

Three Tier Quality Assurance Mechanism under XII Plan RGGVY Project

Subject: Changes proposed in Quality Assurance Mechanism for XII Plan RGGVY Projects

Quality Assurance Structure of XII Plan RGGVY works

The Project Implementation Agency (PIA) shall be solely responsible & accountable for assuring quality in RGGVY works. Accordingly, PIA shall formulate a comprehensive Quality Assurance (QA) Plan with an objective to build a zero defect infrastructure under RGGVY works. The QA Plan shall be integral part of the contract agreement with turnkey contractor. Documentation with regard to Manufacturing Quality Plan (MQP) & Field Quality Plan (FQP) shall be maintained by PIA and kept in proper order for scrutiny during the course of project execution by Quality Monitors.

The internal quality assurance mechanism followed by PIA and the turnkey contractor shall be termed as **level-zero** of overall quality assurance plan of the XII plan RGGVY works.

Quality checks under Level-Zero of QAM: Level-zero is of utmost importance. Under this level, the turnkey contractor & PIA shall strictly perform following QA checks during the course of project execution:

- a. 100% pre-dispatch inspections of all material as per MQP/ Drawings/ Technical Specifications & applicable national & international standards
- b. 100% villages with all infrastructure are to be verified for quality as per MQP/ Drawings/Technical Specifications and FQP
- c. 100% of all 33/11 kV sub stations (New & Augmented) for quality of material as per MQP/Drawings/Technical Specifications and erection works in the field as per FQP
- d. 100% verification of BPL connections

Vendor approval: PIAs shall purchase all materials for RGGVY works only from the vendors approved by their quality Assurance departments. A manufacturer's facility may be visited and the capability assessed suitably before accepting it as approved vendor. State utilities may adopt vendors approved by CPSUs.

Material Inspection: All materials of REDB (33/11kV or 66/11kV substation) as well as that of VEI (Village Electricity Infrastructure) shall both be inspected at manufacturer premises before dispatch.

FQP for civil works: PIA shall prepare a separate FQP for civil works. The turnkey contractor shall adhere to this FQP while carrying out physical works.

FQP for testing & commissioning: PIA shall prepare a comprehensive FQP for testing & commissioning of S/s (REDB) as well as VEI. The electrical system shall be energized only after performing all tests as described in the FQP. Proper records in this regard, including

tests on earth resistance, insulation resistance of 33 KV line, 11 KV line including spur lines, Distribution Transformer & power substation's equipment etc shall be maintained.

QA documentation: All QA checks conducted in the field as per FQP shall be properly documented & signed by the quality engineer of the turnkey contractor & countersigned by PIA's representative. These documents shall be maintained in proper order & easily available at site for verification by Quality Monitors.

Three tier Quality Assurance Mechanism

XII Plan RGGVY Projects shall have a 3-tier Quality Assurance Mechanism (QAM). The 3-tier QAM shall exclude level-zero, the in-process quality assurance plan followed by the Project Implementation Agency (PIA) during the physical execution of the project.

TIER – I Mechanism

1.0 Under Tier-I of Quality Assurance Mechanism, QA checks shall be performed by a Third Party Inspection Agency (TPIA) to be deployed by PIA through outsourcing by tendering process. PIA shall designate a Senior Executive Engineer/Assistant Engineer level officer as Project Implementing Agency's Quality Assurance Coordinator (PQAC) at district level and for State Level Quality Assurance responsibility, PIA shall designate a senior officer to the level of Superintending Engineer /Dy. GM (for CPSU) office as its State Quality Assurance Coordinator(SQAC).

The TPIA shall perform test inspections & checks and shall ensure conformity on part of system procedural and policy implementation.

Upon award of the contract and start of the works, PIA through its State Level Officer or in case of CPSU through its Regional office, shall ensure quality of materials procured and workmanship of executed works.

PIA is required to engage a Third Party Inspecting Agency (TPIA), who will verify the quality of RGGVY works in 50% of the villages covered in a project.

1.1. **Material Inspection:** Important materials of REDB (33/11kV or 66/11kV) substation as well as that of VEI (Village Electricity Infrastructure) shall both be inspected at manufacturer premises before dispatch.

