

Bharat Heavy Electricals Limited
Ranipet-632406, India.
Quality Recommendation (Mech)

BHAD: FGD: AGT: 307

Dt. 01-11-2021


AGITATORS For	Indent No	Indent Dt.	PGMA	Technical Specification
TSGENCO – BHADRADRI TPS (4X270 MW) Project	RFW11446	27.10.2021	FW241	FGD: AGITATORS:Rev:01, DT:09.09.2021, BTPS:ABS-AGTR:R00 AND TECI – LT MOTOR/05, 28.07.2021
	RFW11447		FW241	
	RFW11448		FW988	

“As the item is covered under Sub-QR list, the proposed vendors for the same shall be accepted by QA after acceptance of vendor by Customer and BHEL Engg group.”

1. Since Agitators appears under Sub-QR item, Sub-QR approved vendor by Engg. acceptable to Quality also.
2. Vendor acceptance if any by Customer shall be confirmed by Commercial project Coordinator being non NTPC project.
3. Inspection and testing shall be done as per approved Quality plan, Quality plan to be approved by Customer/ Customer Consultant after review of BHEL.
4. Painting shall be as per Customer approved Painting schedule.
5. Arrange MQP from sub QR Cleared vendor for taking up with Customer for their review and approval. Find herewith-attached indicative MQP (QP NO.AGT:704/00, DT: 07.10.2020). This MQP is indicative only and actual Quantum of Check/Stage may differ based on Project/Customer requirement and their approved MQP.
6. All the Agitators shall be inspected at supplier works as per approved QP/Approved Drawing/Approved datasheet and Technical Specification.
7. Packing of items shall be as per BHEL Engg Approved Packing Drawing/Packing Specifications.
8. BHEL Authorized representatives shall have the right to witness the necessary inspection and testing of goods mentioned in the PO. The supplier shall inform BHEL in advance about the readiness of the goods for inspection and testing. Inspection / Inspection wavier / approval by BHEL does not absolve Supplier's responsibility for conformity of the specification as per the terms of PO. Material Test Certificates shall be submitted to BHEL.
9. Annexure 'Q' and BOI's Details shall be part of enquiry File and shall be filled by Supplier with their duly sign and seal.
10. **Following Notes applicable for Inspection Purpose:**
 - a. Latest version of standards & Specification shall be applied.
 - b. Materials shall be procured in compliance to Functional Technical specification.
 - c. Gauges and measuring instruments with valid calibration only shall be used.
 - d. Inspection / Inspection wavier / approval by BHEL does not absolve Supplier's responsibility for conformity of the responsibility for conformity of the specification as per the terms of PO.
 - e. BHEL /BHEL Authorized representatives shall have the right to witness the necessary inspection and testing of goods mentioned in the PO.
 - f. In case of Vendor Drawing & Datasheet, it needs approval by BHEL Engineering.
 - g. QP shall be read along with relevant PO, BHEL Specification / Approved Drawing / Datasheet.



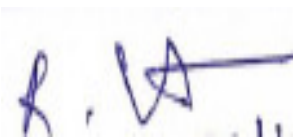
Sd\ - Rakesh Kr Madhu
Dy/Mgr-QA

Sd\ - K Renjith
Mgr/QA

 BHEL Ranipet		MANUFACTURING QUALITY PLAN						PROJECT: AS PER PO PACKAGE: FGD PACKAGE Main Contractor: BHEL						
		Manufacturer Name and Address: M/s BHEL / CUSTOMER Approved Source										ITEM: AGITATOR		
												QP NO: AGT:704,REV:00 DT: 07.10.2020		
												Page 1 of 4		
SL. NO.	COMPONENT & OPERATION	CHARATERISTICS	CLASS	TYPE OF CHECK	QUATUM OF CHECK		REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD		AGENCY			REMARKS
1	2	3	4	5	M	C/N	7	8	9	D*	M	C	N	11

1.0 RAW MATERIALS INSPECTION

1.1	Shaft & Blades, rubber composition & other material including castings & forgings	Chem. & Mech Properties	Major	Review of MTC	1/ Heat	-	Drawing/Data Sheet	TC	√	P	V	V	For shaft Dia ≥ 40mm UT shall be done as per ASTM A 388.
		Dimensions		Measure nt	100%			IR		P	-	-	
		Surface Defects		Visual	100%			IR		P	-	-	
2.0	Motor	Make, Type, Rating, Vibration, noise and power Review of Routine test report	Major	Review of manufacture's test report	100%	-	Drawing/Data Sheet	TC/ Report	√	P	V	V	
3.0	Gear box	Make, Type, Rating, vibration, noise Review of Routine/Run test Report	Major	Review of manufacture's test report	100%	-	Drawing/Data Sheet	TC/ Report	√	P	V	V	

