

- z) Bureau of Indian Standards Institution (BIS).
- aa) Indian Electricity Rules.
- bb) Indian Boiler Regulations (IBR).
- cc) Indian Explosives Act.
- dd) Indian Factories Act.
- ee) Tariff Advisory Committee (TAC) rules.
- ff) Emission regulation of Central Pollution Control Board (CPCB).
- gg) Pollution Control regulations of Dept. of Environment, Govt. of India
- hh) Central Board of Irrigation and Power (CBIP) Publications

FORMAT OF QUALITY ASSURANCE PROGRAMME

VENDOR'S LOGO , NAME & ADDRESS		MANUFACTURING QUALITY ASSURANCE PLAN				DOC NO: XXXXX-CAL-QAP-M-0001			
		ITEM : -				REV NO : 0 1 2 3 4			
						DATE :			
CLIENT :		LOCATION :							
PROJECT :		REFERENCE PURCHASE ORDER NO. & DT :							
VENDOR :		REFERENCE APPROVED DATA SHEET :							
SUB VENDOR :		REFERENCE APPROVED DRAWING. NO. :							
ABBREVIATIONS : QAP - QUALITY ASSURANCE PLAN, CR - CRITICAL, MA - MAJOR, MI - MINOR SPEC - SPECIFICATION, TC - TEST CERTIFICATES P - PERFORM w - WITNESS V - VERIFY CHP - CUSTOMER HOLD POINT				AGENCY : 1 - DCPL/PROJECT AUTHORITY 2 - SUPPLIER 3 - SUB-SUPPLIER 4 - MANUFACTURER 5 - THIRD PARTY INSPECTION AGENCY		GENERAL REMARKS 1 THE ITEMS WHICH ARE FALLING UNDER ANY STATUTORY AUTHORITY'S (LIKE I.B.R. ETC.) SCOPE SHALL BE SUBJECTED TO THAT STATUTORY AUTHORITY'S INSPECTION CLEARENCE.			
NOTES: 1. EXACT MATERIAL / PROCESS / INSPECTION / TESTS FOLLOWED BY THE MANUFACTURER SHALL BE SPECIFIED 2. EXACT REFERENCE DOCUMENT/ACCEPTANCE STANDARD SHALL BE SPECIFIED 3. IN CASE SPECIFIED ACCEPTANCE STANDARD / NORMS IS OTHER THAN NATIONAL / INTERNATIONAL STANDARDS STANDARD / COPY OF THE ACCEPTANCE NORMS FOLLOWED BY THE MANUFACTURER SHALL BE SUBMITTED FOR REVIEW RECORD 4 FINAL INSPECTION DOSSIER SHALL BE PREPARED BY MANUFACTURER & SHALL BE ENDORSED BY INSPECTIONION AGENCY									
Prepared by				Checked by			Approved By		
Revision	R0	R1	R2	R0	R1	R2	R0	R1	R2
DATE									

VENDOR'S LOGO, NAME & ADDRESS			ITEM :						DOC NO:				
									REV NO :		R0	R1	R2
									DATE :				
SL NO.	DESCRIPTION	CHECKS			CATEGORY	REF DOCS	ACCEPTANCE NORM	FORMAT OF RECORD	AGENCY			REMARKS	
		TYPE	METHOD	QUANTUM					P	W	V		
1	2	3	4	5	6	7	8	9	12	13	14	15	
1.00													
Notes:													
Prepared by				Checked by				Approved By					
Revision	R0	R1	R2	R0	R1	R2	R0	R1	R2				
DATE													



**TECHNICAL SPECIFICATION FOR
FUEL OIL HANDLING SYSTEM
5X800MW YADADRI TPS**

SPECIFICATION NO. PE-TS-417-166-A001

SECTION 'I-A'

REVISION 00

DATE: 26.04.2018

PAGE 1 of 1

SECTION- IA

QUALITY ASSURANCE AND INSPECTION REQUIREMENT

STANDARD CHECL LIST FOR :Insulation & Cladding PACKAGE-FULE OIL SYSTEM PROJECT- CHECL LIST NO.:PE-QP-XXX-166-A801 REV.NO. 0								
DATE: 31/03/2012								
SL. No.	TESTS/CHECKS	QUANTUM OF CHECKS	REFERENCE DOC./ ACCEPTANCE NORMS	AGENCY				REMARKS
				M	C	N	D	
1.0	Review of Manufacturer's TC for Mineral wool	Sampling as per IS:8183	Appd.Data Sheet/ IS:8183	P	V	V	√	Ref, Note 1
2.0	Review of Material TC for Aluminium sheet	One/Lot	Appd.Data Sheet/ IS:737	P	V	V	√	Ref. Note 2
2.1	Dimensional Check	At random (10%)	-do-	P	V	V	√	
3.0	Packing & Marking	100%	IS:8183/Mfr's Std.	P	V	V	√	
Legend: Records identified with "√" shall be essentially included by contractor in QA documentation M= Manufacturer, C= Main Vendor N= BHEL/Customer P= Perform, W= Witness, V= Verification Note:1.MTC Will comprise the tests in line with IS:8183 2. MTC will Comprise of chemical & mechanical properties.								
MAIN VENDOR/SUB-VENDOR (SIGN WITH DATE & STAMP)				REVIEWING AGENCY (SIGN WITH DATE & STAMP)		APPROVING AGENCY (SIGN WITH DATE & STAMP)		



STANDARD CHECK LIST FOR: PRESSURE REDUCING VALVE

PACKAGE-FULE OIL SYSTEM

PROJECT-

CHECK LIST NO.:PE-QP-XXX-166-A802

REV.NO. 0

DATE: 31/03/2012

SL. No.	TESTS/CHECKS	QUANTUM OF CHECKS	REFERENCE DOC./ ACCEPTANCE NORMS	AGENCY				REMARKS
				M	C	N	D	
1	Review of Material TC for body & diaphragm	One/Lot	Appd.Data Sheet/ Relevant Std.	P	V	V	✓	
2	Hydro test of body	100%	Appd.Data Sheet	P	W	V	✓	
3	End Connection	100%	-do-	P	W	V	✓	
4	Check for IBR TC	100%	-do-	P	V	V	✓	

Legend:

Records identified with ' ✓ shall be essentially included by contractor in QA documentation

M= Manufacturer, C= Main vendor/Sub vendor

N= BHEL/Customer,

P= Perform, W= Witness, V= Verification

Note: 1.For IBR Valves, no physical inspection is carried out by contractor/customer.Material will be accepted based on review of IBR Test Certificates.

MAIN VENDOR/SUB-VENDOR
(SIGN WITH DATE & STAMP)

REVIEWING AGENCY
(SIGN WITH DATE & STAMP)

APPROVING AGENCY
(SIGN WITH DATE & STAMP)

 PEM MAUX		STANDARD QUALITY PLAN FOR STRUCTURAL STEEL							QUALITY PLAN NO.:PE-QP-XXX-166-A803				
									PACKAGE-FULE OIL SYSTEM				
									PROJECT-				
									REV.NO. 0 DATE: 31/03/2012				
							SHEET 1 OF 1						
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	M	C	CU	
1.0	Structural	a) Chemical Composition	M	Chemical Analysis	Sample	IS:2062/Spec./Drg.	IS:2062/Spec./Drg.	Mfr's TC	✓	P	V*	V	
		b) Mechanical test	M	Mechanical Properties	-do-	-do-	-do-	Mfr's TC	✓	P	V*	V	
		c) Dimensional conformity	M	Measurement	100%	-	-	Mfr's TC	✓	P	W**	V	
* In case material is procured from dealer, and co-related TCs are not available, check test on identified sample will be carried out at recognised testing laboratory. ** In case material is despatched directly from SAIL/IISCO plant to project site, the witnessing required is waived and material will be accepted on challan & MTC of SAIL/IISCO													
LEGEND: RECORDS IDENTIFIED WITH "✓" SHALL BE ESSENTIALLY INCLUDED BY CONTRACTOR IN QA DOCUMENT. M - MANUFACTURER C - MAIN VENDOR CU - BHEL/CUSTOMER/NOMINATED INSPECTION AGENCY "P" PERFORM, "W" WITNESS AND V VERIFICATION													
MAIN VENDOR/SUB-VENDOR (SIGN WITH DATE & STAMP)				REVIEWING AGENCY (SIGN WITH DATE & STAMP)				APPROVING AGENCY (SIGN WITH DATE & STAMP)					