1.1.1. **Inspection of S/S (REDB) materials:** Following materials have been identified as important materials for s/s:

- | | |
|----------------------------|------------------------|
| 1. Power Transformer, | 7. Energy meter |
| 2. Circuit Breaker, | 8. Insulators, |
| 3. Current Transformer | 9. Earthing materials, |
| 4. Potential Transformers, | 10. Battery, |
| 5. Isolators, | 11. Battery Chargers, |
| 6. Control & Relay Panel, | 12. ACDB/DCDB Board, |

Ten percent (10%) of aforesaid REDB materials shall be inspected by the TPIA as per MQP. The inspection/testing/ witnessing of acceptance tests shall be as per Drawings/Technical Specifications & applicable national & international standard.

1.1.2. **Inspection of VEI Materials:** Following materials have been identified as important material for VEI:

- | | |
|------------------------------|----------------------------|
| 1. Distribution Transformer, | 8. AB switch(GO switch), |
| 2. Overhead Conductor, | 9. HG fuse, |
| 3. Energy Meter, | 10. Earthing materials |
| 4. Pole, | 11. Hardware: channels, PG |
| 5. Insulators, | Clamp connector, |
| 6. Cables, | suspension clamp, tension |
| 7. Lightning Arrester | clamp, nut & bolts |

Ten percent (10%) of aforesaid VEI materials shall be inspected by the TPIA as per MQP. The inspection/testing/ witnessing of acceptance tests shall be as per Drawings/Technical Specifications & applicable national & international standard.

1.1.3. **Sampling from field:** Any material, including following important materials, may be picked from site for testing at test laboratory chosen by REC/MoP

- | | |
|------------------------------|-----------------------------|
| 1. Distribution Transformer, | 8. AB switch(GO switch), |
| 2. Overhead Conductor, | 9. HG fuse, |
| 3. Energy Meter, | 10. Earthing materials |
| 4. Pole, | 11. Hardware: channels, PG |
| 5. Insulators, | Clamp connector, suspension |
| 6. Cables, | clamp, nuts & bolts |
| 7. Lightning Arrester | |

All expenditures towards packing, transport, inspection, testing charges etc shall be borne by the PIA.

1.2. **50%** villages as per MQP/ Drawings/ Technical Specifications and FQP

1.2.1. 50% villages are to be inspected in 2 (two) stages. Stage-I inspection shall cover 10% and Stage-II inspection shall cover 50% villages including revisit of the villages inspected during stage-I inspection.

1.2.2. Stage-I inspection shall begin and end when the physical progress in the project is completed in 10% and 30 % of villages respectively. Five (5) nos. of villages in a project are to be thoroughly inspected at the very beginning when the same is completed in the project. These villages after rectification of defects will become modal quality village. The findings of inspection of

these five villages shall be used as training resource and necessary improvement in Quality Assurance.

1.2.3. Stage-II inspection shall begin and end when the physical progress in the project is completed in 50% and 90 % of villages respectively.

- 1.3. 100% New and 100% Augmented 33/11 kV or 66/11 kV capacity substation for quality of material as per MQP/Drawings/Technical Specifications and works in the field as per FQP.
- 1.4. In 50% villages of the project, 100% verification of BPL connections, 100% Distribution Transformer Substations, 100% LT Lines, 50% of 33kv Lines and 100% of the 11KV lines attributed to the village (emanating from cut-point/grid substation) as well as the 11 KV line laid within the village, verification of energisation of village & BPL beneficiaries, installation of service connections in public places, hours of supply in the village, time taken by DISCOM to raise first energy bill in favor of beneficiaries.
- 1.5. TPIA shall also oversee the Contract Management Part of PIA like contractual provisions of identifying defects and their communication to working agencies, timely rectification of defects, time line Assurance mechanism of PIA for rectification of defects, resolution of project related issues and action on delayed project. In their visit, they would give thrust on adherence on systems and procedures of RGGVY schemes by PIA and turnkey contractors. They would also ensure availability and awareness of project specific drawings, documents, quality assurance plans among all stakeholders in PIA, contractor staff/workers.
- 1.6. TPIA shall also see the progress of up-loading of monitoring observations and its compliance details including site photographs in RGGVY web portal.

