

Procurement of Transformers for Tato-I Hydro Electric Project (186 MW), Arunachal Pradesh		Schedule of Requirements
		Volume II Section-II
		SOR

Volume II

Section II

Schedule of Requirements (SOR)

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1. INTRODUCTION

Broad schedule of requirements is furnished herewith for price schedule as mentioned in Section-IX, Vol-I of the Bid Documents. The schedule of requirements is indicative of requirements of major transformer equipment and essential services. The scope of supplies and services shall be as per various clauses in the different volumes of this Package and the tenderer shall be responsible to ensure completeness of supplies and services even though these are not fully covered in this volume.

Any item of supply not explicitly listed but otherwise either evident by the contents of the specifications or essential for smooth operation of the equipment shall be construed as forming part of the supply and no additional charges shall be payable for the same.

If any particular items which were not explicitly listed are found to be essential, the tenderer / contractor shall affirm the inclusion of the same in the scope of supply without any extra charge on the contrary if any items reflected in this Schedule of Requirement is not required; the tenderer shall exclude such items. However, such inclusion / exclusion shall be brought out in the Schedule of Deviation with justification for consideration of the purchaser.

Tenderer shall have to quote as per list of items / equipment detailed in this section as well as taking Technical Specifications & drawings into consideration.

The schedule of requirement given below may under-go a change during detail engineering-

Mandatory special tools, tackles & slings etc. if in two different sections, the same shall be considered only once for procurement and it shall be brought-out in the schedule of deviation.

Tenderers have liberty to include / delete the items suiting to their plants & equipment but such inclusion / deletion shall be clearly reflected in schedule of deviation with proper justification subject to acceptance of the purchaser. The spare parts shall be interchangeable with and shall be of the same or higher quality than the original component.

Tenderers shall have to quote for each individual mandatory spares.

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2. SCHEDULE OF REQUIREMENTS:

1	GENERATOR TRANSFORMERS	
1.1	<p>Generator Transformer :</p> <p>11kV/220/√3kV, 27 MVA, 1 Ph, 50Hz, Z=12.5%, off circuit tap changer, Vector group YNd11, OFWF step-up transformer suitable for 3 Ph bank connection in Delta/Star with neutral solidly grounded. Transformer shall be supplied complete with HV neutral bushing for connection to neutral bus, HV bushing suitable for oil to gas termination and LV bushings with flanges suitable for IPBD termination and external delta formation, 1No, 2 core, 17.5 kV, 400/1/1A CL PS Neutral (external zero sequence) CT per bank ,1 Nos. 3 core, 400/1/1/1A , CT mounted in HV bushing turret, first fill of oil + 10% extra oil complete with Air cell type conservator, Two automatic Pressure reducer (From 3 to 5 kg/cm² to a constant 0.2 kg/sq.cm (a value less than oil pressure inside the tank)) for each Transformer bank. WTI, OTI, Optical sensor for temperature measuring, Buchholz relay, MOG, Breather, MB, oil pumps, oil to water coolers and associated instruments, valves, flanges etc. as per technical specification and as below :</p>	10 Nos.
1.1.1	First fill of oil for all equipment supplied, with 10% extra oil	As required
1.1.2	The 11 kV interface flange with the 5000 A insulated phase duct.	As required
1.1.3	The 220 kV SF6 Insulated transformer termination for connection to 220 kV GIS tube including the coordination, supervision and approval of the termination connection.	As required
1.1.4	The insulated neutral bus and zero sequence external CT (two cores required) including insulators and supports.	As required
1.1.5	The current transformer, protection and control cables, and connections between the transformer control cabinets, marshalling kiosks and the marshalling box & RTU Cubicle.	As required
1.1.6	Marshalling box per transformer bank complete with disconnect type terminals for voltage circuits and short-circuiting type	1/bank

