

SECTION- PROJECT

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Annexure-I SPECIFIC REQUIREMENTS (Section-Project) - C/ENGG / SPEC / SECPROJECT/SPECIFIC REQUIREMENT Rev. No 07

SECTION- PROJECT

1.0 GENERAL

1.1 Preamble

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:

- World Class: Setting superior standards in capital project management and operations for the industry and ourselves.
- Global: Leveraging capabilities to consistently generate maximum value for all stakeholders in India and in emerging and growing economies.
- Inspiring, nurturing and empowering the next generation of professionals.
- Achieving continuous improvements through innovation and state of the art technology.
- Committing to highest standards in health, safety, security and environment." as its mission.

1.2 POWERGRID through its subsidiary, POWERGRID Ramgarh Transmission Limited is undertaking the implementation of "Transmission system for evacuation of power from REZ in Rajasthan (20GW) under Phase-III Part E1".

1.3 Following Transmission System is envisaged under "Transmission system for evacuation of power from REZ in Rajasthan (20GW) under Phase-III Part E1" through RTM route:

A. Substations:

- a) Establishment of 3x1500 MVA, 765/400kV & 3x500 MVA, 400/220kV Pooling Station at Fatehgarh-3 (new section) along with 2x330MVAR, 765kV & 2x125 MVAR, 420kV Bus Reactor.

This Specification covers 10 Numbers of 765/400/33kV, 1-Ph, 500MVA Transformers only. The balance 3x500MVA, 400/220/33kV, 3-Ph, transformers, 7x110MVAR, 765kV 1-Ph, Reactor and Construction of 765/400/220kV bays at Fatehgarh-3 substation along with 2x125 MVAR, 420kV Bus Reactor are being executed through separate package(s).

2.0 SCOPE

The scope of this specification shall cover following:

- 2.1 Design, engineering, manufacture, testing at manufacturer's works, supply, transportation, unloading and delivery at site including insurance & storage, erection, testing and commissioning at site of the following:
 - a. Ten (10) numbers of 500MVA, 1-Phase, $(765/\sqrt{3})/(400/\sqrt{3})/33$ kV Autotransformers to operate as Three (3) numbers of 3-Phase banks of $\{(765/\sqrt{3})/(400/\sqrt{3})/33\}$ Autotransformers with one unit as common spare for these banks along with all fittings, accessories including individual marshalling box for each Auto Transformer, common marshalling box for each bank of 3-single phase units, foundation bolts (if any), cables, insulating oil etc.
- 2.2 The detailed scope of works is brought out in the subsequent clauses of this section.
 1. Design, engineering, manufacture, testing at manufacturer's works, supply, transportation, unloading and delivery at site including insurance & storage, erection, testing and commissioning at site of the following:
 - a. $(765/\sqrt{3})/(400/\sqrt{3})/33$ Auto-transformers as mentioned above along with all fittings & accessories including on-line insulating oil drying system (Cartridge type), individual marshalling box for each Auto Transformer, common marshalling box for each bank of 3-single phase units, foundation bolts (if any), cables, insulating oil etc.
 - b. All cables including special cables from Transformer to marshalling box and only special cable (if any) from marshalling box to C&R panels shall be in the scope of contractor.
- 2.3 Design, engineering, manufacture, testing at manufacturer's works, supply, transportation, unloading and delivery at site including insurance & storage, testing at site of mandatory spares as per bid price schedule.
- 2.4 The contractor shall be fully responsible for providing all equipment, materials, system and services specified or otherwise which are required to complete the successful erection, testing and commissioning of the equipment in all respects.
- 2.5 Any other items not specifically mentioned in the specification but which is required for erection, testing and commissioning and satisfactory operation of equipment covered in this specification are deemed to be included in the scope of specification unless specifically excluded.

3.0 PHYSICAL AND OTHER PARAMETERS

3.1 **Location of the substation** - The location of substation is indicated below:

Name of Substation	Name of State	Nearest Railway Station
765/400/220kV Fatehgarh-3 PS	Rajasthan	Fatehgarh

3.2 **Meteorological data** - For design purposes, meteorological data are as below:

Altitude	Less than 1000 meter above mean sea level (MSL)
Snow fall	NIL
Seismic Zone	As per IS 1893 (Part-1)
Wind Zone	NBC 2016
Min./Max. Design Ambient Temperature	0/50 Degree Centigrade
Coastal Area consideration	No

4.0 SCHEDULE OF QUANTITIES

The bill of quantity is indicated in the Bid price Schedules. All equipment/items for which bill of quantity has been indicated in Bid price Schedules 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 Lot/Set, 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. 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 Transformer shall be included in the bid price and shall be provided at no extra cost to Employer.