 STANDARD QUALITY PLAN FOR STEEL PLATE PEM MAUX		QUALITY PLAN NO.:PE-QP-XXX-166-A804										
		PACKAGE-FULE OIL SYSTEM										
		PROJECT-										
		REV.NO. 0					DATE: 31/03/2012					
SHEET 1 OF 1												
SL. NO.	COMPONENT & OPERATIONS	CHARACTERISTICS CHECKED	CATEGORY	TYP/ METHOD OF CHECK	EXTENT OF CHECK	REFERENCE DOCUMENTS	ACCEPTANCE NORMS	FORMAT OF RECORDS	AGENCY			REMARKS
									P	W	V	
1.0	Steel Plate	a) Chemical Composition	MA	Chemical Analysis	Sample	IS:2062/Spec./Drg.	IS:2062/Spec./Drg.	Mfr's TC	3		2*,1	
		b) Mechanical test	MA	Mechanical Properties	-do-	-do-	-do-	Mfr's TC	3		2*,1	
		c) Dimensional conformity	MA	Measurement	100%	-	-	Mfr's TC	3	2**	1	
* In case material is procured from dealer, and co-related TCs are not available, check test on identified sample will be carried out at testing laboratory. ** In case material is despatched directly from SAIL/TISCO plant/Stock yard to project site, the witnessing required is waived and material will be accepted on MTC of SAIL/TISCO LEGEND CR - Critical characteristics MA - Major characteristics MI - Minor characteristics P - Agency Performing the Test. W - Agency Witnessing the Test. V - Agency Verifying the Test. 1 - BHEL 2 - Vendor 3 - Sub-vendor 4-CUSTOMER MAIN VENDOR/SUB-VENDOR (SIGN WITH DATE & STAMP) REVIEWING AGENCY (SIGN WITH DATE & STAMP) APPROVING AGENCY (SIGN WITH DATE & STAMP)												

STANDARD CHECK LIST FOR: :Safety Relief Valve
 PACKAGE-FULE OIL SYSTEM
 PROJECT-
 CHECK LIST NO.:PE-QP-XXX-166-A805
 REV.NO.0
 DATE:31/03/2012



SL. No.	TESTS/CHECKS	QUANTUM OF CHECKS	REFERENCE DOC./ ACCEPTANCE NORMS	AGENCY				REMARKS
				M	C	CU	D	
1	Review of Material TC for body & stem	One/Lot	Appd.Data Sheet/ Relevant Std.	P	V	V	✓	
2	Hydro test of body	100%	Appd.Data Sheet	P	W	V	✓	
3	Set pressure	100%	-do-	P	W	V	✓	
4	Check for IBR TC	100%	-do-	P	V	V	✓	

Legend:

Records identified with ' ✓ shall be essentially included by contractor in QA documentation

M= Manufacturer, C= Main vendor

CU=BHEL/Customer

P= Perform, W= Witness, V= Verification

For IBR Valves, no physical inspection carried out by contractor/customer. Material will be accepted based on review of IBR test certificates.

MAIN VENDOR/SUB-VENDOR
 (SIGN WITH DATE & STAMP)

REVIEWING AGENCY
 (SIGN WITH DATE & STAMP)

APPROVING AGENCY
 (SIGN WITH DATE & STAMP)

			STANDARD QUALITY PLAN FOR SUMP PUMP				QUALITY PLAN NO.: PE-QP-XXX-166-A807 PACKAGE-FULE OIL SYSTEM PROJECT- REV.NO. 0 SHEET 1 OF 2 DATE: 31/03/2012						
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	M	C	CU	D	11
1.0	RAW MATERIAL												
1.1	CASING/ROTOR(IMPELLER) HOUSING	i) SURFACE DEFECTS ii) DIMENSIONAL CONFORMITY iii) MECHANICAL & CHEMICAL TEST iv) HARDNESS TEST	MAJOR	VISUAL MEASUREMENT PHYSICAL PROPERTIES/ CHEM. ANALYSIS MEASUREMENT	100% 100% 1/HEAT 100%	APPD. DATA SHEET/ DRG./ MFR's DRG./IS:210 Gr. FG 200/RELEVANT STD.	APPD. DATA SHEET/ DRG./ MFR's DRG./IS:210 Gr. FG 200/RELEVANT STD.	IR & TC	P	V	-		
1.2	IMPELLER	i) SURFACE DEFECTS ii) DIMENSIONAL CONFORMITY iii) MECHANICAL & CHEMICAL TEST iv) HARDNESS v) DYPENETRATION TEST (AFTER MACHINING)	MAJOR	VISUAL MEASUREMENT PHYSICAL PROPERTIES/ CHEM. ANALYSIS MEASUREMENT DYPENETRATION TEST	100% 100% 1/HEAT 100% 100%	APPD. DATA SHEET/DRG. MFR's DRG./ RELEVANT STD.	APPD. DATA SHEET/DRG. MFR's DRG./ RELEVANT STD.	IR & TC	P	V	-		
1.3	SHAFT	i) DIMENSIONAL CONFORMITY ii) MECHANICAL & CHEMICAL TEST iii) UT DIA > 50MM **	MAJOR	MEASUREMENT PHYSICAL PROPERTIES/ CHEM. ANALYSIS UT	100% 1/HEAT 100%	MFR's DRG./ APPD. DATA SHEET/ MFR's CATALOGUE ASTM A388	MFR's DRG./ MFR's CATALOGUE/ RELEVANT STD. ASTM A388	IR & TC	P	V	-		
1.4	SHAFT SLEEVE	i) CHEMICAL ANALYSIS ii) HARDNESS	MAJOR	CHEMICAL MEASUREMENT	1/HEAT 100%	MFR's STD./MFR's CATALOGUE	RELEVANT STANDARD/ IS	IR & TC	P	V	-		
1.5	WEARING RINGS	i) MECHANICAL & CHEMICAL TEST ii) HARDNESS	MAJOR	PHYSICAL PROPERTIES/ CHEM. PROPERTIES MEASUREMENT	1/HEAT 100%	MFR's STD./MFR's CATALOGUE	RELEVANT STANDARD/ IS	IR & TC	P	V	-		
LEGEND: RECORDS IDENTIFIED WITH " ✓ " SHALL BE ESSENTIALLY INCLUDED BY CONTRACTOR IN QA DOCUMENT. M - MANUFACTURER C - MAIN VENDOR CU - BHEL/CUSTOMER INDICATE "P" PERFORM "W" WITNESS AND V. VERIFICATION IR - INSPECTION REPORT, MTC - MTRL/MFR'S TEST CERTIFICATES MAIN VENDOR/SUB-VENDOR (SIGN WITH DATE & STAMP)													
REVIEWING AGENCY (SIGN WITH DATE & STAMP)													
APPROVING AGENCY (SIGN WITH DATE & STAMP)													

		STANDARD QUALITY PLAN FOR SUMP PUMP				QUALITY PLAN NO.: PE-QP-XXX-166-A807 PACKAGE-FULE OIL SYSTEM PROJECT- REV.NO. 0 SHEET 2 OF 2 DATE: 31/03/2012							
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	M	C	CU	D	11
2.0	INTERNAL TEST												
2.1	CASING	SOUNDNESS OF CASTING	MAJOR	HYDROSTATIC TEST	100%	HYDROSTATIC TEST AT 200% OF PUMP RATED HEAD OR 150% SHUT OFF HEAD WHICHEVER IS HIGHER FOR 30 MTS.	NO LEAKAGE	IR & TC	P	V	V	✓	
2.2	SHAFT	DP ON SHAFT	MAJOR	DPT	100%	ASME E165	NO LINEAR DEFECTS	IR & TC	P	V	V	✓	
2.3	IMPELLER	RESIDUAL UNBALANCE	MAJOR	DYNAMIC/STATIC BALANCING	100%	ISO 1940 GR.6.3	ISO 1940 GR.6.3	IR & TC	P	V	V	✓	
3.0	FINAL INSPECTION												
3.1	OVERALL DIMENSION	DIMENSIONAL	MAJOR	MEASUREMENT	100%	APPD. DRAWING/ MFR's DRAWING	APPD. DRAWING/ MFR's DRAWING	IR & TC	P	W	W	✓	
3.2	PERFORMANCE TEST WITH LAB MOTOR	i) Q V/s HEAD ii) Q V/s POWER iii) Q V/s EFFICIENCY iv) NOISE LEVEL & VIBRATION	CRITICAL	MEASUREMENT	100%	APPD.DRG./MFR's DRG./APPROVED. DATASHEET/HIS	APPD.DRG./MFR's DRG./APPROVED. DATASHEET/HIS	IR & TC	P	W	W	✓	
3.3	STRIP TEST	STRIP TEST	CRITICAL	VISUAL (WEAR & TEAR)		**	85 dBA MAX. AT 1Mtr, & 75 MICRON MAX. NO UNDUE WEAR	IR & TC	P	W	W	✓	
3.4	REVIEW OF DOCUMENTATIONS					APPD. QAP	APPD. QAP		V	V	V	✓	
3.5	PAINTING	VISUAL	MINOR	VISUAL	100%	SPECIFICATION/ PAINTING SCH-EDULE/Mfr's Std.	SPECIFICATION/ PAINTING SCH-EDULE/Mfr's Std.	IR	P	V	-		** STRIP DOWN TEST ON 100% BASIS SHALL BE DONE INCASE ABNORMAL PERFORMANCE OTHERWISE SAME SHALL BE RESTRICTED TO BEARING INSPECTION ONLY
NOTE: ALL MATERIAL OF CONSTRUCTION SHALL BE AS PER APPROVED DATA SHEET/DRAWING													
LEGEND: RECORDS IDENTIFIED WITH " ✓ " SHALL BE ESSENTIALLY INCLUDED BY CONTRACTOR IN QA DOCUMENT. M - MANUFACTURER C - MAIN VENDOR CU - BHEL/CUSTOMER INDICATE "P" PERFORM "W" WITNESS AND V VERIFICATION IR - INSPECTION REPORT, MTC - MTRL./MFR'S TEST CERTIFICATES													
MAIN VENDOR/SUB-VENDOR (SIGN WITH DATE & STAMP)				REVIEWING AGENCY (SIGN WITH DATE & STAMP)				APPROVING AGENCY (SIGN WITH DATE & STAMP)					