MANUFACTURER SIGN & STAMP	LEGEND: * RECORDS, IDENTIFIED WITH "TICK" (√) UNDER COLUMN 'D' SHALL BE SUBMITTED TO CUSTOMER AS A 'QA' DOCUMENTATION PACKAGE. M: MANUFACTURE/SUB SUPPLIER, C: MAIN CONTRACTOR (BHEL/BHEL AIA), N: CUSTOMER P: PERFORM W: WITNESS AND V: VERIFICATION / REVIEW OF RECORDS, MTC: MATERIAL TEST CERTIFICATE, TC: TEST CERTIFICATE, MA: MAJOR, MI: MINOR, COC: CERTIFICATE OF CONFORMANCE, IR: INSPECTION REPORT, TR: TEST REPORT AIA: AUTHORISED INSPECTION AGENCY.	Rakesh Kr Madhu (Dy.Mgr/QA)	K Renjith (Manager/QA)	R Arunachalam (DGM/QA & QC-OLI)
				
		PREPARED BY	REVIEWED BY	APPROVED BY

528592/2021/BAP-QA MECH



Ranipet

MANUFACTURING QUALITY PLAN

Manufacturer Name and Address:

M/s BHEL / CUSTOMER Approved Source

ITEM: AGITATOR



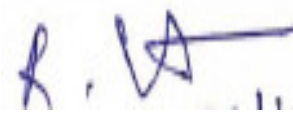
QP NO: AGT:704, REV:00 DT: 07.10.2020

Page 2 of 4

PROJECT: AS PER PO
PACKAGE: FGD PACKAGE
Main Contractor: BHEL

SL. NO.	COMPONENT & OPERATION	CHARATERISTICS	CLASS	TYPE OF CHECK	QUATUM OF CHECK		REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD		AGENCY			REMARKS
					M	C/N					M	C	N	
1	2	3	4	5	6		7	8	9	D*	10			11

4.0	IN PROCESS INSPECTION													
4.1	Welding Qualifications	WPS,PQR,WPQ	Major	WPS, PQR & WPQ	100%	-	ASME Sec IX/AWS D1.1	WPS/PQR	√	P	V	V		
4.2	Marking, cutting, Edge preparation Tacking	Dimensions	Major	Measure ment	100%	-	Appd. Drawing	IR		P	-	-		
4.3	Shaft & Impeller	Visual & Dimension check, face out and run out of shaft (after flange welding)	Major	Measure ment	100%	100%	As per Spec. & Appd. Drawing	IR	√	P	V	V		
4.4	Welds	Visual, Dimension	Major	Visual, Measure ment	100%	100%	ASME Sec-VIII/ AWS D1.1	IR	√	P	V	V		
4.5	Weld surface check	Weld surface check	Major	Measure ment DPT	10%	10%	ASME Sec-VIII/AWS D1 Appendix 8	IR	√	P	W	V		

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MANUFACTURING QUALITY PLAN

Manufacturer Name and Address:

M/s BHEL / CUSTOMER Approved Source



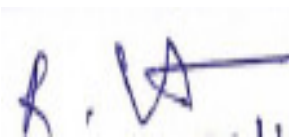
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Page 3 of 4

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PACKAGE: FGD PACKAGE
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					M	C/N					M	C	N	
1	2	3	4	5	6		7	8	9	D*	10			11
4.6	Impeller	Balancing	Major	Visual, Measure ment	100%	10%	ISO 1940-G40/Appd.Drg.& Data sheet		TR	√	P	W	V	
4.7	Rubber Lining	Thickness of Rubber, Hardness, Spark test, Adhesion Test on Test piece	Major	Measure ment	100%	10%	As per Specs./ Appd. Drg. & data sheet	Appd.Drg.& Data sheet,	TR	√	P	W	V	
5.0	FINAL INSPECTION													
5.1	Final Assembly Base Frame, Agitator etc.	Visual-Workmanship, Dimensional,	Major	Visual, Measure ment	100%	10%	Appd.Drg. & Spec,		IR	√	P	W	V	
5.2	Run test of Agitator assembled with Gearbox & Motor. Medium- Slurry (Duration-30 minutes)	Current,RPM, Vibration,Noise & Temperature rise	Major	Measure ment	100%	10%	Manufacturer's procedure/ Approved Drawing/Data Sheet		IR	√	P	W	W	

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MANUFACTURING QUALITY PLAN

Manufacturer Name and Address:

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Page 4 of 4

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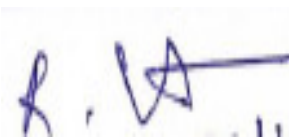
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					M	C/N					M	C	N	
1	2	3	4	5	6		7	8	9	D*	10			11

5.3	Painting	Visual,DFT	Major	Paint Shade & DFT measure ment	100%	10%	NTPC Approved Painting Schedule	IR	√	P	W	V	
5.4	Marking	Visual	Major	Visual	100%	10%	Appd.Dwg	IR	√	P	W	V	
5.5	Review of QA Documents	MQP Compliance	Major	Compliance Record	100%	100%	Completion of all documents, Test Report as per Approved MQP	IR	√	P	V	V	

Note: This QP is applicable for Mandatory spare also. All other minor items, which are not cover under this QP, shall be manufactured inspected as per OEM (Original equipment Manufacturer)/BHEL standard practice and relevant standard. Relevant TC/COC will be submitted for the same.

