

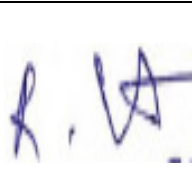



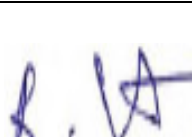

 Ranipet	MANUFACTURER'S NAME AND ADDRESS		MANUFACTURING QUALITY PLAN							
			ITEM: SLURRY PUMP				PROJECT: AS PER PO			
	Customer Approved Source		SYSTEM: FGD APPLICATION				BHEL WO : AS PER INTERNAL W/O			
			QP NO.	FGS:SLP:723, REV:00		DATE: 08.01.2021		MAIN CONTRACTOR		M/S BHEL, RANIPET
						PAGE 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
					M C/N				M C N	
1.	2.	3.	4.	5.	6.	7.	8.	9.	D*	** 10.

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



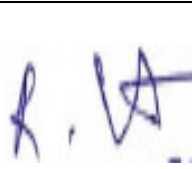
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						PAGE NO:		Page 2 of 5						
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					M	C/N					M	C	N	
1.	2.	3.	4.	5.	6.		7.	8.	9.	D*	** 10.			11.
		Hardness Test		Mechanical Hardness	100%		Drawing/Specification		Test Report	√	P	V	V	
		Internal 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)		
								Prepared by		Reviewed by		Approved by		


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				PAGE NO:		Page 3 of 5								
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					M	C/N				D*	M	C	N	
1.	2.	3.	4.	5.	6.	7.	8.	9.	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.
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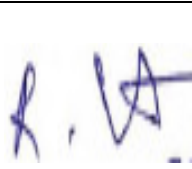
3.0 FINAL INSPECTION


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	

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					M C/N				M C N			
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
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 Complement s	100%	Manufacturing Quality Plan		Protocol	√	V	V	V

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

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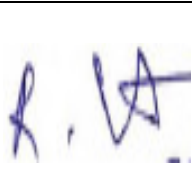
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				PAGE NO:		Page 5 of 5						
SL. NO	COMPONENT & OPERATIONS	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK		REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD		AGENCY	REMARKS
					M	C/N					M C N	
1.	2.	3.	4.	5.	6.	7.	8.	9.	D*	** 10.	11.	

- 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.

Sl 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.			
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		Prepared by	Reviewed by	Approved by

Receipt No : 783346/2022/BAP-QA_MECH

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

Receipt No : 783346/2022/BAP-QA_MECH

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

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

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

Receipt No : 795913/2022/BAP-QA_MECH

PROJECT: TANGEDCO NORTH CHENNAI 1 X 800 MW STAGE-III TPS- FGD (BHEL W.O no: G802) Customer Order Ref. No.: CE/Proj-II/SE/E/P-II/IV/AEE3/F.NCTPS Stg-III(FGD)/D.62/21 dtd 22.02.2021 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) used in SLURRY PUMPS TANGEDCO NORTH CHENNAI 1 X 800 MW STAGE-III TPS- FGD (BHEL W.O no: G802)		DOC.NO: BAP/QR/G802/North Chennai FGD: LTM /Slurry Pumps: 001 Rev NO.: 00 PAGE : Page 1 of 2 DATE: 20.04.2022		##Enquiry No: ## OEM Supplier Name & Address: ##Offer reference: ##Date: Contact Official Name: Mobile no: Email id:	
Sl. NO.	DESCRIPTION	BHEL and Ultimate Customer - TANGEDCO (Tamilnadu Generation and Distribution 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)							
01	Quality Plan Requirement	OEM/LT Motor Manufacture shall confirm to follow SQP:QP:E:LTM:813 Rev,02 dt 27.09.2014 for LT Motors (30 Kw and above). For LT Motors below 30 Kw, Routine Test Certificate along with Certificate of Conformance shall be provided by LT Motor Manufacturer/ OEM vendor.					
02	BHEL / Ultimate Customer – TANGEDCO approved vendors	LT Motors are to be procured only from Ultimate Customer - TANGEDCO 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	No material shall be dispatched without BHEL / BHEL AIA/ Ultimate Customer – TANGEDCO (as applicable) 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 - TANGEDCO approved data sheet / drg / spec (As applicable).					
05	Packing	Packing shall be as per Specification / Drg. / Data sheet including sea worthy packing if any to avoid any transit & handling damages .					
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 – TANGEDCO 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) Approved QP (iii) TCs identified by BHEL/TANGEDCO for record for “CHP” (Customer Hold Point) Verification & Witness “W” portion as given in QP.					
07	Document	(iv) Final Inspection Report + TC					

