




944528/2022/BAR-QA-MECH

SL. NO		COMPONENT & OPERATIONS	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK	REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD	AGENCY	REMARKS		
1.		2.	3.	4.	5.	6.	7.	8.	9.	D*	** 10.	11.	
1.0 RAW MATERIALS													
1.1	Volute Casing, Casing Cover	Chemical & Mechanical Properties	Major	Chemical & Mechanical Properties, Hardness check	1 Sample / Heat	NTPC Approved GA Drawing / Data Sheet/ Specification	MTC	√	P	V	V		
1.2	Impeller, Wear Plate.	Chemical & Mechanical Properties	Major	Chemical & Mechanical Properties, Hardness check	1 Sample / Heat	Drawing & Specification	MTC	√	P	V	V		
1.3	Volute Casing	Surface Defects	Major	DPT on machined surface	100%	ISO4987	ISO 4987, Level 2	DPT Report	√	P	V	V	
1.4	Cover Plate & Frame Plate	Soundness	Major	RT *	100 %	ASME Sec V, ASTM - E446 Level - 5	Test Report	√	P	V	V	*For Gypsum Bleed Pumps	
1.5	Shaft	Chemical Composition	Major	Chemical composition	1 Sample /Heat	Drawing/Specification	Test Report	√	P	V	V		
		Mechanical Properties		Mechanical Tests, Heat treatment if applicable		Drawing/Specification	Test Report	√	P	V	V	HT Chart Review.	
Manufacturer Sign & Seal		Legend: * Record, identified with "tick" (√) under column 'D' shall be submitted to customer as a QA documentation package. M: Manufacturer / Sub supplier, C: Main Contractor/BHEL/BHEL AIA. N: NTPC P: Perform: witness, V: review of records, MA: Major and MI: Minor, DPT: Dye Penetrant Test, UT: Ultrasonic Testing TC: Test Certificate, IR: inspection report, MTC: Material Test Certificate. COC: Certificate of conformance.					 Rakesh Kr Madhu (Dy Mgr / QA)		 K Renjith (Mgr / QA)		 R Arunachalam (DGM/QA)		
							Prepared by		Reviewed by		Approved by		

MANUFACTURER'S NAME AND ADDRESS

Ranipet Customer Approved Source

MANUFACTURING QUALITY PLAN

ITEM: SLURRY PUMP

PROJECT: AS PER PO

SYSTEM: FGD APPLICATION

BHEL WO : AS PER INTERNAL W/O

QP NO.

FGS:SLP:723, REV:00

DATE: 08.01.2021

MAIN CONTRACTOR

M/S BHEL, RANIPET




PAGE NO:

Page 1 of 5



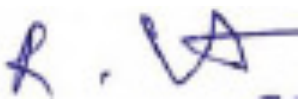
SL. NO	COMPONENT & OPERATIONS	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK	REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD	AGENCY	REMARKS	
1.	2.	3.	4.	5.	6.	7.	8.	9.	D*	** 10.	11.

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1.2	Impeller, Wear Plate.	Chemical & Mechanical Properties	Major	Chemical & Mechanical Properties, Hardness check	1 Sample / Heat	Drawing & Specification	MTC	√	P	V	V		
1.3	Volute Casing	Surface Defects	Major	DPT on machined surface	100%	ISO4987	ISO 4987, Level 2	DPT Report	√	P	V	V	
1.4	Cover Plate & Frame Plate	Soundness	Major	RT *	100 %	ASME Sec V, ASTM - E446 Level - 5	Test Report	√	P	V	V	*For Gypsum Bleed Pumps	
1.5	Shaft	Chemical Composition	Major	Chemical composition	1 Sample /Heat	Drawing/Specification	Test Report	√	P	V	V		
		Mechanical Properties		Mechanical Tests, Heat treatment if applicable		Drawing/Specification	Test Report	√	P	V	V	HT Chart Review.	



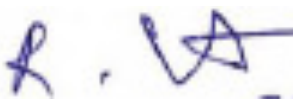
Legend: * Record, identified with "tick" (√) under column 'D' shall be submitted to customer as a QA documentation package. **M:** Manufacturer / Sub supplier, **C:** Main Contractor/BHEL/BHEL AIA. **N:** NTPC **P:** Perform: witness, **V:** review of records, **MA:** Major and **MI:** Minor, **DPT:** Dye Penetrant Test, **UT:** Ultrasonic Testing **TC:** Test Certificate, **IR:** inspection report, **MTC:** Material Test Certificate. **COC:** Certificate of conformance.

