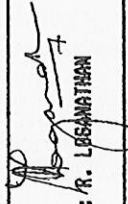
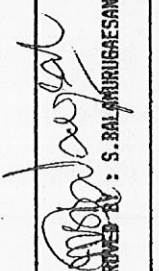
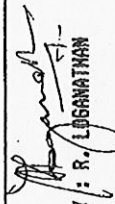
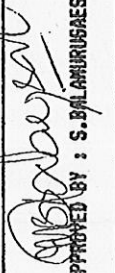


BHARAT HEAVY ELECTRICALS LIMITED PIPING CENTRE MADRAS - 17 QUALITY ASSURANCE & CONTROL DEPT. 8A03			STANDARD QUALITY PLAN FOR BOILER FEED PUMP			QP NO. QPS:08 REV.NO. 0 DATE. 24.02.94		
PREPARED BY : R. LEGANATHAN 			REVIEWED BY : A.D. JEVASINGH PAUL 			APPROVED BY : S. BALAKRISHNAN 		
PAGE: 1 OF 3								
S.NO	COMPONENT OR OPERATION	CHARACTERISTICS	TYPE OF CHK	QUANTITY OF CHECK	REF. DOCUMENT/ACCEPTANCE STANDARD	TYPE OF RECORD	AGENCY	REMARKS
1	2	3	4	5	6	7	8	9
1.0	MATERIAL CONTROL							
1.1	Suction & Delivery Cover, Base-Plate.	Physical & Chemical Properties	Analysis	One/Heat/ Batch	AS PER BHEL APPROVED DATA SHEET	Lab Report	H V	BHEL APPD. VENDOR
1.2	Impeller, Diffuser.	-do-	Analysis	"	-do-	"	H V	B - BHEL
1.3	Renewable Plate, Wearing Ring and Island.	-do-	Analysis & Hardness Check	"	-do-	"	H V	H - HOLD
1.4	Shaft Sleeve	-do-	Analysis	"	-do-	"	H V	V - VERIFICATION
1.5	Bars/Forgings for Shafts.	Physical & Chemical Properties	Analysis	"	-do-	"	H V	W - WITNESS
1.6	Heat Treatment of Castings (if applicable)	Soundness	Measurement	100%	AS PER MANUFACTURING DRAWING	Ins. Report	H V	
1.7	Companion Flange	Physical & Chemical Properties	Analysis	One/Heat/ Batch	AS PER ASTM A 388 - #	UT Report	H V	# Defect Echo with in 20% of BWE is acceptable.
2.0	IN PROCESS CONTROL							
2.1	All Components Under 1.0	Visual & Dimensional Check	Visual Exam.	100%	AS PER MANUFACTURING DRAWING	Ins. Report	H V	
2.2	Delivery Cover, Chamber.	Leak Tightness.	Hydro. Test (Duration - 30 mts. min.)	100%	AS PER BHEL APPROVED DATA SHEET	Ins. Report	H V	

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BHARAT HEAVY ELECTRICALS LIMITED PIPING CENTRE MADRAS - 17 QUALITY ASSURANCE & CONTROL DEPT. 9A03			STANDARD QUALITY PLAN FOR BOILER FEED PUMP			QP NO. QPS:08 REV.NO. 0 DATE. 24.02.94		
PREPARED BY : R. LOGANATHAN 			REVIEWED BY : A.D. JEVASINGH PAUL 			APPROVED BY : S. BALANURUSASAN 		
PAGE: 2 OF 3								
S.NO	COMPONENT OR OPERATION	CHARACTERISTICS	TYPE OF CHK	QUANTITY OF CHECK	REF. DOCUMENT/ACCEPTANCE STANDARD	TYPE OF RECORD	AGENCY	REMARKS
1	2	3	4	5	6	7	8	9
2.3	Impellers	a) External Surface Defects b) Static, Dynamic Residual Imbalance.	LPI Static and Dynamic Balancing Test	100%	AS PER ASTM E165/No linear indications AS PER ISO:1940 Gr.6.3 for Static & Gr.2.5 for Dynamic	Insp. Report	M	UT -ULTRASONIC TEST HLPI-LIQUID PENETRANT INSPECTION
2.4	Shafts	Surface Defects	LPI	100%	AS PER ASTM E165		M	
3.0	SUB ASSEMBLY CONTROL							
3.1	Rotor Assembly	a) Eccentricity b) Static, Dynamic Residual Imbalance.	Measurement Static and Dynamic Balancing Test	100%	AS PER MANUFACTURING DRAWING AS PER ISO:1940 Gr.6.3 for Static & Gr.2.5 for Dynamic	IR/Log Book Insp. Report	M M	
3.2	Complete Pump Assy.	Alignment, Completeness, Clearances, Freedom, Cleanliness, Correctness.	Measurement Visual Visual	100%	AS PER BHEL APPROVED DATA SHEET	IR/Check Lists	M	Note-1 Acceptance Norms: a) Discharge-ISO:5120 b) Vibrations, Noise Bearing Temp. rise
4.0	FINAL INSPECTION							
4.1	Pump with Actual Motor (As per appd. QP)	Discharge vs Head Discharge vs Power Discharge vs Efficiency Vibration, Noise, Bearing Temp. rise, Leakage	Performance Test	100%	-do- (Note-1)	Test Record Plotted Curves	M	- API 610 No -ve Tol. on Efficiency No +ve Tol. on Bkdr No Leakages.

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STANDARD QUALITY PLAN FOR BOILER FEED PUMP				GP NO. 096:08 REV. NO. 0 DATE. 24.02.94				
BHARAT HEAVY ELECTRICALS LIMITED PIPING CENTRE MADRAS - 17 QUALITY ASSURANCE & CONTROL DEPT. 6A03				APPROVED BY : S. BALANURUSAM REVIEWED BY : A.D. JEVASINSH PAUL				
PREPARED BY : R. LOBHATHAN				PAGE: 3 OF 3				
S.NO	COMPONENT OR OPERATION	CHARACTERISTICS	TYPE OF CHK	QUANTUM OF CHECK	REF. DOCUMENT/ACCEPTANCE STANDARD	TYPE OF RECORD	AGENCY	REMARKS
1	2	3	4	5	6	7	8	9
4.2	Strip down exam. after performance test.	Undue wear, tear & breakage.	Visual Exam.	One/Type/Size	AS PER BHEL APPROVED DATA SHEET/ NO UNDUE WEAR, TEAR, AND BREAKAGE	Insp. Report	M	
4.3	Complete Pump	Completeness, Correctness, Cleanliness, Workmanship, Overall dimension, Orientation and finish.	Visual & Measurement	100%	AS PER MANUFACTURING DRAWING		M	
4.4	Completion of all stages.	Final completion.	Verification of documents	100%	AS PER BHEL APPROVED DATA SHEET 096:08		M	
5.0	PAINTING & PACKING							
5.1	Surface Coating	Surface finish, DFT & Colour	Visual	100%		Insp. Report + Check list	M	
5.2	Packing	Soundness, Method, Preservative			AS PER BHEL PURCHASE ORDER			
5.3	Identification	P.O. No., M.O/DU DETAILS, S.I. No.						
		PACKING SLIPS.						

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