



BHARAT HEAVY ELECTRICALS LIMITED
PROJECT ENGINEERING MANAGEMENT, NOIDA

Date: 16 May 2020

CORRIGENDUM- 06

PROJECT	:	5X800 MW YADADRI TPS
PACKAGE	:	CONDENSATE POLISHING UNIT
ENQUIRY NO	:	E-6389/2019 Dated. 24.02.2020
SUBJECT	:	PRE- BID CLARIFICATION & TECH AMENDMENT# 1

Type of Corrigendum			
Technical Corrigendum -	☒	Commercial Corrigendum -	☐

Please note the following:

- 1. Reply to Pre Bid Queries & Technical Amendment # 1 attached with this corrigendum shall be treated as part of NIT.**

All the other terms and conditions of the tender enquiry shall remain unchanged. All the bidders are requested to quote accordingly.

Yours faithfully,

For and on behalf of BHEL

Sharad Chandra
Dy. Manager/BOP

Pre-Bid clarification for Condensate polishing Unit Package							
Tender: PE/PG/YAD/E-6389/2019							
Project: Design, engineering, manufacturing, supply, testing, erection & commissioning, etc of Condensate Polishing Unit system for 5 x 800 MW Yadadri TPS.							
S.No	Volume	Section	Clause	Page No	Specification requirement	Clarification	BHEL Reply dated 13/05/2020
1	SPECIFICATION NO. PE-TS-417-155A-A001	SECTION : I, SUB-SECTION: IA	6.00.00 Operation & Control Philosophy of CPU Plant	62 of 663	Each CP System, shall be operated for service and resin transfer from concerned Service Area - Equipment Control center (ECC) to be located indoor in the vicinity of Condensate Polisher Vessels of each TG unit.	Please confirm whether the ECC is in Bidder Scope.	Bidder to note that for operation of CPU system, Unitized Service vessel I/O room and Regeneration Control room are envisaged. Further bidder to note that Equipment Control center (ECC) for CPU is in BHEL scope and not in bidder's scope.
2	SPECIFICATION NO. PE-TS-417-155A-A001	SECTION : I, SUB-SECTION: IA	B. Regeneration System, Sub-Clause I.	15 of 663	The 1st set of Regeneration System Shall consist of following below mentioned items and shall be provided by the bidder: 1) One (1) no. Resin Separation & Cation Regeneration Vessel complete with all accessories. 2) One (1) no. Anion resin regeneration vessel complete with all accessories. 3) One (1) no. mixed resin storage Vessel complete with all accessories.	The type of vessels (S.No 1,2, & 3) shall be depend on the supplier recommendations .Hence our Systems Calls for the following vessels without affecting the performance guarantees. 1. SCR/V (Resin Separation cum Cation regeneration vessel) - 1 No. 2. ARV/MRSV (Anion regeneration vessel Cum Mixed resin storage vessel) - 1 No Kindly confirm.	The type of external regeneration vessels for ion exchange resins are tentative. However, any other proven alternative scheme of external regeneration as per the standard practice of Supplier of CPU System may also be adopted subject to suitability of the same in all respects for satisfactory operation and performance of Condensate Polisher Mixed Beds. However, design requirement shall be as per tender specification. The same has been also mentioned in tender specification section I, sub-section - IA, clause 4.0,B,I Sr. no. 1 to 7 page 15 of 663. Further Bidder to refer amendment# 1, Schedule-A. sr. no. 3. Bidder to refer and follow the same .
3	SPECIFICATION NO. PE-TS-417-155A-A001	SECTION : I, SUB-SECTION: IA	B. Regeneration System, Sub-Clause II.	18 of 663	The 2st set of Regeneration System Shall consist of following below mentioned items and shall be provided by the bidder: 1) One (1) no. Resin Separation & Cation Regeneration Vessel complete with all accessories. 2) One (1) no. Anion resin regeneration vessel complete with all accessories. 3) One (1) no. mixed resin storage Vessel complete with all accessories.	The type of vessels (S.No 1,2, & 3) shall be depend on the supplier recommendations .Hence our Systems Calls for the following vessels without affecting the performance guarantees. 1. SCR/V (Resin Separation cum Cation regeneration vessel) - 1 No. 2. ARV/MRSV (Anion regeneration vessel Cum Mixed resin storage vessel) - 1 No Kindly confirm.	The type of external regeneration vessels for ion exchange resins are tentative. However, any other proven alternative scheme of external regeneration as per the standard practice of Supplier of CPU System may also be adopted subject to suitability of the same in all respects for satisfactory operation and performance of Condensate Polisher Mixed Beds. However, design requirement shall be as per tender specification. The same has been also mentioned in tender specification section I, sub-section - IA, clause 4.0,B,II Sr. no. 1 to 7 page 18 of 663. Further Bidder to refer amendment# 1, Schedule-A. sr. no. 4. Bidder to refer and follow the same .
4	SPECIFICATION NO. PE-TS-417-155A-A001	SECTION : I, SUB-SECTION: IB		276 of 663	TG Equipment Plant Layout	Please Confirm the Size of Service Area Layout.	Bidder to refer the TG Hall equipment plan at EL0.00 M layout drawing attached with tender specification at page no. 275 & 276 of 663 for size of service vessel area layout. Further Bidder to note that SV area earmarked between row Aa' & Ad & cloumn no. 28 & 3 (for unit -I), column no. 15& 16 (for unit-II), column no. 28 & 29 (for unit-III), column no. 41 & 42 (for unit -IV) and column 54 & 55 (for unit-V) as space for CPU.Bidder to refer and broadly follow the same.
5	SPECIFICATION NO. PE-TS-417-155A-A001	SECTION : I, SUB-SECTION: IB	D. ADDITIONAL REQUIREMENT, Sl. No 10)	25 of 663	MCC, DDCMIS based control room & battery room shall be located in CPU regeneration area building.	Kindly Confirm the Scope of MCC, DDCMIS based control room & Batterys room scope.	Bidder to note that MCC, DCS Panels, HMI, UPS alongwith Batteries are in BHEL scope and civil work of control room ,MCC room & Battery room shall be also in scope of BHEL.
6	SPECIFICATION NO. PE-TS-417-155A-A001	SECTION : I, SUB-SECTION: IA	5.04.00 Exchange Resins	54 of 663	Uniformity coefficient	Please Confirm Uniformity Coefficient of Resin	Please note that as such no uniformity coefficient of resins has been specified in tender specification. However based on resin selection and provenness criterion as specified in tender specification clause 5.04.00 pages 54 & 55 of 663 and other tender specification requirements , bidder to select the uniformity coefficient of CPU resins.