Tier– II Mechanism

2.0 Rural Electrification Corporation (REC), the nodal agency for RGGVY works, shall operate Tier-II of Quality Assurance Mechanism. REC shall designate a senior officer (ZM/CPM of the state) as REC State Quality Assurance Coordinator (RSQAC) at its State level project office. Under this mechanism, adherence to system procedures and guidelines shall also be verified by inspection agency through RSQAC.

REC shall outsource independent agencies to verify the quality of RGGVY works in 20% of the villages covered under the Project in addition to conducting pre-dispatch quality checks of all important materials at the vendor's outlet. These independent agencies are designated as REC Quality Monitors (RQM). RQM will review the inspections carried out by TPIA for 2% of villages.

2.1. **Material Inspection:** Important materials of REDB (33/11kV or 66/11kV substation) as well as that of VEI (Village Electricity Infrastructure) shall both be inspected at manufacturer premises before dispatch.

2.1.1. **Inspection of S/S (REDB) materials:** Following materials have been identified as important materials for s/s:

- | | |
|----------------------------|----------------------------|
| 1. Power Transformer, | 9. Earthing materials, |
| 2. Circuit Breaker, | 10. Battery, |
| 3. Current Transformer | 11. Battery Chargers, |
| 4. Potential Transformers, | 12. ACDB/DCDB Board, |
| 5. Isolators, | 13. 11 kV XLPE Cables |
| 6. Control & Relay Panel, | 14. Cables other than 11kV |
| 7. Energy meter | |
| 8. Insulators, | |

At least one type from each of aforesaid 14 materials shall be inspected by the RQM as per MQP. The inspection/testing/ witnessing of acceptance tests shall be as per Drawings/Technical Specifications & applicable national & international standard.

2.1.2. **Inspection of VEI materials:** Following materials have been identified as important material for VEI:

- | | |
|------------------------------|-----------------------------------|
| 1. Distribution Transformer, | 8. AB switch(GO switch), |
| 2. Overhead Conductor, | 9. HG fuse, |
| 3. Energy Meter, | 10. Earthing materials |
| 4. Pole, | 11. Hardware: channels, PG Clamps |
| 5. Insulators, | connectors, suspension clamp, |
| 6. Cables, | tension clamp, nuts & bolts |
| 7. Lightning Arrester | |

At least one type from each of aforesaid materials shall be inspected by the RQM as per MQP. For item no. 11, at least one type of each of listed hardware materials shall be inspected. The inspection/testing/ witnessing of acceptance tests shall be as per Drawings/Technical Specifications & applicable national & international standard.

2.1.3. **Sampling from field:** Any material, including following important materials, may be picked from site for testing at test laboratory chosen by REC/MoP

- | | |
|------------------------------|----------------------------|
| 1. Distribution Transformer, | 8. AB switch(GO switch), |
| 2. Overhead Conductor, | 9. HG fuse, |
| 3. Energy Meter, | 10. Earthing materials |
| 4. Pole, | 11. Hardware: channels, PG |
| 5. Insulators, | Clamp connector, |
| 6. Cables, | suspension clamp, tension |
| 7. Lightning Arrester | clamp, nuts & bolts |

All expenditures towards packing, transport, inspection, testing charges etc shall be borne by the PIA.

2.2. 20% villages as per MQP/ Drawings/ Technical Specifications and FQP

2.2.1. 20% villages are to be inspected in 2 (two) stages. Stage-I inspection shall cover 5% and Stage-II inspection shall cover 20% villages including the villages inspected during stage-I inspection.

2.2.2. Stage-I inspection shall begin and end when the physical progress in the project is completed in 10% and 30 % of villages respectively. Five (5) nos. of villages in a project are to be thoroughly inspected at the very beginning when the same is completed in the project. These villages after rectification of defects will become modal quality village. The findings of inspection of these five villages shall be used as training resource and necessary improvement in Quality Assurance.

2.2.3. Stage-II inspection shall begin and end when the physical progress in the project is completed in 70% and 90 % of villages respectively.

2.3. 100% New and 100% Augmented 33/11 kV or 66/11 kV capacity substation for quality of execution of works at site as per FQP.