		STANDARD QUALITY PLAN FOR BALL VALVE					QUALITY PLAN NO.:PE-QP-XXX-166-A808 PACKAGE-FULE OIL SYSTEM PROJECT- REV.NO. 0 SHEET 1 OF 3							DATE: 31/03/2012	
SL. NO.	COMPONENT & OPERATION	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK	REFERENCE DOCUMENT	ACCEPTANCE NORM	FORMAT OF RECORD	AGENCY				REMARKS		
1	2	3	4	5	6	7	8	9	D	M	C	CU	10		
1.0 1.1	MATERIALS: BODY & END PIECE	CHEMICAL COMPOSITION	CRITICAL	CHEM. TEST	ONE/ HEAT	APPD.DRG./ DATA SHEET	APPD.DRG./ DATA SHEET/ RELEVANT STD.	MATRL. TC/ MFR'S TC	✓	P	V	V			
		MECHANICAL PROPERTIES	- DO -	MECH. TEST	ONE/HEAT/ HEAT TREAT- MENT BATCH	- DO -	- DO -	- DO -	✓	P	V	V			
		HEAT TREATMENT	- DO -	REVIEW OF HT CHART	100%	- DO -	- DO -	- DO -/HT CHART	✓	P	V	V			
		IDENTIFICATION & CORRELATION	MAJOR	VISUAL	100%	- DO -	- DO -	INTERNAL RECORD		P	V	-			
		SURFACE DEFECTS	- DO -	- DO -	100%	MSS-SP-55	FREE FROM DEFECTS	- DO -	✓	P	V	-			
		DIMENSIONAL	- DO -	MEASU- REMENT	100%	APPD. DRG./ RELEVANT STD.	APPD. DRG./ RELEVANT STD.	LOG BOOK		P	V	-			
LEGEND: RECORDS, IDENTIFIED WITH ✓ ' SHALL BE ESSENTIALLY INCLUDED BY CONTRACTOR IN QA DOCUMENTATION. M: MANUFACTURER . C:MAIN VENDOR, CU: BHEL/CUSTOMER INDICATE "P" PERFORM, "W" WITNESS AND "V" VERIFICATION															
MAIN VENDOR/SUB-VENDOR (SIGN WITH DATE & STAMP)				REVIEWING AGENCY (SIGN WITH DATE & STAMP)				APPROVING AGENCY (SIGN WITH DATE & STAMP)							



STANDARD QUALITY PLAN FOR
BALL VALVE

QUALITY PLAN NO.:PE-QP-XXX-166-A808

PACKAGE-FULE OIL SYSTEM

PROJECT-

REV.NO.
SHEET

0
2 OF 3

DATE: 31/03/2012

SL. NO.	COMPONENT & OPERATION	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK	REFERENCE DOCUMENT	ACCEPTANCE NORM	FORMAT OF RECORD	AGENCY				REMARKS
									D	M	C	CU	
1	2	3	4	5	6	7	8	9	10				11
1.2	BALL, SPINDLE, GLAND, LEVER FASTENERS	CHEMICAL COMPOSITION	CRITICAL	CHEM. TEST	ONE/ HEAT	APPD.DRG./ DATA SHEET	APPD.DRG./ DATA SHEET/ RELEVANT STD.	TEST CERT.	✓	P	V	V	
		MECHANICAL PROPERTIES	- DO -	MECH. TEST	ONE/HEAT/ HEAT TREATMENT BATCH	- DO -	- DO -	- DO -	✓	P	V	V	
		HEAT TREATMENT (as applicable)	- DO -	REVIEW OF HT CHART	100%	- DO -	- DO -	- DO - / HT CHART	✓	P	V	V	
		SURFACE DEFECTS	MAJOR	- DO -	100%	MSS-SP-55	FREE FROM DEFECTS	- DO -	✓	P	V	-	
		DIMENSIONS	- DO -	MEASUREMENT	100%	APPD. DRG./ RELEVANT STD.	- DO -	LOG BOOK		P	V	-	
1.3	BODY SEAL, STEM SEAL, GLAND PACKING	DIMENSIONS	- DO -	- DO -	100%	- DO -	- DO -	INTERNAL RECORD		P	V	-	
		TEMPERATURE RESISTANCE	- DO -	TEMP. CHECK	100%	PTFE /RELEVANT STD.	RELEVANT STD.	TEST CERTIFICATE	✓	P	V	V	
2.0	IN-PROCESS INSPECTION:												
2.1	MACHINING OF BODY END-PIECE GLAND BALL, SPINDLE	DIMENSIONS	-DO-	MEASUREMENT	100%	MFG. DRG.	MFG. DRG.	LOG BOOK		P	V	-	
		SURFACE FINISH	- DO -	VISUAL	100%	- DO -	MFG. DRG./MFG. STD.	- DO -		P	V	-	
2.2	BALL, SPINDLE	HARDNESS	-DO -	HARDNESS TEST	100%	APPD. DRG./ DATA SHEET/ TECH.SPEC.	APPD. DRG./ DATA SHEET/ TECH.SPEC./MFG. STD.	TEST CERT.	✓	P	V	V	
		SURFACE DEFECTS	CRITICAL	DPT	100%	ASTM-E-165	NO LINEAR INDICATION	INTERNAL RECORD	✓	P	V	-	

LEGEND:
RECORDS, IDENTIFIED WITH ✓ ' SHALL BE ESSENTIALLY INCLUDED BY CONTRACTOR IN QA DOCUMENTATION.

M: MANUFACTURER .
C: MAIN VENDOR, CU: BHEL/CUSTOMER
INDICATE "P" PERFORM, "W" WITNESS AND "V" VERIFICATION

MAIN VENDOR/SUB-VENDOR
(SIGN WITH DATE & STAMP)

REVIEWING AGENCY
(SIGN WITH DATE & STAMP)

APPROVING AGENCY
(SIGN WITH DATE & STAMP)

