

**TENDER SPECIFICATION
FOR**

**DISASSEMBLY OF 5 NO OIL FILLED
TRANSFORMERS ,TRANSPORTATION TO
STORES AND
ERECTION,TESTING & COMMISSIONING
OF 05 No. 2500 KVA, 11/.415 KV
DRY TYPE
TRANSFORMERS**

AT NHPC BAIRASUL POWER STATION

CUSTOMER- M/S. NHPC

ON BEHALF OF

**BHARAT HEAVY ELECTRICALS LIMITED,
JHANSI: 284120
TENDER SPECIFICATION NO:
BHEL/JHS/FES/078/19**

BHARAT HEAVY ELECTRICALS LIMITED , JHANSI
FIELD ENGINEERING SERVICES

1.0 Field Engineering Services of Bharat Heavy Electricals Limited, Jhansi invites offer for the work to be carried out as stated in clause No. 5.0.

2.0 **PROJECT:**

- (i) Customer : M/s NHPC
(ii) Site: : BAIRA SUL POWER STATION

3.0 **DETAILS OF EQUIPMENT:**

05 Nos.2500 KVA, 11/ 0.415 KV THREE PHASE DRY TYPE TRANSFORMER

4.0 **APPROXIMATE SHIPPING WEIGHT AND DIMENSIONS:**

Shipping weight	-	9000 Kg
Dimension (Approx.)	-	Over All Shipping
Length	-	3000 MM
Width	-	2020 MM
Height	-	3310 MM
Total weight with fittings	-	10000 Kg approx..

Note-The above details are tentative & may vary.No extra charges shall be paid for variations in details as indicated above.

5.0 **SCOPE OF WORK OF THE CONTRACT:**

- 5.1 The Contractor should visit the site before quoting the rate for knowing the site condition & other details for working at site. The details of work is as per annexed specification of M/sNHPC .
- 5.2 After arrival of the transformer with accessories at site, material inspection shall be Done by M/S NHPC at site however contractor to co-ordinate the same. It will be the contractor's responsibility to facilitate M/S NHPC representative in inspection and checking of transformer and all associated accessories supplied with transformer.
- 5.3 The storage of material shall be done by the contractor at site. After proper storage, in case of delay in erection, the transformer with all accessories shall be handed over to M/S NHPC with proper handing over documents. The receipt of the material will be completed only after completion of the above activity. Before receipt, the contractor will be the custodian of the material.
- 5.4 Dismantling of old oil filled transformers and shifting , storage , transportation etc. has to be arranged by vendor in line with site condition.

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- 5.5 Before arrival of the transformer at site the contractor has to give the details of the infrastructure required for storage of transformer with accessories so that it can be provided by M/S NHPC in time to avoid delay.
- 5.6 If erection start date of the transformer is within one months from the date of receipt, then in this period the contractor shall be the custodian of the material at site upto completion of commissioning and normal operation of the transformer otherwise the complete material will be handed over to M/S NHPC with proper handing over documentation. Latter on the contractor will be informed regarding date of start of the erection well in advance and contractor has to mobilize manpower at least 07 days before the start date of erection.
- 5.7 If the material has been handed over to M/S NHPC then at the time of start of erection the vendor has to receive all materials, which he had handed over to M/S NHPC at the time of receipt, in complete. Day to day issue of material will not be permitted. No material will be provided by M/S NHPC during job execution to complete the contract.
- 5.8 The material handling from storage site to erection/dismantling site will be in contractor's scope.
Material handling equipment crane, hydra and truck for material shifting inside the plant premises shall be arranged by contractor during job execution to complete the contract.
- 5.9 All equipment cabling i.e. from transformer body mounted instruments to transformer MB shall be in the contractor's scope. Any cutting, welding, Aluminum welding etc, minor modification shall be contractor Scope. All these works shall be done by the qualified welder. All critical welding will be checked at as per specified norms to ensure the quality of the welding.
- 5.10 After completion of the erection, all recommended testing of the transformer has to be conducted by the contractor in presence of M/S NHPC representative as per instruction of Engineer-in-charge. All test result should be as per specified specification and approved field quality plan (Copy enclosed). Contractor has to submit at least five (05) copies of test result.
- 5.12 All testing equipment shall be arranged by the contractor with valid calibration certificate. If any special instrument required by the contractor to complete the testing. It can be provided by M/S NHPC subject to availability. No extra payment will be made by BHEL in this regard.
- 5.13 After completion of the erection and testing the transformer will be back charged from High Voltage site for which necessary isolation shall be arranged by the contractor and after completion of this activity restoration of the system shall be done by the contractor. In case of any fault/failure during back charging same has to be rectified by the contractor free of cost.
- 5.14 During erection of the transformer, if any alteration has been made in fire line then it has to be restored by the contractor after completion of erection and before back charging of transformer.

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- 5.15 Before back charging the transformers wheels should be properly secured to avoid any movement of the transformer.
- 5.16 The personnel employed by the contractor for erection and testing of transformer at site should be experienced in this field.
- 5.17 If contractor is deploying any subcontractor for execution of job of the erection and testing of transformer, the subcontractor should have adequate experience and credential in same field i.e. erection, testing, storage, shifting etc. of similar size of transformer. The sub contractor should have "A" class electrical license, PF registration and other legal formalities which are required to execute the job in NHPC s/s premises. Also prior permission from BHEL shall be taken before any deployment of any sub contractor.
- 5.18 All safety equipment for the working personnel's has to be provided by the contractor. In case of any accident/miss happening contractor shall be only responsible to settle the case.
- 5.19 All special T&P required for erection i.e. lifting jacks, winch etc, shall be arranged by the contractor.
- 5.20 Details of any civil work required for the completion of job done by M/S NHPC Drawing/ Requirements for the same shall have to be furnished by the contractor well in advance.

6.0 INSPECTION AND TESTING AT SITE

Upon receipt at site the Contractor shall make the transformer ready by fitting all accessories for use as a replacement of the existing transformers. For this purpose the contractor shall carry out a detailed inspection and testing program for field activities covering areas right from the receipt of material stage up to readiness for commissioning stage. It is contractor's responsibility to draw up and carry out a program duly approved by the Project Manager.

7.0 RECEIPT AND STORAGE CHECKS

- a) Checks and record & of each package, visible parts of the transformer etc. for any damage.
- b) Visual check for wedging of core and coils before fitting up with oil and also check conditions of core and winding in general.

8.0 CHECK/TEST ON ASSEMBLED TRANSFORMER (Before Oil filling)

All tests in line with NHPC requirement.

- 9.0 Facilities of Filter Machine, Crane of suitable capacity, Oil storage etc. required for completion of the work shall be provided by contractor.
- 10.0 No overrun charges shall be paid in the event the completion period is getting extended.

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- 11.0 Price shall be inclusive of all taxes and duties.
- a) GST shall be applicable as per prevailing rates on Total Contract Value.
 - b) All credits applicable in GST shall be suitably passed on to BHEL as per government guidelines. In case of credit is not available as denied by GST portal due to improper documentation or wrong uploading of data by bidder, the same will be recovered from the bidder along with interest, if any.

12.0 Price will be evaluated on the basis of schedule of price attached with the tender document.

13.0 **TERMS OF PAYMENT:**

90% payment after completion of contract activity. Balance 10% after 1 year from the date of completion of Erection, Testing & Commissioning & handover.

14.0 **SCHEDULE OF WORK:** Tentative schedule for activities under scope of work shall be submitted within 1 week from date of handing over site/plinth by customer. The successful bidder shall be required to start the work immediately.

15.0 Tender documents consist of general terms and conditions, special terms and conditions mandatory requirement for considering the offer proforma for schedule of prices are attached.

Typed/written offer in duplicate should be sent in double sealed cover. Offer should be submitted in two parts viz part-1 technical cum commercial offer and part 2 price bid. The technical cum commercial offer shall be opened first and Technically acceptable tenders finalized. Afterwards price bids of techno commercially acceptable tender shall be opened by tender committee. The inner cover should be sealed with tender's distinctive seal and super scribed with tender notice No. JHS/FES/078/19 and address to:

Sr.DGM (FES/RPD)
Bharat Heavy Electricals Limited
P.O. BHEL-Jhansi (U.P.)
Pin – 284 120

The tender cover should bear the address of this office and identification of tender. The tender will be received up to 13:00 hours on 11/06/2019 and will be opened at 14:00 hours on 11/06/2019 itself, in presence of tender's representative as may be present. The validity of offer should be 120 days from the date of tender opening. Dropping of tender in the tender box is responsibility of the vendor.

16.0 **EMD** as specified to be deposited in favour of BHEL-Jhansi (SBI Branch BHEL, Jhansi Code No. 3807) is to be submitted along with offer.

17.0 Tender cost of Rs. 400/- + GST as Applicable
(` Rupees Four Hundred & GST as Applicable only)
(payable through a Separate EFT/ submission as described along with technical bid, in case the documents downloaded from website)

18.0 **TENDER SUBMISSION** ; Tender should be submitted in double –cover under Two part bid system i.e. The techno-commercial & price bids respectively as depicted below:

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- 19.0 The outer cover should only bear the address of this office and should not have Any Indication that a tender is within

To, Outer Cover
Sr. DGM(FES&RPD),
BHEL, Jhansi-284120

- 20.0 **The two inner covers** shall respectively contain the techno-commercial bid in one and the Price bid in another. Each cover shall be super scribed with the tender's name.Tender Number and sealed with tenders distinctive SEAL and addressed as shown on the respective covers sketched below:

TECHO- COMMERCIAL BID COVER (PART-I)		
TECHO NO. BHE/JHS/FES/078/19. Due on- 11/06/2019		
FROM,	TO,	
FIRM NAME		Sr. DGM (FES/RPD)
FIRM'S SEAL		BHEL, Jhansi-284120

PRICE BID COVER (PART-II)		
TECHO NO. BHE/JHS/FES/078/19 Due on- 11/06/2019		
FROM,	TO,	
FIRM NAME		Sr. DGM (FES/RPD)
FIRM'S SEAL		BHEL, Jhansi-284120

- 21.0 The tenders duly filled and complete in all respects shall be dropped in the tender Box Located at CISF Gate of our Administrative Building .
- 22.0 Tenders are advised to note and strictly follow the time scheduled as noted at Preceding Paras above to avoid inconveniences later and possibility of non acceptance of tender by BHEL.
- 23.0 **DEPUTATION OF REPRESENTATIVE FOR NEGOTIATIONS:**
After opening of the tenders if BHEL Jhansi decides to negotiate the tendered should be in a position to depute his representatives at short notice with full authority for negotiating, as well as commercial terms and concluding the contract.

