

Quality Management System in POWERGRID

Topic of Discussion

- ***An Overview of Quality System***
- ***Quality Assurance Plan***
- ***Vendor approval process***
- ***Manufacturer Quality Plan***

ABOUT POWERGRID



- Power Grid Corporation of India Limited (POWERGRID), is a Schedule 'A', 'Maharatna' Public Sector Enterprise of Govt. of India which was incorporated on 23rd Oct 1989.
- Company owns and operates about **172,662 ckt kms** of transmission lines and **265 sub-stations** with transformation capacity of about **485,777 MVA**.
- Availability of transmission network during the year 2021-22 is maintained at over **99%** using state of art technologies.
- Public listed Company :**51.34%** holding by Government of India and balance **48.66%** by public
- Consistently rated “Excellent” under Memorandum of Understanding with Ministry of Power since 1993-94.

What is Quality?

Hard to describe, hence, Every individual defines Quality in his own way.

Some of the common definitions of Quality are as follows:

- Fitness to use
- Reliability
- Serviceability
- Aesthetics
- Luxurious, Rich, Expensive
- Affordability
- Conformance to Standards
- Durability
- Value for money

What Is Quality

In ISO -8402 : 1994 - Quality Management and Quality Assurance – Vocabulary, it is defined as:

“ Totality of features and characteristics of an Entity that bears on its ability to satisfy stated and implied needs”

Where entity is defined as product / service

Overall concept of Quality



QUALITY STEP BY STEP

Why Quality Management

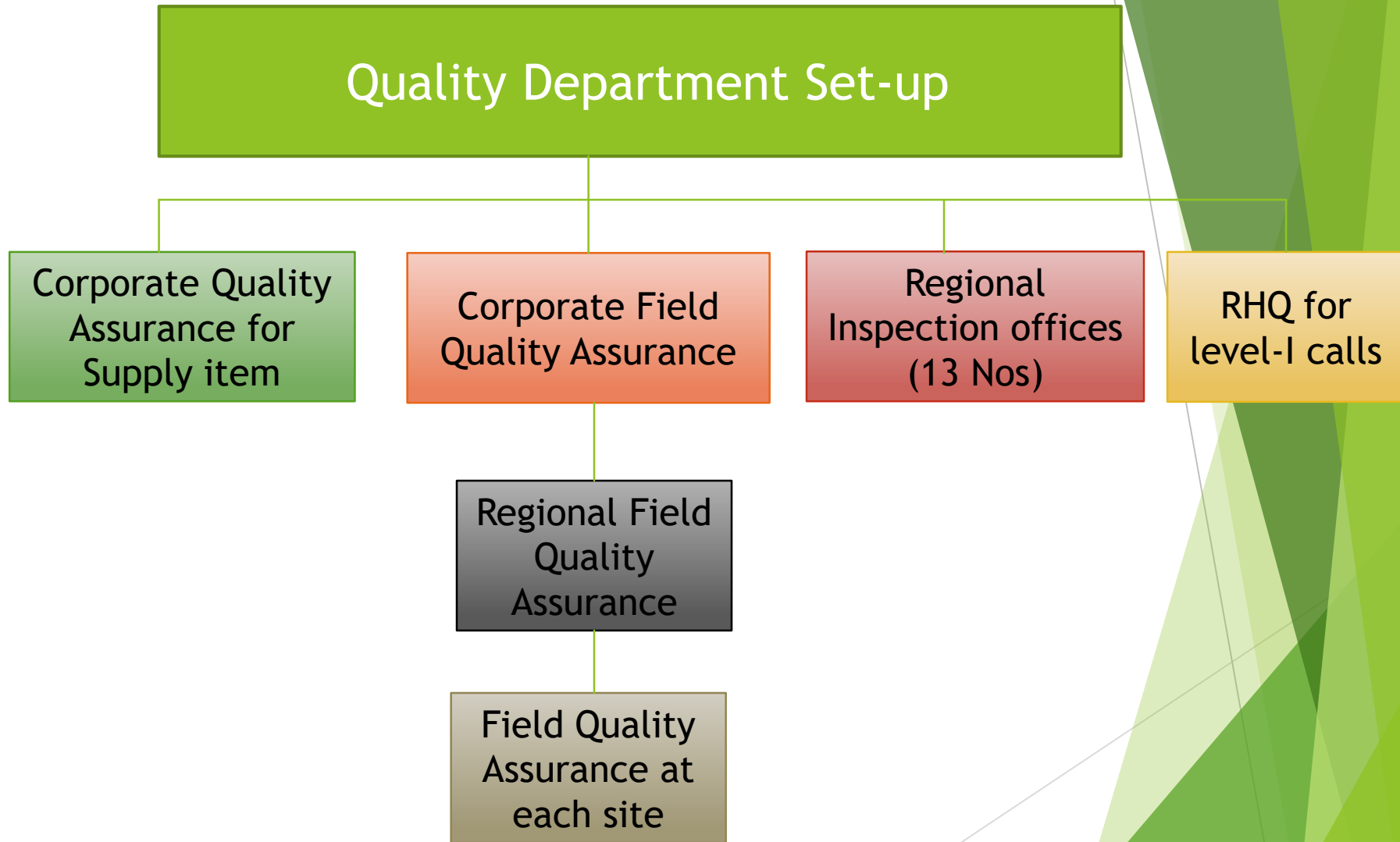
- To handle such a large volume of work involving various materials, equipment and manufacturers
- To reduce time for inspection activities based on type, complexity and importance of equipment
- For timely completion of Projects with specified requirement
- To deliver quality output by each concerned
- To improve processes and monitoring mechanism
- For high availability of installed system
- To minimize O&M cost i.e. less spare inventory
- To bring more transparency
- For confidence building and satisfaction of stakeholders

Quality Assurance & Inspection Department

Objective :

To assure the Quality of Product & Services at different stages of implementation of various projects/contracts so that the product meets the specified technical/functional requirement in line with the organizational goals taking due care of all the occupational health, operational hazards/safety, environmental concerns including those related to energy efficiency & social aspects proactively.

Quality System in POWERGRID



Quality Structure

Roles and responsibilities of Corporate QA

- Pre-award QA activities
- MQP finalisation / re-validations
- Quality surveillance / Audits / Process Inspection
- Vendor/Sub-vendor assessment and approval
- Vendor development
- Deviation disposal
- Developmental Initiatives including systems and procedure for QA&I
- Failure analysis
- Review and Updation of ICMS / Compendium
- Corporate level systems certifications viz ISO
- Encourage Make In India initiative by promoting MSE vendors

Quality Structure

Roles and responsibilities of Inspection Offices

- Inspect the material as per TS / BOQ / Drawing / Standards / Plant Standards / MQP
- Issue CIP / MICC as per contractual requirement including signing of reports wherever witnessed
- Report the failure and / or deficiencies observed during inspections
- Quality surveillance / Audits / Process Inspection / Vendor/Sub-vendor assessment and approval as and when directed
- To follow the guidelines / procedure / instruction issued by CQA and communicate feedback
- Thirteen Inspection Offices (at Gurgaon, Kolkata, Mumbai, Nagpur, Vadodara, Hyderabad, Bangalore, Chennai, Bhopal, Vapi, Chandigarh, Nasik & Raipur)

Quality Structure


Responsibility of Corporate FQA

- FQP finalisation
- To prepare guidelines, formats & procedures for implementation of FQP.
- To ensure compliance of FQP, wherever applicable
- Carrying out FQA audits on Surveillance basis
- Coordination with Regions, QA & I, Engineering for activities related to Field Quality
- Updation of FQP based on feedback.