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

944528/2022/BAR-QA-MECH

SL. NO		COMPONENT & OPERATIONS		CHARACTERISTICS		CLASS		TYPE OF CHECK		QUANTUM OF CHECK		REFERENCE DOCUMENT		ACCEPTANCE NORMS		FORMAT OF RECORD		AGENCY		REMARKS							
1.		2.		3.		4.		5.		6.		7.		8.		9.		D*		** 10.		11.					
				Hardness Test				Mechanical Hardness		100%		Drawing/Specification		Test Report		√		P		V		V					
				Internal Soundness				UT		100%		ASTM A 388		ASTM A 788		UT Report		√		P		V		V			
				Surface & Sub Surface Defects				MT-on m/c Surface		100%		ASTM E709		ASTM A 788		MT Report		√		P		V		V		MT- Magnetic Particle Test	
1.6		Impeller		Surface & Sub Surface Defects		Major		DPT		Accessible Areas		ISO4987		ISO 4987, Level 2		DPT Report		√		P		V		V			
2.0 IN PROCESS INSPECTION																											
2.1		Impeller/Volute Casing/ Wear Plate / Casing Cover/ Shaft After Machining		Surface Condition/ Defects/ Measurement		Major		Visual and Measurement		100%		Drawing		IR (Protocol)		P		-		-							
2.2		Couplings		Verification of TC		Major		Review of TC		100%		Technical Specification / Drawing		COC/TC		√		P		V		-					
2.3		Rotating Parts		Balancing		Major		Static & Dynamic Balancing		100%		ISO 1940		ISO 1940, grade 2.5 or lower		Balancing Report		√		P		V		V			
2.4		Volute Casing		Soundness		Major		Static		100 20%		See		No Leakage		Test		√		P		W		Test			
Manufacturer Sign & Seal				Legend: * Record, identified with "tick" (√) under column 'D' shall be submitted to customer as a QA documentation package. M : Manufacturer / Sub supplier, C : Main Contractor/BHEL/BHEL AIA. N : NTPC P : Perform: witness, V : review of records, MA : Major and MI : Minor, DPT : Dye Penetrant Test, UT : Ultrasonic Testing TC : Test Certificate, IR : inspection report, MTC : Material Test Certificate. COC : Certificate of conformance.																							
				Rakesh Kr Madhu (Dy Mgr / QA)				K Renjith (Mgr / QA)																R Arunachalam (DGM/QA)			
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1.		2.		3.		4.		5.		6.		7.		8.		9.		D*		** 10.		11.	
								Pressure Testing of Casing		%/10 % of each type		Remarks Column				Report				W		Pressure at 2x rated head or 1.5x shut of head whichever is higher for 30min.	
3.0 FINAL INSPECTION																							
3.1		Complete Pump Assembly		Completeness		Major		Visual & Dimensional		100 %		*		Approved GA Drawing		IR		√		P W W			
				Measurement- Flow vs Head(Complete operating range), Power, Efficiency		Major		Performance testing of pump		100 %		*		Approved Drawing /Data Sheet		Performance Test Report		√		P W W		*BHEL to witness 20% of each type of Pump and NTPC-one Pump per type.	
				Vibration Velocity RMS [MM/S] Bearing Temperature Noise Level RMS[MM/S]				Measurement		100 %		*		Approved Drawing. Approved Data Sheet		Performance Test Report		√		P W W			
				NPSH Test		Major		Measurement		1 Pump / each type				Design Standard of Pump		NPSH Test		√		P W W			
Manufacturer Sign & Seal				Legend: * Record, identified with "tick" (√) under column 'D' shall be submitted to customer as a QA documentation package. M : Manufacturer / Sub supplier, C : Main Contractor/BHEL/BHEL AIA. N : NTPC P : Perform: witness, V : review of records, MA : Major and MI : Minor, DPT : Dye Penetrant Test, UT : Ultrasonic Testing TC : Test Certificate, IR : inspection report, MTC : Material Test Certificate. COC : Certificate of conformance.								 Rakesh Kr Madhu (Dy Mgr / QA)				 K Renjith (Mgr / QA)				 R. Arunachalam (DGM/QA)			
												Prepared by				Reviewed by				Approved by			

Ranipet

ADDRESS

Customer Approved Source

MANUFACTURING QUALITY PLAN

ITEM: SLURRY PUMP

PROJECT: AS PER PO

SYSTEM: FGD APPLICATION

BHEL WO : AS PER INTERNAL W/O

QP NO.

FGS:SLP:723, REV:00

DATE: 08.01.2021

MAIN CONTRACTOR

M/S BHEL, RANIPET



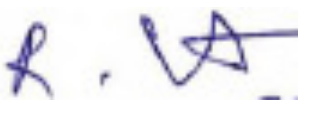
PAGE NO:

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9/4/2022/BAR-QA-MECH

SL. NO		COMPONENT & OPERATIONS	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK	REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD	AGENCY			REMARKS	
1.		2.	3.	4.	5.	6.	7.	8.	9.	D*	** 10.			11.
						/ design			Report					
3.2	Complete Pump Assembly	Leak test	Major	Leakage testing	100%	Mfg. Drawing, Approved Data Sheet	No Leakage	Report	√	P	W	W		
3.3		Strip Down Test (Not Required If Performance Test is Fine.)	Major	Visual	100%	Mfg. Drawing, Approved Data Sheet		Report	√	P	W	W	Only Required in case of Abnormal Sound	
3.4	Painting	Dry Film Thickness/Paint shade	Major	Visual & Measurement	100%	NTPC Approved Painting Schedule		IR(Protocol)	√	P	V	V		
3.5	Packing	Preservation	Major	Visual & Measurement	100%	Technical Spec/ BHEL approved Packing Procedure/Drawing		COC	√	P	V	-		
4.0 DOCUMENTATION														
4.1	Check of Quality Assurance Documentation	Compliance to MQP	Major	Check of Compliments	100%	Manufacturing Quality Plan		Protocol	√	V	V	V		

NOTE: 1. (\$) – 10 % of each type for NTPC (Customer).

