

**The Tata Power Company Limited Invites Tenders** through E-Tender Two-Part bidding process from interested bidders (with manufacturing / assembling facilities in India) for the following electrical package required for its Transmission Divisions: -

**A. Summary of the tendered packages:**

Sr. No.	Description	Tender Reference no.	Bid Guarantee Fee / EMD (Rs.)	Tender Fee (Rs.)
For the following package contact person shall be Mr. Pravinkumar Jagtap ( <a href="mailto:pravinkumar.jagtap@tatapower.com">pravinkumar.jagtap@tatapower.com</a> ).				
1.	Corrigendum to Tender issued vide advertisement published Dtd. 26th September 2024 – Supply of 145 kV Isolators for Kalyan, Ambarnath and Trombay receiving stations.	CC25PJ021	50,000 /-	2,000 /-

Please note, above is a Corrigendum to the Tender CC25PJ021 advertised on 26th September 2024.

The bidders who have already participated in the Tender shall be retained as “Participant” & they shall not be required to participate again by submitting the Tender Fee of INR 2,000 /-.

For additional technical details and Revised BOQ for the subject works please refer **Section C** below.

**B. Guidelines for Participating:**

Interested bidders having executed similar projects can participate by submitting the following up to **1500 Hrs. 07<sup>th</sup> October 2024**.

Last Date of receipt of pre-bid queries, if any. By 10th October 2024.

Last Date of Posting Consolidated replies to all the pre-bid queries as received by 14th October 2024.

Last date and time of receipt of Bids By 18th October 2024.

1. Non-Refundable Tender Fee, as indicated in table above, in the form of
  - a. Direct deposit in the following bank account and submit the receipt along with a covering letter clearly indicating the Tender Reference number –  
Beneficiary Name – The Tata Power Co. Ltd.  
Bank Name – HDFC Bank Ltd.  
Branch Name – Fort Branch, Mumbai  
Address – Maneckji Wadia Building, Nanik Motwani Marg, Fort, Mumbai 400023.

Branch Code – 60

Bank & Branch Code – 400240015

Account No – 00600110000763

Account type – CC

IFSC Code – HDFC0000060

2. Bidders to also submit duly signed and stamped letter indicating name of authorized person, contact number and e-mail id (mandatory) on Bidder's letterhead. It is mandatory to mention Tender Reference no. in the said letter.

Note: - Once the above-mentioned documents are received, detailed RFQ shall be issued through our e-tender system.

Interested Bidder must get in touch with respective contact person, mentioned above, at Tata Power Sahar Receiving Station, T2 Airport Road, Sahar, Andheri (E), Mumbai 400 059 (Near Leela Hotel) for submitting the documents.

It may please be noted that all future correspondence will be strictly done only with **Interested Bidders** who have done the above steps in time with Authorized Person only through Tata Power E-Tender System.

Earnest Money Deposit (EMD) of **INR 0.50 Lakhs** is not to be submitted now and is required at a later stage along with tender submission in the form of Bank Guarantee.

#### **Section C:**

1. **Addition technical details:** (Specification for 145kV Isolators for Trombay station).
2. **Revised BOQ**

**The Tata Power Company Ltd.****Engineering (T&D)**

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## Procurement of 145kV Isolator for BPCL 110 kV supply extension at Trombay

**Document Title: Specification for 145kV Isolator**

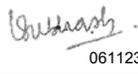
**Project ID: TE00517**

**Document No: TE/SP/0051/FY24**

### TATA POWER

The Tata Power Company Limited

Antop hill receiving station, samadhan road antop hill, Mumbai 400 037.

Revision	Date	Description	Approvals		
			Prepared By	Checked By	Approved By
0	26-10-2023	First Issue	PSM	NPT	SKV
					 061123

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**CHECK LIST FOR DOCUMENTS TO BE SUBMITTED ALONG WITH THE BID**

<b>S No</b>	<b>Document Name</b>	<b>Submitted by Bidder Yes / No</b>
1	Signed copy of bid document as a token of acceptance	
2	Dully filled in schedules, listed in section 'C'. i.e. Schedule C1 to C9	
3	Qualifying Requirement -Attached as annexure II of Excel sheet	
4	Quality Assurance Plan (QAP), Manufacturing Quality Plan (MQP), Field Quality Plan (FQP) as applicable.	
5	General Arrangement Drawings for equipment offered	
6	Filled up Data Sheets– Attached as Annexure IV of Excel Sheet	
7	Type Test Reports as applicable.	

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## A1 INTENT OF SPECIFICATION

Tata power has planned to procure total 2 no's of 145 kV isolator with earth switch and 4 no's of 145 kV isolator without earth switch at Trombay station-A. This enquiry specification covers the Engineering, Design, manufacturing, Supply and supervision during erection, testing and commissioning of 145kV isolators along with Cu clamps and connectors.

## A2 PROJECT INFORMATION

1.0	Owner	The Tata Power Company Limited
2.0	Consultant	NA
3.0	Location of the plant	Trombay Thermal Power Station Mahul road, Chembur Mumbai 400074, Maharashtra, India
4.0	Nearest Rail head	Site is connected by rail network
5.0	Transport	Access roads are available for movement of materials to site.
6.0	Plant Elevation	Above mean sea level but less than 1000 meters
7.0	Climatic conditions	Atmosphere is generally hot, humid and is conducive to pollution, rust and fungus growth. It is laden with salt sprays, chemical fumes, steam and dust. Relative humidity is over 95% during 4 months in a year when about 3000 mm (total) rainfall takes place. The equipment offered shall be suitable for satisfactory operation under these conditions and polluted atmosphere
7.1	Temperatures:	
	(a) Maximum dry bulb temperature	36.7 Deg C
	(b) Minimum dry bulb temperature	18.3 Deg C
	(c) Design temperature for electrical equipment / devices	50 Deg C
	(d) Design humidity	100%
7.2	Relative humidity	
	(a) Maximum during monsoon	100%

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(b) Minimum during December to 22%  
January

8.0 Wind data

Calculations for wind effect shall be in accordance with IS: 875-1987(Part-3) taking into account the following:

- (i) Basic wind speed = 44 m/sec
- (ii) Factor K1, K2, K3 = as per IS 875 Part-3
- (iii) Category of terrain = as per IS 875

10.0 Seismic conditions

The proposed site is located in seismic zone III as per the Indian Standard IS 1893 latest issue, Coefficient: 0.04, Importance factor (I): 2.5 for electrical equipment and 1.5 for others.

11.0 Air Quality

Atmosphere polluted with industrial gases and wastes

12.0 Sea water temperature

- (a) Maximum 36.7 Deg C
- (b) Minimum 22.8 Deg C
- (c) Average 29.8 Deg C

13.0 Auxiliary Power Supply:

Auxiliary electrical equipment to be supplied against this specification shall be suitable for operation on the following system:

(a)	DC solenoids, DC alarm control and protection	220 V DC, 2-wire unearthed DC supply from Station Battery / Battery Charger.
(b)	AC control & protective devices	110V, 1 phase, 2 wire, 50 Hz AC supply with one lead earthed.
(c)	Construction supply	415V, 3 phase, 3 wire, 50Hz AC supply with resistance earthed.
(d)	DC Power Supply System for Protection and Control	220 V DC, 2-wire ungrounded DC supply
(e)	DC Power Supply System for SCADA	48 V DC, 2-wire ungrounded DC supply
(f)	Communication Supply	48 V DC Positive grounded, 2 wire DC supply

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(g)	The above voltages may vary as follows: All devices shall be suitable for continuous operation over the entire range of voltage and frequency indicated below without any change in their performance. AC supply Voltage variation $\pm 10\%$ Frequency variation $\pm 5\%$
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#### 14.0 Earthing

#### Solidly Earthed System

Tropicalisation: The equipment shall be given tropical and fungicidal treatment in view of the above-mentioned climatic conditions. Tropical protection shall conform to BS: CP 1014:963 entitled "Protection of Electrical Power Equipment against climatic condition"

### A3 SCOPE OF WORK

The scope of work includes the following:

1. Engineering, Design, manufacturing, Transportation, Supply and supervision during erection, testing and support for commissioning of the 145kV isolators with Cu clamps and connectors on both sides as per standard engineering practices, IS & IEC standards (Bimetallic strip shall be used for clamps if equipment connectors are of aluminium).
2. Demonstration / testing of the system at Bidder's works as per the approved Tata Power SQP (Refer annexure-2 attached with the specifications) before dispatch of the system at site.
3. Bidder to depute people to Supervise & Validate commissioning check points & site equipment test results during Installation, testing & commissioning of the isolators as per Tata Power approved Standard Field Quality Plan (Refer Annexure-3 attached with Standard Specification). The technical expert shall be involved until the equipment is commissioned & handed over.
4. Adherence to General requirements of Quality Assurance & Inspection and Standard Sampling plan for switchyard equipment Inspection attached with the standard specifications.

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5. Site Acceptance Test to the Purchaser's satisfaction.
6. Submission of technical documentation related to design, installation, testing, operation & maintenance of the equipment and submission of Test Reports, job progress reports etc.
7. Submission of type test report which is not older than 5 years
8. The bidder must confirm the technical support for next 25 years, for the equipment being procured under this requirement. Warranty Period for Isolators shall be 48 Months from date of Commissioning or 60 Months from date of despatch.

It is not the intent of this specification to specify completely herein, all details of design & construction of 145 kV isolators. However, the equipment shall conform in all respects to high standards of engineering, design & workmanship.

#### **A4 TERMINAL POINTS**

The following are the terminal points for this specification,

1. The Isolator Base channel which is mounted on GI / concrete structure is the terminal point from installation point of view.
2. The Isolator clamp/connector mounted on current carrying stud / pad of Isolator is the terminal point for onward connection to busbars / conductors.
3. The Isolator's earthing stud is the terminal point for connecting grid earthing conductor.
4. The Isolator's Terminal block in Operating mechanism panel for terminating Control & Monitoring wires.

#### **A5 EXCLUSIONS**

1. The GI / concrete support structure
2. Civil Works and Installation is excluded from scope.
3. The cabling from CRP to terminal box Isolator
4. Earthing risers for isolator

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**A6 CODES AND STANDRS**

Refer Standard Technical specification for Isolator 33kV, 145kV & 245kV (DOC no. ENGG/ELEC/STD-SPEC/01)

**A7 BIDDER'S QUALIFICATION REQUIREMENTS**

Refer Standard Technical specification for Isolator 33kV, 145kV & 245kV (DOC no. ENGG/ELEC/STD-SPEC/01)

**A8 PROJECT SCHEDULE / MILESTONES**

Bidder shall submit with the bid, a detailed Project Schedule covering the following based on the milestones tabulated below:

- a. Start of 'Engineering'
- b. Completion of 'Engineering'
- c. Commencement of 'Manufacturing'/Manufacturing process
- d. Commencement of Supply

<b>Milestone</b>	<b>Target</b>
Prebid meeting	1 <sup>st</sup> week from RFQ
Bid Submission	2 <sup>nd</sup> week from RFQ
Drawing submission	1 <sup>st</sup> week from PO
Inspection of equipment	4 <sup>th</sup> week from PO
Delivery of equipment	5 <sup>th</sup> week from PO

**A9 SUBMISSIONS BY BIDDERS**

**Bidder shall submit the following information along with the Technical Bid.**

1. Dully filled in schedules, listed in section 'C'.
2. Confirmation to Standard Quality Plan for equipment specified
3. General Arrangement Drawings for equipment offered

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4. Internal GA Drawing for equipment offered
5. Schematic diagram for Control Circuit of equipment offered
6. Filled up Data Sheets as per section 'B' (in attached Excel format – Excel soft file to be sent with Technical Bid) & in PDF with company stamp & authorized signature
7. All the Type Test Reports as per SQP in last 5 years from date of bid submission
8. The supply list of same or higher rating equipment offered in last 5 years
9. Confirmation on technical support for next 25 years.

**Bidder shall submit following information after award of contract**

1. General Arrangement Drawings for equipment offered
2. Internal General Arrangement Drawings for equipment offered
3. GTP & BOM for equipment offered
4. Schematic diagram for Control Circuit of the equipment offered
5. MQP & SQP for equipment offered
6. O&M Manual

**A10 DETAILED TECHNICAL SPECIFICATIONS**

**A10.1 MECHANICAL - NA**

**A10.2 CIVIL AND ARCHITECTURAL - NA**

**A10.3 CONTROL, INSTRUMENTATION AND AUTOMATION – NA**

**A10.4 ELECTRICAL**

**SPECIFIC REQUIREMENTS OF 145 kV ISOLATORS**

**1.0 Scope**

Engineering, Design, manufacturing, Supply and supervision during erection, testing and support for commissioning of 145kV isolators along with Cu clamps and connectors.

**2.0 Technical requirement of 145 kV , 1250 A isolators with Earth switch**

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Sr. No.	Parameters	Trombay Station-A
1	Rated Voltage kV	110 kV
2	Maximum design voltage	145 kV
3	Current Rating, A	1250 A
a)	Dynamic (Peak), KA	
i)	Main switch	100 KAp
ii)	Earth switch	100 KAp
b)	3Sec (RMS), KA	
i)	Main switch	40 KA, for 3 secs.
ii)	Earth switch	40 KA, for 3 secs
4	Switch design	3P, single center break, gang operated, O/D, horizontal type
5	Operating Mechanism	Motor and Manual Operated Mechanism
6	Motor Operating voltage,	415V AC 3PH, 50 Hz
7	Control Voltage	220V DC
8	Clamps	
a)	Fixed /Flexible	Flexible and Fixed
b)	Dimension	For 2' IPS Cu tube (Horizontal to vertical)
c)	Material Type	Tinned Cu
9	No. of auxiliary contact provided	
a)	Main blades	6 NO + 6 NC rated for 220V DC, 2A
b)	Grounding blades	6 NO + 6 NC rated for 220V DC, 2A

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**Technical requirement of 145 kV , 1250 A isolators without earth switch**

Sr. No.	Parameters	Trombay Station-A
1	Rated Voltage kV	110 kV
2	Maximum design voltage	145 kV
3	Current Rating, A	1250 A
a)	Dynamic (Peak), KA	
i)	Main switch	100 KAp
ii)	Earth switch	Not required
b)	3Sec (RMS), KA	
i)	Main switch	40 KA, for 3 secs.
ii)	Earth switch	Not required
4	Switch design	3P, single center break, gang operated, O/D, horizontal type
5	Operating Mechanism	Motor and Manual Operated Mechanism
6	Motor Operating voltage,	415V AC 3PH, 50 Hz
7	Control Voltage	220V DC
8	Clamps	
a)	Fixed /Flexible	Flexible and Fixed
b)	Dimension	For 2' IPS Cu tube (Horizontal to vertical)
c)	Material Type	Tinned Cu
9	No. of auxiliary contact provided	
a)	Main blades	6 NO + 6 NC rated for 220V DC, 2A
b)	Grounding blades	Not required

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### **3.0 Technical requirement of Clamps & connectors**

Refer standard specs for Clamps & connectors.

#### **A11 LAYOUT REQUIREMENTS**

1. The height of live terminals from the ground & Phase to Phase distance should be as per the IEC/IS Standards. Equipment to be grounded at two points
2. The height of Top of Mechanism box from the ground should be maximum 2 meters. such that it is easily accessible
3. The general arrangement of Isolator along with its accessories should be such that, required statutory clearances are maintained in the existing / new switchyard arrangement.
4. All the external field terminals, pole to marshalling shall be droppable one.

#### **A12 QUALITY REQUIREMENTS**

Refer Standard Technical specification for Isolator 33kV, 145kV & 245kV (DOC no. ENGG/ELEC/STD-SPEC/01)

#### **A13 PERFORMANCE REQUIREMENTS**

Refer Standard Technical specification for Isolator 33kV, 145kV & 245kV (DOC no. ENGG/ELEC/STD-SPEC/01)

#### **A14 MAINTAINANCE REQUIREMENTS**

1. Bidder to submit trouble shooting manual.
2. One copy of bound manual covering erection and maintenance instructions and all relevant information and drawings pertaining to the main equipment as well as auxiliary devices shall be furnished along with each Isolator. Additionally four copies of the manuals shall be forwarded to the signatory.
3. The erection manual shall include precautions to be taken during erection of critical components of the Isolator which require correct and accurate installation or alignment.

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4. Replacement of any defective component shall be simple & free from any obstruction.
5. Suitable platform with hand railings should be provided for ease of operation and maintenance

**A15 TOOLS AND TACKLES FOR ERECTION AND COMMISSIONING**

NA

**A16 SPARES**

Bidder needs to include competitive price for Mandatory Spare parts against the specified list and schedules.

Bidder shall include list of spares with quantities as recommended by him required for three years trouble free operation of equipment's.

**< Clearance of Engineering Disciplines (as under) shall be taken on office copy for records. The concurrence signatures shall not be printed on document being sent outside of Project Engineering >**

Rev No	Date	Originator	Reviewed By	Cleared By		Approved By (HOD)
				HOD	Signature	
				Mechanical		
				Civil		
				Piping & Layout		
				C & I		
				Automation		
				Electrical		

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**B1 – DATA SHEETS**

Refer Standard Technical specification for Isolator 33kV, 145kV & 245kV (DOC no. ENGG/ELEC/STD-SPEC/01)

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**B2 –STANDARD SPECIFICATIONS**

Refer Standard Technical specification for Isolator 33kV, 145kV & 245kV -ENGG/ELEC/STD-SPEC/01)

Refer Standard Technical Specifications for Clamps & Connectors - ENGG/STD-SPEC/94/20

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**B3- SCHEDULE OF MANDATORY SPARES**

List of required mandatory spares specified in Section-A.