2.4. In 20% villages of the project, 100% verification of BPL connections, 100% Distribution Transformer Substations, 500 m(for hilly areas)/1KM (for plain areas) of 33kV Lines, 100% LT Lines and 100% of the 11KV lines attributed to the village (emanating from cut-point/grid substation) as well as the 11 KV line laid within the village, verification of energisation of village & BPL beneficiaries, installation of service connections in public places, hours of supply in the village, time taken by DISCOM to raise first energy bill in favor of beneficiaries.

2.5. RQM shall also oversee the Contract Management Part of PIA like contractual provisions of identifying defects and their communication to working agencies, timely rectification of defects, time line Assurance mechanism of PIA for rectification of defects, resolution of project related issues and action on delayed project. In their visit, they would give thrust on adherence on systems and procedures of RGGVY schemes by PIA and turnkey contractors. They would also ensure availability and awareness of project specific drawings, documents, quality assurance plans among all stake holders in PIA contractor staff/workers.

2.6. RQM shall also see the progress of up-loading of monitoring observations and its compliance details including site photographs in RGGVY web portal.

Tier – III Mechanism

3.0 Ministry of Power, Govt. of India shall enforce Tier-III of Quality Assurance Mechanism.

Ministry of Power shall outsource independent agencies to verify the quality of RGGVY works in 1% of the villages covered under the Project. These independent agencies would be designated as National Quality Monitors (NQM). NQM will review the inspections carried out by TPIA for 0.1% of villages.

3.1. Under this mechanism, adherence to system procedures and guidelines shall also be verified by inspection agency through Quality Assurance Coordinator. Following checks shall be conducted by NQM:

- 3.1.1. 1% randomly selected villages as per approved drawings/ Technical Specifications and FQP
- 3.1.2. At-least one 33/11 kV or 66/11 kV capacity new substation for quality of execution of works at site as per FQP/approved drawings/technical specifications
- 3.1.3. At-least one 33/11 kV or 66/11 kV capacity augmented substation for quality of execution of works at site as per FQP/approved drawings/technical specifications.
- 3.1.4. Review of material test records (MQP & FQP) of important items as described at section 2.1.1 & 2.1.2
- 3.1.5. In 1% villages of the project, 100% verification of BPL connections, 100% Distribution Transformer Substations, 100% of LT Lines and 100% of the 11KV lines attributed to the village (emanating from cut-point/grid substation) as well as the 11 KV line laid within the village, verification of energisation of village & BPL beneficiaries, installation of service connections in public places, hours of supply in the village, time taken by DISCOM to raise first energy bill in favor of beneficiaries.
- 3.1.6. NQM shall also oversee the Contract Management Part of PIA like contractual provisions of identifying defects and their communication to working agencies, timely rectification of defects, time line Assurance mechanism of PIA to rectification of defects, resolution of project related issues and action on delayed project. In their visit, they would give thrust on adherence on systems and procedures of RGGVY schemes by PIA and turnkey contractors. They would also ensure availability and awareness of project specific drawings, documents, quality assurance plans among all stake holders in PIA contractor staff/workers.

3.1.7. NQM shall also see the progress of up-loading of monitoring observations and its compliance details including site photographs in RGGVY web portal.

Abbreviations:

RGVY -	Rajiv Gandhi Grameen Vidutikaran Yojana
MoP -	Ministry of Power
REC -	Rural Electrification Corporation Ltd
PIA -	Project Implementation Agency
QAM -	Quality Assurance Mechanism
QA -	Quality Assurance
FQP -	Field Quality Plan
MQP -	Manufacturing Quality Plan
REDB -	Rural Electricity Distribution Backbone
VEI -	Village Electricity Infrastructure
PQCC -	PIA Quality Control Coordinator
RQCC -	REC Quality Control Coordinator
CPSU -	Central Public Sector Undertaking
TPIA -	Third Party Inspection Agency
RQM -	REC Quality Monitors
NQM -	National Quality Monitors
SQAC -	State Quality Assurance Coordinator
RSQAC -	REC State Quality Assurance Coordinator
ZM -	Zonal Manager
CPM -	Chief Project Manager
BPL -	Below Poverty Line
BOQ -	Bill of Quantity
Village -	Village means village with all associated Hamlets/Mauza/Dhani/Thanda etc.