		STANDARD QUALITY PLAN FOR BALL VALVE					QUALITY PLAN NO.:PE-QP-XXX-166-A808 PACKAGE-FULE OIL SYSTEM PROJECT- REV.NO. 0 SHEET 3 OF 3 DATE: 31/03/2012							
SL NO.	COMPONENT & OPERATION	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK	REFERENCE DOCUMENT	ACCEPTANCE NORM	FORMAT OF RECORD	AGENCY				REMARKS	
									D	M	C	CU		
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
2.3	BALL & SEAT	BLUE MATCH	CRITICAL	BLUE MATCHING	100%	THE SURFACE WILL BE SMOOTH & WILL HAVE UNIFORM METAL TO METAL CONTACT	SAME AS COL.7	LOG BOOK	✓	P	V	V		
3.0	<u>ASSEMBLY</u>	DIMENSIONS	MAJOR	MEASUREMENT	*AS PER NOTE-1 BELOW	APPD. DRG./RELEVANT STD.	APPD. DRG./RELEVANT STD.	INTERNAL RECORD	✓	P	W	W		
		OPENING & CLOSING	- DO -	OPERATION	- DO -	SMOOTH OPERATION OF VALVE	- DO -	- DO -	✓	P	W	W		
4.0	<u>TESTING:</u>													
4.1	SHELL	LEAKAGE	CRITICAL	HYDRO-STATIC	*AS PER NOTE-1 BELOW	APPD. DRG./DATA SHEET	NO LEAKAGE	TEST CERTIFICATE	✓	P	W	W		
4.2	SEAT	- DO -	- DO -	- DO -	- DO -	- DO -	- DO -	- DO -	✓	P	W	W		
4.3	SEAT	- DO -	- DO -	AIR	- DO -	- DO -	- DO -	- DO -	✓	P	W	W		
4.4	FIRE SAFE TEST REPORT WITNESSED BY LLOYD/BV SHALL BE FURNISHED FOR REVIEW													
4.5	REVIEW OF QA DOCUMENTATION AS PER APPD. QP													
5.0	<u>PAINTING :</u>	QUALITY & THICKNESS OF PAINT	MAJOR	VISUAL & MEASUREMENT	100%	TECH. SPEC./DATA SHEET/MFG. STD.	SAME AS COL.7	INTERNAL RECORD		P	V	-		
6.0	<u>PACKING:</u>		MAJOR	VISUAL	100%			INTERNAL RECORD		P	-	-		
NOTE-1: 100% BY MANUFACTURER 10% BY TECHNO For Actuator operating valves - Actuator test certificate shall be furnished to BHEL for review. For Fire safe valves - valves are to be accepted based on fire test certificates														
LEGEND: RECORDS, IDENTIFIED WITH ' ' SHALL BE ESSENTIALLY INCLUDED BY CONTRACTOR IN QA DOCUMENTATION. M: MANUFACTURER . C: MAIN VENDOR, CU: BHEL/CUSTOMER INDICATE "P" PERFORM, "W" WITNESS AND "V" VERIFICATION														
MAIN VENDOR/SUB-VENDOR (SIGN WITH DATE & STAMP)					REVIEWING AGENCY (SIGN WITH DATE & STAMP)					APPROVING AGENCY (SIGN WITH DATE & STAMP)				

STANDARD QUALITY PLAN FOR CS PIPE -ERW								QUALITY PLAN NO.:PE-QP-XXX-166-A809 PACKAGE-FULE OIL SYSTEM PROJECT- REV.NO. 0 SHEET 1 OF 1					DATE: 31/03/2012	
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	M	C	CU	11	
1.0	ERW PIPE	a) Physical & Chemical test	M	Physical & Chemical Properties	Sample	IS:1239 Pt.1/ API 5L Gr. B/ Appd. Data sheet	IS:1239 Pt.1/ API 5L Gr. B/ Appd. Data sheet	MTC/ Mfr's TC	✓	P	V	V	Refer Note-1	
		b) Dimensional conformity	M	Measurement	At random	-do-	-do-	MTC/ Mfr's TC	✓	P	V	V		
		c) Hydro test	M	Leak test	100%	-do-	-do-	MTC/ Mfr's TC	✓	P	V	V		
Note-1: In case material is procured from dealer, and co-related Mfr's TCs are not available, check test on identified sample will be carried out at testing laboratory and hydro test at pressure 1.5 times of design pressure on 10% of total quantity will be witnessed by BHEL.														
LEGEND: RECORDS IDENTIFIED WITH " " SHALL BE ESSENTIALLY INCLUDED BY CONTRACTOR IN QA DOCUMENT. M - MANUFACTURER C - MAIN VENDOR CU - BHEL/CUSTOMER "P" PERFORM, "W" WITNESS AND V VERIFICATION														
MAIN VENDOR/SUB-VENDOR (SIGN WITH DATE & STAMP)						REVIEWING AGENCY (SIGN WITH DATE & STAMP)				APPROVING AGENCY (SIGN WITH DATE & STAMP)				



STANDARD QUALITY PLAN FOR
CCS /CFS GATE,GLOBE & CHECK VALVE
(UP TO 50 NB-FCS #800 & 1 NO. 50 NB GLOBE
VALVE #600) (65 NB & ABOVE CCS # 150)

QUALITY PLAN NO.:PE-QP-XXX-166-A810

PACKAGE-FULE OIL SYSTEM

PROJECT-

REV.NO. 0

DATE: 31/03/2012

SHEET 1 OF 2

SL. NO.	COMPONENT & OPERATIONS	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK	REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD	AGENCY				REMARKS
									D	M	C	N	
1	2	3	4	5	6	7	8	9	10	11	12	13	11
1	Raw Material:												
	Body, bonet, gld.,Flange, Disc, / wedge	Chem. & mech. Test Dimensions Surface quality	CR MR MR	Chem.& mech.Test Measurement Visual	Per Heat 100% 100%	Appd.Drg./ Mfg. Drg./ Data Sheet Mfg. Drg./ Data Sheet	Relevant Standard Mfg. Drg./ Data Sheet Defect Free	MTC IR IR	✓ ✓ ✓	P P P	V V V	V V V	Body will carry the heat mark for co-relation with CMT
1.1	Stem,body seat ring,gland.	Chem. & mech. Test	CR	Chem.& mech.Test	Per Heat	Appd.Drg./Relevant Std.	Appd.Drg./Relevant Std.	MTC	✓	P	V	V	
1.2	Fasteners	Chem. & mech. Test	MR	Chem.& mech.Test	Per Heat	Appd.Drg./Relevant Std.	Appd.Drg./Relevant Std.	IR	✓	P	V	V	
1.3	Gasket & gland packing	Compliance to PO	MR	Measurement	100%	Appd.Drg./Relevant Std.	Appd.Drg./Relevant Std.	IR	✓	P	V	V	
2.0	In Process Inspection												
2.1	Machining of valves components	Surface quality Dimension	MR MR	Visual Measurement	100% 100%	Mfg. Drg. Mfg. Drg.	Mfg. Drg. Mfg. Drg.	IR IR	✓ ✓	P P	V V	V V	
2.2	Spindle	Surface finish	MR	Measurement	100%	Mfg. Drg.	Mfg. Drg.	IR	✓	P	V	V	
2.3	Wedge / disc , seatring, stem & back seat	Lapping	MR	Blue Matching	100%	100% metal to metal contact	100% metal to metal contact	IR	✓	P	V	V	

LEGEND:
RECORDS IDENTIFIED WITH " ✓ " SHALL BE ESSENTIALLY INCLUDED BY CONTRACTOR IN QA DOCUMENT.

M MANUFACTURER/SUB-CONTRACTOR
C CONTRACTOR/NOMINATED INSPECTION AGENCY,
N CUSTOMER. INDICATE "P" PERFORM "W" WITNESS AND
V VERIFICATION AS APPROPRIATE CHP
SHALL IDENTIFIED IN COLUMN "N"
IR - INSPECTION REPORT, CMT-CERTIFICATE OF MATERIAL &TEST

MAIN VENDOR/SUB-VENDOR
(SIGN WITH DATE & STAMP)

REVIEWING AGENCY
(SIGN WITH DATE & STAMP)

APPROVING AGENCY
(SIGN WITH DATE & STAMP)