Quality Structure

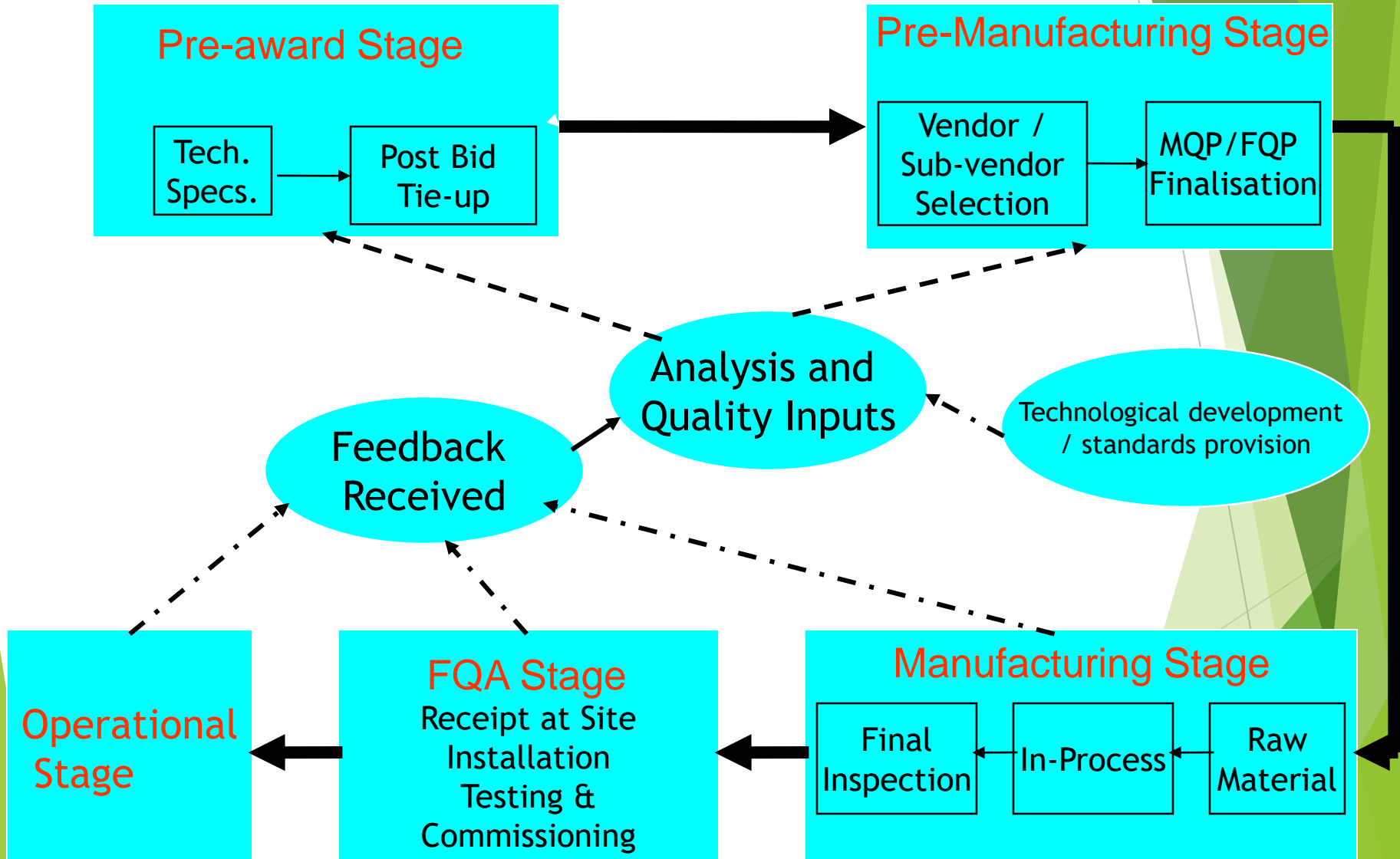
Responsibility of Regional FQA

- To follow the guidelines / procedure / instructions issued by Corporate FQA and communicate feedback, if any
- To assure quality of storage, erection and commissioning of equipment/items as per the guidelines
- To ensure compliance of FQP, wherever applicable



Quality Assurance Plan (QAP)

Quality in Project Cycle Chain



Quality Assurance & Inspection Plan

- ▶ Quality Assurance and Inspection Plan is broadly mention in Cl no 8.3 of POWERGRID technical Specification (Rev 15), which is part of contract agreement (LOA).
- ▶ **Some of the key highlights of this plan are :**
 - ❑ Contractor shall procure bought out items from sub-vendors as per the list in “Compendium of Vendors” available on POWERGRID web-site www.powergrid.in after ensuring compliance to the requirements/conditions mentioned therein.
 - ❑ Contractor shall ensure that order for items where MQP/ITP/FAT is required will be placed only on vendors having valid MQP/ITP/FAT

Inspection Level of various equipment/items

- ▶ Equipment/items are classified in four level based on criticality (*Level- I being the least critical*)
- **LEVEL -1** :- Like Cable Lug/ Gland, Test and measuring equipment, Split AC etc

Contractor to raise all inspection calls and review the report of tests carried out by the manufacturer, on his own, as per applicable standards/ POWERGRID specification and submit to concerned POWERGRID inspection office/Inspection Engineer.

CIP/MICC will be issued by POWERGRID based on review of test reports/certificates of manufacturers

Inspection Level of various equipment/items

- ❑ **LEVEL- 2** - Like Lighting Panel , Lighting pole, Junction Box, EOT Crane, Lift, Cable joint kit etc
- Contractor to raise inspection calls and carry out the inspection on behalf of POWERGRID on the proposed date of inspection as per applicable standards/specification.
- In case POWERGRID wishes to associate itself during inspection, the same would be intimated to Contractor.

Inspection Level of various equipment/items

- ❑ **LEVEL- 3** :- Like Surge Arrester, Cable , LT Switchgear/ ACDB/ DCDB, Clamps and connector, Air Vessel etc
- Contractor to raise inspection calls for both, stage (as applicable) & final inspection and carry out the stage inspections (if applicable) on behalf of POWERGRID on the proposed date of inspection as per applicable standards/specification. However, in case POWERGRID wishes to associate itself during stage inspection, the same would be intimated to Contractor and CIP will be issued by POWERGRID. Else, Contractor would submit the test reports/ certificates of stage inspection after their own review and CIP will be issued by POWERGRID based on review of test reports/ certificates.
- Final inspection will be carried out by POWERGRID and CIP/MICC will be issued.

Inspection Level of various equipment/items

- ❑ **LEVEL- 4** :- Like Transformer/ Reactor , Ckt Breaker , CT/CVT/ IVT, Isolator, Conductor, Tower, Hardware, Insulator etc.
- Contractor to raise inspection calls for both, stage (as applicable) & final inspections. POWERGRID will carry out the inspection for both stage & final inspection as per applicable standards/ specification and CIP/MICC will be issued by POWERGRID.