RECORD OF REVISION

REV NO	DATE	DESCRIPTION
00	07.10.2020	Original Issue

MANUFACTURER SIGN & STAMP	LEGEND: * RECORDS, IDENTIFIED WITH "TICK" (√) UNDER COLUMN 'D'SHALL BE SUBMITTED TO CUSTOMER AS A 'QA' DOCUMENTATION PACKAGE. M: MANUFACTURE/SUB SUPPLIER, C: MAIN CONTRACTOR(BHEL/BHEL AIA), N: CUSTOMER P: PERFORM W: WITNESS AND V: VERIFICATION / REVIEW OF RECORDS, MTC: MATERIAL TEST CERTIFICATE, TC: TEST CERTIFICATE, MA: MAJOR, MI: MINOR, COC: CERTIFICATE OF CONFORMANCE, IR: INSPECTION REPORT, TR: TEST REPORT AIA: AUTHORISED INSPECTION AGENCY.	Rakesh Kr Madhu (Dy.Mgr/QA)	K Renjith (Manager/QA)	R Arunachalam (DGM/QA & QC-OLI)
		 PREPARED BY	 REVIEWED BY	 APPROVED BY

Annexure Q

	Indent No:	Enquiry no:	
Sl.No	BHEL / Customer Requirements	## Specific confirmations by the manufacturer (Acceptable/Not acceptable)	
1	Quality Plan Requirement: (If SQP is not given & Vendor QP applicable)		
	(i) MQP (Manufacturing Quality Plan) shall be submitted in attached format for BHEL/Customer review & approval. Our SQP/Typical MQP/ MQP Format is attached for guidance & use.		
	(ii) MQP shall invariably cover w.r.t Inward inspection including on Raw material Procurement, In process and Final inspection in elaborated way/details.		
	(iii) Bidder shall also to give specific confirmation that on need basis, their competent officials shall visit to BHEL / customer for finalization of Quality plan including test procedure/methodology during preaward / post award approval / detailed engineering in the event of an order.		
	(iv) No deviation on BHEL/Customer approved MQP/ SQP (In case BHEL SQP is provided) is acceptable.		
	(v) Bidder shall agree to submit all cross referred documents other than codes/standards to BHEL/Customer/Consultant.		
	Important Notes shall be included in MQP : (a) Latest revision of Standard s & Specification shall apply. Only International Standards are applicable. (b) Materials shall be procured in compliance to Functional Technical Specification. (c) Inspection shall be in compliance with Approved Quality Control Procedure for the Product. (d) NDT shall be carried out by Qualified Personnel with compliance to Approved NDT Procedures and Acceptance Norms, as per ASME standard. (e) Gauges and measuring Instruments, with valid calibration only shall be used. (f) Cleaning and Painting of products shall be carried out as per Approved Painting Schedule. (g) Finished Products shall be packed to comply with Approved Packing Schedule. (h) Welding shall be carried out by Qualified Personnel with compliance to Approved NDT Procedures and Acceptance Norms, as per ASME standard.		
2	Domestic / Inland Inspection will be carried out by BHEL/BHEL appointed Third Party Inspection Agency (TPIA) / Customer/Customer Appointed Inspection Agency/Consultant. This is applicable for all Stage inspection and Final Inspection identified as "W" - Witness or "CHP" - Customer Hold Point as per customer approved Quality Plan/ Technical specification / Approved Drawing/ Approved Data sheet / Scheme / PID / PFD / SLD (Process Instrumentation Diagram / Process Flow Diagram / Single Line Diagram) etc. (as applicable).		
3	Inspection Agency for Foreign Bidders and also for Indian Bidder but importing from Foreign Sources: (1) Any one of the following Third Party Inspection Agency (TPIA) shall be appointed by the bidder and same shall be furnished by the bidder in techno commercial bid itself. (2) The details of TPIA with contact details like Name of the official, Phone no, Email id shall also to be submitted during pre/post award. However cost for such inspection agency shall be borne by the bidder only. Inspection charges for such inspection agency shall be indicated separately so that if BHEL/Customer is undertaking the inspection by on their own , then these charges are non claimable by the bidder. For NTPC Project ensure TPI Approved by NTPC. Refer our QC Procurement email in this regard. List of TPIA 1.M/s Bureau Veritas 2.M/s TUV-Nord 3.M/s TUV-SUD 4.M/s TUV Rheinland 5.M/s Lloyds Register 6.M/s SGS 7.M/s Germanischer Lloyd 8.M/s QUEST 9.M/s Certification Engineers International 10.M/s Intertek 11.M/s IR Class Systems and Solutions 12.M/s DNV 13. M/s Fichtner 14. M/s ABS Inspection Services		

