SECTION-PROJECT

1.0 GENERAL

1.1. Power Grid Corporation of India Ltd. (POWERGRID), a Govt. of India Enterprise is responsible for bulk Power transmission of electrical energy from various Central Govt. Power Projects to various utilities/beneficiaries and interconnecting regional grids, operating and maintaining the National electrical grid of India. It is established with mandate of "We will become a Global Transmission Company with Dominant Leadership in Emerging Power Markets with World Class Capabilities by:

a. World Class: Setting superior standards in capital project management and operations for the industry and ourselves.

b. Global: Leveraging capabilities to consistently generate maximum value for all stakeholders in India and in emerging and growing economies.

c. Inspiring, nurturing and empowering the next generation of professionals.

d. Achieving continuous improvements through innovation and state of the art technology.

e. Committing to highest standards in health, safety, security and environment" as its mission.

1.2. Govt. of India has identified the Transmission scheme for upgradation of bay equipment at Gooty end under reconductoring of Gooty-Thumkur (Pavagada) 400KV D/c line with HTLS conductor through RTM mode by POWERGRID.

1.3. Scope of the transmission scheme to be implemented through RTM route are as under-

i) Reconductoring of Gooty-Thumkur (Pavagada) 400KV D/c line with HTLS conductor - Being carried out under separate package

ii) Upgradation of bay equipment at Thumkur (Pavagada) end - Being carried out under separate package

iii) Upgradation of bay equipment at Gooty end – Present scope

1.4. It is the intent of this specification to describe primary features, materials, and design & performance requirements and to establish minimum standards for the work. The specification is not intended to specify the complete details of various practices of manufactures/ bidders, but to specify the requirements with regard to performance, durability and satisfactory operation under the specified site conditions.

1.5. The work to be done under this specification shall include all labour, plant, equipment, material and performance of all work necessary for the complete installation and commissioning of switchyard. All apparatus, appliances, material and labour etc. not specifically mentioned or included, but are necessary to complete the entire work or any portion of the work in compliance with the requirements implied in this specification is deemed to be included in the scope of contractor.

1.6. Before proceeding with the construction work the Contractor shall fully familiarize himself with the site conditions and General arrangements & scheme etc. Though the Employer shall endeavor to provide the information, it shall not be binding for the

Employer to provide the same. The bidders are advised to visit the substation sites and acquaint themselves with the topography, infrastructure and the design philosophy. The bidder shall be fully responsible for providing all equipment, materials, system and services specified or otherwise which are required to complete the construction and successful commissioning, operation & maintenance of the substation in all respects. Complete design (unless specified otherwise in specification elsewhere) and detailed engineering shall be done by the Contractor.

2.0 SCOPE:

2.1 The broad scope of this specification shall cover followings:

Station Name	400/220kV Gooty Substation
Extension Voltage Level	400kV
Bus-Switching Scheme	One and a Half Breaker Scheme
Fault level	63kA/1sec

2.2 The detailed scope of work of the substation package is brought out in subsequent clauses of this section.

2.2.1 Extension of 400/220KV Gooty substation:

2.2.1.1 Design, engineering, manufacture, testing at manufacturer's works, supply including transportation and insurance, unloading, storage, erection, testing and commissioning at site the following equipment/items, complete in all respects:

All the AIS equipment such as 400kV Circuit Breakers (including support structure), Isolators, Current Transformers, Wave traps, Surge Arresters are of current rating 3150A only.

A) ERECTION HARDWARE (as per BPS):

Reconductoring of Gooty-Thumkur (Pavagada) 400kV D/c line with HTLS conductor and bay upgradation works at Pavagada substation are being carried out under separate package.

Accordingly, under present scope BPS items under Erection Hardware shall include:

- HTLS conductor (or its equivalent conductor): Required for current carrying path of Pavgada-I & II Line, including replacement of Jack bus interconnection (wherever applicable including bus connection for 404-405-406, 410-411-412 Dias), shall be supplied by Employer as owner-supplied material (OSM), without any cost implication to contractor.
- Quad ACSR Bersimis conductors for Droppers for carrying Line current & 4.5" AL. IPS Tube for Equipment interconnection shall be under present scope of contract.