Sr.DGM (FES/RPD)
Bharat Heavy Electricals Limited,
JHANSI-284120 (U.P.)

SPECIAL TERMS AND CONDITIONS FOR PART –1

In addition to General conditions following conditions will also be applicable:

- 1.0 Each transformer will be comprehensively insured by BHEL, Jhansi to cover transport upto site, placement on plinth, erection, testing and commissioning and handing over to Customer. However, the contractor for the work of placing transformer on plinth will be responsible for external damages as per rule 8 of carriers Act 1965.
- 2.0 The necessary materials required during movement of transformers upto the plinths such as jacks, sleepers, rails etc shall have to arranged by the contractor at his own cost.
- 3.0 10% of the contract value will be paid after satisfactory completion of one year of handing over the equipment to Customer.
- 4.0 Any information and confidential documents of BHEL, coming into the knowledge of the contractor during the course of execution shall not be passed on to any outside agency failing which it shall be treated as breach of the contract resulting in termination of the contract.
- 5.0 **LIQUIDATED DAMAGES FOR DELAY IN COMPLETION**

It is expressly understood and agreed that if the contractor fails to successfully complete all activities including the testing & commissioning of Power Transformer as per schedule specified in the Contract, the contractor shall pay to the BHEL as liquidated damages, and not as penalty a sum calculated at the following rate:

A sum of Rs.@0.5%- per week or part thereof for each day of delay incompletion Of testing and commissioning of Power Transformer as per the scope of work of The Contractor under the Contract.

The maximum Liquidated damage(LD) for delay i. e LD for delay in successful Completion of Testing Power Transformer shall be 10% of the contract price. The Liquidated damaged amount if any, will be recovered from the payments due under the Erection and/ or any other means as deemed fit by the BHEL. GST amount shall be levied and deducted from contractor bill in respect of LD.

- 6.0 Collection of any short supply/replacement items send by BHEL from the nearest transporter go down shall be in scope of contractor, free of charges.
- 7.0 0.5 KV test between core to clamp/earth of transformer before filling of oil and testing of all protection device before their erection.
- 8.0 Draining of oil into drums for further processing / storage to be arranged by contractor.
- 9.0 All bushing should be tested before erection.

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- 10.0 Internal inspection, tightening of all joints and loose parts and attending dislocation inside the transformer and tapping by crape paper wherever required (crape paper to be supplied by BHEL).
- 11.0 Removal of foreign material inside the tank before filling of oil.
- 12.0 Refitting all dismantled parts of its replacing gaskets (New gaskets will be supplied by BHEL).
- 13.0 All the T &P, Welding Machine, vacuum etc shall be arranged by Contractor.
- 13.0 The offers of the bidders who are on the banned list and the offer of the bidders, who engage the services of the banned firms, shall be rejected. The list of banned firms is available on BHEL website www.bhel.com.

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Annexure "B"

Tender No. BHE/JHS/FES/078/19

Date:- 28/05/2019

PRICE BID

Sl. No.	Description of Work & Work Order	Qty.	Rate per Trfr. (Rs.)	Total Price (Rs.)
01	DISASSEMBLY OF 5 NO OIL FILLED TRANSFORMERS ,TRANSPORTATION TO STORES AND ERECTION, TESTING & COMMISSIONING OF 05 No. 2500 KVA, 11/.415 KV DRY TYPE TRANSFORMERS	05 No.		
			Total (Rs)	

Rupees in Words

Rupees in figures

Note:

- (1) Offer to be valid for 120 days
- (2) BHEL may delete, add any activity/activities at the time of order.
- (3) GST will be payable extra as applicable.
- (4) If there is a discrepancy between words and figures, the amount in words shall prevail.
- (5) BHEL may go for Reverse Auction after Techno-Commercial evaluation instead of submitted related Price Bid. Bidder should confirm participation in Reverse Auction alongwith Techno-Commercial Bid. *Non-Acceptance to participate in RA may result in non-consideration of your bid in case BHEL decides to go for RA..*
- (6) In case more than one contractor quoted the l1(lowest and technically accepted) rates, l1 shall be decided based discount offerd in sealed bid.

I/We agree with above and all other terms & conditions of the contract.

(Signature of Contractor with Seal)

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1.0. **GENERAL TERMS AND CONDITION**

1.1 **SCOPE OF WORK – As per attached annexure of M/s NHPC.**

1.2. **LOSS OR DAMAGE**

The contractor is responsible for the safe erection of the equipment/materials.

1.3. **PAYMENT (Mode of payment Performa enclosed)**

Subject to any deductions which the BHEL may be authorized to make under the Contract the contractor shall be entitled to payment wherever he has taken up to the erection work at the request of Customer as follows.

a) Within the schedule period.

90% of erection charges will be paid wherever applicable & where the work is completed within contractual period. On completion of the work & commissioning to the satisfaction of the concerned field Engineer.

(b) TDS as applicable & any other tax applicable those will be deducted from the bill amount.

(c) **MODE OF PAYMENT:** The payment admissible on progressive payment bills May be paid on the 10th days or next working day if 10th happens to be holidays) after presentation of bill and final settlement of bill after 90 days after such verification as is considered necessary. **A NO CLAIM CERTIFICATE** should be submitted with the final bill certifying that there are no other outstanding dues and this is the last bill in settlement of full and final payment. A NO DUES CERTIFICATE should be obtained from BHEL site/customer that all borrowed tools and equipment have been refunded in goods condition and hire charges paid for such equipment. However, in case if any delay BHEL will not accept any interest liability on such bills.

1.4 **SCHEDULE OF REPAIR/ SERVICING ERECTION**

The erection work shall be completed for the transformer entrusted within one month from the date of handing over of site plinth by customer.

The date notified by the customer as unit commissioned shall be taken as the date of completion of works and reckoned for assessing the delay.

The delivery period will not normally be extended. Hence all efforts shall be taken to complete the work within the contracted period specified i.e. within 1 month from the date of receipt of plinth.

1.5 **DEFECTIVE ERECTION :**

a) If during the period of erection, it is found that goods already erected are defective in workmanship or do not confirm to specification or unsuitable for the purpose for which they erected, then it will be open to the BHEL either to repudiate the entire contract and claim such loss that the BHEL may suffer on the account on **risk & cost** basis or require the contractor to rectify the work

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- b) Similarly, if during the guarantee period of the transformer any of the goods found to be defective in workmanship or do not confirm to specification or draw unsuitable for the purpose for which they are erected. It will be open to the BHEL either to repudiate the entire contract and claim damages or accept such part of the goods that are satisfactory and require the contractor to replace the balance or the claim composition for the entire loss sustain by the BHEL on that account.

1.6 ACCESS TO SITES AND WORKS ON SITE:

- a) The works so far as it is carried out on the customer premises shall be carried out at such time as the customer may approve & the customer shall give the contractor reasonable facilities for carrying out the works.
- b) In the execution of the works no person other than the contractor or its duly appointed representative and workmen shall be allowed to do work on the site except by the special permission in writing to the site Engineer or his representative.

1.7 CO-OPERATION WITH OTHER CONTRACTOR:

The contractor shall cooperate with all other contracts or tradesman/representative(s) of the customer who may be performing other works on behalf of the owner and the workmen who may be employed by the customer & doing work in the vicinity of the works under the contract. The contractor shall also so arrange to perform its work as top minimize, to the maximum extent possible, interference with the work of other contractors and their work men. Any injury or damage that may be sustained by the employees of the other contractors and the customer due to the contractor's work shall promptly be made good by the contractor at its own expense. The site Engineer shall determine the resolution of difference or conflict that may arise between the contractor and other contractors or between the contractor and the workmen of the customer in regard to their work, if the work of the contractor is delayed because of any acts of omission of another contractor the contractor shall have no claim against the owner on that account other than an extension of time for completing its works. The site Engineer shall be notified promptly by the contractor of any defects in the other contractor work that could affect the contractor's works. The site Engineer shall determine the corrective measures, if any required to rectify this situation after inspection of the works and such decisions by the site Engineer shall be binding on the contractor.

1.8 DISCIPLINE OF WORKMEN:

The contractor shall adhere to the disciplinary procedure set by the site Engineer in respect of its/its employees and workmen at site. The site Engineer shall be at liberty to object to the presence of any representative or employee of the contractor at the site, if in the opinion of the site Engineer such representative/employees has misconduct himself or is incompetent or negligent or otherwise undesirable .The contractor shall remove such person(s) objected to & provide competent replacement in his place.

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1.9 PROTECTION OF WORK:

The contractor shall have total responsibility for protecting its works till it is finally taken over by the customer. No claim will be entertained by the BHEL or by the site Engineer for any damage or loss to the contractor works and the contractor shall be responsible for complete restoration of the damaged works to original conditions, to comply with the specifications and drawings.

Should any such damage to the contractor's works occur because of any other party not being under its supervision or control the contractor shall make, its claim directly to the party concerned without involving the BHEL.

If disagreement or conflict or dispute develops between the contractor and the other party or parties concerned regarding the responsibility for damage to the contractor works the same shall be resolved as per the provisions of security deposit clause above titled co-operation with other contractors. The contractor shall not cause any delay in the repair of such damaged works because of any delay in the resolution of such disputes. The contractor shall proceed to repair the work; immediately & no cause thereof will be assigned pending resolution of such disputes.

