

<b>Project:</b>	<b>220 kV GIS at 2x60 MW Vyasi HEP</b>
<b>Customer:</b>	<b>UJVN LTD.</b>
<b>Doc No:</b>	<b>ETC-BOQ/GIS/NOTE.1 Rev.0</b>
<b>Title:</b>	<b>SCOPE NOTE 1 - STANDARD SCOPE NOTE FOR E.T.C. WORKS</b>
<b>Sr No.</b>	<b>PARTICULARS</b>
1.1	Individual item may vary up-to any extent and even may get deleted, however overall contract value may vary +/-30%. Variation will be valid up-to contract stage.
1.2	Loading/Unloading, handling and shifting of material at site, proper stacking, assembly, installation, pre-commissioning test and commissioning tests (as per BHEL / Customer FQP) are included in the scope. Scope includes loading / unloading of the material from truck/trailor at site with Hydra/crane e.t.c. complete in all respect. All T&P including hyrda / crane is in bidder's scope.
1.3	Bidder Supplied Material - Bidder (ETC contractor) to supply material of proven design and make, which have already been extensively used and tested (as applicable). Bidder to obtain approval from BHEL Engineer incharge / Customer prior to supply.
1.4	Following documents will be required for billing of supplied items:
	Lorry receipt (LR)
	Tax invoice
1.5	<p><b>Supply of Insulating mats:</b></p> <p>The scope covers supply and laying of insulating mats of "class A" conforming to IS: 15652-2006. These insulating mats shall be laid in front of all floor mounted AC and DC switchboards and control &amp; relay panels located in control room building/ Switchyard panel room / GIS LCC Panel e.t.c.</p> <p>The insulating mats shall be made of elastomer material free from any insertions leading to deterioration of insulating properties. It shall be resistant to acid, oil and low temperature.</p> <p>Upper surface of the insulating mats shall have small aberration (rough surface without edges) to avoid slippery effects while the lower surface shall be plain or could be finished slip resistant without affecting adversely the dielectric property of the mat.</p> <p>Insulating mat (wherever applicable) shall be of pastable type, to be fixed permanently on the front and rear side of the panels except for the chequered plate area which shall not be pasted as per requirement. The insulating mats shall generally be fixed and joints shall be welded as per recommendations in Annexure-A of IS: 15652.</p> <p>Width of insulating mats shall generally be of 1.5 meters or as per site requirements. Length shall be supplied as per site requirements. The insulating mats offered shall conform to IS: 15652-2006.</p>

1.6	<p><b>SUPPLY OF CABLE TAGS AND MARKERS</b></p> <p>Each cable and conduit run shall be tagged with numbers that appear in the cable and conduit schedule. The tag shall be of aluminium with the number punched on it and securely attached to the cable conduit by not less than two turns of 20 SWG GI wire conforming to IS:280. Cable tags shall be of rectangular shape for power cables and of circular shape for control cables.</p> <p>Location of cables laid directly underground shall be clearly indicated with cable route marker made of galvanised iron plate.</p> <p>Location of underground cable joints shall be indicated with cable route marker with an additional inscription "Cable joints".</p> <p>The cable route marker shall project 150 mm above ground and shall be spaced at an interval of 30 meters and at every change in direction. They shall be located on both sides of road and drain crossings as per relevant standard.</p> <p>Cable tags shall be provided on all cables at each end (just before entering the equipment enclosure), on both sides of a wall or floor crossing, on each duct/conduit entry and at each end &amp; turning point in cable tray/trench runs.</p> <p>Cable tags shall be provided inside the switchgear, motor control centres, control and relay panels etc., wherever required for cable identification, where a number of cables enter together through a gland plate.</p>
1.7	HV test kit is in scope of GIS Supplier
1.8	All the drawings and documents enclosed as per note or referred elsewhere shall be followed for ETC work.
1.9	Minor Civil works such as modification of civil foundations, making foundations for JB/Panel/MK etc, making holes in the trenches/ wall/ ceiling of building, chipping work, grouting work, fixing of trench material will be in the scope of ETC contractor.
1.10	Any cutting of masonry / concrete work, which is necessary shall be done by the contractor at his own cost and shall be made good to match the original work.
1.11	All final adjustment of foundation levels, chipping and dressing of foundation surfaces, setting and grounding of anchor bolts, sills, inserts and fastening devices shall be carried out by the contractor including minor modification of civil works as may be required for erection.
1.12	Wall openings at suitable locations for ventilation fans shall be made by the bidder. Civil works such as <b>grouting, filling up of crevices/ cut outs</b> etc. during installation of equipment shall also be in bidder's scope. Any other damage caused to civil works during ETC work of the equipment/ system shall be made good to the original finish by the bidder at no extra cost to the BHEL.

