

Clarification-I dated 11.12.2023 to the RfP document of Appointment of Independent Engineer for "Transmission system for evacuation of power from REZ in Rajasthan (20 GW) under Phase III-Part F" (Spec. No. CTUIL/IE/2023-24/23)

Sr. No	Clause No.	As per RfP Document	Clarifications sought by bidders	Clarifications from CTUIL
1	Clause no 3.1 (5), Section I of RfP Document	"± 2x300MVA STATCOM, 4x125MVA MSC, 2x125MVA MSR at Fatehgarh-3 PS along with 2 nos. of 400kV bays at Fatehgarh-3 PS"	<ol style="list-style-type: none"> <li>1. Kindly provide the scope of work related to STATCOM in TOR.</li> <li>2. Kindly mention which field engineer is to be deputed for STATCOM.</li> </ol>	<ol style="list-style-type: none"> <li>1. Amendment-I is to be referred.</li> <li>2. As STATCOM is a substation item, therefore Field Engineer deputed for substation work at Fatehgarh-III PS will look after the STATCOM work.</li> </ol>

Amendment-I dated 11.12.2023 to the RfP document of Appointment of Independent Engineer for “Transmission system for evacuation of power from REZ in Rajasthan (20 GW) under Phase III- Part F” (Spec. No. CTUIL/IE/2023-24/23)

Sl. No.	Clause No.	Existing Clause	New Clause
1	Cl. 4.2 of ToR, Section-II_ Terms of Reference, RfP Document	<p><b>4.2 Substation</b></p> <p><i>Independent Engineer shall check in accordance with the provisions of RfP (for TBCB projects)</i></p> <p>.</p> <p>.</p> <p>.</p> <p><b>New Clause Added</b></p>	<p><b>4.2 Substation</b></p> <p><i>Independent Engineer shall check in accordance with the provisions of RfP (for TBCB projects)</i></p> <p>.</p> <p>.</p> <p>.</p> <p>7. Specifications of the STATCOM equipment including MSR, MSC, VSC Valves, coupling transformer, MV switchgear, instrument transformer, surge arrester etc. installed by TSP with respect to the regulations/standards and specifications mentioned in RfP document by going through GTP, drawings, type test reports provided by TSP.</p>

In view of the above amendment, the existing section “02 Section-II\_Terms of Reference” is hereby replaced with “02 Section-II\_Terms of Reference\_rev1” and attached herewith.

सेंट्रल ट्रांसमिशन यूटिलिटी ऑफ इंडिया लिमिटेड  
CENTRAL TRANSMISSION UTILITY OF INDIA LIMITED

(Wholly Owned Subsidiary of Power Grid Corporation of India Limited)

(A Government of India Enterprise)

**SECTION-II: TERMS OF REFERENCE (TOR)**

**for**

**Appointment of Independent Engineer for "Transmission system for evacuation of power from REZ in Rajasthan (20 GW) under Phase III-Part F".**

(Spec. No. CTUIL/IE/2023-24/23)

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## TERMS OF REFERENCE (TOR) FOR INDEPENDENT ENGINEER

### 1. Introduction & Background

- 1.1 These Terms of Reference for the Independent Engineer (the "TOR") are being specified pursuant to the Transmission Service Agreement (TSA) entered into between the Employer (the "CTUIL") and Transmission Service Provider (the "TSP") for **"Transmission system for evacuation of power from REZ in Rajasthan (20 GW) under Phase III-Part F"** under Tariff Based Competitive Bidding (TBCB) route **(copy of which is annexed hereto and marked as Annexure-A1 to form part of this TOR).**

### 2. The Independent Engineer (IE)

- 2.1 The Independent Engineer shall be a company registered or incorporated in India as per Companies Act, 2013 or Companies Act, 1956.
- 2.2 The Independent Engineers' team of key personnel will comprise Project Manager, and experts in different disciplines, having requisite experience of similar type of works (as mentioned in clause 8.1) required for the contract. The Independent Engineer will have to deploy only personnel who have the specified relevant qualification and experience.
- 2.3 The Independent Engineer shall discharge its duties in a fair, impartial and efficient manner, consistent with the highest standards of professional integrity and Good Industry Practice. Independent Engineer shall not have any affiliation with any Transmission Service Provider (TSP) undertaking the subject transmission scheme.