STANDARD QUALITY PLAN FOR CCS /CFS GATE,GLOBE & CHECK VALVE (UP TO 50 NB-FCS #800 (65 NB & ABOVE CCS # 150)								QUALITY PLAN NO.:PE-QP-XXX-166-A810 PACKAGE-FULE OIL SYSTEM PROJECT- REV.NO. 0 SHEET 2 OF 2 DATE: 31/03/2012					
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	M	C	N	11
3.0	Testing & Final Inspection												
3.1	Performance	Operation	CR	Manual	100%	Appd. Drg./Data Sheet	Should be smooth	IR	✓	P	W	W*	Not Applicable for Check Valve *RANDOM 10% BY CUSTOMER
3.2	Shell &Sheet / backseat	Pr. Testing	CR	Hyd. Testing	100%	Appd. Drg./Data Sheet	Relevant Standard / Data Sheet	CMT	✓	P	W	W*	
3.3	Seat	Pr. Testing	CR	Pneumatic Testing	100%	Appd. Drg./Data Sheet	Relevant Standard / Data Sheet	CMT	✓	P	W	W*	
3.4	Valve Assembly	1. Chk. For completeness/ Visual Inspection	MR	Visual	100%	Appd. Drg. / Tech. Spec. / Data Sheet	Appd. Drg./Data Sheet	IR	✓	P	W	W*	
		2. Dimention	MR	Measurement	10%	Appd. Drg./Data Sheet	Appd. Drg./Data Sheet	IR	✓	P	W	W*	
		3. Wear Travel / valve lift	MR	Manual	100%	Appd. Drg.	Appd. Drg.	IR	✓	P	W	W*	
4.0	Painting & Packaging												
		1. Painting & Packaging	MR	Manual	100%	Appd. Drg. / Tech. Spec.	Appd. Drg. / Tech. Spec.	IR		P	V		
		2. Tagging	MR	Manual	100%	Appd. Drg. / Tech. Spec.	Appd. Drg. / Tech. Spec.	PS / RS		P	V		
LEGEND: RECORDS IDENTIFIED WITH " ✓ " SHALL BE ESSENTIALLY INCLUDED BY CONTRACTOR IN QA DOCUMENT. M MANUFACTURER/SUB-CONTRACTOR C CONTRACTOR/NOMINATED INSPECTION AGENCY, N CUSTOMER. INDICATE "P" PERFORM "W" WITNESS AND V VERIFICATION AS APPROPRIATE CHP SHALL IDENTIFIED IN COLUMN "N" IR - INSPECTION REPORT, CMT-CERTIFICATE OF MATERIAL &TEST													
MAIN VENDOR/SUB-VENDOR (SIGN WITH DATE & STAMP)				REVIEWING AGENCY (SIGN WITH DATE & STAMP)				APPROVING AGENCY (SIGN WITH DATE & STAMP)					



**STANDARD QUALITY PLAN FOR
OIL STRAINER**

QUALITY PLAN NO.: PE-QP-XXX-166-A811
PACKAGE-FULE OIL SYSTEM

PROJECT-

REV.NO. 0 **DATE:** 31/03/2012
SHEET 1 OF 2

SL. NO.	COMPONENT & OPERATIONS	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK	REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD	AGENCY				REMARKS
									D	M	C	CU	
1	2	3	4	5	6	7	8	9	10				11
1.0	Raw Material												
1.1	Body, flange, dished end	Physical & Chemical Properties	MA	Physical & Chemical Test	1/Sample	Appd. Drg.	Appd. Drg./ Mfg.Std.	Mtrl.TC	✓	P	V	V	
1.2	Screen	1. Chem. composition	MA	Chem. Test	1/Sheet	- do -	- do -	- do -	✓	P	V	V	
		2. Dimension, Mesh Size	MA	Meas.	100%	- do -	- do -	log book		P	V	V	
2.0	In Process												
2.1	Welding Procedure Specification	Parameter	MA	Verification	100%	ASME-IX	ASME-IX	QW-482	✓	P	V	V	BHEL approved WPS & PQR Shall be furnished for review.
2.2	Procedure Qualification Record & Welder Qualification	Weld Soundness/ Qualification	MA	Qualification test RT	100%	ASME-IX	ASME-IX	QW-483/484	✓	P	V	V	
3.0	Weld fit up	Dimension alignment orientation	MA	Meas./ Visual	100%	Appd. WPS	Appd. WPS	log book		P	V	V	
4.0	Weldments - Final Run (all welds)	Surface Defect	MA	Penetration Test	10%	ASTME-165	No defects	- do -	✓	P	V	V	
4.1	Root run (butt welds & back gauged welds)	-do-	MA	-do-	100%	-do-	-do-	-do-	✓	P	V	V	

LEGEND:
RECORDS IDENTIFIED WITH ✓ " SHALL BE ESSENTIALLY INCLUDED BY CONTRACTOR IN QA DOCUMENT.

"M" MANUFACTURER
"C" MAIN VENDOR
CU - BHEL/CUSTOMER
INDICATE "P" PERFORM "W" WITNESS AND"
V" VERIFICATION

MAIN VENDOR/SUB-VENDOR
(SIGN WITH DATE & STAMP)

REVIEWING AGENCY
(SIGN WITH DATE & STAMP)

APPROVING AGENCY
(SIGN WITH DATE & STAMP)



**STANDARD QUALITY PLAN FOR
OIL STRAINER**

QUALITY PLAN NO.: PE-QP-XXX-166-A811
PACKAGE-FULE OIL SYSTEM

PROJECT-

REV.NO. 0 **DATE:** 31/03/2012

SHEET 2 OF 2

SL. NO.	COMPONENT & OPERATIONS	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK	REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD	AGENCY				REMARKS
									D	M	C	CU	
1	2	3	4	5	6	7	8	9	10				11
5.0	Assembly of Internal Fittings Basket placement	Orientation Location of Tapping Points & fitting of Internals	MA	Visual & Meas.	100%	Appd. Drg.	Appd. Drg./ Mfg.Std.	log book		P	V	V	
6.0	<u>Final Assembly</u>												
6.1	Final Inspection	Completeness Cleanliness Dimension	MA	Visual & Meas.	100%	- do -	Appd. Drg./ Data Sheet	Inspection Report		P	W	W	
		Leak tightness	CR	Hyd. Test at 1.5 times of design pr. for 30 min.	100%	- do -	No leakage	Test Record	✓	P	W	W	
7.0	Review of QA Documents as per QP												

LEGEND:
RECORDS IDENTIFIED WITH "✓" SHALL BE ESSENTIALLY INCLUDED BY CONTRACTOR IN QA DOCUMENT.

"M" MANUFACTURER
"C" MAIN VENDOR
CU - BHEL/CUSTOMER
INDICATE "P" PERFORM "W" WITNESS AND
V" VERIFICATION

MAIN VENDOR/SUB-VENDOR
(SIGN WITH DATE & STAMP)

REVIEWING AGENCY
(SIGN WITH DATE & STAMP)

APPROVING AGENCY
(SIGN WITH DATE & STAMP)

		STANDARD QUALITY PLAN FOR POSITIVE DISPLACEMENT PUMP (SINGLE/TWIN SCREW PUMP)						QUALITY PLAN NO.:PE-QP-XXX-166-A812 PACKAGE-FULE OIL SYSTEM PROJECT- REV.NO. 0 SHEET 1 OF 2 DATE: 31/03/2012					
SL. NO. 1	COMPONENT & OPERATIONS 2	CHARACTERISTICS 3	CLASS 4	TYPE OF CHECK 5	QUANTUM OF CHECK 6	REFERENCE DOCUMENT 7	ACCEPTANCE NORMS 8	FORMAT OF RECORD 9	AGENCY				REMARKS 11
									D	M	C	CU	
1.0	Raw Material & Bought Out Items												
1.1	Casing, stuffing box & end cover	i) Chemical test	MA	Chemical Analysis	Sample/ heat	Appd. Data Sheet/ Appd. Drg./ IS:210 FG260	Same as Cl.7	Material TC	✓	P	V	V	
		ii) Physical test	MA	Physical Properties	Sample/ heat	- do -	Same as Cl.7	Material TC	✓	P	V	V	
		iii) Hardness	MA	Meas.	At random	As per Appd. Data Sheet	- do -	Material TC	✓	P	V	V	
1.2	Shaft, Rotor, Step-up gear, Timing gear	i) Chemical test	MA	Chemical Analysis	Sample/ heat	As per Appd. Data Sheet/ Drg.	Same as Cl.7	Material TC	✓	P	V	V	
		ii) Physical test	MA	Physical Properties	- do -	- do -	Same as Cl.7	Material TC	✓	P	V	V	
		iii) Heat treatment	MA	Heat treatment	100%	- do -	- do -	HT Chart	✓	P	V	V	
		iv) Hardness	MA	Meas.	- do -	- do -	- do -	- do -	✓	P	V	V	
1.3	Bearing	Make, size & bearing No.	MA	Visual	100%	Mfg. Drawing/ Mfg. Catalogue	- do -	Log Book		P	-	-	
2.0	In Process Control												
2.1	Machining of all Components	i) Dimension	MA	Meas.	100%	- do -	- do -	- do -		P	V	V	
		ii) Surface finish	MA	Visual	100%	- do -	- do -	- do -		P	-	-	
2.2	Casing	Pressure test	MA	Hyd. Test with water	100%	1.5 x max. discharge pr. for 15 minutes.	No leakage/Seepage	Test Report	✓	P	V	V	
2.3	Shaft, Rotor/Screw, Step-up gear, timing gear	1. Internal Defects	CR	UT(after skin - machining)	100%	ASTM A388	Refer Note.1 (page2)	Test Report	✓	P	V	V	
		2. Surface Defects	CR	DPT(after - final machining)	100%	ASTM E:165	No linear indication >1.6mm	Test Report	✓	P	V	V	
		3. Case Hardness of timing gear	CR	Hardness	100%	EN-36 to BS970/ As per data sheet	After case carburising, hardened & tempered to have tooth hardness of 56 to 59 HRC	H T report	✓	P	V	V	NA
2.4	Balancing of Rotor Assly.	Static & Dynamic	CR	Balancing	100%	VDI 2060 Cl. 6.3/ ISO 1940 Gr.6.3	ISO 1940 Gr.6.3	Test Report	✓	P	V	V	only in case of Twin Screw Pump
LEGEND: RECORDS IDENTIFIED WITH ✓ " SHALL BE ESSENTIALLY INCLUDED BY CONTRACTOR IN QA DOCUMENT. "M" MANUFACTURER "C" MAIN VENDOR "CU" BHEL/CUSTOMER.. "P" PERFORM "W" WITNESS AND "V" VERIFICATION													
MAIN VENDOR/SUB-VENDOR (SIGN WITH DATE & STAMP)				REVIEWING AGENCY (SIGN WITH DATE & STAMP)				APPROVING AGENCY (SIGN WITH DATE & STAMP)					