Manufacturer Sign & Seal	Legend: * Record, identified with "tick" (√) under column 'D' shall be submitted to customer as a QA documentation package. M: Manufacturer / Sub supplier, C: Main Contractor/BHEL/BHEL AIA. N: NTPC P: Perform: witness, V: review of records, MA: Major and MI: Minor, DPT: Dye Penetrant Test, UT: Ultrasonic Testing TC: Test Certificate, IR: inspection report, MTC: Material Test Certificate. COC: Certificate of conformance.			
		Rakesh Kr Madhu (Dy Mgr / QA)	K Renjith (Mgr / QA)	R Arunachalam (DGM/QA)
		Prepared by	Reviewed by	Approved by

944528/2022/BAR-QA-MECH




MANUFACTURER'S NAME AND ADDRESS		MANUFACTURING QUALITY PLAN											
 Ranipet Customer Approved Source		ITEM: SLURRY PUMP					PROJECT: AS PER PO						
		SYSTEM: FGD APPLICATION					BHEL WO : AS PER INTERNAL W/O						
		QP NO.	FGS:SLP:723, REV:00			DATE: 08.01.2021		MAIN CONTRACTOR		M/S BHEL, RANIPET			
SL. NO		COMPONENT & OPERATIONS	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK		REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD		AGENCY	REMARKS
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						M C/N						M C N	

- All other items, which are not cover under this QP, shall be manufactured inspected as per OEM (Original equipment Manufacturer)/BHEL standard practice and relevant standard. Relevant TC/COC will be submitted for the same.
- This QP is applicable for Mandatory Spare supply also.
- Separate MQP to be submitted for Electric Motor.

SI No	Types of Pumps	Quantity	No of Pumps as Per Approved Datasheet / GA Drawing
01.	Limestone slurry feed Pump	06	
02.	Gypsum bleed Pump	06	
03.	Primary hydro cyclone feed tank Pump	02	
04.	Filtrate water tank Pump	02	
05.	Secondary hydrocyclone feed tank	02	
06.	Waste water tank Pump	04	
07.	Auxiliary absorbent tank Pump	02	
08.	Emergency transfer Pump	03	
09.	Absorber area drain sump Pump	06	
10.	Gypsum area drain sump Pump	02	
11.	Limestone area drain sump Pump	02	

Record of revision

Rev no	Date	Description
00	08.01.2021	Original Issue – First submission.

Manufacturer Sign & Seal	Legend: * Record, identified with "tick" (√) under column 'D' shall be submitted to customer as a QA documentation package. M : Manufacturer / Sub supplier, C : Main Contractor/BHEL/BHEL AIA. N : NTPC P : Perform: witness, V : review of records, MA : Major and MI : Minor, DPT : Dye Penetrant Test, UT : Ultrasonic Testing TC : Test Certificate, IR : inspection report, MTC : Material Test Certificate. COC : Certificate of conformance.			
		Rakesh Kr Madhu (Dy Mgr / QA)	K Renjith (Mgr / QA)	R Arunachalam (DGM/QA)
		Prepared by	Reviewed by	Approved by

Annexure Q

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

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:

Details of BOI's/ Sub Systems with respect to Main Items

SI No.	Item/ Sub system Name	Quantity	Supplier Name	Place of Manufacturing
OEM (ORIGINAL EQUIPMENT MANUFACTURER) SEAL AND SIGN.				

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 /Slurry Pumps: 001 Rev NO.: 00 PAGE : Page 1 of 2 DATE: 16.07.2022		##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	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. Alternatively. if LT Motor Manufacturer has TSGENCO already approved MQP, it can be submitted for TSGENCO formal approval in the event of an order. If TSGENCO approved QP is not available, fresh QP to be submitted for approval				
02	BHEL / Ultimate Customer – TSGENCO approved vendors	LT Motors are to be procured only from Ultimate Customer - TSGENCO approved vendors and no deviation on this specific requirement is acceptable. If Ultimate customer is not agreeing for any of LT Motor make, then it is the responsibility of OEM vendor to get approval from BHEL/Ultimate customer during execution of the contract.				
03	Inspection Methodology to be adopted at Actual LT Motor Manufacture works by OEM vendor	<u>LT Motors (Up to 200KW) – Inspection Categorization: II</u>				
		All Routine Tests & Type tests including Degree of Protection Test Reports shall be ensured by OEM/LT Motor Manufacture as per Ultimate Customer TSGENCO approved 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.				
04	Painting Requirements	Painting requirement like paint shade and painting thickness including no of coats if any are to be ensured by the OEM vendor and LT Motor manufacture for these LT Motors as per BHEL/ Ultimate Customer - TSGENCO approved data sheet / drg / spec (As applicable).				