- Present scope shall include replacement of conductors for Pavgada-I- & II-Line Jack bus Equipment interconnections (wherever applicable for 404-405-406, 410-411-412 Dias) along with associated dropper & jumpers.
- Associated Erection hardware including clamps & connectors of 3000A/3150A current rating are in present scope of works (For 404-405-406, 410-411-412 Dias).
- **Insulator strings & associated hardware fittings:** Existing String Hardware & Insulator shall be re-used. However, supply of clamps/connectors for the HTLS conductor on String Hardware is under present scope. Contractor is to ensure safe dismantling of the String Hardware & Insulator & any damage to String Hardware & Insulator shall be replenished by contractor with new ones, without any additional, cost implication to Employer.
- Required spacers & any other insulators along with hardware required to complete the scope of work is to be provided by the agency.
- Dropper for LA-Twin ACSR Bersimis and associated Hardware including Clamp & connector shall be supplied to suit above new conductor configuration under present scope of supply.
- All dismantled materials shall be handed over to POWERGRID.
- **Mandatory Spares:** The agency shall supply one set of spare clamps and connectors of each type required for the bay upgradation works at Gooty Substation. Spare clamps and connectors corresponding to all types of equipment covered under the scope of work shall be supplied. No separate BOQ line items have been provided for the supply of these spare clamps and connectors. The cost towards the supply of spare clamps and terminal connectors, as specified in the project scope, is deemed to be included in the rates of the main BOQ items.

2.3 The work to be done under this specification shall include all labour, plant, equipment, material and performance of all work necessary for the complete installation and commissioning of the switchyard. All apparatus, appliances, material and labour etc. not specifically mentioned or included, but are necessary to complete the entire work or any portion of the work in compliance with the requirements implied in this specification is deemed to be included in the scope of contractor

2.4 The Contractor shall also be responsible for the overall co-ordination with internal/external agencies, project management, loading, unloading, handling, moving to final destination for successful erection, testing and commissioning of the substation/switchyard.

2.5 Design of substation and its associated electrical & mechanical auxiliaries systems includes preparation of single line diagram, electrical layout, erection key diagrams & BOQ, Drawings & TTR of clamps & connectors, Hardware and other relevant drawings

& documents required for engineering of all facilities within the fencing to be provided under this contract, are covered under the scope of the Contractor.

2.6 Any other items not specifically mentioned in the specification, but which are required for erection, testing and commissioning and satisfactory operation of the substation are deemed to be included in the scope of the specification unless specifically excluded.

2.7 Employer has standardized its technical specification for various equipment and works for different voltage levels. Items, which are not applicable for the scope of this package as per schedule of quantities described in BPS, the technical specification for the items should not be referred to.

3 SPECIFIC EXCLUSIONS

The following items of work are specifically excluded from the scope of the specifications:

400/220kV Gooty SS Extn:-

a. Employer's site office and stores.

b. Transit Camp

c. Approach Road outside substation boundary wall

d. ACDB & DCDB Extension

4.0 PHYSICAL AND OTHER PARAMETERS

4.1 Location of the Substation – The location of substation is indicated below:

Sr. No	Name of Substation	Name of State	Nearest Rail Head
1.	400/220KV Gooty SS	Andhra Pradesh	Gooty

4.2 Meteorological data - The meteorological data are as below

Name of Substation	400/220KV Gooty SS
Altitude	Less than 1000 meter above mean sea level (MSL)
Snow fall	NIL
Seismic Zone	NBC 2016
Wind Zone	NBC 2016
Min./Max. Ambient Temperature	0 / 50 degree centigrade
Coastal Area consideration	No

5.0 SCHEDULE OF QUANTITIES

The requirement of various items/equipment and civil works are indicated in Bid price Schedules.

