RAJASTHAN RAJYA VIDYUT UTPADAN NIGAM LIMITED (RRVUNL)

2 X 660 MW SURATGARH STPS UNIT 7 & 8

AMENDMENT No. 1

TECHNICAL SPECIFICATION
FOR
MISCELLANEOUS PUMPS

Specification No. : PE-TS-392-100-N001 (REV. 0)

BHARAT HEAVY ELECTRICALS LIMITED
POWER SECTOR
PROJECT ENGINEERING MANAGEMENT
PPEI BUILDING, SECTOR 16 A
NOIDA - 201301

1.0 The following amendment to specification requirement for Misc. Pumps (Horizontal) for Suratgarh project w.r.t. the specification No. PE-TS-392-100-N001 of Suratgarh Project Misc. pumps may be noted by the bidders:

Specification requirements for pumps have been revised (changes marked in BOLD) as per Amended Data Sheet-A enclosed. Changes made in the Datasheet -A are also listed below:

a.) Sl. No. 1.2 for Hotwell Make up pumps shall be read as (2W + 2S) in place for (2W + 2W).

b.) Sl. No. 3.1 for DMCW O/H tank Make up pumps shall be read as 'Horizontal Centrifugal type' in place of 'Horizontal centrifugal type between bearing pump'.

c.) Sl. No. 3.3 for DMCW O/H tank Make up pumps shall be read as 'to be decided by bidder' in place of 'axial split/ radial split type'.

All other specification requirement for Gp 'I' Misc. pumps (except for those indicated in Amended Data Sheet-A enclosed) specified in specification no. PE-TS-392-100-N001, shall remain unchanged.