### 3. Objective of the Assignment

- 3.1 The overall objective of the assignment is to monitor the execution/construction of substations, transmission lines, underground cables, communication systems etc on behalf of the employer (CTUIL) for the transmission projects awarded to the TSP under Tariff Based Competitive Bidding (TBCB) route within the framework of TSA.
- 3.2 **Roles and functions of Independent Engineer**

The role and functions of the Independent Engineer shall include the following:

- a) Progress Monitoring
- b) Ensuring Quality

- c) Determining the costs of any works or services and/or their reasonableness during construction phase;
- d) Determining the period or any extension thereof, for performing any duty or obligation during construction phase;
- e) Determining the valuation of the Project Assets.
- f) Assisting the employer in resolution of disputes and determining validity of change in law or force majeure conditions and their effects on the parties (employer, TSP, CEA or any related agency).
- g) Undertaking all other duties and functions in accordance with the Transmission Service Agreement.

#### **4. Scope of Work**

##### **4.1 Transmission Line**

Independent Engineer shall check in accordance with the provisions of RfP (for TBCB projects):

1. Selection of tower type provided by TSP has been as per regulations/ specifications mentioned in the RfP.
2. Tower has been prototype tested as per relevant standards.
3. Applicability of multicircuit towers in line passing through forest areas as per provisions of RfP and regulations/ specifications.
4. Detailed specifications of conductor meeting the functional specifications specified in RFP.
5. Specifications of Transmission line equipment (i.e. insulator, earthwire, OPGW, associated accessories, hardware fittings, aviation lights etc) with respect to the regulations/standards and specifications mentioned in RfP document by going through GTP, drawings & test reports provided by TSP.

##### **4.2 Substation**

Independent Engineer shall check in accordance with the provisions of RfP (for TBCB projects):

1. SLD & GA prepared by TSP for conformity with the present scope of work as well as future provisions.

2. Switching Scheme, Installation type (AIS/GIS/Hybrid/MTS), feeder distribution /bay configuration and ratings of bus-bars/bay equipment of the substation in accordance with the provisions of RfP.
3. Specifications of the substation equipment (i.e. Circuit Breakers, Isolators, Instrument Transformers, Surge Arrestors, Protection system, PLCC, Communication equipment, Transformers, Reactors, auxiliaries etc.) installed by TSP with respect to the regulations/standards and specifications mentioned in RfP document by going through GTP, drawings, type test reports provided by TSP.
4. Ratings of auxiliary system viz LT Transformers, battery banks, battery chargers, LT switchgear, DG Set, Fire protection system, Visual monitoring system installed by TSP and ensure that selected rating is suitable for the scope of work (present scope & future provisions).
5. Coverage/suitability of bus-bar protection and Substation Automation System (SAS) for the complete scope of work (present scope & future provisions).
6. Line Gantry/Towers for adjacent future line bay are suitable for extension, wherever applicable.
7. Specifications of the STATCOM equipment including MSR, MSC, VSC Valves, coupling transformer, MV switchgear, instrument transformer, surge arrester etc. installed by TSP with respect to the regulations/standards and specifications mentioned in RfP document by going through GTP, drawings, type test reports provided by TSP.

The independent Engineer shall review the GTP, Drawings & Test reports (type, routine, acceptance tests) provided by TSP and any abnormality observed with respect to RfP provisions shall be reported by IE to employer immediately.

### **4.3 Quality & Construction Monitoring**

1. The Independent Engineer shall follow up with the TSP to get the approved MQP & FQP submitted after award of contract(s) on priority and maximum within one hundred and twenty (120) days from the Effective Date of TSA.
2. The Independent Engineer, through its Field Engineer would check the records maintained by TSP, and verify that the Project is built and completed in good workmanship using sound engineering & construction practices; using materials/equipment that are newly manufactured as per the MQP and

following the approved FQP for construction, erection, testing & commissioning.