528592/2021/BAP-QA_MECH

Sl.No	BHEL / Customer Requirements	## Specific confirmations by the manufacturer (Acceptable/Not acceptable)
4	Stage Inspection during manufacturing Process : Stage Inspection during manufacturing shall be carried out as per approved quality plan and all necessary documents shall be provided for review, verification and clearance for further processing. This inspection call shall be given well in advance (at least 2 weeks before) to TPI/Bidder's own inspection agency to avoid delay in the manufacturing processes.	
5	Inspection before despatch for domestic supplier : Inspection before despatch at supplier's works shall be carried out by BHEL appointed Inspection agency (as in Sl no. 2). Inspection shall be done as per approved Quality plan/ Technical specification/ Approved Drawing/ Approved Data sheet .	
6	Inspection at Foreign Source/Supplier: (a) As in sl no: 3. shall be ensured without fail (b) No material / items shall be despatched without getting the written communication from BHEL / Customer inspection carried out by Bidder appointed Third Party Inspection Agency (As per Sl no.3) / Customer/Customer Appointed Inspection Agency/Consultant. This is applicable for all Stage inspection and Final Inspection identified as "W" - Witness or "CHP" - Customer Hold Point as per customer approved Quality Plan/ Technical specification / Approved Drawing/ Approved Data sheet / Scheme / PID / PFD / SLD (Process Instrumentation Diagram / Process Flow Diagram / Single Line Diagram) etc. (As applicable). Inspection before despatch for Foreign supplier : Inspection before despatch at supplier's works shall be carried out by bidder appointed inspection agencies having international presence at vendors and or vendor's sub vendor works. Inspection shall be done as per approved Quality plan/ Technical specification/ Approved Drawing/ Approved Data sheet by TPIA mentioned in Sl no: 03 at supplier's cost.	
7	Painting shall be done strictly as per BHEL/Customer approved painting schedule / scheme only. Paint Thickness / Paint shade shall be ensured as per BHEL / Customer approved painting schedule / specification / data sheet etc. No deviation is acceptable unless otherwise accepted by BHEL/Customer in writing. Any conflict if any among BHEL / Customer approved painting schedule / Spec / data sheet etc. shall be brought to the notice of BHEL well in advance before proceeding including the BOI being procured for assy / skid like motors etc.	
8	Specific conformation for document package in the event of an order (2 Hard copies & soft copy in PDF file) is to be given containing the following with proper linkages (i) Index Sheet (ii) MQP/RQP/Endorsement Sheet (As applicable) (iii) TCs identified by BHEL/ Customer for record for "CHP" / "W" and Verification portion ("V") as given in approved QP. (iv) Final inspection report + TC including Chemical + Mechanical + HT + NDT etc. (v) Third party Inspection report + TC (vi) Customer CHP/ MDCC (vii) Type test / Performance Test reports conducted (viii) Type test / Performance Test approval/ clearance obtained from BHEL/Customer (ix) BOM with As Build Drgs with actual make / rating used with BHEL/customer approved drawings.	
9	Packing / Seaworthy Packing shall be as per BHEL Packing schedule / approved drg / sketch. This shall be ensured to take care transit / handling / transshipment in Road / Sea / Air. Photographs are to be submitted for BHEL review before despatching the material as per contract conditions.	
10	Outsourcing of test facilities: Bidder shall ensure all the testing facilities in house. However If any of the test facilities are not available with successful bidder, then bidder shall ensure the same at NABL accredited third party lab / Govt / Govt Lab for major testing such as NDT, Electrical & Mechanical testing.	
11	Important Note: No deviation on the above requirement 01 to 10 is acceptable with respect to Quality Requirement and those offers not meeting these specific customer requirement is liable for rejection and hence the bidder shall submit all the required documentary evidences in the offer itself.	
12	## Necessarily to be filled up by the bidder at the time of offer itself otherwise the offer may not be considered w.r.t Quality Requirement being customer specific requirement.	
VENDOR SIGN AND STAMP:		Vendor Name & Address:

CONTRACT QUALITY REQUIREMENTS (CQR) for LT MOTORS (IE3) Up to 200KW

PROJECT: Bhadradi 4 X 270 MW TPS- FGD & MOEF (BHEL W.O no: G 301, G302, G303 and G304) CONTRACT NO: 3000000020 CE/TPC/SE-TPC IV/EME 10/D 69/D.NO 521/18, Dt: 18.03.19 PACKAGE: FGD PACKAGE MAIN CONTRACTOR: BHEL - RANIPET SUB CONTRACTOR (OEM) & ADDRESS: (To be filled by OEM VENDOR)	CONTRACT QUALITY REQUIREMENTS (CQR) for LT MOTORS (Energy Efficient Motor as per IS 12615 (or) as per International Standards like IEC, DIN, BS etc) Up to 200KW Bhadradi 4 X 270 MW TPS- FGD & MOEF (BHEL W.O no: G 301, G302, G303 and G304)	DOC.NO: BAP/QR/G301 To - G 304) / Bhadradi FGD: LTM /Agitators: 001 Rev NO.: 00 PAGE : Page 1 of 2 DATE: 03.11.2021	##Enquiry No: ## OEM Supplier Name & Address: ##Offer reference: ##Date: Contact Official Name: Mobile no: Email id:
Sl. NO.	DESCRIPTION	BHEL and Ultimate Customer - TSGENCO (Telangana State Power Generation Corporation Limited)., Quality Requirements	##Specific confirmations by the vendor