7	SPECIFICATION NO. PE-TS-417-155A-A001	SECTION : I, SUB-SECTION: IA	4.0 Neutralising System, Sub-clause 4.1 (iii) & 4.2 (iii) Material of Construction	265 of 663	RCC inside lined with PVC sheet (3 mm thick)	We understood, that The N-pit Tank is Civil Construction, However it will not in the scope of Bidder. Kindly Confirm	Bidder undersanding is correct i.e neutralisation pit (RCC With 3 mm PVC sheet lining) civil work is under BHEL scope. However mechanical , electrical and Control and instrumentation items related to Neutralization pit as defined in tender specification shall be in bidder's scope of supply.
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Pre-Bid clarification for Condensate polishing Unit Package - 2nd set							
Tender.		PE/PG/YAD/E-6389/2019					
Project:		Design, engineering, manufacturing, supply, testing, erection & commissioning, etc of Condensate Polishing Unit system for 5 x 800 MW Yadadri TPS.					
Ref.							
Date:		20.03.2020					
S.No	Volume	Section	Clause	Page No	Specification requirement	Clarification	BHEL Reply dated 13/05/2020
1	SPECIFICATION NO. PE-TS-417-155A-A001	SECTION : I, SUB-SECTION: IA	4.0 Scope of Supply (Mechanical) A. Service Facility Sl. No 18	13 of 663	One no. cation Conductivity Analyzer at condensate common outlet header of each TG unit & Three (3) nos. cation Conductivity Analyzer at outlet of each Condensate polishing Mixed Beds / Condensate Polisher Service vessels of all TG units. Hence total number of specific conductivity analysers to be supplied for all 5 TG units shall be 50 numbers for service vessel area.	There is a contradiction in the requirement of Cation Conductivity Analyzer or Specific conductivity Analyzer. Eventhough it is cation conductivity analyzer, The quantity required is only 20 Numbers as per the specifications. Kindly confirm	Bidder to note that the requirement specified in mentioned clause is regarding the cation conductivity analyser only . Further Bidder to note that One no. cation Conductivity Analyzer at condensate common outlet header of each TG unit & Three (3) nos. cation Conductivity Analyzer at outlet of each Condensate polishing Mixed Beds / Condensate Polisher Service vessels of all TG units. Hence total number of cation conductivity analysers to be supplied for all 5 TG units shall be 50 numbers for service vessel area. Further Bidder to refer amendment# 1, Schedule-A. sr. no. 1.
2	SPECIFICATION NO. PE-TS-417-155A-A001	SECTION : II, SUB-SECTION: IIA	2.00.00 GENERAL DESIGN FEATURES Sub-Clause 2.01.00 Design	519 of 663	Design of all pressure vessels shall conform to ASME Section VIII or acceptable equivalent international standard. Design pressure shall be the maximum expected pressure to which the vessels may be subjected to plus 10% additional margin. Maximum expected pressure for vessels placed in the discharge line of pumps shall be based on the shut-off head of the pumps plus static head at pumps suction if any. Design pressure of condensate service vessels is indicated elsewhere in this specification. For all other pressure vessels, design pressure shall be at least 10 Kg/cm ² (g) minimum or as per system design whichever is higher.	There is contradiction between the two statement. The first Statement Refers Plus 10% additional margin and the Second statement says Plus 5% extra margin. Kindly confirm the additional margin to be considered.	Bidder to follow the requirement as mentioned in tender specification SECTION : I, SUB-SECTION: IA ,Clause - III,Sl. No 2, page 21 of 663 for the same. Further Bidder to refer amendment# 1, Schedule-A. sr. no. 10.
	SPECIFICATION NO. PE-TS-417-155A-A001	SECTION : I, SUB-SECTION: IA	Clause - III Sl. No 2	21 of 663	All the pressure vessels (except service vessels) shall be designed for a pressure that is maximum expected pressure to which the vessel may be subjected plus 5% extra margin, Maximum expected pressure for vessels placed in the discharge line of pumps shall be based on the shut-off head of the pumps plus static head at pump suction or 10 kg/cm ² (g) whichever is higher.		
3	SPECIFICATION NO. PE-TS-417-155A-A001	SECTION : I, SUB-SECTION: IA	3.2 Bulk Acid storage tanks, sub clause vi) useful capacity	257 of 663	Capacity of both tanks together shall adequate to hold the quantity of commercial Acid (30-33% HCl) required for thirty (30) days of operation of 2 TG Units complete cation resin regeneration requirement plus acid required to neutralize excess alkali present in regeneration waste of 1st set of regeneration system.	Pls clarify whether capacity should be calculated considering chemical requirement for standby vessel also.	Capacity of both tanks together shall adequate to hold the quantity of commercial Acid (30-33% HCl) required for thirty (30) days of operation of 2 TG Units CPU working vessels complete cation resin regeneration requirement plus acid required to neutralize excess alkali present in regeneration waste of 1st set of regeneration system for 30 days.
4	SPECIFICATION NO. PE-TS-417-155A-A001	SECTION : I, SUB-SECTION: IA	PID FOR CPU	257 of 663	P&ID	Kindly clarify whether individual Inlet header to each service vessel shall be CS instead of rubber lined which is shown after NRV.	Bidder to note that individual inlet line header to each service vessel shall be carbon steel rubberlined material (CSRL) after NRV as indicated CPU tender P&ID.
5	SPECIFICATION NO. PE-TS-417-155A-A001	SECTION : I, SUB-SECTION: IA	CHEMICAL PROPERTIES	55 of 663	Cation-Anion resin ratio shall be 2.0 parts cation to 1.0 part anion by volume.	Kindly clarify whether cation anion ratio can be 1.5:1	Bidder to note that "Cation-anion resin ratio shall be 2.0 parts Cation to 1.0 part anion by volume" as already specified in tender specification section I, sub-section -IA,clause 5.04.02 page 54 of 663.
6	SPECIFICATION NO. PE-TS-417-155A-A001	SECTION : I, SUB-SECTION: IA	B.REGENERATION SYSTEM 15)	16 of 663	One (1) no. Activated carbon filter for alkali complete with internals.	Kindly clarify whether ACF has been already provided in DM Plant	Bidder to note that Activated carbon filter for alkali complete with internals has been called for CPU package and the same shall be in CPU package bidder's scope supply. Bidder to refer and follow tender specification requirement as specified in SECTION : I, SUB-SECTION: IA, Clauses 4.0, B ,I. 15 & 4.0, B ,II. 15 pages 16 & 19 of 663.
7	SPECIFICATION NO. PE-TS-417-155A-A001	SECTION : I, SUB-SECTION: IA	B.REGENERATION SYSTEM 23)	16 of 663	One (1) no. hose Station for Transfer of Hydrochloric Acid (30-33% HCl). The hose station shall consist of two (2) sets of rubber hoses each of size 80 mm /NB @ 20 m, provided along with coupling & Diaphragm type isolation valves.	Acid Unloading pump being 1W+1S , One set of hose is sufficient. Kindly confirm	Bidder to follow tender specification as specified in SECTION : I, SUB-SECTION: IA, Clauses 4.0, B ,I. 23 & 4.0, B ,II. 23 pages 16 & 19 of 663.
8	SPECIFICATION NO. PE-TS-417-155A-A001	SECTION : I, SUB-SECTION: IA	B.REGENERATION SYSTEM 26)	17 of 663	One (1) no. hose Station for Transfer of Alkali (48% NaOH). The hose station shall consist of two (2) sets of rubber hoses each of size 80 mm /NB @ 20 m, provided along with coupling & Diaphragm type isolation valves.	Alkali Unloading pump being 1W+1S , One set of hose is sufficient. Kindly confirm	Bidder to follow tender specification requirment as specified in SECTION : I, SUB-SECTION: IA, Clauses 4.0, B ,I. 26 & 4.0, B ,II. 26 pages 17 & 20 of 663.

9	SPECIFICATION NO. PE-TS-417-155A-A001	SECTION : I, SUB-SECTION: IA	B.REGENERATION SYSTEM 31)	17 of 663	isolation gates for each compartment shall be provided in the CPU regeneration area.	Isolation gates will not be in bidder scope ,N-Pit being BHEL scope. Kindly confirm	Tender specification requirement is clear, as per tender specification isolation gates shall be in bidder's scope of supply. Bidder to refer tender specification SECTION : I, SUB-SECTION: IA ,4.0 mechanical scope of supply b) iv) effluent neutralization system page 21 & 22 of 663.
10	SPECIFICATION NO. PE-TS-417-155A-A001	SECTION : I, SUB-SECTION: IA	B.REGENERATION SYSTEM 31)	22 of 663	Similarly, all piping between the external regeneration facility (1st stage & 2nd stage) and the skids for chemical dosing and acid/alkali preparation, and acid & alkali storage shall also be designed, supplied, erected and tested by the bidder.	As per given clause skid mounted has to be considered for chemical area but as per provided equipment layout skid mounted arrangements not indicated,Accordingly we will proceed without skid . Kindly confirm.	Bidder to refer the tender specification SECTION : I, SUB-SECTION: IA,4.0 B) regeneration sytem page 15 of 663 where it is clearly mentioned as "The Acid and alkali unloading equipment for regeneration of condensate polishing resins shall preferably be mounted on skid. In order to facilitate erection at site chemical dosing preparation equipment shall be mounted on structural steel skids and assembled (including piping) at the manufacturer's shop, to the maximum extent possible, prior to shipping. The number of mechanical connections shall be minimized by the use of pipe headers wherever possible. The bidder may also supply and install this equipment's independently instead of assembling the skids." bidder to refer and follow the same.
11	SPECIFICATION NO. PE-TS-417-155A-A001	SECTION : I, SUB-SECTION:	P & ID	252 of 663	P&ID for Service vessel area Drg No:- PE-DG-417-155A-A001	The line material for MBE inlet & outlet mentioned as A 106 Gr.C & condensate rinse given as A 106 Gr.B.PI confirm which material to be followed	Tender specification requirement is clear as per which differenet line MOC are as mentioned below , bidder to refere and follow the same : 1)Common condensate inlet line MOC : SA 106 Gr.C 2)Individual MBE vessel inlet line MOC (After NRV as indicated in tender CPU P&ID): SA 106 Gr.C with Rubber lining. 3) Individual MBE vessel outlet line MOC (As indicated in tender CPU P&ID): SA 106 Gr.C with Rubber lining. 4) Condensate common outlet line MOC (As indicated in tender CPU P&ID) : SA 106 Gr.C with Rubber lining up to demarkation point as indicated in P&ID & SA 106 Gr.C After demarkation point. 5) CPU service vessel by-pass line MOC : SA 106 Gr.C 6) Rinse to condenser Hotwell line MOC : SA 106 Gr. B Further bidder to note that rinse recirculation pumps suction, discharge & rinse recirculation lines MOC shall be changed from SA 106 Gr. B to SA 106 Gr.C. Further Bidder to refer amendment# 1, Schedule-A. sr. no. 7 & 8. Bidder to follow the same.
12	SPECIFICATION NO. PE-TS-417-155A-A001	SECTION : I, SUB-SECTION:	P & ID	252 of 663	P&ID for Service vessel area Drg No:- PE-DG-417-155A-A001	PI confirm the material for the following lines to be followed:- 1.Rinse recirculation pump suction 2. Rinse recirculation pump discharge 3. MBE vessel Air vent	Bidder to note that rinse recirculation pumps suction, discharge & rinse recirculation lines MOC shall be changed from SA 106 Gr. B to SA 106 Gr.C. Further MBE vessel Air vent line MOC shall be SA 106 Gr.C. Bidder to follow the same.
13	SPECIFICATION NO. PE-TS-417-155A-A001	SECTION : I, SUB-SECTION:	P & ID	252 of 663	P&ID for Service vessel area Drg No:- PE-DG-417-155A-A001	MBE individual inlet line material shown as CSRL in downstream of NRV.Shall be proceed with CS instead of CSRL.	Bidder to note that MBE individual inlet line MOC shall be CSRL only as per CPU tender P&ID . Bidder to follow the same.
14	SPECIFICATION NO. PE-TS-417-155A-A001	SECTION : I, SUB-SECTION:	P & ID	252 of 663	P&ID for Service vessel area Drg No:- PE-DG-417-155A-A001	MBE outlet header line material shown as CSRL upto common isolation valve.Shall we proceed with CS from individual outlet of MBE.	Bidder to note that MBE outlet header line MOC up to common isolation valve from individual outlet lines of MBE shall be CSRL only as per CPU tender P&ID . Bidder to follow the same.
15	SPECIFICATION NO. PE-TS-417-155A-A001	SECTION : I, SUB-SECTION: IA	D, Additional Requirement Si No 13	25 of 663	Bidder to prepare layout drawings in 3D modelling soft ware	Modelling to be done in any specific software or choice of bidder	Bidder to refer amendment# 1, Schedule-A. sr. no. 15.
16	SPECIFICATION NO. PE-TS-417-155A-A001	SECTION : I, SUB-SECTION: IA	D, Additional Requirement Si No 22	16 of 663	All the equipment, piping etc. shall be assembled on two structural steel skids one for acid and one for alkali dosing equipment.	As per Equipment layout the equipments are placed individually without skid arrangements.Shall we follow as per layout	Bidder to refer the tender specification SECTION : I, SUB-SECTION: IA,4.0 B) regeneration sytem page 15 of 663 where it is clearly mentioned as "The Acid and alkali unloading equipment for regeneration of condensate polishing resins shall preferably be mounted on skid. In order to facilitate erection at site chemical dosing preparation equipment shall be mounted on structural steel skids and assembled (including piping) at the manufacturer's shop, to the maximum extent possible, prior to shipping. The number of mechanical connections shall be minimized by the use of pipe headers wherever possible. The bidder may also supply and install this equipment's independently instead of assembling the skids." Bidder to refer and follow the same.
17	SPECIFICATION NO. PE-TS-417-155A-A001	SECTION : I, SUB-SECTION: IA	B. REGENERATION SYSTEM	15 of 663	The bidder may also supply & install the equipment independently instead of assembling in skids	Please confirm the same shall be followed	Bidder to refer reply mentioned at sr. no. 16 above.