3. The Independent Engineer shall verify, through documentation provided by TSP (i.e. GTP, drawings, test reports, MQP etc.), that following major substation equipment/ items, transmission line materials have been provided in accordance with relevant CEA Regulations and Indian Standards (in case Indian Standards for any particular equipment/ system/ process is not available, IEC/ IEEE or equivalent International Standards and Codes shall be followed).
  - Transformers, Reactors, Circuit Breakers, Instrument Transformers, Surge Arresters, Protection relays, clamps & connectors, GIS equipment/bus duct etc.
  - Equipment in terminal stations of HVDC installations including Thyristor/ IGBT valves, Converter Transformers, smoothing reactors, Transformer bushings and wall bushings etc.
  - Towers and gantry structures inside the AC/DC substation.
  - Transmission line towers/poles, Conductors, earthwire, OPGW, insulator, associated accessories, hardware fittings for insulators, aviation lights etc.
4. The Independent Engineer shall monitor the quality of construction materials, foundation and workmanship through visual inspection, documentation & test reports etc. provided by TSP (FQP etc) and through field visits, wherever required.
5. The Independent Engineer shall verify that the Tower types installed for crossing power lines, railways, national highways and state highways by TSP has been in accordance with the RfP. Further, IE shall also verify compliance to rules/regulations of railways and other relevant Highway authorities for crossings of power lines, railways, national highways and state highways.
6. Independent Engineer shall ensure conformity of the conductor specifications with the functional specifications specified in RFP.
7. The Independent Engineer shall verify that Site Acceptance Test (SAT)/ pre-commissioning tests of all major substation equipment, component, system, facilities have been successfully carried out before commissioning by checking the records maintained by TSP. Further, Independent Engineer shall ensure that the Type tests, FAT and SAT reports are available at the substation / terminal station of HVDC installations for future ready reference.



8. Independent Engineer (Project Manager/ Experts) shall carry out inspections during the Project execution, as and when deemed necessary **or as directed by Employer.**
9. Independent Engineer shall check that TSP is following Cyber security compliances, import from neighbouring countries as per Finance ministry regulations, Make in India compliances, MLC compliances and any other statutory regulations imposed by the Govt. from time to time as required under RfP/TSA.
10. The Independent Engineer shall assist in taking remedial action to avoid slippages leading to delay in completion of works by the TSP.
11. The Independent Engineer shall also assist in any allied activities deemed necessary for successful and timely completion of work during contract execution.

#### **4.4 Progress Monitoring**

1. The Independent Engineer shall follow up with the TSP to get the Project Execution Plan submitted after award of contract(s) on priority and maximum within one hundred and twenty (120) days from the Effective Date of Transmission Service Agreement (TSA).

The Project Execution Plan submitted by the TSP shall comprise detailed schedule of all the equipment/items/materials required for the Project, right from placement of award till the dispatch from works and receipt at the site. Further, it should also include various stages of the construction schedule up to the commissioning of the Project.

The Independent Engineer shall review Project Execution Plan submitted by the TSP which includes organization structure, time plan and methodology for executing the Project, award of major contracts, designing, engineering, procurement, shipping, construction, testing and commissioning in conformity with the Scheduled COD as specified in Schedule 2 of Transmission Service Agreement (TSA).

2. Independent Engineer shall review the monthly progress reports to be submitted by TSP. The forms for submission of monthly progress report shall be finalised by Independent Engineer with the TSP. The reports should mention likely completion date of each Element with regard to the Project and its execution (in accordance with prescribed form).

