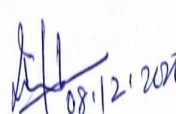




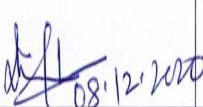

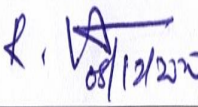
S.no	Components & operation	Characteristics	Class	Type of check	Quantum of check		Reference document	Acceptance Norms	Format of records 9	Agency				Remarks 11
					M	B/C				D	M	B	C	
1	2	3	4	5	M	B/C	7	8		D	M	B	C	


I.0 RAW MATERIALS													
1.1	Castings of Suction, Discharge & Stage Casings, Impeller, Diffuser	Chemical analysis, Mechanical, Heat Treatment	Major	Mechanical Chemical analysis, Heat treatment	Each heat/ Melt	Each heat/ Melt	Respective material specification / Drawing/ Datasheet	MTC	√	P	V	-	
1.2	Suction, Discharge & Stage Casings, Impeller, St. Boxes	Surface defects	Major	DP Test	As Cast accessible surface	As cast accessible surface	ASTM E165 ASME Sec. VIII Div. 1 Appx. 8	DP Test Report	√	P	V	--	
1.3	Bar stock for shaft	Physical Test, Chemical analysis	Major	Physical test, Chemical analysis	Each heat/ Melt	Each heat/ Melt	Respective material specification / Drawing/ Datasheet	MTC	√	P	V	-	
		Internal defects	Major	UT	100%	100%	ASTM A388 @@	Test Report					
1.4	Shaft & Shaft Sleeve	Physical Test, Chemical analysis	Major	Chemical analysis, Hardness	Each heat/ Melt	Each heat/ Melt	Respective material specification / Drawing/ Datasheet	TC / Lab test Report	√	P	V	-	
1.5	Wearing ring casting	Chemical analysis, Hardness as applicable	Major	Chemical analysis, Hardness	Each heat/ Melt	Each heat/ Melt	Respective material specification / Drawing/ Datasheet	TC / Lab test Report	√	P	V	-	

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	Prepared by	Reviewed by	Approved by

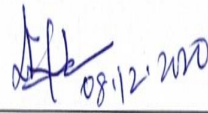

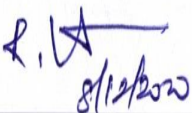
S.no		Components & operation		Characteristics		Class		Type of check		Quantum of check		Reference document		Acceptance Norms		Format of records		Agency		Remarks	
1		2		3		4		5		M B/C		7		8		9		10		11	


S.no		Components & operation		Characteristics		Class		Type of check		Quantum of check		Reference document		Acceptance Norms		Format of records		Agency		Remarks	
1.6		Auxiliary items Piping & Casing drain, Vent, Flushing piping as applicable) -Pipe, Flanges, Fittings, Valves as applicable		COC		Minor		Visual & Verification		100%		Rando m		Respective material specification / Drawing/ Datasheet		COC		√ P V -			
2.0 BOUGHT OUT ITEMS																					
2.1		Mechanical Seal		Material compliance		Major		Visual & Verification		100%		100%		Approved Drawing/ Datasheet		MTC/ COC		√ P V -			
2.2		Coupling		Balancing		Major		Dynamic Balancing		100%		100%		ISO 1940		ISO 1940 Gr. 2.5		MTC/Repor t/COC		√ P V -	
3.0 INPROCESS INSPECTION																					
3.1		Suction & Discharge casing, Stage casing.		Pressure Test		Major		Hydrostatic Test		100%		100%		Approved data Sheet		No Leakage		Report		√ P V -	
3.2		Impeller		Balancing		Major		Dynamic Balancing		100%		100%		As per ISO 1940		As per ISO 1940 Grade 2.5		Report		√ P V -	
3.3		Suction & Discharge casing, Stage casing.		Surface Defects		Major		DP Test		Access ible machin ed		Access ible machin ed		ASME E 165		ASME Sec. VIII Div. 1 Appx. 8		Test Report		√ P V -	

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				Prepared by		Reviewed by		Approved by	

 Manufacturer Name & Address: As Per PO Ranipet		MANUFACTURING QUALITY PLAN												
		System: Water System.				QP NO:DES:605		PROJECT: AS PER PO						
		Sub System: Horizontal Centrifugal Pump (HP Pumps)				REV. NO: 01		MAIN SUPPLIER: BHEL, BAP RANIPET						
						DATE: 08.12.2020				Page 3 of 4				
S.no	Components & operation	Characteristics	Class	Type of check	Quantum of check		Reference document	Acceptance Norms	Format of records	Agency			Remarks	
1	2	3	4	5	M	B/C	7	8	9	D	M	B	C	11