Receipt No : 795913/2022/BAP-QA_MECH

PROJECT: TANGEDCO NORTH CHENNAI 1 X 800 MW STAGE-III TPS- FGD (BHEL W.O no: G802) Customer Order Ref. No.: CE/Proj-II/SE/E/P-II/IV/AEE3/F.NCTPS Stg-III(FGD)/D.62/21 dtd 22.02.2021 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) used in SLURRY PUMPS TANGEDCO NORTH CHENNAI 1 X 800 MW STAGE-III TPS- FGD (BHEL W.O no: G802)	DOC.NO: BAP/QR/G802/North Chennai FGD: LTM /Slurry Pumps: 001 Rev NO.: 00 PAGE : Page 2 of 2 DATE: 20.04.2022	##Enquiry No: ## OEM Supplier Name & Address: ##Offer reference: ##Date: Contact Official Name: Mobile no: Email id:
SI. NO.	DESCRIPTION	BHEL and Ultimate Customer - TANGEDCO (Tamilnadu Generation and Distribution 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)

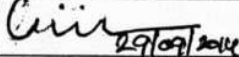
	Package / Dossier..contd	(v) BHEL AIA (BHEL Appointed Inspection Agency) / BHEL report + TC (vi) Ultimate customer TANGEDCO CHP (Customer Hold Point) / MDCC (Material Despatch Clearance Certificate) (vii) Type test reports conducted/submitted with approval with approved data sheet and BOM with actual make used with Customer approved drgs.																																																																					
08	Important notes	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 – TANGEDCO 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.																																																																					
09	Vendor shall furnish following details of LT Motor involved in Slurry Pumps:-																																																																						
	<table><tr><th rowspan="2">S. No</th><th rowspan="2">Pump</th><th colspan="3">LT Motor</th></tr><tr><th>Rating (in kW)</th><th>Quantity (in nos)</th><th>Make</th></tr><tr><td>1</td><td>Limestone Slurry Feed Pump</td><td></td><td></td><td></td></tr><tr><td>2</td><td>Gypsum Bleed Pump</td><td></td><td></td><td></td></tr><tr><td>3</td><td>Primary Hydro-cyclone Feed Tank Pump</td><td></td><td></td><td></td></tr><tr><td>4</td><td>Filtrate Water Tank Pump</td><td></td><td></td><td></td></tr><tr><td>5</td><td>Secondary Hydro-cyclone Feed Tank Pump</td><td></td><td></td><td></td></tr><tr><td>6</td><td>Waste Water Tank Pump</td><td></td><td></td><td></td></tr><tr><td>7</td><td>Auxiliary Absorbent Tank Pump</td><td></td><td></td><td></td></tr><tr><td>8</td><td>Emergency Transfer Pump</td><td></td><td></td><td></td></tr><tr><td>9</td><td>Absorber Area Drain Sump Pump</td><td></td><td></td><td></td></tr><tr><td>10</td><td>Gypsum Area Drain Sump Pump</td><td></td><td></td><td></td></tr><tr><td>11</td><td>Limestone Area Drain Sump Pump</td><td></td><td></td><td></td></tr><tr><td>12</td><td>Other LT motors involved in the system (if any)</td><td></td><td></td><td></td></tr></table>	S. No	Pump	LT Motor			Rating (in kW)	Quantity (in nos)	Make	1	Limestone Slurry Feed Pump				2	Gypsum Bleed Pump				3	Primary Hydro-cyclone Feed Tank Pump				4	Filtrate Water Tank Pump				5	Secondary Hydro-cyclone Feed Tank Pump				6	Waste Water Tank Pump				7	Auxiliary Absorbent Tank Pump				8	Emergency Transfer Pump				9	Absorber Area Drain Sump Pump				10	Gypsum Area Drain Sump Pump				11	Limestone Area Drain Sump Pump				12	Other LT motors involved in the system (if any)					
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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 – TANGEDCO specific requirements.

