

**GOVERNMENT OF INDIA  
CENTRAL ELECTRICITY AUTHORITY  
(MINISTRY OF POWER)  
Distribution Planning & Technology Division  
Sewa Bhawan (North Wing), Room No. 622, 6th Floor,  
R. K. Puram, New Delhi-110066  
email: cedpt-cea@gov.in**

**PUBLIC NOTICE**

CEA published '**Guidelines for Model Quality Assurance Plan (MQAP) for major equipment of Power sector**' in March 2022 covering MAQP for all the segments of power sector i.e. Generation (Thermal, Hydro), Transmission and Distribution. Further, Central Electricity Authority (Technical Standards for Construction of Electrical Plants and Electric Lines) Regulations, 2022 notified on 23<sup>rd</sup> December, 2022 has made these Guidelines for MQAP as mandatory.

Now, on the advise of Ministry of Power to do away the Factory Acceptance Tests including stage inspections at factory during manufacturing of the equipment/material for distribution sector, the MQAP for distribution sector have been revised and are attached herewith for comments/ suggestions.

All the Stakeholders and members of public are requested to send their comments/ suggestions on aforementioned draft revised Guidelines to Chief Engineer (DP&T), Sewa Bhawan (North Wing), Room No. 611, 6th Floor, R. K. Puram, New Delhi-110066 by post or through e-mail (**cedpt-cea@gov.in**) latest by **14.03.2022**.

Chief Engineer (DP&T), CEA  
Dt 21-2-2023

## **ANNEXURE D**

### **QUALITY ASSURANCE PLAN OF MAJOR EQUIPMENTS USED IN DISTRIBUTION SYSTEM**

## **QUALITY ASSURANCE PLAN**

The Utility shall be solely responsible & accountable for assuring quality in the project works. Utility shall formulate a detailed comprehensive Quality Assurance (QA) plan for the works to be carried out with an objective to create quality infrastructure works. The QA Plan shall be integral part of the contract agreement with the contractor / equipments supplier and erection agency as the case may be, in case of turnkey/partial turnkey/ or departmental execution of works. Utility has to ensure that the quality of materials/equipments supplied at site and execution of works carried out at field is in accordance to Quality Assurance Plan /Guaranteed Technical Particulars (GTP) and Technical specifications /Approved Drawings/Data Sheets etc.

The utility through Contractor/PMA appointed by utility shall strictly ensure Quality Assurance checks during the day to day course of project execution, and ensure the quality of material and equipment as per Quality Plan/ Approved Drawings / Technical Specifications/ Datasheet/ GTP/applicable national & international standards etc.

The utility should ensure that Quality Assurance Plan should be prepared keeping in view the following:

- All equipments/materials shall comply with the relevant Indian Standard/International Standards if IS is not available.
- All type tests, Routine tests & Acceptance tests shall be as per relevant IS.
- Pre-Dispatch Inspection (except for Power Transformers), may be excluded from the scope of quality monitoring and more emphasis should be laid upon field works quality inspections.
- Samples of material / equipment supplied by the contractors/manufacture may be picked up randomly from Stores / Field from a lot for testing in NABL accredited Labs before accepting the lot.
- Sample sizing may be based on risk profiling of material/equipment supplied by vendors/contractors. Sample Sizes may be of Two (2) types. 1<sup>st</sup> sample size may be same for all vendors and in case of failure of 1st samples, 2nd sample size may be larger than 1st sample size for such vendors/contractors.
- Field works quality inspections may be given more emphasis. The field quality inspection may be carried out in 3 (three) stages as: (i) On completion of 40% - 50% works, (ii) Completion

of 90% - 100% works and (iii) Final inspection.

- All coordination activities including reporting etc. should be through an IT based solution rather than deploying manpower for this purpose.
- The cost of quality monitoring may be optimized including the manpower cost for coordination activities.

