





1029906/2022/BAP/QA

 Ranipet	MANUFACTURER'S NAME & ADDRESS		STANDARD QUALITY PLAN			PROJECT: STANDARD							
	Item/subsystem: HORIZONTAL CENTRIFUGAL PUMP		QP NO: HZ PUMP:610 Rev:00 Date:15.06.2021 Page 1 of 3										
SL NO	COMPONENT & OPERATION	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK		REFERENCE DOCUMENTS	ACCEPTANCE NORMS	FORMAT OF RECORD	AGENCY			REMARKS
1	2	3	4	5	6		7	8	9 D	M	B	C	11
					M	B/C							

RAW MATERIAL INSPECTION													
1	CASTING	CHEMICAL COMPOSITION	MAJOR	CHEMICAL ANALYSIS	1 SAMPLE / HEAT	RELEVANT MATERIAL SPECS AS PER APPD. DRG. / DATA SHEETS	MTC	√	P	V	-	NO REPAIR WELDING IS PERMITTED ON CI AS CAST / PUNCHED HEAT NO SHALL BE PROVIDED FOR CORRELATION	
		MECHANICAL PROPERTIES	MAJOR	TENSILE TEST	1 SAMPLE / HEAT	RELEVANT MATERIAL SPECS AS PER APPD. DRG. / DATA SHEETS	MTC	√	P	V	-		
		SURFACE EXAMINATION	MAJOR	VISUAL INSPECTION	100%	CASTING WILL BE FREE FROM CRACKS, SHRINKAGE , COLD SHUT, INJURIES, POROSITY SAND FUSION ETC	IR	√	P	V	-		
2	IMPELLER	CHEMICAL COMPOSITION	MAJOR	CHEMICAL ANALYSIS	1 SAMPLE / HEAT	RELEVANT MATERIAL SPECS AS PER APPD. DRG. / DATA SHEETS	MTC	√	P	V	-		
		MECHANICAL PROPERTIES	MAJOR	TENSILE TEST & HARDNESS	1 SAMPLE / HEAT	RELEVANT MATERIAL SPECS AS PER APPD. DRG. / DATA SHEETS	MTC	√	P	V	-		
		HEAT TREATMENT (As applicable)	CRITICAL	REVIEW OF TIME- TEMP CHART	100%	RELEVANT MATERIAL SPECS AS PER APPD. DRG. / DATA SHEETS	HT CAHRT	√	P	V	-		
		SURFACE EXAMINATION	MAJOR	VISUAL INSPECTION	100%	CASTING WILL BE FREE FROM CRACKS, SHRINKAGE , COLD SHUT, INJURIES, POROSITY SAND FUSION ETC	IR		P	V	-		
3	SHAFT / SHAFT SLEEVES	CHEMICAL COMPOSITION	MAJOR	CHEMICAL ANALYSIS	1 SAMPLE / HEAT	RELEVANT MATERIAL SPECS AS PER APPD. DRG. / DATA SHEETS	MTC	√	P	V	-		
		MECHANICAL PROPERTIES	MAJOR	TENSILE TEST	1 SAMPLE / HEAT	RELEVANT MATERIAL SPECS AS PER APPD. DRG. / DATA SHEETS	MTC	√	P	V	-		
		SOUNDNESS	CRITICAL	VISUAL INSPECTION	100%	RELEVANT PROCEDURE	UT Report	√	P	V	-	FOR BAR DIA. ≥50 MM.	
4	WEARING RINGS	CHEMICAL PROPERTIES	MAJOR	CHEMICAL ANALYSIS	1 SAMPLE / HEAT	RELEVANT MATERIAL SPECS AS PER APPD. DRG. / DATA SHEETS	MTC	√	P	V	-		
		MECHANICAL PROPERTIES	MAJOR	TENSILE TEST & HARDNESS	1 SAMPLE / HEAT	RELEVANT MATERIAL SPECS AS PER APPD. DRG. / DATA SHEETS	Report	√	P	V	-		

M – Manufacturer / Subcontractor, B - BHEL /BHEL Authorized Inspection Agency, C- End Customer , P - perform, V - Verification of reports, IR – Inspection Report. W - Witness, TC - Test certificate, DP- Dye penetrant. DR – Dimensional report. MTC- Material test Certificate. * Record, identified with "tick" (√) shall be submitted to customer as a QA documentation package.	Prepared by	Reviewed by	Approved by
			
	Rakesh Kr Madhu (Dy.Mgr/QA)	K Renjith (Manager/QA)	R Arunachalam (DGM/QA)

1029906/2020/BAP/QA

MECH MANUFACTURER'S NAME & ADDRESS



Ranipet

STANDARD QUALITY PLAN

Item/subsystem:
HORIZONTAL CENTRIFUGAL PUMP

QP NO: HZ PUMP:610
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PROJECT: STANDARD

SL NO 1	COMPONENT & OPERATION 2	CHARACTERISTICS 3	CLASS 4	TYPE OF CHECK 5	QUANTUM OF CHECK 6		REFERENCE DOCUMENTS 7	ACCEPTANCE NORMS 8	FORMAT OF RECORD 9 D	AGENCY 10			REMARKS 11
					M	B/C				M	B	C	

IN PROCESS INSPECTION													
5	CASING & WEAR AREA	DIMENSIONAL	MAJOR	MEASURE	100%		MANUFACTURING DRAWING	IR	√	P	V	-	
		HYDROSTATIC TEST OF CASTING	CRITICAL	PRESSURE TEST	100%	20%	SEE NOTE 2	NO LEAKAGE	IR	√	P	W	-
6	IMPELLER	DIMENSIONAL	MAJOR	MEASURE	100%		MANUFACTURING DRAWING	IR	√	P	V	-	
		DYNAMIC BALANCING	CRITICAL	MEASURE	100%	20%	ISO 1940, GR. 6.3		IR	√	P	W	-
7	DPT OF MACHINED AREA OF CASINGS & IMPELLER	SOUNDNESS OF CASTING	MAJOR	NDT-DPT	100%		MANUFACTURER PROCEDURE	DPT Report	√	P	V	-	
8	SHAFT & SLEEVES	DIMENSIONAL	MAJOR	VISUAL	100%		MANUFACTURING DRAWING	IR	√	P	V	-	
		SOUNDNESS	CRITICAL	ULTRASONIC TEST	100%		RELEVANT PROCEDURE	UT Report	√	P	W	-	FOR SHAFT DIA ≥ 50 MM ONLY (EXCEPT THREADED PORTION) SEE NOTE-1
		DP TEST ON MACHINED AREA	MAJOR	DP TEST	100%		RELEVANT PROCEDURE	DPT Report	√	P	V	-	

FINAL INSPECTION

M – Manufacturer / Subcontractor,
B - BHEL /BHEL Authorized Inspection Agency,
C- End Customer , P - perform,
V - Verification of reports, IR – Inspection Report.
W - Witness, TC - Test certificate, DP- Dye penetrant.
DR – Dimensional report. MTC- Material test Certificate.
* Record, identified with "tick" (√) under column 'D' shall be submitted to customer as a QA documentation package.

Prepared by	Reviewed by	Approved by
Rakesh Kr Madhu (Dy.Mgr/QA)	K Renjith (Manager/QA)	R Arunachalam (DGM/QA)

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					M	B/C				M	B	C	

9	PUMP ASSEMBLY	DIMENSIONAL	MAJOR	MEASURE	100%	100%	APPROVED G.A. DRAWING	IR	√	P	V	-	
10	PERFORMANCE TEST WITH JOB MOTOR	Q VS H	CRITICAL	MEASURE	100%	100%	APPROVED PERFORMANCE TEST PROCEDURE & APPROVED DATA SHEET	IR	√	P	W	-	
		Q VS P											
		Q VS E											
		NOISE LEVEL											
		VIBRATION	MAJOR	MEASURE						P	W	-	
		BEARING TEMP	MAJOR	MEASURE						P	W	-	
11	NPSHR TEST	NPSHR TEST	CRITICAL	MEASURE	100%	1 NO / MODEL	APPROVED NPSHR TEST PROCEDURE	IR	√	P	W	-	
12	PAINTING AND PACKING	TYPE OF PAINT. APPEARANCE. DFT CONFORMANCE TO PACKING SPECIFICATION	MAJOR	VISUAL & MEASURE	100%		TECHNICAL SPECIFICATION /CUSTOMER APPROVED PAINTING SCHEDULE	IR	√	P	V	-	

NOTES:

- a. All the inspection/ test reports shall be submitted to Inspection agency for review and record purpose.
- b. Latest revision of Drawings, specification and standard shall be used.
- c. Materials shall be procured in compliance to Functional Technical Specification.
- d. Gauges and measuring instruments with valid calibration only shall be used.
- e. Inspection / Inspection waiver / approval by BHEL does not absolve Supplier's responsibility for conformity of the specification as per the terms of PO.
- f. BHEL /BHEL Authorized representatives shall have the right to witness the necessary inspection and testing of goods mentioned in the PO.
- g. In case of Vendor Drawing, it needs approval by BHEL Engineering.
- h. This QP Shall be read along with relevant PO, BHEL Specification/Drawing/Approved Datasheet.
- i. This QP is applicable for Mandatory spare supply also specific to the item/project wise.

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	Rakesh Kr Madhu (Dy.Mgr/QA)	K Renjith (Manager/QA)	R Arunachalam (DGM/QA)

Annexure Q

		Indent No:	Enquiry no:	
Sl.No	BHEL / Customer Requirements	## Specific confirmations by the manufacturer (Acceptable/Not acceptable)		
	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.			
1	(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 Lloyds 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			

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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: Yadadri 5 X 800 MW TPS- FGD (BHEL W.O no: R4R8, R4R9, R4S0, R4S1, R4S2) 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 Yadadri 5 X 800 MW TPS- FGD (BHEL W.O no: R4R8, R4R9, R4S0, R4S1, R4S2)	DOC.NO: BAP/QR/G301 To - G 304) / Yadadri FGD: LTM /Water Pumps: 001 Rev NO.: 00 PAGE : Page 1 of 3 DATE: 05.09.2022	##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	Type Test Requirements	A. Vendor shall submit the type test reports of all the type tests as listed in SL NO: 01 (D) below and carried out within 10 years from the date of Issue of Notification : 21.12.2019. These reports should be for the test conducted on the identical/similar LT MOTORS (Energy Efficient Motor as per IS 12615 (or) as per International Standards like IEC, DIN, BS etc s to those proposed to be supplied under this enquiry and test (s) either should have been conducted at an independent laboratory (or) should have been witnessed by BHEL AIA (BHEL Appointed Inspection Agency) / BHEL (or) Ultimate client TSGENCO at respective LT Motor Manufacture of OEM vendor.	
		B. However, if vendor is not able to submit the similar / identical type test report as per above condition (or) in the case of type test reports are not found to be meeting the specification requirement, the vendor shall conduct all the tests at no additional cost to BHEL either at third party lab (or) own lab in the presence of BHEL AIA (BHEL Appointed Inspection Agency) / BHEL /Ultimate client TSGENCO and submit the reports for review & approval.	
		C. Type Test reports review and approval by BHEL AIA (BHEL Appointed Inspection Agency) / BHEL / Ultimate client TSGENCO is must in line with TSGENCO approved data sheet / BOM/GA Drawing etc.	
		D. The following Type test reports to be submitted covering the following for above 50KW LT Motor as per relevant BIS (Bureau of Indian Standard) - BIS 12615 / IEC 60034 or any other international standard like DIN, BS, IEC etc	
		i. Measuring of resistance of winding of stator and wound rotor (if applicable) ii. No load test at rated voltage to determine input current, power and speed. iii. Open circuit voltage ratio of wound rotor motor (in case slip ring motors) iv. Full load test to determine efficiency power factor and slip v. Temperature rise test. vi. Momentary excess load test vii. High voltage test viii. Test for vibration severity of motor ix. Test of noise levels of motor (Noise level for all the motors shall be limited to 85dB(A) except for BFP motor for which the maximum limit shall be 90dB(A).) x. Over speed test xi. Degree of Protection Tests (Minimum Ingress Protection - IP 55). xii. Type test reports for motors located in fuel oil area having flame proof enclosures as per BIS 2148/ IEC 60079-1	

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

PROJECT: Yadadri 5 X 800 MW TPS- FGD (BHEL W.O no: R4R8, R4R9, R4S0, R4S1, R4S2) 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 Yadadri 5 X 800 MW TPS- FGD (BHEL W.O no: R4R8, R4R9, R4S0, R4S1, R4S2)	DOC.NO: BAP/QR/G301 To - G 304) / Yadadri FGD: LTM /Water Pumps: 001 Rev NO.: 00 PAGE : Page 2 of 3 DATE: 05.09.2022	##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

		E. The TCs / Type Test reports shall also be given as PDF file with index sheet & page control thro Email & Soft Copy (File size to less than 9MB).	
02	Quality Plan Requirement	OEM/LT Motor Manufacture shall confirm to Ultimate Customer TSGENCO approved MQP QP:R827:ELE:003 Rev 01 received along with letter ref no: CE/TPC/SE-3/EME-11/YTPS (5 X 800 MW)/QAP/D.No.12/19 dt 02.02.2019. (or) OEM/LT Motor Manufacturer to submit their QP for BHEL and Ultimate Customer TSGENCO review and approval.	
03	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.	
04	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.	
		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.	
05	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).	