Sr. No.	Equipment tag no.	Description of spare	Material of construction	Part no	Quantity included per unit of equipment	Remark
1		Jaw Male & Female along with arm				
2		Insulator set				
3		Set of Contactors & overload Relay				

Seal of the Company

Signature

Designation

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**C1 - SCHEDULE OF QUANTITIES AND PRICES**

**SUPPLY:**

Sr No	Description	Qty. No.		
<b>A</b>	<b>TROMBAY STATION B - Trombay Thermal Power Station Mahul Road, Chembur, Mumbai-400074</b>			
1	145kV, 1250A, 3P single center break type, horizontal type Isolator along with all accessories isolator With Earth switch	2		
2	145kV, 1250A, 3P single center break type, horizontal type Isolator along with all accessories, Without Earth switch	4		
3	<del>Flexible tinned copper clamps &amp; connectors for 2" IPS Cu tube as per site requirement</del>	<del>18</del>		
4	<del>Fixed tinned copper clamps &amp; connectors for 2" IPS Cu tube as per site requirement</del>	<del>18</del>		

**SERVICES:**

Sr. No	Description	Qty. Set / Nos.	Unit Price (Rs.)	Item Price (Rs.)
	NIL			

<b>PROJECT ID :</b> TE00517 <b>SPEC NO :</b> TE/SP/0051/FY24 <b>REV : A</b> <b>DATE : 26/10/2023</b>	<b>Specification for 145kV Isolator</b> <b>Procurement of 145kV Isolator for BPCL 110 kV supply extension at Trombay</b>	Section-C Page 19 of 28
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**C2- PROJECT TIME SCHEDULE**

Seal of the Company

Signature

Designation

Note: The bidder shall indicate schedule of milestones and also attach/furnish a detailed bar chart identifying customer inputs.

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**C3- SCHEDULE OF DEVIATIONS FROM TECHNICAL SPECIFICATIONS**

All deviations from this specification, shall be set out by the Bidders, indicating clause no and page in this schedule. Unless **specifically** mentioned in this schedule, the tender shall be deemed to conform to the purchaser’s specifications:

Sr. No.	Clause No.	Details of deviation with justifications
-----	-----	-----

We confirm that there are no deviations apart from those detailed above.

Seal of the Company

Signature

Designation

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**C4- SCHEDULE OF DEVIATIONS FROM GENERAL & SPECIAL CONDITIONS OF  
 CONTRACT**

All deviations from this specification, shall be set out by the Bidders, indicating clause no and page in this schedule. Unless **specifically** mentioned in this schedule, the tender shall be deemed to conform to the purchaser’s specifications:

Sr. No.	Clause No.	Details of deviation with justifications
-----	-----	-----

confirm that there are no deviations apart from those detailed above.

Seal of the Company

Signature

Designation

<b>PROJECT ID :</b> <b>TE00517</b> <b>SPEC NO :</b> <b>TE/SP/0051/FY24</b> <b>REV : A</b> <b>DATE : 26/10/2023</b>	<b>Specification for 145kV Isolator</b>	Section-C Page 22 of 28
	<b>Procurement of 145kV Isolator for BPCL 110 kV supply extension at Trombay</b>	

**C5- SCHEDULE OF DRAWINGS & DOCUMENT SUBMISSION**

As part of the proposal, the BIDDER shall furnish the schedule of drawing/document submission

<b>Sr. No.</b>	<b>Title of Drawing/Document</b>	<b>Target Date of submission</b>	<b>For Information/Review/Approval</b>	<b>Remarks</b>
1.0				
1.1				
1.2				
2.0				
2.1				
2.2				

Seal of the Company

Signature

Designation

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**C6- SCHEDULE OF MANDATORY SPARES**

As part of the proposal, the BIDDER shall indicate below the list of recommended spares for three years of trouble free operation of the equipment/system offered by him.

Sr. No.	Equipment tag no.	Description of spare	Material of construction	Part no	Quantity recommended per unit of equipment	Unit price	Total price	Delivery period from date of LOI	Remarks

Seal of the Company

Signature

Designation

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**C7 - SCHEDULE OF SPECIAL ERECTION/MAINTENANCE TOOLS & TACKLES**

As part of the proposal, the BIDDER shall indicate below, the list of erection/maintenance tools & tackles offered by him.

Sr. No.	Description of spare	Quantity recommended per unit of equipment	Unit price	Total price	Delivery period from date of LOI	Remarks

Seal of the Company

Signature

Designation

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**C8 - SCHEDULE OF PLACES OF MANUFACTURE, TESTS AND INSPECTION**

For major equipment / systems, the Bidder shall indicate the name of the Manufacturer / SUBCONTRACTOR and place of test and inspection.

ITEM OF EQUIPMENT	Manufacturer / SUBCONTRACTOR	PLACE OF TESTING & INSPECTION

Seal of the Company

Signature

Designation



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**DRAWINGS AND DOCUMENTS**

**D1 TENDER PURPOSE**

1. Bidder shall submit the following information along with the Technical Bid.
2. Dully filled in schedules, listed in section 'C'.
3. Quality Assurance Plan (QAP), Manufacturing Quality Plan (MQP)
4. General Arrangement Drawings for equipment offered
5. Filled up Data Sheets-(in attached Excel format – Excel soft file to be sent with Technical Bid) & in PDF with company stamp & authorized signature
6. All the Type Test Reports as per SQP in last 5 years from date of bid submission
7. The supply list of same or higher rating in last 5 years
8. Confirmation on technical support for next 25 years.
9. Schedule of Technical Deviations
10. Manufacturing & Delivery schedule

**D2 AFTER AWARD OF CONTRACT**

1. General Arrangement Drawings for equipment offered
2. Filled up Data Sheets
3. Test Plans
4. O & M manual including handling and commissioning guidelines

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**E - ANNEXURES**

1. Annexure E1- Standard Specifications for 33kV,145kV,245kV,Isolator with PQR, SQP, FQP & SSP
2. Annexure E2- Standard Specifications for clamps and connectors
3. Annexure E3- General requirement of quality assurance and inspection

THE TATA POWER COMPANY LIMITED

STANDARD  
TECHNICAL SPECIFICATION  
FOR  
ISOLATORS  
(33kV, 145kV, 245kV)

(DOCUMENT NO - ENGG/ELEC/STD-SPEC/01)



Tata Power

Project Engineering

Rev. No	Date	Revision History	Prepared By (Name & Sign)	Checked By (Name & Sign)	Approved By (Name & Sign)
R0	12.02.2016	First Issue	PP	CPB	AM
R1	15.06.2018	QR added	PP	SBL	AM
A	11.07.2019	QR revised. Spec refined based on learnings from recent supply	PBT	SBL	AM
B	26.05.2022	QR revised, Safety parameters and Remote operation of E/S & added. Pollution class updated	NPT <i>Nikhil</i>	UGP <i>UGP</i>	AAB <i>ABuddhiwant</i>

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- 4. Codes & Standards**
- 5. Design Requirements**
- 6. Layout Requirements for the equipment**
- 7. Safety Requirements**
- 8. Operational and Maintenance Requirements**
- 9. Technical Parameters of Equipment including DATA SHEET**
- 10. Quality Requirements (including SQP and FQP)**
- 11. Inspection, Testing and Performance Requirements along with Warranty**
- 12. Spares**
- 13. Data Submission by Bidder**
  - 13.1 With the Bid**
  - 13.2 After award of contract**

## **Enclosures: -**

**Annexure – 1 : PQR**

**Annexure – 2: Standard Quality Plan**

**Annexure – 3: Standard Field Quality Plan**

**Annexure – 4: Standard Sampling plan for switchyard equipment's**

**Annexure – 5: Sample Isolator schematic diagram AC & DC supply**

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## 1. Introduction

The specific requirement covers design, manufacture, testing at works, supply, transport, delivery to site, Supervision services to site for erection, testing and commissioning of 33kV, 145kV & 245kV Outdoor Type Isolators with Porcelain Insulator and CU Clamps & connectors as per relevant IS and IEC standards. The bidder must supply the equipment being procured under this specific requirement.

## 2. Pre-Qualifying Requirements

Please refer Annexure - 1

## 3. System Description and Scope

The scope of work includes the following:

- 3.1. Design, manufacture, testing at works, supply, transport to site, un-loading, handling, installation, testing, commissioning of 33kV/145kV/245kV isolators having 3 pole, single centre break/ Double Break type gang operated, outdoor, horizontal mounting (Insulators Vertical) type complete with motorized as well as manual operating mechanism and as per relevant IS and IEC standards. The bidder must supply the equipment being procured under this specific requirement.
- 3.2. Engineering, Design, Manufacturing & Supply of fixed & flexible tinned copper clamp with bimetallic strip (as required) on both sides
- 3.3. Demonstration / testing of the system at Bidder's works as per the approved Tata Power SQP (attached with the specifications) before dispatch of the system at site (FAT).
- 3.4. Bidder to depute people for supervision & validation of commissioning check points & site equipment test results during Installation, testing & commissioning of the Isolator as per Tata Power approved Standard Field Quality Plan (attached with the specifications). The technical expert shall be involved until the equipment is commissioned & handed over.

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- 3.5. Submission of technical documentation related to design, installation, testing, operation & maintenance of the equipment and submission of Test Reports, job progress reports etc.
- 3.6. Submission of type test report for same rating Isolator as per relevant IS/ IEC standards, which is not more than 5 years old as on the scheduled date of bid opening. Acceptability criteria of time period for type test may be extended by another 5 years as a special case, if there is no change in design / material of construction (MOC) and a declaration of OEM to confirm this. The type test should have been done in a reputed test facility which is NABL certified or equivalent international testing facility on identical design.
- 3.7. The bidder must confirm on their letterhead the technical support for next 25 years, for the equipment being procured under this requirement. Bidder shall provide minimum 5 years warranty for the equipment supplied.
- 3.8. Acceptance of Purchaser's preferred list of vendor / sub vendor / OEM, which will be shared as part of Technical Specifications. However, if Bidder introduces additional vendor/sub vendor the same will be evaluated separately. This vendor/sub vendor evaluation / assessment shall inter-alia include (i) document verification; (ii) Bidders work / manufacturing facilities visit (iii) manufacturing capacity, details of works executed, works in hand, anticipated in future and the balance capacity available for present scope of works; (iv) details of plant and machinery, manufacturing and testing facilities, manpower and financial resources; (v) details of quality systems in place; (vi) past experience and performance; (vii) customer feedback; (viii) response to complaint.
- 3.9. Acceptance (without any deviations) of minimum quality requirements defined in Tata Power Standard Quality Plans & Standard Field Quality Plans of technical specifications. It is not the intent of this specification to specify completely herein, all details of design & construction of Isolator. However, the equipment shall conform in all respects to high standards of engineering, design & workmanship.

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#### 4. Codes & Standards

Std no.	Details
IS:9921 or IEC 62271-102	Alternating current isolators (Disconnectors) and earthing switches
IEC-60129	Alternating current isolators (Disconnectors) and earthing switches
IS:2544	Insulators
IS-5350	Solid Core Insulators
IEC-60198	Solid core post Insulators
IEC-60815	Selection & Dimensioning of HV insulators for polluted condition
IS:13947	Low voltage switchgear and control gear
IS:4691	Degree of protection provided by enclosure
IS:325	Three phase induction motors
IS:4722	Rotating electrical machines
IS:2629	Recommended practice for hot dip galvanizing of iron and steel

#### 5. Design Requirements

- 5.1. Isolators shall be 3 pole, single centre break type gang operated, outdoor, horizontal mounting (Insulators Vertical) type complete with motorized as well as manual operating mechanism for both the main switch & earth switch (as per site requirement). All the necessary accessories shall be supplied along with Isolator.
- 5.2. All Isolators shall be provided with high pressure current carrying contacts on the hinge and jaw ends and all contact surfaces shall be silver plated. The contact shall be designed such that no external springs shall be used to achieve desired high contact pressure.
- 5.3. All Isolators shall be complete with rigid structural steel base for each pole. (These will be installed on Purchaser's structures). The structural steel base shall have the facility for continuous adjustment / alignment of solid core insulators without shims.
- 5.4. Flexible ground connection complete with non-ferrous bolts for connecting the operating handle to Purchaser's ground system shall be furnished for each 3pole isolator. The size of the grounding cable will be 0.2 sq.in. (130 sq.mm) copper conductor.

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- 5.5. The operating mechanism of the Isolators shall be so designed that all the three blades and their moving contacts are in positive control throughout the entire cycle of operation. The joints in operating link mechanism shall be of such material which do not require any periodic lubrication, and which shall not create excessive jamming or play. It shall be mechanically dependable so that after final adjustments have been made, no parts of the mechanism will be displaced to cause improper function of the switch, when the switch is opened or closed at any speed. Adequate means shall be provided to insulate the operating gear and accessible parts of the pipe from the isolator. The time of operation shall not exceed 12 seconds.
- 5.6. Sealed, lifelong lubricated, weatherproof, corrosion resistant, greaseless, anti-friction, type bearings shall be provided for rotating insulator stacks and for operating mechanism.
- 5.7. The Isolators shall be constructed such that the blade of the Isolator will not fail in closed/open position, or inadvertently open/close when in close/open position, if the operating shaft gets disconnected.
- 5.8. Auxiliary contacts (6 NO + 6 NC) for remote indication shall also be provided for both main and earthing blades separately. The auxiliary switches shall be fitted at a convenient height from ground level to facilitate examination and wiring from ground level. Signal boxes shall be supplied at operating level only.
- 5.9. All castings, except current carrying parts, shall be made of malleable iron or cast steel. No grey iron shall be used in the manufacture of any part of the switch.
- 5.10. Current carrying castings shall be of non-corrodible and non-ferrous material and resistivity to the full flow of rated current shall not produce a temperature rise exceeding 55 deg.C. above an ambient temperature of 50 deg.C. (max). Cast copper may be used for isolator parts requiring high conductivity where this does not impair mechanical strength of the Isolator. Current carrying copper alloy parts shall not contain over 10% of zinc.
- 5.11. The terminal pad for busbar/conductor connection shall have 360 deg freedom of rotation and shall have built in cover to prevent deposition of dust and foreign particles.
- 5.12. All bolts/nuts or pins used in current carrying parts shall be of stainless-steel Grade 316.

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- 5.13. Nut bolts used for current carrying parts should be hot dipped GI 8.8 grade and required torque wrenches should be used.
- 5.14. All structural steel, operating pipes, phase coupling rods, operating mechanism boxes, bolts, pins, etc. used for other than current carrying parts shall be galvanised. All processing shall be done after fabrication. linkages, bearings, bush-pins, hinges shall not require any periodic lubrication/adjustments. Supplier shall enclose test reports for additional extended mechanical endurance test, which justifies that there are no undue wear & tear and loss of adjustment after large number of operations.
- 5.15. The isolator base frame shall have the facility of pipe sleeves for installing hooking arrangement of safety lanyard. The base frame shall have additional holes (for 16 mm bolt) on both ends for fixing cleats for installing working platforms.
- 5.16. Operating link mechanism shall have the provision to prevent any change in end position of isolator due to external forces on the arm, even when the drive is de-coupled from isolator. Isolator boxes and other parts shall be adjusted for correct alignment after galvanising.
- 5.17. The Isolator shall be capable of successfully withstanding the maximum rated momentary currents when applied in such a manner that the electro-magnetic forces tending to open the closed isolator blades are exerted and also in such a manner that maximum forces are exerted between poles of three phase group operated Isolators.
- 5.18. The air brake Isolators shall have adequate mechanical strength and thermal capacity to withstand stresses corresponding to the specified short circuit duties.
- 5.19. The minimum clearance between live parts in the open position of the Isolator shall be such that the test withstand voltages of the switch will be at least 10% in excess of the insulator maximum withstand voltage to ground.
- 5.20. Manual operating handles for both main and earthing blades shall be fitted at a height of 760 mm from ground level.
- 5.21. Mechanism boxes for mounting one mechanical interlock shall be provided on the operating handle for main blade. A mechanical interlock between main and grounding blades shall be provided.
- 5.22. All the AC and DC external field terminals shall be of droppable type.

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5.23. The Isolators shall be complete with channel base, castle type interlocks, operating shafts, safety hooks / platforms / arrangement for attaching safety lanyard, inter-phase pipes, levers, operating mechanism, grounding connectors for operating shaft, motorised mechanism with signal boxes, out board bearings, insulators, etc. shall be supplied. All similar parts, particularly removable ones shall be interchangeable with one another.

5.24. Hot dip galvanised shall be min 120 microns.

5.25. Interlocks

5.24.1 Isolators shall be provided with pad locking facility to lock them in fully open or fully closed positions.

5.24.2 Main blade and grounding blade shall be mechanically interlocked such that it will not be possible to close the grounding blade when main blade is closed and vice versa.

5.24.3 Castell or equivalent type key interlock for use with circuit breaker shall also be provided on both main and grounding blade of the Isolators.

5.24.4 The manual operated Isolators offered shall be capable of being converted to motorised operation at a future date.

5.26. Motor drive

5.25.1 Each Isolators shall be provided with a motor operated drive for local/remote operation of the main switch.

5.25.2 Each Isolators shall be provided with a motor operated drive for local operation of the Earth switch only. ***If specified in Section A of project specification, local / remote operation shall be provided for Earth switch.***

5.25.3 Separate power supply and drive shall be provided for operating the main switch and earthing switch in case the earth switch is specified as motor operated.

5.25.4 The motor drive shall be enclosed in at least 3 mm Aluminium/ Stainless steel Grade 316 enclosure. All metal parts shall be thoroughly cleaned to remove all rust, scales, corrosion, grease and other adhering foreign matter. Steel surfaces exposed to weather shall be hot dip galvanised. All machine finished or bright surfaces shall be coated with a suitable preventive compound and suitably selected to withstand tropical heat and

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extremes of weather. The paint shall not scale off or crinkle or be removed by abrasion due to normal handling. Bolts and nuts shall be of galvanised steel, hinges shall be of aluminium/stainless steel.