3. The Independent Engineer shall monitor the development of the Project for its timely completion. The progress shall be reviewed by the Independent Engineer against the Project Execution Plan. The Independent Engineer shall prepare its report on monthly basis and submit the same to Employer highlighting the progress achieved till the end of respective month vis-à-vis milestone activities, areas of concern, if any, which may result in delay in the timely completion of the Project.
4. The monthly progress report shall include an overview of the status of work at site, quality of construction, safety measures/aspects, the source of materials used and conformity of Construction Works with the Scope of the Project with high resolution photographs of the inspected equipment/site works. Further, status of ROW, forest clearance, PTCC clearance, approval of Supreme Court appointed committee for GIB areas etc. to be mentioned in the progress report.
5. The monthly progress report shall include the compliance of all the equipment/ materials received at site in particular month with respect to provisions of RfP/ standards/ regulations. In case of any non-conformity in product/services/work, analysis shall be carried out by the Independent Engineer and corrective actions shall be suggested for any work, whenever there is any deviation observed in the drawings, specifications/ parameters, work methods or construction.
6. The Independent Engineer shall review the detailed bar (GANNT) chart of the Project outlining each activity (taking longer than one Month), linkages as well as durations as submitted by the TSP.

The Independent Engineer shall monitor the progress of works as per the approved GANNT bar chart, certify the achievement of contractual milestones defined and keep TSP advised about possible bottlenecks while recommending actions to mitigate the same.

They shall compile systematic records of TSP's site activities to adequately document the progress and performance of the work. These records shall support determination of responsibility for slow progress of contracts.

7. Independent Engineer shall verify the readiness of the elements including the statutory clearances & completion of civil works, fixing of all components and finalisation of punch points (if any) prior to charging of the elements.
8. The reports/observations of the IE shall be submitted to both the Employer and the TSP and suggest corrective measures, if any.

#### **4.5 Other duties and functions**

1. Independent Engineer shall undertake all other duties and functions in accordance with the Transmission Service Agreement, whenever referred by the Employer.
2. Independent Engineer shall depute its substation/ transmission line experts for witnessing the type tests/ FAT at manufacturers location whenever desired by the Employer. The travel/ accommodation expenses of the same shall be reimbursed as per the rates mentioned in bidding document.

#### **5. Dispute Resolution:**

- 5.1 Any disputes with regard to works being executed by the TSP shall be resolved in the most amicable manner in accordance with the provisions of the contract.
- 5.2 The Independent Engineer shall examine and make recommendations on claims received from the TSPs for time extension, extra work or expenses etc. arising due to change in law or Force Majeure. In this respect, the Independent Engineer shall certify positive and negative quantity deviation with respect to the contracted quantities, review justification and costing prepared by the TSP.  
  
The proposals for cost variations shall be processed in the shortest possible time duly coordinated with the TSP and the Employer.
- 5.3 If Transmission Service Agreement (TSA) is terminated on account of Force Majeure Events, non-requirement of any Element or Project during Construction, Employer's non-fulfilment of Role & TSP's Event of Default, the TSP shall be entitled for Termination Payment equivalent to valuation of Project Assets. The Independent Engineer shall determine the valuation of the Project Assets in case of such events as required under Transmission Service Agreement, whenever referred by Employer.
- 5.4 The Independent Engineer shall determine the costs of any works or services and/or their reasonableness during construction phase as required under Transmission Service Agreement, whenever referred by Employer.
- 5.5 The Independent Engineer shall assist the Parties in resolution of Disputes, whenever such dispute is referred by Employer.
- 5.6 Organize and conduct meetings as desired by Employer and submit reports/ proceedings of the meetings to Employer.

#### **6. Authorised signatories**

Independent Engineer shall designate and notify up to 2 (two) persons employed in its firm to sign for and on behalf of the Independent Engineer, and any communication or document required to be signed by the Independent Engineer shall be valid and effective only if signed by any of the designated persons; provided that the Independent Engineer may, by notice in writing, substitute any of the designated persons by any of its employees.

## **7. Deliverables:**

The Independent Engineer shall be responsible for following deliverables (the "Deliverables") during the course of this Consultancy.

### **7.1 Monthly Report**

The progress of the TBCB projects shall be reviewed by the Independent Engineer against the Project Execution Plan of TSP. The Independent Engineer shall prepare its report on monthly basis and submit the same to Employer highlighting the progress achieved till the end of respective month vis-a-vis milestone activities, areas of concern, if any, which may result in delay in timely completion of the Project.