Receipt No : 795913/2022/BAP-QA_MECH


 Ranipet	STANDARD QUALITY PLAN FOR LT MOTOR (from 30KW to 200KW) Of ESP & FAN Application	
REF. NO.	REVISION NO.	EFFECTIVE DATE
QP:E:LTM:813	02	27 09 2014


TITLE : Standard Quality Plan for LT Motor (From 30KW To 200KW)	
SIGNATURE	
PREPARED BY : CH.ANILSINGH /AEI/QA	
REVIEWED : P.YASODA KRISHNA/ENGG/QA	
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 :

 Ranipet	STANDARD QUALITY PLAN FOR LT MOTOR (from 30KW to 200KW) Of ESP & FAN Application	
REF. NO.	REVISION NO.	EFFECTIVE DATE
QP:E:LTM:813	02	27 09 2014


RECORD OF REVISION

REV. NO	EFFECTIVE DATE	REMARKS
00	05 02 2003	Original issue-Converted from PRQA to SQP after the review in 30 th PCM on QA-Electrics
01	01 08 2009	Revised based on customer change in requirements like in NTPC vindhyachal and Rihand
02	27 09 2014	Revisit of RQP,MQP and SQP with respect to identical type test requirement


 BHARAT HEAVY ELECTRICALS LTD BOILER AUXILIARIES PLANT, RANIPET - 632 406. Ranipet		STANDARD QUALITY PLAN FOR LT MOTOR (FROM 30KW TO 200KW) Of ESP & FAN Application							SQP:QP:E:LTM:813			
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Sl. No.	COMPONENT / ASSEMBLY / OPERATION/TESTS	CHARACTE- RISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK	REFERENCE DOCUMENT	ACCEPTANCE STANDARD	FORMAT OF REC	AGENCY			REMARKS
									D	M	B	
1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	
1.1	Enamelled round copper conductor (Dual coated)M/M	1.Overall diameter	Major	Mechanical	1 sample/lot	IS 13730 1993 Part 13	IEC 60317-0-1 2008	Plant format	P	V		
		2.Bare conductor diameter	Major	Mechanical	1 sample/lot	BHEL Spec & Apprd Datasheet	BHEL Spec & Apprd Datasheet	Plant format	P	V		
		3.Increase in diameter	Major	Mechanical	1 sample/lot	--do--	--do--	Plant format	P	V		
		4. Peel test (above 1mm dia.)	Major	Mechanical	1 sample/lot	--do--	--do--	Plant format	P	V		
		5.Mandrel winding test	Major	Mechanical	1 sample/lot	--do--	--do--	Plant format	P	V		
		6. Jerk test (upto 1mm dia.)	Major	Mechanical	1 sample/lot	--do--	--do--	Plant format	P	V		
		7.Resistance to abrasion	Major	Mechanical	1 sample/lot	--do--	--do--	Plant format	P	V		
		8.BDV Test	Major	Electrical	1 sample/lot	--do--	--do--	Plant format	P	V		
		9.Electrical resistance	Major	Electrical	1 sample/lot	--do--	--do--	Plant format	P	V		
		10.heat shock	Major	Electrical	1 sample/lot	--do--	--do--	Plant format	P	V		
		11.Elongation	Major	Mechanical	1 sample/lot	--do--	--do--	Plant format	P	V		
		12.Cut through test	Major	Thermal	1 sample/lot	--do--	--do--	Plant format	P	V		
		13.Temp.index test	Major	Electrical	1 sample/lot	IEC 60172	IEC 60172	Insp report/ Supplier Tc	P	V		
		14.Continuity (insulation)	Major	Electrical	1 sample/lot	--do--	--do--	Insp report/ Supplier Tc	P	V		
		15.Tandelta	Major	Electrical	1 sample/lot	--do--	--do--	Insp.report/ Supplier Tc	P	V		