3.4	Pump Assembly	Performances, Vibrations, Bearing temperature, rise, Sound level	Critical	Performances with shop motor, Vibration test, sound level test	100%	100%	Approved Data Sheets	Test Report	√	P	W	-		
3.5	Pump ASSEMBLY	Strip Test	Major	Visual Insp. Of wear parts, Measurement of Wear ring Clearance	100%	100%	Approved Data sheets / C.S Drawing	Approved Data sheets / C.S Drawing	Inspection Report	√	P	W	-	Only In case of abnormal Performance test.
4.0 FINAL INSPECTION														
4.1	Pump Assembly along with all accessories	Overall dimensions along with job motor*	Major	Measurement, Visual inspection. Verification of accessories	100%	100%	Approved Drawings / Datasheet	Report	√	P	W	-	If job motor ordered with PUMP	
4.2	QA Dossier	Review of Inspection Certificates	Major	Review of reports	100%	100%	PO/ Technical specification	COC	√	P	W	-		
4.3	Painting, Packing & Preservations	Visual, Measurement	Major	Paint DFT Check	100%	100%	PO/ Technical specification/ Approved Packing Procedure	COC	√	P	V	-		

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	Prepared by	Reviewed by	Approved by

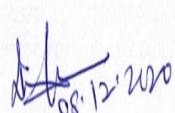

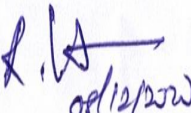
S.no		Components & operation	Characteristics	Class	Type of check	Quantum of check		Reference document	Acceptance Norms	Format of records	Agency			Remarks	
1		2	3	4	5	M	B/C	7	8	9	D	M	B	C	11
		 Manufacturer Name & Address: As Per PO Ranipet		MANUFACTURING QUALITY PLAN System: Water System. QP NO:DES:605 PROJECT: AS PER PO Sub System: Horizontal Centrifugal Pump (HP Pumps) REV. NO: 01 DATE: 08.12.2020 MAIN SUPPLIER: BHEL, BAP RANIPET Page 4 of 4											

NOTES:

1. Latest revision of standards & specifications shall apply. Only International Standards are applicable. Indian & Chinese Standards are not applicable.
 2. Materials shall be procured in compliance to Functional Technical Specification.
 3. Inspection shall be in compliance with approved Quality Control Procedure for the product.
 4. NDT shall be carried out by Qualified Personnel with compliance to approved NDT Procedures and Acceptance Norms, as per ASME Section V.
 5. Gauges and measuring Instruments, with valid calibration only shall be used
 6. Cleaning and Painting of products shall be carried out as per Approved Painting Schedule.
 7. Finished Products shall be packed to comply with approved Packing Schedule.
- @@ Normal Probe of 2MHz frequency and 20mm diameter shall be used. With this probe, the Back Wall Echo (BWE) in sound area shall be set at 100% FSH (Full screen height). At this gain setting and defect Echo $\geq 20\%$ FSH is not acceptable. Also loss of BWE $> 20\%$ FSH is not acceptable.

Record of Revision

Rev no	Date	Description
00	05.08.2008	Original Issue – First submission
01	08.12.2020	Reviewed and totally revised

LEGENDS: Records, identified with "tick" (✓) shall be essentially included by supplier in QA documentation. M: Manufacturer/Sub-supplier, B: Main Supplier (BHEL/BHEL AIA), C: Customer, P: Perform, W: witness and V: verification CHP: Customer Hold Point (Customer shall identify in column "c" as 'w'). MTC: Material test certificate. COC: Certificate of conformance, DP: Dye penetrant test, UT: Ultrasonic testing	Rakesh Kr Madhu (Dy.Mgr/QA)	K Renjith (Mgr/QA)	R Arunachalam (DGM/QA)
			
	Prepared by	Reviewed by	Approved by

Receipt No : 728308/2022/BAP-QA_MECH

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. 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 : 728308/2022/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 / transhipment 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

