

ETC BOQ of BHEL make 132kV and 33kV Gas Insulated Substation at Vittalwadi APGENCO.						
BOM No.	ITEM	DESCRIPTION	UNIT	QTY	Rate	Amount
		SECTION (A)				
1		Material Handling				
1.1		Shifting of the material from store to site with truck/trailor (upto approx. 10 KM).The scope of work includes loading of material with hydra on truck/trailor at store, unloading of the material from truck/trailor at site with Hydra (in case EOT crane is available in GIS hall then unloading of the same by EOT crane, it may be noted the EOT crane is in customer scope).	MT	200MT		
		SECTION (B)				
2.0		Gas Insulated Switchgear (132kV, 1600A, 31.5kA for 1 sec) Work shall include Erection , Testing and commissioning of 132kV GIS.The supervision shall be provided by the GIS manufacturer . However all the tools & tackels as per the enclosed "List of contractor's tools in Annexure-B" shall be arranged by the bidder.				
2.1		132kV Incomer Bays (2 nos.) as per details given below (BOM item no. 2.1.1 to 2.1.12) along with main bus 1 in line with BOM item no. 2.4	No.	2		
2.1.1		3 Pole Circuit Breaker	No.	2	Price to be quoted for incomer bay in BOM item no. 2.1	
2.1.2		3 pole Current Transformer	No.	2		
2.1.3		3 pole Line isolator including MOM box and connecting rod	No.	2		
2.1.4		3 Pole Insulated Maintenance Earth Switch including MOM box and connecting rod	No.	2		
2.1.5		3 pole bus isolator including MOM box and connecting rod	No.	2		
2.1.6		3 pole Surge Arrestor	No.	2		
2.1.7		3 Pole Potential Transformer	No.	2		
2.1.8		SF6 Gas Filling/Recovery/Re-filling Cycle. The cycle of the gas filling/recovery/re-filling will be followed multiple time till the Completion of the HV test. Gas processing and filling unit (DILO machine) shall be in the scope of BHEL.	Set	2		
2.1.9		Common Points/Straight Enclosures/Bellows and other remaining applicable items of the 132KV GIS etc.	Set	2		
2.1.10		Control Cabling (Laying, Glanding and termination) between Local Control Cabinet,GIS Equipments	Set	2		
2.1.11		Equipment Earthing	Set	2		
2.1.12		Cable Tray for GIS equipment/LCC	Set	2		
2.2		132kV Outcomer Bays (2 nos.) as per detail given below (BOM item no. 2.2.1 to 2.2.12)	No.	2		
2.2.1		3 Pole Circuit Breaker	No.	2	Price to be quoted for outgoing bay in BOM item no.2.2	
2.2.2		3 pole Current Transformer	No.	2		
2.2.3		3 pole Line isolator including MOM box and connecting rod	No.	2		
2.2.4		3 Pole Insulated Maintenance Earth Switch including MOM box and connecting rod	No.	2		
2.2.5		3 pole bus isolator including MOM box and connecting rod	No.	2		
2.2.6		3 pole Surge Arrestor	No.	2		
2.2.7		3 Pole Potential Transformer	No.	2		
2.2.8		SF6 Gas Filling/Recovery/Re-filling Cycle. The cycle of the gas filling/recovery/re-filling will be followed multiple time till the Completion of the HV test. Gas processing and filling unit (DILO machine) shall be in the scope of BHEL.	Set	2		
2.2.9		Common Points/Straight Enclosures/Bellows and other remaining applicable items of the 132KV GIS etc.	Set	2		
2.2.10		Control Cabling (Laying, Glanding and termination) between Local Control Cabinet,GIS Equipments	Set	2		
2.2.11		Equipment Earthing	Set	2		
2.2.12		Cable Tray for GIS equipment/LCC	Set	2		