For Field Quality :- Contractor shall have a separate workforce having appropriate qualification & experience and deploy suitable tools and plant for maintaining quality requirement during construction in line with applicable Field Quality Plan (FQP).

How Inspection are planned

- Contractor shall submit inspection calls over internet through POWERGRID website.
- The required vendor code and password to enable raising inspection call will be furnished to the main Contractor within 30 days of award of contract on submission of documents.
- Raising Inspection call shall be inline with L2 schedule i.e. supply bar chart approved by POWERGRID and not before 30 days from schedule indicated in the bar chart and follow site readiness (eg in case of battery)

How Inspection are planned

- ▶ POWERGRID reserves the right to witness any or all type, acceptance and routine tests specified, for which the Contractor shall give POWERGRID/ Inspector Twenty one (21) days written notice of any material being ready for testing All inspection calls for overseas material shall be given at least forty five (45) days in advance.
- ▶ The equipment shall be dispatched to site only after approval of Routine and Acceptance test results and Issuance of Dispatch Clearance in writing by POWERGRID.
- ▶ Customer inspection Point (CIP)/Material Inspection clearance certificate (MICC) shall be issued by the POWERGRID after inspection of the equipment or review of test reports as applicable.
- ▶ Contractor shall ensure that material which has been cleared for dispatch after inspection will be dispatched within 30 days in case of domestic supplies and within 60 days in case of Off-shore supplies from the date of issuance of CIP

Customer Inspection Point (CIP) and Material Inspection Clearance Certificate (MICC)

- ▶ Customer Inspection Points (CIPs) are identified in the MQP, wherein the inspection and testing is witnessed. The CIP stage could be either in the raw material induction stage, in process stage and/or final inspection stage. There are 05 category of CIPs
 - ❑ Category A (CAT-A) – Material inspected and cleared for dispatch
 - ❑ Category B (CAT-B) – Conditional dispatch at the risk and cost of EPC
 - ❑ Category C (CAT-C) – Material kept under hold
 - ❑ Category D (CAT-D) – Material rejected
 - ❑ Category E (CAT-E) – Material not offered

MICC is issued only for the items cleared in CAT-A only.

Sample CIP



पावर ग्रिड कॉर्पोरेशन ऑफ इंडिया लिमिटेड
(भारत सरकार का उद्यम)
POWER GRID CORPORATION OF INDIA LIMITED
(A Government of India Enterprise)

CIP NO: 9000065002

CIP DATE: Oct 26, 2020

A

CUSTOMER INSPECTION POINT (CIP) REPORT

CALL ID : 2020101243 / Oct 22, 2020
Concluded as Acceptable and authorized for Despatch

Combination of CIP - NIL

CIP STAGE INSPECTION FOR DESPATCH

Material must be dispatched from the manufacturer's premises with in 30 days for on-shore supplies and 60 days for offshore supplies from the issuance of CIP

Purchase Document	6900002483	Manufacturer CIP No	NIL
Contract Name	PO for Off-Shore Contract Agreement for Substation package for STATCOM installations at: (I) 400kV Lucknow and 400kV Nalagarh Substations under installation of STATCOMs in Northern Region; and (II) 400kV Gwalior substation under installation of STATCOMs in Western Region.	Contractor IC No	NIL
Contractor	2200000121 / Montnets Rongxin Technology / No. 108, Keji Road, High-Tech Distr / Liaoning / China	Inspection Date	26.10.2020 to 26.10.2020
Manufacturer	3000000988 / Electrotecnica Artech Hermanos / S.L., Derio Bidea 28, Mungia, Vizca / Spain / Spain	MQP No	AS PER ITP
Annexed Sheet	2	Manual CIP Details	NIL

Part 1

Inspection Report ID	Item ID	Item Name	UM (PO)	PO Line Item Qty	UM (Com. Mat)	Qty Offered	Qty Accepted	Qty Cumm Accept
890000510610	1000032261	INSTRUMENT TRANSFORMERS-MSC - 52kV Voltage Transformer	SET	1.000	EA	1.000	1.000	0.000

Part 2

CIP Reason	CIP Remarks
BT No 52kV VT, Make Artech Spain, Type URD-52, SF No 20011747 for Nalagarh STATCOM project. Inspection witness by POWERGRID Waived off. M/s RKPE has submitted the test report. The submitted test report reviewed in line with ITP and found generally in order. This VT is against replacement of damage VT at site.	Submitted test report found generally in order. Material cleared for dispatch. Since the subject VT is replacement against damage VT of Nalagarh, No MISC is applicable

(On Behalf of Contractor) :

(On Behalf of Manufacturer) :

(On Behalf of POWERGRID) :

Signature

Signature

Signature

Name :

Name :

name : Anurag Arora

Designation :

Designation :

Designation :

Stamp :

Stamp :

Stamp :

Date :

Date :

Date :

Sample MICC



पावर ग्रिड कॉर्पोरेशन ऑफ इंडिया लिमिटेड
(भारत सरकार का उद्यम)
POWER GRID CORPORATION OF INDIA LIMITED
(A Government of India Enterprise)

MICC NO: 1200044655 MATERIAL INSPECTION CLEARANCE CERTIFICATE (MICC)

MICC Date : Oct 5, 2020

Purchase Document : 6900005414

MFG. MICC No. : Nil

Contract Name : Off-Shore Contract Agreement Ref. No. CC-CS/698-SR2/
HVDC-3249/7/G-10/R/CA-11/7214 for execution of ±320kV, 2 X
1000MW VSC based HVDC Terminals and DC XLPE Cable system
between Pugalur and North Trichur associated with HVDC Bipole link
between Western region (Raigarh, Chhattisgarh) and Southern region
(Pugalur,

Contractor : 2200000153 / Sumitomo Electric
Industries, Ltd. / 1-3-13,
Motoaksaka, Minatoku / Tokyo /
Japan

Part I (Details of Item Inspected)

PO Line Item Number	Material	Material Description	UM	PO Line Item Qty	MICC Accepted Qty	MICC Cumm. Qty
660	1000016757	Oil Pressure Tank and 4 tapes	EA	1.000	1.0000	1.000

Part II (CIP Details)

CIP Number	CIP Date	Inspection Call ID	Manufacturer	Issued By
8000056417	Oct 5, 2020	2020091137	3000001096 / Sumitomo Electric / 5-1-1, Hidaka-Cho	Anurag Arora

Part III (MICC Details)

MICC Remarks	Recovery Detail, if Any
Nil	Nil

Certificate

Certified that the Material is Inspected / test certificates reviewed and authorized for despatch as per CIP's given above in part II. All the deviation observed during manufacturing and / or inspection / review have been properly disposed off by the competent authority. This certificate is issued for on account payment purpose only for billable items as above and as per Purchase document approved BOM. This however does not absolve the contractor of his contractual responsibilities.