1.10 EMPLOYMENT OF LABOUR:

- a) The contractor will be expected to employ on the work only its regular skilled employees with experience in the particular type of work. No female labor shall be employed after darkness. No person below the age of eighteen years shall be employed.
- b) All traveling expenses including provisions of all necessary transport to worker to & fro site, lodging allowances and other payment to the contractor employees shall be sole responsibility of the contractor.
- c) The hours of the work on the site shall be decided by the customer and the contractor shall adhere to it. Working hours will normally be eight (8) hours per day Monday through Saturday.
- d) Contractor's employees shall bear identification badges while on work at site.
- e) In case the owner becomes liable to pay any wages or dues to the labor or any Government agency under any of the provisions of the minimum wages act, Workmen compensation act, contract labor regulation abolition act or any other law due to act of omission of the contractor, the owner may make such payments and shall recover the same from the contractor's bills.
- f) The contractor shall be provided with supply of electricity for the purposes of the contract only at one point in the project site. The contractor at its own cost shall make its own further distribution arrangement. All temporary wiring shall comply with local regulations and will be subject to site Engineer's inspection and approval before connection to supply.

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1.11. **FACILITIES TO BE PROVIDED BY THE CONTRACTOR:**

- a) Tools scaffolding and tackles.
- b) The contractor shall bring to site all the construction/erection equipment tools tackle, scaffolding etc required for pre-assembly, erection of the equipment covered under the contract. He shall submit a list of all such materials to the site Engineer before the commencement of pre-assembly at site.
 - i) The following items are generally required.
 - 1) Lifting equipment
 - a) Derrick or Mobile Crane of adequate capacity
 - b) Wire ropes
 - c) Pulley blocks
 - d) Chain blocks
 - e) Manila ropes
 - f) Shackles 'D'
 - g) Winch for moving transformer
 - h) Crane
 - i) Empty drums

2) **Testing Equipment**

- a) 1 KV Megger (Motorised)
- b) Resistance Bridge
- c) AVO Meter
- d) Ratio Meter (T.T.R)
- e) Multimeter
- ii) After the completion of the works, the contractor shall not remove the materials such as construction equipment, erection tools and tackles scaffolding etc., from the site without permission of the Site Engineer.

a. **FIRST AID:**

The contractor shall provide necessary first aid facilities for all its employees, representatives and workmen working at the site. Adequate number of contractor's personnel shall be trained in administering first aid.

b. **CLEANLINESS:**

The contractor shall be responsible for keeping the entire allotted area clean and free from rubbish, debris etc, during the period of Contract.

Waste oil shall be disposed of in a manner acceptable to the Owner. Under no circumstances shall waste oil be dumped into uncontrolled drains.

c. **FIRE PROTECTION:**

All the Contractor's supervisor personnel and sufficient number of workers shall be trained for fire-fighting and shall be assigned specific fire protection duties enough

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of such trained personnel shall be available at the site during the entire period of the contract.

The contractor shall provide enough fire protection equipment of the types and number for the ware-house, office, temporary structures, labour colony area etc. Access to such fire protection equipment, shall be easy and kept open at all times.

1.12 SECURITY:

The contractor shall have total responsibility for all equipment and materials in its custody, stores, loose semi-assembled and/or erected by it at site.

The contractor shall make suitable security arrangements including employment of security personnel to ensure the protection of all materials, equipment and works from theft, fire, pilferage and any other damages and loss. All materials of the contractor shall enter and leave the work site only with the written permission of the Site Engineer in the prescribed manner.

1.13 MATERIAL HANDLING AND STORAGE:

13.1 All the equipment furnished the Control and arriving at site shall be promptly received unloaded and transported and stores; in the storage by the contractor.

13.2 The contractor shall be responsible for examining all the consignment and shall notify the site Engineer/BHEL, Jhansi (within 10 days of receipt of materials) of any damage, shortage, discrepancy etc, for the purpose of replacement/insurance claim along with LR-NO etc. However the contractor shall be solely responsible for any shortages or damages in transit handling and/or in storage and erection of the equipment at site during Erection, testing & commissioning as well as for preferring all claims with the underwriter(s) any demurrage, wharf age and other such charges claimed by the transporters, railways etc shall be to the account of the contractor.

13.3 The contractor shall maintain an accurate and exhaustive record detailing out the list of all equipment received by it for the purpose of erection and keep all such record open for the inspection of the Site Engineer.

13.4 All equipment shall be handled very carefully to prevent any damage or loss. No bare wire ropes, slings etc shall be used for unloading and/or handling of the equipment without the specific written permission of the Site Engineer. The equipment stores shall be properly protected to prevent damage either to the equipment or to the floor where they are stored.

13.5 The contractor shall ensure that all the packing materials and protection devices used for the various equipment during transit and storage are removed before the equipment are installed.

13.6 All the materials stores in the open or dusty location (s) shall be covered with suitable weather proof and flame proof covering material wherever applicable.

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	Rs. 200,000 each occurrence
Property Damage	Rs. 100,000 each occurrence

17.3 Comprehensive General Liability Insurance:

17.3.1 The insurance shall protect the contractor against all claims arising from injuries, disabilities, disease or death of members of public or damage to property of others due to any Act or omission on the part of the contractor, its agents, its employees, its representative and sub-contractor or from riots, strikes and civil commotion. This insurance shall also cover all the liabilities of the Contractor arising out of the Case titled difference of suits under General Conditions of contract of this Volume 1 A.

17.3.2 The hazards to be covered will pertain to the works and areas where the contractor, its agents and employees have to perform work pursuant to the contract.

17.3.3 The above are only illustrative list of insurance covers normally required and it will be the responsibility of the contractor to maintain on necessary insurances coverage to the extent both in time & amount to take care of all its liabilities either direct or indirect in pursuance of the contract.

18.0 WORK AND SAFETY REGULATIONS:

18.1 The contractor shall insure proper safety of all the workmen, materials plant and equipment belonging to it or to the others, working at the site. The contractor shall also be responsible for provision of all safety notices & safety equipment required by the law and legislation deemed necessary by the site Engineer.

18.2 All equipment used in construction and erection by contractor shall meet Indian/ International standards and where such standards do not exist, the contractor shall insure these to be absolutely safe. All equipment shall be strictly operated and maintained by the contractor in accordance with manufactures operation manuals and safety instruction as per guidelines/rules in this regard.

18.3 Periodical examinations and all tests for lifting / hoisting equipment and tackles shall be carried, out in accordance with the relevant-provisions of factories Act 1948, Indian Electricity Act and associated laws/Rules in force from time to time . A register of such examinations and tests shall be properly maintained by the contractor and will be promptly. Produced as and when desired by Site Engineer or by the persons authorized by him.

18.4 No electrical cable in used by the contractor owners will be distributed without proper permission.

18.5 No repair work shall be carried out on any live equipment the equipment must be declared safe by the site Engineer and a permit to work shall be issued by the site Engineer before any repair work is carried out by the contractor. While working on electric lines/equipment

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whether live or dead, suitable type and sufficient quantity of tool will, have to be provided by the contractor to electricians/workmen/officers.

- 18.6 The contractor shall employ necessary number of qualified, full time electricians/electrical supervisors to maintain its temporary electrical installations.
- 18.7 In case any accident occurs during the construction/erection or other associated activities undertaken by the contractors thereby causing any minor or major or fatal injury to its employees due to any reason what so ever it shall be responsibility of the contractor to promptly inform the same to the site Engineer in prescribed form and also to all the authorities envisaged under the applicable laws.
- 18.8 The site Engineer shall have the right at its sole discretion to stop of the work, if in its opinion the work is being carried out in such a way as may cause accidents & endanger the safety of the persons and/or property and or equipment. In such cases, the contractors shall be informed in writing about the nature of hazards and possible injury/accident & he shall comply to remove short comings promptly. The contractors, after stopping the specific work, can, if felt necessary appeal against the order of stoppage of work to the site Engineer within 3 days of such stoppage of works and the decision of the site. Engineer in this respect shall be conclusive and binding on the contractor.
- 18.9 The contractor shall not be entitled for any damages/compensation for stoppage of work due to safety reasons as provided above and the period such stoppage of work will not be taken as an extension of time for completion of work and will not be the ground for waiver of levy of liquidated damages.
- 18.10 The contractors shall follow and comply with all safety rules, relevant provisions of applicable laws pertaining to the safety of workmen, employees plant and equipment as may be prescribed from time to time without any demur, protest or contest or reservation. In case of any unconformity between statutory requirements and safety rules referred, above, the latter shall be binding on the contractor unless the statutory provisions are more stringent.
- 18.11 If the contractor does not take all safety precautions and/or fails to comply with the Safety rules as prescribed by the owner or as prescribed under the applicable law for the safety of the equipment plant and personnel and the contractors does not prevent hazards conditions which may cause injury to its own employees or employees of other contractors or owner or any other person at site or adjacent thereto, the contractor shall be responsible for payment of compensation to the owner as per the following schedule.

- | | | |
|----|--|----------------------------|
| a. | Fatal injury or accident causing death | Rs. 3,00,000/= per persons |
|----|--|----------------------------|

These are applicable for death injury to any person whatsoever

- | | | |
|----|---|--------------------------------------|
| b. | Major injures or accident causing 25% or more permanent disability to workmen or employees. | Rs. 20,000/= per person
whosoever |
|----|---|--------------------------------------|

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Permanent disability shall have the same meaning as indicated in workmen's compensation Act. These compensation mentioned above shall be in addition to the compensation payable to the workmen/employees under the relevant provisions of the workmen's compensation Act and rules framed their under or any other applicable law as applicable from time to time. In case the owner is made to pay such compensation, the contractor will be liable to reimburse the owner such amount (s) in addition to the compensation indicated above. This is advisable to contractor to provide "**Group Insurance Policy**" to their workers.