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

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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	Packing	Packing shall be as per Specification / Drg. / Data sheet including sea worthy packing if any to avoid any transit & handling damages .	
07	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 MS Aditya Chakravathy., Manager (QC-Proc)., Mobile no: +919489202788., Email id: msachakravarthy@bhel.in and Mr Zeeshan Ali., Dy. Manager (QC-Proc)., Mobile no: +91 9443149691., Email id: zeeshan@bhel.in including for inspection related activities for immediate response / resolution.	
08	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.	
09	Important notes	Inspection Categorization: I Inspection by Main contractor (BHEL) / BHEL AIA/Ultimate Customer TSGENCO 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 POWER GENERATION CORPORATION LIMITED (A Govt. Of Telangana Undertaking) Vidyut Soudha, Hyderabad - 500082. Phone: 040 - 23499261 Fax: 040 - 23499263.	
	From: The Chief Engineer Thermal Projects Construction, TSGENCO, 3 rd Floor, A-Block, VidyutSoudha, Khiarathabad Hyderabad-500 082. cetpctgenco@gmail.com	To: M/s BHEL/BAP, Ranipet,Vellore (Dist), Tamil Nadu-632 406 Ph: 9848265808. E-mail: mmahesh@bhel.in

Kind Attention: Sri M Mahesh,Dy. Manager(Commercial)

Lr.No.CE/TPC/SE-3/EME-11/YTPS(5X800MW)/QAP/D.No.12/19,Dt:02.02.19

Sir,

Sub: TSGENCO – YTPS (5X800MW) – Approval of QAP for LT Motor of ESP & FAN application submitted by M/s BHEL/BAP, Ranipet - Reg.

- Ref: 1) M/s BHEL Letter ref: BAP:COMML:LT Motor of ESP & Fan:Rev-00, Date:29.11.2018
 2) TSGENCO Email dt 05.12.2018
 3) M/s BHEL Letter ref: BAP:COMML:LT Motor QP:Rev:01, Date: 05.01.2019
 4) M/s TCE Email dt: 22.01.2019

Please refer to the mail cited (3) wherein the revised QAP for LT Motor of ESP & FAN application was submitted for approval.

Sl. No.	BHEL Reference No.	Title	Rev.
1	QP:R827:ELE:003	QAP for LT Motor of ESP & Fan application	01

The above Quality Plan furnished by M/s BHEL/BAP, Ranipet is herewith reviewed and approved. Approved copy of the above Quality Plan is enclosed herewith for taking further necessary action at your end.

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

It is requested to upload the approved QAP in PEDM Portal.

Encl: As Above.

Yours faithfully




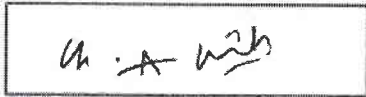
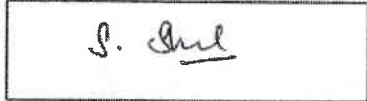

CHIEF ENGINEER/TPC


Copy communicated to:


- 1) Chief Engineer/Construction/YTPS Site/Damaracherla/Nalgonda Dist.
- 2) DE/Tech to Director/Projects/TSGENCO/Vidyut Soudha/Hyderabad.
- 3) Sri Y.A.Srinivas Rao, BHEL/PMG Camp Office, Vidyut Soudha, Hyderabad.
- 4) M/s Tata Consulting Engineers Limited, 73/1, Sheriff Centre, St. Marks road, Bangalore-560 001.
- 5) M/s TCE /Room No.323 /Site Office/Vidyut Soudha/Hyderabad

1031038/2022/BAP-QA_MECH

 Ranipet	QUALITY PLAN FOR LT MOTOR Of ESP & FAN Application for YADADRI TPS 5 X 800MW, TSGENCO, EPC PACKAGE (Customer No: R827, R828, R829, R830, R831, R4L4)	
	REF. NO.	REVISION NO.
QP:R827:ELE:003	01	11 12 2018

TITLE	:	Quality Plan for LT Motor of ESP & FAN application
PROJECT	:	YADADRI TPS 5 X 800MW, TSGENCO, EPC PACKAGE
		SIGNATURE
PREPARED BY	:	CH.ANILSINGH DY.ENGINEER/QA
		
REVIEWED	:	S.SHEELA DY.MANAGER/QA
		
APPROVED BY	:	K.C GANDHI PARIMALAM DGM/QA
		
ISSUED & CONTROLLED BY :	QUALITY ASSURANCE BHEL, RANIPET - 632 406.	
DOCUMENT STATUS	<input type="checkbox"/>	INFORMATION COPY
	<input type="checkbox"/>	CONTROL COPY
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ISSUED TO:	CONTROL COPY NO :	


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Thermal Projects Construction
TSGENCO, Vidut Soudha,
Khairatabad, Hyd-500 082.


 Ranipet	QUALITY PLAN FOR LT MOTOR Of ESP & FAN Application for YADADRI TPS 5 X 800MW, TSGENCO, EPC PACKAGE (Customer No: R827, R828, R829, R830, R831, R4L4)	
REF. NO.	REVISION NO.	EFFECTIVE DATE
QP:R827:ELE:003	01	11 12 2018

<u>RECORD OF REVISION</u>		
REV. NO	EFFECTIVE DATE	REMARKS
00	27 11 2018	Original Issue
01	11 12 2018	Revised based on the customer comments received vide email dated 05 12 2018.




Chief Engineer
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Khairatabad, Hyd-500 092.

1031038/2022/BAP-QA_MECH

 BHARAT HEAVY ELECTRICALS LTD BOILER AUXILIARIES PLANT, RANIPET - 632 406.		QUALITY ASSURANCE PLAN FOR LT Motor of ESP & FAN application			PROJECT: YADADRI TPS 5 X 800MW, TSGENCO, EPC PACKAGE (Cust No: R827, R828, R829, R830, R831, R4L4)			QP:R827:ELE:003 REV. NO: 01 DATE: 11 12 2018 Page 3 of 12				
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	C	
1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.
1.1	Enamelled round copper conductor (Dual coated)M M	1.Overall diameter 2.Bare conductor diameter 3.Increase in diameter 4. Peel test (above 1mm dia.) 5.Mandrel winding test 6. Jerk test (upto 1mm dia.) 7.Resistance to abrasion 8.BDV Test 9.Electrical resistance 10.heat shock 11.Elongation	Major Major Major Major Major Major Major Major Major Major Major	Mechanical Mechanical Mechanical Mechanical Mechanical Mechanical Mechanical Electrical Electrical Electrical Mechanical	1 sample/lot 1 sample/lot 1 sample/lot 1 sample/lot 1 sample/lot 1 sample/lot 1 sample/lot 1 sample/lot 1 sample/lot 1 sample/lot 1 sample/lot	IS 13730 1993 Part 13 BHEL Spec & Apprd Datasheet --do-- --do-- --do-- --do-- --do-- --do-- --do-- --do-- --do--	IEC 60317-0-1 2008 BHEL Spec & Apprd Datasheet --do-- --do-- --do-- --do-- --do-- --do-- --do-- --do-- --do--	Plant format Plant format Plant format Plant format Plant format Plant format Plant format Plant format Plant format Plant format Plant format	P P P P P P P P P P P	V V V V V V V V V V V		



Chief Engineer
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 TSGENCO, Vidyut South
 Khairatabad, Hyd-500 082.

 Ranipet		BHARAT HEAVY ELECTRICALS LTD BOILER AUXILIARIES PLANT, RANIPET – 632 406.			QUALITY ASSURANCE PLAN FOR LT Motor of ESP & FAN application			PROJECT: YADADRI TPS 5 X 800MW, TSGENCO, EPC PACKAGE (Cust No: R827, R828, R829, R830, R831, R4L4)		QP:R827:ELE:003 REV. NO: 01 DATE: 11 12 2018 Page 4 of 12		
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	C	
1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.


1.2	INSULATION MATERIAL:	1.Thickness & width	Major	Mechanical	1 sample/lot	BHEL Spec & Apprd Datasheet	BHEL Spec & Apprd Datasheet	Plant format	P	V		
		2.Tensile strength	Major	Mechanical	1 sample/lot	--do--	--do--	Plant format	P	V		
		3. BDV at elevated temp.in air.	Major	Electrical	1 sample/lot	--do--	--do--	Plant format	P	V		
		4.Tear resistance	Major	Mechanical	1 sample/lot	--do--	--do--	Plant format	P	V		
		5.conformation of glass fabric	Major	Physical	1 sample/lot	--do--	--do--	Plant format	P	V		
		6.Compatibility with impregnation varnish	Major	Chemical	1 sample/lot	--do--	--do--	Plant format	P	V		
		7.Thermal ageing	Major	Thermal	1 sample/lot	--do--	--do--	Plant format	P	V		
		8.IR	Major	Electrical	1 sample/lot	--do--	--do--	Insp.report / Supplier Te	P	V		
		9.Elongation	Major	Mechanical	1 sample/lot	--do--	--do--	Insp.report / Supplier Te	P	V		
1.3	Impregnation varnish	1.BDV test	Major	Electrical	1 sample/lot	--do--	--do--	Plant format	P	V		
		2.Density	Major	Physical	1 sample/lot	--do--	--do--	Plant format	P	V		
		3.Viscosity	Major	Physical	1 sample/lot	--do--	--do--	Plant format	P	V		
		4.Non volatile matter	Major	Chemical	1 sample/lot	--do--	--do--	Plant format	P	V		
		5.Drying time	Major	Thermal	1 sample/lot	--do--	--do--	Plant format	P	V		
		6.Resoftening	Major	Thermal	1 sample/lot	--do--	--do--	Plant format	P	V		
		7. Compatibility with thinner% min.	Major	Physical	1 sample/lot	--do--	--do--	Plant format	P	V		



Chief Engineer


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 Ranipet		BHARAT HEAVY ELECTRICALS LTD BOILER AUXILIARIES PLANT, RANIPET – 632 406.		QUALITY ASSURANCE PLAN FOR LT Motor of ESP & FAN application			PROJECT: YADADRI TPS 5 X 800MW, TSGENCO, EPC PACKAGE (Cust No: R827, R828, R829, R830, R831, R4L4)		QP:R827:ELE:003 REV. NO: 01 DATE: 11 12 2018 Page 5 of 12			
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	C	
1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.
1.4	Motor Shaft Material	8.Reaction of varnish with copper	Major	Chemical	1 sample/lot	--do--	--do--	Plant format	P	V		
		9.Stability of varnish in an open vessel	Major	Chemical	1 sample/lot	--do--	--do--	Plant format	P	V		
		10.Self life	Major	Visual	1 sample/lot	--do--	--do--	Plant format	P	V		
		1.Chemical composition	Major	Chemical	1 sample/lot	--do--	--do--	Supplier TC	P	V		
		2.Yield strength	Major	Mechanical	1 sample/lot	BHEL Spec & Apprd Datasheet	BHEL Spec & Apprd Datasheet	Supplier TC	P	V		
		3.Tensile strength	Major	Mechanical	1 sample/lot	--do--	--do--	Supplier TC	P	V		
		4.Elongation	Major	Mechanical	1 sample/lot	--do--	--do--	Supplier TC	P	V		
		5.Hardness	Major	Mechanical	1 sample/lot	--do--	--do--	Supplier TC	P	V		
		6.Dimensions	Major	Mechanical	1 sample/lot	--do--	--do--	Supplier TC	P	V		
		7.Grain size inclusion rating	Major	Mechanical	1 Sample/lot	--do--	--do--	Supplier TC	P	V		
1.5	Stamping Steel	8.Heat treatment cycle	Major	Thermal	100%	--do--	--do--	Supplier TC	P	V		
		9.Ultrasonic test	Major	NDT	100%	--do--	--do--	Supplier TC	P	V		
		10.Heat treatment cycle	Major	Thermal	100%	--do--	--do--	Supplier TC	P	V		
		1.Specific core loss	Major	Electrical	1 sample/lot	--do--	--do--	Supplier TC	P	V		
		2.Magnetisation	Major	Electrical	1 sample/lot	--do--	--do--	Supplier TC	P	V		
		3.Insulation resistance	Major	Electrical	1 sample/lot	--do--	--do--	Supplier TC	P	V		
		4.Stacking factor	Major	Mechanical	1 sample/lot	--do--	--do--	Supplier TC	P	V		

R. Srinivasan
Chief Engineer

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Maintained, Ltd. 500.