(On Behalf of POWERGRID) :

Signature :

Name : Anurag Arora

Designation :

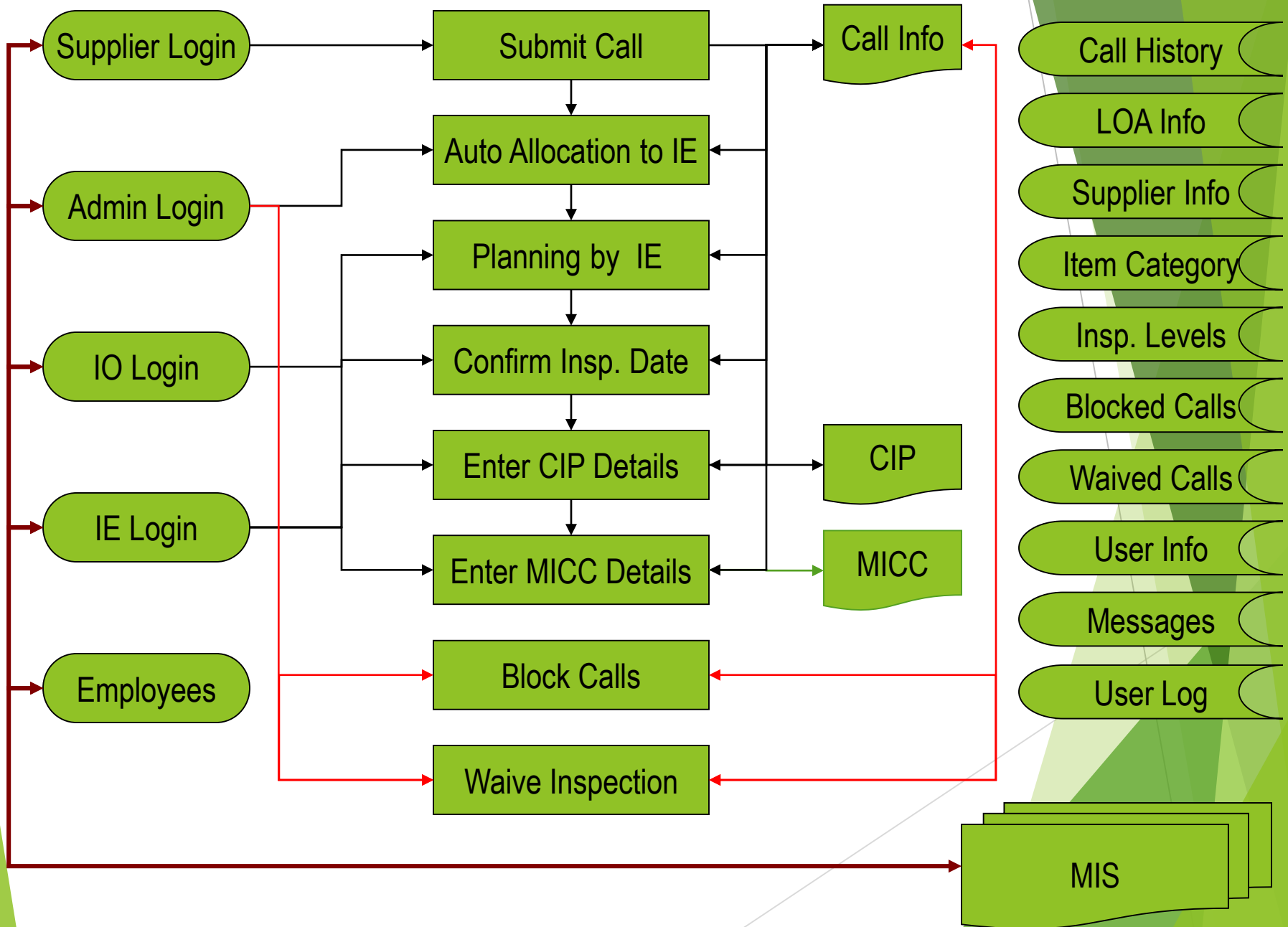
Stamp :

Date :

Web based Inspection Management System

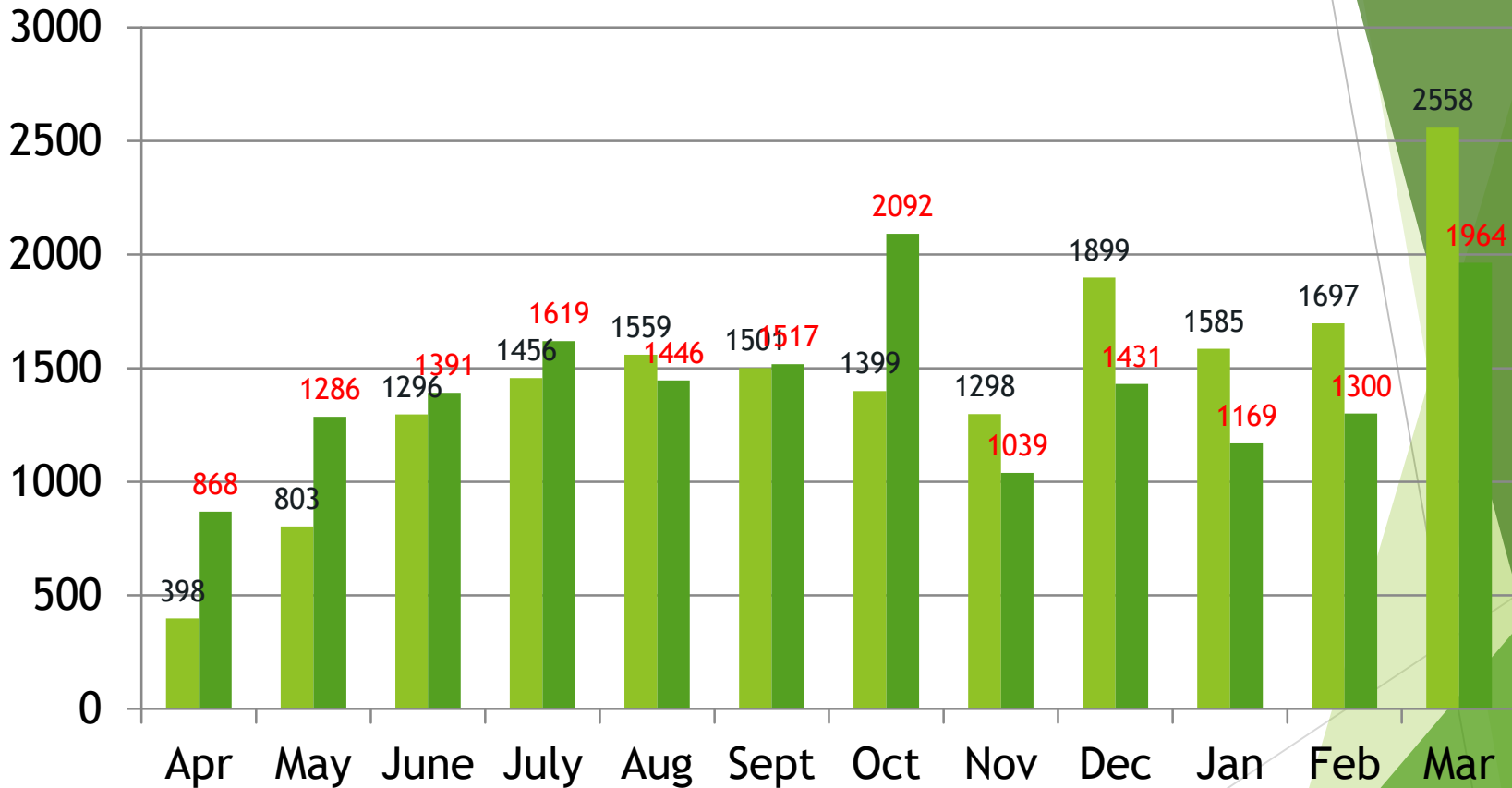
- Complete record of Inspection activities available in SAP/Internet.
- Reduction in Communication expenses Viz FAX, STDs etc.
- Improved Control over Inspection Activities.
- Improved utilisation of Manpower.
- Increased Vendor satisfaction.
- On Line monitoring of Inspection Activities.
- Discipline in Inspection Process
- Transparent Information for all concerned