19.0 **CODE REQUIREMENTS:**

The erection requirement and procedures to be followed during the installation of the equipment shall be in accordance with the relevant ASME Codes accepted good Engineering parties, the engineer's drawings and other applicable Indian codes and laws and regulations of the Government of India.

20.0 **CHECK OUT OF CONTROL SYSTEMS :**

After completion of wiring & cabling the contractor shall check out the operation of all control system for the equipment furnished and installed under these specification and documents.

21.0 **CABLING:**

- 21.1 All cables shall be supported by the conducts or cable tray run in air or in cable channels these install in exposed runs parallel or perpendicular to dominate surfaces with right angle turn made symmetrical bends for fittings. When cables are run on cable trays, they shall be clamped at a minimum intervals of 2000 mm or otherwise as directed by the Site Engineer.
- 21.2 Each cable whether power of control, shall be provided with a metallic or plastic tag of an approved type bearing a cable ref. no indicated in the cable and conduct list (prepared by the contractors). Every five meter run or part thereof and at both ends of the cable adjacent to the terminations. Cable routing is to be done in such a way that cables are accessible for any maintenance and for easy identification.
- 21.3 Sharp bending and kinking of cables shall be avoided. The minimum radial for PVC insulated Cables 1100 Volts grade shall be 15 D where D is overall diameter of the cable installation of other cables like high voltage, coaxial screened compensating, mineral; insulated shall be in accordance with the cable manufacturer's recommendations. Wherever cables cross roads and water, oil sewage or gas lines, special care should be taken for the protection of the cables in designing the cable channels.
- 21.4 In each cables runs some extra length shall be kept at a suitable point to enable 1 or 2 straight thought joints to be made, should be cable develop fault at a later date.

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- 21.5 Control cable terminations shall be made in accordance with wiring diagram, using identifying codes-subject to site engineer's approval Multicore control cable Jackets shall be removed as required to train and terminate the conductors. The cable jackets shall be left on the cable as far as possible to the point of the first conductor branch. The insulated conductors from which the jacket is removed shall be neatly twined in bundles and terminated. The bundles shall be firmly but not tidily tied utilizing plastic or nylon ties or specifically treated fungus protected cord made for this purpose. Control cable conductor's insulation shall be securely and evenly out.
- 21.6 The connectors for control cable shall be covered with a transparent insulating sleeve so as to prevent accident contact with ground or adjacent terminals and shall preferably terminate in Elmex terminals and washers. The insulating sleeve shall be fire resistant & shall be long enough to over pass the conductor insulation. All control cables shall be fanned out & connection made to terminal blocks and test equipment for proper operation before cables are corded together.

Note- Please note that for any dispute , matter will be dealt at "Jhansi Judicial-Court".

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SECTION-1

22.0 GENERAL INSTRUCTIONS TO TENDERERS:

22.1 DESPATCH INSTRUCTIONS;

22.1.1 This tender specification as a whole duly furnishing all the details required and other documents as required in the following pages, shall be duly signed and sent in a scaled cover duly super scribing the name of work as given in the tender notice

22.1.2 The tender shall be addressed to-Sr.DGM (FES & RPD), BHEL,Jhans(UP)-284120.

22.1.3 Tender submitted by post shall be sent REGISTEREDPOST ACKNOWLEDGEMENT DUE' and shall be posted with the due allowance for any postal delay. The tenders received after the due date and time of opening are liable to be rejected. Telegraphic offers and offers received by telex may not be considered unless confirmed in writing by a detailed offer.

22.1.4 The tenders shall be opened by the authorized officer of BHEL at his office at the time and date as specified-in-the tender notice; in the presence of such of those enterers or their authorized representatives who may be present.

22.1.5 The tenderers shall closely person all the clauses, specifications and drawings indicated in the Tender Documents before quoting should the tenderer have any doubt about the meaning of any portion of the Tender Specifications or find discrepancies or commission in the Drawings or the tender documents issued are incomplete or shall require clarification on any of the technical aspect scope of work etc, he shall at once contact the authority inviting-the tender for clarification before the submission of the tender.

22.1.6 Before tendering the tenderers are advised to inspect the site of work and the environment and be well acquainted with the actual working and other prevalent conditions, facilities available, position of material and labor. No claim will be entertained later on the round of lack of knowledge.

22.1.7 Tenderer must fill up all the schedules and furnish all the required information as per the instructions given in various sections of the tender specification. Each and submitted along with the offer by the Tenderer in taken of complete acceptance thereof. The information furnished shall be complete by itself.

22.1.8 The Tenderer shall quote the rates in English Language and international numerals. These rates shall be entered in figures as well as in words. For the purposes of the tender. The metric system of units shall be used.

22.1.9 All entries in the tender shall either be typed or be in ink. Erasers and over writing are not permitted and may render such tenders liable to summary rejection. All cancellations and insertions shall be duly attested by the tenderer.

22.1.10 Contractor's Offers and remarks and any deviations shall be with reference to erections and clause numbers given in the order schedule.

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23.0 EARNEST MONEY DEPOSIT

23.1 Earnest Money deposit will be as per the Tender documents.

Every tenderer must be accompanied by the prescribed amount forms.

(All securities are to be discharged and pledged in favour of BHEL)

23.2.1 EMD as specified should be enclosed along with tender in the Form of EFT receipts.

23.3 The earnest money deposit of the successful tenderer will be converted into security deposit for the due fulfillment of the contract.

23.4 In case of unsuccessfully tenderers the Earnest Money will be refunded to them within a reasonable time after finalization of the tender.

23.5 BHEL reserves the right of forfeiture of Earnest Money Deposit in case the successful tenderer.

(a) Fails to start the work as may be indicated in the letter of intent.

(b) After opening of Tender, revokes his tender within the stipulated period or alters his earlier quoted rates/conditions.

24.0 Authorization and Attestation:

24.1 Tenders shall be signed by persons duly authorized/empowered to do so certify copies of such authority and relevant documents shall be submitted along with the tenders.

25.0 Validity of Offer:

The rates in the Tender shall be kept open for acceptance for a minimum period of 120 days from the date of opening of tenders. If a tenderer withdraws a revokes his tender or revises the tendered rates or conditions for any item within the aforesaid period, his Earnest Money Deposit is liable to be forfeited. In case the Bharat Heavy Electricals Limited, calls for negotiations such, negotiations shall not amount to cancellation or withdrawal of the original offer which shall be binding on the tenderers.

26.0 Execution of Contract:

The successful tenderer's responsibility under this contract commences from the date of issue of the letter of intent by Bharat Heavy Electricals Limited. The successful tenderer shall be required to execute an agreement in the prescribed form with the BHEL within reasonable time after the acceptance of his tender and in any case before submitting the first bill for payment. The expenses for completion and stamping the agreement shall be borne by the Contractor.

27.0 **Security Deposit:** The total amount of security deposit will be 5% of the contract value. EMD of the successful tenderer shall be converted and adjusted towards the required amount of security deposit

The security Deposit should be collected before start of the work by the contractor.

27.1 Security Deposit may be furnished in any one of the following forms:

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- i) Cash (as permissible under the Income Tax Act)
- ii) Pay Order ,Demand Draft in favour of BHEL
- iii) Local cheques of scheduled banks, subject to realization.
- iv) Securities available from Post Office such as National Savings Certificates,Kissan Vikas Patras etc.(Certificates should be held in the name of Contractor furnishing the security and duly pledged in favour of BHEL and discharged on the back).
- v) Bank Guarantee from Scheduled Banks / Public Financial Institutions as defined in the Companies Act. The Bank Guarantee format should have the approval of BHEL.
- vi) Fixed Deposit Receipt issued by Scheduled Banks/Public Financial institutions as defined in the Companies Act. The FDR should be in the name of the contractor, A/C BHEL duly discharged on the back.
- vii) Security deposit can also be recovered at the rate of 10% from the running bills. However in such cases at least 50% of the Security Deposit should be collected before start of the work and the balance 50% may be recovered from the running bills.

Note: In case of small value contracts not exceeding Rs. 10 lakhs and all SAS jobs, work can be started before Security Deposit is collected. However, payment can be released only after collection/recovery of initial 50% Security Deposit).

- viii) EMD of the successful tenderer can be converted and adjusted against the security deposit.
- ix) The security deposit shall not carry any interest.

(Note: Acceptance of Security Deposit against SI No. (iv) and (vi) above will be subject to hypothecation or endorsement on the documents in favour of BHEL. However BHEL will not be liable or responsible in any manner for the collection of interest or renewal of the documents or in any other matter connected therewith).

- 27.2 If the value of the work done at any time exceeds the accepted agreement value the Security Deposit shall be correspondingly enhanced and the extra security deposit shall be immediately recovered from payments due to him.
- 27.3 If the value of the work done at any time exceeds the accepted agreement value the Security Deposit shall be correspondingly enhanced and the extra security deposit shall be immediately recovered from payments due to him.
- 27.4 Failure to deposit the security within the stipulated time may lead to forfeiture of Earnest Money and cancellation of the award of work.
- 27.5 In case the contractor desired to furnish full security deposit, as may be indicated in the letter of intent, he may do so in any one of the forms as mentioned in clause 1.8.2 above in Which case no deduction from bills will be effected. However, the deposit should cover upto the period of warranty also.
- 27.5A In any part of Security Deposit of the Contractor is held in the form of approved securities it shall be kept transferred in the name of Bharat Heavy Electricals Limited, Jhansi in such a

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manner that BHEL can realize it fully without reference to the contractor. BHEL shall not be responsible for any depreciation in the value of the security while in BHELs custody or for any loss of interest thereon.