5.0 REFERENCE DRAWINGS

The layout of Transformers shall depend on the substation layout arrangement and therefore shall be finalized during detailed engineering.

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.

6.0 DIFFERENT SECTIONS OF TECHNICAL SPECIFICATION

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:

Sl. No.	Description	Rev. No.
1.	Section-Project	Rev-00
2.	Section-GTR	Rev-15
3.	Section-765kV Auto-Transformer	Rev-08

In case of any discrepancy between Section-PROJECT and other sections, Section-PROJECT shall prevail over the other sections. In case of any discrepancy between Section-GTR and other individual sections, requirement of individual section shall prevail.

Above Technical Specifications (other than Section-Project) are standard sections 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 such items should not be referred to.

7.0 MANDATORY SPARES

The Mandatory Spares shall be included in the bid proposal by the bidder. The prices of these spares shall be given by the Bidder in the relevant schedule of BPS and shall be considered for evaluation of bid. It shall not be binding on the Employer to procure all of these mandatory spares.

The bidder is clarified that no mandatory spares shall be used during the commissioning of the equipment. Any spares required for commissioning purpose shall be arranged by the Contractor. The unutilized spares, if any, brought for commissioning purpose shall be taken back by the Contractor.

Wherever spares in BPS/Technical Specification have been specified as “each type/each rating/each type & rating”: If the offered spare/spares is sufficient to replace the respective main equipment of all types/ratings, then such offered spare/spares shall be acceptable. It implies that common spare/spare set fulfilling the spare requirement of all types/ratings shall also be acceptable, provided it is configurable at site itself without special assistance of OEM.

Mandatory Spares, wherever mentioned, are envisaged for the equipment/items being supplied under the main equipment heads under present scope meeting the requirements of Technical Specifications. The component/sub-component of an equipment/item specified in BPS/Break-up under Mandatory Spare, which is not applicable as per the offered design of respective main equipment, shall not be referred to.

8.0 EXCLUSIONS:

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

- i) Formation of common Neutral & Tertiary Delta for 3-Phase bank of Transformers.
- ii) HV, IV, Tertiary, Neutral and Auxiliary buses for 765/400/33kV Autotransformers for connecting spare unit of Transformer
- iii) Earthing works and civil foundation works for autotransformers, its fittings, fire protection walls, HV bus, IV bus, Auxiliary bus, Neutral bus & Tertiary delta bus.

- iv) Fire protection system for Auto-Transformers.
- v) Auxiliary power and control cables from control room / Bay control room to common marshaling box.
- vi) Soil investigation.
- vii) Terminal connectors.
- viii) Cable trenches.
- ix) Integration of Online insulating oil drying system with SAS and associated Ethernet switch, LIU patch cords etc.
- x) Online Dissolved Gas (Multi-gas) and Moisture Measuring Equipment
- xi) Fiber optic sensor-based temperature measuring system

9.0 SPECIFIC REQUIREMENT

9.1 Relevant/applicable clauses of Specific Requirements as mentioned at C/ENGG/SPEC/SEC-PROJECT/SPECIFIC REQUIREMENT Rev. no. 07 (attached as Annexure-I) shall also be referred for specified scope of work.

9.2 500 MVA, $(765/\sqrt{3})/(400/\sqrt{3})/33$ kV 1-Ph Auto Transformer to be supplied under subject package shall be without OLTC (On load tap changer). Accordingly, the specification/parameters for Tap other than principal tap, OLTC and RTCC mentioned elsewhere in other sections of Technical Specification shall not be referred to.

9.3 OTI & WTI shall be wired to Digital RTCC relay through 4-20 mA signals.

9.4 The system fault level is as mentioned below:

Sl. No.	Substation	765kV	400kV
1.	Fatehgarh-3 PS	50kA for 1sec	63kA for 1sec

9.5 In Section-GTR and other sections, the term, Owner and/or Purchaser/ Customer may be read as Employer.