ANNEXURE I

Technical Quality Audit Parameters for Power Distribution

S.no.	Parameters	Benchmark	Reference Document	Indicator	Sub-Indicators	Maximum Marks	Marks obtained	Weightage (%)
1	Planning, Design	Technical framework and comprehensive planning	DPR	1.1) Integrated planning for load growth estimation	1.1.1) Analysis of the existing distribution network and its operational situation and its uses.	3		20%
					1.1.2) Analyze quantitative and qualitative historical data for last 3 years and future assessment for at least 5 years in consultation with all stake holders.	3		
					1.1.3) Accurate Substation capacity, voltage level determination keeping in view maximum loading of power transformer.	3		
					1.1.4) Adoption of automated tools like SCADA, DMS, OMS, and latest simulation software etc.	3		
				1.2) Project Proposal Approval	1.2.1) Administrative and Technical Approvals from the Competent Authorities	3		

					1.2.2) Timeline Scheduling Estimation for Different Phases of the Project	3		
				1.3) Selection of land	1.3.1) Preliminary survey.	2		
					1.3.2) The location of Sub-stations keeping in view ROW, Soil Strength testing, earth resistivity, load centre topology of area etc.	2		
					1.3.3) Land acquisition, forest and other dept clearances and transfer of land in the name of department	2		
					1.3.4) Selection of grid sub-station such as indoor, outdoor, underground, Air Insulated (AIS), Gas Insulated (GIS) or Hybrid etc.	2		
					1.3.5) Walk over survey of transmission line based on HARSAC submission	2		
					1.3.6) Gazette notification and its publication of the route of transmission line.	2		
					1.3.7) Horticulture Planning	2		
				1.4) Load Flow Studies and short circuit analysis	1.4.1) APFC switched capacitors Bank on Sub-stations for Reactive Power Compensation at appropriate places as per requirement.	5		

					1.4.2) The actual short circuit current value may be used to decide switchgear standard specifications	5		
					1.4.3) Technical losses for Sub-transmission system as per standards.	5		
				1.5) SS Design, layout, equipment design and drawings	1.5.1) Selection of design parameters like Capacity Voltage level, fault level, etc. And selection of Incoming/Outgoing Gantry Structure	4		
					1.5.2) Fixation of maximum capacity of Sub-stations as per latest CEA standards /Regulations.	3		
					1.5.3) Selection of rating for cable as per site conditions.	3		
					1.5.4) Provision for equipment maintenance without interrupting the entire supply.	3		
					1.5.5) Protection grading, coordinated configuration to ensure the minimum zones are impacted by faults	3		
					1.5.6) Independent circuit breaker control of incoming and outgoing feeders.	3		

					1.5.7) Grounding/Earthing design as per site condition to ensure safety of equipment and personnel	2		
				1.6) Quality, reliability, functionality, and maintainability of supply	1.6.1) Provision of two incoming feeders from two different sources (wherever feasible) for meeting N-1 contingency for reliability considerations.	2		
					1.6.2) Provision of two different transformers for meeting N-1 contingency for reliability considerations.	4		
					1.6.3) Provision of additional transformer of sufficient capacity for future load growth to meet the N-1 condition at the sub-station	3		
					1.6.4) Provision for Spare 11Kv Panel/Rack for Emergencies	2		
					1.6.5) SS to cater voltage regulation should not exceed the standard limits.	3		
				1.7) Cost analysis, Budget planning, and timeline estimates	1.7.1) Financial implication with cost index up to implementation period.	3		
					1.7.2) Identification of funding agency with annual budget allocation.	3		
					1.7.3) Period for DPR approval	3		

					1.7.4) Selection of network equipment based on merits of overall service life to ensure optimization of cost and system reliability.	3		
				1.8) DNIT Approval and Award of work. (Trunkey project) Administrative and Technical approvals from the competent authorities	1.8.1) DNIT preparation, approval, and call of tender	3		
					1.8.2) Evaluation of Tender based technical and financial bid analysis and allotment of work order maintaining transparency.	3		
					TOTAL	**100**		
2	Execution and implementation and inspection and testing	Technical Methodology for implementation	Contract Agreement	2.1) Joint Pre-Survey by Operation and Construction Wing along with Contractor	2.1.2) Pre survey by Operation and Construction Wing along with contractor before permit of work	7		40%
					2.1.3) Verification of regularity compliances for contractor.	8		
					2.1.4) Timely handing over of hindrance free land to the executing agency	7		
				2.2) Use of all construction materials	2.2.1) Use of all construction material as per relevant codes and specifications.	10		
				2.3) Implementation	2.3.1) Execution of civil work such as control room building, foundations, fencing, grouting, cable trenches etc. and execution o	10		