Inspection Management System Flow Chart



Inspection Call Trend

Total calls received in Financial year 2019-20 & 2020-21



Detail of Inspection Calls

	Achieved in FY 19-20 (In Nos.)	Achieved in FY 21-22 (In Nos.)
Total Domestic inspection calls	17449	17122
Total No. of CAT A CIP issued	13322	15287
Total No. of MICC issued	6150	5407

FY 2022-23 has started with a positive note. 100% Physical witnessing has been commenced w. e. f. 01st April 2022 for domestic inspections. For Foreign inspections also, regular inspections as per Quality Assurance Plan have been approved except for China, Hongkong, Russia and Ukraine.

Quality Initiatives

➤ **Opportunity in the era of Pandemic:**

Like many industries, pandemic due to Covid 19 has affected and taught a lot to us as well. Lot of initiative taken by QA&I for strengthening of our Quality System.

- Online Inspection Call Generation By Contractor
- Automatic Call Allocation To Inspection Engineer Based On Predefined Logic
- Adopting virtual mode of inspection for timely delivery of material during pandemic.
- Digital Signature For Signing Soft Copy of Report
- CIP/MICC Generated In System and Verified By Digital Signature
- CIP/MICC Along with Digitally Signed Report Are Uploaded in System
- MICC is Released Online By Inspector In SAP System For Finance Department
- Keeping all the digital record pertaining to inspection in SAP. All material dispatch clearances were given in time

Quality Initiatives

- Standardization of manufacturing Quality plan, FAT procedure, audit checklist.
- Online Availability of Reference Documents for Inspection (Technical Specification, Drawings, Standard Manufacturing Quality Plan, IEC Standards, IEEE Standards etc.)
- Technical skill upgradation through virtual quality meet.
- Virtual meeting organized with vendor for disposal of any quality related issues
- Document repository in digital form of various departmental circular, guidelines, formats for helping executives.

Shift from Product to Process Inspection

Quality Initiatives

- Regular Process Checks & Audits
- Verification of Compliance to the Observations made during Assessment and Process Audit.
- MQP/ITP of Minor but Critical Equipment like Hanger, D-Shackle, Nuts & Bolts, Re-Rollers, Breaker Structures, EOT Cranes, UPS etc.
- Vendor approval for one year and subsequent renewal based on performance during initial approval period instead of earlier open approval
- Regular involvement in failure analysis to find out Root Cause of Failure.

Quality Initiatives

- Combination of inspection calls under same / separate Contracts.
- Shifting of Product to Process inspection of main manufacturer / critical component manufacturer
- Grading of vendor based on select parameters for reductions in inspections
- Opening of Quality Improvement Register at manufacturer works for continuous monitoring of quality improvements
- Emphasis on development of in-house facilities by manufacturer.
- Issuance of CIPs by Region for Inspection Level-I items

Quality Initiatives

- Category-D CIPs are analyzed and Corrective/Preventive actions are taken at Manufacturer works to avoid Problem in future.

As a validation measure, Cable tested at manufactured works are selected for re-testing in accredited Third Part Lab,

- Outsourcing of galvanizing and fabrication activity from unapproved sources also found at the works
Warning letters issued to all.

Quality Initiatives

- Procedure / Guidelines for Sample Sealing during acceptance testing of Conductor, Earth wire , Cables & OPGW.
- Procedure for revalidation of calibration every year for testing and measuring equipment / instruments at the supplier's works from accredited approved lab in presence of POWERGRID executive.
- Removal of Vendors from COV based on Site Feedback, not showing interest towards improvement, Regular Cat-D CIP.
- Guidelines for taking care of unethical practices by suppliers

Quality Initiatives

- To ensure that tower or structure material is fabricated from billets of primary producers, chemistry of MS and HT steel of each primary producer has been finalised.
- Chemistry is also tested on finished angle sections directly procured by fabricators from prime producers without initial inspection (Zero inspection) at raw material stage.
- New sub-vendors (primary producer with integrated plant) are approved for billets with same controlled chemistry to meet the scarcity of billets for re-rollers.

Quality Initiatives

- **PG embossing introduced on Nut and Bolts to avoid mixing of B & N manufactured from unapproved wire rod sources.**



To streamline the process of manufacturing of B & N, MQP has been finalised and implemented at all fastener works.

- **Raw material sources for B&N also fixed**

Confidence building and Transparency

- Defining various approval processes in Internal documents and making it available on web-site
- Defining requirement of MQPs and Inspection Levels at the time of award itself
- Web based Inspection Call Management System
- On-line issuance of CIP and MICC
- Compendium of approved vendors at web-site for reference of all concerned
- Annual vendor meet to address their issues and get 360⁰ feedback.

Make in India Approach

765kV Class Transformer/ Reactor

- Presently being supplied from Indian works, mostly
- Foreign bidders to supply at least one Transformer/ Reactor from India

765kV class CBs, Instrument Transformers

- Most of these are presently being supplied from Indian works

GIS Equipment

- 400kV & below GIS Switchgear now being offered from India by a no. of vendors
- For 765kV Class GIS, Foreign manufacturer have established their manufacturing facility in India .
- For 765kV Class GIS, it is mandatory for a bidder to supply at least one bay from its Indian Factory.

±800kV HVDC Equipment

- Thyristor- at least 50% to be assembled in India

SVC & STATCOM

- At least one SVC/STATCOM to be sourced from India

HTLS Conductors, Insulators & EHV cable

- Suitable provisions being proposed to promote manufacturing in India

Making India Industry Rich



- Indian manufacturers have requisite skills, have developed systems over the period & manufacture quality products.
- Support for vendor development and capacity enhancement.
- But.....We need to improve further on
.....
 - Engineering/R&D activities
 - Quality during manufacturing
 - Field Quality

Integrated Management Systems & ISO certifications

- POWERGRID achieved unique distinction of being first power utility and second company in the world to get certified with Integrated Management System(IMS) as per Publically Available Specification, PAS 99 integrating requirement of ISO 9001(Quality), ISO 14001(Environment) and ISO 45001:2018(Occupational Health and Safety Management System).
- POWERGRID achieved another milestone in its quest for excellence in quality management and got certified to Social Accountability standard SA-8000.
- POWERGRID Corporate office & NTAMC building is also certified for ISO 50001 for energy efficiency.
- POWERGRID has also acquire certification for Information security management system ISO 27001.