18	SPECIFICATION NO. PE-TS-417-155A-A001	SECTION : I, SUB-SECTION: IA	2.0 DESIGN CONDITIONS FOR CONDENSATE POLISHING UNIT	10 of 663	The distance between CPU Regeneration & Service vessel area of TG hall is given for 5 units	As per P&ID a common header is connected to TG 1 & 2 and another header is connected to 3,4 & 5.Please clarify the pipe length given in tender	Bidder to note that the distances mentioned in referred clause and page number are mentioned to get the approximate distances between different CPU TG units service vessel area to common external CPU regeneration area. Further bidder to note that all piping for CPU service vessel area for all 5 TG units and both regeneration system along with its different interconnection as described/ indicated in technical specification shall be in bidder's scope. However for specific pipe lengths bidder to refer tender specification SECTION : I, SUB-SECTION: IA, Clauses 4.0, C pages 22 to 24 of 663.
19	SPECIFICATION NO. PE-TS-417-155A-A001	SECTION : I, SUB-SECTION: IA	Data Sheet - A, Si No 6, (iv)	269 of 663	Specification for NRV,PRV is furnished in Section-II A for LP piping & CL300 in high pressure piping	Kindly share the HP CL300 specification	Bidder to refer tender specification SECTION : II, SUB-SECTION: IIA,Power cycle piping valves and specialties , pages 479 to 517 of 663 .
20	SPECIFICATION NO. PE-TS-417-155A-A001	SECTION : I, SUB-SECTION: IA	-	271 of 663	Equipment Layout of Condensate Polishing Unit (Regeneration Area)	The location of CPU Resin transfer pumps in pump house. Please furnish us the pipe length to be considered from pump house to CPU Regeneration building.	For Distance between CPU Resin transfer pumps in pump house to CPU Regeneration building , Bidder to refer tender specification SECTION : I, SUB-SECTION: IA ,4.0 mechanical scope of supply c) piping , sr. no. 10 , page 22 of 663.
21	SPECIFICATION NO. PE-TS-417-155A-A001	SECTION : I, SUB-SECTION: IA	-	275 of 663	TG Equipment layout plan at ground floor	The area allocated for Service vessel layout is 7.5 m x 17.5 m. Considering Rinse recirculation pumps-2 Nos, Blowers - 2 nos, Sampling panels, Analyzer racks & Instrument racks the space provided may be congested for access & piping. BHEL to review the allocated space after considering all aspects.	Please note that the area allocated for Service vessel layout is 7.5 m x 17.5 and bidder to accommodate the CPU Service Vessel area equipments in the provided space. However the equipment layout shall be discussed during detailed engineering and slight adjustment shall be done to accommodate the SV area equipments .
22	SPECIFICATION NO. PE-TS-417-155A-A001	Spec. No.: PE-TS-417-145-I SI no: 6	Specific Technical requirement	Page 297 of 663	The junction boxes/LIEs for termination of instruments, solenoid valve, limit switches etc. are in bidder's scope. All instruments shall be terminated on JB/LCP in field and both instrument and JB & LCP are in bidder scope.	LCP whether it is concerned with system or any package, if applicable requirement shall be decided by bidder - please clarify All instrument shall be by default pipe mounted or shall be mounted nearby structural supports and LIE/LIR requirement shall be decided during detailed engineering based on the availability of space inside the Service area by bidder.	Bidder to note that all instruments shall be grouped and terminated in Junction boxes/LIE/LIR in field. Except DCS panels, HMI, Backup panel which are in BHEL scope, any local control panel envisaged by bidder is in Bidder' scope of supply.
23	SPECIFICATION NO. PE-TS-417-155A-A001	Spec. No.: PE-TS-417-145-I SI no: 14	Specific Technical requirement	Page 298 of 663	All transmitters & electronics items including JBs will be explosion proof / intrinsically safe as per hazardous area classification.	We understood that CPU Service and regeneration area are under safe zone and explosion proof / intrinsic safe requirement is applicable or not?	Bidder to refer transmitter specifications (Page 579 of 663) wherein it is specified that enclosure for all the transmitters shall be IP 65 (explosion proof). Bidder to comply the technical specification.
24	SPECIFICATION NO. PE-TS-417-155A-A001	Spec. No.: PE-TS-417-145-I SI no: 3	Specific Technical requirement	Page 297 of 663	Redundancy of sensors shall be provided, irrespective of instrumentation shown in the PID, by bidder as per following: (i) Triple redundancy for all analog and binary inputs required for protection of system /drives. (ii) For all other control functions & alarms, dual redundancy of the sensors shall be provided by the bidder.	Please note that, since we understood that CPU Service and regeneration area are under safe zone hence (i)dual redundancy for all analog and binary inputs are sufficient for Protection of systems/drives. (ii) For all other control functions & alarms, one instrument shall be considered by bidder	Bidder to follow the requirement of redundancy as mentioned in the specific clause at page 297 of 663 of the specification.
25	SPECIFICATION NO. PE-TS-417-155A-A001	Spec. No.: PE-TS-417-145-I SI no: 17	Specific Technical requirement	pg 298 of 663	Electronic instruments shall not be located close to hot lines, vessels or other hot equipment. Ambient temperatures exceeding 80 °C shall not result in calibration difficulties or rapid deterioration of electronic components.	Please confirm the ambient working temperature for all the instruments.	Please refer project information details/ site data mentioned in the tender specification.Bidder to refer sheet 1 to 7 of 663 of tender specification for ambient working temperature for all the instruments.
26	SPECIFICATION NO. PE-TS-417-155A-A001	Spec. No.: PE-TS-417-145-I SI no: 25	Specific Technical requirement	Page 299 of 663	Bidder to note that all the transmitters/instruments supplied by Bidder shall be rack mounted. The racks shall be preassembled and provided by Bidder. Also no instruments / analyzers & JBs/Racks should be protruding on the walkway.	All instrument shall be by default pipe mounted or shall be mounted nearby structural supports and LIE/LIR requirement shall be decided during detailed engineering based on the availability of space inside the Service area by bidder.	Bidder to follow the specification requirement and provide all the transmitters/instruments rack mounted. Further requirement shall be decided during detailed engineering.