 BHARAT HEAVY ELECTRICALS LTD BOILER AUXILIARIES PLANT, RANIPET – 632 406. Ranipet		QUALITY ASSURANCE PLAN FOR LT Motor of ESP & FAN application			PROJECT: YADADRI TPS 5 X 800MW, TSGENCO, EPC PACKAGE (Cust No: R827, R828, R829, R830, R831, R4L4)			QP:R827:ELE:003 REV. NO: 01 DATE: 11 12 2018 Page 6 of 12				
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	C	
1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.
1.6	Aluminum Ingots	5.Ductility	Major	Mechanical	1 sample/lot	--do--	--do--	Supplier TC	P	V		
		6.Thickness of coating	Major	Mechanical	1 sample/lot	--do--	--do--	Supplier TC	P	V		
		7.Visual check(Waviness)	Major	Visual	1 sample/lot	--do--	--do--	Supplier TC	P	V		
		8.Temperature Withstand capacity	Major	Measure	1 sample/lot	--do--	--do--	Supplier TC	P	V		
		1.Chemical Composition	Major	Chemical	1 sample/lot	BHEL Spec & Apprd Datasheet	BHEL Spec & Apprd Datasheet	Supplier TC	P	V		
1.7	Casting: Body& End shields	1.Grade of casting	Major	Chemical	1 sample/lot	--do--	--do--	Supplier TC	P	V		
		2.Surface defects	Major	Visual	100%	--do--	--do--	Inspection record	P	V		
		3.Hardness	Major	Mechanical	1 sample/lot	--do--	--do--	Supplier TC	P	V		
		4.Tensile strength	Major	Mechanical	1 sample/lot	--do--	--do--	Supplier TC	P	V		
		5.Dimensions	Major	Mechanical	1 sample/lot	--do--	--do--	Inspection record	P	V		
1.8	FAN(Cast Iron)	1.Dimensions	Major	Mechanical	1 sample/lot	--do--	--do--	Inspection record	P	V		
		2.Protective paint	Major	Visual	100%	--do--	--do--	Inspection record	P	V		
1.9	Terminal Box & Covers	1.Dimensions	Major	Mechanical	1 sample/lot	--do--	--do--	Insp. Report	P	V		



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 Khairatabad, Hyd-500 082.


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 Ranipet		BHARAT HEAVY ELECTRICALS LTD BOILER AUXILIARIES PLANT, RANIPET - 632 406.		QUALITY ASSURANCE PLAN FOR LT Motor of ESP & FAN application			PROJECT: YADADRI TPS 5 X 800MW, TSGENCO, EPC PACKAGE (Cust No: R827, R828, R829, R830, R831, R4L4)		QP:R827:ELE:003 REV. NO: 01 DATE: 11 12 2018 Page 7 of 12			
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	C	
1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.
2.0	Bearings(SKF or FAG)	1.Type & Make	Major	Visual	100%	--do--	--do--	Inspection record	P	V		
		2.Dimensions-ID,OD & width	Major	Mechanical	1 sample/lot	--do--	--do--	Inspection record	P	V		
2.1	Earthing bolts & Nuts with washer Paints	Dimensions	Major	Measurement	100%	--do--	--do--	Inspection report	P	V		
		1.Viscosity at 32C	Major	Mechanical	1 sample/lot	BHEL Spec & Apprd Datasheet	BHEL Spec & Apprd Datasheet	Insp. record	P	V		
		2.Drying time	Major	Visual	1 sample/lot	--do--	--do--	Supplier TC	P	V		
		3. Dry film property	Major	Visual	1 sample/lot	--do--	--do--	Supplier TC	P	V		
2.2	Gasket	1.Dimensions	Major	Meas.	As per IS / Plant std.	--do--	--do--	Insp. report / Supplier Tc	P	V		
		2.Neoprene test	Major	Physical	As per IS / Plant std.	--do--	--do--	Insp. Report / Supplier Tc	P	V		
		3.Hardness	Major	Mechanical	As per IS / Plant std.	--do--	--do--	Insp. report / Supplier Tc	P	V		
		4.Ageing test	Major	Physical	As per IS / Plant std.	--do--	--do--	Insp. Report / Supplier Tc	P	V		
		5.Tensile	Major	Measurement	As per IS / Plant std.	--do--	--do--	Insp. Report / Supplier Tc	P	V		
		6.Elongation	Major	Measurement	As per IS / Plant std.	--do--	--do--	Insp. Report / Supplier Tc	P	V		
2.3	Terminal Block	1.Dimensions	Major	Measurement	Plant std.	--do--	--do--	Insp. Report /	P	V		
		2.Proof voltage test	Major	Electrical	Plant std.	--do--	--do--	Insp. Report /	P	V		



Chief Engineer


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 BHARAT HEAVY ELECTRICALS LTD BOILER AUXILIARIES PLANT, RANIPET – 632 406. Ranipet		QUALITY ASSURANCE PLAN FOR LT Motor of ESP & FAN application				PROJECT: YADADRI TPS 5 X 800MW, TSGENCO, EPC PACKAGE (Cust No: R827, R828, R829, R830, R831, R4L4)			QP:R827:ELE:003 REV. NO: 01 DATE: 11 12 2018 Page 8 of 12			
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	C	
1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.


II												
INPROCESS INSPECTION:												
2.4	Machined Cast iron body	1.Blow holes/cracks	Major	Visual	100%	BHEL Spec & Apprd Datasheet	BHEL Spec & Apprd Datasheet	Insp. Record	P	V		
		2.Surface finish	Major	Visual	100%	--do--	--do--	Insp. Record	P	V		
		3.Bore ID and other Dimensions	Major	Mechanical	100%	--do--	--do--	Insp. Record	P	V		
2.5	Machined End shields	1.Blow holes/cracks	Major	Visual	100%	--do--	--do--	Insp. Record	P	V		
		2.Dimensions	Major	Mechanical	100%	--do--	--do--	Insp. Report	P	V		
2.6	Balancing(Rotor & Fan)	1.Permisssiable unbalance	Major	Visual	1 sample	--do--	--do--	Insp. Report	P	V	V	
2.7	Stator core	1.Core length dia	Major	Mechanical	100%	--do--	--do--	Insp. Record	P	V		
		2. Core locking	Major	Visual	100%	--do--	--do--	Insp. Record	P	V		
		3. Rigidity of core.	Major	Mechanical	100%	--do--	--do--	Insp. Record	P	V		
2.8	Die cast Rotor	1.Core length	Major	Mechanical	100%	--do--	--do--	Insp. Record	P	V		
		2.Blow holes	Major	Visual	100%	--do--	--do--	Insp. Record	P	V		
2.9	Impregnation	1.Dip & bake cycles as per OA requirement	Major	Process parameter	100%	--do--	--do--	Insp. Record	P	V		
3.0	Rotor machining	1.Rotor OD	Major	Mechanical	100%	--do--	--do--	Insp. Record	P	V		
		2.Balancing	Major	Mechanical	100%	--do--	--do--	Insp. Record	P	V		


 Chief Engineer

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 Ranipet		BHARAT HEAVY ELECTRICALS LTD BOILER AUXILIARIES PLANT, RANIPET - 632 406.		QUALITY ASSURANCE PLAN FOR LT Motor of ESP & FAN application			PROJECT: YADADRI TPS 5 X 800MW, TSGENCO, EPC PACKAGE (Cust No: R827, R828, R829, R830, R831, R4L4)		QP:R827:ELE:003 REV. NO: 01 DATE: 11 12 2018 Page 9 of 12			
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	C	
1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.
3.1	Space Heater(if applicable)	1. Insulation resistance 2. H.V. Test 3. Resistance 4. Wattage test	Major Major Major Major	Electrical Electrical Electrical Electrical	100% 100% 100% 100%	--do-- --do- --do-- --do--	--do-- --do- --do-- --do--	Insp. Record Insp. Record Insp. Record Insp. Record	P P P P	V V V V		
3.2	Final Assembly	1. Completeness 2. Runout in case of flanged motors 3. Mounting dimension	Major Major Major	Visual Mechanical Mechanical	100% 100% 100%	--do-- --do-- --do--	--do-- --do-- --do--	Insp. Record Insp. Record Insp. Record	P P P	V V V		
III	FINAL INSPECTION AND TESTING:											
3.3	Routine Test	1. Resistance Measurement on winding & space heater 2. Insulation Resistance before/after H.V. Test on winding & space heater 3. H.V. Test on winding & space heater 4. Phase sequence & direction of rotation 5. No load run test 6. Reduced voltage running test 7. Locked rotor test	Major Major Major Major Major Major Major	Electrical Electrical Electrical Electrical Electrical Electrical Electrical	100% 100% 100% 100% 100% 100% 100%	BHEL Spec & Apprd Datasheet --do-- --do-- --do-- --do-- --do-- --do--	BHEL Spec & Apprd Datasheet --do-- --do-- --do-- --do-- --do-- --do--	Insp. Record Insp. Record Insp. Record Insp. Record Insp. Record Insp. Record Insp. Record	P P P P P P P	W W W W W W W	W W W W W W W	



 Chief Engineer
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 Khairatabad, Hyd-500 982.

 Ranipet		BHARAT HEAVY ELECTRICALS LTD BOILER AUXILIARIES PLANT, RANIPET – 632 406.			QUALITY ASSURANCE PLAN FOR LT Motor of ESP & FAN application			PROJECT: YADADRI TPS 5 X 800MW, TSGENCO, EPC PACKAGE (Cust No: R827, R828, R829, R830, R831, R4L4)			QP:R827:ELE:003 REV. NO: 01 DATE: 11 12 2018 Page 10 of 12		
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	C		
1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	

3.4	Type Test	7.1 Two successive Starts from cold Condition	Major	Electrical	100%	--do--	--do--	Insp. Record	P	W	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.
		7.2 Three equally spread starts pre hour.	Major	Electrical	100%	BHEL Spec & Apprd Datasheet	BHEL Spec & Apprd Datasheet	Insp. Record	P	W	W	
		7.3 Two hot restart from hot condition.	Major	Electrical	100%	--do--	--do--	Test Record	P	W	W	
		8.Vibration test	Major	Mechanical	100%	--do--	--do--	Test report	P	W	W	
		9.Name plate verification	Major	Visual	100%	--do--	--do--	Test report	P	W	W	
		10.Paint shade, thickness& adhesion	Major	Vis/Meas	100%	--do--	Apprd Drawing	Insp. Record	P	W	W	
		11.Moutings & Overall dimensions	Major	Vis/Meas.	100%	--do--	--do--	Insp. Record	P	W	W	
		1. Measuring of resistance of winding of stator and wound rotor (if applicable)	Major	Electrical	1 motor in a batch	--do--	--do--	Insp. Record	P	V	V	
		2. No load test at rated voltage to determine input current , power and speed.	Major	Electrical	1 motor in a batch	--do--	--do--	Insp. Record	P	V	V	
		3. Open circuit voltage ratio of wound rotor motor (in case slip ring motors	Major	Electrical	1 motor in a batch	--do--	--do--	TC	P	V	V	

P. S. Srinivas
Chief Engineer


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 Ranipet		BHARAT HEAVY ELECTRICALS LTD BOILER AUXILIARIES PLANT, RANIPET - 632 406.		QUALITY ASSURANCE PLAN FOR LT Motor of ESP & FAN application			PROJECT: YADADRI TPS 5 X 800MW, TSGENCO, EPC PACKAGE (Cust No: R827, R828, R829, R830, R831, R4L4)		QP:R827:ELE:003 REV. NO: 01 DATE: 11 12 2018 Page 11 of 12			
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	C	
1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.

		4. Locked rotor reading of voltage, current and power input at a suitable Reduced voltage	Major	Electrical	1 motor in a batch	BHEL Spec & Apprd Datasheet	BHEL Spec & Apprd Datasheet	TC	P	V	V	
		5. Full load test to determine efficiency power factor and slip	Major	Electrical	1 motor in a batch	--do--	--do--	TC	P	V	V	To determine Efficiency, power factor & slip
		6. Temperature rise test.	Major	Electrical	1 motor in a batch	--do--	--do--	TC	P	V	V	
		7. Momentary overload test	Major	Electrical	1 motor in a batch	--do--	--do--	TC	P	V	V	
		8. Insulation resistance test	Major	Electrical	1 motor in a batch	--do--	--do--	TC	P	V	V	
		9. High voltage test	Major	Mechanical	1 motor in a batch	--do--	--do--	TC	P	V	V	
		10. Test for vibration severity of motor	Major	Mechanical	1 motor in a batch	--do--	--do--	TC	P	V	V	
		11. Test of noise levels of motor	Major	Visual	1 motor in a batch	--do--	--do--	TC	P	V	V	
		12. Over speed test	Major	Mechanical	1 motor in each frame size	BHEL Spec & Apprd Datasheet	BHEL Spec & Apprd Datasheet	TC	P	V	V	

[Signature]
 Chief Engineer

Thermal Projects Constructi.
 TSGENCO, Vidyut Soudha,
 Khairatabad, Hyd-500 002.

 Ranipet		BHARAT HEAVY ELECTRICALS LTD BOILER AUXILIARIES PLANT, RANIPET – 632 406.			QUALITY ASSURANCE PLAN FOR LT Motor of ESP & FAN application			PROJECT: YADADRI TPS 5 X 800MW, TSGENCO, EPC PACKAGE (Cust No: R827, R828, R829, R830, R831, R4L4)		QP:R827:ELE:003 REV. NO: 01 DATE: 11 12 2018 Page 12 of 12		
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	C	
1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.