ITEM: LT MOTORS (Energy Efficient Motor as per IS 12615 (or) as per International Standards like IEC, DIN, BS etc) Up to 200KW

01	Quality Plan Requirement	OEM/LT Motor Manufacture shall confirm to Ultimate Customer TSGENCO approved MQP QP:BHAD:ELE:002 Rev 00 received along with letter ref no: CE/TPC/SE-3/MANAGURU/E-BOP/QAP's/D.No: 01/15 dt 06.06.2015 .	
02	BHEL / Ultimate Customer – TSGENCO approved vendors	LT Motors are to be procured only from Ultimate Customer - TSGENCO approved vendors and no deviation on this specific requirement is acceptable. If Ultimate customer is not agreeing for any of LT Motor make, then it is the responsibility of OEM vendor to get approval from BHEL/Ultimate customer during execution of the contract.	
03	Inspection Methodology to be adopted at Actual LT Motor Manufacture works by OEM vendor	<u>LT Motors (Up to 200KW) – Inspection Categorization: II</u> All Routine Tests & Type tests including Degree of Protection Test Reports shall be ensured by OEM/LT Motor Manufacture as per Ultimate Customer TSGENCO approved MQP QP:BHAD:ELE:002 Rev 00 received along with letter ref no: CE/TPC/SE-3/MANAGURU/E-BOP/QAP's/D.No: 01/15 dt 06.06.2015.	
		All Routine & Type Tests are to be ensured by OEM Vendor and same shall be offered to BHEL/ BHEL AIA (BHEL authorized inspection Agency) / Ultimate Customer-TSGENCO for inspection & witnessing including review of Degree of Protection Test Reports as per above approved MQP / approved data sheet / drg / spec / as per relevant BIS (Bureau of Indian Standard) - BIS 12615 / IEC 60034 etc and all the Routine Test Reports , Type test Reports including Degree of protection test report with Inspection report (IR) to be submitted for BHEL/Ultimate Customer – TSGENCO for review and to obtain inspection and dispatch clearance .	
		No material shall be dispatched without BHEL / BHEL AIA and Ultimate Customer – TSGENCO Inspection and dispatch clearance.	
04	Painting Requirements	Painting requirement like paint shade and painting thickness including no of coats if any are to be ensured by the OEM vendor and LT Motor manufacture for these LT Motors as per BHEL/ Ultimate Customer - TSGENCO approved data sheet / drg / spec (As applicable).	
05	Packing	Packing shall be as per Specification / Drg. / Data sheet including sea worthy packing if any to avoid any transit & handling damages .	

CONTRACT QUALITY REQUIREMENTS (CQR) for LT MOTORS (IE3) Up to 200KW

PROJECT: Bhadradi 4 X 270 MW TPS- FGD & MOEF (BHEL W.O no: G 301, G302, G303 and G304) CONTRACT NO: 3000000020 CE/TPC/SE-TPC IV/EME 10/D 69/D.NO 521/18, Dt: 18.03.19 PACKAGE: FGD PACKAGE MAIN CONTRACTOR: BHEL - RANIPET SUB CONTRACTOR (OEM) & ADDRESS: (To be filled by OEM VENDOR)	CONTRACT QUALITY REQUIREMENTS (CQR) for LT MOTORS (Energy Efficient Motor as per IS 12615 (or) as per International Standards like IEC, DIN, BS etc) Up to 200KW Bhadradi 4 X 270 MW TPS- FGD & MOEF (BHEL W.O no: G 301, G302, G303 and G304)	DOC.NO: BAP/QR/G301 To - G 304 / Bhadradi FGD: LTM /Agitators: 001 Rev NO.: 00 PAGE : Page 2 of 2 DATE: 03.11.2021	##Enquiry No: ## OEM Supplier Name & Address: ##Offer reference: ##Date: Contact Official Name: Mobile no: Email id:
Sl. NO.	DESCRIPTION	BHEL and Ultimate Customer - TSGENCO (Telangana State Power Generation Corporation Limited)., Quality Requirements	##Specific confirmations by the vendor

ITEM: LT MOTORS (Energy Efficient Motor as per IS 12615 (or) as per International Standards like IEC, DIN, BS etc) Up to 200KW