All equipments/items, Structures and civil works for which quantities has been given in the BPS shall be payable on unit rate basis. During actual execution, any variation in

such quantities shall be paid based on the unit rate under each item incorporated in Letter of award.

Wherever the quantities of items/works are indicated in Set/LOT/LS, the bidder is required to estimate the quantity required for entire execution and completion of works and incorporate their price in respective Bid price schedules. For erection hardware items, Bidders shall estimate the total requirement of the works and indicate module wise lump sum price bay wise and include the same in relevant Bid price schedules. Any material/works for the modules not specifically mentioned in the description in BPS, as may be required shall be deemed to be included in the module itself.

No cost compensation shall be considered on account of "Set/LOT/LS" items in any case if number of bays specified in section project remains unchanged.

Bidder should include all such items in the bid proposal sheets, which are not specifically mentioned but are essential for the execution of the contract. Item which explicitly may not appear in various schedules and required for successful commissioning of substation shall be included in the bid price and shall be provided at no extra cost to Employer.

6.0 BASIC REFERENCE DRAWINGS

a) The substation shall be designed considering current ratings as indicated below:

Name of the Substation	400KV Voltage Level
400/220KV Gooty Substation	63KA for 1 Sec

b) Plot plan and coordinates of substation land shall be provided to the successful bidder during detailed engineering.

c) The reference drawings, which form a part of the specifications, are given at Annexure-I. The bidder shall maintain the phase to earth clearance, phase to phase clearance and sectional clearances, clearances between buses, bus heights but may alter the locations of equipment to obtain the statutory electrical clearances required for the substation. The enclosed drawings give the basic scheme and associated services etc. In case of any discrepancy between the drawings and text of specification, the requirements of text shall prevail in general. However, the Bidder is advised to get these clarified from Employer.

d) It is responsibility of contractor to develop general arrangement drawing, layout drawings, single line drawing, foundation & cable trench layout, erection key diagram & all other layout drawings for present scope of work.

7.0 DIFFERENT SECTIONS OF TECHNICAL SPECIFICATION

SECTION-PROJECT

Employer has standardized its technical specification for various equipment and works for different voltage levels. Items, which are not applicable for the scope of this package as per schedule of quantities described in BPS, the technical specification for the items should not be referred to.

For the purpose of present scope of work, technical specification shall consist of following sections and they should be read in conjunction with each other.

1	Section-Project	Rev 00
2	Section-General Technical Requirement (GTR)	Rev 15
3	Section-Switchyard Erection	Rev 10
4	Specific Requirements with Annexures	Rev-10

In case of any discrepancy between Section-PROJECT and Section-GTR and other technical specifications on scope of works, Section-PROJECT shall prevail over all other sections.

In case of any discrepancy between Section-GTR and individual sections for various equipment, requirement of individual equipment section shall prevail.

In case of any discrepancy between Main body of Section-Project and Annexure(s) of Section-Project, provisions specified in Main body of Section-Project shall prevail. In case of any discrepancy between BPS and other sections, BPS shall prevail over the other sections of the technical specifications. However, for rating of the BPS items, associated Section-Project shall prevail & is to be referred to.

9.0 SPECIFIC REQUIREMENT

9.1 Relevant/applicable clauses of Specific Requirements as mentioned at C/ENGG/SPEC/SEC-PROJECT/SPECIFIC REQUIREMENT Rev. no. 10 (attached as **Annexure-II**) shall also be referred for specified scope of work. Any discrepancy between clause 9.0 Section-PROJECT and Specific Requirements as mentioned at C/ENGG/SPEC/SEC-PROJECT/SPECIFIC REQUIREMENT Rev. no. 10 (attached at Annexure-II) on scope of works, the requirement stipulated at clause 9.0 of section project shall prevail.

9.2 **Clause No. "New Annexure-13" of Sl. No. B.25 of Specific requirement, Rev no. 10 (attached as Annexure-II) stands deleted.**

9.3 "Minimum specified creepage distance for insulator string/ longrod insulators/ outdoor bushings shall be 31 mm/kV".