3.5	Preservation and Packing	13. Degree of Protection Tests	Major	Visual	100%	--do--	--do--	TC	P	V	V	
		1.Completness	Major	Review	100%	--do--	--do--	TC	P	V	V	
		2.Mounting & over all Dimensions	Major	Visual	100%	--do--	--do--	Insp. Record	P	V	V	
		3. Painting(label)	Major	Visual	100%	--do--	--do--	Insp. Record	P	V	V	
		4. Motors located on rubber mats.	Major	Visual	100%	--do--	--do--	Insp. Record	P	V	V	
		5. Motors covered with polythene sheets.	Major	Visual	100%	-do--	-do--	Insp. Record	P	V	V	
		6. Packing	Major	Visual	100%	-do--	-do--	Insp. Record	P	V	V	

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/BHEL TPI agency/Customer/Customer Consultant 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/BHEL TPI agency/Customer/Customer Consultant.

4) Type test clearance from BHEL/BHEL TPI agency/Customer/Customer Consultant 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 C=Customer/Customer Consultant.


Chief Engineer
Thermal Projects Constructio
TSGENCO, Vidyut Soudha
Khairatabad, Hyd-500 055

1027109/2022/BAP/QA

MECH MANUFACTURER'S NAME & ADDRESS



Ranipet

STANDARD QUALITY PLAN

Item/subsystem:
HORIZONTAL CENTRIFUGAL PUMP

QP NO: HZ PUMP:610
Rev:00
Date:15.06.2021
Page 1 of 3

PROJECT: STANDARD

SL NO 1	COMPONENT & OPERATION 2	CHARACTERISTICS 3	CLASS 4	TYPE OF CHECK 5	QUANTUM OF CHECK 6		REFERENCE DOCUMENTS 7	ACCEPTANCE NORMS 8	FORMAT OF RECORD 9 D	AGENCY 10			REMARKS 11
					M	B/C				M	B	C	

RAW MATERIAL INSPECTION													
1	CASTING	CHEMICAL COMPOSITION	MAJOR	CHEMICAL ANALYSIS	1 SAMPLE / HEAT	RELEVANT MATERIAL SPECS AS PER APPD. DRG. / DATA SHEETS	MTC	√	P	V	-	NO REPAIR WELDING IS PERMITTED ON CI AS CAST / PUNCHED HEAT NO SHALL BE PROVIDED FOR CORRELATION	
		MECHANICAL PROPERTIES	MAJOR	TENSILE TEST	1 SAMPLE / HEAT	RELEVANT MATERIAL SPECS AS PER APPD. DRG. / DATA SHEETS	MTC	√	P	V	-		
		SURFACE EXAMINATION	MAJOR	VISUAL INSPECTION	100%	CASTING WILL BE FREE FROM CRACKS, SHRINKAGE , COLD SHUT, INJURIES, POROSITY SAND FUSION ETC	IR	√	P	V	-		
2	IMPELLER	CHEMICAL COMPOSITION	MAJOR	CHEMICAL ANALYSIS	1 SAMPLE / HEAT	RELEVANT MATERIAL SPECS AS PER APPD. DRG. / DATA SHEETS	MTC	√	P	V	-		
		MECHANICAL PROPERTIES	MAJOR	TENSILE TEST & HARDNESS	1 SAMPLE / HEAT	RELEVANT MATERIAL SPECS AS PER APPD. DRG. / DATA SHEETS	MTC	√	P	V	-		
		HEAT TREATMENT (As applicable)	CRITICAL	REVIEW OF TIME- TEMP CHART	100%	RELEVANT MATERIAL SPECS AS PER APPD. DRG. / DATA SHEETS	HT CAHRT	√	P	V	-		
		SURFACE EXAMINATION	MAJOR	VISUAL INSPECTION	100%	CASTING WILL BE FREE FROM CRACKS, SHRINKAGE , COLD SHUT, INJURIES, POROSITY SAND FUSION ETC	IR		P	V	-		
3	SHAFT / SHAFT SLEEVES	CHEMICAL COMPOSITION	MAJOR	CHEMICAL ANALYSIS	1 SAMPLE / HEAT	RELEVANT MATERIAL SPECS AS PER APPD. DRG. / DATA SHEETS	MTC	√	P	V	-		
		MECHANICAL PROPERTIES	MAJOR	TENSILE TEST	1 SAMPLE / HEAT	RELEVANT MATERIAL SPECS AS PER APPD. DRG. / DATA SHEETS	MTC	√	P	V	-		
		SOUNDNESS	CRITICAL	VISUAL INSPECTION	100%	RELEVANT PROCEDURE	UT Report	√	P	V	-	FOR BAR DIA. ≥50 MM.	
4	WEARING RINGS	CHEMICAL PROPERTIES	MAJOR	CHEMICAL ANALYSIS	1 SAMPLE / HEAT	RELEVANT MATERIAL SPECS AS PER APPD. DRG. / DATA SHEETS	MTC	√	P	V	-		
		MECHANICAL PROPERTIES	MAJOR	TENSILE TEST & HARDNESS	1 SAMPLE / HEAT	RELEVANT MATERIAL SPECS AS PER APPD. DRG. / DATA SHEETS	Report	√	P	V	-		

M – Manufacturer / Subcontractor, B - BHEL /BHEL Authorized Inspection Agency, C- End Customer , P - perform, V - Verification of reports, IR – Inspection Report. W - Witness, TC - Test certificate, DP- Dye penetrant. DR – Dimensional report. MTC- Material test Certificate. * Record, identified with "tick" (√) shall be submitted to customer as a QA documentation package.	Prepared by	Reviewed by	Approved by
	Rakesh Kr Madhu (Dy.Mgr/QA)	K Renjith (Manager/QA)	R Arunachalam (DGM/QA)

1027109/2020/BAP/QA

MECH

MANUFACTURER'S NAME &
ADDRESS

Ranipet

STANDARD QUALITY PLAN

Item/subsystem:
HORIZONTAL CENTRIFUGAL
PUMPQP NO: HZ PUMP:610
Rev:00
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PROJECT: STANDARD

SL NO 1	COMPONENT & OPERATION 2	CHARACTERISTICS 3	CLASS 4	TYPE OF CHECK 5	QUANTUM OF CHECK 6		REFERENCE DOCUMENTS 7	ACCEPTANCE NORMS 8	FORMAT OF RECORD 9 D	AGENCY 10			REMARKS 11
					M	B/C				M	B	C	

IN PROCESS INSPECTION														
5	CASING & WEAR AREA	DIMENSIONAL	MAJOR	MEASURE	100%		MANUFACTURING DRAWING		IR	√	P	V	-	
		HYDROSTATIC TEST OF CASTING	CRITICAL	PRESSURE TEST	100%	20%	SEE NOTE 2	NO LEAKAGE	IR	√	P	W	-	SEE NOTE -1
6	IMPELLER	DIMENSIONAL	MAJOR	MEASURE	100%		MANUFACTURING DRAWING		IR	√	P	V	-	
		DYNAMIC BALANCING	CRITICAL	MEASURE	100%	20%	ISO 1940, GR. 6.3		IR	√	P	W	-	SEE NOTE-1
7	DPT OF MACHINED AREA OF CASINGS & IMPELLER	SOUNDNESS OF CASTING	MAJOR	NDT-DPT	100%		MANUFACTURER PROCEDURE		DPT Report	√	P	V	-	
8	SHAFT & SLEEVES	DIMENSIONAL	MAJOR	VISUAL	100%		MANUFACTURING DRAWING		IR	√	P	V	-	
		SOUNDNESS	CRITICAL	ULTRASONIC TEST	100%		RELEVANT PROCEDURE		UT Report	√	P	W	-	FOR SHAFT DIA ≥ 50 MM ONLY (EXCEPT THREADED PORTION) SEE NOTE-1
		DP TEST ON MACHINED AREA	MAJOR	DP TEST	100%		RELEVANT PROCEDURE		DPT Report	√	P	V	-	
FINAL INSPECTION														

M – Manufacturer / Subcontractor,
 B - BHEL /BHEL Authorized Inspection Agency,
 C- End Customer , P - perform,
 V - Verification of reports, IR – Inspection Report.
 W - Witness, TC - Test certificate, DP- Dye penetrant.
 DR – Dimensional report. MTC- Material test Certificate.
 * Record, identified with "tick" (√) under column 'D' shall be submitted to customer as a QA documentation package.

Prepared by

Rakesh Kr Madhu (Dy.Mgr/QA)

Reviewed by

K Renjith (Manager/QA)

Approved by

R Arunachalam (DGM/QA)

1027109/2020/BAP/QA

MECH MANUFACTURER'S NAME & ADDRESS



Ranipet

STANDARD QUALITY PLAN

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PROJECT: STANDARD

SL NO 1	COMPONENT & OPERATION 2	CHARACTERISTICS 3	CLASS 4	TYPE OF CHECK 5	QUANTUM OF CHECK 6		REFERENCE DOCUMENTS 7	ACCEPTANCE NORMS 8	FORMAT OF RECORD 9 D	AGENCY 10			REMARKS 11
					M	B/C				M	B	C	

9	PUMP ASSEMBLY	DIMENSIONAL	MAJOR	MEASURE	100%	100%	APPROVED G.A. DRAWING	IR	√	P	V	-	
10	PERFORMANCE TEST WITH JOB MOTOR	Q VS H	CRITICAL	MEASURE	100%	100%	APPROVED PERFORMANCE TEST PROCEDURE & APPROVED DATA SHEET	IR	√	P	W	-	
		Q VS P											
		Q VS E											
		NOISE LEVEL											
		VIBRATION	MAJOR	MEASURE						P	W	-	
		BEARING TEMP	MAJOR	MEASURE						P	W	-	
11	NPSHR TEST	NPSHR TEST	CRITICAL	MEASURE	100%	1 NO / MODEL	APPROVED NPSHR TEST PROCEDURE	IR	√	P	W	-	
12	PAINTING AND PACKING	TYPE OF PAINT. APPEARANCE. DFT CONFORMANCE TO PACKING SPECIFICATION	MAJOR	VISUAL & MEASURE	100%		TECHNICAL SPECIFICATION /CUSTOMER APPROVED PAINTING SCHEDULE	IR	√	P	V	-	

NOTES:

- a. All the inspection/ test reports shall be submitted to Inspection agency for review and record purpose.
- b. Latest revision of Drawings, specification and standard shall be used.
- c. Materials shall be procured in compliance to Functional Technical Specification.
- d. Gauges and measuring instruments with valid calibration only shall be used.
- e. Inspection / Inspection waiver / approval by BHEL does not absolve Supplier's responsibility for conformity of the specification as per the terms of PO.
- f. BHEL /BHEL Authorized representatives shall have the right to witness the necessary inspection and testing of goods mentioned in the PO.
- g. In case of Vendor Drawing, it needs approval by BHEL Engineering.
- h. This QP Shall be read along with relevant PO, BHEL Specification/Drawing/Approved Datasheet.
- i. This QP is applicable for Mandatory spare supply also specific to the item/project wise.

M – Manufacturer / Subcontractor, B - BHEL /BHEL Authorized Inspection Agency, C- End Customer , P - perform, V - Verification of reports, IR – Inspection Report. W - Witness, TC - Test certificate, DP- Dye penetrant. DR – Dimensional report. MTC- Material test Certificate. * Record, identified with "tick" (√) under column 'D' shall be submitted to customer as a QA documentation package.	Prepared by	Reviewed by	Approved by
	Rakesh Kr Madhu (Dy.Mgr/QA)	K Renjith (Manager/QA)	R Arunachalam (DGM/QA)

Annexure Q

		Indent No:	Enquiry no:	
Sl.No	BHEL / Customer Requirements	## Specific confirmations by the manufacturer (Acceptable/Not acceptable)		
	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.			
1	(v) Bidder shall agree to submit all cross referred documents other than codes/standards to BHEL/Customer/Consultant.			
	<p>Important Notes shall be included in MQP :</p> <p>(a) Latest revision of Standards & Specification shall apply. Only International Standards are applicable.</p> <p>(b) Materials shall be procured in compliance to Functional Technical Specification.</p> <p>(c) Inspection shall be in compliance with Approved Quality Control Procedure for the Product.</p> <p>(d) NDT shall be carried out by Qualified Personnel with compliance to Approved NDT Procedures and Acceptance Norms, as per ASME standard.</p> <p>(e) Gauges and measuring Instruments, with valid calibration only shall be used.</p> <p>(f) Cleaning and Painting of products shall be carried out as per Approved Painting Schedule.</p> <p>(g) Finished Products shall be packed to comply with Approved Packing Schedule.</p> <p>(h) Welding shall be carried out by Qualified Personnel with compliance to Approved NDT Procedures and Acceptance Norms, as per ASME standard.</p>			
2	<p>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).</p>			
3	<p>Inspection Agency for Foreign Bidders and also for Indian Bidder but importing from Foreign Sources:</p> <p>(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.</p> <p>(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.</p> <p>List of TPIA</p> <ol style="list-style-type: none"> 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 Lloyds 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 			

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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: 300000020 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 /Water Pumps: 001 Rev NO.: 00 PAGE : Page 1 of 4 DATE: 03.09.2022		##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	Type Test Requirements	A. Vendor shall submit the type test reports of all the type tests as listed in SL NO: 01 (D) below and carried out within 10 years from the data of Issue of Notification : 21.12.2019. These reports should be for the test conducted on the identical/similar <u>LT MOTORS (Energy Efficient Motor as per IS 12615 (or) as per International Standards like IEC, DIN, BS etc</u> s to those proposed to be supplied under this enquiry and test (s) either should have been conducted at an independent laboratory (or) should have been witnessed by BHEL AIA (BHEL Appointed Inspection Agency) / BHEL (or) Ultimate client TSGENCO at respective LT Motor Manufacture of OEM vendor.	
		B. However, if vendor is not able to submit the similar / identical type test report as per above condition (or) in the case of type test reports are not found to be meeting the specification requirement, the vendor shall conduct all the tests at no additional cost to BHEL either at third party lab (or) own lab in the presence of BHEL AIA (BHEL Appointed Inspection Agency) / BHEL /Ultimate client TSGENCO and submit the reports for review & approval.	
		C. Type Test reports review and approval by BHEL AIA (BHEL Appointed Inspection Agency) / BHEL / Ultimate client TSGENCO is must in line with TSGENCO approved data sheet / BOM/GA Drawing etc.	