- 5.25.5 The motor operated drive shall be outdoor, weather-proof and suitable for local and remote operation of the isolator. It shall have facility for manual operation of the isolator in case of a problem with motor drive.
- 5.25.6 Motors shall be totally enclosed, weather-proof outdoor type and tropicalised. The motor shall be 3Ph Induction Motor to achieve best torque-speed characteristics. The operating voltage shall be either 220V / 110V DC for DC motors & 415V for 3Ph Induction Motor. Magnetic contactor type of starters suitable for direct-on-line duty shall be provided for control of motors.
- 5.25.7 Thermal overload relay shall be provided for motor protection. The relay shall have 2 NO + 2 NC potential free contacts reserved for purchaser's use.
- 5.25.8 The motor drive control cubicle shall be of IP 65 or IP55 class with additional rain protection, waterproof, dust-proof and vermin proof by use of suitable synthetic rubber gasket. All wiring in the cubicle shall be of multi stranded copper wires. Insulation shall be such that it shall not support combustion.
- 5.25.9 Suitable reduction gearing shall be provided between the motor and the drive shaft of the disconnect switch. The design of the drive shall be such that angular travel of the output shaft shall not alter even if motor over-runs due to any eventuality like failure of limit switch etc.
- 5.25.10 Limit switches (heavy duty type) for motor control shall be fitted to sense the open and close positions of the disconnect switch. Requirement of Auxiliary contacts for signalling/interlocking shall be as per IEC 129 as below,
- 5.25.11 Signaling/Interlocking of the closed position shall not take place unless it is certain that the contacts will reach a position in which the rated normal current, the peak withstand current and the short time withstand current can be carried safely.
- 5.25.12 Signaling/Interlocking of open position shall not take place unless the movable contacts have reached a position such that the clearance between contacts is at least 80% of the

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gap or the isolating distance, or unless it is certain that the movable contacts will reach their fully open position.

- 5.25.13 The drive shall be provided with a 'Fail-safe' interlocking solenoid to prevent its operation in case interlocks are not satisfied. Provision shall be made for mechanical interlocking with the breaker, when the drive is in manual mode.
- 5.25.14 The control circuit shall be wired with minimum 2.5 sq.mm, PVC insulated, multi stranded copper wire of 1100 V grade FRLS type. The wiring shall be terminated on the terminals using round type lugs only.
- 5.25.15 6 NO + 6 NC potential free auxiliary contacts, rated for 220V/110V DC, 2A, shall be provided. The contacts shall close or open only at the end of the isolator operation. All contacts shall be wired up to terminal block for use by user. It shall be noted that all auxiliary contacts shall be individually adjustable and convertible from NO to NC or vice-versa even at site. Rupturing capacity of auxiliary switch contacts shall be independent of speed of operating mechanism. It should be possible to replace individual contact.
- 5.25.16 Cable entry shall be provided from the bottom and knock out type gland plate shall be provided for 8 Nos., 1inch double compression cable glands.
- 5.25.17 All terminal blocks shall be of disconnecting type ELMEX make, type CMDT4 or equivalent. (Minimum 60 Nos. of 20A rating shall be provided).
- 5.25.18 Timer for cutting out the power supply to the motor shall be provided, as a backup in case of limit switch failure.
- 5.25.19 A suitable lamp (LED with protective cover) and space heater with thermostat shall be provided inside the housing of the motor drive.
- 5.25.20 Industrial socket with protective cover shall be provided inside operating box.
- 5.25.21 2 Nos. earthing terminals shall be provided for connecting the motor drive body to the station ground with 2 x 0.1 sq.in. copper conductor
- 5.25.22 Pad locking arrangement shall be provided for the motor drive cubicle.
- 5.25.23 AC & DC power supply monitoring relay shall be of continuous duty and shall be provided with 2 NO + 2NC potential free contacts.

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5.25.24 Interlocks between power and control circuits shall be provided so that if power supply to drive motor is not available, the close/ open contactors do not get energised even on local/remote commands.

5.27. Insulators:

5.27.1 36kV/145kV/245KV Porcelain Solid Core Post Insulators with hot dipped galvanized ferrous parts. These insulators are required for Isolator application. The insulators of solid core type (six nos. for centre break type isolator) shall be in scope of Bidders. The Insulator shall confirm to IS: 2544 and IEC 60168. The porcelain of Insulator shall confirm to minimum cantilever strength of 6kN for 132 kV and 8kN for 220 kV respectively. The pressure due to contact shall not be transferred to the insulators after the main blades are fully closed.

5.27.2 The porcelain shall be sound, free from defects, thoroughly vitrified and smoothly glazed. Insulators shall have compression type of glaze with good lustre and of uniform brown colour. The glaze shall be unaffected by sudden changes in temperature and by atmospheric pollution of ozone acids, alkali dust, chemical fumes, etc.

5.27.3 Cement used in the construction of insulator shall not cause fracture by expansion or loosening by contraction and individual parts shall be correctly located during cementing. Cement shall not give rise to chemical reaction with metal fitting and its thickness shall be uniform.

5.27.4 Under surfaces and grooves shall be shaped for easy cleaning. Shell shall be substantially symmetrical in shape without appreciable warping. The outer porcelain surface shall be smooth, without any projection. This is necessary for similarity with available insulators.

5.27.5 Insulator's shall be designed to avoid excessive concentration of electrical stresses in any section or across leakage surfaces. Design features which increase radio influence level shall be avoided.

5.27.6 Each insulator shall have the rated strength marked clearly on the insulator body. Each insulator shall also bear symbols identifying the manufacturer, month and year of manufacture, minimum failing load etc.

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- 5.27.7 The material used for the bus support insulator shall be as follows: -  
 Cap – MCI, Cushion-Cork, Cement – Portland, Shells – Porcelain brown glazed, Base – MCI.
- 5.27.8 The thread of the tapped holes in the insulator metal fittings shall be cut after galvanising or other similar means. All other thread shall be cut after galvanising or other similar means. The tapped hole shall be suitable for bolts with galvanised threads conforming to latest IS-1362. Effective length of the thread shall not be less than the nominal diameter of the bolt.
- 5.27.9 The Solid Core insulator unit shall be assembled in a suitable jig to ensure the correct positioning of the top and bottom metal fittings relatively to one another. The faces of the metal fittings shall be parallel and at right angle to the axis of the insulator and the corresponding holes in the top and the bottom metal-fitting shall be in a vertical plane containing the axis of the insulator.
- 5.27.10 The Solid Core Insulators shall be suitable to withstand below mentioned seismic acceleration and wind pressure.
- |                               |                    |
|-------------------------------|--------------------|
| Seismic acceleration capacity | 0.5 G Horizontal   |
|                               | 0.25 G Vertical    |
| Wind Pressure                 | 55 mtrs./sec (Max) |
- 5.27.11 Bidders shall make available data on all the essential features of design including the method of assembly of shells and metal parts, number of shells per insulators, the manner in which mechanical stresses are transmitted through shells to adjacent parts provision for meeting expansion stresses, results of corona and thermal shock tests, recommended working strength and any special design or arrangement employed to increase insulator life under service conditions.
- 5.28. Other requirements
- 5.28.1 Current Density: Current density to be adopted for all part of the Isolator and terminal connector shall not exceed the following limits:
- (i) Hollow tube section: Copper – 2.0 / Aluminium – 1.25 A/mm<sup>2</sup>
  - (ii) Other sections & terminal connectors: Copper – 1.60 / Aluminium – 1.0 A/mm<sup>2</sup>

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- 5.28.2 The earthing switches should be of non-ferrous materials especially of the same material as that of main switch assembly and able to carry the same fault current as assigned to the main disconnecter and withstand the dynamic stresses.
- 5.28.3 Flexible copper connections between rotating shaft of the isolator / earthing switch and the frame shall have cross section suitable to withstand rated short time current rating.
- 5.28.4 Signaling of the closed position shall not take place unless it is certain that the movable contacts have reached a position in which the rated normal current, the peak withstand current and the short time withstand current can be carried safely. Limit position switches shall be provided for this Signaling.
- 5.28.5 Signaling of the open position shall not take place unless the movable contact have reached a position such that the clearance between the contacts is at least 80% of the isolating distance.
- 5.28.6 A Local/Remote selector switch, contractors, open/ close push buttons etc. shall be provided on the control cabinet of the isolator to permit its operation through local or remote push buttons.
- 5.28.7 Sample Isolator Schematic Diagram is given in Annexure – 1.

## 6. Layout Requirements

In case of one to one replacement with existing GOD, the dimensions should match the required clearances & existing layout

## 7. Safety Requirements

- 7.1. The porcelain insulator housing shall be of “shatter proof” and shall be suitable for Class-D, heavy pollution level.
- 7.2. 2” GI pipe should be provided on the top for anchoring the safety harness during
- 7.3. maintenance.
- 7.4. Isolators shall be provided with pad locking facility to lock them in fully open or fully closed positions.

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- 7.5. Main blade and grounding blade shall be mechanically interlocked such that it will not be possible to close the grounding blade when main blade is closed and vice versa.
- 7.6. Castel or equivalent type key interlock for use with circuit breaker shall also be provided on both main and grounding blade of the Isolators.

### 8. Operational and Maintenance Requirements

- 8.1. Parts subject to wear, corrosion or other deterioration or requiring adjustments, inspections or repair are readily accessible and capable of convenient removal, when required.
- 8.2. 2" GI pipe should be provided on the top for anchoring the safety harness during maintenance.
- 8.3. The height of Isolator should match the height of connecting bus.
- 8.4. The length of pipe connecting main blade to operating mechanism box shall match the site conditions.
- 8.5. The safety platforms & safety sleeves for work at height during construction & maintenance shall be part of Bidder's scope
- 8.6. Additional name plate and drawing shall be made available on inside of the MB.

### 9. Technical Parameters of Equipment including DATA SHEET

The technical specifications contained in this section are for the guidance, deviations, if any, from these specifications, may be considered, provided they are either to improve the utility, performance and efficiency or to secure overall economy.

S no.	Description	Unit	Tata Power Requirement		
			33 kV	145 kV	245 kV
1.0	Make		Tata Power approved		
2.0	Type		Gang Operated		
3.0	Nominal voltage	kV	33	110	220
4.0	Highest system voltage	kV	36	145	245
5.0	Frequency	Hz	50	50	50

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S no.	Description	Unit	Tata Power Requirement		
			33 kV	145 kV	245 kV
6.0	Continuous current rating at design ambient temp of 50 Deg C (As per project requirement)	A	600 / 1250 / 2500	1250 / 2000 / 2500	1250 / 2000 / 2500
7.0	Short circuit withstand for time duration of 3 sec (As per project requirement)	kA	25	40	40 / 50
8.0	Rated dynamic short circuit current	kAp	62.5	100	100 / 125
9.0	Full wave impulse withstand voltage (1.2/50 microsec.)	kVp			
a)	Across the isolating distance		±195	±750	±1200
b)	To earth and between poles		±170	±650	±1050
10.0	One-minute power frequency withstand voltage				
a)	Across the isolating distance	kV (rms)	80	315	530
b)	To earth and between poles		70	275	460
11.0	Operating time	ms	≤12	≤12	≤12
12.0	Maximum corona extinction voltage in all positions	kV (rms)	156	105	NA
13.0	Max. radio interference voltage for frequency between 0.5 MHz and 2 MHz in all positions	Micro volts	500 at 156 kV (rms)	500 at 92 kV (rms)	NA
14.0	Creepage distance	mm/kV	31	31	31
15.0	Pollution class for Hallow insulator	--	Class-D Heavy (as per IEC 60815)		
16.0	Magnetising current	--	The Isolators shall be capable of breaking magnetising current of the order of 0.8 Amps at 0.15 pf (lag) at rated voltage.		

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S no.	Description	Unit	Tata Power Requirement		
			33 kV	145 kV	245 kV
17.0	Temperature rise over design ambient temperature	--	<55 deg C at ambient temp 50 deg C		
18.0	<b>Cantilever and Tensile strength</b>	N	<b>6000</b>		
19.0	Mechanical Endurance Class	--	Isolator-M2 E/S-M0		
20.0	Operating mechanism of Main switch and Earth switch	--	A.C. Motor operated		
21.0	Control Voltage	VDC	110/220		
22.0	Auxiliary contacts continuous current rating	A	10		
23.0	Breaking Capacity of auxiliary contacts	A	2 A DC with circuit time constant not less than 20 ms		
24.0	Design Temp	Deg C	50		
25.0	Seismic Acceleration	--	0.3g horizontal		
26.0	Altitude above mean sea level	M	Not exceeding 1000 Meters		
27.0	System neutral earthing	--	Effectively Earthed		

#### 10. Quality Requirements (including SQP and FQP)

Bidder to prepare and submit Manufacturing Quality Plan (MQP) and Field Quality Plan (FQP) for approval of Owner to ensure that a well-engineered and contractually compliant system is produced. The program shall provide for early detection of actual or potential deficiencies, timely and effective corrective action, and a method of tracking all such deficiencies. Tata Power Standard Quality Plan (SQP) and Field Quality Plan (SFP) are attached with this specification defining minimum inspection and testing requirements during shop and site inspection respectively. Bidder to ensure that these requirements are compiled in MQP and FQP submitted for approval.

##### 10.1 Factory Acceptance Test (FAT)

- a) Owner approved MQP shall be referred for shop inspection. The purpose is to ensure that the Bidder has interpreted the specified requirements correctly and that the FAT

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includes checking to the degree required by the user. The general philosophy shall be to deliver a system to site only after it has been thoroughly tested and its specified performance has been verified, as far as site conditions can be simulated in a test lab.

- b) The purpose is to ensure that the Bidder has interpreted the specified requirements correctly and that the FAT includes checking to the degree required by the user. The general philosophy shall be to deliver a system to site only after it has been thoroughly tested and its specified performance has been verified, as far as site conditions can be simulated in a test lab.
- c) The purpose of Factory Acceptance Testing is to ensure trouble free installation at site. Prior to release for shipment of the equipment the Purchaser or his representative will witness Factory Acceptance Test (FAT) in which the system is checked against the specifications and approved FQP.
- d) Type and routine tests certificates shall be furnished. Tests for components shall be as per relevant standard specifications and approved FQP
- e) System tests shall be performed on the completely assembled Breaker system. Type, routine and optional tests covered in Owner approved MQP with this specification shall be conducted in addition to the system tests.
- f) Bidder shall incorporate all FAT comments prior to despatch. After Bidder confirms that all changes have been incorporated, Purchaser's Office will issue Despatch Clearance.
- g) The Test Reports as well as Test Certificates of OEM, third party, Bidder shall be submitted for approval / verification.
- h) FAT and Despatch Clearance by the Purchaser shall not relieve the Bidder from complete responsibility for the total system and its performance subsequently.

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## 11. Inspection and Testing and performance requirements along with warranty

Bidder should follow Tata Power SQP mentioned in this specification.

### 11.1 Performance Guarantee Parameters

- Bidder should guarantee Performance parameters mentioned in Technical Parameters of equipment.
- Satisfactory operation of the system offered shall be guaranteed for 3 years from the date of taking over of system by purchaser after SAT including trouble-free & intervention-free operation.
- Bidder shall undertake to repair or replace any part, which is defective or unequal to the rated duties due to faulty materials, design or workmanship.

### 11.2 Warranty

- Bidder shall warrant that the equipment hardware is free of defects in material and workmanship or faults in design, in so far as the equipment fails to meet the requirements of this technical specification, for a period of 36 months from the date of final acceptance by the purchaser after completion of 30 days trouble free operation.
- With respect to defects in equipment part, Bidder's liability is to make good by replacing the faulty equipment. It is the responsibility of the Bidder to replace the faulty equipment within 30 working days.
- The Bidder will cover the cost associated with the shipping of defective or failed items during warranty period. The new equipment, parts shall be delivered free of charge.
- Bidder shall extend all warranties / guarantees to the purchaser, provided by sub-Vendors, of duration longer than that in this specification

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## 12. Spares

Bidder needs to include competitive price for Mandatory Spare parts against the specified list and schedules.

Bidder shall include list of spares with quantities as recommended by him required for three years trouble free operation of equipment.

## 13. Data Submission By Bidder

### 13.1 With the Bid.

- Filled up Technical datasheet and Technical Deviations of Specifications
- Confirmation to Standard Quality Plan
- General Arrangement Drawings for equipment offered
- Schematic diagram for Control Circuit of Isolator
- Overall schematic diagram for BESS
- Type test reports for offered Isolator
- Schedule of Recommended spares and tools & Tackles
- Manufacturing Quality Plan (MQP)
- Field Quality Plan / Commissioning Check list
- Supply list of Isolators in last 5 years
- Stamped copy of this specification

### 13.2 After award of contract

- General outline dimension drawing of Isolator front and side elevation, top and bottom plan, views showing all accessories, mounting arrangement on steel structures, spacing and size of the bolts, total creepage distance of bushing,

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electrical diagram with component details, terminal arrangement, Marshalling box, size of terminals, grounding terminals and lifting lugs, net and shipping weight, shipping dimension etc.

- Name and rating plate diagram of Isolator
- Guaranteed Technical particulars
- Manufacturing Quality Plan & Field Quality Plan
- O&M Manual & Recommended Commissioning checklist
- Spares & tools & tackles list
- Type test reports for same rating Isolator
- Manufacturing Quality Plan & Field Quality Plan

**All above drawings / documents shall be submitted within 7 days of PO issue.**

Bidder must agree for handing over, to Purchaser, all project related drawings in PDF version. The pdf versions of above drawings shall be submitted through Wrench for formal approval process.