27.5B **STAMP DUTY : Every Contractor should pay the stamps duty as per India Stamp Act 1899** are as follow, which will be payable to Government by BHEL, and not refundable to Contractor:

- | | | |
|------|--------------------------|---|
| i) | If deposit cash | Rs. 125/= per thousand |
| ii) | If through FDR/NSC/KVP | Rs. 70/= per thousand |
| iii) | If third party guarantee | Rs. 100/= per thousand |
| iv) | If Bank Guarantee | Rs. 5/= per thousand
which was not exceed Rs. 10,000/= |

27.6 BHEL reserves the right of forfeiture of Security Deposit in addition to other, claims and penalties in the event of the contractor's failure to fulfill any of the contractual obligations or in the event of termination of contract as per terms and conditions of contract.

28.0 **Return of Security deposit:**

Security deposit will be refunded after one year on successful completion of work. If the contractor duly performs and completes the contract in all respects to the entire satisfaction of BHEL and presents an absolute "No demand certificate in the customer/BHEL form and return properties belonging to BHEL handed over rent or hired by him for carrying out the said works total amount of security deposit will be released to the contractor after deducting all costs of expenses or other amounts that are to be paid to BHEL under this or other contracts entered into with the contractor.

28.1 No interest shall be payable by BHEL on Earnest Money /Security Deposit or on any money due to tile contractor by BHEL.

29.0 **Rejection of tender and other conditions:**

29.1 The acceptance of tender will rest with BHEL which does not bind itself to accept the lowest tender or any tender and reserves to itself full right for the following without assigning any reasons what so ever:

- (a) To reject any or all of the tenders.
- (b) To award the work in part.
- (c) Either of the stated in (a) & (b) to modify

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- 29.2 Conditional tenders, tenders containing absurd or unworkable rates and amounts and tenders which are incomplete and otherwise considered defective and tenders not in accordance with the tender conditions, specifications etc are liable to be rejected.
- 29.3 If a tenderer expires after submission of the tender or after the acceptance of his tender. BHEL may at their direction, cancel such tender. If a partner of a firm expires after submission of the tender or after the acceptance of the tender, BHEL may cancel such tender at their discretion unless the firm retains its character.
- 29.4 **BHEL** will not be bound by any Power of Attorney guaranteed by the tenderer or by changes in the compositions of the firm made subsequent to the execution of the contract.
- 29.5 If the tenderer deliberately gives wrong information in his tender, BHEL reserves the right to reject such tender at any stage or to cancel the contract, if awarded and forfeit the Earnest Money/Security Deposit.
- 29.6 Canvassing in any form in connection with the tenders is strictly prohibited and the tenders submitted by the Contractors who report to canvassing are liable to rejection.
- 29.7 Should a tenderer or contractor or in the case of a firm or company of contractor's one or more of its partners/shareholders/Directors have a relation or relations employed in the capacity of an Officer of BHEL, the authority inviting tender shall be informed of the fact along with the offer, failing this, BHEL cancel the contract and forfeit the Earnest Money/Security Deposit.

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Section II

GENERAL CONDITIONS OF THE CONTRACT

30.0 DEFINITIONS ;

The following terms shall have the meaning hereby assigned to them except where the context requires otherwise.

- 30.1 BHEL (or B H E L) shall mean Bharat Heavy Electricals Limited, Jhansi a Company registered under Indian Companies Act 1956 . With its Registered Office at BHEL House Siri Fort, New Delhi- 110049 or its administrative Officers or its site Engineer or other employees authorized to deal with any matters with which these persons are concerned on its behalf.
- 30.2 **‘GENERAL MANAGER’ / ADD. GENERAL MANAGER’** shall mean the Officer in administrative charge BHEL, Jhansi.
- 30.3 **‘ENGINEER’ OR ‘ENGINEER CHARGE’** shall mean Engineer deputed by BHEL The term includes ‘SITE ENGINEER’ ‘RESIDENT ENGINEER’ and ASSISTANCE SITE ENGINEER’ of BHEL at the site as well as the officers in charge at BHEL Jhansi.
- 30.4 **‘SITE’** shall mean the place or places at which the plants/equipment are to be erected and services are to be performed as per the specification of this contract.
- 30.5 **CLIENTS OF BHEL or CUSTOMER** shall mean the project authorities to whom BHEL is supplying the equipment.
- 30.6 **CONTRACTOR** shall mean the individual, firm or company who enters into his contract with BHEL and shall include their executors, administrators, successors and assignees.
- 30.7 **CONTACT or CONTRACT DOCUMENT’** shall mean and include the agreement or work order, the accepted appendices of rates. Schedule of quantities if any and general conditions, of contract, the special conditions of contract Instructions to the tenderers the drawings, the specifications, the special specifications, if any, the tender documents and the letter of indent/Accepting Letter issued by BHEL. Any conditions or terms stipulated by the contractor in the tender documents or supporting letters shall not form part of the contract unless specifically accepted in writing by BHEL and incorporated in the agreement.
- 30.8 **GENERAL CONDITIONS OF CONTRACT** shall mean the instructions to the Tenderers and general conditions of contract pertaining to the work detailed.
- 31.0 **TENDER SPECIFICATION’** shall mean the ‘specific conditions. Technical Specifications, appendices, size information and drawing pertaining to the work in which the workers are required to submit their officer. Also this will include the specifications covered under specifications detailed in NIT of client of BHEL for erection, testing and commissioning of plant; individual specification No. will be assigned to each tender specification.
- 32.0 **TENDER DOCUMENTS** “shall mean the document listed in Index like Tender Specification No. JHS/FES/80/19 invitation letter, Technical particular of transformer.
- 32.1 Special terms and condition part-I including schedule of price and payment as Per Annexure-A, Annexure B Price Bid & General terms and conditions etc.

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- 33.0 **LETTER OF INDENT** 'shall mean the intimation by a letter to the tenderer that the tender has been accepted in accordance with previous contained in that letter. The responsibility of the contractor commence from the date of issue of this letter and all the terms and conditions of contract are applicable from this date.
- 34.0 **COMPLETION TIME**' shall mean the period by date specified in the acceptance of tender for handing over of the erected equipment/plant which are found acceptable by the Engineer being of required standard and confirming to the specification of the contract.
- 35.0 **PLANT** shall mean and can note the entire assembly of the plant and equipment covered by the contract.
- 36.0 **EQUIPMENT**' shall mean all equipment, machineries, materials structural, electrical and other components of the plant covered by the contract.
- 37.0 **TESTS** shall mean and include such test or tests to be carried out on the part of the contractor as are prescribed in the contract or considered necessary by BHEL in order to as certain the quality, workmanship, performance and efficiency of the contract work or part thereof.
- 38.0 **APPROVED 'DIRECTED' of 'INSTRUCTED** shall mean approved directed or instructed by BHEL.
- 39.0 **WORK OR CONTRACT WORK** shall mean and include supply of all categories of labourspecified consumables, tools and tackles required for, complete and satisfactory site transportation, handing storing , erecting, testing and commissioning of the equipment to the entire satisfaction of BHEL.
- 40.0 **SINGULAR AND PLURAL** ETC words carry in singular number shall also include plural and vice versa, where the context so required. Words importing the masculine gender shall be taken to include the feminine gender and words importing persons shall include any Company or Association or body of individuals, whether incorporated or not.
- 41.0 **'HEADINGS'**" the headings in these general conditions are solely for the purpose of facilitating reference and shall not be deemed to be part thereof or be taken into consideration in the interpretation or construction thereof or of the contract.
- 42.0 **"Month"** shall mean calendar month.
- 43.0 **"WRITING"** shall include any manuscript type written or printed statement Under the signature or seal as the case may be
- 43.1 Law governing the contract any Court Jurisdiction. The Contract shall be governed by the Law .For the time being enforce in the Republic of India. The civil jurisdiction, Jhansi shall alone have exclusive jurisdiction in regard to all claims, in respect of this contract.
- 44.0 **ISSUE OF NOTICE;**

The contractor shall furnish to the BHEL Engineer the name designation and address of his authorized agent and all complaints, notices, communications and reference shall be

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deemed to have been duly given to the contractor if delivered to the contractor or his authorized agent or left at or posted to the address either of the contract or of his representative and shall be deemed to have been no given in the case of posting oil the day on which they would have reached such address in the ordinary course of post or which they were so delivered of/or left Use of

45.0 USE OF LAND;

No land belonging to BHEL or their customer temporary possession of BHEL shall be occupied by the contractor without the written permission of BHEL

46.0 COMMENCEMENT OF WORK;

46.1 The contractor shall commence the works within the time indicated in the letter of intent from BHEL and shall proceed with the same with due expedition without delay.

46.2 If the successful tenderer fails to start the work within the stipulated time BHEL at its sole discretion will have the right to cancel the contract. His earnest money and/or Security Deposit with BHEL with stand forfeited without any further reference to him, without prejudice to any and all of BHEL's other rights and remedies in this regard.

46.3 All the works shall be carried out under the direction and to the satisfaction of BHEL.

46.4 The erected/constructed plant or work performed under the contract shall be taken over when it has been completed in all respects and duly tested or satisfactorily put into operation at site.

47 MODE OF PAYMENT AND MEASUREMENT OF THE WORK COMPLETED:

1 All payments due to the contractor shall be paid only Account payee Cheque.

2 The contractor shall present his bill on the formats prescribed by BHEL for every payment. After verification of such bills by BHEL, all items having financial value shall be certified by BHEL Engineer and the bills prepared based on the same and connected technical documents which form part of this specification.

3 Measurement shall be restricted to that for which is required to ascertain the financial Liability of BHEL under this Contract.

4 Work which is to be measured in detail shall be measured as per standard procedure without reference to any local procedures excepting where it is otherwise stated in the tender documents. The measurement shall be taken jointly by persons duly authorized on the part of BHEL by the contractor.

5 If at any time due to any reason whatsoever, it becomes necessary to measure the workdone in full or in part the expenses towards such in measurement shall be taken jointly by persons duly authorized on the part of BHEL by the contractor.