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 /Water Pumps: 001 Rev NO.: 00 PAGE : Page 2 of 4 DATE: 03.09.2022		##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	Type Test Requirement...Contd	D. The following Type test reports to be submitted covering the following for above 50KW LT Motor as per relevant BIS (Bureau of Indian Standard) - BIS 12615 / IEC 60034 or any other international standard like DIN, BS, IEC etc				
		i. Measuring of resistance of winding of stator and wound rotor (if applicable) ii. No load test at rated voltage to determine input current, power and speed. iii. Open circuit voltage ratio of wound rotor motor (in case slip ring motors) iv. Full load test to determine efficiency power factor and slip v. Temperature rise test. vi. Momentary excess load test vii. High voltage test viii. Test for vibration severity of motor ix. Test of noise levels of motor (Noise level for all the motors shall be limited to 85dB(A) except for BFP motor for which the maximum limit shall be 90dB(A).) x. Over speed test xi. Degree of Protection Tests (Minimum Ingress Protection - IP 55). xii. Type test reports for motors located in fuel oil area having flame proof enclosures as per BIS 2148/ IEC 60079-1				
		E. The TCs / Type Test reports shall also be given as PDF file with index sheet & page control thro Email & Soft Copy (File size to less than 9MB).				
02	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 . (or) OEM/LT Motor Manufacturer to submit their QP for BHEL and Ultimate Customer TSGENCO review and approval.				
03	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.				

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 /Water Pumps: 001 Rev NO.: 00 PAGE : Page 3 of 4 DATE: 03.09.2022		##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

04	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.		
		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.		
05	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).		
06	Packing	Packing shall be as per Specification / Drg. / Data sheet including sea worthy packing if any to avoid any transit & handling damages .		
07	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.		

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: 300000020 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 /Water Pumps: 001 Rev NO.: 00 PAGE : Page 4 of 4 DATE: 03.09.2022	##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

08	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.	
09	Important notes	<u>Inspection Categorization: II</u> 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.

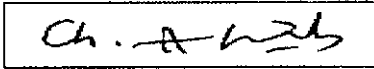
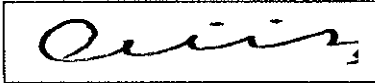
However, approval of the above Quality Plan does not absolve M/s BHEL of its responsibility of supplying the above item to the specifications and relevant standards and to ensure satisfactory performance of the above equipment as per the terms of the contract.

Encl: As above



 CHIEF ENGINEER/ TPC

1029803/2022/BAP-QA_MECH

	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.
QP:BHAD:ELE:002	00	24/042015


TITLE : Quality Plan for LT Motor of ESP & FAN application	
SIGNATURE	
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	<input type="checkbox"/> INFORMATION COPY <input type="checkbox"/> CONTROL COPY
<input checked="" type="checkbox"/> 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.	
ISSUED TO:	CONTROL COPY NO :

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


 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 1 of 5		
Sl. No.	COMPONENT / ASSEMBLY / OPERATION/TESTS	CHARACTIE - RISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK	REFERENCE DOCUMENT	ACCEPTANCE STANDARD	FORMAT OF REC	AGENCY	REMARKS
1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.

Sl. No.	COMPONENT / ASSEMBLY / OPERATION/TESTS	CHARACTIE - RISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK	REFERENCE DOCUMENT	ACCEPTANCE STANDARD	FORMAT OF REC	AGENCY	REMARKS
1.0	FINAL INSPECTION AND TESTING:									
1.1	Routine Test	1. Resistance Measurement on stator winding & space heater 2. Insulation Resistance before/after H.V. Test on winding & space heater 3. H.V. Test on winding & space heater 4. Phase sequence & direction of rotation 5. No load run test 6. Reduced voltage running test 7. Locked rotor test 7.1 Two successive Starts from cold Condition. 7.2 Three equally spread starts per hour.	Major	Electrical	100%	BHEL Spec & Apprd Datasheet	BHEL Spec & Apprd Datasheet	Insp. Record	P	W
			Major	Electrical	100%	--do--	--do--	Insp. Record	P	W
			Major	Electrical	100%	--do--	--do--	Insp. Record	P	W
			Major	Electrical	100%	--do--	--do--	Insp. Record	P	W
			Major	Electrical	100%	--do--	--do--	Insp. Record	P	W
			Major	Electrical	100%	--do--	--do--	Insp. Record	P	W
			Major	Electrical	100%	--do--	--do--	Insp. Record	P	W
			Major	Electrical	100%	--do--	--do--	Insp. Record	P	W
			Major	Electrical	100%	--do--	--do--	Test Report	P	W


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 CEFNC

 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 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		
1.	2.	3.	4.	5.	6.	7.	8.	9.	M	B	11.	
2	Type Test	7.3 Two hot restart from hot condition. 8.Vibration test 9.Name plate verification 10.Paint shade, thickness& adhesion 11.Moutings & Overall dimenstoris	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.	
		1. Measuring of resistance of winding of stator and wound rotor (if applicable) 2. No load test at rated voltage to determine input current , power and speed. 3. Open circuit voltage ratio of wound rotor	Major	Electrical	1 motor in a batch	--do--	--do--	Insp. Record	P	V		
			Major	Electrical	1 motor in a batch	--do--	--do--	Insp. Record	P	V		
			Major	Electrical	1 motor in a batch	--do--	--do--	TC	P	V		
			Major	Electrical	1 motor in a batch	--do--	--do--	TC	P	V		

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CE/TPI

 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-EL:E:002 REV. NO: 00 DATE: 24/04/2015 Page 3 of 5		
Sl. No.	COMPONENT / ASSEMBLY / OPERATION/TESTS	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK	REFERENCE DOCUMENT	ACCEPTANCE STANDARD	FORMAT OF AGENCY REC	REMARKS		
1.	2.	3.	4.	5.	6.	7.	8.	9.	10.		
		motor (in case slip ring motors	Major	Electrical	1 motor in a batch	BHEL Spec & Apprd Datasheet	BHEL Spec & Apprd Datasheet	TC	P	V	
4.	Locked rotor reading of voltage, current and power input at a suitable educed voltage	Major	Electrical	Electrical	1 motor in a batch	--do--	--do--	TC	P	V	To determine Efficiency, power factor & slip
5.	Full load test to determine efficiency power factor and slip	Major	Electrical	Electrical	1 motor in a batch	--do--	--do--	TC	P	V	
6.	Temperature rise test.	Major	Electrical	Electrical	1 motor in a batch	--do--	--do--	TC	P	V	
7.	Momentary overload test	Major	Electrical	Electrical	1 motor in a batch	--do--	--do--	TC	P	V	
8.	Insulation resistance test	Major	Electrical	Electrical	1 motor in a batch	--do--	do--	TC	P	V	
9.	High voltage test	Major	Mechanical	Mechanical	1 motor in a batch	do--	--do--	TC	P	V	
10.	Test for vibration severity of	Major	Mechanical	Mechanical	1 motor in a batch	--do--	--do--	TC	P	V	

MDP
 6/16
 CE/TPC

 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 4 of 5		
Sl. No.	COMPONENT / ASSEMBLY / OPERATION/TESTS	CHARACTE - RISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK	REFERENCE DOCUMENT	ACCEPTANCE STANDARD	FORMAT OF AGENCY REC	REMARKS	
1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.
3	Preservation and Packing	motor	Major	Visual	1 motor in a batch	BHEL Spec & Apprd Datasheet	BHEL Spec & Apprd Datasheet	TC	P	V
		11. Test of noise levels of motor	Major	Mechanical	1 motor in each frame size	--do--	--do--	TC	P	V
		12. Over speed test	Major	Visual		--do--	--do--	TC	P	V
		13. Degree of Protection Tests	Major	Review	100%	--do--	--do--			V
		1.Completeness	Major	Visual	100%	--do--	--do--			V
		2.Mounting & over all Dimensions	Major	Visual	100%	--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	Visual	100%	--do--	--do--		P	V
		6. Packing	Major	Visual	100%	--do--	--do--			V

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 6/6/2022
 CE/PTC

1025791/2022/BAP/QA

MECH

MANUFACTURER'S NAME &
ADDRESS

Ranipet




STANDARD QUALITY PLAN

Item/subsystem:
HORIZONTAL CENTRIFUGAL
PUMPQP NO: HZ PUMP:610
Rev:00
Date:15.06.2021
Page 1 of 3

PROJECT: STANDARD

SL NO 1	COMPONENT & OPERATION 2	CHARACTERISTICS 3	CLASS 4	TYPE OF CHECK 5	QUANTUM OF CHECK 6		REFERENCE DOCUMENTS 7	ACCEPTANCE NORMS 8	FORMAT OF RECORD 9 D	AGENCY 10			REMARKS 11
					M	B/C				M	B	C	

RAW MATERIAL INSPECTION													
1	CASTING	CHEMICAL COMPOSITION	MAJOR	CHEMICAL ANALYSIS	1 SAMPLE / HEAT	RELEVANT MATERIAL SPECS AS PER APPD. DRG. / DATA SHEETS	MTC	√	P	V	-	NO REPAIR WELDING IS PERMITTED ON CI AS CAST / PUNCHED HEAT NO SHALL BE PROVIDED FOR CORRELATION	
		MECHANICAL PROPERTIES	MAJOR	TENSILE TEST	1 SAMPLE / HEAT	RELEVANT MATERIAL SPECS AS PER APPD. DRG. / DATA SHEETS	MTC	√	P	V	-		
		SURFACE EXAMINATION	MAJOR	VISUAL INSPECTION	100%	CASTING WILL BE FREE FROM CRACKS, SHRINKAGE, COLD SHUT, INJURIES, POROSITY SAND FUSION ETC	IR	√	P	V	-		
2	IMPELLER	CHEMICAL COMPOSITION	MAJOR	CHEMICAL ANALYSIS	1 SAMPLE / HEAT	RELEVANT MATERIAL SPECS AS PER APPD. DRG. / DATA SHEETS	MTC	√	P	V	-		
		MECHANICAL PROPERTIES	MAJOR	TENSILE TEST & HARDNESS	1 SAMPLE / HEAT	RELEVANT MATERIAL SPECS AS PER APPD. DRG. / DATA SHEETS	MTC	√	P	V	-		
		HEAT TREATMENT (As applicable)	CRITICAL	REVIEW OF TIME- TEMP CHART	100%	RELEVANT MATERIAL SPECS AS PER APPD. DRG. / DATA SHEETS	HT CAHRT	√	P	V	-		
		SURFACE EXAMINATION	MAJOR	VISUAL INSPECTION	100%	CASTING WILL BE FREE FROM CRACKS, SHRINKAGE, COLD SHUT, INJURIES, POROSITY SAND FUSION ETC	IR		P	V	-		
3	SHAFT / SHAFT SLEEVES	CHEMICAL COMPOSITION	MAJOR	CHEMICAL ANALYSIS	1 SAMPLE / HEAT	RELEVANT MATERIAL SPECS AS PER APPD. DRG. / DATA SHEETS	MTC	√	P	V	-		
		MECHANICAL PROPERTIES	MAJOR	TENSILE TEST	1 SAMPLE / HEAT	RELEVANT MATERIAL SPECS AS PER APPD. DRG. / DATA SHEETS	MTC	√	P	V	-		
		SOUNDNESS	CRITICAL	VISUAL INSPECTION	100%	RELEVANT PROCEDURE	UT Report	√	P	V	-	FOR BAR DIA. ≥50 MM.	
4	WEARING RINGS	CHEMICAL PROPERTIES	MAJOR	CHEMICAL ANALYSIS	1 SAMPLE / HEAT	RELEVANT MATERIAL SPECS AS PER APPD. DRG. / DATA SHEETS	MTC	√	P	V	-		
		MECHANICAL PROPERTIES	MAJOR	TENSILE TEST & HARDNESS	1 SAMPLE / HEAT	RELEVANT MATERIAL SPECS AS PER APPD. DRG. / DATA SHEETS	Report	√	P	V	-		

