



BHARAT HEAVY ELECTRICALS LIMITED
PROJECT ENGINEERING MANAGEMENT, NOIDA

Date-22-Nov-19

CORRIGENDUM- 05

PROJECT	:	1X660 MW UPRVUNL PANKI EXTN
PACKAGE	:	EFFLUENT TREATMENT PLANT
ENQUIRY NO	:	PE/PG/PKI/E-6311/2019 Dated. 05.10.2019
SUBJECT	:	TECHNICAL AMENDMENT

Type of Corrigendum			
Technical Corrigendum -	☒	Commercial Corrigendum -	☐

In reference to the above mentioned tender enquiry for **EFFLUENT TREATMENT PLANT** package, please note the following:

- 1. Amendment to technical specification is enclosed herewith. Kindly consider the same while submitting the offer.**

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

Upendra Chaudhary
Manager



AMENDMENT ON TECHNICAL SPECIFICATION
FOR
EFFLUENT TREATMENT PLANT (ETP)
1X660 MW PANKI THERMAL POWER STATION

SPECIFICATION NO.: PE-TS-426-164-A001

AMENDMENT NO # 3

REV. NO. 00

DATE: 20/11/2019

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ANNEXURE-A

The following modifications with respect to Technical Specification for EFFLUENT TREATMENT PLANT (ETP) BHEL's Technical specification no PE-TS-426-164-A001 shall apply. Bidder to note that existing clauses/ details as appearing in the specification stands deleted and clauses/details as mentioned in "Modified clause/details" column shall be applicable and complied by the bidder as listed below in **SCHEDULE A**.

SCHEDULE-A

MODIFIED CLAUSES/ PAGE NUMBERS:

Sl no.	Vol. No.	Section/ Description	Clause no	Page no	Existing clause/details	Modified clause/details																																
1.	IIB	SECTION- C1	ANNEXUE-VI	109 of 519	ANNEXURE-VI, WATER ANALYSIS, REV. NO.00	ANNEXURE-VI, WATER ANALYSIS, REV. NO.01 Dtd. 20.11.19 which shall be used for design considerations.																																
2.	III			519 of 519	FORMAT FOR GUARANTEED AUXILIARY POWER CONSUMPTION FIGURES (TO BE FILLED BY THE BIDDER) – REV. NO.-00	FORMAT FOR GUARANTEED AUXILIARY POWER CONSUMPTION FIGURES (TO BE FILLED BY THE BIDDER) – REV. NO.-01 DTD.20.11.19. Bidder has to quote GPC as per this format.																																
3.	IIB	SECTION- C1	3.1.4	16 of 519	Four (4) Nos. sludge trolley for disposal of sludge.	Four (4) Nos. sludge trolley of capacity 250 kg each for disposal of sludge.																																
4.	IIB	SECTION- C1	3.1	15 of 519	<table><tr><th colspan="4">Basis of treatment system (For Oily Waste)</th></tr><tr><th>Parameter</th><th>Unit</th><th>TPI Inlet</th><th>TPI Outlet</th></tr><tr><td>Oil Concentration</td><td>ppm</td><td>1000</td><td>10</td></tr><tr><td>Suspended Solids</td><td>ppm</td><td>300</td><td><100</td></tr></table>	Basis of treatment system (For Oily Waste)				Parameter	Unit	TPI Inlet	TPI Outlet	Oil Concentration	ppm	1000	10	Suspended Solids	ppm	300	<100	<table><tr><th colspan="4">Basis of treatment system (For Oily Waste)</th></tr><tr><th>Parameter</th><th>Unit</th><th>TPI Inlet</th><th>TPI Outlet</th></tr><tr><td>Oil Concentration</td><td>ppm</td><td>1000</td><td>1000</td></tr><tr><td>Suspended Solids</td><td>ppm</td><td>300</td><td>300</td></tr></table> Oil concentration is generally free oil. Type of oil skimmer shall be selected by the bidders as per system requirement and	Basis of treatment system (For Oily Waste)				Parameter	Unit	TPI Inlet	TPI Outlet	Oil Concentration	ppm	1000	1000	Suspended Solids	ppm	300	300
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20.11.19
Jyoti
DGM-MAX

Shamun
B K Verma
Manager/MAX



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						proven practice. In case any additional equipment's is required to meet the outlet parameter of TPI, then same shall be in bidder's scope.
5.	IIB	SECTION-C1	3.4.8	23 of 519	3.4.8 DESIGN CRITERIA FOR UF-RO The Design TDS of feed water to UF-RO System shall be minimum 3000 ppm. The Bidder need to calculate / derive the ionic analysis / composition for the combined waste based on quantity and quality of individual stream from different sources as per Annexure-IV, "Water Analysis". In case the TDS of derived composition of combined waste is less than 3000 ppm the same shall be adjusted to make the design TDS OF 3000 ppm.	
6.	IIB	SECTION-C1	Drawings	112 of 519	P&ID FOR EFFLUENT TREATMENT PLANT - DRAWING NO.-PE-DG-426-164-A001, REV-1 - In P&ID Cleaning Solution Pumps of UF Skid and RO Skid is shown as horizontal centrifugal pump.	P&ID FOR EFFLUENT TREATMENT PLANT - DRAWING NO.-PE-DG-426-164-A001, REV-1 -Cleaning Solution Pumps of UF Skid and RO Skid shall be considered. Positive displacement, constant speed, variable stroke and diaphragm in line with the data sheet clause no. 4.39.00. However in case positive displacement pump is not suitable, then alternative centrifugal pump shall also be acceptable, subject to end client (UPRVUNL) approval.
7.	IIB	SECTION-C1	3.4.7.32	19 of 519	Two (2) Nos. (2 x 50 %) Micron Cartage Fillers for UF system with all accessories required.	Two (2) Nos. (2 x 50 %) Basket Strainers of 150 micron for UF system with all