Way forward



- Strict Adherence to Safety norms
- More focus on Field Quality
- Skill development
- Focus on prevention rather than detection.
- Self stimulating & self regulating system for process checks leading to envisaged quality product.
- Reduce inspections intelligently.
- Thorough Strictness on Staff Integrity

The background features abstract, overlapping green geometric shapes in various shades, primarily on the left and right sides, framing a central white area. The shapes include triangles and polygons, some with thin white outlines.

Vendor Development Programme

Vendor Development

- Vendor development is a regular process in POWERGRID . A lot of thrust is given to develop and approve new vendors in line with Govt of India MSME development initiative.
- At POWERGRID, manufacturer having good facility with emphasis on quality are encouraged to get registered with POWERGRID .
- Increase in Vendor base , development / adoption of new emerging technologies , improvement in the quality system and enhancement of vendor capacity are key focussed areas in POWERGRID

Official link of approved vendor on POWERGRID Website

- Once a vendor gets registered with POWERGRID , their name appears on POWERGRID Website in Compendium of Vendor and is accessible to all the stakeholders . The website link is
- <http://apps.powergrid.in/ims/50-0001-002.aspx>



Home/होम Action Menu/एक्शन मेनू View Menu/व्यू मेनू Other Menu/अन्य मेनू COV Menu Guest Menu/गेस्ट मेनू

Compendium of Vendors of the Equipment...

Enter a Search String :

Enter the Field to Search for: Search Clear Filter No Paging

[URL for NABL accredited test laboratory](#)

Go to [Laboratory Search](#) >> [accredited labs](#) >> [field:Testing](#) >> [Discipline:Please Select](#) >> [Group](#) >> [Please Select](#) >> [SEARCH](#).

- [List of Important Components of LA upto 420 KV class.](#)
- [List of Important Components of Power Transformer upto 420 KV class.](#)
- [List of Important Components of Power Transformer for 765 KV class.](#)
- [List of Important Components of CT upto 420 KV class.](#)
- [POWERGRID Approved Cement Brand](#)
- [Vendor List for Circuit Breaker](#)
- [Vendor List of Items/Components for SAS and C&R Panels](#)
- [Vendor List Items/Components for Fire Protection System](#)
- [Sub Vendor list for components of LT & DT Transformers up to 33 KV class](#)
- [GIS Main Component Vendor List](#)
- [Vendor List Ner](#)

Official link of approved vendor on POWERGRID Website

- One can search in this web-link for any approved vendor based on the item or by Vendor name .
- The confirmation that whether subject vendor is approved by POWERGRID or kept under hold is also mentioned in this .
- An example for search of item say “cable” is shown in the coming slide



INSPECTION CALL MANAGEMENT SYSTEM
World's Second Company to Obtain PASS99 Certification



POWER GRID CORPORATION OF INDIA LIMITED
(A Government of India Enterprise)

Home/होम Action Menu/एक्शन मेनू View Menu/व्यू मेनू Other Menu/अन्य मेनू COV Menu Guest Menu/गेस्ट मेनू

Compendium of Vendors of the Equipment...

Enter a Search String :

Enter the Field to Search for: ItemName

Equipment Name	Item Name	Vendor	Address	City	Approval For	PG / DMS	Conditional Remarks
CABLE SYSTEM	CABLE TERMINATION SYSTEMS	RAYCHEM RPG LIMITED	Raychem RPG Private Limited Village_ Kanjari, Taluka - Halol Nr Halol GIDC, Dist - Panchmahal Gujarat 389350	VADODARA	Upto 66 kV	PG	
CABLES	PVC POWER CABLE	HAVELLS INDIA LIMITED	A-461/462, MIA, ALWAR	ALWAR	UPTO 1.1 KV	PG	
CABLES	PVC CONTROL CABLE	HAVELLS INDIA LIMITED	A-461/462, MIA, ALWAR	ALWAR	UPTO 1.1 KV	PG	
CABLES	CABLE (INSTRUMENTATION)	CORDS CABLE INDUSTRIES	A-525, INDUSTRIAL AREA, CHOPANKI, BHIWADI, DISTT: ALWAR, RAJASTHAN.	BHIWADI	SCADA PROJECTS	PG	
CABLES	PVC CONTROL CABLE	KEI INDUSTRIES	D-90 OKHLA INDUSTRIAL AREA,PHASE-I,NEW-DELHI-110020 WORKS: 919/920, RIICO Industrial Area,PHASE III, Bhiwadi, Dist- Alwar-301 109 . Rajasthan.	BHIWADI	UPTO 1.1 KV	PG	
CABLES	PVC POWER CABLE	KEI INDUSTRIES	D-90 OKHLA INDUSTRIAL AREA,PHASE-I,NEW-DELHI-110020 WORKS:919/920, RIICO Industrial Area,PHASE III, Bhiwadi, Dist- Alwar-301 109 . Rajasthan.	BHIWADI	UPTO 1.1 KV	PG	
CABLES	XLPE CABLE	KEI INDUSTRIES	D-90 OKHLA INDUSTRIAL AREA,PHASE-I,NEW-DELHI-110020 WORKS:919/920, RIICO Industrial Area,PHASE III, Bhiwadi, Dist- Alwar-301 109 . Rajasthan.	BHIWADI	UPTO 33 KV	PG	
CABLES	PVC POWER CABLE	SUYOG ELECTRICALS LIMITED	A/2 2204/2205, G.I.D.C., HALOL, DIST:PANCHMAHAL-389350	PANCHMAHAL	UPTO 1.1 KV	PG	
CABLES	PVC CONTROL CABLE	SUYOG ELECTRICALS LIMITED	A/2 2204/2205, G.I.D.C., HALOL, DIST:PANCHMAHAL-389350	PANCHMAHAL	UPTO 1.1 KV	PG	
CABLES	AERIAL BUNCH CABLES	SUYOG ELECTRICALS LIMITED	A/2,2205, G.I.D.C., halol, Distt : Panchmahal	PANCHMAHAL	UPTO 1.1 KV	RE/APDRP	

Vendor Approval Process

- The Vendor Registration process is a transparent process in POWERGRID.
- The Process involve request from Micro or Small Enterprise Vendor along with relevant documents to be submitted to POWERGRID Corporate Engg or QA&I dept for further processing .
- The documents submitted by vendors are reviewed

Vendor Approval Process

Various items are broadly categorized as QR and Non – QR items

QR Items –

Qualifying Requirements as mentioned in the Technical Specification like CB, Transformer, CT, CVT, LA, LT Panels, Cable, Isolator, Tower, conductor, insulators etc.

Committee formed with nomination from Engg Department and QA&I Department

Non QR Items by QA&I deptt.