<div><div><div>बीएसईएल</div><div></div><div>Ranipet</div></div></div>		BHARAT HEAVY ELECTRICALS LTD BOILER AUXILIARIES PLANT, RANIPET - 632 406.		STANDARD QUALITY PLAN FOR LT MOTOR (FROM 30KW TO 200KW) Of ESP & FAN Application						SQP:QP:E:LTM:813		
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									D	M	B	
1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.		12.

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 Tc	P	V	
		9.Elongation	Major	Mechanical	1 sample/lot	--do--	--do--	Insp.report / Supplier Tc	P	V	
1.3	VARNISHED FIBER GLASS FIBER SHEET:	1.Bore diameter	Major	Mechanical	1 sample/lot	--do--	--do--	Plant format	P	V	
		2.Wall thickness	Major	Mechanical	1 sample/lot	--do--	--do--	Plant format	P	V	
		3.Bending before/after ageing	Major	Mechanical	1 sample/lot	--do--	--do--	Plant format	P	V	
		4. BDV at room temp. & elevated temp.	Major	Electrical	1 sample/lot	--do--	--do--	Plant format	P	V	
		5. Insulation Resistance	Major	Electrical	1 sample/lot	--do--	--do--	Plant format	P	V	
		6.Stability of coating	Major	Mechanical	1 sample/lot	BHEL Spec &	BHEL Spec &	Plant format	P	V	


 BHARAT HEAVY ELECTRICALS LTD BOILER AUXILIARIES PLANT, RANIPET – 632 406. Ranipet		STANDARD QUALITY PLAN FOR LT MOTOR (FROM 30KW TO 200KW) Of ESP & FAN Application							SQP:QP:E:LTM:813			
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									D	M	B	
1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	


1.4	SYNTHETIC RESIN BONDED GLASS FIBER SHEET	7.Burning test	Major	Chemical	1 sample/lot	Apprd Datasheet --do--	Apprd Datasheet --do--	plant format	P	V	
		8.Glass content	Major	Chemical	1/type	--do--	--do--	Insp. Report/ Supplier Tc	P	V	
		9.Voltage proof test at room temp.&at 155C	Major	Electrical	1/type	--do--	--do--	Insp. Report / Supplier Tc	P	V	
		1.Thicknsss & width	Major	Mechanical	1 sample/lot	--do--	--do--	Supplier TC	P	V	
		2.Specific gravity	Major	Mechanical	1 sample/lot	--do--	--do--	Supplier TC	P	V	
		3.Water absorption	Major	Chemical	1 sample/lot	--do--	--do--	Supplier TC	P	V	
		4.BDV Test	Major	Electrical	1 sample/lot	--do--	--do--	Supplier TC	P	V	
		5.Insln.Resistance	Major	Electrical	1 sample/lot	--do--	--do--	Supplier TC	P	V	
		6.Comparative tracking index	Major	Thermal	1 sample/lot	--do--	--do--	Supplier TC	P	V	
		7.Thermal stability	Major	Thermal	1 sample/lot	--do--	--do--	Supplier TC	P	V	
		8.Tensile strength	Major	Mechanical	1 sample/lot	--do--	--do--	Supplier TC	P	V	
		9.Compression strength	Major	Mechanical	1 sample/lot	--do--	--do--	Supplier TC	P	V	
1.5	Composite of polyamide paper and polyester	1.Thickness	Major	Mechanical	1 sample/lot	--do--	--do--	Plant format	P	V	
		2.Tensile strength	Major	Mechanical	1 sample/lot	--do--	--do--	Plant format	P	V	
		3.Elongation	Major	Mechanical	1 sample/lot	BHEL Spec &	BHEL Spec &	Plant format	P	V	