**STANDARD QUALITY PLAN FOR
POSITIVE DISPLACEMENT PUMP
(SINGLE/TWIN SCREW PUMP)**

QUALITY PLAN NO.:PE-QP-XXX-166-A812

PACKAGE-FULE OIL SYSTEM

PROJECT-

REV.NO. 0
SHEET 2 OF 2

DATE: 31/03/2012

SL. NO.	COMPONENT & OPERATIONS	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK	REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD	D	AGENCY			REMARKS
										M	C	CU	
1	2	3	4	5	6	7	8	9	D	10	10	CU	11
3.0	Assembly Control Final Inspection & Testing:												
3.1	Pump Assembly	i) Completeness, correctness, overall dimension	MA	Visual & Meas.	100%	Appd. Drg.	Same as Cl.7	Log Book	✓	P	W	W	
3.2	Performance Test - with test bed motor	1.Performance for capacity, head,power consp., speed, efficiency.	CR	Performance Test	100%	VDMA/ HIS/Appd. Data sheet	Appd. Data sheet/curves/ VDMA/HIS	Test Report	✓	P	W	W	
		2. NPSHR for twin Screw pump	CR	- do -	10%	-do-	Appd. Data sheet/curves Appd. Document	- do -	✓	P	W	W	
		3. Vibration/Noise	CR	- do -	100%	Appd. Data Sheet/ Value given in Cl.8	75 micron at bearings 85 dbA measured at a distance of 1 mtr. Same as Cl.7	- do -	✓	P	W	W	Noise & vibration value measured at shop is for reference only.
		4. Relief valve set pr.	CR	- do -	100%	Appd. Data Sheet		- do -	✓	P	W	W	
3.3	Review of QA Documentation as per approved QP			-	-	-	-	-		V	V	V	
3.4	Painting	Surface Preparation & shade of painting	MA	Visual	100%	As per Mfg. Std.	Same as Cl.7	-		P	V	-	
Note: 1. Defect giving echo height more than 20% on total CRT Screen height shall be treated as unacceptable.. Defect causing reduction in backwall echo less than 80% of Screen height shall be treated as unacceptable. Frequency 2 MHz min. 2. In case of mismatch in material in QP with Data Sheet, the material indicated in approved data sheet will be final.													
LEGEND: RECORDS IDENTIFIED WITH ✓ " SHALL BE ESSENTIALLY INCLUDED BY CONTRACTOR IN QA DOCUMENT. "M" MANUFACTURER "C" MAIN VENDOR "CU" BHEL/CUSTOMER.. "P" PERFORM "W" WITNESS AND "V" VERIFICATION													
MAIN VENDOR/SUB-VENDOR (SIGN WITH DATE & STAMP)				REVIEWING AGENCY (SIGN WITH DATE & STAMP)				APPROVING AGENCY (SIGN WITH DATE & STAMP)					

		STANDARD QUALITY PLAN FOR CS PIPE -SEAMLESS						QUALITY PLAN NO.:PE-QP-XXX-166-A813 PACKAGE-FULE OIL SYSTEM PROJECT- REV.NO. 0 DATE: 31/03/2012 SHEET 1 OF 1					
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	M	C	CU	11
1.0	SEAMLESS PIPE	a) Physical & Chemical test	M	Physical & Chemical Properties	Sample	ASTM A106 Gr.B/ Appd. Data sheet	ASTM A106 Gr.B/ Appd. Data sheet/ Relevant Std.	MTC/ Mfr's TC	✓	P	V	V	Refer Note-1
		b) Dimensional conformity	M	Measurement	100%	-do-	-do-	MTC/ Mfr's TC/IR	✓	P	V	V	
		c) Hydro test	M	Leak test	100%	-do-	-do-	MTC/ Mfr's TC	✓	P	V	V	
Note-1: In case material is procured from dealer, and co-related Mfr's TCs are not available, check test on identified sample will be carried out at testing laboratory and hydro test at pressure 1.5 times of design pressure on 10% of total quantity will be witnessed by BHEL													
LEGEND: RECORDS IDENTIFIED WITH " ✓ " SHALL BE ESSENTIALLY INCLUDED BY CONTRACTOR IN QA DOCUMENT. M - MANUFACTURER C - MAIN VENDOR CU - BHEL/CUSTOMER "P" PERFORM, "W" WITNESS AND V VERIFICATION													
MAIN VENDOR/SUB-VENDOR (SIGN WITH DATE & STAMP)				REVIEWING AGENCY (SIGN WITH DATE & STAMP)				APPROVING AGENCY (SIGN WITH DATE & STAMP)					

STANDARD QUALITY PLAN FOR IB TYPE & TD TYPE STEAM TRAP 25NB & 15NB								QUALITY PLAN NO.: PE-QP-XXX-166-A814 PACKAGE-FULE OIL SYSTEM PROJECT- REV.NO. 0 DATE: 31/03/2012 SHEET 1 OF 1						
SL. NO. 1	COMPONENT & OPERATIONS 2	CHARACTERISTICS 3	CLASS 4	TYPE OF CHECK 5	QUANTUM OF CHECK 6	REFERENCE DOCUMENT 7	ACCEPTANCE NORMS 8	FORMAT OF RECORD 9	AGENCY				REMARKS 11	
									D	M	C	CU		
1	Raw Material Body, Filter cap, Disc, Cover & Filter screen	i) Chemical Composition	Major	Chemical Analysis	Sample Check	As per Appd. Drg./ Data Sheet	As per Appd. Drg./ Data Sheet	MTC	✓	P	V	V		
		ii) Mechanical Test	Major	Physical properties	- do -	- do -	- do -	- do -	- do -		P	V		V
2	Final Inspection	i) Visual	Major	Visual Inspn.	100%	As per Appd. Drg.	As per Appd. Drg.	Inspn. Report		P	W	V		
		ii) Dimension	Major	Meas.	100%	- do -	- do -	- do -	- do -		P	W		V
		iii) Hyd. Test	Major	Leak Test	100%	As per Appd. Drg./ Data sheet	As per Appd. Drg./ Data sheet	Test Report	✓	P	W	V		
3	Review of QA Documents as per approved QP									V	V	V		IBR certificate as applicable shall be furnished as part of QA documentation.
LEGEND: RECORDS IDENTIFIED WITH " ✓ " SHALL BE ESSENTIALLY INCLUDED BY CONTRACTOR IN QA DOCUMENT. M - MANUFACTURER C - MAIN VENDOR CU - BHEL/CUSTOMER. INDICATE "P" PERFORM "W" WITNESS AND V VERIFICATION IR - INSPECTION REPORT, MTC - MTRL./MFR'S TEST CERTIFICATES														
MAIN VENDOR/SUB-VENDOR (SIGN WITH DATE & STAMP)				REVIEWING AGENCY (SIGN WITH DATE & STAMP)				APPROVING AGENCY (SIGN WITH DATE & STAMP)						