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 /Slurry Pumps: 001 Rev NO.: 00 PAGE : Page 2 of 2 DATE: 16.07.2022		##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

05	Packing	Packing shall be as per Specification / Drg. / Data sheet including sea worthy packing if any to avoid any transit & handling damages .	
06	For Inspection call	Inspection call by OEM Vendor for LT Motor inspection at Actual LT Motor Manufacture works to be raised for BHEL/BHEL AIA inspection / Ultimate Customer – TSGENCO including for type test witnessing if any to be ensured / addressed to Mr R Kesavan., DGM (QC-Proc)., Mobile no: +91 9443006303., Email id: kesavan@bhel.in and Mr Zeeshan Ali., Sr. Engineer (QC-Proc)., Mobile no: +91 9443149691 ., Email id: zeeshan@bhel.in including for inspection related activities for immediate response / resolution.	
07	Document Package / Dossier	Specific confirmation for Document Package in the event of an order (3 hard copies + soft copies in Pdf file) is to be given containing the following with proper linkages (.) (i) Index Sheet (ii) Ultimate Customer TSGENC Approved MQP (iii) TCs identified by BHEL/TSGENCO for record for “CHP ” (Customer Hold Point) Verification & Witness “W” portion as given in MQP / RQP / MQP (as applicable). (iv) Final Inspection Report + TC (v) BHEL AIA (BHEL Appointed Inspection Agency) / BHEL report + TC (vi) Ultimate customer TSGENCO CHP (Customer Hold Point) / MDCC (Material Despatch Clearance Certificate) (vii) Type test reports conducted/submitted with approval with approved data sheet and BOM with actual make used with Customer approved drgs.	
08	Important notes	<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 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.

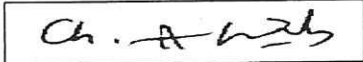
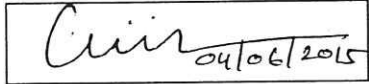
Encl: As above (10 Pages)


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	--do--	--do--	Plant format	P	V
			Major	Mechanical	1 sample/lot	--do--	--do--	Plant format	P	V
			Major	Mechanical	1 sample/lot	--do--	--do--	Plant format	P	V
			Major	Mechanical	1 sample/lot	--do--	--do--	Plant format	P	V
			Major	Mechanical	1 sample/lot	--do--	--do--	Plant format	P	V
			Major	Mechanical	1 sample/lot	--do--	--do--	Plant format	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	Electrical	1 sample/lot	--do--	--do--	Plant format	P	V
			Major	Electrical	1 sample/lot	--do--	--do--	Plant format	P	V
			Major	Mechanical	1 sample/lot	--do--	--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 LT Motor of ESP application				PROJECT: M/S KOTHAGUDAM TPS (Stage VII, Unit 12, TSGENCO, EPC 1 X 800 MW) (Customer No: R 824)		REMARKS
				TYPE OF CHECK	QUANTUM OF CHECK	REFERENCE DOCUMENT	ACCEPTANCE STANDARD	FORMAT OF REC	AGENCY	
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


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


 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	Chemical Visual	1 sample/lot 100%	--do-- --do--	--do-- --do--	Supplier TC Inspection record	P P	V V	
1.8	FAN(Cast Iron) (If Applicable)	1.Dimensions 2.Protective paint	Major	Mechanical Visual	1 sample/lot 100%	--do-- --do--	--do-- --do--	Supplier TC Inspection record	P P	V 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 Mechanical	100% 1 sample/lot	--do-- --do--	--do-- --do--	Inspection record Inspection record	P P	V V	


Handwritten Signature
Chief Engineer (H/O)
Thermal Projects Construction
TSGENCO, Vidyut Saha
Khairatabad, Hyderabad-50


Sl. No.	COMPOONENT / ASSEMBLY / OPERATION/TESTS	CHARACTE - RISTICS	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)		REMARKS	
				TYPE OF CHECK	QUANTUM OF CHECK	REFERENCE DOCUMENT	ACCEPTANCE STANDARD	FORMAT OF REC	AGENCY	M	B
1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	
3.4	FINAL INSPECTION AND TESTING:										
III	Routine Test										
4.1	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%	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%	BHEL Spec & Apprd Datasheet	BHEL Spec & Apprd Datasheet	Test report	P	W			
	Major	Electrical	100%	--do--	--do--	Test report	P	W			



 Chief Engineer (I/C)
 Thermal Projects Construction
 TSGENCO, Vidyut Sujana,
 Khairatabad, Hyderabad-82

Sl. No.	COMPONENT / ASSEMBLY / OPERATION/TESTS	CHARACTERISTICS	CLASS	QUALITY ASSURANCE PLAN FOR			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.		
 BHARAT HEAVY ELECTRICALS LTD BOILER AUXILIARIES PLANT, RANIPET - 632 406.		LT Motor of ESP application		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 8 of 10	M	B			
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	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	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		
			Major	Electrical	1 motor in a batch	--do--		Insp. Record	P	V		
			Major	Electrical	1 motor in a batch	--do--		TC	P	V		
			Major	Electrical	1 motor in a batch	BHEL Spec & Apprd Datasheet	BHEL Spec & Apprd Datasheet	TC	P	V		
						--do--	--do--					