06	For Inspection call	Inspection call by OEM Vendor for LT Motor inspection at Actual LT Motor Manufacture works to be raised for BHEL/BHEL AIA inspection / Ultimate Customer – TSGENCO including for type test witnessing if any to be ensured / addressed to Mr R Kesavan., DGM (QC-Proc)., Mobile no: +91 9443006303., Email id: kesavan@bhel.in and Mr Kovarathanan., DM (QC-Proc)., Mobile no: +91 8903502628., Email id: kovak@bhel.in including for inspection related activities for immediate response / resolution.	
07	Document Package / Dossier	Specific confirmation for Document Package in the event of an order (3 hard copies + soft copies in Pdf file) is to be given containing the following with proper linkages (.) (i) Index Sheet (ii) Ultimate Customer TSGENC Approved MQP (iii) TCs identified by BHEL/TSGENCO for record for “CHP” (Customer Hold Point) Verification & Witness “W” portion as given in MQP / RQP / MQP (as applicable). (iv) Final Inspection Report + TC (v) BHEL AIA (BHEL Appointed Inspection Agency) / BHEL report + TC (vi) Ultimate customer TSGENCO CHP (Customer Hold Point) / MDCC (Material Despatch Clearance Certificate) (vii) Type test reports conducted/submitted with approval with approved data sheet and BOM with actual make used with Customer approved drgs.	
08	Important notes	Inspection Categorization: II Inspection by Main contractor (BHEL) / BHEL AIA based on Ultimate Customer – TSGENCO approved MQP & based on inspection as in sl no:02 & 04. Any cost implication for conducting checks / tests including for witnessing of any of the tests at Actual LT Motor Manufacture Works by BHEL / BHEL AIA / Ultimate Customer – TSGENCO is in the scope of OEM Supplier only and no extra cost if any will be admissible in the event of an order and also during execution of the contract.	

Supplier signature with seal

Necessarily to be filled up & submitted by the OEM vendor at the time of offer itself otherwise the offer may not be considered w.r.t Quality Requirements against LT Motors being BHEL/ ultimate customer – TSGENCO (Telangana State Power Generation Corporation Limited) specific requirements.



TELANGANA STATE POWER GENERATION CORPORATION LIMITED
(A Govt. Of TS Undertaking)
Vidyut Soudha, Hyderabad - 500082.
Phone: 040 - 23499261 Fax: 040 - 23499263

From:
The Chief Engineer,
Thermal Projects Construction,
TSGENCO, 3rd Floor, A-Block,
Vidyut Soudha, Khairathabad
Hyderabad-500 082.

To:
C.Srinivasan, DGM,
Quality Department,
BHEL , Ranipet.

Lr.No.CE/TPC/SE-3/MANUGURU/E-BOP/QAP's/D.No. 01 /15,Dt.06.06.2015.

Sir,

Sub: MANGURU (4X270 MW) -LT Motor of ESP-QAP-Approval- Reg.

Ref: BHEL/TSGENCO OFFICE/DOC/0017, Dated 05.06.15.


* * * *

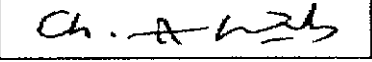
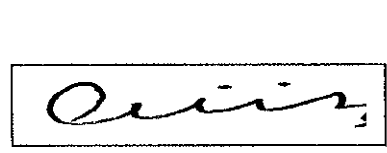
The Quality Assurance plan pertaining to LT motor for ESP and Fan Application required for 4X270MW Manuguru submitted by M/s. BHEL/Ranipet is reviewed and approved QAP is herewith furnished.

However, approval of the above Quality Plan does not absolve M/s BHEL of its responsibility of supplying the above item to the specifications and relevant standards and to ensure satisfactory performance of the above equipment as per the terms of the contract.


Encl: As above


CHIEF ENGINEER/ TPC

 Ranipet	QUALITY PLAN FOR LT MOTOR Of ESP & FAN Application for BHADRADRI TPS (TSGENCO, EPC PACKAGE 4 X 270 MW) (Customer No: R373,R374,R375 & R376)	
REF. NO.	REVISION NO.	EFFECTIVE DATE
QP:BHAD:ELE:002	00	24/042015


TITLE : Quality Plan for LT Motor of ESP & FAN application	
<div style="text-align: right;">SIGNATURE</div>	
PREPARED BY : CH.ANILSINGH/ASST.ENGINEER/QA	
REVIEWED & APPROVED BY: C.SRINIVASAN/ DGM/QA	
ISSUED & CONTROLLED BY : QUALITY ASSURANCE BHEL, RANIPET - 632 406.	
DOCUMENT STATUS	<div style="display: flex; flex-direction: column; align-items: flex-start;"> <div style="display: flex; align-items: center; margin-bottom: 10px;"> <input type="checkbox"/> INFORMATION COPY </div> <div style="display: flex; align-items: center;"> <input type="checkbox"/> CONTROL COPY </div> <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> ✓ It is a control copy only if the mark against the control copy is in other than black colour. Otherwise it will be an uncontrolled copy. Check for current revision. </div> </div>
ISSUED TO:	CONTROL COPY NO :