STANDARD QUALITY PLAN FOR SUCTION HEATER (HEAT EXCHANGER)								QUALITY PLAN NO.: PE-QP-XXX-166-A815 PACKAGE-FULE OIL SYSTEM PROJECT- REV.NO. 0 DATE: 31/03/2012 SHEET 1 OF 1					
SL. NO. 1	COMPONENT & OPERATIONS 2	CHARACTERISTICS 3	CLASS 4	TYPE OF CHECK 5	QUANTUM OF CHECK 6	REFERENCE DOCUMENT 7	ACCEPTANCE NORMS 8	FORMAT OF RECORD 9	AGENCY				REMARKS 11
									D	M	C	N	
									10				
1.	<u>Materials</u>												
	a) Shell, plates for tube sheet, & Dished end	i) Chemical Composition	Major	Chemical Analysis	Sample	Appd.Drg./ASME SEC-II	Same as Cl.7	Material Test Cert.	✓	P	V	V	
		ii) Mechanical Test	Major	Physical Properties	- do -	- do -	- do -	- do -	✓	P	V	V	
	b) Tubes	i) Chemical Composition	Major	Chemical Analysis	- do -	- do -	- do -	- do -	✓	P	V	V	
		ii) Mechanical Test	Major	Physical Properties	- do -	- do -	- do -	- do -	✓	P	V	V	
2.	<u>In Process Inspection</u>												
A.	U-Tube	i) Thinning Test on tubes	Major	By Destruction test	Sample	TEMA' C/Appd. Drg.	17% thinning	Inspn. Report	✓	P	V	V	
		ii) Mock-up Test on tube to tube sheet joint	Major	- do -	100%	- do -	- do -	- do -	✓	P	V	V	
		iii) Dimensional Check	Major	By Meas.	100%	Appd. Drg.	- do -	- do -		P	V	-	
		iv) Hydraulic Test (for tube bundle)	Major	Hydraulic	100%	Appd. Drg.	No Leakage	- do -	✓	P	V	V	
B.	Shell	a) Welding Procedure	Major	WPS	100%	ASME-Sec.IX	Same as Cl.7	QW-482	✓	P	V	V	
		b) Welder Procedure Qualification Test	Major	PQR	100%	- do -	- do -	QW-483	✓	P	V	V	WPS to be approved by BHEL/ NTPC. Qualified welders only to be employed.
LEGEND: RECORDS IDENTIFIED WITH "TICK" SHALL BE ESSENTIALLY INCLUDED BY CONTRACTOR IN QA DOCUMENT. "M" MANUFACTURER/SUB-CONTRACTOR "C" CONTRACTOR/NOMINATED INSPECTION AGENCY. "N" CUSTOMER. INDICATE "P" PERFORM "W" WITNESS AND "V" VERIFICATION AS APPROPRIATE CHP SHALL IDENTIFIED IN COLUMN "N"													
MAIN VENDOR/SUB-VENDOR (SIGN WITH DATE & STAMP)				REVIEWING AGENCY (SIGN WITH DATE & STAMP)				APPROVING AGENCY (SIGN WITH DATE & STAMP)					

		STANDARD QUALITY PLAN FOR SUCTION HEATER (HEAT EXCHANGER)						QUALITY PLAN NO.:PE-QP-XXX-166-A815 PACKAGE-FULE OIL SYSTEM PROJECT-REV.NO. 0 SHEET 1 OF 1 DATE: 31/03/2012					
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	M	C	N	11
3.	Tube Sheets	c) Dimensional Check	Major	Meas.	100%	Appd. Drg.	Same as Cl.7	Inspn. Report		P	V	-	
	Final Inspection Finished Product after completion	a) Dimensional Check	Major	Meas.	100%	- do -	- do -	- do -		P	V	-	
		b) Assembly Check	Major	Visual	100%	- do -	- do -	- do -		P	V	-	
		i) Welding	Major	Visual	100%	Appd. WPS	- do -	- do -		P	V	V	
		ii) NDT for Shell fabrication	Major	DP test	100%	ASME SEC-V	- do -	- do -		P	V	V	
		iii) NDT for Dished end to Shell joint	Major	Spot Radiography	10%	- do -	- do -	Radiography Report	✓	P	V	V	
		iv) NDT for Shell to Tube sheet joint	Major	DP test	100%	- do -	- do -	Inspn. Report		P	V	V	
		v) NDT for Dish fabrication	Major	DP test on Knuckle	100%	- do -	- do -	- do -		P	V	V	
		vi) Dimensional Check	Major	Meas.	100%	Appd. Drg.	- do -	- do -	✓	P	W	W	
		vii) Hydraulic Test for Shell side and tube side	Critical	Hydrostatic	100%	Appd. Drg./ 1.5 x Design Pr.	No Leakage	- do -	✓	P	W	W	
viii) Review of QA Document as per approved QP	-	-	-	-	-	-	-	-	-	-			
ix) Painting	Major	Visual	100%	Mfg. Std.	Same as Cl.7	-		P	-	-			
LEGEND: RECORDS IDENTIFIED WITH "TICK" SHALL BE ESSENTIALLY INCLUDED BY CONTRACTOR IN QA DOCUMENT. "M" MANUFACTURER/SUB-CONTRACTOR "C" CONTRACTOR/NOMINATED INSPECTION AGENCY, "N" CUSTOMER. INDICATE "P" PERFORM "W" WITNESS AND "V" VERIFICATION AS APPROPRIATE CHP SHALL IDENTIFIED IN COLUMN "N"													
MAIN VENDOR/SUB-VENDOR (SIGN WITH DATE & STAMP)				REVIEWING AGENCY (SIGN WITH DATE & STAMP)				APPROVING AGENCY (SIGN WITH DATE & STAMP)					



STANDARD CHECK LIST FOR OIL HOSE

CHECK LIST NO.:PE-QP-XXX-166-A816

PACKAGE-FULE OIL SYSTEM

PROJECT-

REV.NO. 0

SHEET 1 OF 1

REV.NO. 0

DATE: 31/03/2012

SL. NO.	COMPONENT & NO.	CHARACTERISTICS	TYPE OF CHECK	REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD	AGENCY			REMARKS
							M	C	N	
							8			
1	Material for									
1.1	Synthetic Rubber	Polymer Confirmation	Chemical Analysis	Appd.data sheet/ Relavent Code	Same as Cl.7	Lab Test Certificate	P	V	V	
1.2	Canvas	Mechanical Test	Tensile	-do-	-do-	- do -	P	V	V	
1.3	Bonding Agents	Bonding Strength	Properties	-do-	-do-	- do -	P	V	V	
1.4	End Fittings	Chem. & Mech. Test	Chem.& Mech properties	-do-	-do-	- do -	P	V	V	
2	In Process Inspection									
2.1	Compound									
	Oil Resistance	i) Oil Resistance test	Oil Resistance check	-do-	-do-	Lab Test Report	P	V	V	
		ii) Heat Resistance	Heat Resistance check	-do-	-do-	Lab Test	P	V	V	
2.2	Sheeting	i) Visual Inspection	Visual	Mfg. Drg.	Mfg. Drg.	Inspn. Report	P	-	-	
		ii) Dimension	Meas.	- do -	- do -	- do -	P	-	-	
2.3	Hose Making	i) Visual Inspection	Visual	- do -	- do -	- do -	P	-	-	
		ii) Dimensional	Meas.	- do -	- do -	- do -	P	-	-	
2.4	Wrapping	Tightening	Visual	- do -	- do -	- do -	P	-	-	
2.5	Flange	Dimension	Meas.	- do -	- do -	- do -	P	-	-	

LEGEND:

"M" MANUFACTURER/SUB-CONTRACTOR
 "C" CONTRACTOR/NOMINATED INSPECTION AGENCY,
 "N" CUSTOMER. INDICATE "P" PERFORM "W" WITNESS AND
 "V" VERIFICATION AS APPROPRIATE CHP
 SHALL IDENTIFIED IN COLUMN "N"

MAIN VENDOR/SUB-VENDOR
(SIGN WITH DATE & STAMP)

REVIEWING AGENCY
(SIGN WITH DATE & STAMP)

APPROVING AGENCY
(SIGN WITH DATE & STAMP)