		BHARAT HEAVY ELECTRICALS LTD BOILER AUXILIARIES PLANT, RANIPET - 632 406.		STANDARD QUALITY PLAN FOR LT MOTOR (FROM 30KW TO 200KW) Of ESP & FAN Application					SQP:QP:E:LTM:813 REV. NO: 02 DATE: 27 09 2014 Page 6 of 15			
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									D	M	B	
1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	
1.6	Impregnation varnish	4.BDV test	Major	Electrical	1 sample/lot	Apprd Datasheet	Apprd Datasheet	Plant format	P	V		
						--do--	--do--	Plant format	P	V		
		5. Temp. stability as received/after folding in 'U' shaped slot liner	Major	Thermal	1 sample/lot	--do--	--do--	Plant format	P	V		
		6.Visual	Major	Visual	1 sample/lot	--do--	--do--	Plant format	P	V		
		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		
		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		
1.7	Motor Shaft Material	1.Chemical composition	Major	Chemical	1 sample/lot	--do--	--do--	Supplier TC	P	V		
		2.Yield strength	Major	Mechanical	1 sample/lot	BHEL Spec &	BHEL Spec &	Supplier TC	P	V		

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									D	M	B	
1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	


1.8	Stamping Steel	3.Tensile strength	Major	Mechanical	1 sample/lot	Apprd Datasheet	--do--	Apprd Datasheet	--do--	Supplier TC	P	V	EC gr purity: -99.6%
		4.Elongation	Major	Mechanical	1 sample/lot	--do--	--do--	--do--	--do--	Supplier TC	P	V	
		5.Hardness	Major	Mechanical	1 sample/lot	--do--	--do--	--do--	--do--	Supplier TC	P	V	
		6.Dimensions	Major	Mechanical	1 sample/lot	--do--	--do--	--do--	--do--	Supplier TC	P	V	
		7.Grain size inclusion rating	Major	Mechanical	1 Sample/lot	--do--	--do--	--do--	--do--	Supplier TC	P	V	
		8.Heat treatment cycle	Major	Thermal	100%	--do--	--do--	--do--	--do--	Supplier TC	P	V	
		9.Ultrasonic test	Major	NDT	100%	--do--	--do--	--do--	--do--	Supplier TC	P	V	
		10.Heat treatment cycle	Major	Thermal	100%	--do--	--do--	--do--	--do--	Supplier TC	P	V	
		1.Specific core loss	Major	Electrical	1 sample/lot	--do--	--do--	--do--	--do--	Supplier TC	P	V	
		2.Magnetisation	Major	Electrical	1 sample/lot	--do--	--do--	--do--	--do--	Supplier TC	P	V	
		3.Insulation resistance	Major	Electrical	1 sample/lot	--do--	--do--	--do--	--do--	Supplier TC	P	V	
		4.Stacking factor	Major	Mechanical	1 sample/lot	--do--	--do--	--do--	--do--	Supplier TC	P	V	
		5.Ductility	Major	Mechanical	1 sample/lot	--do--	--do--	--do--	--do--	Supplier TC	P	V	
		6.Thickness of coating	Major	Mechanical	1 sample/lot	--do--	--do--	--do--	--do--	Supplier TC	P	V	
		7.Visual check(Waviness)	Major	Visual	1 sample/lot	--do--	--do--	--do--	--do--	Supplier TC	P	V	
		8.Temperature Withstand capacity	Major	Measure	1 sample/lot	--do--	--do--	--do--	--do--	Supplier TC	P	V	