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	terminals for current circuits and all the necessary incoming and outgoing terminal blocks including all inter-connecting cables.	
1.1.7	Marshalling kiosks per transformer complete with disconnect type terminals for voltage circuits and short-circuiting type terminals for current circuits and all the necessary incoming and outgoing terminal blocks including all inter-connecting cables.	3/bank
1.1.8	The water connection to the isolation valves provided within the transformer enclosure including flexible and supports.	As required
1.1.9	The 415/240 V AC cables and connections between the main and standby oil pump control panels and the common marshalling box.	As required
1.1.10	The 415/240 V AC disconnect switches (2 per Bank of transformers.	As required
1.1.11	RTU Panel (TRB)	1/bank
1.1.12	Mandatory Spares as per Technical Specification.	1 Lot.
1.1.13	Continuous Online Monitoring and Analyzing System for a minimum of 3 fault gasses as given in specification as OPTIONAL for Generator Transformers. (The same shall not be considered for Bid Evaluation.)	1 Lot
2.	DISTRIBUTION TRANSFORMERS	
2.1	Station-Service Transformer (SST) : Station Service Transformer: 5000 kVA, 220 kV / 33 kV, 3 phase, 50 Hz, YNyn0, Step-down, Oil Type, Indoor transformer with Off-Circuit Tap Changer and suitable for cable connection for LV.	1 No.
2.2	Station Auxiliary Transformer (SAT): Station Auxiliary Transformer: 1500 kVA, 33/0.433 kV, 3 phase, 50 Hz, Dyn11, Dry Type, Indoor transformer with Off-Circuit Tap Changer and suitable for cable connection.	2 Nos.
2.3	Unit Auxiliary Transformer (UAT):	3 Nos.

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	Unit Auxiliary Transformer: 630 kVA, 11 kV / 0.433 kV, 3 phase, 50 Hz, Dyn11, Step-down, Dry Type, Indoor transformer with Off-Circuit Tap Changer and suitable for cable connection for LV.	
2.4	HRT INTAKE AUXILIARY TRANSFORMER :	1 No.
	HRT Intake Auxiliary Transformer: 160 kVA, 33 kV / 0.433 kV, 3 phase, 50 Hz, Dyn11, Step-down, Oil Type, transformer with Off-Circuit Tap Changer	
2.5	VALVE HOUSE AUXILIARY TRANSFORMER:	1 No.
	Valve House Auxiliary Transformer: 160 kVA, 33 kV / 0.433 kV, 3 phase, 50 Hz, Dyn11, Step-down, Oil Type, transformer with Off-Circuit Tap Changer	
2.6	Mandatory Spares as per Technical Specification.	1 Lot.
3	Earthing Material of equipment for connection from over ground riser.	1 Lot.
4	Transformer Oil Filtration system	
	6000 LPH Transformer Oil Filtration System including 25KL storage tank as per specification.	1 Lot.

3. NOTES

- 1) The specifications and accompanying drawings are intended to describe and provide a finished piece of work. It is to be understood and agreed by Contractor, that the work desired shall be complete in detail, even though every item involved is not particularly mentioned. Contractor shall be required to provide all materials, equipment, labor, etc. necessary for the entire completion of the work described and shall not avail himself of any manifesting unintentional error, omission or inconsistency that may exist. The contractor shall carry out and complete the work in every respect to the satisfaction of Employer. The work shall meet the requirements laid down by the Employer/Engineer, latest local regulations of state, safety codes, fire and general insurance regulations and all other standards accepted practices.
- 2) This specification calls for execution of the Work in the most expeditious manner to ensure successful and timely commercial operation of the equipment installed. It is essential that Contractor has adequate experience for supply/erection/commissioning of similar equipment under his direct responsibility and supervision. It must have in its possession,

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adequate quantity of precision tools and erection/installation aids and must have on its direct roll, adequately qualified and experienced supervisory staff and craftsmen.

- 3) The contractor shall supply the equipment from reputed and experienced manufacturers. Preferred makes of major equipment shall be as per enclosed list.
- 4) The Bidder shall furnish the main offer as per above details, for the purpose of evaluation. However, the Bidder can make an alternative, if desired, for consideration of owner along with all the required information.