 Chief Engineer (I/c)
 Thermal Projects Construction
 TSGENCO, Vidyut Soudha,
 Kharabadi, Hyderabad-82

 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	CHARACTERISTICS	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--		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--		TC	P	V	
		8. Insulation resistance test	Major	Electrical	1 motor in a batch	do--		TC	P	V	
		9. High voltage test	Major	Mechanical	1 motor in a batch	--do--	--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	


 Internal Projects Construction
 TSGENCO, Vidut Soudha,
 Khairatabad, Hyderabad-02


 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 :

- 1) Vendor shall submit raw material test certificates and internal test report for Enameled copper conductor, INSULATION MATERIALS, Impregnation varnish, Motor Shaft Material, Stamping Steel, Aluminum Ingots, yoke (Casting Body & End shields), Terminal Box & Covers, Bearings (SKF or FAG), Gasket, Terminal Block during inspection to BHEL/BHEL AIA for review and acceptance.
- 2) Vendor shall also submit INPROCESS INSPECTION report for Machined Cast iron body, Machined End shields, Balancing (Rotor & Fan), Hydraulic Pressure Testing, Stator core, Die cast Rotor, Impregnation, Rotor machining, Space Heater (if applicable) and Final Assembly during inspection to BHEL/BHEL AIA for review and acceptance.
- 3) Identical design type test report shall be submitted to BHEL/TPI agency during inspection for review and acceptance.. The validity of type test report shall be 5 years from date of purchase order. Otherwise vendor has to conduct these test in presence of BHEL/TPI.
- 4) Type test clearance from BHEL/TPI to be obtained during Inspection at vendor works




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

M: Manufacturer B=Contractor/BHEL /TPI agency



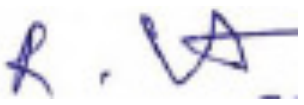

 Chief Engineer
 Thermal Projects Construction
 TSGENCO, Vidyut Soudha,
 Kharasol, Hyderabad-50


 श्री. श्रीनिवास / C. SRINIVASAN
 उप महाप्रबंधक / Dy. General Manager
 गुणवत्ता आश्वासन / Quality Assurance
 बीएचएल, रानीपेट / BHEL, Ranipet-632406

938425/2022/BAR-QA-MECH

SL. NO		COMPONENT & OPERATIONS	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK	REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD	AGENCY	REMARKS		
1.		2.	3.	4.	5.	6.	7.	8.	9.	D*	** 10.	11.	
1.0 RAW MATERIALS													
1.1	Volute Casing, Casing Cover	Chemical & Mechanical Properties	Major	Chemical & Mechanical Properties, Hardness check	1 Sample / Heat	NTPC Approved GA Drawing / Data Sheet/ Specification	MTC	√	P	V	V		
1.2	Impeller, Wear Plate.	Chemical & Mechanical Properties	Major	Chemical & Mechanical Properties, Hardness check	1 Sample / Heat	Drawing & Specification	MTC	√	P	V	V		
1.3	Volute Casing	Surface Defects	Major	DPT on machined surface	100%	ISO4987	ISO 4987, Level 2	DPT Report	√	P	V	V	
1.4	Cover Plate & Frame Plate	Soundness	Major	RT *	100 %	ASME Sec V, ASTM - E446 Level - 5	Test Report	√	P	V	V	*For Gypsum Bleed Pumps	
1.5	Shaft	Chemical Composition	Major	Chemical composition	1 Sample /Heat	Drawing/Specification	Test Report	√	P	V	V		
		Mechanical Properties		Mechanical Tests, Heat treatment if applicable		Drawing/Specification	Test Report	√	P	V	V	HT Chart Review.	
Manufacturer Sign & Seal		Legend: * Record, identified with "tick" (√) under column 'D' shall be submitted to customer as a QA documentation package. M : Manufacturer / Sub supplier, C : Main Contractor/BHEL/BHEL AIA. N : NTPC P : Perform: witness, V : review of records, MA : Major and MI : Minor, DPT : Dye Penetrant Test, UT : Ultrasonic Testing TC : Test Certificate, IR : inspection report, MTC : Material Test Certificate. COC : Certificate of conformance.					 Rakesh Kr Madhu (Dy Mgr / QA)		 K Renjith (Mgr / QA)		 R Arunachalam (DGM/QA)		
							Prepared by		Reviewed by		Approved by		