Such progress report shall include an overview of the status, progress, quality and safety of construction, including the work methodology adopted, the materials used and their sources, and conformity of Construction Works with the Scope of the Project and the Specifications and Standards along with High resolution photographs of the inspected equipment. Based on the progress, Employer and/ or CEA shall issue written instructions to the TSP to take corrective measures, as may be prudent for the timely completion of the Project.

### **7.2 Completion Report**

Final completion report of the project in respect of all elements of the Project shall be compiled along with as-built SLD, GA, earthing drawing and shall be submitted to the Employer.

### **7.3 Documentation**

The Independent Engineer shall provide to Employer soft copies of the following documents/ details, as and when finalized by TSP:

- Co-ordinates of substation land.
- SLD, General Arrangement & Electrical layout drawing of substation
- Earthmat layout

- SAS Architecture
- Bus bar protection scheme
- Fire Protection system layout
- LT Switchgear layout
- Foundation & cable trench layout
- Route survey of Transmission line
- Type & number of Towers finalized for Transmission line including river, railway, highway crossing etc.

## 8. Team Composition

The Independent Engineer shall provide experienced personnel to carry out the assignment throughout the duration of the project management services in accordance with task/requirement of the project.

8.1 The team shall include the following key personnel:

Sl. No.	Position	Experience and Qualification requirements of key experts
1.	Team Leader cum Project Manager	The Team Leader shall be responsible for overall coordination of the consultancy services to ensure satisfactory fulfillment of contracted services. He shall join important review meetings in Employer offices/ at sites and otherwise, also keep himself updated about the progress of the assignment and provide guidance to team, as needed. He shall be responsible for submission of the progress and other reports included in the assignment. He shall coordinate with all stakeholders (including senior state government officials and Client management) and oversee satisfactory delivery of services.

Sl. No.	Position	Experience and Qualification requirements of key experts
		He/ She should be Graduate in Electrical/ Mechanical / Civil Engineering having at least 8 years' experience in EHV transmission projects and have worked in at least two (2) assignments for 345kV or above transmission project as team leader/Project Manager.
2.	Substation Expert	Graduate in Electrical Engineering having at least 5 years' experience in EHV transmission substation projects and have worked in at least two (2) assignments for 345kV or above substation projects.
3.	Transmission Line Expert	Graduate in Electrical/ Civil Engineering having at least 5 years' experience in EHV transmission line projects and have worked in at least two (2) assignments for 345kV or above transmission line projects.
4.	Field Engineer-I (Substation)	Graduate/Diploma in Electrical/Civil Engineering having at least 2 years' experience in construction of EHV transmission substation projects. Field Engineer shall be posted at site during contract period.
5.	Field Engineer-II (Substation)	Graduate/Diploma in Electrical/Civil Engineering having at least 2 years' experience in construction of EHV transmission substation projects. Field Engineer shall be posted at site during contract period.
6.	Field Engineer-I (Transmission Line):	Graduate/Diploma in Electrical/Civil Engineering having at least 2 years' experience in construction of EHV transmission line projects. Field Engineer shall be posted at site during contract period.

Sl. No.	Position	Experience and Qualification requirements of key experts
7.	Field Engineer-II (Transmission Line):	Graduate/Diploma in Electrical/Civil Engineering having at least 2 years' experience in construction of EHV transmission line projects. Field Engineer shall be posted at site during contract period.

**Note:** The Key Personnel shall preferably be an employee of Bidder. In case the Key Personnel is being hired by the bidder, the bidder needs to furnish a declaration with bid mentioning the nature of engagement to ensure his availability in the event of award. After award of contract, hiring agreement between Independent Engineer & Key personnel shall be furnished by successful bidder to CTU within 15 days from the issuance of GeM Contract Order.

## 9. Termination of appointment

9.1 If the TSP has reason to believe that the Independent Engineer is not discharging its duties and functions in a fair, efficient and diligent manner, it may make a written representation to the Employer and seek termination of the appointment of the Independent Engineer.

Upon receipt of such representation, the Employer shall hold a tripartite meeting with the TSP and Independent Engineer for an amicable resolution, and the decision of Employer shall be final.

9.2 The Employer may, in its discretion, terminate the appointment of the Independent Engineer at any time.