27	SPECIFICATION NO. PE-TS-417-155A-A001	Spec. No.: PE-TS-417-145-I SI no: 29	Specific Technical requirement	Page 299 of 663	Editable & pdf copy of following Drawings/Documents and data shall be furnished after award of the contract: - Control & operational write-up for the system - Recommended control scheme/ logic diagram - Process manuscript for implementation in DCS - List of Drives (Solenoid valves etc) - I/O list (DCS) - GA & wiring diagram of local panel. - Power requirement. - Local control panel and field instruments quality plan. - Local control panel & instruments data sheet. - JB grouping document. - Cable schedule and cable interconnection drawing. - Instrument schedule - Alarm Schedule - SOE schedule - Instrument hook-up diagram. - Mandatory spare BOQ - UPS load list	Please note that, recommended control scheme/ logic diagram shall not be applicable since control & operational write up for the system serves the same. Please note that, SOE shall not be applicable since DCS is in M/s BHEL Scope	Bidder to follow the specification requirement and submit the recommended control logic/scheme and SOE points for our reference and further implementation in DCS.
28	SPECIFICATION NO. PE-TS-417-155A-A001	Spec. No.: PE-TS-417-145-I SI no: 31	Specific Technical requirement	Page 300 of 663	Solenoid valves shall be kept in pneumatic junction boxes only. Air distribution for SOV's shall be through SS manifold with SS isolation valves and auto drain traps and SS tubing from SOV to valves shall not be more than 6 meters.	Please note that, SOV shall be a part of actuator accessories hence pneumatic junction boxes are not applicable - please confirm	Bidder to follow the specification requirement mentioned at the referred clause & page number.
29	SPECIFICATION NO. PE-TS-417-155A-A001	Section : II, SUB-SECTION: IIC	1.00.00 Specification for Electronic Transmitters 1.01.00 Pressure Transmitter	Page 577 of 663	Enclosure Class : IP-65 (Explosion proof for NEC Class-1, Division 1 area)	We understood that CPU Service and regeneration area are under safe zone and explosion proof / intrinsic safe requirement is applicable or not?	Bidder to follow the technical specification and provide the Enclosure Class : IP-65 (Explosion proof for NEC Class-1, Division 1 area) for all the transmitters.
30	SPECIFICATION NO. PE-TS-417-155A-A001	Section : II, SUB-SECTION: IIC	1.00.00 Specification for Electronic Transmitters 1.01.00 Pressure Transmitter	Page 577 of 663	600 Ohms (min.) at 24 Volts D.C.	Load Impedance shall differ vendor to vendor - Bidder shall decide during Detailed engineering	Bidder to follow the specification requirement mentioned at the referred clause & page number.
31	SPECIFICATION NO. PE-TS-417-155A-A001	Section : II, SUB-SECTION: IIC	1.00.00 Specification for Electronic Transmitters 1.02.00 Differential Pressure Transmitter / Flow Transmitter	Page 579 of 663	Enclosure Class : IP-65 (Explosion proof for NEC Class-1, Division 1 area)	We understood that CPU Service and regeneration area are under safe zone and explosion proof / intrinsic safe requirement is applicable or not?	Please refer reply mentioned at sr. no. 29 above.
32	SPECIFICATION NO. PE-TS-417-155A-A001	Section : II, SUB-SECTION: IIC	1.00.00 Specification for Electronic Transmitters 1.05.00 Radar Type Level Measurement	Page 583 of 663	Enclosure Class : IP-65 (Explosion proof for NEC Class-1, Division 1 area)	We understood that CPU Service and regeneration area are under safe zone and explosion proof / intrinsic safe requirement is applicable or not?	Please refer reply mentioned at sr. no. 29 above.
33	SPECIFICATION NO. PE-TS-417-155A-A001	Section : II, SUB-SECTION: IIC	1.00.00 Specification for Electronic Transmitters 1.06.00 Ultrasonic Level Transmitter	Page 584 of 663	Enclosure Class : IP-65 (Explosion proof for NEC Class-1, Division 1 area)	We understood that CPU Service and regeneration area are under safe zone and explosion proof / intrinsic safe requirement is applicable or not?	Please refer reply mentioned at sr. no. 29 above.
34	SPECIFICATION NO. PE-TS-417-155A-A001	Section : II, SUB-SECTION: IIC	1.00.00 Specification for Electronic Transmitters 1.06.00 Ultrasonic Level Transmitter SI No. 12	Page 585 of 663	Operating temp. : Transmitter- 500 C and Sensor - 800 C	Please confirm the ambient working temperature for all the instruments.	Please refer project information details/ site data mentioned in the tender specification. Bidder to refer sheet 1 to 7 of 663 of tender specification for ambient working temperature for all the instruments.
35	SPECIFICATION NO. PE-TS-417-155A-A001	Section : II, SUB-SECTION: IIC	1.00.00 Specification for Electronic Transmitters 4.03.00 Ultrasonic Level Transmitter SI No. 12	Page 597 of 663	IP-65 (Explosion proof)	We understood that CPU Service and regeneration area are under safe zone and explosion proof / intrinsic safe requirement is applicable or not?	Please refer reply mentioned at sr. no. 29 above.
36	SPECIFICATION NO. PE-TS-417-155A-A001	Section : II, SUB-SECTION: IIC	1.00.00 Specification for Electronic Transmitters 4.03.00 Ultrasonic Level Transmitter SI No. 8	Page 597 of 663	Temperature : 300 Deg.C	Please confirm the ambient working temperature for all the instruments.	Please refer project information details/ site data mentioned in the tender specification. Bidder to refer sheet 1 to 7 of 663 of tender specification for ambient working temperature for all the instruments.
37	SPECIFICATION NO. PE-TS-417-155A-A001	Section : II, SUB-SECTION: IIC	10.00.00 Solenoid Valves	Page 606 of 663	Enclosure Class : IP-65 (Explosion proof for NEC Class-1, Division 1 area)	We understood that CPU Service and regeneration area are under safe zone and explosion proof / intrinsic safe requirement is applicable or not?	Please refer reply mentioned at sr. no. 29 above.
38	SPECIFICATION NO. PE-TS-417-155A-A001	Section : II, SUB-SECTION: IIC	10.00.00 Solenoid Valves	Page 606 of 663	Mounting : On pipe or on panel	Please note that, SOV shall be a part of actuator accessories hence pneumatic junction boxes are not applicable - please confirm	Please refer reply mentioned at sr. no. 28 above.
39	SPECIFICATION NO. PE-TS-417-155A-A001	Section : II, SUB-SECTION: IIC	6.03.00 Silica Analyzer	Page 612 of 663	4 - 20 ma DC (isolated) into 600 ohms	Load Impedance shall differ vendor to vendor - Bidder shall decide during Detailed engineering	Please refer reply mentioned at sr. no. 30 above.
40	SPECIFICATION NO. PE-TS-417-155A-A001	Section : II, SUB-SECTION: IIC	6.04.00 Sodium Analyzer Assembly	Page 613 of 663	BACK UP PANEL	We understood that, since DCS is in M/s BHEL Scope and if Backup panel is applicable for CPU is under M/s BHEL Scope.	Bidder understanding is correct. However, recommended MIMIC diagram is to be furnished by bidder.
41	SPECIFICATION NO. PE-TS-417-155A-A001	Section : II, SUB-SECTION: IIC	4.00.00 Local Instrument Rack (LIR) & Local Instrument Enclosure (LIE)	Page 628 of 663	LOCAL INSTRUMENT RACK (LIR) & LOCAL INSTRUMENT ENCLOSURE	All instrument shall be by default pipe mounted or shall be mounted nearby structural supports and LIE/LIR requirement shall be decided during detailed engineering based on the availability of space inside the Service area by bidder.	Please refer reply mentioned at sr. no. 26 above.

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Sr. No.	Volume	Section	Clause No.	Page No.	Specification Requirement	Clarification	Reason for Clarification / Bidder's Assumption	BHEL REPLY dated 13/05/2020
Mechanical Clarification								
1.	PE-TS-417-155A-A001	I	4.0.A. Serial no. 31	14 of 663	Motor operated valve instead of pneumatic isolation valve shall be provided for each CPU to DM water line as indicated in P&ID. Further if any valve which is not indicated or indicated as pneumatic in tender P&ID the same shall be considered by bidder as Motorized isolation valve.	Please clarify the scope of Motor operated valve.	Specification requirement is not clear as specification description and P&ID are contradictory.	Bidder to follow auto valves (motorised/pneumatic operated) as indicated in tender P&ID of CPU and the same shall be in bidder's scope. Further Bidder to refer amendment# 1, Schedule-A. sr. no. 2 & 6.
2.	PE-TS-417-155A-A001	I	vi) of 12.2	38 of 663	N-Pit effluent piping (150 NB) from N Pit up to CMB OF ETP shall be in bidder's scope. The piping distance to be considered from 1st set of regeneration system N-pit to CMB of ETP shall be 1500 m. Similarly, the piping distance to be considered from 2nd of regeneration system N-pit to CMB of ETP shall be 1500 m.	BHEL's pipe racks & pipe pedestals shall be used for N-Pit effluent piping between 1st & 2nd set of regeneration system N-pit to CMB of ETP. Please confirm.	Specification requirement is not clear regarding the scope of pipe racks & pipe pedestals.	Bidder understanding is correct. N-pit effluent transfer piping from 1st set & 2 nd set of CPU regeneration system N-pit to CMB of ETP shall be routed on BHEL's pipe racks & pipe pedestals. However, piping and the supporting posts for pedestals along with all necessary hanger, clamps, connecting steel, fixing bolts, nuts, etc for the same shall be in bidder's scope.