The Utility should prepare a separate Field Quality Plan (FQP) for civil, electrical, mechanical, etc. works supported with drawings which shall be approved by their competent authority and may be uploaded at web portal. The contractor should adhere to FQP while carrying out physical works. The Utility should also prepare a comprehensive FQP for testing & commissioning of Grid Substations, Distribution transformer Substation, 33 KV, 11 KV line, LT line etc. The system should be energized only after performing all tests as described in the FQP and after clearance from Electrical Inspector. Proper records in this regard, including tests on earth resistance, insulation resistance of 11 kV line & Distribution Transformer etc. shall be maintained, jointly signed by Utility and contractor. All the quality assurance checks conducted in the field should be documented properly and signed by the quality engineer of the contractor & utility and shall be kept for future reference. These documents shall be maintained by the Utility in proper order and shall be made available at site for verification during inspection.

#### **VENDOR APPROVAL:**

It is a Good Practice that all the materials to be procured for project works shall be purchased from the authorized vendors approved by the Quality Assurance Department of Utility. Approved vendors list should be uploaded periodically on the utility web portal. New vendors/suppliers may be approved by the utility, provided capability of manufacturer's is assessed suitably by visiting the factory premises and checking the testing facility available before accepting it as approved vendor.

#### **TYPE TEST & ROUTINE TESTS:**

All the Type Tests & Routine Tests shall be carried out as per Indian Standards. The validity of Type Tests of major equipments / materials shall be as per Annexure-I.

## **SITE ACCEPTANCE TEST:**

The sample of following important materials should be picked up randomly from the lot received at site and tested at third party NABL accredited laboratory before accepting the lot.

1. Distribution Transformer
2. Ring Main Unit
3. CT/PT Unit (Outdoor) & Metering Cubicle (Indoor)
4. Circuit Breaker,
5. Insulators,
6. Cables
7. Conductor
8. Control & Relay Panel,
9. Overhead Conductor/ ABC
10. Energy Meter
11. Poles
12. Insulators
13. Capacitor
14. Distribution Box

The utility may add the important material in the above list. The /testing/ of site acceptance tests shall be as per approved Drawings/Technical Specifications/Datasheet/GTP/QA Plan and applicable national & international standard.

## **PRE-COMMISSIONING TESTS**

On completion of erection of the equipment and before charging, each item of the equipment shall be thoroughly cleaned and then inspected jointly by the Utility and the contractor for correctness and completeness of installation and acceptability for charging, leading to initial pre-commissioning tests at Site. The list of pre-commissioning tests to be performed should be included in the Contractor's quality assurance programme.

## **COMMISSIONING TESTS**

The contractor will use all required instrumentation and control equipment during commissioning tests and such measuring equipment and devices should be duly calibrated as far as practicable. The tests will be conducted at the specified load points and as near the specified cycle condition as practicable. The contractor will apply proper corrections in calculation, to take into account conditions, which do not correspond to the specified conditions. Any special equipment, tools and tackles required for the successful completion of the Commissioning tests shall also be provided by the contractor.

The specific tests to be conducted on equipment should be included in the technical specifications. However where the pre-commissioning tests have not been specified specifically they shall be as per relevant IS code of practice or as mutually agreed. The Contractor shall also be responsible for ensuring compliance to all statutory requirements for commissioning and successful operation of the system.

## **QUALITY ASSURANCE OF COMPLETED WORKS**

The sample size for Inspection/ verification of works completed (the indicative sample size for is applicable only for fully completed works) may be as below:

- 100% New Power Substations.
- 100% Augmented Substations
- 10% of HT feeders (in terms of sanctioned length of Project i.e. District, covering at least 10% of the total sanctioned number of feeders) for each voltage level and /configuration (OH/AB/UG/HVDS), including Bay extensions as applicable.
- 5% of HT feeder reconductoring / replacement /renovation work (in terms of sanctioned length of Project i.e. District, covering at least 5% of the total sanctioned number of feeders) for each voltage level and /configuration (OH/AB/UG).
- 5% of New DTR Substations (11/0.4kV) for each KVA level.
- 5% of Capacity augmentation of DTR Substations (11/0.4kV) for each KVA level.
- 5% of LT lines (in terms of sanctioned length of Project i.e. District/Circle) for each

configuration (OH/AB/UG)

- 5% of LT Lines reconductoring/replacement/renovation work (in terms of sanctioned length of Project i.e. District/Circle) for each configuration (OH/AB/UG).
- 5% of any other works sanctioned in the DPR with sanction value more than 5% of the sanctioned cost.
- IT/OT/SCADA/DMS/AMI System infrastructure – primarily at system/field level for high level functional checks.
- Works completed under Smart metering component: - 1% or 1,000 Meters of consumer Smart meters implemented under the scheme, whichever is less, including the LT auxiliary works. - 2% of DT/Feeder/Boundary meters implemented under the scheme, including the auxiliary works.