## Bidders Prequalifying Requirements for AIS 33 kV 145 kV 245 kV Class Isolators

Sheet 14 of 48

S No	Parameter	Tata Power Requirement	Documents To be submitted by Bidder to ascertain meeting of Pre-qualification requirement
1	2	3	4
1	Infrastructure	Bidder must be an OEM of 145kV & above rating Outdoor type Isolator with manufacturing facility / assembly in India.	Self-undertaking to be submitted in this regard. Tata Power reserves the right to inspect the said manufacturing facility as a proof of compliance to this parameter.
2	Supply and Experience	<p>Bidder shall have supplied at least 150 nos of 145 kV and above rating outdoor type isolators in last 3 years as on date of bid submission. Out of these, 50 nos of isolators shall be in satisfactory service for last 2 years as on date of bid submission.</p> <p>Indian Subsidiaries of global companies having plant in India are also eligible to bid if the qualification requirements stated above are met independently or in combination with the parent company. Declaration from parent company needs to be submitted.</p>	<p>Supply List &amp; Performance Certificates from the utilities / clients</p> <p>Self-undertaking to be submitted in this regard. TATA Power reserves the right to inspect the said manufacturing facility as a proof of compliance to this parameter.</p>
3	Type Test	<p>The bidder shall submit Type test reports obtained from NABL/ International Accredited Lab for the equipment / material offered. The type tests should have been conducted on the equipment / material of the same design.</p> <p>The type tests should have been conducted within 5 years prior to the date of bid opening. Time period for type test may be extended by another 5 years as a special case, if there is no change in design / material of construction (MOC).</p> <p>In case the type test reports furnished are not for the quoted equipment / material but for the equipment / material with higher voltage class and/or different capacity, then type test shall be carried out for the offered equipment / material from NABL / International Accredited Lab without any cost implication to the owner and the Type Test reports shall be submitted before despatch of the equipment / material.</p>	<p>Type Test Report.</p> <p>Undertaking that there is no change in design / material of construction (MOC) if Type Test Report older than 5 years but less than 10 years prior to date of bid opening has to be considered (if applicable)</p> <p>Undertaking that type test shall be carried out for the offered equipment / material from NABL / International Accredited Lab without any cost implication to the owner and the Type Test reports shall be submitted before despatch of the equipment / material, in case type test reports furnished are not for the quoted equipment / material but for the equipment / material with higher voltage class and/or different capacity, (if applicable)</p>
4	Commercial Capability		Copy of audited Balance Sheet and P&L Account to be submitted in this regard.
5	EPC Experience (If applicable)	<p>In case the package involves installation &amp; commissioning of the equipment / material, then the bidder shall have the following experience:</p> <p>a) He should have successfully completed one single order of value ..... (80% of estimated value of similar work in last three years) OR</p> <p>b) He should have successfully completed two single orders of value ..... (50% of estimated value of similar work in last three years) OR</p> <p>c) He should have successfully completed three single orders of value ..... (40% of estimated value of similar work in last three years).</p>	Performance Certificates from the utilities / clients

*Murthy*

*Murthy*

*Murthy*  
20/2/2016

TATA POWER		The Tata Power Company Limited Corporate Engineering-Quality Assurance Inspection & Testing				
TPQAIT-QAXX-00-EX-SQP-030 REV 0		STANDARD QUALITY PLAN FOR ISOLATOR (110KV & ABOVE)				
Sr. No	COMPONENT / OPERATION	CHARACTERISTICS CHECKED		TYPE / METHOD OF CHECK	REMARKS	
1	2	3		4	5	
1.0	<b>MATERIAL:</b>	(Generally in-line with technical specification, drawing and datasheet)				
1.0	Contactor/ solenoids	1	Pick up voltage & Coil Resistance	TC Verification	To be carried out by supplier.	
		2	Contact Resistance			
2.0	Motor	1	As per relevant IS standard	TC Verification		
3.0	Insulator	1	As per IS-731, IEC 575, IEC 60233 including TYPE test	TC Verification		
4.0	Electrolytic Copper/ Al. Extrusion	1	Mechanical, Electrical & Chemical Properties	TC Verification		
5.0	Machined Comp.	1	Visual Inspection	TC Verification		
		2	Dimensional check			
		3	Mechanical properties			
6.0	Brass Forging	1	Mechanical & Chemical Properties	TC Verification		
7.0	Al Casting	1	Mechanical & Chemical Properties	TC Verification		
8.0	Motor Drive box	1	Metal sheet thickness	TC Verification		
		2	Dimensional check			
		3	Painting			
		4	IP class			
2.0	<b>INPROCESS INSPECTION:</b> (Generally in line with manufacturer standard)					
1.0	Assembly of complete motor drive	1	Functional test	Testing & Measurement	To be carried out by supplier.	
		2	Marking (phase/ direction)			
		3	Power freq Test on Aux control circuit			
2.0	Base Assembly	1	Visual & Dimensional check	Testing & Measurement		
		2	Marking			
3.0	Contact arm assembly	1	Dimension, alignment, cleanliness	Testing & Measurement		
4.0	Electro plating of current carrying contacts (silver/ tinn)	1	Thickness test as per IS 3203	Testing & Measurement		
5.0	Galvanizing of MS components	1	Surface preparation	Testing & Measurement		
		2	Uniformity			
		3	Mass of coating or thickness			
		4	Adhesion			
3.0	<b>ELECTRICAL TESTS:</b> (As per IS 9921 part 4, IEC 62271-102 & IEC 129)					
1.0	Routine test	1	Visual Inspection & BOM verification	Testing & Measurement		Customer Hold Point
		2	Measurement of resistance of the main circuit.			
		3	Power frequency test on main and auxiliary circuit.			
		4	Mechanical operation test			
		5	Manual operation on Main switch & Earth switch			
		6	Mechanical & Electrical Interlock between Isolator & Earth switch			
		7	Opening / Closing time(operating time) of Isolator & Earth switch			
		8	Levelling and alignment of structure and base frame			
		9	Functional test on auxiliary switches.			
		10	Visual check for contact alignment.			
		11	Resistance on main circuit			
		12	a) Isolator:			
		1	50 Operations on Isolator at control supply voltage			
		2	10 operations on Isolator at +10% of voltage			
3	10 operations on Isolator at -15% of rated voltage					
13	b) Earth Switch:					
1	50 Operations on Isolator at rated supply voltage					
2	10 operations on Isolator at +10% of rated voltage					
3	10 operations on Isolator at -15% of rated voltage					
14	Insulation resistance check for isolator in open and closed condition					

**TATA POWER**

The Tata Power Company Limited  
Corporate Engineering-Quality Assurance Inspection & Testing



TPQAIT-QAXX-00-EX-SQP-030  
REV 0

**STANDARD QUALITY PLAN FOR  
ISOLATOR (110KV & ABOVE)**

Sr. No	COMPONENT / OPERATION	CHARACTERISTICS CHECKED	TYPE / METHOD OF CHECK	REMARKS	
1	2	3	4	5	
		15	Testing and Measurement		
		16			Check for electrical clearance while opening and closing of isolator as well as earth switch
		17			Check phase to phase and phase to earth clearance of the poles
		18			Check for proper operation of limit and auxiliary switch and mechanical interlock between isolator and earth switch.
		19			Insulation resistance & power frequency test on power & control circuit.
		20			Record of operating time for isolator opening and closing operation
		21			Insulation resistance of motor
		22			Operate the isolator and record the motor current.
		23			Functional test in manual and local/ remote mode
4.0	TYPE Tests	1	Testing & Measurement	Valid TYPE tests certificate not older than 5 year is prerequisite.	
		2			Di-electric test
		3			Temperature rise test
		4			Short time current withstand/Peak withstand test
		5			Lighting & Switching impulse voltage test
Mechanical Endurance test					
Any Separate Type/ Design validation tests shall be carried out in accordance with TATA POWER specification or as per mutually agreed in MQP.					
5.0	<b>PACKING, PRE-SHIPMENT &amp; DISPATCH:</b>				
1.0	PRE-SHIPMENT & PACKING	Overall Dimensions.	Measurement		
		Completeness of accessories & fittings.	As per BOM & Spares list		
		Packing of Accessories.	Measurement		
2.0	DISPATCH	Issue of Release note / MDCC.		CHP	
NOTE	<p>A) ALL MATERIAL SHALL BE AS PER APPROVED DRAWING/ DATA SHEET.          B) STATUTORY REQUIREMENTS WILL BE COMPLIED BY THE CONTRACTOR.          C) TATA POWER / ITS REP IDENTIFICATION STAMP ON MATERIALS WILL BE PRESERVED, IF REQD, SAME SHALL BE TRANSFERRED BY TATA POWER / ITS REP ONLY FOR MATERIAL TRACEABILITY.          D) FINAL INSPECTION OF THE MAJOR ACTIVITIES ARE WITNESSED BY CLIENT AND IT IS HOLD POINT (AT THE DISCRETION TATA POWER)          E) MANUFACTURER SHALL PREPARE AND SUBMIT COMPLETE MANUFACTURING QUALITY PLAN IN PRESCRIBED FORMAT OR THEIR REGULAR FORMAT INDICATING THEIR REGULAR PRACTICES, TAKING CARE OF MINIMUM REQUIREMENT AS INDICATED ABOVE.          F) INSPECTION OF THE MAINTAINANCE SPARES SHALL BE OFFERED ALONG WITH THE MAIN SUPPLY AS PER THE INSPECTION STAGES OF 1 TO 4.          G) CALIBRATION CERTIFICATES OF THE EQUIPMENT USED FOR TESTING SHALL BE PROVIDED FOR REVIEW.          H) TATA POWER RESERVES THE RIGHT TO DEMAND / VERIFY/ AUDIT/ WITNESS ANY OF THE CHECK POINTS MENTIONED IN THE SCOPE OF SUPPLIER.</p>				
	Meant for (Internal Circulation / External – Stakeholders Circulation)				
			<i>Ruoh</i> 10/31/2015	<i>CR Bhonslay</i> 11/31/2015	<i>Shubhan</i> 11/31/2015
	R0	First issue	RP	CRB	SGP
	Rev.No	Reason for Revision	Prepared By & Date	Checked By & Date	Approved By & Date
	Meant for (Internal Circulation / External – Stakeholders Circulation)				

TATA POWER		The Tata Power Company Limited Corporate Engineering-Quality Assurance & Inspection		TATA				
TPQAIT-QAXX-00-EX-FQP-124 REV.0		STANDARD FQP FOR OUTDOOR ISOLATOR / DISCONNECTOR SWITCH (up to 400KV)						
Sr. No	COMPONENT / OPERATION	CHARACTERISTICS CHECKED	CLASS OF CHECK	TYPE OF CHECK	EXTENT / FREQUENCY OF CHECK	REFERENCE DOCUMENTS / ACCEPTANCE NORM	FORMAT OF RECORD	REMARKS
1	2	3	4	5	6	7	8	9
1.0	Receipt of Material	Availability of instruction manuals, drawings, quality dossier including IRN. Verification of main unit and all loose items / accessories for any visual damage and shortage during transit.	Minor	Physical	At the Time of Receipt.	IRN, MDCC, Bill of material, shipping list	Site Inspection register	Any shortfall/ damage shall be analyzed & reported jointly with site FQC.
2.0	Storage & Preservation	If Permanent location is not ready for placing the isolator assembly. Storage Type-2. Marshalling box to be placed under the covered shed. Check availability of all tools, tackles and ropes, Hydra etc. required for erection works are available.	Major	Physical	At the time of storage.	Manufacturer's Instruction Manual.	Site Inspection register	Vendor to define type of storage for components as attachment
3.0	PRE-ERECTION	Check civil foundation readiness and leveling. Install and check leveling and alignment of structure and base frame. Mount moving mechanism & support insulator and isolator assembly over insulator. Check for manual operation to check the freeness of assembly. Checks for mechanical interlock in manual operation between isolator and earth switch. Check alignment of Disconnector Switch, Earthing Switch and between Disconnector Switch & Earthing Switch. Check contact engagement and synchronisation of main contacts while closing and opening operation. Check Corona rings are provided and fixed properly (as applicable)	Major	Physical / Measurement	Once before erection.	Manufacturer's Instruction Manual.	Site Inspection register	Check joint protocol for handing over of area from Civil to Elect and FQC
4.0	ERECTION		Major	Physical	100%	Site approved drawing & Instruction Manual.	Inter dept. handing over protocol. Site Test Report*	*STR will be signed by contractor, construction representative



The Tata Power Company Limited  
Corporate Engineering-Quality Assurance & Inspection

**TATA POWER**

TPQAIT-QAXX-00-EX-FQP-124  
REV.0

**STANDARD FQP FOR OUTDOOR ISOLATOR / DISCONNECTOR SWITCH (up to 400KV)**

Sl. No	COMPONENT / OPERATION	CHARACTERISTICS CHECKED	CLASS OF CHECK	TYPE OF CHECK	EXTENT / FREQUENCY OF CHECK	REFERENCE DOCUMENTS / ACCEPTANCE NORM	FORMAT OF RECORD	REMARKS
1	2	3	4	5	6	7	8	9
		<p>Check each earth switch connected to earth thru. braided wire and earthing strip connections.</p> <p>Check auxiliary switches are set and operating correctly.</p> <p>Check phase to phase and phase to earth clearance of the Disconnecter pole during operation &amp; Earth Switch arm clearance on off condition.</p> <p>Check for tap off connection with line and end termination are as per drawing.</p> <p>Cable termination and tightness checked in Marshalling box.</p> <p>All cable identification tags provided and all cores are provided with identification ferrule in marshalling box.</p> <p>Check the ground connection &amp; resistivity of system earth mat</p>	Major	Physical  Measurement	100%	Site approved drawing & Instruction Manual.	Site Test Report*	*STR will be signed by contractor, construction representative
5.0	<b>PRE-COMMISSIONING</b>	<p>Check the contact resistance for main contact in closed condition.</p> <p>Check insulation resistance of Disconnecter Switch in closed condition.</p> <p>Check proper operation of limit switch, auxiliary switch.</p> <p>Check for interlocks between isolator, circuit breaker and earth switch (local and remote as applicable)</p> <p>Checks for mechanical interlock in manual operation between isolator and earth switch.</p> <p>Check for isolator &amp; earth switch indication function in marshalling box.</p> <p>Check motor drive current in marshalling box.</p> <p>Check IR value of control circuit.</p> <p>Check for heater and thermostat circuit, illumination circuit</p>	Critical	Testing & Measurement	100%	Factory test report.	Site Test Report*	*STR will be signed by contractor, construction representative and FQC representative



The Tata Power Company Limited  
Corporate Engineering-Quality Assurance & Inspection

STANDARD FQP FOR OUTDOOR ISOLATOR / DISCONNECTOR SWITCH (up to 400KV)

TPOAIT-QAXX-00-EX-FQP-124  
REV.0

Sr. No	COMPONENT / OPERATION	CHARACTERISTICS CHECKED	CLASS OF CHECK	TYPE OF CHECK	EXTENT / FREQUENCY OF CHECK	REFERENCE DOCUMENTS / ACCEPTANCE NORM	FORMAT OF RECORD	REMARKS
1	2	3	4	5	6	7	8	9
6.0	<u>COMMISSIONING</u>	Check for abnormality after energisation.	Critical	Testing & Measurement	100%	Approved Drg. Data sheet.	Commissioning Report.	
7.0	<u>Handing Over</u>							
	<u>Final documentation</u>	Compilation of all stage inspection protocol, test reports including closure of non conformance.	Critical	Visual	100%	NA	*SWCF	Site work completion file

**N O T E**  
 A). STATUTORY REQUIREMENTS WILL BE COMPLIED BY THE CONTRACTOR.  
 B). FOR STAGES WITNESSED / DOCUMENTS REVIEWED BY TATA POWER, COPIES OF RELEVANT DOCUMENTS WILL BE FURNISHED TO TATA POWER.  
 C). TATA POWER / ITS REP. IDENTIFICATION STAMP ON MATERIALS WILL BE PRESERVED / GOT TRANSFERRED BY TATA POWER / ITS REP AT APPROPRIATE STAGES. (IF REQUIRED).  
 D). THE EXTENT INDICATED IN COLUMN 8 IS IN CONTRACTOR'S SCOPE. TATA POWER MAY INSPECT AS PER THIS COLUMN OR RANDOM SAMPLES AT ITS DISCRETION.  
 E). COLUMN 7 WILL BE AS PER TATA POWER APPROVED DRAWINGS / DATA SHEETS / CONTRACT DOCUMENTS WHEREVER APPLICABLE.  
 F). INSTRUMENTS FOR LEAK TESTS AND PERFORMANCE TESTS WILL HAVE VALID CALIBRATION CERTIFICATE WITH TRACEABILITY TO NATIONAL LEVEL.

**Critical Category is HOLD point.**  
 This activity required inspection / Verification & acceptance by inspection authority responsible for this stage before further processing is permitted., 24 Hrs advance notice to be given to FQC. Contractor / sub contractor shall not process activity beyond this point without written permission by TATA POWER FQC.  
 This activity shall be formed by TATA POWER (Execution + FQC), Main & Sub- Contractor (Execution + FQC).  
 ( Also Surveillance by Head FQC / Project Head )

**Major Category is Witness point.**  
 This activity required inspection / Verification & acceptance by inspection authority responsible for this stage before further processing. 24 Hrs advance notice to be given to TATA POWER (Execution) . Contractor /sub contractor shall not process activity beyond Witness point without written permission by TATA POWER (Execution). This activity shall be performed by TATA POWER ( Execution ), Main and Sub- Contractor (Execution + FQC),  
 ( Surveillance by FQC )

**Minor Category is Review point.**  
 This activity required review of documents by TATA POWER for the compliance & acceptance, However 24 Hrs advance notice to be given to TATA power (Execution).  
 This activity shall be formed by Main and Sub- Contractor (Execution + FQC).  
 ( Surveillance by Execution / Project Head )

TATA POWER FQC is also authorized to carryout surveillance in any major & minor class of check at their discretion.