938425/2022/BAR-QA-MECH

SL. NO		COMPONENT & OPERATIONS	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK		REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD		AGENCY	REMARKS		
1.		2.	3.	4.	5.	M	C/N	7.	8.	9.	D*	** 10.	11.		
			Hardness Test		Mechanical Hardness	100%		Drawing/Specification		Test Report	√	P	V	V	
			Internal Soundness		UT	100%		ASTM A 388	ASTM A 788	UT Report	√	P	V	V	
			Surface & Sub Surface Defects		MT-on m/c Surface	100%		ASTM E709	ASTM A 788	MT Report	√	P	V	V	MT-Magnetic Particle Test
1.6	Impeller	Surface & Sub Surface Defects	Major	DPT	Accessible Areas			ISO4987	ISO 4987, Level 2	DPT Report	√	P	V	V	
2.0 IN PROCESS INSPECTION															
2.1	Impeller/Volute Casing/ Wear Plate / Casing Cover/ Shaft After Machining	Surface Condition/ Defects/ Measurement	Major	Visual and Measurement		100%		Drawing		IR (Protocol)		P	-	-	
2.2	Couplings	Verification of TC	Major	Review of TC		100%		Technical Specification / Drawing		COC/TC	√	P	V	-	
2.3	Rotating Parts	Balancing	Major	Static & Dynamic Balancing		100%		ISO 1940	ISO 1940, grade 2.5 or lower	Balancing Report	√	P	V	V	
2.4	Volute Casing	Soundness	Major	Static		100	20%	See	No Leakage	Test	√	P	W		Test
Manufacturer Sign & Seal		Legend: * Record, identified with "tick" (√) under column 'D' shall be submitted to customer as a QA documentation package. M : Manufacturer / Sub supplier, C : Main Contractor/BHEL/BHEL AIA. N : NTPC P : Perform: witness, V : review of records, MA : Major and MI : Minor, DPT : Dye Penetrant Test, UT : Ultrasonic Testing TC : Test Certificate, IR : inspection report, MTC : Material Test Certificate. COC : Certificate of conformance.													
								Rakesh Kr Madhu (Dy Mgr / QA)		K Renjith (Mgr / QA)		R Arunachalam (DGM/QA)			
								Prepared by		Reviewed by		Approved by			



Ranipet

MANUFACTURER'S NAME AND ADDRESS

Customer Approved Source

MANUFACTURING QUALITY PLAN

ITEM: SLURRY PUMP

PROJECT: AS PER PO

SYSTEM: FGD APPLICATION

BHEL WO : AS PER INTERNAL W/O

QP NO.

FGS:SLP:723, REV:00

DATE: 08.01.2021



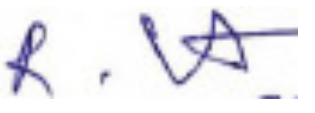
MAIN CONTRACTOR

M/S BHEL, RANIPET

PAGE NO:

Page 2 of 5

938425/2022/BAR-QA-MECH

SL. NO		COMPONENT & OPERATIONS	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK		REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD		AGENCY	REMARKS	
1.		2.	3.	4.	5.	M	C/N	7.	8.	9.	D*	M C N	11.	
					Pressure Testing of Casing	%	/10 % of each type	Remarks Column		Report			W	Pressure at 2x rated head or 1.5x shut of head whichever is higher for 30min.
3.0		FINAL INSPECTION												
3.1	Complete Pump Assembly	Completeness	Major	Visual & Dimensional	100 %	*		Approved GA Drawing	IR	√	P	W	W	
		Measurement- Flow vs Head(Complete operating range), Power, Efficiency	Major	Performance testing of pump	100 %	*		Approved Drawing /Data Sheet	Performance Test Report	√	P	W	W	*BHEL to witness 20% of each type of Pump and NTPC-one Pump per type.
		Vibration Velocity RMS [MM/S] Bearing Temperature Noise Level RMS[MM/S]		Measurement	100 %	*		Approved Drawing. Approved Data Sheet	Performance Test Report	√	P	W	W	
		NPSH Test	Major	Measurement	1 Pump / each type			Design Standard of Pump	NPSH Test	√	P	W	W	
Manufacturer Sign & Seal		Legend: * Record, identified with "tick" (√) under column 'D' shall be submitted to customer as a QA documentation package. M : Manufacturer / Sub supplier, C : Main Contractor/BHEL/BHEL AIA. N : NTPC P : Perform: witness, V : review of records, MA : Major and MI : Minor, DPT : Dye Penetrant Test, UT : Ultrasonic Testing TC : Test Certificate, IR : inspection report, MTC : Material Test Certificate. COC : Certificate of conformance.												
								Rakesh Kr Madhu (Dy Mgr / QA)		K Renjith (Mgr / QA)		R Arunachalam (DGM/QA)		
								Prepared by		Reviewed by		Approved by		

MANUFACTURING QUALITY PLAN

ITEM: SLURRY PUMP

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M/S BHEL, RANIPET

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Page 3 of 5



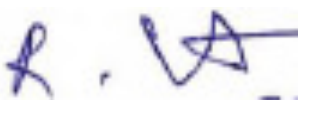
Ranipet

Customer Approved Source


938425/2022/BAR-QA-MECH

SL. NO		COMPONENT & OPERATIONS	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK	REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD	AGENCY			REMARKS	
1.		2.	3.	4.	5.	6.	7.	8.	9.	D*	** 10.			11.
						/ design			Report					
3.2	Complete Pump Assembly	Leak test	Major	Leakage testing	100%	Mfg. Drawing, Approved Data Sheet	No Leakage	Report	√	P	W	W		
3.3		Strip Down Test (Not Required If Performance Test is Fine.)	Major	Visual	100%	Mfg. Drawing, Approved Data Sheet	Report	√	P	W	W	Only Required in case of Abnormal Sound		
3.4	Painting	Dry Film Thickness/Paint shade	Major	Visual & Measurement	100%	NTPC Approved Painting Schedule	IR(Protocol)	√	P	V	V			
3.5	Packing	Preservation	Major	Visual & Measurement	100%	Technical Spec/ BHEL approved Packing Procedure/Drawing	COC	√	P	V	-			
4.0 DOCUMENTATION														
4.1	Check of Quality Assurance Documentation	Compliance to MQP	Major	Check of Compliments	100%	Manufacturing Quality Plan	Protocol	√	V	V	V			

NOTE: 1. (\$) – 10 % of each type for NTPC (Customer).