M – Manufacturer / Subcontractor, B - BHEL /BHEL Authorized Inspection Agency, C- End Customer , P - perform, V - Verification of reports, IR – Inspection Report. W - Witness, TC - Test certificate, DP- Dye penetrant. DR – Dimensional report. MTC- Material test Certificate. * Record, identified with "tick" (√) shall be submitted to customer as a QA documentation package.	Prepared by	Reviewed by	Approved by
			
	Rakesh Kr Madhu (Dy.Mgr/QA)	K Renjith (Manager/QA)	R Arunachalam (DGM/QA)

1025791/2020/BAP/QA

MECH
 MANUFACTURER'S NAME &
 ADDRESS

 Ranipet



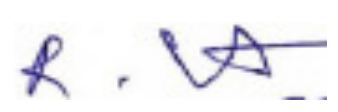
STANDARD QUALITY PLAN
 Item/subsystem:
 HORIZONTAL CENTRIFUGAL
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 QP NO: HZ PUMP:610
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 Date:15.06.2021
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PROJECT: STANDARD

SL NO 1	COMPONENT & OPERATION 2	CHARACTERISTICS 3	CLASS 4	TYPE OF CHECK 5	QUANTUM OF CHECK 6		REFERENCE DOCUMENTS 7	ACCEPTANCE NORMS 8	FORMAT OF RECORD 9 D	AGENCY 10			REMARKS 11
					M	B/C				M	B	C	

IN PROCESS INSPECTION													
5	CASING & WEAR AREA	DIMENSIONAL	MAJOR	MEASURE	100%		MANUFACTURING DRAWING	IR	√	P	V	-	
		HYDROSTATIC TEST OF CASTING	CRITICAL	PRESSURE TEST	100%	20%	SEE NOTE 2	NO LEAKAGE	IR	√	P	W	-
6	IMPELLER	DIMENSIONAL	MAJOR	MEASURE	100%		MANUFACTURING DRAWING	IR	√	P	V	-	
		DYNAMIC BALANCING	CRITICAL	MEASURE	100%	20%	ISO 1940, GR. 6.3		IR	√	P	W	-
7	DPT OF MACHINED AREA OF CASINGS & IMPELLER	SOUNDNESS OF CASTING	MAJOR	NDT-DPT	100%		MANUFACTURER PROCEDURE	DPT Report	√	P	V	-	
8	SHAFT & SLEEVES	DIMENSIONAL	MAJOR	VISUAL	100%		MANUFACTURING DRAWING	IR	√	P	V	-	
		SOUNDNESS	CRITICAL	ULTRASONIC TEST	100%		RELEVANT PROCEDURE	UT Report	√	P	W	-	FOR SHAFT DIA ≥ 50 MM ONLY (EXCEPT THREADED PORTION) SEE NOTE-1
		DP TEST ON MACHINED AREA	MAJOR	DP TEST	100%		RELEVANT PROCEDURE	DPT Report	√	P	V	-	

FINAL INSPECTION

M – Manufacturer / Subcontractor, B - BHEL /BHEL Authorized Inspection Agency, C- End Customer , P - perform, V - Verification of reports, IR – Inspection Report. W - Witness, TC - Test certificate, DP- Dye penetrant. DR – Dimensional report. MTC- Material test Certificate. * Record, identified with "tick" (√) under column 'D' shall be submitted to customer as a QA documentation package.	Prepared by	Reviewed by	Approved by
			
	Rakesh Kr Madhu (Dy.Mgr/QA)	K Renjith (Manager/QA)	R Arunachalam (DGM/QA)

1025791/2020/BAP/QA

MECH

MANUFACTURER'S NAME &
ADDRESS

Ranipet

STANDARD QUALITY PLAN

Item/subsystem:
HORIZONTAL CENTRIFUGAL
PUMPQP NO: HZ PUMP:610
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PROJECT: STANDARD

SL NO 1	COMPONENT & OPERATION 2	CHARACTERISTICS 3	CLASS 4	TYPE OF CHECK 5	QUANTUM OF CHECK 6		REFERENCE DOCUMENTS 7	ACCEPTANCE NORMS 8	FORMAT OF RECORD 9 D	AGENCY 10			REMARKS 11
					M	B/C				M	B	C	

9	PUMP ASSEMBLY	DIMENSIONAL	MAJOR	MEASURE	100%	100%	APPROVED G.A. DRAWING	IR	√	P	V	-	
10	PERFORMANCE TEST WITH JOB MOTOR	Q VS H	CRITICAL	MEASURE	100%	100%	APPROVED PERFORMANCE TEST PROCEDURE & APPROVED DATA SHEET	IR	√	P	W	-	
		Q VS P											
		Q VS E											
		NOISE LEVEL											
		VIBRATION	MAJOR	MEASURE						P	W	-	
		BEARING TEMP	MAJOR	MEASURE						P	W	-	
11	NPSHR TEST	NPSHR TEST	CRITICAL	MEASURE	100%	1 NO / MODEL	APPROVED NPSHR TEST PROCEDURE	IR	√	P	W	-	
12	PAINTING AND PACKING	TYPE OF PAINT. APPEARANCE. DFT CONFORMANCE TO PACKING SPECIFICATION	MAJOR	VISUAL & MEASURE	100%		TECHNICAL SPECIFICATION /CUSTOMER APPROVED PAINTING SCHEDULE	IR	√	P	V	-	

NOTES:

:	<p>a. All the inspection/ test reports shall be submitted to Inspection agency for review and record purpose.</p> <p>b. Latest revision of Drawings, specification and standard shall be used.</p> <p>c. Materials shall be procured in compliance to Functional Technical Specification.</p> <p>d. Gauges and measuring instruments with valid calibration only shall be used.</p> <p>e. Inspection / Inspection waiver / approval by BHEL does not absolve Supplier's responsibility for conformity of the specification as per the terms of PO.</p> <p>f.. BHEL /BHEL Authorized representatives shall have the right to witness the necessary inspection and testing of goods mentioned in the PO.</p> <p>g. In case of Vendor Drawing, it needs approval by BHEL Engineering.</p> <p>h. This QP Shall be read along with relevant PO, BHEL Specification/Drawing/Approved Datasheet.</p> <p>i. This QP is applicable for Mandatory spare supply also specific to the item/project wise.</p>
---	--

M – Manufacturer / Subcontractor, B - BHEL /BHEL Authorized Inspection Agency, C- End Customer , P - perform, V - Verification of reports, IR – Inspection Report. W - Witness, TC - Test certificate, DP- Dye penetrant. DR – Dimensional report. MTC- Material test Certificate. * Record, identified with "tick" (√) under column 'D' shall be submitted to customer as a QA documentation package.	Prepared by	Reviewed by	Approved by
			
	Rakesh Kr Madhu (Dy.Mgr/QA)	K Renjith (Manager/QA)	R Arunachalam (DGM/QA)

Annexure Q

		Indent No:	Enquiry no:	
Sl.No	BHEL / Customer Requirements	## Specific confirmations by the manufacturer (Acceptable/Not acceptable)		
	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.			
1	(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 Standards & 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 Lloyds 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			

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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 Up to 200KW

PROJECT: Kothagudam 1 X 800 MW TPS- FGD (BHEL W.O no: G 801) CONTRACT NO: 300000022 CE/TPC/SE1/EME7/KTPS- VII/D.NO 54/D.No.51.19, Dt: 03.08.2019 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 Kothagudam 1 X 800 MW TPS- FGD (BHEL W.O no: G 801)		DOC.NO: BAP/QR/G801 /Kothagudam FGD: LTM /Water Pumps: 001 Rev NO.: 00 PAGE : Page 1 of 4 DATE: 02.09.2022		##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	Type Test Requirements	A. Vendor shall submit the type test reports of all the type tests as listed in SL NO: 01 (D) below and carried out within 10 years from the data of Issue of Notification: 29.05.2018. These reports should be for the test conducted on the identical/similar LT MOTORS (Energy Efficient Motor as per IS 12615 (or) as per International Standards like IEC, DIN, BS etc s to those proposed to be supplied under this enquiry and test (s) either should have been conducted at an independent laboratory (or) should have been witnessed by BHEL AIA (BHEL Appointed Inspection Agency) / BHEL (or) Ultimate client TSGENCO at respective LT Motor Manufacture of OEM vendor.		
		B. However, if vendor is not able to submit the similar / identical type test report as per above condition (or) in the case of type test reports are not found to be meeting the specification requirement, the vendor shall conduct all the tests at no additional cost to BHEL either at third party lab (or) own lab in the presence of BHEL AIA (BHEL Appointed Inspection Agency) / BHEL /Ultimate client TSGENCO and submit the reports for review & approval.		
		C. Type Test reports review and approval by BHEL AIA (BHEL Appointed Inspection Agency) / BHEL / Ultimate client TSGENCO is must in line with TSGENCO approved data sheet / BOM/GA Drawing etc.		

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

PROJECT: Kothagudam 1 X 800 MW TPS- FGD (BHEL W.O no: G 801) CONTRACT NO: 300000022 CE/TPC/SE1/EME7/KTPS- VII/D.NO 54/D.No.51.19, Dt: 03.08.2019 PACKAGE: FGD PACKAGE MAIN CONTRACTOR: BHEL - RANIPET SUB CONTRACTOR (OEM) & ADDRESS: (To be filled by OEM VENDOR)		CONTRACT QUALITY REQUIREMENTS (CQR) for <u>LT MOTORS (Energy Efficient Motor as per IS 12615 (or) as per International Standards like IEC, DIN, BS etc)</u> <u>Up to 200KW</u> Kothagudam 1 X 800 MW TPS- FGD (BHEL W.O no: G 801) 		DOC.NO: BAP/QR/G801 /Kothagudam FGD: LTM /Water Pumps: 001 Rev NO.: 00 PAGE : Page 2 of 4 DATE: 02.09.2022		##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	Type Test Requirement...Contd	D. The following Type test reports to be submitted covering the following for above 50KW LT Motor as per relevant BIS (Bureau of Indian Standard) - BIS 12615 / IEC 60034 or any other international standard like DIN, BS, IEC etc				
		i. Measuring of resistance of winding of stator and wound rotor (if applicable) ii. No load test at rated voltage to determine input current, power and speed. iii. Open circuit voltage ratio of wound rotor motor (in case slip ring motors) iv. Full load test to determine efficiency power factor and slip v. Temperature rise test. vi. Momentary excess load test vii. High voltage test viii. Test for vibration severity of motor ix. Test of noise levels of motor (Noise level for all the motors shall be limited to 85dB(A) except for BFP motor for which the maximum limit shall be 90dB(A).) x. Over speed test xi. Degree of Protection Tests (Minimum Ingress Protection - IP 55). xii. Type test reports for motors located in fuel oil area having flame proof enclosures as per BIS 2148/ IEC 60079-1				
		E. The TCs / Type Test reports shall also be given as PDF file with index sheet & page control thro Email & Soft Copy (File size to less than 9MB).				
02	Quality Plan Requirement	OEM/LT Motor Manufacture shall confirm to Ultimate Customer TSGENCO approved MQP QP:R824:ELE:003 Rev 01 received along with letter ref no: CPP/TSG/SET-3/511/KTPS-VII(1 X 800 MW)/LT Motor QAP/D.No.114/15 dt 03.07.2015 (or) OEM/LT Motor Manufacturer to submit their QP for BHEL and Ultimate Customer TSGENCO review and approval.				
03	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.				

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

PROJECT: Kothagudam 1 X 800 MW TPS- FGD (BHEL W.O no: G 801) CONTRACT NO: 300000022 CE/TPC/SE1/EME7/KTPS- VII/D.NO 54/D.No.51.19, Dt: 03.08.2019 PACKAGE: FGD PACKAGE MAIN CONTRACTOR: BHEL - RANIPET SUB CONTRACTOR (OEM) & ADDRESS: (To be filled by OEM VENDOR)		CONTRACT QUALITY REQUIREMENTS (CQR) for <u>LT MOTORS (Energy Efficient Motor as per IS 12615 (or) as per International Standards like IEC, DIN, BS etc)</u> <u>Up to 200KW</u> Kothagudam 1 X 800 MW TPS- FGD (BHEL W.O no: G 801) 		DOC.NO: BAP/QR/G801 /Kothagudam FGD: LTM /Water Pumps: 001 Rev NO.: 00 PAGE : Page 3 of 4 DATE: 02.09.2022		##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**

04	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 QP:R824:ELE:003 Rev 01 received along with letter ref no: CPP/TSG/SET-3/511/KTPS-VII(1 X 800 MW)/LT Motor QAP/D.No.114/15 dt 03.07.2015.		
		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.		
05	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).		
06	Packing	Packing shall be as per Specification / Drg. / Data sheet including sea worthy packing if any to avoid any transit & handling damages .		
07	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 MS Aditya Chakravarthy., Manager (QC-Proc), Mobile no: +91 9489202788., Email id: msachakravarthy@bhel.in and Mr Zeeshan Ali., Dy. Manager (QC-Proc), Mobile no: +91 9443149691 ., Email id: zeeshan@bhel.in including for inspection related activities for immediate response / resolution.		