RECORD OF REVISION		
REV. NO	EFFECTIVE DATE	REMARKS
00	24/04/2015	Original Issue


<div></div> <div>Ranipet</div>				BHARAT HEAVY ELECTRICALS LTD BOILER AUXILIARIES PLANT, RANIPET – 632 406. QUALITY ASSURANCE Contractor: BHEL Ranipet – 632 406				QUALITY ASSUARENCE PLAN FOR LT Motor of ESP application				PROJECT: BHADRADRI TPS (TSGENCO, EPC PACKAGE 4 X 270 MW) (Cust No: R373,R374,R375 & R376)				QP:BHAD:ELE-002 REV. NO: 00 DATE: 24/04/2015 Page 1 of 5	
Sl. No.	COMPONENT / ASSEMBLY / OPERATION/TESTS	CHARACTE - RISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK	REFERENCE DOCUMENT	ACCEPTANCE STANDARD	FORMAT OF REC	AGENCY		REMARKS						
									M	B							
1.	2.	3.	4.	5.	6.	7.	8.	9.	10.		11.						

1.0	FINAL INSPECTION AND TESTING:	1. Resistance Measurement on stator winding & space heater	Major	Electrical	100%	BHEL Spec & Apprd Datasheet	BHEL Spec & Apprd Datasheet	Insp. Record	P	W	
1.1	Routine Test	2. Insulation Resistance before/after H.V. Test on winding & space heater	Major	Electrical	100%	--do--	--do--	Insp. Record	P	W	
		3. H.V. Test on winding & space heater	Major	Electrical	100%	--do--	--do--	Insp. Record	P	W	
		4. Phase sequence & direction of rotation	Major	Electrical	100%	--do--	--do--	Insp. Record	P	W	
		5. No load run test	Major	Electrical	100%	--do--	--do--	Insp. Record	P	W	
		6. Reduced voltage running test	Major	Electrical	100%	--do--	--do--	Insp. Record	P	W	
		7. Locked rotor test	Major	Electrical	100%	--do--	--do--	Insp. Record	P	W	
		7.1 Two successive Starts from cold Condition.	Major	Electrical	100%	--do--	--do--	Test Record	P	W	
		7.2 Three equally spread starts per hour.	Major	Electrical	100%	--do--	--do--	Test report	P	W	

Ans
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CETWC


<div> Ranipet</div>		BHARAT HEAVY ELECTRICALS LTD BOILER AUXILIARIES PLANT, RANIPET – 632 406. QUALITY ASSURANCE Contractor: BHEL Ranipet – 632 406			QUALITY ASSURANCE PLAN FOR LT Motor of ESP application			PROJECT: BHADRADRI TPS (TSGENCO, EPC PACKAGE 4 X 270 MW) (Cust No: R373,R374,R375 & R376)			QP-BHAD-ELE:002 REV. NO: 00 DATE: 24/04/2015 Page 2 of 5	
Sl. No.	COMPONENT / ASSEMBLY / OPERATION/TESTS	CHARACTE - RISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK	REFERENCE DOCUMENT	ACCEPTANCE STANDARD	FORMAT OF REC	AGENCY		REMARKS	
									M	B		
1.	2.	3.	4.	5.	6.	7.	8.	9.	10.		11.	
2	Type Test	7.3 Two hot restart from hot condition.	Major	Electrical	100%	BHEL Spec & Apprd Datasheet	BHEL Spec & Apprd Datasheet	Test report	P	W	Identical design type test report shall be submitted to BHEL/TPI agency during inspection for review and acceptance.. The validity of type test report shall be 5 years from date of release of purchase order. Otherwise vendor has to conduct these test in presence of BHEL/TPI.	
		8.Vibration test	Major	Mechanical	100%	--do--	--do--	Insp. Record	P	W		
		9.Name plate verification	Major	Visual	100%	--do--	--do--	Insp. Record	P	W		
		10.Paint shade, thickness& adhesion	Major	Vis/Meas	100%	--do--	--do--	Insp. Record	P	W		
		11.Moutings & Overall dimensions	Major	Vis/Meas.	100%	--do--	--do--	Insp. Record	P	W		
		1. Measuring of resistance of winding of stator and wound rotor (if applicable)	Major	Electrical	1 motor in a batch	--do--	Apprd Drawing	Insp. Record	P	V		
		2. No load test at rated voltage to determine input current , power and speed.	Major	Electrical	1 motor in a batch	--do--	--do--	TC	P	V		
		3. Open circuit voltage ratio of wound rotor	Major	Electrical	1 motor in a batch	--do--	--do--	TC	P	V		

By CE/TPI


<div> Ranipet</div>			<div>BHARAT HEAVY ELECTRICALS LTD BOILER AUXILIARIES PLANT, RANIPET – 632 406. QUALITY ASSURANCE Contractor: BHEL Ranipet – 632 406</div>			<div>QUALITY ASSUARENCE PLAN FOR LT Motor of ESP application</div>			<div>PROJECT: BHADRADRI TPS (TSGENCO, EPC PACKAGE 4 X 270 MW) (Cust No: R373,R374,R375 & R376)</div>				<div>QP:BHAD-ELE:002 REV. NO: 00 DATE: 24/04/2015 Page 3 of 5</div>	
Sl. No.	COMPONENT / ASSEMBLY / OPERATION/TESTS	CHARACTE - RISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK	REFERENCE DOCUMENT	ACCEPTANCE STANDARD	FORMAT OF REC	AGENCY		REMARKS			
									M	B				
1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.				