2.3	Metering bay (01 No.) as per detail given below (BOM item no. 2.3.1 to 2.3.6)	No.	1		
2.3.1	3 Pole Voltage Transformer	No.	1	Price to be quoted for metering bay in BOM item no. 2.3	
2.3.2	3 Pole Disconnecter including MOM box and connecting rod	No.	1		
2.3.3	SF6 Gas Filling/Recovery/Re-filling Cycle. The cycle of the gas filling/recovery/re-filling will be followed multiple time till the Completion of the HV test. Gas processing and filling unit (DILO machine) shall be in the scope of BHEL.	Set	1		
2.3.4	Control Cabling (Laying, Glanding and termination) between Local Control Cabinet, GIS Equipments	Set	1		
2.3.5	Equipment Earthing	Set	1		
2.3.6	Cable Tray for GIS equipment/LCC	Set	1		
2.4	Main Bus 1 (Prices for this item shall be included in BOM item no. 2.10)			Price to be included in BOM item no. 2.1	
2.4.1	Erection of Complete Main Bus including Enclosure and Bus bar	No.	1		
2.4.2	SF6 Gas Filling/Recovery/Re-filling Cycle. The cycle of the gas filling/recovery/re-filling will be followed multiple time till the Completion of the HV test. Gas processing and filling unit (DILO machine) shall be in the scope of BHEL.	No.	1		
2.4.3	Equipment Earthing	No.	1		
2.5	Termination of 132kV XLPE Cable				
2.5.1	Termination of 132kV XLPE cable for Incomer bays at 132KV GIS end. The supply of termination kit and supervision of the same will be in GIS supplier scope.	No	2		
2.5.2	Termination of 132kV XLPE cable for Outcomer bays at 132KV GIS end. The supply of termination kit and supervision of the same will be in GIS supplier scope.	No	2		
	SECTION (C)				
3	Gas Insulated Switchgear (33kV, 1200A, 25kA for 1 sec) Work shall include Erection , Testing and commissioning of 33kV GIS.The supervision shall be provided by the GIS manufacturer . However all the tools & tackels as per the enclosed "List of contractor's tools as per Annexure-B" shall be arranged by the bidder.				
3.1	33kV Transformer Incomer bays with 33kV XLPE cable termination at GIS end. The supply of termination kit will in scope of GIS manufacturer. The scope of work includes all the other related work to be done for the completion of work if applicable i.e. installation of trays, cabling and earthing etc.	Nos.	2		
3.2	33kV BUS PT bays.The scope of work includes all the other related work to be done for the completion of work if applicable i.e. installation of trays, cabling and earthing etc.	Nos.	2		
3.3	33kV Outgoing Line Feeder with 33kV XLPE cable termination at GIS end. The supply of termination kit will in scope of GIS manufacturer.The scope of work includes all the other related work to be done for the completion of work if applicable i.e. installation of trays, cabling and earthing etc.	Nos.	5		
3.4	33kV Bus Coupler bay. The scope of work includes all the other related work to be done for the completion of work if applicable i.e. installation of trays, cabling and earthing etc.	Nos.	2		
3.5	Supply & fixing of C-Channel for fixing of GIS in Floor	Kg	500		
	SECTION (D)				
4	Control & Protection System for 132 kV GIS comprising of following bays				
4.1	132kV Incomer Control Panel	Nos.	2		
4.2	132kV Outgoing Transformer Feeder Control Panel	Nos.	2		
4.3	132kV Incomer Protection Panel	Nos.	2		
4.4	132kV Outgoing Transformer Protection Panel	Nos.	2		
4.5	SCADA Interface Panel	Nos.	1		
	SECTION (E)				
5	Other Switchyard Items			Not in ETC contractor's scope. Hence rate not to be quoted.	
5.1	132kV and 33kV Cable and its outdoor cable termination	Lot	1		
5.2	132/33kV Transformer and its associated items	Lot	1		
5.3	Wave Trap, Lightning Arresters, CVT, Wall Mounted Insulators	Lot	1		
5.4	Station Battery, Charger, ACDC Board	Lot	1		
5.5	Outdoor and Indoor Illumination	Lot	1		
5.6	Station Earthing	Lot	1		
5.7	Lightning Protection	Lot	1		
5.8	LT Power and Control Cables	Lot	1		
5.9	Cable Trench Material	Lot	1		
5.10	EOT Crane	Lot	1		
	Total Amount (Rs.)				

	Notes:
1	All ETC works shall be done as per APTRANSCO / BHEL drawings . Copy of drawings shall be issued at contract stage.
2	Handling, shifting to & from stores, assembly, installation, pre-commissioning test and commissioning tests are included in the scope.
3	For 132kV GIS, work shall include Erection / Installation, Testing and commissioning of 132kV GIS including its LCC (Local Control cabinet) . The supervision shall be provided by manufacturer of GIS. Arrangement of Tools other than HV Test Kit shall be part of the scope. The scope also include laying, glanding and termination of LT cable in-between GIS, LCC, Scada and CR Panels..
4	For 33kV GIS work shall include Erection / Installation, Testing and commissioning of 33kV GIS. The supervision shall be provided by manufacturer of GIS. Arrangement of Tools other than HV Test Kit shall be part of the scope.
5	The work shall include Erection / Installation, Testing and commissioning of 132kV Control & Protection Panels and accessories . Testing and commissioning of numerical relays are in scope of OEM. Necessary skilled electrician & labour to be provided by ETC contractor during testing & commissioning of relays in 132 kV control and protection panel , 33 kV GIS , etc.
6	MS welding - apply red primer paint then aluminium paint then bitumen after welding. Paint Shade shall be as agreed by customer.
7	GS welding - apply 2 coats of cold galvanising after welding.
8	Quoted rates are deemed to be inclusive of all miscellaneous works to be done for completion of work.
9	All paint, welding electrodes & other consumable by contract supplies shall be part of ETC works. Paint/Welding electrode make etc. is subject to BHEL/CUSTOMER site incharge approval.
10	The quantities given above may change by +/- 25%.
11	Cable Termination kit shall be supplied by GIS Manufacturer, and supervision of termination will also be in scope of manufacturer for 132KV XLPE cable only. However, termination is in the scope of ETC contractor
12	Earthing of GIS Bays is in the scope of ETC contractor.
13	The installation of 132KV GIS on the floor will be done on grouted channels in the floor , and the 132KV GIS will be welded on the channels.The scope of work shall includes grouting of channels in the floor also, however the supply of the channels will be in GIS manufacturer scope.
14	The supply of the Control and Power Cable, Cable glands, Cable tray and earthing material will be in scope of Customer.
	Enclosures:
1	Approved drawings and documents of GIS and Building
2	Annexure-A - Tools & Tackles for GIS Testing provided by GIS supplier.
3	Annexure-B-Tools & Plants other then general T&P for the ETC work of GIS to be arranged by bidders.