504440/2021/BAP-QA_MECH

PROJECT: NTPL Tuticorin 2 x 500 MW (BHEL W.O no: G515, G516) PACKAGE: FGD PACKAGE MAIN CONTRACTOR: BHEL - RANIPET SUB CONTRACTOR (OEM) & ADDRESS: (To be filled by OEM VENDOR)		CONTRACT QUALITY REQUIREMENTS (CQR) for LT MOTORS used in <u>Process Water Pumps & Mist Eliminator Wash Water Pumps for FGD application</u> NTPL Tuticorin 2 x 500 MW FGD Project (BHEL W.O no: G515, G516)		DOC.NO: BAP/QR/G515,G516 /NTPL Tuticorin/ LTM/Water Pumps: 001 Rev NO.: 00 PAGE : Page 1 of 2 DATE: 15.10.2021		##Enquiry No: ## OEM Supplier Name & Address: ##Offer reference: ##Date: Contact Official Name: Mobile no: Email id:	
Sl. NO.	DESCRIPTION	BHEL and Ultimate Customer - NTPL Quality Requirements				##Specific confirmations by the vendor	

ITEM: LT Motors

01	Quality Plan Requirement	<ol style="list-style-type: none"> 1. MQP is applicable for these LT Motors and accordingly Actual LT Motor Manufacturer and OEM shall submit the MQP for BHEL and ultimate customer NTPL and its consultant DCPL approval. 2. If any of LT Motor manufacturer is having, ultimate customer NTPL and its consultant DCPL approved MQP (Manufacturing Quality Plan) / NTPC approved RQP (Reference Quality Plan) and having validity, the same is applicable for these LT Motor for inspection subject to obtaining ultimate customer NTPL and its consultant DCPL formal approval in the event of an order. 3. If LT Motor Manufacture / OEM vendor does not have MQP/RQP, they should submit a fresh MQP to BHEL/NTPL (in BHEL format) for review & approval. (copy attached). 	
02	BHEL / Ultimate Customer – NTPL approved vendors	LT Motors are to be procured only from Ultimate Customer - NTPL approved vendors and no deviation on this specific customer requirement is acceptable.	
03	Inspection Methodology to be adopted at Actual LT Motor Manufacture works by OEM vendor	BHEL/ BHEL AIA (BHEL authorized inspection Agency) / Ultimate Customer-NTPL to witness / perform inspection at LT Motor Supplier works and submit all the inspection documents and routine & Type test reports including Degree of Protection Test Reports (IP 55) as per approved MQP & approved data sheet / drg / spec / as per relevant BIS (Bureau of Indian Standard) - BIS 325 /IS 12615/ IEC 60034 etc. No material shall be dispatched without BHEL / BHEL AIA and Ultimate Customer – NTPL 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 for these LT Motors as per BHEL/ Ultimate Customer - NTPL and its consultant M N Dastur 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 – NTPL including for type test witnessing 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: kovak@bhel.in including for inspection related activities for immediate response / resolution.	

ANNEXURE-II: MANUFACTURING QUALITY PLAN

ANNEXURE-II: MANUFACTURING QUALITY PLAN													
MFGR.'s LOGO		MANUFACTURER'S NAME AND ADDRESS			MANUFACTURING QUALITY PLAN				PROJECT : NLC TAMILNADU POWER LTD (2 X 500 MW)				
									PACKAGE : FGD PACKAGE				
									CONTRACT NO. :				
									MAIN-SUPPLIER : BHEL RANIPET				
		ITEM: LT MOTOR SUB-SYSTEM: WATER PUMPS			QP NO.:								
					REV. NO.:								
					DATE:								
					PAGE: OF....								
SL. NO	COMPONENT & OPERATIONS	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK	REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD	AGENCY			REMARKS	
									M	C	L		
1.	2.	3.	4.	5.	6.	7.	8.	9.	D*	10.			11.
		LEGEND: * RECORDS, IDENTIFIED WITH "TICK" (√) WILL BE ESSENTIALLY INCLUDED BY SUPPLIER IN QA DOCUMENTATION.							DOC. NO.:			REV.....	
		** M: MANUFACTURER/SUB-SUPPLIER							CAT.....				
		C: SUPPLIER/NOMINATED INSPECTION AGENCY, L: PURCHASER											
		P: PERFORM W: WITNESS AND V: VERIFICATION. AS APPROPRIATE,											
		CHP: PURCHASER WILL IDENTIFIED IN COLUM "N"											
MANUFACTURER/ SUB-SUPPLIER		MAIN-SUPPLIER (BHEL)					FOR PURCHASE R USE						
SIGNATURE									REVIEWED BY		APPROVED BY		APPROVAL SEAL