6 The contractor shall bear the expenditure involved, if any in making the measurement. The contractor shall without extra charges, provide all the assistance with appliances and other things necessary measurement.

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7. The measurement entered in the bills prepared shall be signed with date by the both
The contracting parties.
8. The contractor will be intimated in writing by the site Engineer, the proposed date of
measurement. If the contractor's representative fails to participate in the joint measurement, the
BHEL Engineer shall have the power, to proceed by himself to take
measurement in which case the measurement shall be accepted by the Contractor
as final.
9. Passing of measurement as per bills does not amount to acceptance of the completion
of the work mentioned. Any left out work has to be completed; if pointed out a later
date by BHEL

48.0 RIGHTS OF BHEL ;

BHEL reserves the following right in respect of this contract without entitling the Contractor
for any compensation.

- 1 To get the work done through other agency at the risk and cost of the Contractor in the event
of Contractor's poor progress, or inability to progress the work for completion as stipulated
in the contract, poor quality of the work etc. and to recover compensation for such losses
from the contractor including BHEL's supervision charges and overheads from security
deposit/other – dues.
- 2 To withdraw any portion of work and/or to restrict/alter the quantum of work as
indicated in the contract during the progress of erection and get it done through other agency
aid/or by departmental labors to BHEL's commitment to its customer or incase BHEL decides to
advance the date of completion due to other emergency reasons/BHEL's obligation to its
customer.
- 3 To terminate the contract after giving reasonable notice and forfeit Security Deposit
and recover the loss sustained in getting the balance work done through other agencies
in addition to liquidated damaged in the events of.
- 4 Contractor's continued poor progress brought to his notice from time to time
- 5 Withdrawal from or abandonment of the work before completion of the work.
- 6 Corrupt act of Contractor
7. Insolvency of the Contractor

49.0 Persistent disregard to the instructions in writing of BHEL.

50.0 Assignment transformer sub-letting of the contract without BHEL's written
permission. Non-fulfillment of any contractual obligations or obligations under the
law. Any delay in works for reasons attributable to the contractor will have to be
compensated by him either, by increasing, man power and resources or by working
extra hours and more than he shift without any cost.

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- 51.0 To recover any money due from the contractor, from any money due to the contractor under this contract or any other contract or from the Security Deposit.
- a. To claim compensation for losses sustained including BHEL's supervision charges and overheads in completion on termination of contract to impose penalty for delay in completion of the work, at the rate ½% of the contract value per week of delay or part thereof subject to a ceiling of 10% of the contract value.
 - b. To terminate the contract or to restrict the quantum of work and pay for the portion of work executed in case BHEL's contract with their customers are terminated for any reasons.
 - c. To effect recovery from any amounts due to the contractor under this or any other contract etc, in any offer from, the moneys BHEL is forced to pay to anybody due to Contractor's failure to fulfill any of his obligations.
 - d. While every Endeavour will be made by BHEL they can not guarantee uninterrupted work due to conditions beyond their control Contractor will not be entitled for any compensation/extra payment on this account.
 - e. In the event of any nature, the decision of BHEL shall be final & binding on the Contractor. Responsibilities of the Contractor in respect of local laws employment of workers etc. The following are the responsibilities of the Contractor in respect of observation of local laws employment of personnel, payment of taxes etc.
- 52.0 As far as possible, unskilled workers shall be engaged from the local areas in which the work is being executed.
- 53.0 The Contractor at all times during the continuance of this contract, shall in all his dealings with local labors for the time being employed on or in connection with the work, have due regard to all local festivals and religious and other customs.
- 54.0 The contractor shall comply with all states and Central Laws, Statutory Rules, Regulations etc such as the payment of Wages Act Minimum Wages Act. Workmen compensation Act Employees liability Act, Industrial Dispute Act. Employees Provident Fund Scheme Employees State Insurance Scheme. Contract Labors (Regulation & Abolition) Act 1970 and other Acts. Rules & Regulation for labors as may be enacted by the Government during the tender of the Contract and having force or jurisdiction at site. The contractor shall give to the local Governing body. Police and other relevant authorities all such notice as may be required by law.
- 55.0 The Contractor shall pay all taxes, Fees, license charges deposits duties tools, royalty, commission or other charges which may be liable on account of any of his operation in executing the contract. In case BHEL is forced to pay any of such taxes. BHEL shall have the right to recover the same from the Contractor either from his bills or otherwise as deemed fit.

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- 56.0 All the properties/equipment/components of BHEL/their client loaned with or without deposit to the Contractor in connection with the contract shall remain the properties of BHEL/their client. The Contractor shall use such properties for the purpose of execution of this contract. All such properties/equipment/components shall be deemed to be in good condition when received by the Contractor unless he notifies within 48 hours to the contrary. The contractor shall return them in good condition as and when required by BHEL/their client. In case of non- return, loss damage repairsetc, the cost thereof, as may be fixed by the site Engineer will be recovered from the Contractor.
- 57.0 It is not obligatory on the part of BHEL to supply any tools and tackles or other materials other than those specifically agreed to do so by BHEL. However, depending upon the availability /possibility. BHEL's customer's handling equipment and other plants may be made available to the contractor on payment of the hire charges/free of charges as fixed, subject to the conditions laid down by BHEL/Customer from time to time. Unless paid in advance, such hire charges if applicable shall be recovered from Contractor's bill/Security Deposit in One installment.
- 58.0 The contractor shall not claim any compensation of the scope of work, due to change in design which curtails the quantum.
- 59.0 The contractor shall fully indemnify BHEL against all claims of whatsoever nature arising during the course of erection/construction/performing work under the contract.
- 60.0 In case the contractor is required to undertake any work outside the scope of this contract the rates payable shall be those mutually agreed upon.
- 61.0 The contractor shall keep the area of works and shall remove debris etc, while executing day today work. Upon completion of work the contractor shall remove from the vicinity of work all scrap packing materials rubbish unused and other materials and deposit them in places to be specified by the BHEL Engineer. The contractor will also demolish all the hutment's sheds offices, constructed and used by him and shall clean the debris. In the event of his failure to do so the same will be arranged to be removed by the BHEL Engineer, the expenses therefore will be recovered from the contractor.
- 62.0 The contractor shall arrange and coordinate his work in such a manner as to cause no hindrance to other agencies working in the same premises.
- 63.0 All safety rules and codes applied by the client/BHEL at site shall be observed by the Contractor without exception. The contractor shall be responsible for the safety of the equipment/material and works to be performed by him and shall maintain all lights, fencing guards, signs etc or other protection necessary for the purpose Contractor shall also take such additional precautions as may be indicated from time to time by the Engineer with a view to prevent pilferage accident , fire hazards and due precautions shall be taken against fire, hazards and atmospheric conditions, suitable number of electrical staff watch and ward, store keepers to take care of equipment, materials and construction tools and tackles completion of the work under this contract.

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The Contractor shall arrange necessary for such type for such safety devices as are necessary for such type of work and carry out the requisite tests of handling equipment, lifting tools, tackles etc, as per prescribed standards and practices,

- 64.0 The contractor will be directly responsible for payment of wages to his workmen. Pay roll sheet giving all the payments given to the workers and duly signed by the contractor's representative should be furnished to BHEL site office for record purpose.
- 65.0 The intent of specification is to provide services according to most modern and Proven techniques and codes. The commission of specific reference to any method equipment or material necessary for the proper and efficient performance of work shall not relieve the contractor of the responsibility of providing such facilities to complete the work.
- 66.0 In case of any class of the work for which there is no such specification as laid down in the contract such work shall be carried out in accordance with the instructions and requirements of the Engineer.
- 67.0 No levy or payment or charge made or imposed shall be impeached by reason of any clerical error or by reason of any mistake in the amount levied or demanded or charged.
- 68.0 The detailed drawings specification, instruction manual, if any available with the BHEL Engineer will form part of tender specification. These documents will be made available for reference only to the contractor during execution of work.
- 69.0 Should any error or ambiguity be discovered in the specification or information the contractor shall forthwith bring the same to the notice of BHEL before commencement of work BHEL's interpretation such cases shall be final and binding on the contractor.
- 70.0 Also on idle labors charges will be admissible in the event of any stoppage caused in the work resulting in Contractor's labors being rendered idle due to any cause at any time.
- 71.0 No overrun charges shall be paid in the event of the completion period extended for any reason whatsoever.
- 72.0 It is possible that some repair/rectification, modification may be needed on the equipment to be erected/constructed/work to be performed under this specification for reasons not attributable to the contractor. All such repair/rectification/modification work which can be done with the available facilities at site shall be carried out by the contractor free of cost and no extra charges shall be paid to the contractor.
- 73.0 The quality and progress of work will be regularly reviewed. The schedule and program of work will be given to the contractor in advance and it will be the obligation of the contractor to achieve the desired quality and progress of work by suitably reinforcing their labors force and/or by working extra hours or in more than one shift without any extra cost. Workmen found unsuitable for the work will be replaced

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immediately by the contractor on being informed by BHEL.