1.13	Removal of gravel, if gravelling is already done, for connection of Equipment earthing strip to the existing mat (wherever earthing mat is already laid), and after completion of earthing , contractor should place the gravel to bring it in original shape.
1.14	The quantities given in items mentioned above may undergo a change to any extent. However cumulative contract value may vary +/- 30%.
1.15	Quoted rates are deemed to be inclusive of miscellaneous works viz erection of clamps and connectors.
1.16	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 approval.
1.17	All the phases are to be identified by painting the structures Red, Yellow and Blue by reflecting colour as per as built condition. Phase identification colour is to be provided around the top of the structure with colour band of 100 mm width at a height of approximately 2000mm from the finished ground level.
1.18	All ground connections shall be made by electric arc welding. All welded joints shall be allowed to cool down gradually to atmospheric temperature before putting any load on it. All arc welding with large dia. conductors shall be done with low hydrogen content electrodes.
1.19	Equipment erection (say Surge Arrestor ) means complete erection, metallics, connectors (expansion/rigid tubular for Al.Tube / single/double/quadruple conductor), connection to the next in line (if connected to overhead busbar or droppers) including PG clamps/Tee connectors etc. This will be clear from the enclosed electrical layout drawings.
1.20	Equipment and tower erection would include supply and erection of miscellaneous items , viz Phase colour discs , labels painting of equipments , phase colour painting , phase marking , bay identification board , danger plates , rubber mats , device number marking on the equipment, keyboard etc as per site requirements. Supply & Mounting of phase color discs & Danger plates shall be as per IS-2551; 1982 & IS 5; 1978.
1.21	Complete ETC package is under the scope of bidder. All T&P including hydras, cranes etc. required to complete the job shall be provided by bidder only.
1.22	Quantity of supply items are provisional and shall be notified during detailed engineering stage.
1.23	MS Welding - The M.S. flat/angle/channel shall be finally painted with two coats of Red oxide primer and two coats of Zinc riched enamel paint.
1.24	In cable tray / ladder if minor fabrication is required the same shall be applied with one coat of red lead primer, one coat of oil primer followed by two finishing coats of aluminium paint. Supporting steel shall be painted before laying of cables. The painting shall be done with one coat of red lead paint and two coats of approved bituminous aluminium paint

1.25	Testing instruments (duly calibrated) have to be arranged by ETC Contractor at it's own cost on returnable basis (List is only provided for information, if any other instrument not mentioned below but required for successful completion of ETC work shall be in ETC contractor scope)
1.25.1	OMICRON or equivalent kit for Numerical relay testing
1.25.2	DCRM (Dynamic Contact Resistance Measurement kit) OPERATIONAL ANALYZER
1.25.3	CRM (Contact Resistance Measurement kit)
1.25.4	Relay test kit
1.25.5	Capacitance and Tan delta measurement Kit
1.25.6	Dew Point Measurement kit
1.25.7	5kV/1kV Megger
1.25.8	Primary current Injection Kit of suitable rating
1.25.9	Secondary current/Voltage Injection kit
1.25.10	1Ph Variac
1.25.11	Multimeters
1.25.12	Clamp on meter
1.25.13	Leakage Tester
1.25.14	Gas leak detector
1.26	General Tools and Tackles to be arranged by ETC Contractor on returnable basis. (based on general requirement for erection, testing and commissioning of GIS under scope): The following is the list of Items which may be extended further depending upon the site timely requirements
1.26.1	Tools for GIS erection (to be arranged by Bidder on returnable basis) as per ANNEXURE-B
1.26.2	14/16 ton Hydra with lifting tools (Shackle, slings etc), and 25MT Swing Crane for GIS Bay & accessories shifting on site
1.26.3	Hand Pallet Trolley (Qty-2) for GIS modules & accessories boxes shifting
1.26.4	Power supply sockets with extension board inside GIS room Qty-2 nos.
1.26.5	Vacuum cleaner machine for GIS room cleaning Qty-2 nos.
1.26.6	Necessary numbers of fire extinguisher
1.27	Proper test reports for the tests conducted at site shall be prepared by the contractor on the formats provided by BHEL/UJVNL and the reports shall be presented for approval of BHEL and UJVNL engineer in required no. of sets in hard copy.
1.28	It shall be the bidder responsibility to arrange for the charging clearance/approval from the CEA or the concerned agency well before the scheduled date of charging of equipment.
1.29	Arrangement of temporary/ adequate illumination for site work/watch and ward/security and safety of material at site shall be in scope of ETC contractor.
1.30	Drilling/anchoring in RCC for fixing bolts with chemical grouts for GIS erection shall be in the bidders scope.