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Sr. No.	Volume	Section	Clause No.	Page No.	Specification Requirement	Clarification	Reason for Clarification / Bidder's Assumption	BHEL REPLY dated 13/05/2020
3.	PE-TS-417-155A-A001	I	iii) & iv) of 4.1	195 of 663	iii) Spare Diaphragm for above 20% of total quantity used for each type and size with minimum no. four (4) for each type and size. iv) Diaphragm 20% of total quantity used for each type and size with minimum no. two (2) for each type and size.	For Mandatory Spares, only applicable spares for equipment being supplied for CPU Package shall be supplied. All duplicate descriptions, if any in the list shall be deleted from scope of supply. Please confirm.	Duplicate description of spares.	Bidder to follow tender specification, Section: I, Sub-Section: IA, Annexure –VI, Mandatory spares, note no. VIII & IX, page 198 of 663 regarding the applicable spares for equipment being supplied for CPU Package. Regarding the items provided with duplicate descriptions in CPU package mandatory spares list, the same shall be also in bidder's scope of supply. Further Bidder to refer amendment# 1, Schedule-A. sr. no. 12.

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Sr. No.	Volume	Section	Clause No.	Page No.	Specification Requirement	Clarification	Reason for Clarification / Bidder's Assumption	BHEL REPLY dated 13/05/2020
4.	PE-TS-417-155A-A001	I	4.3 & 4.4	265, 266 of 663	Neutralized pit disposal pumps: Type- Vertical Centrifugal	Based on our past executed project experience, we recommend Horizontal centrifugal pump instead of Vertical Centrifugal pump. Please confirm.	Instead of vertical pump, Horizontal centrifugal pump is more suitable for application of regeneration waste.	Tender specification requirement is clear. However, Bidder's proposal regarding the neutralised pit disposal pumps horizontal centrifugal type along with the priming arrangement and its accessories (i.e. valves, piping, instrumentation etc.) instead of vertical centrifugal pumps shall be accepted subjected to acceptance of the same from end customer during detail engineering without any price and delivery implication to BHEL and end customer.

Sr. No.	Volume	Section	Clause No.	Page No.	Specification Requirement	Additional Clarification	Reason for Clarification / Bidder's Assumption	BHEL REPLY dated 13/05/2020
General Clarification								
1.	PE-TS-417-155A-A001	IB	3.2 of 3.0	279 of 663	DOCUMENTS TO BE SUBMITTED ALONG WITH BID 3.2 No technical submittal such as copies of data sheets, drawings, write-up, quality plans, type test certificates, technical literature etc, is required during tender stage. Any such submission even if made, shall not be considered as part of offer.	Regarding document submission during tender stage, we shall follow clause No. 3.2 (page 279 of 663).	Documents submission asked under clause No.8.01.00 (page 346 of 663) & clause No. 20.0 (page 49 of 663) are contradictory with details mentioned in clause No. 3.2 (page 279 of 663). Please confirm if our understanding is correct.	Bidder has to submit the documents along with their techno commercial offer as mentioned in tender specification Section I, Sub-section-IA, Clause. no 20.0 page 48 & 49 of 663. Further Bidder to refer amendment# 1, Schedule-A. sr. no. 9.
2.	PE-TS-417-155A-A001	IIA	8.00.00	346 of 663	TENDER STAGE DOCUMENT SUBMISSION 8.01.00 The Bidder shall submit along with his bid all documents/drawings as requested in respective specifications. The documents shall include but not be limited to the following: a) All Bid proposal sheets duly filled up.continue..... f) L-1 network indicating target dates..... g) List of suppliers for all bought out items			
3.	PE-TS-417-155A-A001	IA	20.0	49 of 663	BIDDER TO FURNISH 4 SETS OF TECHNO-COMMERCIAL BID INCLUDING FOLLOWING DOCUMENT/ INFORMATION Signed and stamped copy of equipment layout of CPU regeneration area.			

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Sr. No.	Volume	Section	Clause No.	Page No.	Specification Requirement	Additional Clarification	Reason for Clarification / Bidder's Assumption	BHEL reply dated 13/05/2020
Mechanical Clarification								
1.		Subsection IA	14.1	39 of 663	BHEL & Customer reserves the right for inspection of imported items by BHEL/Customer officials (if felt necessary). The same shall be decided during detail engineering during approval of QP's.	Please confirm list of items which BHEL would like to do Inspection during execution of the job.	Clarity required as the same will have time & cost implications.	As per tender specification, BHEL has not mentioned any CPU items under minimum imported category. However, Sub vendor list and inspection criteria submitted by bidder shall be finalised by Customer and BHEL during detailed engineering. Based upon the approved sub vendor list, if any CPU item falls under imported category, then BHEL & customer reserves the right for inspection of imported items in line with BHEL & Customer approved QAP during detailed engineering.

Sr. No.	Volume	Section	Clause No.	Page No.	Specification Requirement	Additional Clarification	Reason for Clarification / Bidder's Assumption	BHEL reply dated 13/05/2020
2.		Sub-section: IA		70 of 663	Material test, DIM & all test as per relevant standard/approved datasheet for resins/activated carbon & internals of CPU.	Mfg. Standard certificate for resin / activated carbon will be furnished. For internal for CPU is Driplex proprietary item hence Driplex conformance certificate will only be furnished.	DIM are not applicable for resin, activated carbon & internal for CPU.	Bidder to note that material test, Dimensions & all test as per relevant standard/approved datasheet shall be applicable for resins/activated carbon & internals of CPU. However same shall be finalized during detail engineering as per sub – vendor list and inspection criterion document approval by BHEL & end customer.

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3.		Sub-section: IA	12.2	38 of 663	vi) N-Pit effluent piping (150 NB) from N Pit up to CMB OF ETP shall be in bidder's scope. The piping distance to be considered from 1st set of regeneration system N-pit to CMB of ETP shall be 1500 m. Similarly, the piping distance to be considered from 2nd of regeneration system N-pit to CMB of ETP shall be 1500 m.	We are assuming that piping from N Pit up to CMB OF ETP shall be laid on BHEL's provided pipe racks/pedestals. Please confirm if our understanding is correct.	The specification is not cleared about laying of piping from N Pit up to CMB OF ETP.	Bidder understanding is correct. N-pit effluent transfer piping from 1st set & 2 nd set of CPU regeneration system N-pit to CMB of ETP shall be routed on BHEL's pipe racks & pipe pedestals. However, piping and the supporting posts for pedestals along with all necessary hanger, clamps, connecting steel, fixing bolts, nuts, etc. for the same shall be in bidder's scope.



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The following modifications with respect to **TECHNICAL SPECIFICATION FOR CONDENSATE POLISING UNIT** BHEL's Technical specification no **PE-TS-417-155A-A001** shall apply.

Bidder to note that existing clauses/details as appearing in the specification stands deleted / replaced and clauses/details as mentioned in "Modified to or Read as" column shall be applicable and complied by the bidder as listed below in **SCHEDULE A**.

In addition, new clauses and scope are also added as listed below in **SCHEDULE B** and shall be a part of tender specification (**PE-TS-417-155A-A001**). Bidder to comply the same.

SCHEDULE- A

MODIFIED CLAUSES/PAGE NUMBERS:

Sl no.	Section	Sub-Section/ Description	Clause no	Page no	Existing clause/details	Modified to or Read as
1.	I	Sub-Section– I-A	4.0, A. sr. no. 18	13 of 663	One no. cation Conductivity Analyser at condensate common outlet header of each TG unit & Three (3) nos. cation Conductivity Analyser at outlet of each Condensate polishing Mixed Beds / Condensate Polisher Service vessels of all TG units. Hence total number of specific conductivity analysers to be supplied for all 5 TG units shall be 50 numbers for service vessel area.	One no. cation Conductivity Analyser at condensate common outlet header of each TG unit & Three (3) nos. cation Conductivity Analyser at outlet of each Condensate polishing Mixed Beds / Condensate Polisher Service vessels of all TG units. Hence total number of cation conductivity analysers to be supplied for all 5 TG units shall be 50 numbers for service vessel area. Bidder to adhere the same.
2.	I	Sub-Section– I-A	4.0, A. sr. no. 31	14 of 663	Motor operated valve instead of pneumatic isolation valve shall be provided for each CPU to DM water line as indicated in P&ID. Further if any valve which is not indicated or indicated as pneumatic in tender P&ID the same shall be considered by bidder as Motorized isolation valve.	Referred clause stands deleted.
3.	I	Sub-Section– I-A	4.0, B,I. sr. no. 1 to 3	15 of 663	The 1st set of Regeneration System Shall consist of following below mentioned items and shall be provided by the bidder: 1) One (1) no. Resin Separation & Cation Regeneration Vessel complete with all accessories. 2) One (1) no. Anion resin regeneration vessel complete	The 1st set of Regeneration System Shall consist of following below mentioned items and shall be provided by the bidder: 1) One (1) no. Resin Separation Vessel complete with all accessories. 2) One (1) no. Anion Resin Regeneration Vessel