		motor (in case slip ring motors	Major	Electrical	1 motor in a batch	BHEL Spec & Apprd Datasheet	TC	P	V			
	4.	Locked rotor reading of voltage, current and power input at a suitable educed voltage	Major	Electrical	1 motor in a batch	--do--	TC	P	V			To determine Efficiency, power factor & slip
	5.	Full load test to determine efficiency power factor and slip	Major	Electrical	1 motor in a batch	--do--	TC	P	V			
	6.	Temperature rise test.	Major	Electrical	1 motor in a batch	--do--	TC	P	V			
	7.	Momentary overload test	Major	Electrical	1 motor in a batch	--do--	TC	P	V			
	8.	Insulation resistance test	Major	Electrical	1 motor in a batch	do--	TC	P	V			
	9.	High voltage test	Major	Mechanical	1 motor in a batch	--do--	TC	P	V			
	10.	Test for vibration severity of	Major	Mechanical	1 motor in a batch	--do--	TC	P	V			


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<div>BHARAT HEAVY ELECTRICALS LTD BOILER AUXILIARIES PLANT, RANIPET - 632 406. QUALITY ASSURANCE</div> <div>Ranipet</div>			BHARAT HEAVY ELECTRICALS LTD BOILER AUXILIARIES PLANT, RANIPET - 632 406. QUALITY ASSURANCE			Contractor: BHEL Ranipet - 632 406			QUALITY ASSAURENCE PLAN FOR LT Motor of ESP application			PROJECT: BHADRADRI TPS (TSGENCO, EPC PACKAGE 4 X 270 MW) (Cust No: R373,R374,R375 & R376)			QP:BHAD-ELE:002 REV. NO: 00 DATE: 24/04/2015 Page 4 of 5		
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									M	B							
1.	2.	3.	4.	5.	6.	7.	8.	9.	10.		11.						
3	Preservation and Packing	motor	Major	Visual		BHEL Spec & Apprd Datasheet	BHEL Spec & Apprd Datasheet	TC	P		V						
		11. Test of noise levels of motor	Major	Mechanical	1 motor in a batch	--do--	--do--	TC	P		V						
		12. Over speed test	Major	Visual	1 motor in each frame size	--do--	--do--	TC	P		V						
		13. Degree of Protection Tests	Major	Review	100%	--do--	--do--				V						
		1.Completeness		Visual	100%	--do--	--do--				V						
		2.Mounting & over all Dimersions	Major	Visual		--do--	--do--				V						
		3. Painting(label)	Major	Visual	100%	--do--	--do--				V						
		4. Motors located on rubber mats.	Major	Visual	100%	--do--	--do--			P		V					
		5. Motors covered with polythene sheets.	Major			--do--	--do--										
		6. Packing	Major			--do--	--do--			P		V					

by 6/6
CE/ATC

 Ranipet BHARAT HEAVY ELECTRICALS LTD BOILER AUXILIARIES PLANT, RANIPET - 632 406. QUALITY ASSURANCE Contractor: BHEL Ranipet - 632 406	QUALITY ASSUARENCE PLAN FOR LT Motor of ESP application				PROJECT: BHADRADRI TPS (TSGENCO, EPC PACKAGE 4 X 270 MW) (Cust No: R373.R374.R375 & R376)				QP:BHAD:ELE:002 REV. NO: 00 DATE: 24/04/2015 Page 5 of 5	
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1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.

Note :

1) Vendor shall submit raw material test certificates and internal test report for Enameled copper conductor, INSULATION MATERIALS, Impregnation varnish, Motor Shaft Material, Stamping Steel, Aluminum Ingots, yoke (Casting Body & End shields), Terminal Box & Covers, Bearings (SKF or FAG), Gasket, Terminal Block during inspection to BHEL/BHEL AIA for review and acceptance.

2) Vendor shall also submit INPROCESS INSPECTION report for Machined Cast iron body, Machined End shields, Balancing (Rotor & Fan), Hydraulic Pressure Testing, Stator core, Die cast Rotor, Impregnation, Rotor machining, Space Heater (if applicable) and Final Assembly during inspection to BHEL/BHEL AIA for review and acceptance.

3) Identical design type test report shall be submitted to BHEL/TPI agency during inspection for review and acceptance.. The validity of type test report shall be 5 years from date of release of purchase order. Otherwise vendor has to conduct these test in presence of BHEL/TPI.

4) Type test clearance from BHEL/TPI to be obtained during Inspection at vendor works

Legends:

TC = Test Certificates : Drg = Drawing : IR = Insulation Resistance : BOM = Bill of Material HV = High Voltage P = Perform/ V = verification/ Review of TC/Test Report W = Witness

M: Manufacturer B=Contractor/BHEL /TPI agency

Handwritten signature
CE/TTC