MANUFACTURERS NAME & ADDRESS				MANUFACTURING QUALITY PLAN				PROJECT: PACKAGE: CONTRACT: CONTRACT: DOC NO. P						
				ITEM : QAP FOR OIL HOSE.		PAGE 1 OF 1								
SL. NO.	COMPONENT & OPERATION	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTAM OF CHECK	REFERENCE DOCUMENTS	ACCEPTANCE NORMS	FORMAT OF RECORD	AGENCY				REMARKS	
1	2	3	4	5	6	7	8	9	D	M	C	N	10	11
A	RAW MATERIALS													
1.0	NEOPRENE & NITRILE	POLYMER IDENTIFICATION	MAJOR	CHEMICAL	SAMPLE	ASTM -D297	ASTM - D297	LAB CERT./ QC REPORT		P	V	V		
B	END FITTINGS													
1.1	FLANGE	CHEMICAL COMPOSITION	MAJOR	CHEMICAL	SAMPLE	IS-2062 GR.B	IS-2062 GR.B	- DO -		P	V	V		
1.2	PIPE	PHYSICAL & CHEMICAL	MAJOR	PHYSICAL & CHEMICAL	SAMPLE	ASTM A 106 GR.B	ASTM A 106 GR.B	- DO -		P	V	V		
C	IN PROCESS CHECKS													
1.3	RUBBER TEST SLAB	a). TENSILE STRENGTH	MAJOR	BEFORE & AFTER AGEING	SAMPLE	IS-10733/83 TYPE-2B	IS-10733/83 TYPE- 2B	- DO -		P	V	V		
		b). ELONGATION AT BREAK	MAJOR	- DO -	SAMPLE	- DO -	- DO -	- DO -		P	V	V		
		c). ADHESION TEST	MAJOR	ADHESION	SAMPLE	- DO -	- DO -	- DO -		P	V	V		
		d). OIL RESISTANCE TEST	MAJOR	OIL RESISTANCE COMPOUND	SAMPLE	- DO -	- DO -	- DO -		P	V	V		
D	FINAL INSPECTION													
1.4	FINISHED PRODUCT CHECK FOR COMPLETENESS	a). VISUAL & DIMENSIONAL	MAJOR	VISUAL & DIMENSIONS	100%	APP. DRG./BS-1435/75	APP. DRG./BS-1435/75	- DO -		P	W	V		10% QUANTITY
		b). HYDRAULIC TEST	MAJOR	PRESSURE TEST	100%	EN-1765/2004	- DO-	- DO -		P	W	V		MAY BE
		c). ELONGATION CHECK	MAJOR	ELONGATION MEASURE	100%	- DO-	- DO-	- DO -		P	W	V		SELECTED AT
		d). BENDING RADIUS CHECK	MAJOR	BEND RADIUS CHECK	100%	- DO-	- DO-	- DO -		P	W	V		RANDOM FOR
		e). VACUUM TEST	MAJOR	VACUUM CHECK	100%	- DO-	- DO-	- DO -		P	W	V		WITNESS
		f). MARKING CHECK	MAJOR	VISUAL	100%	- DO-	- DO-	- DO -		P	W	V		
CLIENT		LEGEND :					FOR BHEL USE						REV.	
		* RECORDS IDENTIFIED WITH 'TICK' SHALL BE ESSENTIALLY DETERMINED BY CONTRACTOR IN QA DOCUMENTATION "M" MANUFACTURER												
CONTRACTOR		C' CONTRACTOR, 'P' PERFORM, 'W' WITNESS, 'V' VERIFICATION AS APPROPRIATE CHP												
MANUFACTURE		BHEL SHALL IDENTIFIED IN COLUMN 'N' BHEL.												
SIGNATURE							REVIEWED BY		NAME & SIGN OF APPROVING AUTHORITY & SEAL					



STANDARD CHECK LIST
STANDARD CHECK LIST FOR: CS-FITTINGS (FORGED/SEAMLESS)
PACKAGE-FULE OIL SYSTEM
PROJECT-
CHECK LIST NO.:PE-QP-XXX-166-A817
REV.NO. 0
DATE: 31/03/2012

Sheet 1 of 1

SL. NO.	TESTS/CHECKS	QUANTUM OF CHECKS	REFERENCE DOCUMENT./ ACCEPTANCE NORMS	AGENCY				REMARKS
1	2	3	4	M	C	N	D	6
1	Visual and Dimensional Checks for each size and type	100% by Manufacturer and 10% by BHEL	Appd. Data Sheet/ Relevant Standard	P	W	W	✓	Inspn. Report shall be furnished
2	Check for Logo mark & Specification	-do-	-do-	P	V	V		
3	Check for TC of mother pipe/forgings	100%	-do-	P	V	V	✓	Manufacturer's TCs of mother pipe/forgings shall be furnished
4	Cross check for Mech/Chem properties of mother pipe/forging	One/Heat	-do-	P	V	V	✓	-do-

LEGEND:

RECORDS IDENTIFIED WITH "TICK" SHALL BE ESSENTIALLY INCLUDED BY CONTRACTOR IN QA DOCUMENTATION.

M= MANUFACTURER/SUB-CONTRACTOR

C= CONTRACTOR/NOMINATED INSPECTION AGENCY,

N= CUSTOMER

P= PERFORM; W= WITNESS; V= VERIFICATION

MAIN VENDOR/SUB-VENDOR
(SIGN WITH DATE & STAMP)

REVIEWING AGENCY
(SIGN WITH DATE & STAMP)

APPROVING AGENCY
(SIGN WITH DATE & STAMP)

CHECK LIST

Check list for item : Dished-end for Flash Tank
 Check list No. :
 Project :
 Package : Fuel Oil Handling
 Contract No. :
 Contractor : BHEL
 Sub-Contractor :

SL. NO.	TESTS/CHECKS	QUANTUM OF CHECKS	REFERENCE DOCUMENT/ ACCEPTANCE NORMS	FORMAT OF RECORDS	AGENCY				REMARKS
					D	S	C	N	
A.	<u>RAW MATERIAL</u>								
	Plate - conforming to IS 2002 Gr.A								
	Chemical Composition & Physical Properties	1 sample/heat	IS:2002 Gr.A	Material TC	√	V	V	V	
B	<u>IN PROCESS INSPECTION</u>								
	UT on Plate	100%	ASTM A388 (Defect giving echo height more than 20% on total CRT Screen height shall be treated unacceptable. Defect causing reduction in backwall echo less than 80% of Screen height shall be treated as unacceptable)	UT Report	√	P	V	V	
C.	<u>FINAL INSPECTION</u>								
	1 Visual Exam.	100%	Appd.Drg.	Inspn. Report	√	P	V	V	
	2 Dimensional Check	100%	Appd.Drg.	-do-	√	P	V	V	
	3 DP on Knuckle	100%	ASTM E165	-do-	√	P	V	V	

Legend

S = SUB-CONTRACTOR
 C= CONTRACTOR
 N= CUSTOMER
 P= PERFORM; W= WITNESS; V= VERIFICATION
 " √ " Marked document to be furnished along with QA Doc. Pkg.

Manufacturer's Name & Address :			QUALITY ASSURANCE PLAN Item : Plug Valve Sub-System : Fuel Oil System Page No.: 1 OF 4				Project : Contract Contractor Sub-Contractor					
Sl. No.	Components & Operations	Characteristic/Item	Class	Type of check	Extent of Check	Reference Document	Acceptance Norm	Format of Record	Agency			Remarks
1	2	3	4	5	6	7	8	9	10	11	12	13
A RAW MATERIAL												
1	Castings (Body, Cover, Plug)	a) Verification	MA	Material TC	100%	Appr. Drg. Tech. Specs.	Tech. Specs.	Material TC	✓	3	3	1,2
		b) Size/Class	MA	Material TC	100%	Appr. Drg. Tech. Specs.	Tech. Specs.	Material TC	✓	3	3	1,2
		c) Material Id.	MA	Material TC	100%	Appr. Drg. Tech. Specs.	Tech. Specs.	Material TC	✓	3	3	1,2
		d) Heat No.	MA	Material TC	100%	Appr. Drg. Tech. Specs.	Tech. Specs.	Material TC	✓	3	3	1,2
		e) Surface Defect	MA	Visual	100%	MSS-SP-55	No crack acceptable	Inspection Report		3	3	1,2
		f) Dimension	MA	Vernier scale	100%	Mfg. Drg.	Mfg. drg.	Mfg. drg.		3	3	1,2
		g) RT on body	MA	Physical	100%	NDT Report	ANSI B16.34 ANNEX-I	NDT REPORT	✓	3	3	1,2
		h) Tensile Properties	MA	Verification of foundry TC	100%	Tech. Specs.	Relevant Standard			3	3	1,2
		i) Chemical Properties	MA	Verification of foundry TC	100%	Tech. Specs.	Relevant Standard			3	3	1,2
		j) Heat Treatment	MA	Verification of foundry TC	100%	Tech. Specs.	Relevant Standard			3	3	1,2
BHEL SUB-CONTRACTOR		LEGEND : Records identified with "✓" shall essentially be included by Contractor in QA Documents 1 - BHEL 2 - PACKAGE SUPPLIER 3 - Manufacturer CR - Critical Characteristics MA - Major Characteristics MI - Minor Characteristics IR - Inspection Report, MTC - Material/Manufacturer's Test Certificate						CLIENT NO REV. CAT.				
								REVIEWED BY NAME & SIGNATURE OF APPROVING AUTHORITY				
SIGNATURE												