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					with all accessories. 3) One (1) no. mixed resin storage Vessel complete with all accessories.	complete with all accessories. 3) One (1) no. Cation Resin Regeneration Vessel / Mixed Resin Storage Vessel complete with all accessories. Bidder to adhere the same.
4.	I	Sub-Section– I- A	4.0, B, II. sr. no. 1 to 3	18 of 663	The 2nd set of Regeneration System Shall consist of following below mentioned items and shall be provided by the bidder: 1) One (1) no. Resin Separation & Cation Regeneration Vessel complete with all accessories. 2) One (1) no. Anion resin regeneration vessel complete with all accessories. 3) One (1) no. mixed resin storage Vessel complete with all accessories.	The 2nd set of Regeneration System Shall consist of following below mentioned items and shall be provided by the bidder: 1) One (1) no. Resin Separation Vessel complete with all accessories. 2) One (1) no. Anion Resin Regeneration Vessel complete with all accessories. 3) One (1) no. Cation Resin Regeneration Vessel / Mixed Resin Storage Vessel complete with all accessories. Bidder to adhere the same.
5.	I	Sub-Section– I- A	3.04.00	53 of 663	The bed cross section in the service vessels shall be such that the average velocity of condensate through it shall not exceed 2 meters/min (120 M3/hr/M2) at the design flow rate for spherical vessel. Internal diameter of the service vessels (excluding the rubber lining) of spherical type shall be selected meeting the above mentioned velocity criteria. The effective depth of mixed bed in condensate polisher service vessel shall be not less than 1100 mm.	The bed cross section in the service vessels shall be such that the average velocity of condensate through it shall not exceed 1.75 meters/min (105 M3/hr/M2) at the design flow rate for spherical vessel. Internal diameter of the service vessels (excluding the rubber lining) of spherical type shall be selected meeting the above mentioned velocity criteria. The effective depth of mixed bed in condensate polisher service vessel shall be not less than 1100 mm. Bidder to adhere the same.
6.	I	Sub-Section– IA, P&ID OF CPU, SHEET 1 OF 2	NOTE NO. 34	252 OF 663	Motor operated valve instead of pneumatic isolation valve shall be provided for each CPU to DM water line. If the same is not indicated all places in this P&ID, bidder to consider the same in their scope wherever applicable.	Referred note stands deleted.
7.	I	Sub-Section– IA, DATASHEET-A	5.0 , (vi)	268 OF 663	Service vessel rinse piping & rinse recirculation pumps suction and discharge piping-CS to ASTM A 106 Gr. B	Service vessel Rinse to condenser Hot well line piping & Rinse recirculation pumps suction, discharge, rinse recirculation lines piping MOC - CS to ASTM A 106 Gr. B & CS to ASTM A 106 Gr. C respectively.



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						Bidder to adhere the same.
8.	I	Sub-Section– IA,P&ID OF CPU, SHEET 1 OF 2	Piping MOC table sr. no. 10	252 OF 663	RINSE TO CONDENSER HOT WELL AND RINSE RECIRCULATION PUMP SUCTION AND DISCHARGE PIPING-SA 106 GR. B	Service vessel Rinse to condenser Hot well line piping & Rinse recirculation pumps suction, discharge, rinse recirculation lines piping MOC - CS to ASTM A 106 Gr. B & CS to ASTM A 106 Gr. C respectively. Bidder to adhere the same.
9.	II	SUB-SECTION- IIA	8.00.00	346 & 347 OF 663	8.00.00 TENDER STAGE DOCUMENT SUBMISSION 8.01.00 The Bidder shall submit along with his bid all documents/drawings as requested in respective specifications. The documents shall include but not be limited to the following: a) All Bid proposal sheets duly filled up.continue..... f) L-1 network indicating target dates..... g) List of suppliers for all bought out items	Referred clause stands deleted.
10.	II	SUB-SECTION- IIA	2.01.00	519 of 663	Design of all pressure vessels shall conform to ASME Section VIII or acceptable equivalent international standard. Design pressure shall be the maximum expected pressure to which the vessels may be subjected to plus 10% additional margin. Maximum expected pressure for vessels placed in the discharge line of pumps shall be based on the shut-off head of the pumps plus static head at pumps suction if any. Design pressure of condensate service vessels is indicated elsewhere in this specification. For all other pressure vessels, design pressure shall be at least 10 Kg/cm ² (g) minimum or as per system design whichever is higher.	Design of all pressure vessels shall conform to ASME Section VIII or acceptable equivalent international standard. Design pressure shall be the maximum expected pressure to which the vessels may be subjected to plus 5% additional margin. Maximum expected pressure for vessels placed in the discharge line of pumps shall be based on the shut-off head of the pumps plus static head at pumps suction if any. Design pressure of condensate service vessels is indicated elsewhere in this specification. For all other pressure vessels, design pressure shall be at least 10 Kg/cm ² (g) minimum or as per system design whichever is higher. Bidder to adhere the same.
11.	I	Sub-Section– I- A/ P & ID	-	252 to 253 of 663	P&ID OF CONDENSATE POLISHING UNIT	Revised P&ID OF CONDENSATE POLISHING UNIT (2sheets) is attached herewith this amendment for bidder's adherence.



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12.	I	Sub-Section– I- A/ANNEXURE VI, MANDATORY SPARE LIST	-	193 to 197 of 663	ANNEXURE VI,MANDATORY SPARE LIST for Condensate polishing unit included in tender specification.	Revised ANNEXURE VI,MANDATORY SPARE LIST is attached herewith this amendment for bidder's adherence.
13.	I	Sub-Section– I- A	4.0, B,I. sr. no. 9	15 of 663	Two (2) nos. (1W+1S) oil free type air blowers with electric motor drives, for supplying all the process air required for cleaning of the resins and their regeneration processes. Further these blowers shall be also used for air agitation of neutralisation pit (both compartments). Each blower shall be complete with motor, V-belt drive with belt guard, inlet filter, silencer, flexible couplings and discharge snubber, acoustic hood, relief valve, anti-vibration pads etc.as required and shall be mounted on a single base.	Two (2) nos. (1W+1S) oil free type air blowers with electric motor drives, for supplying all the process air required for cleaning of the resins and their regeneration processes. Each blower shall be complete with motor, V-belt drive with belt guard, inlet filter, silencer, flexible couplings and discharge snubber, acoustic hood, relief valve, anti-vibration pads etc.as required and shall be mounted on a single base. Bidder to adhere the same.
14.	I	Sub-Section– I- A	4.0, B, II. sr. no. 9	18 of 663	Two (2) nos. (1W+1S) oil free type air blowers with electric motor drives, for supplying all the process air required for cleaning of the resins and their regeneration processes. Further these blowers shall be also used for air agitation of neutralisation pit (both compartments). Each blower shall be complete with motor, V-belt drive with belt guard, inlet filter, silencer, flexible couplings and discharge snubber, acoustic hood, relief valve, anti-vibration pads etc.as required and shall be mounted on a single base.	Two (2) nos. (1W+1S) oil free type air blowers with electric motor drives, for supplying all the process air required for cleaning of the resins and their regeneration processes. Each blower shall be complete with motor, V-belt drive with belt guard, inlet filter, silencer, flexible couplings and discharge snubber, acoustic hood, relief valve, anti-vibration pads etc.as required and shall be mounted on a single base. Bidder to adhere the same.
15.	I	Sub-Section– I- A	4.0,D,sr. no. 13	25 of 663	Engineering for this project is being carried out in 3D environment at BHEL end. Name of engineering platform on which BHEL is doing the project IS Smart Plant Suite. This is being done to have automated interface checking and thereby minimizing rework at site. Hence bidder, in their own interest, is requested to prepare all layout drawings using 3D Modelling software. These drawings will also be made available to BHEL in soft for checking interface with other agencies in consolidated layout drawings. Bidder's inability to prepare drawing using 3D Modelling software will not be criterion for evaluation of their bid.	Referred clause stands deleted.



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16.	I	Sub-Section– I-A, DATASHEET A	4.3, VII)	265 of 663	4.3 Neutralization Pit Disposal Pumps for 1st set of Regeneration system vii) Material of Construction: Casing: SS-316 / Stainless Steel CF 8M Impeller: SS-316 / Stainless Steel CF 8M Shaft : SS-410	4.3 Neutralization Pit Disposal Pumps for 1st set of Regeneration system vii) Material of Construction: Casing: DUPLEX Stainless steel Impeller: DUPLEX Stainless steel Shaft: DUPLEX Stainless steel Pump Wetted Parts MOC shall also be duplex Stainless steel only. Bidder to adhere the same.
17.	I	Sub-Section– I-A, DATASHEET A	4.4, VII)	266 of 663	4.4 Neutralization Pit Disposal Pumps for 2nd set of Regeneration system vii) Material of Construction: Casing: SS-316 / Stainless Steel CF 8M Impeller: SS-316 / Stainless Steel CF 8M Shaft : SS-410	4.4 Neutralization Pit Disposal Pumps for 2nd set of Regeneration system vii) Material of Construction: Casing: DUPLEX Stainless steel Impeller: DUPLEX Stainless steel Shaft: DUPLEX Stainless steel Pump Wetted Parts MOC shall also be duplex Stainless steel only. Bidder to adhere the same.