	DATA SHEET - A								SPECIFICATION NO.:	PE-TS-392-100-N001 Amendment No. 1
	MISCELLANEOUS PUMPS (HORIZONTAL)								REV. NO.: 00	DATE : 16/06/2014
	2 X 660 MW SURATGARH STPS UNIT 7 & 8								VOLUME : II B	SECTION : D
	PROJECT/PACKAGE	2 X 660 MW SURATGARH STPS UNIT 7 & 8								
Sl. No.	DESCRIPTION	DMCW TG AUX'S PUMPS	DMCW SG AUX'S PUMPS	APH/ESP WASH PUMPS	CHP MAKE UP PUMPS	AHP MAKE UP PUMPS	DM MAKE UP PUMPS	HOTWELL MAKE UP PUMPS	BOILER FILL PUMPS	DMCW O/H TANK MAKE UP PUMPS
		HORIZONTAL PUMPS (GROUP-I)								
1.0	**SERVICE**									
1.1	Total no. of pumps for Project	6	4	2	2	3	2	4	4	4
1.2	No. of working & standby pumps	(2W+1S) per unit	(1W+1S) per unit	(1W+1S) for station	(1W+1S) for station	(2W+1S) for station	(1W+1S) for station	**(2W+2S) for station**	(1W+3S) for station	(1W+3S) for station
1.3	Liquid Handled (ref. water analysis enclosed herein)	PH corrected DM Water	PH corrected DM Water	Blowdown water	Blowdown water	Blowdown water	DM Water	DM Water	DM Water	DM Water
1.4	Location (Indoor / Outdoor)	Indoor	Indoor	Indoor	Indoor	Indoor	Outdoor	Indoor	Indoor	Indoor
1.5	Duty	Continuous	Continuous	Intermittent	Continuous	Continuous	Continuous	Continuous	Intermittent	Intermittent
1.6	No. of pumps working in parallel	2	-	-	-	2	-	2	-	-
1.7	Specific gravity	1	1	1	1	1	1	1	1	1
1.8	System design pressure (kg/sqcm)	10	12	12	10	10	10	10	25	10
2.0	**DESIGN PARAMETERS**									
2.1	Design capacity each, M^3/hr	1050	800	750	325	850	85	130	200	10
2.2	Total dynamic head (MWC)	38	57	82	35	18	60	65	175	50
2.3	Suction Pressure(MWC)	25.5	25.5	Flooded suction	Flooded suction	Flooded suction	Flooded suction	Flooded suction	Flooded suction	Flooded suction
2.4	Design Temperature (°C)	60	60	60	60	60	60	60	60	60
2.5	Maximum permissible speed of pump (RPM)	1500	1500	3000	1500	1500	3000	1500	3000	3000
2.6	Max. limit on shut off head Corresponding to pump TDH (MWC) at 52.5 Hz	Not to exceed 65 MWC	Not to exceed 85 MWC	Not to exceed 110 MWC	Not to exceed 70 MWC	Not to exceed 70 MWC	-	-	-	-
2.7	Operating range	----------30-130% of design duty point flow----------								
2.8	Motor rating	Motor rating (at 50 deg. C ambient) shall be either above the power requirement at any condition of the entire characteristic curve of the pump (viz. 0-130%) or 16% extra of the power required at the design point, whichever is maximum.								
2.9	Permissible tolerance in rated capacity & TDH	no negative tolerance								
2.10	Permissible tolerance in efficiency at rated capacity(%)	no negative tolerance								
2.11	Performance/Design Standard	HIS								
3.0	**CONSTRUCTION FEATURES**									
3.1	Pump type	Horizontal centrifugal type Between Bearing Pump	Horizontal centrifugal type Between Bearing Pump	Horizontal centrifugal type Between Bearing Pump	Horizontal centrifugal type Between Bearing Pump	Horizontal centrifugal type Between Bearing Pump	Horizontal centrifugal type Between Bearing Pump	Horizontal centrifugal type Between Bearing Pump	Horizontal centrifugal type Between Bearing Pump	**Horizontal centrifugal type**
3.2	Impeller type	Closed	Closed	Closed	Closed	Closed	Closed	Closed	Closed	Closed
3.3	Casing type	Axial split type	Axial split type	Axial split type	Axial split type	Axial split type	Axial split type / Radial split type	Axial split type	Axial split/ Radial Split type	**To be decided by bidder.**
3.4	Coupling type	Flexible type	Flexible type	Flexible type	Flexible type	Flexible type	Flexible type	Flexible type	Flexible type	Flexible type
3.5	Sealing arrangement	Gland packing initially & Mechanical seal finally after commisioning	Gland packing initially & Mechanical seal finally after commisioning	Gland packing	Gland packing	Gland packing	Gland packing initially & Mechanical seal finally after commisioning	Gland packing initially & Mechanical seal finally after commisioning	Gland packing initially & Mechanical seal finally after commisioning	Gland packing initially & Mechanical seal finally after commisioning
3.6	Type of Lubrication	Oil/ Grease/ Self Liquid	Oil/ Grease/ Self Liquid	Oil/ Grease/ Self Liquid	Oil/ Grease/ Self Liquid	Oil/ Grease/ Self Liquid	Oil/ Grease/ Self Liquid	Oil/ Grease/ Self Liquid	Oil/ Grease/ Self Liquid	Oil/ Grease/ Self Liquid
3.7	Pump characteristics	Non Overloading type & stable	Non Overloading type & stable	Non Overloading type & stable	Non Overloading type & stable	Non Overloading type & stable	Non Overloading type & stable	Non Overloading type & stable	Non Overloading type & stable	Non Overloading type & stable
3.8	Drain Plugs, vent, lifting lugs, priming connection	Required								
4.0	**MATERIALS OF CONSTRUCTION**									
4.1	Casing	CI to IS 210 FG 260	CI to IS 210 FG 260	CI to IS 210 FG 260	CI to IS 210 FG 260	CI to IS 210 FG 260	SS 304	SS 304	SS 304	SS 304
4.2	Impeller	SS 304	SS 304	SS 304	SS 304	SS 304	SS 304	SS 304	SS 304	SS 304
4.3	Shaft	SS-410	SS-410	SS-410	SS-410	SS-410	SS 304	SS 304	SS 304	SS 304
4.4	Shaft Sleeves	SS-410 (hardened)	SS-410 (hardened)	SS-410 (hardened)	SS-410 (hardened)	SS-410 (hardened)	SS-410	SS-410	SS-410	SS-410
4.5	Impeller Wearing rings	SS 304	SS 304	SS 304	SS 304	SS 304	SS 304	SS 304	SS 304	SS 304
4.6	Wetted fasteners	SS 304	SS 304	SS 304	SS 304	SS 304	SS 304	SS 304	SS 304	SS 304
4.7	Fasteners (others)	High tensile Steel	High tensile Steel	High tensile Steel	High tensile Steel	High tensile Steel	High tensile Steel	High tensile Steel	High tensile Steel	High tensile Steel
4.8	Gland/Seal Cover	CI to IS 210 FG 260	CI to IS 210 FG 260	CI to IS 210 FG 260	CI to IS 210 FG 260	CI to IS 210 FG 260	SS-304	SS-304	SS-304	SS-304
4.9	Lantern Ring	SS 304	SS 304	SS 304	SS 304	SS 304	SS 304	SS 304	SS 304	SS 304
4.10	Mech. seal	Manufacturer standard	Manufacturer standard	NA	NA	NA	Manufacturer standard	Manufacturer standard	Manufacturer standard	Manufacturer standard
4.11	Gland Packing	PTFE/ Grafoil	PTFE/ Grafoil	PTFE/ Grafoil	PTFE/ Grafoil	PTFE/ Grafoil	PTFE/ Grafoil	PTFE/ Grafoil	PTFE/ Grafoil	PTFE/ Grafoil
4.12	Base Plate	MS fabricated IS-2062 (min. thk.-10 mm) Epoxy Coated								
4.13	Stuffing Box	CI to IS 210 FG 260	CI to IS 210 FG 260	CI to IS 210 FG 260	CI to IS 210 FG 260	CI to IS 210 FG 260	SS 304	SS 304	SS 304	SS 304
4.14	Casing Wearing rings (If applicable)	SS 304	SS 304	SS 304	SS 304	SS 304	SS 304	SS 304	SS 304	SS 304
4.15	Connecting Pipe material (for deciding counterflange material)	Carbon Steel as per IS:2062, Plates rolled & welded as per IS 3589	Carbon Steel as per IS:2062, Plates rolled & welded as per IS 3589	Carbon Steel as per IS:2062, Plates rolled & welded as per IS 3589	Carbon Steel as per IS:2062, Plates rolled & welded as per IS 3589	Carbon Steel as per IS:2062, Plates rolled & welded as per IS 3589	SA 312 TP 304 (stainless steel)	SA 312 TP 304 (stainless steel)	SA 312 TP 304 (stainless steel)	SA 312 TP 304 (stainless steel)
5.0	**MANDATORY SPARES**									
	Pumps									
5.1	All gaskets in one Pump	1 Set	1 Set	1 Set	1 Set	1 Set	1 Set	1 Set	1 Set	1 Set
5.2	All O Rings in one pump	1 Set	1 Set	1 Set	1 Set	1 Set	1 Set	1 Set	1 Set	1 Set
5.3	Gland packing in one Pump	1 Set	1 set	1 set	1 set	1 set	1 set	1 set	1 set	1 set
5.4	Impeller	1 No.	1 No.	1 No.	1 No.	1 No.	1 No.	1 No.	1 No.	1 No.
5.5	All Pump bearings in One pump	2 sets	2 sets	2 sets	2 sets	2 sets	2 sets	2 sets	2 sets	2 sets
5.6	Shaft	1 No.	1 No.	1 No.	1 No.	1 No.	1 No.	1 No.	1 No.	1 No.
5.7	Impeller Lock Nut	1 Set	1 Set	1 Set	1 Set	1 Set	1 Set	1 Set	1 Set	1 Set
5.8	Shaft protection sleeve	1 Set	1 Set	1 Set	1 Set	1 Set	1 Set	1 Set	1 Set	1 Set
5.9	Pump Motor Coupling Complete	1 set	1 set	1 set	1 set	1 set	1 set	1 set	1 set	1 set
5.10	All wearing rings in one pump	1 set	1 set	1 set	1 set	1 set	1 set	1 set	1 set	1 set
5.11	Mechanical Seal	1 set	1 set	NA	NA	NA	1 set	1 set	1 set	1 set
5.12	Coupling pad/ Bushing	1 set	1 set	1 set	1 set	1 set	1 set	1 set	1 set	1 set