In case any discrepancy/shortcoming in quality in the completed works is found, based on the report of the Third Party Audit during inspection, then the same should be rectified by the Contractor within the stipulated time limit.

#### **QUALITY ASSURANCE PROGRAMME OF THE BIDDER / CONTRACTOR :**

To ensure that the equipment and services under the scope of the tender whether manufactured or performed within the Contractor's Works or at his Sub-contractor's premises or at the Utility site or at any other place of work, are in accordance with the specifications / tender conditions, the Contractor shall adopt a suitable 'Quality Assurance Programme'. Such programme shall be broadly outlined by the contractor and finalized after discussions with the utility before the award of the contract. The detailed programme shall be submitted by the contractor after the award of contract and acceptance by the Utility.

A Quality Assurance Programme of the contractor shall generally cover the following:

- Organization structure of the Contractor for management and implementation of the proposed quality assurance program
- Documentation control system

- Qualification data for bidder's key personnel
- The procedure for purchases of materials, parts components and selection of sub-Contractor's services including vendor analysis,
- System for shop manufacturing and site erection controls including process controls and fabrication and assembly control
- Control of non-conforming items and system for corrective actions
- test procedure for field activities
- Control of calibration and testing of measuring instruments and field activities
- System for indication and appraisal of field inspection status
- System for quality audits
- System for authorizing release of manufactured product
- System for maintenance of records
- System for handling storage and delivery
- A manufacturing quality plan detailing out the specific quality control measures and procedures adopted for controlling the quality characteristics relevant to each item of equipment furnished and/or services rendered.
- A Field quality Plan covering field activities

The Utility or his duly authorized representative like PMA reserves the right to carry out quality audit and quality surveillance of the system and procedure of the Contractor/his vendor's quality management and control activities.

The Contractor would be required to submit all the Quality Assurance documents as stipulated in the Quality Plan. The contractor shall supply the materials/equipments of type & design which



has already been Type Tested. Contractor/Manufacturer shall provide copy of such tests at the time of bidding and also at site in support of type-tested materials supplied under the contract.

The Utility should share their Quality Assurance Plan /Field Quality Plan (FQP) with the Contractor. The schedule for submission/approval of document as per QAP/FQP shall be finalised before placement of the contract, keeping in view the overall project schedule. The Contractor shall be responsible for any time delay, misinterpretation, error and conflict during design, manufacturing, testing and erection of the Works resulting from non-compliance with the requirements of the approved Specification.

### Proposed Validity of Type Test Certificate – Distribution

Sl. No.	Name of Equipment	Validity Period (in years)
i.	Power Transformer	5
ii.	Distribution Transformers (single Phase and three phase).	5
iii.	Circuit Breaker	5
iv.	Air Break Switches.	5
v.	Isolators	5
vi.	Lightning Arrester	5
vii.	Instrument Transformers (CT/PT/CVT)	5
viii.	Control and Relay Panel (LV and MV)	5
ix.	XLPE Cable and Aerial Bunched Cables.	5
x.	11 kV Capacitor/ Capacitor Bank	5
xi.	Energy Meters <ul style="list-style-type: none"> <li>• Electronic Meter</li> <li>• Smart Meter</li> </ul>	5 3
xii.	Batteries and Charger.	5
xiii.	Conductors (ACSR/AAAC)	5
xiv.	Insulators	5

Note: The above validity periods are based on the validity period as mentioned in the SBD published for RDSS Scheme and tender documents issued by various DISCOMs across the country.