- 74.0 During the erection/construction /performing work under the contract it is very essential that proper and adequate inspection should be made constantly to maintain the quality of workmanship so that any deviation from design dimension does not exceed permissible limits. The proper functioning of the unit, while in operation, depends to a great extent on the above factors. The fact that effective supervision and inspection at the execution stage is less costly than any down time of running unit ever for a short period need not be over-emphasized. For details regarding alignment and permissible dimensional deviations in the sub-assemblies. Engineer may be consulted.
- 75.0 The contractor furnished fortnightly labors report showing by classification of number of employees engaged in various categories of work date wise and a progress report of work as required by BHEL Engineer.
- 76.0 The contractor shall execute the work in the most substantial and work man like manner in stipulated time. Accuracy of work and timely execution are the essence of this contract. The contractor shall be responsible to ensure that the assembly and workmanship conform to the dimensions and clearances. Given in the drawings and/or as per instructions of BHEL Engineers.
- 77.0 The contractor shall take all reasonable care to protect the materials and work till such time the plant/equipment has been taken over by BHEL/their client. Where necessary suitable fencing and lighting shall have to be provided by contractor as a safety of BHEL. Suitable caution, notices shall be displayed where access to any per may be deemed to be unsafe and hazardous.
- 78.0 It will be the responsibility of the contractor to ensure safe lifting of the equipment taking due precautions to avoid any accidents and damage to other equipment and personnel.
- 79.0 The wages shall be paid by the contractor to the workmen directly without the intervention of any Thekedar and that the contractor shall ensure that no amount is deducted or recovered by way of commission or otherwise by any other person from the wages of the workmen.
- 80.0 **CONSEQUENCES OR CANCELLATION :**

Whenever BHEL exercises its authority to terminate the contract/withdraw a portion of work under the clause 2.7 they may complete the work by any means at the contractor's **risk and expense** provided that in the event of the cost of completion(as certified by the Site Engineer which is final and conclusive) being less than the contract cost, the advantage shall be to BHEL and that if the cost of completion exceeds the moneys due to the Contractor under the contract, the contractor shall either pay the excess amount ordered by BHEL or the same shall be recovered from the contractor by any other means. This will be in addition

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to the forfeiture of Security Deposit and recovery of liquidated damage as per relevant clauses.

80.1 In case BHEL completes the work under the provision of this condition on, the cost of such completion to be taken into account in determining the excess cost to be charged to the contract under this condition, shall consist of materials purchased and/or labors, provided by BHEL with an addition of such percentage to cover supervision and establishment, charges as may be decided by BHEL.

81.0 **STRIKES AND LACKOUTS ;**

The Contractor will be fully responsible for all the dispute and other issues connected with his labors. In the event of the Contractor's labors resorting to or the contractor resorting to lockout and if the strike or the lockout declared is not settled within a period of one month. BHEL shall have the right to get the erection work executed employing its own labor or through any other agencies or both and the cost so incurred by BHEL shall be deducted from the Contractor's bills as per clause 2.7.

82.0 For all purposes whatsoever the employees of the Contractor shall not be deemed to be in the employment of BHEL.

83.0 **FORCE MAJEURE:**

83.1 The following shall amount to Force Majeure Acts of God. Acts of any Government War, Sabotage, Riots, Civil Commotion, Police Action, Revolution. Flood , Fire, Cyclones Earth Quake and Epidemic over which contractor has no control

83.2 If the Contractor suffers delay in the due execution of the contractual obligation due to delay caused by Force Majeure as defined above, the agreed legations of the time of completion of the job covered by this contract or the job contractor shall be extended by a period of time equal to the period of delay provided that on the occurrence of any such contingency the contractor immediately reports to BHEL in written of delay and the contractor shall not be eligible for any compensation.

84.0 **GUARANTEE :**

Even though the work will be carried under the supervision of BHEL Engineers the Contractor will be responsible for the quality of the workmanship and shall guarantee the work done for a period of twelve months from the date of completion of work as certified by the Engineer for good workmanship and shall rectify free of cost all defects due to faulty erection detected during the guarantee period starting from the date of the completion of rectification in the event of the contractor failing to repair the defective works within the time specified by the Engineer, BHEL may proceed to undertake the repairs of such defective, works at the contractor's risk and expense without prejudice to any other rights and recover the same from Security Deposit outer dues.

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85.0 **JURISDICTION -**
Any matter of dispute arising out of or in connection with this contract shall be under jurisdiction of Jhansi Court only.

86.0 **ARBITRATION**

All disputes arising in connection with the contract shall be settled by mutual consultation. If no agreement is reached the dispute shall be settled in accordance with Arbitration and conciliation Act, 1996 and the rules made there under. The dispute shall be referred for arbitration to any arbitrator to be appointed by the Head of the unit.

The award of the arbitrator shall be final and binding on both the parties. The venue of the Arbitration shall be at Jhansi in India. The Award to be given by the Arbitration shall be a speaking award. All questions, disputes, differences arising under, out of or in connection with this contract shall be to the exclusive jurisdiction of Jhansi court.

SPECIAL TERMS & CONDITIONS PT II FOR ERECTION & COMMISSIONING

In addition to the "General Terms & Conditions" the following conditions will also be applicable.

1.0 TIME & EXTENSION FOR DELAY:

The time allowed for execution of the work as per schedule in accordance with these conditions shall be of the essence of the contract. The execution of the work shall commence within 7 days after the date of which the engineer in charge, Transformer Service Cell issues written order to commence the work or from the date of handing over the site whichever is later. If the contractor commits default in commencing the execution of the work as aforesaid. BHEL shall without prejudice to any other right or remedy be of liberty to forfeit the security deposit absolutely and cancel the contract.

As soon as possible after contract is concluded the BHEL site in charge and the contractor shall agree upon a time & progress chart "Bar Chart". The chart shall be prepared in direct relation to the time stated in the contract documents for completion of items of the work. It shall indicate the forecast of the date of commencement and completion of the various activities. The work progress shall be in accordance with "Bar Chart" and if any delay is due to contractor side this will be added to the contract period and shall not be liable for any overrun charges if any applicable.

2.0 FACILITIES TO BE PROVIDED/ ARRANGED BY THE CONTRACTOR:

2.1 STORAGE OF ACCESSORIES & CONSTRUCTION OF STORE

All accessories shall have to be stored under suitable shed/cover. The contractor shall construct necessary shed (store – cum- office) if size 12M x 8M x 4M) required for the storage area acquired by the contractor. 10'x10' room will be provided in store-cum-office for BHEL staff. Adequate furniture, fan etc. shall be provided in the office, In front of the store, adequate space shall be acquired and protected by barbed wire for material storage which is suitable for out door.

2.1 MATERIALS: The contractor shall at his own expenses, provide all consumable materials specified in the order.

All materials to be provided by the contractor shall be of good quality and if requested by the site in charge, furnish proof to the satisfaction of the site in charge.

2.2 WATCH & WARD:

The contractor shall provide and maintain at his own expenses all lights, guards, fencing and watching when & Where necessary or required by the BHEL site in charge for the protection of the works or for the safety and convenience of those employed on the works or the public.

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2.3 STORAGE OF REACTORS/TRANSFORMERS;

On arrival of equipment at nearest railway station/site contractor will have to check the physical condition of transformer.

2.4 TOOLS & PLANTS;

The contractor will have to arrange all tools, jacks, cranes/oil storage tank plants/machinery. primary injection kit for CT testing, Kelvin's Double Bridge. Turn Ratio meter, etc. as may be required for complete erection & commissioning.

2.5 OIL STORING;

The contractor have to arrange suitable arrangement for transferring oil in drums for storage.

2.6 ACCOMMODATION;

The contractor will have to make their own arrangement for the accommodation of their staff at site & they must have phone facility at site/residence to contract frequently.

3.0 CONTRACTOR'S SUPERVISOR;

The contractor shall either himself supervise the execution of the work or shall appoint a competent person/engineer approved by the site incharge to act instead. If the contractor fails to appoint a suitable engineer as directed by the site incharge, the site incharge shall have full power to suspend the execution of the work until such date as a suitable person/engineer is appointed and the contractor shall be held responsible for the delay so caused to the work. Supervisor appointed by the contractor should possess Electrical Supervisor Licence from local authorities as required. Contractor must comply with statutory requirements of local authorities customer in the

4.0 FACILITIES TO THE CONTRACTOR;

4.1 URGENT WORK;

If any urgent work (In respect of which the decision of the site Incharge shall be final and binding) for carrying out parallel contract which becomes necessary at once to carry, if out, the site Incharge may be his own or other work people, carry it over as he may consider necessary. If the urgent work shall be such as the contractor is liable under the contract to carry out at his own expenses, all expenses incurred on it by BHEL shall be recoverable from the contractor and be adjusted or set against any sum payable to him.

5.0 MINOR CIVIL WORK;

Although the civil work is not under scope of work, but minor civil work like chipping, repairing of breakage grouting of foundation bolts etc, shall be done by the contractor without any extra work charges. However contractor has to check up the foundation as per drawing prepared by the purchaser well in time and, inform BHEL and purchaser if anything found not as per drawing.

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6.0 CLOSING OF SITE:

At the time of closure of the site, the contractor will hand over all spares and other materials to the customer's store and obtain receipt. All the surplus materials will be properly packed in wooden crates, loaded on trucks and sent to BHEL Jhansi works on "freight to pay" basis by the contractor at his cost.

6.0 MODE OF PAYMENT: The payment admissible on progressive payment bills shall be paid on the 10th days or next working day if 10th happens to be holidays) after presentation of bill and final settlement of bill after 90 days after such verification as is considered necessary. **A NO CLAIM CERTIFICATE** should be submitted with the final bill certifying that there are no other outstanding dues and this is the last bill in settlement of full and final payment. A NO DUES CERTIFICATE should be obtained from BHEL site/customer that all borrowed tools and equipment have been refunded in goods condition and hire charges paid for such equipment. However, in case if any delay BHEL will not accept any interest liability on such bills

8.0 As soon as materials are received at site/store the contractor has to arrange for inspection of all accessories along with BHEL engineer/customer as per dispatch, advice notes for storage/damage and the report for the same must reach Jhansi within fifteen days of materials site.

9.0 No Sub-contractor for storage and erection will be allowed without the written permission of BHEL.

10.0 10% of the contract value will be paid after one year of handing over of the equipment to customer.

11.0 The contractor will be required quote for each part in complete or complete on whichever he proposes to take up, failing which his offer is liable for rejection.

12.0 Any information and confidential document of BHEL coming into the knowledge of the contractor during the course of erection, shall not be passed on to any outside agency, failing which it shall be treated as breach of the contractor resulting in termination of the contract.

13.0 The contractor will be required to follow field quality plan approved by customer with respect to proper storage etc. of accessories, instruction manual with respect to pre-erection, erection, testing activities.