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	Motors									
5.13	Motor of each type & rating	N.A.	N.A.	N.A.	1 No.	1 No.	1 No.	1 No.	1 No.	1 No.
5.14	Motor Bearings	N.A.	N.A.	N.A.	2 Sets	2 Sets	2 Sets	2 Sets	2 Sets	2 Sets
5.15	Space Heater (If applicable)	N.A.	N.A.	N.A.	1 No.	1 No.	1 No.	1 No.	1 No.	1 No.
5.16	Motor cooling fan	N.A.	N.A.	N.A.	3 Nos.	3 Nos.	3 Nos.	3 Nos.	3 Nos.	3 Nos.
6.0	**BID EVALUATION RATE**									
6.1	Bid evaluation rate	Rs.3 Lacs/KW	Rs.3 Lacs/KW	NA	Rs.3 Lacs/KW	Rs.3 Lacs/KW	Rs.3 Lacs/KW	Rs.3 Lacs/KW	NA	NA
6.2	Maximum permissible efficiency for Bid evaluation									
6.2.1	Pump Efficiency	86	84	-	82	86	65	82	-	-
6.2.2	Motor Efficiency	93	93	-	93.7	94.5	92.8	93.5	-	-
Notes :										
1	Material of construction for other components not specified above shall be similarly selected in line with the above for the duty intended and subject to approval.									
2	For items stated as not applicable by bidder, shall have to be supplied without any cost implication to BHEL in the event they are found to be applicable during detail engineering stage.									
3	For all HT motor driven pumps (wherever applicable), bidder shall provide key slots of dimensions 30mm Lx15 mm W x3 mmD on each pump shaft or some other suitable location which shall be confirmed during detail engineering by BHEL.									
4	Wherever SS material is coming in contact with non SS material, suitable isolation (rubber etc.) shall be provided to avoid galvanic corrosion.									