Manufacturer Sign & Seal	Legend: * Record, identified with "tick" (√) under column 'D' shall be submitted to customer as a QA documentation package. M: Manufacturer / Sub supplier, C: Main Contractor/BHEL/BHEL AIA. N: NTPC P: Perform: witness, V: review of records, MA: Major and MI: Minor, DPT: Dye Penetrant Test, UT: Ultrasonic Testing TC: Test Certificate, IR: inspection report, MTC: Material Test Certificate. COC: Certificate of conformance.			
		Rakesh Kr Madhu (Dy Mgr / QA)	K Renjith (Mgr / QA)	R Arunachalam (DGM/QA)
		Prepared by	Reviewed by	Approved by

938425/2022/BAR-QA-MECH



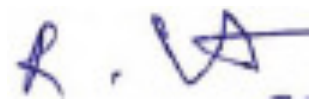
 Ranipet Customer Approved Source		MANUFACTURING QUALITY PLAN												
		ITEM: SLURRY PUMP					PROJECT: AS PER PO							
		SYSTEM: FGD APPLICATION					BHEL WO : AS PER INTERNAL W/O							
		QP NO.		FGS:SLP:723, REV:00			DATE: 08.01.2021		MAIN CONTRACTOR		M/S BHEL, RANIPET			
						PAGE NO:		Page 5 of 5						
SL. NO	COMPONENT & OPERATIONS	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK		REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD		AGENCY			REMARKS
					M	C/N						M	C	
1.	2.	3.	4.	5.	6.		7.	8.	9.	D*	** 10.			11.

- All other items, which are not cover under this QP, shall be manufactured inspected as per OEM (Original equipment Manufacturer)/BHEL standard practice and relevant standard. Relevant TC/COC will be submitted for the same.
- This QP is applicable for Mandatory Spare supply also.
- Separate MQP to be submitted for Electric Motor.

SI No	Types of Pumps	Quantity	No of Pumps as Per Approved Datasheet / GA Drawing
01.	Limestone slurry feed Pump	06	
02.	Gypsum bleed Pump	06	
03.	Primary hydro cyclone feed tank Pump	02	
04.	Filtrate water tank Pump	02	
05.	Secondary hydrocyclone feed tank	02	
06.	Waste water tank Pump	04	
07.	Auxiliary absorbent tank Pump	02	
08.	Emergency transfer Pump	03	
09.	Absorber area drain sump Pump	06	
10.	Gypsum area drain sump Pump	02	
11.	Limestone area drain sump Pump	02	

Record of revision

Rev no	Date	Description
00	08.01.2021	Original Issue – First submission.

Manufacturer Sign & Seal	Legend: * Record, identified with "tick" (√) under column 'D' shall be submitted to customer as a QA documentation package. M : Manufacturer / Sub supplier, C : Main Contractor/BHEL/BHEL AIA. N : NTPC P : Perform: witness, V : review of records, MA : Major and MI : Minor, DPT : Dye Penetrant Test, UT : Ultrasonic Testing TC : Test Certificate, IR : inspection report, MTC : Material Test Certificate. COC : Certificate of conformance.			
		Rakesh Kr Madhu (Dy Mgr / QA)	K Renjith (Mgr / QA)	R Arunachalam (DGM/QA)
		Prepared by	Reviewed by	Approved by

Annexure Q

Indent No:		Enquiry no:	
Sl.No	BHEL / Customer Requirements	## Specific confirmations by the manufacturer (Acceptable/Not acceptable)	
	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 Lloyd 8.M/s QUEST 9.M/s Certification Engineers International 10.M/s Intertek 11.M/s IR Class Systems and Solutions 12.M/s DNV 13. M/s Fichtner 14. M/s ABS Inspection Services		

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

VENDOR SIGN AND STAMP:

Vendor Name & Address:

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

PROJECT: Bhadradi 4 X 270 MW TPS- FGD & MOEF (BHEL W.O no: G 301, G302, G303 and G304) CONTRACT NO: 3000000020 CE/TPC/SE-TPC IV/EME 10/D 69/D.NO 521/18, Dt: 18.03.19 PACKAGE: FGD PACKAGE MAIN CONTRACTOR: BHEL - RANIPET SUB CONTRACTOR (OEM) & ADDRESS: (To be filled by OEM VENDOR)		CONTRACT QUALITY REQUIREMENTS (CQR) for LT MOTORS (Energy Efficient Motor as per IS 12615 (or) as per International Standards like IEC, DIN, BS etc) Up to 200KW Bhadradi 4 X 270 MW TPS- FGD & MOEF (BHEL W.O no: G 301, G302, G303 and G304)	DOC.NO: BAP/QR/G301 To - G 304) / Bhadradi FGD: LTM /Slurry Pumps: 001 Rev NO.: 01 PAGE : Page 1 of 2 DATE: 14.07.2022	##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	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. Alternatively. if LT Motor Manufacturer has TSGENCO already approved MQP, it can be submitted for TSGENCO formal approval in the event of an order. If TSGENCO approved QP is not available, fresh QP to be submitted for approval.	
02	BHEL / Ultimate Customer – TSGENCO approved vendors	LT Motors are to be procured only from Ultimate Customer - TSGENCO approved vendors and no deviation on this specific requirement is acceptable. If Ultimate customer is not agreeing for any of LT Motor make, then it is the responsibility of OEM vendor to get approval from BHEL/Ultimate customer during execution of the contract.	
03	Inspection Methodology to be adopted at Actual LT Motor Manufacture works by OEM vendor	<u>LT Motors (Up to 200KW) – Inspection Categorization: II</u> All Routine Tests & Type tests including Degree of Protection Test Reports shall be ensured by OEM/LT Motor Manufacture as per Ultimate Customer TSGENCO approved MQP QP:BHAD:ELE:002 Rev 00 received along with letter ref no: CE/TPC/SE-3/MANAGURU/E-BOP/QAP's/D.No: 01/15 dt 06.06.2015.	
		All Routine & Type Tests are to be ensured by OEM Vendor and same shall be offered to BHEL/ BHEL AIA (BHEL authorized inspection Agency) / Ultimate Customer-TSGENCO for inspection & witnessing including review of Degree of Protection Test Reports as per above approved MQP / approved data sheet / drg / spec / as per relevant BIS (Bureau of Indian Standard) - BIS 12615 / IEC 60034 etc and all the Routine Test Reports , Type test Reports including Degree of protection test report with Inspection report (IR) to be submitted for BHEL/Ultimate Customer – TSGENCO for review and to obtain inspection and dispatch clearance .	
		No material shall be dispatched without BHEL / BHEL AIA and Ultimate Customer – TSGENCO Inspection and dispatch clearance.	
04	Painting Requirements	Painting requirement like paint shade and painting thickness including no of coats if any are to be ensured by the OEM vendor and LT Motor manufacture for these LT Motors as per BHEL/ Ultimate Customer - TSGENCO approved data sheet / drg / spec (As applicable).	

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 /Slurry Pumps: 001 Rev NO.: 01 PAGE : Page 2 of 2 DATE: 14.07.2022		##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

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

Supplier signature with seal

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



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

From:
 The Chief Engineer,
 Thermal Projects Construction,
 TSGENCO, 3rd Floor, A-Block,
 Vidyut Soudha, Khiarathabad
 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.


* * * *

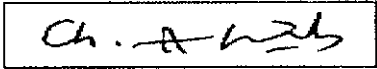
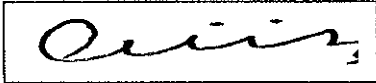
The Quality Assurance plan pertaining to LT motor for ESP and Fan Application required for 4X270MW Manuguru submitted by M/s. BHEL/Ranipet is reviewed and approved QAP is herewith furnished.

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

	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
✓ 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	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.	10.	11.


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--	Test Record	P	W
			Major	Electrical	100%	--do--	--do--	Test report	P	W

Handwritten signature
 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
1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.

2	Type Test	7.3 Two hot restart from hot condition.	Major	Electrical	100%	BHEL Spec & Apprd Datasheet	BHEL Spec & Apprd Datasheet	Test report	P	W	Identical design type test report shall be submitted to BHEL/TPI agency during inspection for review and acceptance.. The validity of type test report shall be 5 years from date of release of purchase order. Otherwise vendor has to conduct these test in presence of BHEL/TPI.		
		8.Vibration test	Major	Mechanical	100%	--do--	--do--	Insp. Record	P	W			
		9.Name plate verification	Major	Visual	100%	--do--	--do--	Insp. Record	P	W			
		10.Paint shade, thickness& adhesion	Major	Vis/Meas	100%	--do--	--do--	Insp. Record	P	W			
		11.Moutings & Overall dimenstoris	Major	Vis/Meas.	100%	--do--	--do--	Insp. Record	P	W			
		1. Measuring of resistance of winding of stator and wound rotor (if applicable)	Major	Electrical	1 motor in a batch	--do--	Apprd Drawing	Insp. Record	P	V			
		2. No load test at rated voltage to determine input current , power and speed.	Major	Electrical	1 motor in a batch	--do--	--do--	TC	P	V			
		3. Open circuit voltage ratio of wound rotor	Major	Electrical	1 motor in a batch	--do--	--do--	TC	P	V			

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 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	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	1 motor in a batch	--do--	--do--	TC	P	V	
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		Major	Mechanical	1 motor in a batch	--do--	--do--	TC	P	V	

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 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 4 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.	
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	100%	--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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