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									D	M	B	
1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	
1.9	Aluminum Ingots	1.Chemical Composition	Major	Chemical	1 sample/lot	BHEL Spec & Apprd Datasheet	BHEL Spec & Apprd Datasheet	Supplier TC	P		V	
2.0	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	
2.1	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	
2.2	FAN	1.Diameter(ID &OD)	Major	Meas.	Sample	--do--	--do--	Insp. Report	P		V	
		2.Paint,casting defects	Major	Visual	100%	--do--	--do--	Insp. report	P		V	
2.4	Terminal Box & Covers	1.Dimensions	Major	Mechanical	1 sample/lot	--do--	--do--	Inspection record	P		V	
2.5	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	
2.6	Earthing bolts & Nuts with washer	Dimensions	Major	Measurement	100%	--do--	--do--	Inspection report	P		V	


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									D	M	B
1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.
2.7	Paints	1. Viscosity at 32C	Major	Mechanical	1 sample/lot	BHEL Spec & Apprd Datasheet	BHEL Spec & Apprd Datasheet	Insp. recoed	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	
2.8	Gasket	1. Dimensions	Major	Meas.	As per IS / Plant std.	--do--	--do--	Insp. report / Supplier Tc	P	V	
		2. Neoprene test	Major	Phy.	As per IS / Plant std.	--do--	--do--	Insp. Report / Supplier Tc	P	V	
		3. Hardness	Major	Mech.	As per IS / Plant std.	--do--	--do--	Insp. report / Supplier Tc	P	V	
		4. Ageing test	Major	Phy.	As per IS / Plant std.	--do--	--do--	Insp. Report / Supplier Tc	P	V	
		5. Tensile	Major	Meas.	As per IS / Plant std.	--do--	--do--	Insp. Report / Supplier Tc	P	V	
		6. Elongation	Major	Meas.	As per IS / Plant std.	--do--	--do--	Insp. Report / Supplier Tc	P	V	
	Terminal Block	1. Dimensions	Major	Meas.	Plant std.	--do--	--do--	Insp. Report /	P	V	
		2. Proof voltage test	Major	Elect.	Plant std.	--do--	--do--	Insp. Report /	P	V	

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1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	


II	INPROCESS INSPECTION:	1.Blow holes/cracks	Major	Visual	100%	BHEL Spec & Apprd Datasheet	BHEL Spec & Apprd Datasheet	Insp. Record	P	V	
2.1	Machined Cast iron body	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	
		1.Blow holes/cracks	Major	Visual	100%	--do--	--do--	Insp. Record	P	V	
2.2	Machined End shields	2.Dimensions	Major	Mechanical	100%	--do--	--do--	Insp. Record	P	V	
		1.Permissible unbalance	Major	Visual	1 sample	--do--	--do--	Insp. Report	P	V	
	Balancing(Rotor & Fan)	1.Pressure withstand capacity	Major	Mechanical	100%	--do--	--do--	Ledger	P	V	
			Major								
2.3	Hydraulic Pressure Testing	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	
2.4	Stator core	3. Rigidity of core.	Major	Mechanical	100%	--do--	--do--	Insp. Record	P	V	
		1.Core length	Major	Mechanical	100%	--do--	--do--	Insp. Record	P	V	
		2.Blow holes	Major	Visual	100%	--do--	--do--	Insp. Record	P	V	
2.5	Die cast Rotor	1.Resistance	Major	Electrical	100%	--do--	--do--	Insp. Record	P	V	
		2.H.V.Test	Major	Electrical	100%	--do--	--do--	Insp. Record	P	V	

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									D	M	B	
1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	