SCHEDULE-B

NEW CLAUSES / SCOPE ADDED:

SI no.	Section No.	Sub-section	Annexure /Clause no.	Page no.	Description			
18.	I	Sub-Section– I-A	4.0, B,I. sr. no. 38	18 of 663	Two (2x100%) nos. (1W+1S) oil free type N –Pit air blowers with electric motor drives, for supplying air required for air agitation of neutralisation pit (both compartments) of 1st set of Regeneration System. Each blower shall be complete with motor, V-belt drive with belt guard, inlet filter, silencer, flexible couplings and discharge snubber, acoustic hood, relief valve, anti-vibration pads etc.as required and shall be mounted on a single base.			
					18	AIR-BLOWERS FOR N-PIT (REGENERATION AREA) (FOR 1ST REGENEARTION SYSTEM)		
					(i)	Total Numbers required	Two (2x100%) Nos. (1W+1SB) with acoustic enclosure	
					(ii)	Type	Rotary ,Twin lobe type, oil free, positive	



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						displacement
					(iii) Location	Indoor
					(iv) Duty	Intermittent
					(v) Capacity and head	As per system requirement
					(vi) Noise Level	85 dB (A) Max. at one meter
					(vii) Pressure gauge	One per blower
					(viii) Material of construction	Casing – Cast Iron GR FG 260 to IS 210 Lobe – Cast Iron GR FG 260 to IS 210 Shaft – Carbon Steel to EN 8
					(ix) Drive motor	The drive motor of each air blower will be Energy Efficiency Class IE-3 as per IS : 12615
					(x) Criteria for selection of drive motor	Minimum 15 % margin over BkW at rated duty point shall be taken and standard motor with next higher KW as available shall be selected. This shall in no way be less than the maximum power required by the Pump.
					(xi) Dynamic Balancing Test	To be provided by bidder
					The same shall be in bidder's scope of supply. Bidder to adhere the same.	
19.	I	Sub-Section– I-A	4.0, B, II. sr. no. 38	21 of 663	Two (2x100%) nos. (1W+1S) oil free type N –Pit air blowers with electric motor drives, for supplying air required for air agitation of neutralisation pit (both compartments) of 2nd set of Regeneration System. Each blower shall be complete with motor, V-belt drive with belt guard, inlet filter, silencer, flexible couplings and discharge snubber, acoustic hood, relief valve, anti-vibration pads etc.as required and shall be mounted on a single base.	
					19	AIR-BLOWERS FOR N-PIT (REGENERATION AREA) (FOR 2nd REGENEARTION SYSTEM)
					(i)	Total Numbers required Two (2x100%) Nos. (1W+1SB) with acoustic enclosure
					(ii)	Type Rotary ,Twin lobe type, oil free, positive displacement
					(iii)	Location Indoor
					(iv)	Duty Intermittent



AMENDMENT TO TECHNICAL SPECIFICATION FOR CONDENSATE POLISING UNIT 5X800 MW YADADRI THERMAL POWER STATION

SPECIFICATION NO.: PE-TS-417-155A-A001

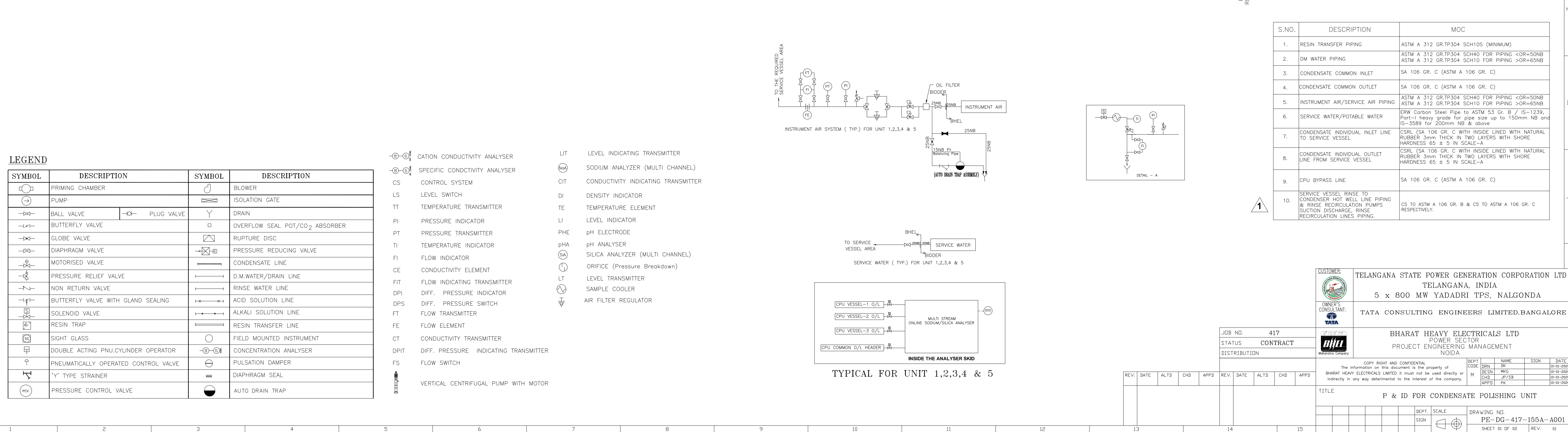
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				(v)	Capacity and head	As per system requirement
				(vi)	Noise Level	85 dB (A) Max. at one meter
				(vii)	Pressure gauge	One per blower
				(viii)	Material of construction	Casing – Cast Iron GR FG 260 to IS 210 Lobe – Cast Iron GR FG 260 to IS 210 Shaft – Carbon Steel to EN 8
				(ix)	Drive motor	The drive motor of each air blower will be Energy Efficiency Class IE-3 as per IS : 12615
				(x)	Criteria for selection of drive motor	Minimum 15 % margin over BKW at rated duty point shall be taken and standard motor with next higher KW as available shall be selected. This shall in no way be less than the maximum power required by the Pump.
				(xi)	Dynamic Balancing Test	To be provided by bidder
				The same shall be in bidder's scope of supply. Bidder to adhere the same.		



	TELANGANA STATE POWER GENERATION CORPORATION LTD TELANGANA, INDIA 5 x 800 MW YADADRI TPS, NALGONDA
OWNER'S CONSULTANT: 	TATA CONSULTING ENGINEERS LIMITED.BANGALORE
Engineering & Design 	BHARAT HEAVY ELECTRICALS LTD POWER SECTOR PROJECT ENGINEERING MANAGEMENT Noida

JOB NO. 417				 Maharashtra Company	BHARAT HEAVY ELECTRICALS LTD POWER SECTOR PROJECT ENGINEERING MANAGEMENT NOIDA			
STATUS CONTRACT								
DISTRIBUTION								
COPY RIGHT AND CONFIDENTIAL The information on this document is the property of BHARAT HEAVY ELECTRICALS LIMITED it must not be used directly or indirectly in any way detrimental to the interest of the company.					DEPT CODE	DRN IRN CHK APPD	NAME SSGN MKG JY/SB PK	SSGN DATE 01-01-2018 01-01-2018 01-01-2018 01-01-2018
REV.	DATE	ALTD	CHD	APPD	TITLE P & ID FOR CONDENSATE POLISHING UNIT			
					DEPT SSGN	SCALE	DRAWING NO. PE-DG-417-155A-A001	
14			15				SHEET 01 OF 02	REV. 01

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ANNEXURE VI
MANDATORY SPARE LIST

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MANDATORY SPARES LIST FOR CONDENSATE POLISHING UNIT

Condensate Polishing Plant (Mandatory Spares List)		
S.No.	Equipment	Spares Quantity for 5 Units
1	Spares for Horizontal Centrifugal Pumps	
1.1	Shaft	2 Nos.
1.2	Shaft Sleeve	4 Nos.
1.3	Impeller	2 Nos.
1.4	Impeller locking nut and bolt	8 Nos.
1.5	Impeller wear ring	8 Nos.
1.6	Casing wear ring	8 Nos.
1.7	Oil Seal	8 Nos.
1.8	Oil Deflector	6 Nos.
1.9	Oil Ring	6 Nos.
1.1	Gland Packing	8 Nos.
1.11	Lantern Ring	6 Nos.
1.12	Mech Seal Assembly	2 Nos.
1.13	Stationary/Carbon Packing and O "Ring for Mechanical Seal"	6 Sets
1.14	Oil Level Gauge	6 Nos.
1.15	Coupling	4 Nos.
1.16	Rubber Bush for Coupling	4 Nos.
1.17	O " Rings "	4 Sets
1.18	Suction Strainers Element	6 Nos.
1.19	Bearing for Pump Motor	4 Sets
2	Spares for Vertical Type Centrifugal Pumps (at Neutralising Pit)	
2.1	Complete Bowl assembly	2 Sets
2.2	Impeller (s)	2 Sets
2.3	Shafts	2 Sets
2.4	Casing wearing (s)	2 Sets
2.5	Impeller wear ring (s)	2 Sets
2.6	Shaft Sleeves	4 Sets
2.7	Shaft Couplings	2 Sets
2.8	Shaft nuts & keys	2 Sets
2.9	Lantern rings	2 Sets
2.1	Bell mouth liner	2 Sets
2.11	Bearings	2 Sets
2.12	Pump motor coupling	2 Sets
3	Spares for Agitators	
3.1	Gear Box Unit Complete	2 Nos.
3.2	Bearing for Gear Box Unit	2 Sets
3.3	Coupling complete (Motor/Gear box and gear box/agitator)	2 Sets