**STORAGE TYPE:**

- TYPE-1: OPEN AREA & ABOVE GROUND ON WOODEN PLANK WITH SLOPE FOR WATER DISPOSITION.
- TYPE-2: OPEN AREA & ABOVE GROUND ON WOODEN PLANK (WITH SLOPE FOR WATER DISPOSITION) AND COVERED WITH TARPAULIN.
- TYPE-3: OPEN SHED WITH FULLY FORMED FLOORING/CEMENT FLOORING.
- TYPE-4: COVERED SHED/STORE ROOM ON RACKS & IDENTIFIED LOCATION.
- TYPE-4A: CLOSED CHAMBER WITH TEMPERATURE & HUMIDITY CONTROL.

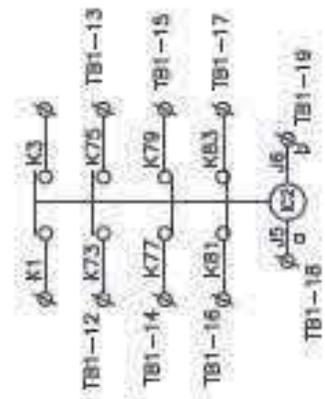
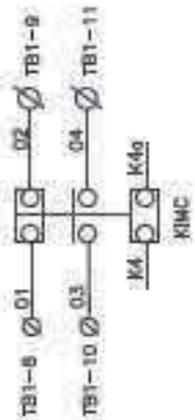
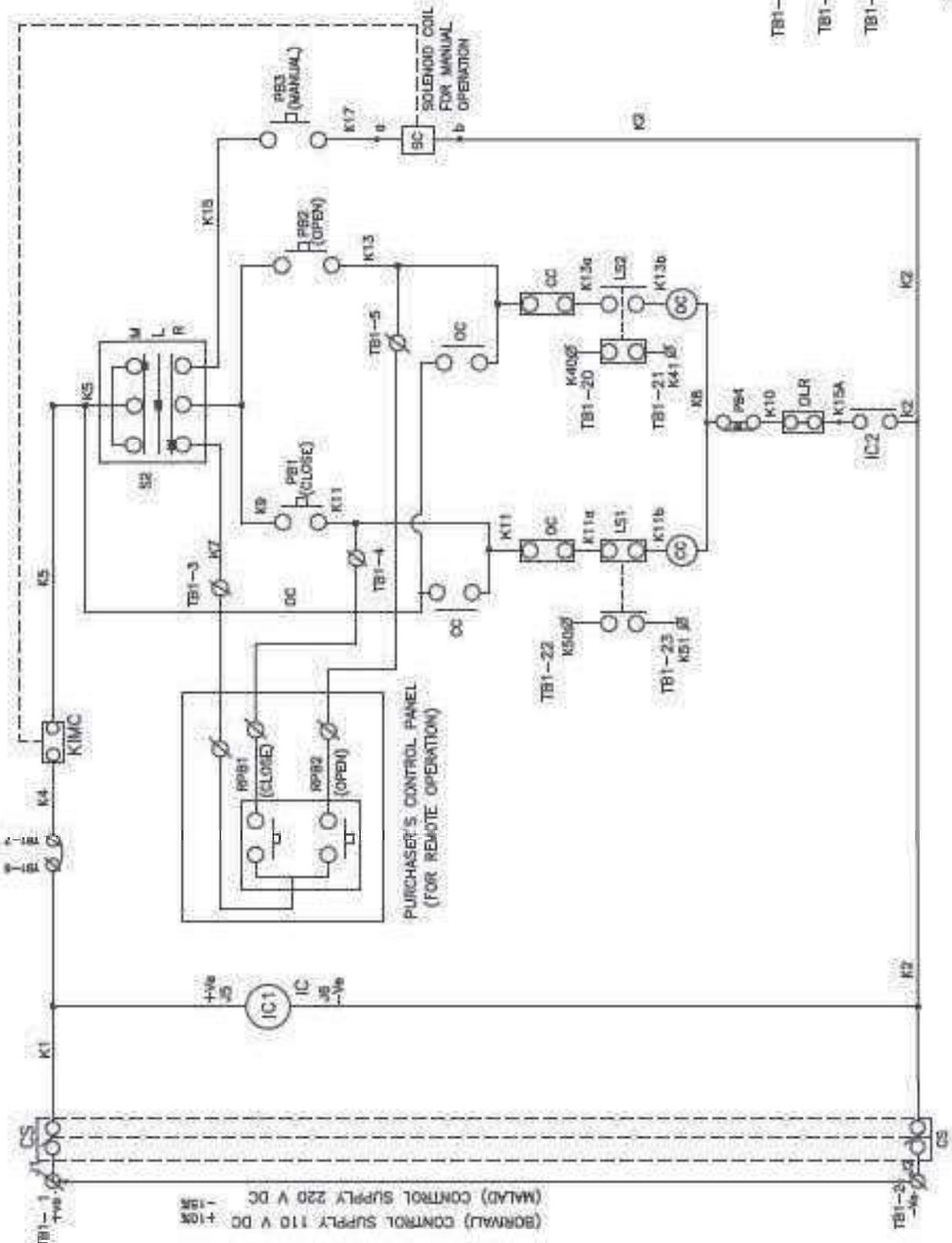
NOTE: Items/equipments having shelf life like paints, alumina, desiccant etc. are to be stored separately for identification purpose.

Rev. No	Reason for Revision	Prepared By & Date	Checked By & Date	Approved By & Date
RO	ISSUE FOR USE	RRP / 22.07.2016	CRB / 22.07.2016	SS /

<p><b>TATA POWER</b></p> <p>TPQA&amp;I-QA&amp;X-00-EX-MISC-249 REV.0</p>	<p><b>The Tata Power Company Limited</b> Corporate Engineering - Quality Assurance &amp; Inspection</p>	 <p>Date of Issue: 25/01/2017</p>
<p><b>SAMPLING CRITERIA FOR WITNESSING FINAL ACCEPTANCE INSPECTION FOR SWITCHYARD EQUIPMENTS</b></p>		
<p><b>EQUIPMENT SYSTEM RATING</b></p>		
<p><b>Equipment</b></p>	<p><b>Upto 33 kV</b></p>	<p><b>Above 33 kV and up to 110 kV</b></p>
<p>Outdoor Switchyard CT</p>	<p>Random 10% of offered Quantity or minimum 3 Nos. whichever is higher</p>	<p>Above 110 kV and up to 400 kV Random 25% of offered Quantity or minimum 3 Nos. whichever is higher</p>
<p>Outdoor Switchyard PT &amp; CVT</p>	<p>Random 10% of offered Quantity or minimum 3 Nos. whichever is higher</p>	<p>Random 25% of offered Quantity or minimum 3 Nos. whichever is higher</p>
<p>Outdoor Switchyard Circuit Breaker</p>	<p>Random 20% of offered Quantity or minimum 3 Nos. whichever is higher</p>	<p>100% of offered lot</p>
<p>Outdoor Switchyard Isolator</p>	<p>Random 10% of offered Quantity or minimum 1 Nos. whichever is higher</p>	<p>1 no. from offered lot of 5 nos max. 2 nos. if offered quantity is more than 5 nos. <sup>ACLD</sup> nos.</p>
<p><b>NOTE:</b></p>		
<p>1 Supplier to conduct 100% internal routine tests as per approved MQP and produce such report for Tata Power review during witness inspection.</p>		
<p>2 100% visual inspection of complete lot by Tata Power during inspection and random selection of equipments for witnessing tests as per final sampling guidelines. In case any sample fails in inspection, complete lot will be rejected. In case manufacturer wants to offer the existing failed lot, Tata Power will reserve the right for witnessing 100% lot for which cost of Tata Power inspection will be deducted from product cost.</p>		
<p>3 100% raw material/ bought out items TC shall be review by Tata Power as per approved MQP.</p>		
<p>* For more than 10 nos of offered quantity, sampling shall be decided as case to case basis</p>		
<p>Confidential and Proprietary – The Tata Power Company Limited.</p>		
<p>R0</p>	<p>RG</p>	<p>SS</p>
<p>First Issue</p>	<p>Prepared By &amp; Date</p>	<p>Checked By &amp; Date</p>
<p>Reason for Revision</p>	<p>Approved By &amp; Date</p>	<p>Approved By &amp; Date</p>



DC supply scheme



NOTE: SCHEME SHOWN WHEN ISOLATOR IN OPEN POSITION & DE-ENERGISED

# THE TATA POWER COMPANY LIMITED

STANDARD  
TECHNICAL SPECIFICATION  
FOR  
Clamps and Connectors

(DOCUMENT NO - ENGG/STD-SPEC/94/20)



**Tata Power**  
**Engineering (T&D)**

Rev. No	Date	Revision History	Prepared By	Checked By	Approved By (HOD)
A	21.07.2020	Final	PSA	RKS/SVD	AM

*Adarsh*

*Amal*

*[Signature]*

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1. Introduction
2. Pre-Qualifying Requirements including TTR
3. System Description and Scope
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5. Design Requirements
6. Layout Requirements for the equipment
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9. Technical Parameters of Equipment including data sheet and make list for bought out items.
10. Quality Requirements (including SQP and FQP)
11. Inspection, Testing and Performance Requirements along with Warranty
12. Mandatory Spares
13. Data Submission by Bidder
  - 13.1 With the Bid (including list of key drawings with dates/period which are part of commercial compliance)
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## 1. Introduction

The document covers the specific requirements for complete design, detailed engineering, manufacture, supply, inspection & testing at Bidder's work, packing, transportation, loading and unloading, delivery to site, storage at site, handling at site, erection, testing, commissioning, performance testing and handing over of Clamps and Connectors.

All equipment, system and services covered under this specification shall comply with all current applicable statutory regulations and safety codes in the locality where the equipment is proposed to be installed. The equipment and systems shall also conform to the latest version of applicable codes and standards on the date of offer made by the Bidder unless otherwise indicated. Nothing in this specification shall be construed to relieve the Bidder of this responsibility

## 2. Pre-Qualifying Requirements including TTR

Refer attached Annexure 1 - PQR

## 3. System Description and Scope

The scope includes Engineering, design, manufacture, supply, transport to site, installation of tinned Cu clamps for connection of Lightning Arrestor, Bus Post Insulator, , Isolators, CT, CVT, Line Termination jumpers, Copper / Stranded conductor bus and Cable Sealing end.

It is not the intent of this specification to specify completely herein, all details of design & technical requirements of clamps & connectors. However, the equipment shall conform in all respects to high standards of engineering, design & workmanship.

## 4. Codes & Standards.

The design, manufacture, performance testing and inspection of equipment shall comply with all currently applicable statutory regulations and safety codes in the locality, where the

ENGG/ELECT/STD-SPEC/ 94/20 Rev: A Date: 21.07.2020	<b>Standard Specification</b>	Page 4 of 7
	<b>Clamps and Connectors</b>	

equipment will be installed. Nothing in this specification shall be construed to relieve the vendor of this responsibility.

IS 5561-1970 or updated version

Unless otherwise specified the equipment shall conform to the latest applicable IS, BS or IEC Standards.

## 5. Design Requirements

- 5.1. Plain washers should be made of mild steel and spring washers shall be made of Electro galvanized.
- 5.2. All casting shall be free from shrinking, blow holes, surface blisters, cavities and other such defects and quality of clamps should be uniform throughout. All sharp corners should be blurred and rounded off.
- 5.3. Assembly should be designed in such a way so as to have minimum contact resistance.
- 5.4. Fittings offered should be inherently resistant from atmospheric corrosion and suitably protected against corrosion during storage and in service.
- 5.5. All clamps should be with proper locking arrangement to provide less vibration and loosening.
- 5.6. Clamps should be so designed that the post insulator shall not be subjected to abnormal stress due to thermal changes in conductor.
- 5.7. The clamps shall be able to handle continuous current of 1600 amps or as specified in the drawing.
- 5.8. The clamps should be able to withstand temperature rise of 45<sup>0</sup> C above the ambient temperature.
- 5.9. All ferrous metal parts intended for outdoor use, except those made of stainless steel, shall be protected by hot dip galvanizing in accordance with IS 2633 – 1964 or latest revision.
- 5.10. The threads of nuts and tapped holes shall be cut after galvanizing and shall be well oiled or greased. All other threads shall be cut before galvanizing.
- 5.11. The design should be such that it should be able to withstand the specified mechanical stresses and carry the rated current without exceeding the specified temperature rise. Minimum factor of safety should be taken as 2.
- 5.12. The connectors shall be indelibly marked with rated current or any identification mark to enable full particulars of the clamp to be supplied.
- 5.13. The following chemical composition should be maintained:

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**Copper Alloy of following composition:**

Sn – 0.6 to 1.5 %

Pb – 2.0 to 2.5 %

Zn – 2.0 to 3.0 %

Fe – 0.5 to 1.0 %

Cu – Balance.

**Impurities should not exceed below mentioned limits :**

Ni – 0.3 % max

Sb – 0.3 % max

Mn – 0.04 % max

Si – 0.04 %

P – 0.04 %

## 6. Layout Requirements for the equipment

NA

## 7. Safety Requirements

NA

## 8. Operational Requirements

NA

## 9. Technical Parameters of Equipment including data sheet and make list for bought out items.

S. No.	Description	Unit	Specific Requirements	Bidder's Response
1.0	<b>GENERAL</b>			
1.1	Material		Tinned Copper	
1.2	Copper Alloy of following composition: Sn – 0.6 to 1.5 % Pb – 2.0 to 2.5 % Zn – 2.0 to 3.0 % Fe – 0.5 to 1.0 %			

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	Cu – Balance			
1.2	Impurities should not exceed below mentioned limits Ni – 0.3 % max Sb – 0.3 % max Mn – 0.04 % max Si – 0.04 % P – 0.04 %		Parallel redundant with Servo Control Voltage stabilizer with Static by-pass	
1.4	Continuous current carrying capacity		1400 A	
1.6	Minimum factor of safety		2	

10. Quality Requirements (including SQP and FQP)

PI refer attached Annexure 3 – Standard Quality Plan for Quality Requirements

11. Inspection, Testing and Performance Requirements along with Warranty

11.1. Inspection and Testing

PI refer attached Annexure 3 – Standard Quality Plan for Inspection and Testing Requirements.

Bidder to carry out all the type tests as per the clause no. 3.3 mentioned in the attached SQP.

11.2. Performance Requirements

11.2.1. The clamps shall be able to handle continuous current of 1400 amps or as specified in the drawings.

11.2.2. The temperature rise while carrying full load current shall not exceed 45°C above site ambient temperature.

11.2.3. Minimum factor of safety should be 2

12. Mandatory Spares

NA

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	<b>Clamps and Connectors</b>	

### 13. Data Submission by Bidder

#### 13.1 With the Bid (including list of key drawings with dates/period which are part of bidder's commercial compliance)

Following drawings and documents shall be prepared based on Owner specifications and statutory requirements and shall be submitted with the bid:

- a. Completely filled in Technical Particulars
- b. General description of the equipment and all components including brochures.
- c. General arrangement
- d. Bill of material
- e. Experience List
- f. Type test certificates

#### 13.2 After award of contract

Sr. No	Descriptions	For Approval	For Review Information	Final submission
1.	Technical parameters	√		√
2.	Cross section Drawing		√	√
3.	QA & QC Plan	√	√	√
4.	Test Certificates	√	√	√

**TATA POWER**

The Tata Power Company Limited  
Corporate Engineering-Quality  
Assurance  
Inspection & Testing



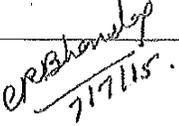
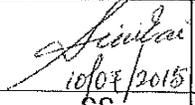
TPQAIT-QAXX-00-EX-SQP-116  
REV.0

STANDARD QUALITY PLAN  
FOR TRANSMISSION LINE  
CLAMPS & CONNECTORS

Date of Issue:

13/7/15

Document Title  
STANDARD QUALITY PLAN  
FOR  
TRANSMISSION LINE CLAMPS & CONNECTORS

		 7/7/15	 7/7/15	 10/07/2015	13/7/15
0	Initial Submission	RG	CRB (Head QA-I-E)	SS Head (QA&I)	RG
Revision No.	Reason for revision	Prepared By & Date	Checked By & Date	Approved By & Date	Issued by & Date