2.6	Wound stator(if applicable)	3. Insulation resistance	Major	Electrical	100%	BHEL Spec & Apprd Datasheet	BHEL Spec & Apprd Datasheet	Insp. Record		P	V	
		4. Polarity	Major	Electrical	100%	--do--	--do--	Insp. Record		P	V	
		1. Dip & bake cycles as per OA requirement	Major	Process parameter	100%	--do--	--do--	Insp. Record		P	V	
		1. Rotor OD	Major	Mechanical	100%	--do--	--do--	Insp. Record		P	V	
2.7	Impregnation	2. Balancing	Major	Mechanical	100%	--do--	--do--	Insp. Record		P	V	
		1. Insulation resistance	Major	Electrical	100%	--do--	--do--	Insp. Record		P	V	
2.8	Rotor machining	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	
2.9	Space Heater(if applicable)	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	
3.0	Final Assembly											

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									D	M	B	
1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	


III	FINAL INSPECTION AND TESTING:											
3.1	Routine Test	1. Resistance Measurement on winding & space heater	Major	Electrical	100%	BHEL Spec & Apprd Datasheet	BHEL Spec & Apprd Datasheet	Insp. Record	P	W		
		2. Insulation Resistance before/after H.V. Test on winding & space heater	Major	Electrical	100%	--do--	--do--	Insp. Record	P	W		
		3. H.V. Test on winding & space heater	Major	Electrical	100%	--do--	--do--	Insp. Record	P	W		
		4. Phase sequence & direction of rotation	Major	Electrical	100%	--do--	--do--	Insp. Record	P	W		
		5. No load run test	Major	Electrical	100%	--do--	--do--	Insp. Record	P	W		
		6. Reduced voltage running test	Major	Electrical	100%	--do--	--do--	Insp. Record	P	W		
		7. Locked rotor test	Major	Electrical	100%	--do--	--do--	Insp. Record	P	W		
		7.1 Two successive Starts from cold Condition (If possible at Rated load)	Major	Electrical	100%	--do--	--do--	Test Record	P	W		

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									D	M	B
1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.

3.2	Type Test	7.2 Three equally spread starts pre hour.	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.
		7.3 Two hot restart from hot condition.	Major	Electrical	100%			Test report	P	W	
		8.Vibration test	Major	Mechanical	100%	--do--	--do--	Insp. Record	P	W	
		9.Name plate verification	Major	Visual	100%	--do--	--do--	Insp. Record	P	W	
		10.Paint shade, thickness& adhesion	Major	Vis/Meas	100%	--do--	--do--	Insp. Record	P	W	
		11.Moutings &Overall dimensions	Major	Vis/Meas.	100%	--do--	Apprd Drawing	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--	--do--	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--	Insp. Record	P	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	

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									D	M	B	
1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.		12.

		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	
		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 moto	Major	Visual	1 motor in a	--do--	--do--	TC		P	V	

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									D	M	B
1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.

3.3	Preservation and Packing	12. Over speed test	Major	Mechanical	batch 1 motor in each frame size 100%	BHEL Spec & Apprd Datasheet	BHEL Spec & Apprd Datasheet	TC	P	V	
		13. Degree of Protection Tests	Major	Visual		--do--	--do--	TC	P	V	
		1. Completeness	Major	Review	100%	--do--	--do--	Insp. Record	P	V	
		2. Mounting & over all Dimensions	Major	Visual	100%	--do--	--do--	Insp. Record	P	V	
		3. Painting(label)	Major	Visual	100%	--do--	--do--	Insp. Record	P	V	
		4. Motors located on rubber mats.	Major	Visual	100%	--do--	--do--	Insp. Record	P	V	
		5. Motors covered with polythene sheets.	Major	Visual	100%	--do--	--do--	Insp. Record	P	V	
		6. Packing	Major	Visual	100%	--do--	--do--	--do--	P	V	

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 CHP=Customer Hold Point M: Manufacturer B=Contractor/BHEL/TPI agency

Note : *Type test clearance from BHEL/TPI to be obtained during Inspection at vendor works.