Other items/equipment whose Qualifying Requirements not mentioned in the Technical Specification like black angle sections, substation structures, core wire, insulation Paper, PICC/CTC, Transformer tank, radiators, Oil, CRGO, Al Bus Bar, Casting, Measuring Instruments etc

List of Documents required for Vendor Registration

The List of documents required to be submitted along with request letter is as follows

1. Registration, License of the works & Proof of MSME
2. Organization chart with name and qualification of key persons
3. List of Plant and Machinery.
4. List of testing equipment with their calibration status.
5. List of Raw material, bought out items with sourcing details
6. List of supply in last three years.
7. Third party approval, if any (viz. ISO, BIS),
8. Pollution clearance wherever applicable
9. Energy Conservation & Efficiency report enclosed (Applicable to industries having contract load more than 100 KVA)
10. Sanctioned load and Back up power/Shed area/Storage area
11. Formats for RM, in process and acceptance testing
12. Type test approvals conducted in last 5 years if applicable
13. Performance Certificates from customers
14. Photographs of factory, plant and machinery & testing facilities

Assessment Process

- After Scrutiny of the documents submitted by vendor to ensure relevance and broad conformation with regard to quality system , Statutory compliances etc , a committee of POWERGRID Officials from Engg and QA&I dept , as the case may be , visit the manufacturing facility of the vendor for assessment.

- During the assessment of facility any Non Conformity/ points of improvement observed is discussed with the vendor .

- Based on the assessment report Issuance of Acceptance/ rejection letter or conveying observations, if any

Approval Process

- After submission of compliances by vendor and its verification by POWERGRID , the vendor is approved and the name of firm is uploaded in the COV
- Any vendor is approved initially for a defined period of one year or for a specific project.
- Based on performance during the period, further extension is granted.
- Standard Feedback format for evaluation.
- Extension is also granted for a defined period based on feedback-6 months in case of any issue or 3 years, if all is well

Testing, Calibration, Instrumentation

At POWERGRID we insist that all the measurement and testing shall be carried out by instruments having valid calibration certificate .

All the test and measuring instruments are required to be calibrated by accredited approved laboratory .

The manufacturer shall ensure that their as well as their sub vendors control, metering & testing instruments are duly calibrated by an agency operating in line with ISO/IEC 17011 and membership & MRA (Mutual Recognition Arrangement) of ILAC (International laboratory accreditation corporation) / APLAC (Asia Pacific Laboratory Accreditation Cooperation) .

Manufacturing Quality Plan (MQP)

Manufacturing Quality Plan

- ▶ Why we need Manufacturing Quality Plan (MQP)
- ▶ Who will make the manufacturing quality plan.
- ▶ What will be the content of MQP
- ▶ How the MQP shall be implemented & its validity.
- ▶ Who will follow the MQP.
- ▶ Who will interpret MQP, in case of any dispute
- ▶ Who is the approving authority for MQP
- ▶ Do we need MQP for all items/ equipment
- ▶ POWERGRID procedure for MQP
- ▶ Disposal of rejected material.

Why we need Manufacturing Quality Plan (MQP)

- ▶ Standard Format to manufacturer & Inspecting officer.
- ▶ Review by POWERGRID based on TS, GTP, Drg., IS/IEC, Plant Stds.
- ▶ Ref Feedback from Site or experience with other suppliers for similar item
- ▶ Discussions and Mutual Agreement with manufacturer
- ▶ Clarity on Sampling plan for acceptance and routine test
- ▶ Clarity on inspection at Stage / or during final acceptance test.
- ▶ Clarity on record review of various raw material used in process for manufacturing.
- ▶ Avoiding dispute at later stage, as manufacturing process and inspection is time consuming & a commercial activity and affect project supply schedule if dispute arises during final stage of inspection.
- ▶ Jointly Sign MQP for 1 year initially
- ▶ Further extension based on – Performance Feedback from RIO, Site, Order Position etc.

Who will make the Manufacturing Quality Plan (MQP)

- ▶ Though POWERGRID has standardized its MQPs for various items/ equipment's , however a new vendor, once approved for an item/equipment, where there is requirement of MQP, needs to be educated for the same.
- ▶ Further, any new item may also arise based on project specific requirement, for which MQP may needs to be finalized.
- ▶ The finalization of MQP involve review of TS/ GTP/ Drawing/ project specific requirement if any/ relevant standard (IS/IEC/ASTM etc).
- ▶ The Manufacturer need to submit the MQP to Quality Assurance dept, which shall be reviewed by respective group, looking after the subject item, and after mutually agreeing the requirement with the manufacturer , the same is putup for approval of competent authority.

Content of Manufacturing Quality Plan (MQP)

Broadly the MQP cover the following important aspects:

- ▶ Standard Header of MQP
- ▶ Notes & Codes [Processed based MQP]
- ▶ Process Flow Chart
- ▶ Raw Material Inspection
- ▶ In Process Inspection, Stage Inspection
- ▶ Routine Test before offering for Final Inspection
- ▶ Final Inspection based on sampling plan
- ▶ Packing & Dispatch

Notes & Codes [Processed based MQP]

► Notes

The MQP should be read in conjunction with POWERGRID specification and shall deem to include additional tests if any required as per the contract.

POWERGRID specification shall include provisions of letter of Award, POWERGRID Approved Drawings / Technical data sheet / BOM / Test Schedule / Test procedure applicable to the specific contract.

In case of any contradiction between the manufacturer's plant standards, this MQP and POWERGRID specification following precedence shall be followed:

- a) POWERGRID specification.
- b) This Manufacturing Quality plan.
- c) Manufacturer's plant standards.

It is the responsibility of the manufacturer to ensure that this document is readily available at their works, as well as at the works of their sub vendors in order to avoid any delay at the time of inspection.

The manufacturer shall ensure that their as well as their sub vendor's control, metering and testing instruments are duly calibrated and should have calibration certificates traceable to Indian/International standards. Calibration records should be available during inspection by POWERGRID. Key testing instruments will be calibrated by an agency having full membership & MRA of ILAC/APLAC

6	In case of any tests being carried out at third party Lab. such lab / facility should be an agency having full membership & MRA of ILAC/APLAC accredited / accepted by POWERGRID
7	The manufacturer shall maintain the proper co-relation of test certificates from raw material stage to finished product stage and the records should be available during inspection. by POWERGRID.
8	Manufacturer shall show the approval of POWERGRID engineering for all contract specific type tests , including specific type tests if any as per the POWERGRID specification, at the time of final inspection
9	All packing cases should be marked with POWERGRID LOA details , name of project , item description and CIP/MICC number (by which material has been cleared for dispatch) .
10	One copy of test report , CIP & MICC shall also be sent along with consignment .
11	Inspection of spare items ordered by POWERGRID shall also be governed by the provisions of this MQP . Items if not governed under MQP shall be offered for inspection as per POWERGRID specifications / Relevant-Indian / International Specification .
12	The manufacturer shall align their quality system and that of their sub-vendors to the requirements of latest ISO 9000 quality standards in a time bound manner .
13	The relevant details of plant standards and quality plan for different ratings are shown in attached Annexure.
14	POWERGRID may review the effective implementation of the processes during the product-inspection / process-inspection. In case any violation in process or process parameters are observed, the reason along with corrective & preventive measures shall be conveyed to POWERGRID within 2 weeks.
15	<p>In case of rejection of the offered lot of cable after testing as per MQP/Technical Specification/IS, the rejected material and the samples already tested shall be scrapped</p> <ol style="list-style-type: none"> 1. The rejected lot/tested samples shall be clearly identified and stored separately to avoid any mix up with any in-process/finished lot till the same is disposed off. 2. The supplier shall arrange for cutting of the rejected cable lot in bits & pieces which shall be sold as scrap. 3. In case supplier intends to dispose off rejected material through any other mode, the same shall be done with approval of RIO . 4. Necessary supporting documents in regard to (2) and (3) above, shall be submitted for verification of POWERGRID RIO and record shall be maintained at manufacturer's works. <p>EM : Equipment Manufacturer CM : Component Manufacturer</p>