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<b>TATA POWER</b>		<b>The Tata Power Company Limited</b> Corporate Engineering-Quality Assurance Inspection & Testing			
TPQAIT-QAXX-00-EX-SQP-116 REV.0		<b>STANDARD QUALITY PLAN FOR TRANSMISSION LINE CLAMPS &amp; CONNECTORS</b>			Date of Issue: 13/11/15
Sr. No.	COMPONENT / OPERATION	CHARACTERISTICS CHECKED		TYPE / METHOD OF CHECK	Remarks
1	2	3		4	7
1	<b>MATERIAL:</b>	(All material shall be as per approved drawing/ data sheet/ Specifications)			
1.1	Aluminium Alloy/ Copper / Cast Iron (as applicable)	i	Mechanical, Chemical & Electrical properties as per relevant Standards & Specifications	MTC Review	
1.2	Hardware (Included Bolt, Nut, Plain)	i	Galvanising Test & Mechanical Tests as per relevant Standards & Specifications	MTC Review	
2	<b>INPROCESS INSPECTION:</b> (Generally in line with manufacturer standard)				
3	<b>FINAL INSPECTION - (IS 5561)</b>				
3.1	<b>Routine Tests</b>	i	Visual Checks	Testing and Measurement	100%
		ii	Dimension Checks		
3.2	<b>Acceptance Test</b>	i	Tensile Strength Test on Assembly	Testing and Measurement	CHP (On sample basis as per IS)
		ii	Resistance Test		
		iii	Dimension Checks		
		iv	Slip Test (IS 2486 Part 1)		
		v	DP Test (on thinner section of load bearing part)		
		vi	Galvanising Test (if applicable)		
3.3	<b>Type tests</b>	i	Temperature Rise	Testing and Measurement	Review of valid/ approved type test reports during final inspection
		ii	Short Time Current Test		
4	<b>PACKING, PRE-SHIPMENT &amp; DISPATCH:</b>				
4.1	PACKING	i	Nos. of pieces & Weight.		
		ii	Completeness of accessories & fittings.		
4.2	DISPATCH		Issue of Inspection Release note / MDCC.		CHP
N O T E	A) ALL MATERIAL SHALL BE AS PER APPROVED DRAWING/ DATA SHEET/ TECHNICAL SPECIFICATIONS.				
	B) STATUTORY REQUIREMENTS WILL BE COMPLIED BY THE CONTRACTOR.				
	C) TATA POWER / ITS REP IDENTIFICATION STAMP ON MATERIALS WILL BE PRESERVED, IF REQD, SAME SHALL BE TRANSFERRED BY TATA POWER / ITS REP ONLY FOR MATERIAL TRACEABILITY.				
	D) FINAL INSPECTION OF THE MAJOR ACTIVITIES ARE WITNESSED BY CLIENT AND IT IS HOLD POINT (AT THE DISCRETION TATA POWER)				
	E) MANUFACTURER SHALL PREPARE AND SUBMIT COMPLETE MANUFACTURING QUALITY PLAN IN PRESCRIBED FORMAT OR THEIR REGULAR FORMAT INDICATING THEIR REGULAR PRACTICES, TAKING CARE OF MINIMUM REQUIREMENT AS INDICATED ABOVE.				
	F) INSPECTION OF THE MAINTAINCE SPARES SHALL BE OFFERED ALONG WITH THE MAIN SUPPLY AS PER THE INSPECTION STAGES OF 1 TO 4.				
	G) CALIBRATION CERTIFICATES OF THE EQUIPMENT USED FOR TESTING SHALL BE PROVIDED FOR REVIEW.				
	H) TATA POWER RESERVES THE RIGHT TO DEMAND / VERIFY/ AUDIT/ WITNESS ANY OF THE CHECK POINTS MENTIONED IN THE SCOPE OF SUPPLIER.				
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*Handwritten signature*  
13/11/15

Annexure: E3

# TATA POWER

## GENERAL REQUIREMENTS OF QUALITY ASSURANCE & INSPECTION

[SHALL BE A PART OF GENERAL TECHNICAL CONDITION]

Document No.: TPQAIT-QAXX-00-GN-QSP-214



Rev 02 Dated 19/05/2017	DP /RP/RG/PU <i>al</i>	SKJ/ RM/CRB <i>SD 19/05/17</i>	SS <i>Sundar 19/05/17</i>
Rev 01 Dated 21/07/2016	SKJ / DP	RG	SS
Rev 00 Dated 21/04/2015	RG / SKJ / PU	SS	SS
Revision no. & Date	Prepared By	Reviewed By	Approved by

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## 1.0 PURPOSE

Purpose of these requirements is to provide uniform general requirements for implementation of Quality Management System for projects being executed by OWNER.

## 2.0 SCOPE

- 2.1 Scope of these requirement covers pre-requisites of the Bidder's/ Supplier's/ Contractor's Quality Management System (QMS) applicable for all phases of contract execution including design, procurement, manufacture, testing, erection and commissioning, applicable other services and further to establish specific factors for which control shall be carried and put into continuing operation by the Bidder/ Supplier /Contractor to ensure that all supplies and services comply with the contract requirements.
- 2.2 The required/specified reliability & other characteristics of quality should initially be "designed in" and then "built in". It is emphasized that satisfactory product and system performance can be achieved only through strict control of all design, manufacturing and erection/installation processes as well as test and inspection.
- 2.3 During bid stage itself, BIDDER shall submit requisite documents to demonstrate that as a supplier/ contractor they have well defined and implemented QMS. They shall also establish that their QMS is taking care of their sub-supplier/agencies, and continually improve its effectiveness in accordance with the requirements of their QMS as per ISO 9001, or any other quality standard.

BIDDER shall submit a project specific organization chart defining the permanent positions responsible for QMS accompanied by a brief description of each position's function and responsibility.

## 3.0 DEFINITION

- **OWNER**  
Tata Power or its subsidiaries/ JV partners.
- **Bidder**  
An organization/ agency, who propose to submit their offer against RFQ/enquiry floated by OWNER. Only successful bidder will be converted to supplier/ contractor on award of contract by OWNER.
- **Supplier / Contractor**  
An organization referred as Supplier/ contractor, who execute the contract awarded by Contracts department of OWNER. It also covers the Agency involved in execution of site/ field activities or provides services (as a contractor) when awarded by Contracts department of OWNER. A Supplier can also be a manufacturer for part of supply for his in-house products.
- **Sub-Supplier/ Sub-vendor**  
An organization, who manufactures, supplies the system or equipment or item and provides services to the supplier. It also covers manufacturer who manufactures and supplies the equipment or its components or items to the sub-suppliers to complete the system supply. It

should also cover the agencies which also support execution of main supplier by providing qualified manpower/ services.

- **Third Party Inspection Agency (TPIA)**  
An third party organization or any neutral agency mutually agreed, deputed for conducting inspection or quality surveillance activities on case to case basic.
- **Inspection Agency (IA)**  
An organization or any agency deputed by OWNER for conducting inspection or quality surveillance activities on behalf of OWNER on case to case basic.
- **Inspection Categorization Plan (ICP)**  
This document shall categorize the Quality Plan and Inspection scope of all equipment/ items in the package. This will also include the schedule for submission and approval of all Quality related documents.
- **Standard Quality Plan (SQP)/ Standard Field Quality Plan (SFP)**  
SQP shall comprise of minimum basic requirements of all tests/checks to be carried out during manufacturing to meet/ conform technical requirement. SQP may be in the form of Inspection & Test Plan (ITP)/ Technical Specification as part of Bid Document.  
Similarly SFP shall comprise of minimum basic requirements of all field tests/checks to be carried out during execution of the project.
- **Manufacturing Quality Plan (MQP)**  
MQP shall comprise of all tests/ checks indicated in standard Quality Plan (SQP) and tech specifications. It shall also include any additional quality checks/ tests required as per discussions (pre & post bid) to be followed during manufacturing of particular item/ equipment.
- **Field Quality Plan (FQP)**  
FQP shall detail out the activities and steps to be performed at project site and shall be followed from receipt of material to pre-commissioning stage. FQP shall be prepared by contractor and to be submitted to OWNER at post award stage of contract for owner's approval.
- **Hold Point/ Customer hold point (CHP)**  
A check point for an activity mentioned in approved MQP/ FQP, which requires inspection/ verification, and acceptance by the OWNER or its representative for this stage before any further work is permitted.  
Supplier shall not process beyond a CHP without written acceptance & clearance of that activity by OWNER in writing
- **Witness Point**  
A check point for an activity mentioned in the approved MQP/ FQP, which will be witnessed by OWNER or its representative.  
Supplier will obtain consent from OWNER to proceed for further work, in case OWNER or its representative is not able to attend the activity within notification period.

- **Review / Verification Point**  
A check point for an activity mentioned in the approved MQP/ FQP that requires review of document/ test record by OWNER or its representative performed by the Supplier for acceptance.
- **Test Report Record**  
Such reports / record are document prepared by Supplier/ Sub-Supplier for test/ check conducted indicating details / types of test including test results, relevant codes etc.
- **Inspection Report (IRT)**  
Such report which covers details of all the checks / activities carried out as per approved MQP. It also covers details of the observations and NCRs during those checks / inspection.
- **Inspection Release Note (IRN)**  
IRN is a document issued on standard format after successful quality checks/inspection and confirming to compliances of all observations and NCs if any).
- **Non Conformity Report (NCR)/ Quality Correction Action Report (QCAR)**  
It is a report on deviation/ non-compliance with respect to the requirements laid down in the PO/ Technical Specification, MQP, Codes & standards. NCR shall be applicable during inspection at Shop as well during site Audits and QCAR shall be applicable for site inspection / surveillance.

#### **4.0 QUALITY ASSURANCE PROGRAMME**

To ensure that the equipment and services under the scope of contract whether manufactured or performed within the Bidder/ Supplier /Contractor's works or at his sub-vendor's premises or at site or at any other place of work are in accordance with the specifications, the Bidder/ Supplier/ Contractor shall adopt suitable project specific QMS based on his organization's Quality Management System, regular practice, statutory requirements and as specified for this specific contract and submit the same for approval of OWNER, to control such activities at all points, as necessary. Such program shall be outlined by the Bidder/ Supplier/ contractor. Any deviation with respect to all above requirements (as specified in SQP, SFP, Technical specification as minimum quality requirements) shall be brought out clearly in the bid stage by bidder.

#### **5.0 SUPPLIER QUALITY MANAGEMENT SYSTEM (QMS)**

- 5.1 All materials, components and equipment covered under the contract including bought outs shall be procured, manufactured and tested at all the stages, as per a comprehensive Quality Assurance Programme. It is the Bidder/ Supplier / Contractor's responsibility to draw up and implement such program duly approved by the OWNER.
- 5.2 All items/equipment in the scope of the contract shall be classified into categories according to the criticality or other attributes of items/ equipment. A detailed proposal addressing vendor approvals and quality control of all such items/ equipment shall be proposed to OWNER for approval.
- 5.3 The detailed quality plans for shop manufactured items and for field activities including civil works (if applicable) shall be drawn up by the Bidder/ Supplier / Contractor separately.

All shop quality plans and field quality plans shall be submitted to OWNER for approval prior to start of manufacturing activities and site activities respectively.

- 5.4 Manufacturing quality plans shall detail out various tests/ inspections to be carried out as per the requirement of the specification, standards mentioned therein, quality practices and procedures followed by Supplier's/ his sub vendor's quality control department. MQP shall be prepared by manufacturer and submitted through supplier post award stage of contract for owner's approval. OWNER approved MQP to be referred during manufacturing & shop inspection. Typical format of Manufacturing Quality Plan is enclosed as **Exhibit A**.
- 5.5 Field quality plans shall detail out for all equipment, the quality practices and procedures etc. to be followed by the execution agency, during various stages of site activities right from receipt of materials/ equipment at site to commissioning stage covering receipt, storage, erection & pre-commissioning tests. It shall comprise of all tests / checks indicated in SFP & Technical Specification including any additional quality checks / tests required as per discussions (pre & post bid). It shall also take care of minimum basic requirement of OEM/manufacturer (as the execution agency may not be part of OEM/manufacturer). OWNER approved FQP is to be referred during execution of work. FQP shall have 5 stages: Receipt, Storage, Pre-erection/ pre fabrication, Erection/ Execution and pre commissioning checks with categorization of checks as Critical (Cr), Major (Mj) and Minor (Mn). Typical format of Field Quality Plan is enclosed as **Exhibit B**.
- 5.6 In these approved manufacturing and field quality plans, OWNER shall identify "Customer Hold Points" & "Witness Points". "Customer Hold Points" are test/checks which shall be carried out in presence of the OWNER's Engineer or its authorized representative and beyond which the work shall not proceed without consent of OWNER/ its authorized representative in writing. "Witness Points" are tests/checks which shall be carried out in presence of the OWNER's Engineer or its authorized representative but the work can proceed to next operation/ stage in case OWNER's Engineer doesn't attend on the mutually agreed date. The above procedure shall be applicable to the Bidder/ Supplier / Contractor's bought out equipment/ items also.
- 5.7 All the critical & major items shall be procured from the sub-vendors approved by OWNER by supplier/vendor/contractor. Detailed list of such sub-vendors offered by supplier/vendor/contractor shall be submitted not later than 7 days after the LOI/ Placement of order whichever is earlier and shall be frozen within 15 days of submission. Request for additional sub-vendors shall not be entertained from the Bidder/ Supplier / Contractor after the sub-vendor list is finalized and frozen. Only in case of Force Majeure Condition, Supplier/ contractor shall establish such condition and propose new/ alternative source. Contractor / supplier shall provide requisite documents for consideration of OWNER. OWNER has right to accept/ reject based on review of details. If required, physical assessment shall be made before conveying such decision. Delays arising out of such exercises shall be entirely to the account of Supplier/ Contractor and shall not relieve him from any obligation, duty or responsibility under the contract. For intended manufacturer/ sub-vendors/ sub-suppliers, details to be submitted are indicated below:
- i. Rating, Range / type etc. of equipment/ item for proposed approval.
  - ii. Organisational structure including QA/QC inspection dept with man power & qualification details.
  - iii. In house design / R&D capability.
  - iv. List of sub-vendors for critical/ major bought out items.

- v. In-coming material inspection plan and Manufacturing Quality Plan.
- vi. In house manufacturing facilities, including process flows.
- vii. In house Testing facilities (including Type testing).
- viii. Experience (Past Track Record) list for last 3 yrs for similar product.
- ix. Performance certificates issued by other customers.
- x. Certification of/ by reputed agencies (ISO/ ASME/ CE/ UL/API/ etc) & also approval certificates from other customers etc.
- xi. Quality Manual.
- xii. Assessment report by contractor/ supplier and their own experience.

**5.8 Non Conformance Report (NCR) / Quality Correction Action Report (QCAR)**

Wherever the non-conformity is found during inspection either by Supplier or OWNER or its representatives, NCR / QCAR shall be issued in prescribed format. Manufacturer /Supplier shall indicate the Correction / CAPA and submit these NCRs/QCARs to OWNER or its representative for their review & resolution. Till such time identified item/equipment will be kept under quarantine. Upon satisfactory completion of the rectification work, final acceptance of the item/equipment shall be documented on the NCR/QCAR format.

Supplier has to close all NCR / QCAR in systematic & time bound manner including all corrective and preventive actions. Job shall progress only after effective resolution of NCR / QCAR.

**Note:** If OWNER observes that any material or equipment is unacceptable with respect to potential safety, reliability, interchangeability or workmanship, OWNER shall issue a non-conformance report NCR / QCAR in this regard to the Supplier/ Contractor. Such NCR/QCAR shall be dealt as above.

- 5.9 No material shall be dispatched from the Bidder's/ Supplier's/ Contractor's /manufacturer's works before the dispatch instruction is given in writing by the owner. subsequent to pre-dispatch inspection including verification of records of all previous tests/ inspections by OWNER/ authorized representative. Any such item/material dispatched by party without clearance from OWNER shall be at suppliers risk & cost only. No IRN/ dispatch clearance shall be issued for the same as post facto.
- 5.10 OWNER or its nominated representative reserves the right to carry out quality audit/ quality surveillance of the systems and procedures of the Bidder/ Supplier/ Contractor's or their sub-vendor's Quality Management System and control activities without prior intimation. The Bidder/ Supplier/ Contractor shall provide all necessary assistance to OWNER or its nominated representative to carry out such audit/ surveillance.
- 5.11 The Bidder/ Supplier/ Contractor shall be responsible for providing, controlling, calibrating, and maintaining the 'measuring & test equipment' required by them for demonstrating compliance of supplies within contract requirements at shop and at site. All the measuring instruments shall be calibrated at periodic intervals determined by Bidder/ Supplier/ Contractor/ sub-vendor on the basis of his suitability, purpose and usage as per the system adopted by him for calibration of such measuring and test equipment. However, in no case, shall the interval between successive calibrations be more than 12 months. All measuring and test instruments shall have valid calibration certificates and calibration data shall be made available to OWNER or its nominated representative on demand.

- 5.12 Quality surveillance/ approval of the results of the tests and inspection shall not, however, prejudice the right of the OWNER to reject the equipment if it does not comply with the specification when erected or does not give complete satisfaction in service and the above shall in no way limit the liabilities and responsibilities of the Bidder/ Supplier / Contractor in ensuring complete conformance of the materials/ equipment supplied to relevant specification, standard, data sheets, drawings etc.
- 5.13 For all spares and replacement items, the quality requirements as agreed for the main equipment supply shall be applicable. Inspection of all mandatory spares and commissioning spares shall be in line with the approved MQP of respective equipment/ item. Interchangeability Certificate shall also be part of quality records for all spares.
- 5.14 **Statutory Inspection**  
Supplier to ensure that Equipment/ items which fall under statutory requirements of country where the equipment will be installed, shall be inspected by statutory authority like IBR etc. In case of imported items, statutory inspection will be carried out by the agency as nominated by Statutory Authority or Statutory authority of the country of origin. Original certificates endorsed by statutory authorities shall be submitted to project manager as identified in the contract.  
Such items shall also be offered to OWNER for inspection irrespective of country of origin.
- 5.15 **Failure to Pass Tests**  
If any item/ equipment fail to pass any test, the Bidder/ Supplier shall rectify or replace the same and, unless OWNER agrees to dispense with repetition of the test, shall repeat the test following a further notice. The cost and expense of any such retest shall be fully borne by the Bidder/ Supplier only.
- 5.16 Major repair/rectification procedures to be adopted to make the job acceptable shall be subject to the approval of the OWNER/ its authorized representative.
- 5.17 All tests shall be carried out to the satisfaction of the OWNER/ its authorized representative either in their presence or as agreed by OWNER. All reports/ protocols, site and shop inspection reports shall be developed specific to the requirements of the project which is acceptable to OWNER. The same shall be applicable to erection testing and pre-commissioning reports and protocols also.
- Only tested, inspected and accepted (by owner) material as listed in PO / ICP shall be dispatched to project site.** Any diversion of such accepted material without any prior approval shall be considered as deviation/ breach of contract and a minimum penalty of 5 times the cost of inspection will be levied.
- 5.18 Approval of any concession shall be the prerogative of the OWNER and approval of concession for a particular case shall not be set as a precedent.

