the chamber shall be such as to enable either the transformer or cable to be subject separately to HV tests.</td></tr><tr><td>4.6.7</td><td>Internal surface of cable boxes shall be painted with epoxy enamel white paint. The minimum dry film thickness (DFT) shall be 100 microns.</td></tr></table> 4.7 Neutral bushings <table><tr><td>4.7.1</td><td>The neutrals of the star-connected HV windings shall be brought out to separate bushing terminals. 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				REV. No. 01										
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			PURCHASE SPECIFICATION FOR ONAN TYPE, 3-PHASE, 3-WINDING, 8.8MVA & 6.4MVA, 33KV / 690V – 690V INVERTER DUTY TRANSFORMER	PS 439-1355
				REV. No. 01
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5.0 Fittings and accessories Following fittings per transformer shall be provided. In case of non-compliance or deviation, vendor shall indicate and provide comments.				
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	1	Oil conservator with equalizer pipe	1 set	
	2	HV cable box	1 set	
	3	HV disconnecting chamber	1 set	
	4	LV cable box	2 sets	
	5	LV disconnecting chamber	2 sets	
	6	Off circuit tap changing switch (OCTC) with operating knob, tap position marking and locking facility, with separate caution plate “Tap switch to be operated only with the transformer de-energized”.	1 set	
	7	Earthing terminals with hardware suitable for connecting 50x6 GI earth strips. Separate terminals shall be provided for cable boxes, tank etc.	1 set	
	8	Radiators (detachable type) with drain valve at the bottom, relief valve at the top, air plug, shut-off valves at every point of connection to the tank and lifting lugs.	4 sets	
	9	Double float Buchholz relay with alarm and trip contact. The relay shall be provided with a test cock suitable for a flexible pipe connection for checking its operation. Buchholz relay shall be provided with 2 nos. shut-off valve (on conservator side and tank side) of size 50 mm for transformer rating up to 10MVA and 80 mm for rating 10MVA and above.	1 set	
	10	Provision for collecting gas and oil from Buchholz relay	1 set	
	11	Silica gel dehydrating breather with oil cup; indicating type cobalt free silica gel breather in transparent enclosure. (maximum height 1400 mm above ground level)	1 set	
	12	Magnetic oil level gauge (MOG), dial type, with alarm contact, minimum and maximum filling level markings. Contact shall be suitable for 110V/220V DC. The oil level at 30 deg C shall be marked on the gauge.	1 set	
	13	Prismatic / toughened glass oil level gauge for transformer and tap changer chamber with min and max markings.	1 set	
	14	Spring operated Pressure relief valve with alarm/trip contacts. Location of this valve shall be such that the hot oil discharge shall not fall on the transformer or any of its parts. This shall include all necessary arrangements to facilitate proper discharge of PRV through discharge pipes away from the transformer.	1 set	
	15	Explosion vent (double diaphragm) with sight glasses and equalizing pipe connection to conservator	1 set	
	16	Thermometer pocket for OTI	1 No	
	17	Temperature sensor for OTI	1 No	
	18	Thermometer pocket for WTI	1 No	
19a	CT for WTI	1 No		

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			ONAN TYPE, 3-PHASE, 3-WINDING, 8.8MVA & 6.4MVA, 33KV /		REV. No. 01
			690V – 690V INVERTER DUTY TRANSFORMER		PAGE 12 OF 16
19b	Bushing CT (P.S Class) for transformer differential protection (HV side)			3 Nos	
19c	Bushing CT (P.S Class) for transformer differential protection (LV side)			6 Nos	
20	Oil temperature indicator, 150 mm dial type, with alarm and trip contacts, maximum reading pointer & resetting device. Oil temperature range: 0-150 deg C (resolution 1 deg C) Oil temperature accuracy: Minimum 1.5% RTD PT-100 temperature sensor for OTI (IEC 751). Analog output of 4-20mA for remote indication of OTI. Maximum height 1500mm above ground level.			1 No	
21	Winding temperature indicator, 150-mm dial type, with alarm and trip contacts, maximum reading pointer & resetting device. Winding temperature range: 0-150 deg C (resolution 1 deg C) Winding temperature accuracy: Minimum 1.5% Analog output of 4-20mA for remote indication of WTI. WTI shall be provided for HV winding and one of the LV windings. Maximum height 1500mm above ground level.			3 Nos (1HV+2LV)	
22	Marshalling box (IP55) shall be provided with removable gland plates and glands for cable entry from bottom side. Marshalling box shall be provided with OTI, WTI, transmitters (for 4-20mA output of OTI and WTI), space heater, thermostat, lamp (LED type), MCBs, power socket, switch for WTI, terminal connectors and all other attachments that are necessary to meet its functional aspects. Terminal connectors for the following signals / connections shall be made available. Number of terminal connectors for each case shall be as per connection requirements: 1) PT-100 sensor from thermometer pocket 2) 4-20mA output for OTI 3) 4-20mA output for WTI 4) WTI CT secondary 5) Alarm contact of WTI 6) Trip contact of WTI 7) Alarm contact of OTI 8) Trip contact of OTI 9) Buchholz relay alarm 10) Buchholz relay trip 11) Magnetic oil level gauge alarm 12) Pressure relief valve alarm trip 13) 90-260V DC power supply (external source) 14) 240V AC supply (external source) 15) Spare connectors: Eight terminals 16) Analog output from Bushing CTs for Transformer Differential protection Note: Alarm and trip contacts shall be rated for 110 / 220V DC which will be confirmed during detailed engineering.			1 set	
23	Inspection window with cover			1 set	
24	Cover lifting lugs / eyes			2 Nos	
25	Core and winding lifting lugs / eyes			2 Nos	