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3.4	Coupling Bolts	2 Sets
3.5	Coupling shim pack (if applicable)	8 Sets
3.6	Oil seals	8 Sets
4	Spares for Valves	
4.1	i) Manual Diaphragm valves	20% of total quantity used for each type and size with minimum no. four (4) for each type /size/rating. (Total Quantity shall be calculated based on population of the item required for 1 CPU service vessel area of 1 TG hall & 1st set of complete regeneration system along with its interconnection valves).
	ii) Spare Diaphragm for above	20% of total quantity used for each type and size with minimum no. four (4) for each type and size. (Total Quantity shall be calculated based on population of the item required for 1 CPU service vessel area of 1 TG hall & 1st set of complete regeneration system along with its interconnection valves).
4.2	i) Non return valves (NRV)	4 nos. of each size & type
	ii) Flaps for above NRV	4 nos. of each size
4.3	Gate/Globe/Ball valves/plug valve/needle valve	
	i) Up to 4"	20% of total quantity used for each type and size with minimum no. four (4) for each type, size. (Total Quantity shall be calculated based on population of the item required for 1 CPU service vessel area of 1 TG hall & 1st set of complete regeneration system along with its interconnection valves).
	ii) Above 4"	2 nos. each type and size.
4.4	Butter fly valve	
	i) Up to 4"	20% of total quantity used for each type and size with minimum no. four (4) for each type, size. (Total Quantity shall be calculated based on population of the item required for 1 CPU service vessel area of 1 TG hall & 1st set of complete regeneration system along with its interconnection valves).
	ii) Above 4"	2 nos. each type and size.
5	Spares for Filter Media/ ION Exchange Resins	
5.1	Media for Activated Carbon Filters	20% of total quantity. (Total Quantity shall be calculated based on quantity of the item required for 1st set of complete regeneration system i.e. Quantity of activated carbon required for 1 complete ACF).
5.2	Resins for each type of exchangers	20% of total quantity. (Total Quantity shall be calculated based on quantity of the item

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		required for 1 CPU service vessel area of 1 TG hall & 1st set of complete regeneration system i.e. 4 charge resins+ 1 resin injection hopper charge)
5.3	Ejectors	Four (4) nos. of each type
6	Spares for Air Blowers	
6.1	Impeller with shaft	2 Sets
6.2	Bearings	2 Sets
6.3	Oil seals	10 Sets
6.4	Filter	2 Sets
7	Pneumatic Control Valve	
7.1	Pneumatic Diaphragm for Diaphragm actuated valve	4 Nos. for each type of Actuator
7.2	Gland Packing	2 sets for each type of Control Valve
7.3	Plug, Seat, Cage, Stem etc.	2 sets for each type of Control Valve
7.4	Retainer Ring, Seal Ring etc.	2 sets for each type of Control Valve
7.5	Gasket	4 Sets for each type of Control Valve
7.6	Position Transmitter complete set	20% of total quantity used in the system for each type and model. (Total Quantity shall be calculated based on population of the item required for 1 CPU service vessel area of 1 TG hall & 1st set of complete regeneration system along with its interconnection valves).
7.7	Control Valve E/P Positioner complete Set	20% of total quantity used in the system for each type and model. (Total Quantity shall be calculated based on population of the item required for 1 CPU service vessel area of 1 TG hall & 1st set of complete regeneration system along with its interconnection valves).
7.8	Complete Set of Solenoid Valve for Pneumatic type On/Off Valve	4 Nos. for each type & ratings
7.9	Solenoid Coil for Pneumatic type On/Off Valve	10 Nos. for each type & ratings
7.10	Position Limit Switch for Pneumatic type On/Off Valve	20 Nos. for each type & ratings
8	C&I Items	
8.1	Transmitters/ Gauges/Switches etc. along with relevant accessories	20% of total or at least four (whichever is higher) for each type along with accessories. [Total Quantity shall be calculated based on population of the item required for 1 CPU service vessel area of 1 TG hall & 1st set of complete regeneration system along with its interconnection instruments].
8.2	Temperature Element (RTD/Thermo-couple) with thermo well	20% of each type, range and immersion length. Minimum 10 nos. .[Total Quantity

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		shall be calculated based on population of the item required for 1 CPU service vessel area of 1 TG hall & 1 st set of complete regeneration system along with its interconnection instruments].
8.3	Analysers	
a)	Field sensor	4 nos.
b)	Field transmitter/ complete electronic unit	2 nos.
c)	Power supply card	2 nos.
d)	Instrumentation hardware	2 nos. each item
8.4	Pneumatic Control Valves & Block Valves	
a)	Plot Relay	2 sets for each valve
b)	Actuator Diaphragm	2 nos. for each valve
c)	Feedback Linkage	2 nos. for each valve
d)	Smart Positioners	20% of total quantity of each model/type. (Total Quantity shall be calculated based on population of the item required for 1 CPU service vessel area of 1 TG hall & 1st set of complete regeneration system along with its interconnection valves).
e)	I/P Converters (If any)	20% of total quantity or minimum 30 nos. (Total Quantity shall be calculated based on population of the item required for 1 CPU service vessel area of 1 TG hall & 1st set of complete regeneration system along with its interconnection valves).
f)	Complete Consumables for Valve Viz. O-ring, Gland Packing, Packing Ring, Bonnet Seal etc	4 Sets each size, rating, type
g)	Valve Disc	4 Sets each size, rating, type
h)	Valve Spindle	4 Sets each size, rating, type
i)	Valve Seat	4 Sets each size, rating, type
j)	Bush	4 Sets each size, rating, type
k)	Guide	4 Sets each size, rating, type
l)	Guide Bush	4 Sets each size, rating, type
m)	Coupling Nut	4 Sets each size, rating, type
n)	Actuator Piston with Rod & Seal	4 Sets each size, rating, type
o)	Control valve stem packing and spare operator moulded rubber diaphragms	2 sets for each size, rating, type
p)	Valve trim (including cage, plug, stem, seat rings, guide bushings etc.) for each of the control valves as offered.	2 sets for each size, rating, type
q)	Solenoid valves, position transmitters, limit switches, I/P convertors, positioners etc of each type	20% of total quantity spare with minimum 2 nos. for each size, rating, type. (Total Quantity shall be calculated based on population of the item required for 1 CPU service vessel area of 1 TG hall & 1st set of complete regeneration system along with

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		its interconnection valves).
8.5	Solenoid Valves	
a)	Solenoid Valve Coil	4 nos. of each rating & insulation
b)	Plunger	2 nos. of each type
c)	Seat	4 nos. of each type & size
d)	Gaskets	4 sets of each type & size
e)	O-Ring set	10 sets of each type & size
8.6	Flow Elements	
a)	Root valves	4 nos. for each flow element
b)	Gland packing for root valves	4 nos. for each flow element
c)	Gaskets	6 nos. for each flow element
8.7	Process Connection Piping (Impulse piping/tubing, sampling piping / tubing & air supply piping as applicable)	
a)	Valves of all types	20% of each type, class, size & model. (Total Quantity shall be calculated based on population of the item required for 1 CPU service vessel area of 1 TG hall & 1st set of complete regeneration system along with its interconnection valves).
b)	Valve Manifolds (2 way/3 way/5 way)	20% of each type, class, size & model. (Total Quantity shall be calculated based on population of the item required for 1 CPU service vessel area of 1 TG hall & 1st set of complete regeneration system along with its interconnection).
c)	Fittings	20% of each type, class, size & model. (Total Quantity shall be calculated based on population of the item required for 1 CPU service vessel area of 1 TG hall & 1st set of complete regeneration system along with its interconnection).
d)	Filter Regulators	40% of each model. (Total Quantity shall be calculated based on population of the item required for 1 CPU service vessel area of 1 TG hall & 1st set of complete regeneration system along with its interconnection).
9	Electrical Items	
10	Motor	
10.1	415 Volt Motor (above 30KW Rating up to 200KW)	
10.1.1	End Shield Cover Driving & Non-Driving End	2 Sets for each type and rating of Motor
10.1.2	Driving End & Non-Driving End Bearing	2 Sets for each type and rating of Motor
10.1.3	Cooling Fan	2 Nos. for each type and rating of Motor
10.1.4	Motor Space Heater	2 Nos. for each type and rating of Motor
10.1.5	Motor Terminal Block	2 Nos. for each type and rating of Motor
10.1.6	Complete Set of Coupling	2 Sets for each Application
10.2	415 Volt Motor (Up to 30KW Rating)	

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10.2.1	Driving End & Non-Driving End Bearing	6 Sets for each type and rating of Motor
10.2.2	Cooling Fan	4 Nos. for each type and rating of Motor
10.2.3	Motor Terminal Block	10 Nos. for each type and rating of Motor
10.2.4	Complete Set of Coupling	2 Sets for each Application
10.3	Lugs & Glands	
10.3.1	Glands & Lugs	40 % of each type, size & rating of cables. (Total Quantity shall be calculated based on population of the item required for 1 CPU service vessel area of 1 TG hall & 1st set of complete regeneration system along with its interconnection).

NOTE:	
1	Unless stated otherwise, a "set" or "Lot" means items required for complete replacement in one equipment of each type / size/ range.
2	<i>Wherever quantity has been specified as percentage (%), it shall mean percentage (%) of the population of the item required for 1 TG unit (CPU service vessel area) & 1st set of complete regeneration system along with the interconnection.</i>
3	In case of Bought Out items, itemised spares list may be vendor specific and may differ from the list of spares mentioned above. In such cases, The quoted price shall be considered for applicable items only without any change in the contract price.