- 5.19 All the equipment shall be of proven design and type tested. Valid type test reports shall be furnished to engineering for review and acceptance prior to offering equipment for inspection.
- 5.20 All documents/ reports/ records shall be issued either in English language or bilingual with English.

## **6.0 INSPECTION CATEGORIZATION PLAN, WELDING & NDT REQUIREMENT**

### **6.1 Inspection Categorization Plan (ICP)**

This document shall be prepared by supplier and to be submitted to OWNER for approval in attached standard format for all package items within 15 days of award of contract. The schedule shall be prepared considering that all MQP should be approved at-least 15 days prior to start of any manufacturing activity and FQP with related procedures shall be finalized at least 15 days prior to dispatch schedule/ site mobilization.

ICP, MQP, FQP and related procedures shall form part of Master Drawing List (MDL)

All the items/equipment in the scope of the contract shall be classified into categories (A/ B/ C) according to the criticality or other attributes of items / equipment. A detailed proposal addressing vendor approvals and quality control of all such items /equipment shall be proposed to OWNER by the Supplier/ Contractor for approval.

Category “A”: Manufacturing Quality Plan (MQP) shall be approved by TATA POWER. Stage &/ or Final Inspection including document review by EPC Contractor and TATA POWER (or its appointed Inspection Agency) as per approved MQP.

Category “B”: Manufacturing Quality Plan (MQP) shall be approved by Tata Power. Stage &/ or Final Inspection including document review by EPC contractor or Tata Power (in case no EPC Contractor) as per approved MQP. Inspection report of EPC contractor/ Supplier with supporting documents review by Tata Power.

Category “C”: Supplier shall carry out inspection as per their regular practice/ standard manufacturing quality plan. Supplier shall submit test report and COC to EPC Contractor/ Tata Power for approval/acceptance. COC shall be in standard format of Tata Power.

### **6.2 Welding & Non-Destructive Testing (applicable for shop as well project site)**

- 6.2.1 Bidder / Supplier/ Contractor shall submit the following documents in requisite copies for review and approval of OWNER/ its authorized representative at least FOUR weeks prior to commencing fabrication/ manufacturing and finalize before start of job. All such submissions shall be made in ENGLISH language only.
- i. Welding procedures together with the relevant procedure qualification records.
  - ii. Non-destructive testing procedures.
  - iii. Heat treatment procedures.
  - iv. Any other special procedure (as applicable) proposed to be used during project execution  
Welding procedures and welders’ qualifications in accordance with the latest revision of ASME Boiler & Pressure Vessels Code, Section IX, (structural welding as per AWS D1.1)

or equivalent standard covering all essential & non- essential variables shall be acceptable to OWNER.

- 6.2.2 Only qualified welders shall be deployed. Welders shall be qualified as per approved WPS in presence of OWNER/ its authorized representative. Electrode/ welding rod used at project site shall be of owners approved. Supplier/ Contractor shall take prior approval.
- 6.2.3 Weld repair procedures are subject to approval of the OWNER. No welding is permitted on C.I. Castings. OWNER reserves the right to examine and witness acceptance tests, prior to and following weld repairs and subsequent post weld heat treatment, mechanical tests etc, at the material manufacturer/ Supplier works.
- 6.2.4 Should any of these welds prove to be defective on inspection, the number of welds to be tested in that system shall be twice that of originally selected. Should any of the second incremental welds prove to be defective, then 100 % of the welds in that system/ group shall be tested.
- 6.2.5 NDT operators shall be qualified in accordance with an agreed nationally accredited scheme such as the Personnel Certification in Non-destructive testing (PCN) scheme and shall be certified to level II or higher of that system.
- 6.2.6 Plate thickness  $\geq 32\text{mm}$  (for structure), Plate thickness  $\geq 25\text{mm}$  (for pressure vessel), Forging / Bar dia.  $\geq 40\text{mm}$  (finished) shall be UT tested.

## **7.0 INSPECTION AT SHOP**

### **7.1 Inspection Scope**

The scope of inspection shall be as per Witness/ Hold Point as defined in approved MQP/ SQP. Supplier has to ensure that all applicable and agreed approved Drawings, Data Sheet etc. are available for any inspection and equipment used for measurement are calibrated. Supplier shall intimate all such cases in advance (as inspection rolling plan) and also through inspection call as per contract agreement.

### **7.2 Inspection Coordination**

Supplier has to identify single point contact for coordination of the entire inspection activities on behalf of Supplier/ sub-supplier. Supplier to ensure that monthly and 3 monthly rolling inspection plan are prepared and submitted in advance to OWNER by 1<sup>st</sup> working day of each month for effective inspection coordination.

### **7.3 Inspection Request**

- 7.3.1 Depending upon the stages of inspection as agreed in manufacturing quality plan, supplier to send Inspection Requests (in OWNER standard format & through system) to OWNER Project Manager for inspection activities to be attended at supplier's / sub-supplier's premises. Supplier to submit all relevant approved reference documents (MQP, Drawings/ Data Sheet etc.) along with inspection request. Supplier has to give sufficient advance notice, as defined below for inspection of any stage. The date of receipt of inspection call by OWNER will hold good.

- 7.3.2 The minimum advance notice period for inspection shall be given below:

- i. Inspection within INDIA : 7 Days
- ii. Overseas (Outside India) Inspection : 30 Days

Supplier to strictly adhere the above mentioned minimum advance notice period.

7.3.3 Supplier shall plan the inspection visits required in a manner so as to achieve maximum inspection stages attended with minimum possible inspection visits/ time where-in more than one external inspection agencies are involved for single inspection activity, inspection by all agencies may be done concurrently.

#### 7.4 Inspection Methodology

7.4.1 Suppliers shall ensure internal inspection before offering inspection to OWNER or its representative. Internal test certificates and previous stage inspection reports to be made available during inspection.

7.4.2 During inspection, Supplier to produce copies of the latest revision of the approved MQP along with drawings, Data Sheet, Standard and accepted type test reports as indicated in approved MQP / agreement to ensure that the inspection is carried out as per the latest revision and approved documents. **If required, Supplier to arrange the necessary codes and standards for reference purposes.**

In case inspection cannot be completed or undertaken due to reasons such as non-readiness of material, back up documents, false inspection call etc. then such reason shall be recorded in Inspection Report. **If Supplier fails to offer the item / equipment for inspection as per the agreed date, he is liable to pay for the time and expenses for the abortive visit of the OWNER or its representative.**

7.4.3 All inspection related documents i.e. mill test reports, Supplier inspection/ tests reports, all inspection/ tests carried out including other records such as stress relieving charts, radiographic reports and other non-destructive testing records in accordance with provision of contract shall be submitted in original form. All such reports shall be duly endorsed/ certified by the main supplier.

7.4.4 Results of Tests and copies of Inspection Report, Test reports, original material test certificates (MTCs), calculations, performance curves etc. shall be promptly made available to the OWNER or its appointed representative by the Supplier, in accordance with this document and shall form part of the subsequent Manufacturers Test Record Book in accordance with the requirements of this document.

7.4.5 Supplier to ensure that all the materials are properly identified/ coded to confirm traceability and correlation purposes.

7.4.6 Supplier shall take special care including packing to protect the final painting and finish product (equipment / item) during handling, transportation, storage and execution stage so that there is no damage occur. In case of any such damage, joint inspection to be carried out at site and necessary action to be taken.

7.4.7 Supplier to ensure finish product is properly identified after completion of inspection and are suitably recorded in Inspection Report by inspection engineer.

## 7.5 Inspection Report & Clearance

### 7.5.1 Inspection Report (IRT)

All inspection visits by OWNER or its appointed agency shall be supported by an inspection report as per the standard format (sample enclosed). Any shortcoming observed w.r.t. approved MQP/ Drawing/ Data Sheet / specification etc. shall be recorded as NCR. IRT shall have detail references of all such NCRs. All such inspection report / NCR shall be jointly signed by supplier and Inspection Engineer. IRT shall be issued to all concern including Supplier and Sub-supplier/ Manufacturer.

### 7.5.2 Inspection Release Note (IRN)

IRN shall be issued only after satisfactory completion of Inspection by OWNER as defined below IRN shall be issued by Tata Power (QA&I dept) thru system in the standard format as closure of particular inspection.

IRN for Category 'A' item (as defined in ICP) shall be issued only after ensuring inspected Equipment / Item meets the requirements of the applicable documents and all NCs have been closed to the satisfaction of Owner. IRN shall be issued in the standard format as closure of particular inspection.

Similarly for Category 'B' items (as defined in ICP) IRN shall be issued after review of inspection report, compliance report and required applicable documents as per approved MQP & Closure of NCs if any are verified and accepted to the satisfaction of Tata Power.

For Category 'C' items (as defined in ICP), IRN shall be issued after review of original manufacturer test certificates, Certificate of Conformance (CoC) from supplier/contractor in Tata Power standard format and required applicable documents as per MQP approved by main supplier / as per their standard procedure are verified and accepted

## 7.6 Material Dispatch Clearance Certificate (MDCC)

Supplier shall obtain dispatch clearance (MDCC) from Project / Plant based on IRN prior to dispatch of any billable material / equipment/ item from manufacturer place to our project site / plant. One set of Quality Dossier (hard copy) for which MDCC has been issued, shall be sent to project site along with material / equipment/ item.

MDCC is not required for material / equipment/ item/ Part supply which are dispatched from one sub-supplier works to another sub-supplier/ supplier works for further assembly and testing (to make it billable). However, clearance in the form of Inspection Report (IRT) is needed in this regard.

## 8.0 QUALITY DOSSIER (FOR SUPPLY PORTION) [Package wise]

Supplier shall compile and submit all stage and final inspection reports as per approved MQP, duly reviewed and endorsed by inspection engineer for reference and records of OWNER. Documents shall be submitted with-in 4 weeks of issuance of final MDCC

Dossier shall consist of following documents, as minimum:

- i. Index Sheet
- ii. Approved bill of material of package.

- iii. All Approved documents (MQP, Drawings & Data Sheet etc.)
- iv. MDCC, IRN & IRT along with all closed NCR of all items.
- v. Factory Acceptance Test (FAT) reports.
- vi. Raw material and bought out item MTC's
- vii. Test Reports corresponding to IRT & MQP.
- viii. Supplier internal inspection reports as per MQP.
- ix. Copy of Statutory and IBR certificates as applicable.

**Note:**

- 1. Each package compilation shall be done on the basis of unit wise and common systems.
- 2. Each volume/ dossier shall be spiral/ hard bounded. Each sheet of dossier to have running numbers.
- 3. One hard copy (in addition to the dossier dispatch with material / equipment/ item) and 2 Soft copies of documents to be submitted as final dossier.

**9.0 FQC DURING CONSTRUCTION AND PRE-COMMISSIONING.**

- 9.1 Supplier Quality Management System is applicable for field activities also and for his further sub agencies deputed at project / plant. Refer clause no: 5.0 (applicable part). Supplier/ Contractor shall deploy sufficient no of QA/ QC persons to take care of daily activities as per agreed/ approved Quality documents. Some of such activities are detailed below. Also QA/ QC head shall regularly co-ordinate with OWNERs FQC team.
- 9.2 Raising of inspection calls on regular basis for various activities as indicated in approved FQP/ other document, carrying out inspection activities along with OWNER's execution / FQC department and maintaining the records duly signed by all concerned.
- 9.3 Various inspection/ quality assurance procedures/ methods at different stages of erection and pre-commissioning will be as per OWNERs approved field quality plans/ codes/ IBR and other statutory provisions and as per OWNER's engineer's instructions.
- 9.4 Preparation of quality assurance log sheets and protocols, welding logs, NDE and post weld heat treatment records, testing & calibration records and other quality assurance documentation as per OWNER's engineer's instructions is within the scope of work/ specification. These records shall be submitted to OWNER for approval from time to time.
- 9.5 A daily logbook of all measurements and testing/ calibration should be maintained by contractor on the job inspection details for various equipment.
- 9.6 All the workers of contractor / sub contractor/it's agencies shall carry identity cards as per the Performa prescribed by OWNER. Only workers duly authorized by OWNER shall be engaged on the work.
- 9.7 Contractor shall provide all the measuring and monitoring devices (MMD) required for completion of the work satisfactorily. These MMDs shall be calibrated & conform to job requirement in respect of measurement range, accuracy level & any other specification.

- 9.8 Re-work necessitated on account of use of invalid MMD shall be entirely to the contractor's account. Contractor shall be responsible to take all corrective actions, including resource augmentation if any, as specified by OWNER to make-up for the loss of time.

**OWNER's FQC team / QAI representative will have the right to carry out Surveillance Audit of supplier/contractor and their agencies including their store without any prior intimation.**

- 9.9 Regular Internal audit shall be conducted by supplier/ contractor QA/QC team of their agencies and their other dept. Such audit reports shall be made available whenever ask for by OWNER FQC team. OWNERs FQC/ QA&I have the right to carryout 2<sup>nd</sup> party audit of supplier/ contractor and their agencies as per predefined Audit schedule.

In course of work OWNER may counter/ finally check the measurements with their own MMDs. Contractor shall render all assistance in conduct of such counter check/ final measurements.

9.10 **Communication**

Direct, formal communication between the SUPPLIER's field QC and OWNER's field QC representative is mandatory. All inspection activities as per field quality plan shall be intimated to OWNER in the form of Request for Inspection (RFI) at least 24 hrs. in advance with intimation to OWNER execution group.

Whenever any major issues / deviations related to design or fabrications are noticed, the same shall be immediately informed to OWNER's field QC by supplier's field QC/ Supplier Project Head. On completion of above activity, joint inspection reports/ protocol shall be made and circulated to concern agencies. Any part of work at the site shall not be **covered up or made inaccessible** without the OWNER Representative's prior approval in the form of joint protocol or otherwise.

SUPPLIER/ Contractor's in-progress inspection reports, log book, follow up/ punch out sheets; records of all DT & NDT etc. shall be made available to OWNER field QC during the course of the work. At the end of the work, SUPPLIER/ Contractor's standard inspection reports, check off sheets, radiographs, master copy of loop diagrams, electrical testing data sheets, etc. shall be handed over to OWNER in an organized and agreed format. SUPPLIER/ Contractor shall verify that all of the required documentation of the equipment has been received and placed in the equipment files. The SUPPLIER/ Contractor is responsible for obtaining any outstanding documentation from his sub-supplier/ agencies.

9.11 **Dealing with open Punch Points NCR/QCAR:**

All open points in the form of observations, non-conformities (NCR, QCAR etc.) that are not responded / closed in time as well as, those were not put up by supplier/ Contractor for resolution/ agreement to OWNER, the same will be considered as violation of contractual obligations and will be dealt suitably during closure of contract. Penalty clauses (if any) shall be applicable as per contract.

Supplier/ Contractor's Performance rating will be impacted as per prevailing policy of OWNER in this regard.

**10.0 ATTACHMENT**

1. Exhibit A – MQP Format
2. Exhibit B – FQP Format
3. Exhibit C – Shop Inspection Request Format
4. Exhibit D – ICP Format
5. Exhibit E – IRN Format
6. Exhibit F – Suggested MDCC Format
7. Exhibit G – RFI Format (For Site Inspection Request)
8. Exhibit H – NCR Format
9. Exhibit I – QCAR Format
10. Exhibit J – Weekly Progress Report format

Exhibit - A

Supplier Logo	<b>THE TATA POWER COMPANY LIMITED</b>	 <b>TATA</b> <b>TATA POWER</b> Document No Page 1 of 1
Supplier Document No	<b>PROJECT NAME</b>  <b>Supplier Name &amp; Address</b>	

**Document Title: MANUFACTURING QUALITY PLAN (MQP)**

**Document No:**

**Consultant:**

**EPC Contractor:**

**Manufacturer Name & Address:**

R1					
R0					
Revision	Date	Reason for Revision	Prepared By	Checked By	Approved By



Supplier Logo

Manufacturing Quality Plan for .....

Document No.  
(As given by PDM, Tata Power)

Supplier Document No

Manufacturer Name & Address

Date & Revision

PACKAGE NAME

Page .. of .....

SR. NO.	COMPONENT Description / Activity	CHARACTERISTICS	TYPE OF CHECK	EXTENT OF CHECK	REF. DOCUMENT / ACCEPTANCE NORM	FORMAT OF RECORD	AGENCY			REMARKS
							M	S/C	O	
1	2	3	4	5	6	7		8	9	
	1.0 MATERIAL:							P	R	R
	2.0 IN-PROCESS INSPECTION:									
	3.0 FINAL INSPECTION:									
	4.0 ISSUANCE OF IRN (BY REVIEWING OF QUALITY DOSSIER)									

- a). Statutory requirements will be complied by the contractor/ Supplier.
- b). Material samples drawn for check testing will be witnessed by TATA POWER or its representative.
- c). For stage inspections, copies of relevant documents will be furnished to TATA POWER for review.
- e). The extent of check for manufacturer shall be 100%.
- f). Column 6 will be as per TATA POWER approved drawings / data sheets / contract documents wherever applicable.
- g). All instruments shall have valid calibration certificate with traceability to national level.