Special remarks for some equipment in the notes in respective MQP

▶ For Transformer:

- ▶ Manufacturer to get clearance/approval from POWERGRID Engineering for Type test on first Transformer of each rating against each contract
- ▶ No inspection call shall be raised unless and until GTP/Drawings/ Design Reviews /Type test reports approved by POWERGRID Engineering
- ▶ X'MER OEM shall ensure that all tests mentioned in the technical specification of subject contract in question need to be carried out strictly, without fail

Special remarks for some equipment in the notes in respective MQP

▶ For Transmission line items like Tower, conductor, Hardware

- ▶ The packing shall be as per POWERGRID specification and have sufficient to withstand rough handling during transit, storage at site and subsequent handling in the field. All packing cases should be marked with POWERGRID LOA details, name of project, item description and CIP/MICC number. (By which material has been cleared for dispatch)
- ▶ Inspection of spare items ordered by POWERGRID shall also be governed by the provisions of this MQP. Item if not governed under MQP shall be offered for inspection as per POWERGRID Specification.
- ▶ Welding jobs shall be done by qualified welders and shall be approved by POWERGRID as per approved welding procedure.

Special remarks for some equipment in the notes in respective MQP

- ▶ **For Transmission line items like Tower, conductor, Hardware**
- ▶ If any activity (for which manufacturer is already approved) is being outsourced due to some exigencies/ unforeseen circumstances, then prior approval from POWERGRID needs to be taken.
- ▶ The manufacturer if purchasing the steel sections directly from the re-rollers, the POWERGRID approved re-roller MQP to be ensured. If black angle sections are procured from steel producers, the manufacturer have the responsibility to check the chemistry of material (agreed chemistry as indicated in std MQP) meeting the test certificate values.
- ▶ Nuts/Bolts, Nuts/lock nut of foundation bolts , Step Bolts / Nuts and other bought out items to be procured from POWERGRID approved sources and inspection at sub-vendor's works with CIP.
- ▶ The sample pieces consumed in a testing shall be replenished by the manufacturer at the time of dispatch. If the offered material meets the quality requirements, CIP/MICC shall be issued for total quantity offered without deducting the weight of materials consumed in testing.

Special remarks for some equipment in the notes in respective MQP

- ▶ **For Transmission line items like Tower, conductor, Hardware**
- ▶ Pieces of light sections to be wire bundled & of heavy sections to be supplied loose. Stacking to have proper ventilation and kept inclined. Damage to galvanization coating to be avoided while handling. The fabricator to ensure sequential supplies and other details as per POWERGRID Technical Specification
- ▶ In case tower part to be used at sub zero temperature, we may carry out Impact testing at -20° C during final inspection in line with IS/ POWERGRID TS.

Special remarks for some equipment in the notes in respective MQP

- ▶ **For Transmission line items like Tower, conductor, Hardware**
- ▶ The conductor manufacturer shall maintain records of the joints in inner layer of the conductor for all the drums and shall submit the records to POWERGRID for review at the time of Inspection.
- ▶ Conductor sealing shall be as per approved sealing procedure. The conductor ends are required to be sealed with heat shrinkable sleeves and shall be properly secured with the drum by "U" clamps (nail). after covering the conductor with PVC adhesive tape to avoid loosening of conductor layers during transit and handling.
- ▶ The manufacturer may supply the conductor in returnable/non-returnable (as per TS) painted steel drums. After preparation of steel surface according to IS 9954, synthetic enamel paint shall be applied after one coat of primer. For Wooden Drums, the inner cheek of the flanges & drum barrels surface shall be painted with Bitumen based paint.

Special remarks for some equipment in the notes in respective MQP

- ▶ For Transmission line items like Tower, conductor, Hardware
- ▶ The Lay ratio of any Aluminum layer shall not be greater than the lay ratio of Aluminum layer immediately beneath it.
- ▶ The conductor manufacturer shall carry out process audits on quarterly basis at galvanized steel wire manufacturer works as per approved MQP of steel wire. The audit report shall be made available for POWERGRID review during product inspection/process audits.
- ▶ Standard length & random length of conductor shall be governed as specified in POWERGRID technical specification.
- ▶ Rejection & retests shall be as per IS 398 part 5.
- ▶ The manufacturer shall inform site and concerned inspection office for 1 sample per 500 kM sample selection at site for re-acceptance test at TPL or at manufacturer's lab. (Refer C1 in TS)
- ▶ The size & acceptance test criteria for different types of conductor shall be as per approved GTP.

Standard Header of MQP

MANUFACTURER NAME & ADDRESS	CUSTOMER	MANUFACTURER CODE	ITEM	MQP NO		VALID FROM
	POWER GRID CORPORATION OF INDIA LTD		REV NO			VALID UPTO
				DATE		

S.NO	Components / Operations & Description Of test	Type of Check	Quantum of Check / Sampling with basis	Reference document for testing	Acceptance Norms	Format of Record	Applicable codes						Remarks
							1	2	3	4	5	6	
A	B	C	D	E	F	G							H

CODES

Code 1	Description	Code 2	Description
A	At Equipment Manufacturer's works	J	The Equipment Manufacturer
B	At Component Manufacturer's works	K	The Component Manufacturer
C	At Authorized Distributor's place	L	The Third Party
D	At Independent Lab	M	The Turnkey Contractor
E	At Turn Key Contractor's location		
F	Not specified		
Code 3	Indicates who shall witness the tests i.e. Witnessing Agency	Code 4	Review of Test Reports/Certificates
P	Component Manufacturer itself	W	By Equipment manufacturer during raw material / bought out component inspection
Q	Component Manufacturer and Equipment Manufacturer	X	By Contractor during product/process inspection
R	Component Manufacturer, Equipment Manufacturer and Contractor	Y	By POWERGRID during product/process inspection
S	Equipment Manufacturer itself	Z	By Contractor and/or POWERGRID during product/process inspection
T	Equipment Manufacturer and Contractor		
U	Equipment Manufacturer, Contractor and POWERGRID		
V	Third Party itself		
Code 5	Whether specific approval of sub-vendor / Component make is envisaged?	Code 6	Whether test records required to be submitted after final inspection for issuance of CIP/MICC
E	Envisaged	Y	Yes
N	Not Envisaged	N	No

Key Points

- ▶ It is ensured that inspection, measuring and testing equipment used by contractors/sub-contractors are calibrated to the specified accuracy class through third party agencies having its tractability as per guidelines/MQP. No equipment is allowed to be used for inspection, measuring and testing purposes unless it is calibrated.
- ▶ Item shall be periodically selected at random from the offered lots and tested both at supplier's works and at third party labs at the supplier's cost and the same shall be witnessed by POWERGRID inspecting official.

QUALITY IS A JOURNEY
AND
NOT A DESTINATION



Thank