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


PROJECT: Kothagudam 1 X 800 MW TPS- FGD (BHEL W.O no: G 801) CONTRACT NO: 300000022 CE/TPC/SE1/EME7/KTPS- VII/D.NO 54/D.No.51.19, Dt: 03.08.2019 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 Kothagudam 1 X 800 MW TPS- FGD (BHEL W.O no: G 801)		DOC.NO: BAP/QR/G801 /Kothagudam FGD: LTM /Water Pumps: 001 Rev NO.: 00 PAGE : Page 4 of 4 DATE: 02.09.2022		##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

08	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.			
09	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.			
10	Vendor shall furnish following details of LT Motor involved in GGH:-				
	S.No	Motor	Make	Rating(in Kw)	Qty (in no.s)
	1				
	2				

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 Vidyut Soudha, Hyderabad - 500082. www.cetpctgenco@gmail.com	
From: The Chief Engineer, Thermal Projects Construction, Vidyut Soudha, Hyderabad - 500 082. Ph: 040-23499261,262 Email id: cetpctgenco@gmail.com	To: M/s BHEL, BOILER AUXILIARIES PLANT, Indira Gandhi Industrial Complex, RANIPÉT-632406.TAM IL NADU. Ph:04172-284260,Fax:04172-281154. E-mail: csrini@bhelrpt.co.in

Kind Attn:Mr. C.Srinivasan, DGM/QA

Lr.No. CPP/TSG/SET-3/511/KTPS-VII(1X800MW)/LT Motor QAP/D.No.114/15,Dt: 03.07.2015.

Sir,

Sub:- KTPS Stage-VII(1X800MW)-LT Motor for ESP and Fan application-Quality Assurance Plan -Approval - Reg.

- Ref:-1 M/s BHEL Mail dated: 19.05.2015.
 2 M/s BHEL e-mail dated: 03.06.2015(rev-01).
 3 DCPL approval mail dated:02.07.2015

* * *


Please refer to the letter 2nd cited above, wherein M/s BHEL/RANIPET submitted the following Quality Assurance Plan of LT Motor for ESP and Fan application pertaining to KTPS-VII(1x800MW) for TSGENCO's review & approval

Sl. No	Document No	Rev	Description
1	QP:R824:ELE:003	01	Quality Assurance Plan of LT Motor for ESP and Fan application

The above Quality Plan furnished by M/s BHEL/RPT is reviewed and is hereby approved. An approved copy of the above Quality Plan is enclosed herewith for taking further necessary action at your end.


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

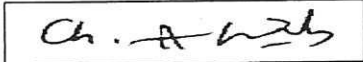
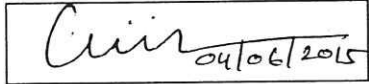
Encl: As above (10 Pages)


CHIEF ENGINEER/TPC(I/C)


Copy communicated to:

1. The Chief Engineer/O&M/KTPS/Paloncha/507115/ Khammam(dt)
2. Superintending Engineer-I/ TPC/ Vidyut Soudha, Khairatabad.


 Ranipet	QUALITY PLAN FOR LT MOTOR Of ESP & FAN Application for KOTHAGUDAM TPS STAGE VII, UNIT 12 (1 x800 MW) (M/S TSGENCO, EPC PACKAGE) (Customer No: R824)	
	REF. NO.	REVISION NO.
QP:R824:ELE:003	01	03 06 2015

TITLE	:	Quality Plan for LT Motor of ESP & FAN application
PROJECT	:	KOTHAGUDAM TPS STAGE VII, UNIT 12 (1 x800 MW)
SIGNATURE		
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	<input type="checkbox"/>	INFORMATION COPY
	<input type="checkbox"/>	CONTROL COPY
<input checked="" type="checkbox"/> 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.		
ISSUED TO:	CONTROL COPY NO :	

RECORD OF REVISION		
REV. NO	EFFECTIVE DATE	REMARKS
00	30/03/2015	Original Issue
01	03/06/2015	Revised based on DCPL comments vide email dated 26/05/2015.

		BHARAT HEAVY ELECTRICALS LTD BOILER AUXILIARIES PLANT, RANIPET - 632 406.		QUALITY ASSURANCE PLAN FOR LT Motor of ESP application			PROJECT: M/S KOTHAGUDAM TPS (Stage VII, Unit 12, TSGENCO, EPC 1 X 800 MW) (Customer No: R 824)		QP:R824:ELE:003 REV. NO: 01 DATE: 03/06/2015 Page 1 of 10	
Sl. No.	COMPONENT / ASSEMBLY / OPERATION/TESTS	CHARACTE - RISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK	REFERENCE DOCUMENT	ACCEPTANCE STANDARD	FORMAT OF REC	AGENCY	REMARKS
1.	2.	3.	4.	5.	6.	7.	8.	9.	M B	10. 11.

I. RAW MATERIAL /BOUGHTOUT ITEM INSPECTION										
1.1	Enamelled round copper conductor (Dual coated)M M	1. Overall diameter 2. Bare conductor diameter 3. Increase in diameter 4. Peel test (above 1mm dia.) 5. Mandrel winding test 6. Jerk test (upto 1mm dia.) 7. Resistance to abrasion 8. BDV Test 9. Electrical resistance 10. heat shock 11. Elongation	Major	Mechanical	1 sample/lot	IS 13730 1993 Part 13 BHEL Spec & Apprd Datasheet --do--	IEC 60317-0-1 2008 BHEL Spec & Apprd Datasheet --do--	Plant format	P	V
			Major	Mechanical	1 sample/lot	BHEL Spec & Apprd Datasheet --do--		Plant format	P	V
			Major	Mechanical	1 sample/lot	--do--		Plant format	P	V
			Major	Mechanical	1 sample/lot	--do--		Plant format	P	V
			Major	Mechanical	1 sample/lot	--do--		Plant format	P	V
			Major	Mechanical	1 sample/lot	--do--		Plant format	P	V
			Major	Mechanical	1 sample/lot	--do--		Plant format	P	V
			Major	Mechanical	1 sample/lot	--do--		Plant format	P	V
			Major	Electrical	1 sample/lot	--do--		Plant format	P	V
			Major	Electrical	1 sample/lot	--do--		Plant format	P	V
			Major	Electrical	1 sample/lot	--do--		Plant format	P	V
			Major	Mechanical	1 sample/lot	--do--		Plant format	P	V



 Chief Engineer
 Thermal Projects Construction
 TSGENCO, Vidyut Sevidha,
 Khairatabad, Hyderabad-82

Sl. No.	COMPONENT / ASSEMBLY / OPERATION/TESTS	CHARACTE - RISTICS	CLASS	QUALITY ASSURANCE PLAN FOR			REFERENCE DOCUMENT	ACCEPTANCE STANDARD	FORMAT OF REC	AGENCY		REMARKS
				LT Motor of ESP application	M/S KOTHAGUDAM TMS (Stage VII, Unit 12, TSGENCO, EPC 1 X 800 MW) (Customer No: R 824)	M				B		
1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.		
1.2	INSULATION MATERIAL:	1.Thickness & width 2.Tensile strength 3. BDV at elevated temp.in air. 4.Tear resistance 5.conformation of glass fabric 6.Compatibility with impregnation varnish 7.Thermal ageing 8.IR 9.Elongation	Major	Mechanical	1 sample/lot	BHEL Spec & Apprd Datasheet --do--	BHEL Spec & Apprd Datasheet --do--	Plant format	P	V		
1.3	Impregnation varnish	1.BDV test 2.Density 3.Viscosity 4.Non volatile matter 5.Drying time 6.Resoftening 7. Compatibility with thinner% min.	Major	Thermal	1 sample/lot	--do--	--do--	Plant format	P	V		
			Major	Electrical	1 sample/lot	--do--	--do--	Insp.report / Supplier Tc	P	V		
			Major	Electrical	1 sample/lot	--do--	--do--	Insp.report / Supplier Tc	P	V		
			Major	Mechanical	1 sample/lot	--do--	--do--	Plant format	P	V		
			Major	Electrical	1 sample/lot	--do--	--do--	Plant format	P	V		
			Major	Physical	1 sample/lot	--do--	--do--	Plant format	P	V		
			Major	Physical	1 sample/lot	--do--	--do--	Plant format	P	V		
			Major	Chemical	1 sample/lot	--do--	--do--	Plant format	P	V		
			Major	Thermal	1 sample/lot	--do--	--do--	Plant format	P	V		
			Major	Electrical	1 sample/lot	--do--	--do--	Plant format	P	V		
			Major	Physical	1 sample/lot	--do--	--do--	Plant format	P	V		
			Major	Chemical	1 sample/lot	--do--	--do--	Plant format	P	V		
			Major	Thermal	1 sample/lot	--do--	--do--	Plant format	P	V		
			Major	Thermal	1 sample/lot	--do--	--do--	Plant format	P	V		
			Major	Physical	1 sample/lot	--do--	--do--	Plant format	P	V		


Chaitanya
 Chief Engineer (E/C)
 Thermal Projects Construction
 TSGENCO, Vidyut Soudha,
 Khairatabad, Hyderabad-82

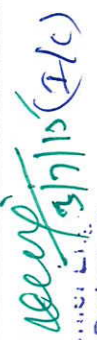
Sl. No.	COMPONENT / ASSEMBLY / OPERATION/TESTS	CHARACTERISTICS	CLASS	QUALITY ASSURANCE PLAN FOR				PROJECT: M/S KOTHAGUDAM TPS (Stage VII, Unit 12, TSGENCO, EPC 1 X 800 MW) (Customer No: R 824)	AGENCY	REMARKS
				LT Motor of ESP application	REFERENCE DOCUMENT	ACCEPTANCE STANDARD	FORMAT OF REC			
1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.
1.4	Motor Shaft Material	8.Reaction of varnish with copper 9.Stability of varnish in an open vessel 10.Self life 1.Chemical composition 2.Yield strength 3.Tensile strength 4.Elongation 5.Hardness 6.Dimensions 7.Grain size inclusion rating 8.Heat treatment cycle 9.Ultrasonic test 10.Heat treatment cycle	Major	Chemical	1 sample/lot	--do--	--do--	Plant format	P	V
			Major	Chemical	1 sample/lot	--do--	--do--	Plant format	P	V
			Major	Visual	1 sample/lot	--do--	--do--	Plant format	P	V
			Major	Chemical	1 sample/lot	--do--	--do--	Supplier TC	P	V
			Major	Mechanical	1 sample/lot	BHEL Spec & Apprd Datasheet	BHEL Spec & Apprd Datasheet	Supplier TC	P	V
			Major	Mechanical	1 sample/lot	--do--	--do--	Supplier TC	P	V
			Major	Mechanical	1 sample/lot	--do--	--do--	Supplier TC	P	V
			Major	Mechanical	1 sample/lot	--do--	--do--	Supplier TC	P	V
			Major	Mechanical	1 sample/lot	--do--	--do--	Supplier TC	P	V
			Major	Mechanical	1 sample/lot	--do--	--do--	Supplier TC	P	V
			Major	Thermal	100%	--do--	--do--	Supplier TC	P	V
			Major	NDT	100%	--do--	--do--	Supplier TC	P	V
			Major	Thermal	100%	--do--	--do--	Supplier TC	P	V
			Major	Electrical	1 sample/lot	--do--	--do--	Supplier TC	P	V
			Major	Electrical	1 sample/lot	--do--	--do--	Supplier TC	P	V
			Major	Electrical	1 sample/lot	--do--	--do--	Supplier TC	P	V
			Major	Mechanical	1 sample/lot	--do--	--do--	Supplier TC	P	V
			Major	Mechanical	1 sample/lot	--do--	--do--	Supplier TC	P	V
15	Stamping Steel	1.Specific core loss 2.Magnetisation 3.Insulation resistance 4.Stacking factor 5.Ductility	Major	Electrical	1 sample/lot	--do--	--do--	Supplier TC	P	V

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 BHARAT HEAVY ELECTRICALS LTD BOILER AUXILIARIES PLANT, RANIPET - 632 406.		QUALITY ASSURANCE PLAN FOR LT Motor of ESP application				PROJECT: M/S KOTHAGUDAM TMS (Stage VII, Unit 12, TSGENCO, EPC 1 X 800 MW) (Customer No: R 824)		QP:R824:ELE:003 REV. NO: 01 DATE: 03/06/2015 Page 4 of 10			
Sl. No.	COMPONENT / ASSEMBLY / OPERATION/TESTS	CHARACTERISTICS	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.	
1.6	Aluminum Ingots	1.Chemical Composition	Major	Chemical	1 sample/lot	BHEL Spec & Apprd Datasheet	BHEL Spec & Apprd Datasheet	Supplier TC	P	V	
1.7	Castings: Body & End shields	1.Grade of casting 2.Surface defects	Major	Visual	100%	--do--	--do--	Inspection record	P	V	
1.8	FAN(Cast Iron) (If Applicable)	1.Dimensions 2.Protective paint	Major	Visual	100%	--do--	--do--	Inspection record	P	V	
1.9	Terminal Box & Covers	1.Dimensions	Major	Mechanical	1 sample/lot	--do--	--do--	Inspection record	P	V	
2.0	Bearings(SKF or FAG)	1.Type & Make 2.Dimensions-ID,OD & width	Major	Visual	100%	--do--	--do--	Inspection record	P	V	