Legends: M – Manufacturer, S – Supplier C – EPC Contractor, O – Owner (Tata Power), P – Perform, W – Witness, R – Documents Review, H – Hold point, Rw (%) – Random Witness

**Exhibit - B**

 <b>TATA</b>	TATA POWER CO. LTD. (QA, I & T DEPARTMENT)	<b>DIVISION:</b>
	FIELD QUALITY PLAN	Document No. :-
		Rev :    Date :

**Document Title: FIELD QUALITY PLAN (FQP)**

**Document No:**

**Consultant:**

**EPC Contractor:**

**Contractor's Name & Address:**

Rev No.	Date	Reason for Revision	Approvals		
			Prepared By	Checked By	Approved By



**TATA POWER**

The Tata Power Company Limited  
Corporate Engineering-Quality Assurance Inspection & Testing.



Doc. No.:

**STANDARD FQP FOR**

Date of Issue:

Sr. No	COMPONENT / OPERATION	CHARACTERISTICS CHECKED	CLASS OF CHECK	TYPE OF CHECK	EXTENT / FREQUENCY OF CHECK	REFERENCE DOCUMENTS / ACCEPTANCE NORM	FORMAT OF RECORD	REMARKS
1	2	3	4	5	6	7	8	9

**N O T E**

A) STATUTORY REQUIREMENTS WILL BE COMPLIED WITH BY THE CONTRACTOR.  
 B) FOR STAGES WITNESSED / DOCUMENTS REVIEWED BY TATA POWER, COPIES OF RELEVANT DOCUMENTS WILL BE FURNISHED TO TATA POWER.  
 C) TATA POWER / ITS REP. IDENTIFICATION STAMP ON MATERIALS WILL BE PRESERVED / GOT TRANSFERRED BY TATA POWER / ITS REP. AT APPROPRIATE STAGES. (IF REQUIRED).  
 D) THE EXTENT INDICATED IN COLUMN 6 IS IN CONTRACTOR'S SCOPE. TATA POWER MAY INSPECT AS PER THIS COLUMN OR RANDOM SAMPLES AT IT'S DISCRETION.  
 E) COLUMN 7 WILL BE AS PER TATA POWER APPROVED DRAWINGS / DATA SHEETS / CONTRACT DOCUMENTS WHEREVER APPLICABLE.  
 F) INSTRUMENTS FOR LEAK TESTS AND PERFORMANCE TESTS WILL HAVE VALID CALIBRATION CERTIFICATE WITH TRACEABILITY TO NATIONAL LEVEL.

**Critical Category is HOLD point.**  
 This activity required inspection / Verification & acceptance by inspection authority responsible for this stage before further processing is permitted.. 24 Hrs advance notice to be given to TATA POWER FQC. Contractor /sub contractor shall not process activity beyond HOLD point without written permission by TATA POWER FQC.  
 This activity shall be performed by Main & Sub- Contractor (Execution + FQC) & witnessed jointly by TATA POWER (Execution + FQC).  
 (Surveillance by Head FQC / Project Head).

**Major Category is Witness point.**  
 This activity required inspection / Verification & acceptance by inspection authority responsible for this stage before further processing. 24 Hrs advance notice to be given to TATA POWER (Execution) . Contractor /sub contractor shall not process activity beyond Witness point without written permission by TATA POWER (Execution).  
 This activity shall be performed by Main and Sub- Contractor (Execution + FQC) & witnessed by TATA POWER Execution & Surveillance by FQC.

**Minor Category is Review point.**  
 This activity required review of documents by TATA POWER for the compliance & acceptance. However 24 Hrs advance intimation to be given to TATA power (Execution).  
 This activity shall be performed by Main and Sub- Contractor (Execution +FQC) .  
 ( Surveillance by Execution / Project Head ).

TATA POWER reserves the right to carryout surveillance at any point of time through FQC.

**TATA POWER**

The Tata Power Company Limited  
Corporate Engineering-Quality Assurance Inspection & Testing.



Doc. No.:

STANDARD FQP FOR

Date of Issue:

Sr. No	COMPONENT / OPERATION	CHARACTERISTICS CHECKED	CLASS OF CHECK	TYPE OF CHECK	EXTENT / FREQUENCY OF CHECK	REFERENCE DOCUMENTS / ACCEPTANCE NORM	FORMAT OF RECORD	REMARKS
1	2	3	4	5	6	7	8	9

**STORAGE TYPE:**

- TYPE-1: OPEN AREA & ABOVE GROUND ON WOODEN PLANK WITH SLOPE FOR WATER DISPOSITION.
  - TYPE-2: OPEN AREA & ABOVE GROUND ON WOODEN PLANK (WITH SLOPE FOR WATER DISPOSITION) AND COVERED WITH TARPAULIN.
  - TYPE-3: OPEN SHED WITH FULLY FORMED FLOORING/CEMENT FLOORING.
  - TYPE-4: COVERED SHED/STORE ROOM ON RACKS & IDENTIFIED LOCATION.
  - TYPE-4A: CLOSED CHAMBER WITH TEMPERATURE & HUMIDITY CONTROL.
- NOTE: Items/equipments having shelf life like paints, alumina, desiccant etc. are to be stored separately for identification purpose.

Rev. No	Reason for Revision	Prepared By & Date	Checked By & Date	Approved By & Date	Issued By.
RO	ISSUE FOR USE				

Confidential and Proprietary -- The Tata Power Company Limited

## Exhibit - C

Tata Power QA&amp;I

Request No:

Date:



## Corporate Engineering – QA&amp;I

Factory Inspection Request Format

<b>Project Name:</b>	
<b>Main Supplier</b>	
<b>Package Name:</b>	
<b>Tata Power P. O. / LOI No.</b>	<b>Date</b>
<b>Item / Equipment offered for inspection:</b>	
<b>Inspection Category:</b>	A / B / C
<b>Sub-supplier (Manufacturer) name &amp; PO Number:</b>	
<b>Type of Inspection:</b> (Please mention the stage number of MQP which will be completed during this inspection)	<b>Stage / Final</b>
<b>Proposed Date of Inspection:</b>	
<b>Place of Inspection:</b> (Please give completed address where material will be inspected, attach route map if required)	
<b>Contact Person for this Inspection along with Mobile No.:</b>	
<b>MQP Doc. No. :</b> <b>Rev. No.:</b> <b>MQP Approval Status:</b>	<b>Yes / No</b>
<b>Inspection Reference Document No:</b> <b>(Drawing/ Data Sheet etc.) approval status</b>	<b>Yes / No</b>
<b>Tata Power PO Item numbers / Billing Breakup No./ Tag No</b> <b>(as applicable) and quantity to be inspected:</b> (Please attach separate list if necessary)	
<b>Current Manufacturing Status (in brief) of item / equipment being offered in this Inspection:</b>	

We hereby confirm that the items have been fully inspected / tested by us, all stages of inspection as per approved MQP have been done and all material test certificates, Q.C. records, approved Drawing / Data Sheet, test reports and valid calibration reports of measuring / testing instruments with traceability are ready with us.

(Signature)

[Name &amp; Designation of Contractor's Representative]

Supplier Logo  Supplier Document No.	<b>THE TATA POWER COMPANY LIMITED</b>	 <b>TATA</b> <b>TATA POWER</b> Document No Page 1 of 1
	PROJECT NAME	
	<b>Supplier Name &amp; Address</b>	
	ICP - PACKAGE NAME	

**Document Title: INSPECTION CATEGOROZATION PLAN (ICP)**

**Document No:**

**Consultant:**

**EPC Contractor:**

**Supplier:**

R1					
R0					
Revision	Date	Reason for Revision	Prepared By	Checked By	Approved By

*Document No: Given as per procedure of Tata Power*



Supplier Logo  Supplier Document No.	<b>THE TATA POWER COMPANY LIMITED</b>	 <b>TATA</b> <b>TATA POWER</b> Document No Page 1 of 1
	PROJECT NAME	
	<b>Supplier Name &amp; Address</b>	
	ICP - PACKAGE NAME	

Sl. No.	Item Description	Imported / Domestic	Manufacturing / Bought Out	Manufacturing Quality Plan No. (No. given as per TATA Power Procedure)	Inspection Category	First Schedule Submission Date*	Final Approval Date*
1	Example: PUMP				A / B / C		
2							
3							
4							
5							
6							

\*Dates indicated are for monitoring purposes of Tata Power Quality Team.

Category "A"	Definition: Manufacturing Quality Plan (MQP) shall be approved by TATA POWER. Stage &/ or Final Inspection including document review by EPC Contractor and TATA POWER (or its appointed Inspection Agency) as per approved MQP.
Category "B"	Definition: Manufacturing Quality Plan (MQP) shall be approved by Tata Power. Stage &/ or Final Inspection including document review by EPC contractor or Tata Power (in case no EPC Contractor) as per approved MQP. Inspection report of EPC contractor/ Supplier with supporting documents review by Tata Power.
Category "C"	Definition: Supplier shall carry out inspection as per their regular practice/ standard manufacturing quality plan. Supplier shall submit test report and COC to EPC Contractor/ Tata Power. COC shall be in standard format of Tata Power.
Note:	1. Any item which is not appearing in above list, however, identified during detailed engineer, same need to be categorized as above. 2. If supplier is not able to submit test report for any Category "C" item, same needs to be finalize during ICP approval.

Document No: Given as per procedure of Tata Power





 <b>THE TATA POWER COMPANY LIMITED</b> <b>MATERIAL DISPATCH CLEARANCE CERTIFICATE</b>			
<b>TATA POWER</b>			
MDCC REFERENCE:			DATE:
PROJECT			
P.O. REF.			
PACKAGE		QAI&T "Clearance For MDCC" REF No.	
SUPPLIER		SUB-SUPPLIER	

Dispatch clearance is hereby given for following equipment/ items:

Sr. No	PO Item No./ BBU	Item Description	Unit	Quantity	Identification/ S. No./ Remarks

PACKING AND DISPATCH INSTRUCTIONS			SUBMIT FOLLOWING TO TATA POWER		
1	Complete assembly with drive, base plate, accessories etc.	1	Quality Dossier	7	As built drawings.
2	Protect machined surfaces against corrosion.	2	Erection, O&M manual.	8	Calibration reports.
3	Blank nozzles and other openings.	3	T.C. for performance / leak tightness / balancing.		
4	Complete painting, affix name plates, tag no., sr. no., etc.	4	Performance calculations, curves.		
5	Pack to prevent damage/ deterioration in handling, transit & storage	5	Guarantee certificates.	9	Dispatch details.
6	Paint dispatch markings and weight.	6	Manufacturing Test Records/ Test Certificates/ COC		

(Please tick above Packing & Dispatch instructions and Documents Requirements as applicable)

**Special Dispatch Instructions (If any):**

	Prepared By:	Approved By:
Signature		
Name		
Designation		
Date		

**NOTES:**

- Acceptance / release of the above items is without prejudice to the terms and conditions of the contract and does not relieve the CONTRACTOR/ SUPPLIER of his guarantees and responsibilities to supply the items in accordance with the specifications, approved drawings, data sheets and other relevant contract documents / conditions.
- CONTRACTOR/ SUPPLIER shall comply with the packing and dispatch instructions and documentation requirements given above.



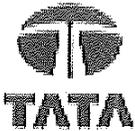
	<b>Field Inspection Requisition</b>		Requisition No.:
	Project :		Date:
	Name of package & Unit No:		
	Agency:		
	Sub Agency:		
<b>INSPECTION/ TEST REQUISITION DETAILS</b>			
1. FQP No. with Rev. & Category of Approval			
2. Test reference of FQP			
3. Category of Test nas per FQP			
4. Applicable Drawing No. with Rev:			
5. Location			
Date and time for inspection / test			
7. Open QCAR/NCR No. (if any) & date against this item/equipment			
It is hereby certified that all previous tests / checks are cleared and no QCAR other than above is pending against this item / equipment			
(Signature) Agency Representative		(Signature) OWNER (Execution)	
8. Post Inspection/ Test (Joint Protocol) : ACCEPTED / NOT ACCEPTED / ACCEPTED WITH CONDITION			
Brief Description:			
(Signature) Agency Representative		(Signature) OWNER (Execution)	(Signature) OWNER (FQC)



	TATA POWER COMPANY LIMITED	Corporate Engineering - QAIT
	Non Conformity Report	NCR No: Date
Project / Plant:		
Tata Power PO No.		Package/Equipment:
Supplier:		Location:
Inspection Report Reference:		Date of issuance of NCR:
Reference Documents: (QA Manuals, Specification, Procedure, Drawing, etc.)		
Requirements as per approved documents, codes and standards:		
Details of NC (Provide complete description, i.e. what, where, how many , item no. etc):		
Root Cause Analysis:		
Corrective Action Proposed:		Preventive Action Proposed:
Supplier Representative Sign. / Date		Tata Power / TPIA Representative Sign. / Date
Engineering Review & Approval for proposed corrective action:		
Engg. Representative Sign. / Date		
Corrective Action Taken:		
Supplier Representative Sign. / Date		
Verification of Correction Action:		
Tata Power / TPIA Representative Sign. / Date		



**Exhibit - I**

	TATA POWER COMPANY LIMITED	Corporate Engineering-QAI&T
	Quality Corrective Action Report ( QCAR )	Doc No.: QAI & T /QCAR Rev.0 Date : 10/09/12

Project / Plant:		Report No.:	
Supplier/Package/Equipment:		EPC Contractor:	
Date of observation:		Date of issuance of QCAR:	
Discipline: Mechanical		Mechanical/Electrical /Civil/C&I: Civil (Structural Work's)	
From		Email ID	
To		Email ID	

**Quality Observations :**

Supplier Sign /Date & Time	EPC Contractor Sign /Date & Time		TATA POWER COMPANY LTD	
	Construction Rep	QA/QC Rep	Construction Rep	QC Rep.

**Root Cause Analysis :**

<b>Corrective Action Proposed :</b>	<b>Preventive Action Proposed :</b>

Supplier Sign /Date & Time	EPC Contractor Sign /Date & Time		TATA POWER COMPANY LTD Sign /Date & Time	
	Construction Rep	QA/QC Rep	Construction Rep.	QC Rep.

**Engineering Review & Approval for proposed corrective action: (Applicable: YES/NO)**

Tata Power Engg. Rep.  
Sign. / Date & Time

**Corrective Action Taken:**

Supplier Sign /Date & Time	EPC Contractor Sign /Date & Time		TATA POWER COMPANY LTD Sign /Date & Time	
	Construction Rep	QA/QC Rep	Construction Rep.	QC Rep.

**Verification of Correction & Preventive Action:**

Tata Power Head- Construction.  
Sign. / Date & Time

Tata Power Head- QC  
Sign. / Date & Time

Copy to HOD -QAI&T, Mumbai.



Exhibit - J

Name of the Project FQC Team		Name of the Project Weekly Field Quality Report (00/00/2015 - 00/00/2015)									
		TATA POWER									
FIELD QUALITY REPORT (CIVIL/ MECH/ELECT.)											
<b>A. FIELD INSPECTIONS</b>											
Sl. No.	Contractor/ Dept.	Work Area	FQ Activity/Test	UOM	Recd.	Acc.	Rep/Rej	Hold	Observations/Remarks		
<b>B. RA BILLS / GRN CLEARANCES</b>											
Sl. No.	Contractor/ Dept.	Package	Description	UOM	Recd.	Acc.	Rep/Rej	Hold	Observations/Remarks		
<b>C. QCAR'S RAISED / AUDIT / DELTAS</b>											
Sl. No.	Contractor/ Dept.	Package	Description	Date	Observations/Remarks						
<b>D. MEETINGS - INTERNAL AND WITH CONTRACTORS</b>											
Sl. No.	Contractor/ Dept.	Package	Date of meeting	Description							
<b>E. AREAS OF CONCERN</b>											
Sl. No.	Contractor/ Dept.	Package	Description								
<b>F. OTHER ACTIVITIES</b>											
Sl. No.	Contractor/ Dept.	Package	Description								

Note: Areas of concern/highlights shall also include long pending and critical non-conformities.

# Revised BOQ

D.5 Price bid-Supply of 145kV Isolators						
For Kalyan & Ambernath RSS				Bidders Name		
S.No	Material Code	Description	Unit	Qty	Rate	Amount
1	2000088674	145kV, 1250A, 3P single center break type, outdoor gang operated, horizontal type Isolator along with all accessories, Without Earth switch	Nos	8		-
2	2000088671	145kV, 1250A, 3P single center break type, outdoor gang operated, horizontal type Isolator along with all accessories, With Earth switch	Nos	4		-
3	2000131240	145kV, 2500A, 3P single center break type, outdoor gang operated, horizontal type Isolator along with all accessories, Without Earth switch	Nos	2		-
4	2000168022	Mandatory spares	Lot	1		-
					<b>Total Basic Price</b>	-
					<b>GST-18%</b>	-
					<b>Total All inclusive Price (A)</b>	-
For Trombay Station						
S.No	Material Code	Description	Unit	Qty	Rate	Amount
1	2000088674	145kV, 1250A, 3P single center break type, outdoor gang operated, horizontal type Isolator along with all accessories, Without Earth switch	Nos	4		-
2	2000088671	145kV, 1250A, 3P single center break type, outdoor gang operated, horizontal type Isolator along with all accessories, With Earth switch	Nos	2		-
					<b>Total Basic Price</b>	-
					<b>GST-18%</b>	-
					<b>Total All inclusive Price (B)</b>	-
					<b>Total All inclusive Price (A+B)</b>	-

List of Mandatory spares	Unit	Qty
Jaw Male & Female along with arm set	Set	3
Insulator	No.	3
Set of Contactors & overload Relay (each type)	Set	1