			PURCHASE SPECIFICATION FOR ONAN TYPE, 3-PHASE, 3-WINDING, 8.8MVA & 6.4MVA, 33KV / 690V – 690V INVERTER DUTY TRANSFORMER	PS 439-1355
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COPYRIGHT AND CONFIDENTIAL The information on this document is the property of Bharat Heavy Electricals Limited. It must not be used directly or indirectly in anyway detrimental to the interest of the company.		26	Tank lifting lugs / eyes for the entire transformer	4 Nos
		27	Jacking pad with hauling eyes, to enable transformer with oil to be raised or lowered using hydraulic or screw jacks.	4 sets
		28	LV cable box supports with mounting plates	2 sets
		29	HV cable box supports with mounting plates	2 sets
		30	Bi-directional flat rollers	4 sets
		31	Base channel with towing holes / lugs	2 sets
		32	Air release hole with plug	1 No
		33	Oil filling hole with cap	1 No
		34	Top filter cum sampling valve with threaded male adapter (blanking plug)	1 No
		35	Bottom filter valve with threaded male adapter (blanking plug)	1 No
		36	Drain valve for conservator, with blanking plug	1 No
		37	Shut-off valves for conservator	2 Nos
		38	Bottom Sampling valve, with blanking plug	1 No
		39	Shut-off valves for radiators, with open and close markings	8 Nos
		40	Drain / Sludge valve at bottom most point of tank to be provided for easy flush out / removal of sludge during maintenance	1 No
		41	Valve schedule plate made of stainless steel	1 No
		42	Rating and diagram plates made of stainless steel or anodized aluminium (Hindi and English)	2 Nos
		43	Terminal marking plates	1 Set
		44	Core to frame earthing hood (2kV isolation)	1 No
		45	Earthing pads	2 Nos
		46	Rain hoods on Buchholz, MOG and PRD with entry points of wires suitably sealed	1 set
		47	Bolts & nuts – G.I / S.S – For all current carrying parts, S.S hardware shall be provided and all other places, G.I hardware shall be provided.	1 set
		48	Protected type Mercury or alcohol in glass thermometer	1 No
		49	Gas sampling pet cock for Buchholz Relay	1 No
		50	Shielding Bushing along with copper flat and insulators	2 set
		51	Valves on transformer tank for NIFPS connection	1 set
		52	Provision for connecting Isolation valve (TCIV) of NIFPS System between transformer tank and conservator	1 set
		53	Mounting arrangement on transformer tank for NIFPS control box mounting	1 set

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			ONAN TYPE, 3-PHASE, 3-WINDING, 8.8MVA & 6.4MVA, 33KV /		REV. No. 01
			690V – 690V INVERTER DUTY TRANSFORMER		PAGE 15 OF 16
8.0 Tests at Site: 8.1 After erection at site all transformer(s) shall be subjected to the following tests: i. Insulation resistance test. ii. Measurement of Voltage Ratio iii. Polarity test. iii. Magnetic Balance test iii. Dielectric test on oil. iv. Physical check. v. Breakdown voltage on transformer oil. Oil filtration (if Oil BDV is not satisfactory) These tests shall be conducted under the supervision of transformer manufacturer.					
9.0 Documents to be submitted along with offer 9.1 Following documents shall be submitted to BHEL along with technical offer: (1) Filled in values/details wherever the same is asked for in BHEL technical specifications (2) Confirmation of NIL deviation to BHEL Purchase Spec. In case any deviation is taken, vendor shall indicate the clause no., BHEL requirement as per the subject clause and the deviation taken.					
10.0 Documents to be submitted after receipt of purchase order 10.1 Following documents shall be submitted for BHEL approval within seven days from date of purchase order. (1) Drawings (a) Overall General Arrangement (plan, elevation, end view) with overall dimensions and BOM. (b) Rating plate details (c) Valve schedule plate details with elevation & side view showing valve positions (d) HV cable box with disconnecting chamber, bushings, gland plate, cable termination details etc. (e) LV cable box with disconnecting chamber, bushings, gland plate, cable termination details etc. (f) Marshalling box GA (front view, side view, bill of items) and wiring diagram (g) Foundation plan (h) Bill of material of transformer (i) Untanking details (removal of core and assembly from tank) (j) Type Test Reports (2) Guaranteed technical specification of transformer in line with Appendix-B (schedule of technical particulars to be furnished by manufacturer) of IS: 2026 Part-1. Over and above the same, any details asked for as per Annexure-1 shall be included. (3) Manufacturing Quality Plan (routine tests, type tests, test certificates) covering incoming materials, in-process checks during manufacturing, final inspection, finished goods, packing and forwarding. (4) Manufacturing clearance shall be subject to approval of the above documents by BHEL/customer.					

			PURCHASE SPECIFICATION FOR ONAN TYPE, 3-PHASE, 3-WINDING, 8.8MVA & 6.4MVA, 33KV / 690V – 690V INVERTER DUTY TRANSFORMER	PS 439-1355
				REV. No. 01
				PAGE 16 OF 16
11.0 Documents to be submitted along with consignment				
11.1		Following documents shall be submitted to BHEL at the time of delivery of the consignment: (1) As built drawings of transformer (2) Routine test reports on transformer (3) Type test reports of transformer (4) Test certificate for transformer oil (5) Operations and maintenance manual of transformer in hard + soft copy		
12.0 Support from vendor during document approval phase				
12.1		During the phase of approval of design / engineering / quality documents (GA, GTP, BOM, MQP, Test report etc), it will be required to hold in-depth discussions with BHEL/customer to provide clarifications through clear understanding of technical queries. Accordingly, when needed, vendor shall hold direct (across-the-table) discussions with BHEL (Bangalore office) and customer to eliminate undue time delays.		

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