				of Civil and Electrical Works	f all electrical works as per requirement and corresponding standards			
					2.3.2) Use of quality materials from approved source and machinery from approved manufacturer. Factory tests for equipment /material as per SOMP / Relevant technical specification.by contractor/department.	10		
				2.4) Execution of Civil, Horticulture, and electrical work as per work order.	2.4.1) Execution of Civil and Horticulture Works as per the plan within specified time period.	10		
					2.4.2) Sampling of material/equipment during Joint Verification as per standards	7		
					2.4.3) Testing in NABL accreditation labs.	7		
					2.4.4) Preparation of site inspection and quality control register.	7		
					2.4.5) Checking of test results by execution authority and action thereof.	7		
					2.4.6) Rectification of defects on regular basis and keeping the record.	10		
					TOTAL	**100**		

3	Commissioning and Handover	Guidelines for Commissioning and handover of sub-station	Completion Report	3.1) Testing and functionality of substation and all its equipment and machinery.	3.1.1) Pre commissioning testing of electrical equipment as per standards	12		20%
					3.1.2) Clearance from Chief Electrical Inspector after completion and subsequent handover of Sub Station to Operation Wing	10		
					3.1.3) Post commissioning testing of all electrical equipment as per work order /relevant equipment codes.	10		
					3.1.4) Handover of the Substation to the department by the contractor	6		
				3.2) Submission of asset management plan and completion certificate and adhering to approved timelines and budget	3.2.1) Submission of assets completion plan and in-built drawings by the agency	10		
					3.2.2) Submission of completion report by the agency as per approved format	10		
					3.2.3) Ensuring the timelines	10		
					3.2.4) Ensuring the expenditure within approved awarded amount	12		
				3.3) Guarantee of works	3.3.1) Post commissioning monitoring and support.	10		
					3.3.2) withhold of security amount	10		
					TOTAL	**100**		

4	Safety and Security	Guidelines for Safety and Security	Safety Plan	4.1) Adherence to safety standards and regulations	4.1.1) All electrical safety requirements, electrical clearances, fire detection & extinguishing system, earthing & ventilation etc. as per standards.	25		**5%**
					4.1.2) Conformance to safety requirements by adhering to appropriate design standards.	15		
					4.1.3) To adopt regular safety and reliability audits of all major equipment of the network.	15		
				4.2) Safety measures for workers	4.2.1) Provision of First aid kits, safety uniforms, display of all safety related warnings, and all emergency contact numbers, Grounding, clearances, fire protection, fencing, etc.	10		
					4.2.2) Conducting regular mock drills to check the response system	5		
					4.2.3) Work permit and authorisation	5		
					4.2.2) Incident response and reporting	10		
					4.2.3) Provision of surveillance to curb unauthorized access	10		

					4.2.4) Display of important safety precautions and instructions	5		
					TOTAL	**100**		
5	Operation and Maintenance	Procedure for Effective Maintenanc e	Assets Manageme nt Plan	5.1) Compliance to prescribed deliverable	5.1.1) Ensuring quality of power and other operational parameters as per SOMP.	20		100%
					5.1.2) Regular operation and maintenance and replacement of material/equipment by contractor as per Work Order for specified period	15		
					5.1.3) Use of software for maintenance scheduling and updates, and display of maintenance schedule.	10		
				5.2) Timely rectification of defects	5.2.1) Emergency response planning	10		
					5.2.2) Maintenance schedule development and its compliance.	10		
					5.2.3) Availability of spare parts.	5		
					5.2.4) Grievance redressal and record keeping.	5		
				5.3) Effective running of substation.	5.3.1) Deployment of skilled manpower for operation and maintenance.	5		

					5.3.2) Deployment of required no. of staff for operation and maintenance.	5		
					5.3.3) Substation operation and maintenance as per SOMP.	5		
					5.3.4) Training and capacity building.	5		
					5.3.5) Equipment monitoring and surveillance using latest technology, such as thermal camera to detect hot spot, SCADA etc.	5		
					TOTAL	**100**		

Sr. No	Parameter	Marking Criteria	Weightage (%)	Marks Obtained
1	Planning, Design		20*	
2	Execution and implementation and inspection and testing		40*	
3	Commissioning and Handover		20*	
4	Safety and Security		5*	
5	Project management	Adherence to project timelines and cost projection	5	
6	Environmental Measures	Considerations of environment factors like sustainability, ecofriendly construction practices.	5	
7	User Feedback	Feedback from beneficiaries, stack holders to access their satisfaction levels	5	
		Total	**100**	
1	Operation and Maintenance		100*	

Breakup of weightage is given in detail framework for these parameters
Parameters that are not applicable to a specific project will not be considered for audit. The weightage will be adjusted accordingly