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MANDATORY REQUIREMENT FOR CONSIDERING THE OFFER:

The following information documents must be submitted along with the technical offer, failing which offer will be rejected.

- a) List of tools & tackles available with Contractor.
- b) List of calibrated instruments like turn ratio meter, double Kelvin bridge, primary injection kit and other measuring instruments available with the contractor.
- c) List of staff expected to be deployed at site with their technical qualification and experience. Site in-charge should be engineering graduate/diploma of electrical engineering faculty with minimum 2-3 years of experience.
- d) Organization chart of organization and site.
- e) Provident Fund Account Number
- f) ESI No. (Desirable)/Insurance coverage to worker at site.
- g) Labor License number (as applicable) if not confirmation with reason is required.
- h) EMD of value **Rs 28,080.-** Only (Ninety Eight Thousand & One hundred & Seventy two Only) and Tender document cost **Rs 472.00**(Inclusive of Rs 72 as GST@ 18%) should be enclosed along with tender in the form of EFT / MR.
- i) Permanent Account Number (PAN) of Income Tax.
- j) GST Registration No.(PAN Based)
- k) Electrical licence of Supervisory work in name of your Employee/ Proprietor.
- l) Self declaration / undertaking must be submitted along with quotation confirming that:
 1. We are not presently put on hold, suspended, de-listed, banded or black listed by any units of BHEL and other Customers.
 2. We have not been booked by CBI and / or indicated by a Court of Law in any criminal case relating to the business during the last 5 years.
 3. The above declaration is absolutely true and best of our knowledge.
- m) Blank Price Bid copy

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n) Average Financial Turnover:

Average Annual financial turnover during last 3 years, ending as on 31st March 2018, should be at least Rs. 4.21 lakhs . Duly audited Financial Statement (FS)/ Balance sheet and P&L A/c / Certificate from CA to be submitted as a supporting document. If all balance sheets/FS are not available for all three years then the average shall be calculated by dividing the sum of turnover of submitted balance sheets/FS by three.

o) Experience in executing similar works in last 7 years ending 31/01/2019 for either of following -

- 1) 3 similar completed works each costing not less than Rs. 5.61 lakhs
"Or"
- 2) 2 similar completed works each costing not less than Rs. 7.02 lakhs.
" Or"
- 3) 1 similar completed work costing not less than Rs. 11.23 lakhs

Experience in similar work means experience in executing E&C of transformers of rating 2.5 MVA / 11 KV and above.

- **Experience in Govt / public sector**

Documentary proof (copy of WO/PO/LOI and work completion certificate) in support of above eligibility criterion shall be submitted along with techno commercial bid.

- **Experience in private sector**

Documentary proof (copy of WO/PO/LOI and work completion certificate along with TDS certificate / Traces) in support of above eligibility criterion shall be submitted along with techno commercial bid.

ANNEXURE

BHEL JHANSI

एनएचपीसी लिमिटेड

(भारत सरकार का उद्यम)

NHPC Limited

(A GOVT. OF INDIA ENTERPRISE)



CIN: L40101HR1975GOI032564

AUXILIARY TRANSFORMERS

Regd. Office: NHPC Office Complex, Sector-33, Faridabad-121003, Haryana (INDIA)

2 AUXILIARY TRANSFORMERS

2.1 Scope of Work

Scope of work under this section covers the provision of labour, tools, plants, materials and performance of work necessary for the design, manufacture, quality assurance, quality control, shop assembly, shop testing, delivery at site, site storage and preservation, disassembly, installation, commissioning, performance and acceptance testing, insurance, training of Employer's personnel, handing over to NHPC and guarantee for two years of Auxiliary transformers as per the specifications hereunder, each complete with all auxiliaries, accessories, spare parts and warranting a trouble free safe operation of the installation.

The scope of work shall be a comprehensive functional system covering all supply and services including but not be limited to following:

2.1.1 Detailed Scope of Works

2.1.1.1 Dismantling:

- i) Dismantling, handling, tagging, transportation and storage/stacking in disposal yard of existing three (3) nos. Unit auxiliary transformers, two (2) nos. station auxiliary transformer, including accessories.

2.1.1.2 Scope of Supply

A) Auxiliary Transformers

- i) Five (5) nos. (3 nos. UTTs + 2 nos. SATs) , 11 / 0.415kV, 2500 KVA, dry type, Auxiliary Transformers complete with cubicles and all necessary accessories such as bushings, off-circuit tap changer, CTs, instrumentation, fittings etc.

B) Miscellaneous Components

- i) Coordination and provision of necessary contacts and/or ports for integration with plant SCADA system.
- ii) Spare parts in accordance to clause 2.8 "Spare Parts" of this section.
- iii) Tools and instruments in accordance to clause 2.9 "Tools and Instruments" of this section

Any other item(s) not mentioned specifically but necessary for the satisfactory completion of scope of work defined above, as per accepted standard(s) / best international practices.



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2.2 Specific Parameters and Layout Conditions

2.2.1 Layout and General Arrangement

A) Existing

The existing three nos. 1.0 MVA 11/0.415KV oil filled Unit auxiliary transformers (UATs) installed at EL 845.65m are feeding power directly to UAB boards at EL 838.80m.

The existing two nos. 1.0 MVA 11/0.415KV oil filled Station service transformers installed at EL 845.65m are supplying power dedicated to respective SSBs at EL 838.80m.

B) Proposed system

The proposed scheme of 415 V is such that all Unit Tap-off transformers (UTT) and Station auxiliary transformers (SAT) shall feed power to Station Service Boards (SSB) boards. SSB boards shall be further connected to Unit auxiliary boards.

All UTTs and SATs shall be placed at EL 838.80m as shown in layout drawing NH/DEM/BSP/PH/03. Contractor shall visit the site and study the existing layout and drawings before supply for fitment of new auxiliary transformers in the space identified in power house.

The 415 V switchgear system shall be solidly grounded, 3 phases, TNS, according to IEC Publication 60364-3.

Station service board shall normally be fed from generating units through the any of three (3) 2.5 MVA UTTs. In case units are in shutdown, station service boards shall normally be fed from 11 KV switchgear through the two (2) 2.5 MVA dedicated SATs. The 11 kV sides of SATs shall be connected to the 11 kV switchgear through 11 KV XLPE cables by contractors of package EM-4(iv) cabling system and shall be coordinated. The 415V side of SATs and UTTs shall be connected to SSBs through LV duct by contractors of package EM-4(vi) MV and LV switchgear and shall be coordinated.

The embedded protection of winding temperature (49) shall be provided by the contractor. However Transformers shall also be protected for instantaneous and time delay over current, earth fault and under voltage protection (50/51/ 50N/51N and 27 relays) and restricted earth fault protections(64R) through numeric type relays provided at MV/ LV Switchgears. For this purpose, Neutral Bushing CT and its wiring upto transformer marshalling kiosk shall be provided by the contractor, however Relays at LV / MV switchgear shall be provided by LV/MV switchgear contractor. The auxiliary Transformer contractor shall coordinate with contractor of E&M works Package EM-4(vi) for providing necessary contacts/ signal for alarm / trip/ annunciation/ protection etc. as per protection requirement of power house. Contacts for control, measurement and protection interface function shall be made available at Terminal boards in marshalling box.

2.3 Rating and Functional Characteristics

2.3.1 UTT and SAT

S.No.	Description	UTT and SAT
1.	Type of Transformer	Dry Type
2.	No. of phase	3
3.	Installation	Indoor
4.	Total No. of Transformers	3+2
5.	Rated KVA	2500
6.	Minimum % Impedance at Principal Tap, rated MVA and rated frequency	6.0%
7.	Minimum efficiency of transformer at 0.8pf and full load	98%
8.	Type of cooling	AN
9.	Winding material	Copper
10.	Connection of Transformer	
a)	HV Winding	Delta
b)	LV Winding	Star with neutral directly earthed
11.	Vector Group	Dyn11
12.	Rated frequency	50 Hz
13.	Rated Voltage	
a)	HV Winding , kV	11
b)	LV Winding , V	415
14.	Tap Changer	
a)	Type	Off circuit
b)	Range	From +5% to -5%
c)	Steps	5, at 2.5% each
d)	Location	HV side
15.	Power frequency withstand voltage	
a)	H.V winding	28 kV
b)	L.V. winding	3 kV
16.	Rated lightning impulse withstand voltage of HV winding (peak)	75 kV
17.	Rated short circuit current on LV side	50 kA
18.	Class of insulation	H

S.No.	Description	UTT and SAT
19.	Neutral Bushing CT	
a)	CT ratio	5000/5
b)	No. of CTs for each transformer	1
c)	Accuracy	PS

2.4 Performance Guarantee

The auxiliary transformers along with all accessories shall be capable of performing intended duties under specified conditions. The Contractor shall guarantee the reliability and performance of the individual equipment as well as of the complete system.

2.5 Design and Construction

2.5.1 Standards

The system and equipment shall be designed, built, tested and installed to the latest revisions of the following applicable standards. In the event of other standards being applicable they will be compared for specific requirement and specifically approved during detailed engineering for the purpose:

S.No.	Standards	Description
1.	IEC 60076-11	Dry type Power transformers
2.	IEC 60529	Degrees of protection provided by enclosures (IP Code)
3.	IEC 61869-1	Instrument transformers – Part 1 ; General requirements
4.	IEC 61869-2	Instrument transformers – Part 2 ; Additional requirements for current transformers
5.	IEC 61869-3	Instrument transformers – Part 3 ; Additional requirements for inductive voltage transformers
6.	IEC 61111	Live working – Electrical insulating matting

2.5.2 Transformers

2.5.2.1 Auxiliary Transformers (Dry Type)

The cubicles housing of the transformers shall be ventilated by natural air. All Auxiliary Transformers shall be of the indoor dry type, cast resin insulated, naturally cooled. Ratings, characteristics, etc. shall comply with the requirements of the IEC 60076-11.



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