Neelganga
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 BHARAT HEAVY ELECTRICALS LTD BOILER AUXILIARIES PLANT, RANIPET - 632 406.		QUALITY ASSURANCE PLAN FOR LT Motor of ESP application			PROJECT: M/S KOTHAGUDAM TPS (Stage VII, Unit 12, TSGENCO, EPC 1 X 800 MW) (Customer No: R 824)		QP:R824:ELE:003 REV. NO: 01 DATE: 03/06/2015 Page 5 of 10				
Sl. No.	COMPONENT / ASSEMBLY / OPERATION/TESTS	CHARACTE - RISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK	REFERENCE DOCUMENT	ACCEPTANCE STANDARD	FORMAT OF REC	AGENCY	REMARKS	
1.	2.	3.	4.	5.	6.	7.	8.	9.	M	B	
2.1	Earthing bolts & Nuts with washer Paints	Dimensions 1. Viscosity at 32C 2. Drying time 3. Dry film property	Major	Measurement Mechanical Visual Visual	100% 1 sample/lot 1 sample/lot 1 sample/lot	--do-- BHEL Spec & Apprd Datasheet --do--	--do-- BHEL Spec & Apprd Datasheet --do--	Inspection report Insp. recoed Supplier TC Supplier TC	P P P P	V V V V	
2.2	Gasket	1. Dimensions 2. Neoprene test 3. Hardness	Major	Meas. Phy. Mech.	As per IS / Plant std. As per IS / Plant std. As per IS / Plant std.	--do-- --do-- --do--	--do-- --do-- --do--	Insp. report / Supplier Tc Insp. Report / Supplier Tc Insp. report / Supplier Tc	P P P	V V V	
2.4	Terminal Block	4. Ageing test 5. Tensile 6. Elongation	Major	Phy. Meas. Meas.	As per IS / Plant std. As per IS / Plant std. As per IS / Plant std.	--do-- --do-- --do--	--do-- --do-- --do--	Insp. Report / Supplier Tc Insp. Report / Supplier Tc Insp. Report / Supplier Tc	P P P	V V V	
II	INPROCESS INSPECTION:	1. Dimensions 2. Proof voltage test	Major	Elect.	Plant std.	--do--	--do--	Insp. Report / Supplier Tc Insp. Report /	P P	V V	
2.5	Machined Cast iron body	1. Blow holes/cracks 2. Surface finish 3. Bore ID and other Dimensions	Major	Visual Visual Mechanical	100% 100% 100%	BHEL Spec & Apprd Datasheet --do-- --do--	BHEL Spec & Apprd Datasheet --do-- --do--	Insp. Record Insp. Record Insp. Record	P P P	V V V	
									10.		11.



 3/7/15 (Hc)

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 BHARAT HEAVY ELECTRICALS LTD BOILER AUXILIARIES PLANT, RANIPET - 632 406.		QUALITY ASSURANCE PLAN FOR LT Motor of ESP application			PROJECT: M/S KOTHAGUDAM TPS (Stage VII, Unit 12, TSGENCO, EPC 1 X 800 MW) (Customer No: R 824)		QP:R824:ELE:003 REV. NO: 01 DATE: 03/06/2015 Page 6 of 10			
Sl. No.	COMPONENT / ASSEMBLY / OPERATION/TESTS	CHARACTE - RISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK	REFERENCE DOCUMENT	ACCEPTANCE STANDARD	FORMAT OF REC	AGENCY	REMARKS
1.	2.	3.	4.	5.	6.	7.	8.	9.	M	B
									10.	11.
2.6	Machined End shields	1.Blow holes/cracks	Major	Visual	100%	--do--	--do--	Insp. Record	P	V
		2.Dimensions	Major	Mechanical	100%	--do--	--do--	Insp. Record	P	V
2.7	Balancing(Rotor & Fan)	1.Permissible unbalance	Major	Visual	1 sample	--do--	--do--	Insp. Report	P	V
		1.Core length dia	Major	Mechanical	100%	--do--	--do--	Insp. Record	P	V
		2. Core locking	Major	Visual	100%	--do--	--do--	Insp. Record	P	V
		3. Rigidity of core.	Major	Mechanical	100%	--do--	--do--	Insp. Record	P	V
2.9	Die cast Rotor	1.Core length	Major	Mechanical	100%	--do--	--do--	Insp. Record	P	V
		2.Blow holes	Major	Visual	100%	--do--	--do--	Insp. Record	P	V
3.0	Impregnation	1.Dip & bake cycles as per OA requirement	Major	Process parameter	100%	--do--	--do--	Insp. Record	P	V
3.1	Rotor machining	1.Rotor OD	Major	Mechanical	100%	--do--	--do--	Insp. Record	P	V
		2.Balancing	Major	Mechanical	100%	--do--	--do--	Insp. Record	P	V
3.2	Space Heater(if applicable)	1.Insulation resistance	Major	Electrical	100%	--do--	--do--	Insp. Record	P	V
		2.H.V.Test	Major	Electrical	100%	--do--	--do--	Insp. Record	P	V
		3.Resistance	Major	Electrical	100%	--do--	--do--	Insp. Record	P	V
		4.Wattage test	Major	Electrical	100%	--do--	--do--	Insp. Record	P	V
3.3	Final Assembly	1.Completeness	Major	Visual	100%	--do--	--do--	Insp. Record	P	V
		2.Runout in case of flanged motors	Major	Mechanical	100%	--do--	--do--	Insp. Record	P	V
		3.Mounting dimension	Major	Mechanical	100%	--do--	--do--	Insp. Record	P	V



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Sl. No.	Component / Assembly / Operation/Tests	Characteristics	Class	Quality Assurance Plan			Project:		Agency	Remarks
				Type of Check	Quantum of Check	Reference Document	Acceptance Standard	Format of Rec		
1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.
<p>BHARAT HEAVY ELECTRICALS LTD BOILER AUXILIARIES PLANT, RANIPET - 632 406.</p> <p>PROJECT: M/S KOTHAGUDAM TPS (Stage VII, Unit 12, TSGENCO, EPC 1 X 800 MW) (Customer No: R.824)</p> <p>QUALITY ASSURANCE PLAN FOR LT Motor of ESP application</p> <p>AGENCY M B</p> <p>REMARKS</p>										
3.4	III	4.1	Major	Electrical	100%	BHEL Spec & Apprd Datasheet	BHEL Spec & Apprd Datasheet	Insp. Record	P	W
<p>FINAL INSPECTION AND TESTING:</p> <p>Routine Test</p> <ol style="list-style-type: none"> 1. Resistance Measurement on winding & space heater 2. Insulation Resistance before/after H.V. Test on winding & space heater 3. H.V. Test on winding & space heater 4. Phase sequence & direction of rotation 5. No load run test 6. Reduced voltage running test 7. Locked rotor test 7.1 Two successive Starts from cold Condition 7.2 Three equally spread starts pre hour. 7.3 Two hot restart from hot condition. 										
			Major	Electrical	100%	--do--	--do--	Insp. Record	P	W
			Major	Electrical	100%	--do--	--do--	Insp. Record	P	W
			Major	Electrical	100%	--do--	--do--	Insp. Record	P	W
			Major	Electrical	100%	--do--	--do--	Insp. Record	P	W
			Major	Electrical	100%	--do--	--do--	Insp. Record	P	W
			Major	Electrical	100%	--do--	--do--	Insp. Record	P	W
			Major	Electrical	100%	--do--	--do--	Insp. Record	P	W
			Major	Electrical	100%	BHEL Spec & Apprd Datasheet	BHEL Spec & Apprd Datasheet	Test report	P	W
			Major	Electrical	100%	--do--	--do--	Test report	P	W


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Sl. No.	COMPONENT / ASSEMBLY / OPERATION/TESTS	CHARACTERISTICS	CLASS	QUALITY ASSURANCE PLAN FOR LT Motor of ESP application			PROJECT: M/S KOTHAGUDAM TPS (Stage VII, Unit 12, TSGENCO, EPC 1 X 800 MW) (Customer No: R 824)	AGENCY	REMARKS			
				TYPE OF CHECK	QUANTUM OF CHECK	REFERENCE DOCUMENT				ACCEPTANCE STANDARD	FORMAT OF REC	
1.	2.	3.	4.	5.	6.	7.	8.	9.	10.			
4.2	Type Test	8. Vibration test 9. Name plate verification 10. Paint shade, thickness & adhesion 11. Mountings & Overall dimensions 1. Measuring of resistance of winding of stator and wound rotor (if applicable) 2. No load test at rated voltage to determine input current, power and speed. 3. Open circuit voltage ratio of wound rotor motor (in case slip ring motors) 4. Locked rotor reading of voltage, current and power input at a suitable Reduced voltage	Major	Mechanical	100%	--do--	--do--	Insp. Record	P	W		
			Major	Visual	100%	--do--	--do--	Insp. Record	P	W		
			Major	Vis/Meas	100%	--do--	Apprd Drawing	Insp. Record	P	W		
			Major	Vis/Meas.	100%	--do--		Insp. Record	P	W		
			Major	Electrical	1 motor in a batch	--do--		Insp. Record	P	V		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 old from date of purchase enquiry. Otherwise vendor has to conduct these test in presence of BHEL/TPI.
			Major	Electrical	1 motor in a batch	--do--		Insp. Record	P	V		
			Major	Electrical	1 motor in a batch	--do--	BHEL Spec & Apprd Datasheet	TC	P	V		
			Major	Electrical	1 motor in a batch	--do--	BHEL Spec & Apprd Datasheet	TC	P	V		


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 BHARAT HEAVY ELECTRICALS LTD BOILER AUXILIARIES PLANT, RANIPET - 632 406.		QUALITY ASSURANCE PLAN FOR LT Motor of ESP application			PROJECT: M/S KOTHAGUDAM TPS (Stage VII, Unit 12, TSGENCO, EPC 1 X 800 MW) (Customer No: R 824)		QP-R824:ELE:003 REV. NO: 01 DATE: 03/06/2015 Page 9 of 10				
Sl. No.	COMPONENT / ASSEMBLY / OPERATION/TESTS	CHARACTE - RISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK	REFERENCE DOCUMENT	ACCEPTANCE STANDARD	AGENCY		REMARKS	
								M	B		
1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	
		5. Full load test to determine efficiency power factor and slip	Major	Electrical	1 motor in a batch	--do--	--do--	TC	P	V	To determine Efficiency, power factor & slip
		6. Temperature rise test.	Major	Electrical	1 motor in a batch	--do--	--do--	TC	P	V	
		7. Momentary overload test	Major	Electrical	1 motor in a batch	--do--	--do--	TC	P	V	
		8. Insulation resistance test	Major	Electrical	1 motor in a batch	do--	--do--	TC	P	V	
		9. High voltage test	Major	Mechanical	1 motor in a batch	--do--	--do--	TC	P	V	
		10. Test for vibration severity of motor	Major	Mechanical	1 motor in a batch	--do--	--do--	TC	P	V	
		11. Test of noise levels of motor	Major	Visual	1 motor in a batch	--do--	--do--	TC	P	V	
		12. Over speed test	Major	Mechanical	1 motor in each frame size	BHEL Spec & Apprd Datasheet	BHEL Spec & Apprd Datasheet	TC	P	V	
		13. Degree of Protection Tests	Major	Visual	100%	--do--	--do--	TC	P	V	


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 BHARAT HEAVY ELECTRICALS LTD BOILER AUXILIARIES PLANT, RANIPET - 632 406.		QUALITY ASSURANCE PLAN FOR LT Motor of ESP application			PROJECT: M/S KOTHAGUDAM TPS (Stage VII, Unit 12, TSGENCO, EPC 1 X 800 MW) (Customer No: R 824)		QP:R824:ELE:003 REV. NO: 01 DATE: 03/06/2015 Page 10 of 10			
Sl. No.	COMPONENT / ASSEMBLY / OPERATION/TESTS	CHARACTE - RISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK	REFERENCE DOCUMENT	ACCEPTANCE STANDARD	FORMAT OF REC	AGENCY	REMARKS
1.	2.	3.	4.	5.	6.	7.	8.	9.	M	B
4.3	Preservation and Packing	1.Completness 2.Mounting & over all Dimensions 3. Painting(label) 4. Motors located on rubber mats. 5 . Motors covered with polythene sheets. 6. Packing	Major Major Major Major Major Major	Review Visual Visual Visual Visual Visual	100% 100% 100% 100% 100% 100%	--do-- --do-- --do-- -do-- -do--	--do-- --do-- --do-- -do-- -do--	Insp. Record Insp. Record Insp. Record Insp. Record Insp. Record --do--	P P P P P P	V V V V V V


Note :

- 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.
- 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.
- 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 purchase order. Otherwise vendor has to conduct these test in presence of BHEL/TPI.
- 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


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