9.4 Clause under Sl. No. A.5. of SPECIFIC REQUIREMENT (REV NO 10), Clause No. 9.2 of Section GTR rev 15 is modified as follows:

The reports for all type tests as per technical specification shall be furnished by the Contractor along with equipment / material drawings. However, type test reports of similar equipments/ material already accepted in POWERGRID shall be applicable for all projects with similar requirements. The type tests conducted earlier should have either been conducted in accredited laboratory (accredited based on ISO / IEC Guide 25 / 17025 or EN 45001 by the national accreditation body of the country where

laboratory is located) or witnessed by POWERGRID/representative authorized by POWERGRID/representative of Utility /representative of accredited test lab/ representative of The National Accreditation Board for Certification Bodies (NABCB) certified agency shall also be acceptable. Unless otherwise specified elsewhere, the type test reports submitted shall be of the tests conducted within the years specified below from the originally scheduled last date of bid submission (Soft Copy). In case the test reports are of the test conducted earlier than the years specified below from the original scheduled last date of bid submission (Soft Copy)., the contractor shall repeat these test(s) at no extra cost to the Employer: -

S. No.	Name of Equipment	Validity of type test (in years)
1	Power Transformer	10
2	LT Transformer	10
3	Shunt Reactor/Series Reactor /Neutral Grounding Reactor	10
4	OLTC	10
5	Bushing of Power Transformers/Reactors	10
6	Fittings and accessories for Power transformers & Reactors	10
7	Circuit Breaker	15
8	Isolator	15
9	Lighting Arrester	15
10	Wave Trap	15
11	Instrument transformer	15
12	GIS & Hybrid GIS	15
13	LT Switchgear	10
14	Cable and associated accessories	10
15	Relays/BCU/Process Interface units /Standalone Merging unit	10
16	Capacitors	10
17	Battery and Battery charger	10
18	Conductor & Earth wire	10
19	Insulators (Porcelain/Glass)	10
20	Composite Insulators	10
21	PLCC	10

Note:- For all other equipment's validity of type test shall be 10 years from the originally scheduled last date of bid submission (Soft Copy).
Equipment shall be supplied from the same manufacturing work, where from the sample unit was manufactured and successfully type tested as per relevant standard.
Further, where offered equipment is based on the design of technology transfer of Parent organization / Joint Venture (JV), type test reports of Parent organization / Joint Venture (JV) shall also be acceptable for the initial period of 03 years from the date of establishment manufacturing facility for offered equipment provided that the design, material, and manufacturing process of the offered equipment are identical to those of the type-tested sample of the original facility. In such cases, while submitting the Type Test Reports, the Original Equipment Manufacturer (OEM), shall furnish an undertaking with it declaring that there is
No change in the Design,
No change in the material,

No change in manufacturing process, and
No amendment/revision in the relevant standard as regard to type test conditions, since the type test In case of own manufacturing plant at different location within India, the type test of the original manufacturing works shall also be acceptable for the equipment manufactured and supplied from the different location subject to the following conditions:
The relevant standard does not bar the same,
The equipment being manufactured at different locations shall be identical in design, drawings, specifications, ratings to that of the type tested sample in the original facility (where it was manufactured and successfully type tested),
The equipment being manufactured at different locations shall be identical in material & critical components, manufacturing process/ practices, and quality control to that of the type tested sample in the original facility (where it was manufactured and successfully type tested),
Also, while submitting the Type Test Reports, the Original Equipment Manufacturer (OEM), shall furnish an undertaking for above conditions (i), (ii) and (iii).
Further, in the event of any discrepancy in the test reports i.e. any test report not acceptable due to any design/manufacturing changes or due to non-compliance with the requirement stipulated in the Technical Specification or any/all type tests not carried out, same shall be carried out without any additional cost implication to the Employer.
The Contractor shall intimate the Employer the detailed program about the type tests at least two (2) weeks in advance in case of domestic supplies & six (6) weeks in advance in case of foreign supplies.