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							accessories required.
8.	IIB	SECTION-C1	Drawings	112 of 519	P&ID FOR EFFLUENT TREATMENT PLANT - DRAWING NO.-PE-DG-426-164-A001, REV-1 - UF SKID RECOVERY 90% 2X225 M3/Hr	P&ID FOR EFFLUENT TREATMENT PLANT - DRAWING NO.-PE-DG-426-164-A001, REV-1 - UF SKID RECOVERY 90% 2X135 M3/Hr.	
9.	IIB	SECTION-C1	Drawings	112 of 519	P&ID FOR EFFLUENT TREATMENT PLANT - DRAWING NO.-PE-DG-426-164-A001, REV-1 - Note No. 14	P&ID FOR EFFLUENT TREATMENT PLANT - DRAWING NO.-PE-DG-426-164-A001, REV-1 - Note No.-14 stands deleted.	
10.	IIB	SECTION-C1	Drawings	112 of 519	P&ID FOR EFFLUENT TREATMENT PLANT - DRAWING NO.-PE-DG-426-164-A001, REV-1 - Discharge of SSF Back Wash Pump - TO ETP CLARIFIER	P&ID FOR EFFLUENT TREATMENT PLANT - DRAWING NO.-PE-DG-426-164-A001, REV-1 - Discharge of SSF Back Wash Water Pump - TO CMB	
11.	IIB	SECTION-C1	3.4.7.82	22 of 519	All the sumps, tanks, reservoirs and other water retaining structures shall be provided by bidder with access ladders/rungs from operating platforms/ground level as the case may be and de-watering pits one for each section (civil work by BHEL).	All RCC sumps/Pit, tanks, reservoirs and other water retaining structures shall be constructed by BHEL, however access ladders/rungs (along with insert plates and embedment plates) from operating platforms/ground level as the case may be shall be provided by bidder. Painting of these ladders/rungs shall be in bidder scope.	
12.	IIB	SECTION-C1	3.4.7.102	Page 23 of 519 (Amendment-1)	RCC tank construction shall be in BHEL scope, however tank lining as mentioned in specification, data sheet or elsewhere shall be supplied by bidder also tank lining shall be applied by bidder.	RCC tank/pit/sump construction shall be in BHEL scope, however tank/pit/sump lining, painting, specific coating as mentioned in specification, data sheet or elsewhere shall be supplied by bidder also tank lining, painting, specific coating shall be applied by bidder.	
13.	IIB	SECTION-C3	2.09.01	205 of 519	Common Requirements for all Analysers	Common requirement for all analyser are tabulated under clause no. 2.09.01. In addition to common requirement specified under clause no. 2.09.01 specific requirement for different types of analysers is attached as Annexure-I.	



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NEW CLAUSES / SCOPE ADDED:

Sl no.	Vol. No.	Section/ Description	Clause no	Page no	Description												
1.	IIB	SECTION- C1	3.4.7.108	Page 23 of 519	MOC for piping, fitting and valves for RO reject and subsequent RO stages (as required) shall be of CPVC. The pressure rating of the CPVC pipe, fitting and valves shall meet the system requirement.												
2.	IIB	SECTION- C1	3.4.7.109	Page 23 of 519	Filing media as defined in Data sheet A for dual media filter shall be in bidders scope of bidder.												
3.	IIB	SECTION- C1	3.4.7.110	Page 23 of 519	Details of RO System a) Capacity of each RO Feed pump shall be Min 120 M3/hr. b) Capacity of each HP pump of 1 st Stage shall be Min 120 M3/hr. c) RO plant outlet capacity shall be 191 M3/hr (i.e. 80% of 239 M3/hr)												
4.	IIB	SECTION- C1	3.4.7.111	Page 23 of 519	Bidder to please note that the minimum details (pump, valves, instruments, equipment, RO streams etc.) shown in P&ID are minimum and is in bidder's scope. Any additional equipment as required to meet system requirement shall be in bidder's scope. Further also please note that only single stage of RO system has been shown in P&ID. However if second stage (or third stage) is required for meeting the overall guarantee of RO recovery & quality parameter, then the same shall be in bidder's scope.												
5.	IIB	SECTION- C1	4.00 d)	Page 88 of 519	Basis of treatment system (For Oily Waste) <table><thead><tr><th>Parameter</th><th>Unit</th><th>TPI Inlet</th><th>TPI Outlet</th></tr></thead><tbody><tr><td>Oil Concentration</td><td>ppm</td><td>1000</td><td>10</td></tr><tr><td>Suspended Solids</td><td>ppm</td><td>300</td><td><20</td></tr></tbody></table> Same shall be guaranteed and demonstrated by the bidder.	Parameter	Unit	TPI Inlet	TPI Outlet	Oil Concentration	ppm	1000	10	Suspended Solids	ppm	300	<20
Parameter	Unit	TPI Inlet	TPI Outlet														
Oil Concentration	ppm	1000	10														
Suspended Solids	ppm	300	<20														

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AMENDMENT ON TECHNICAL SPECIFICATION
FOR
EFFLUENT TREATMENT PLANT (ETP)
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6.	IIB	SECTION- C1	4.00 e)	Page 88 of 519	Guaranteed TSS of water at outlet of ETP clarifier shall be 10 ppm & 10 NTU.
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Signature

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TITLE:

**TECHNICAL SPECIFICATION FOR
EFFLUENT TREATMENT PLANT (ETP)
1X660 MW PANKI THERMAL POWER STATION EXT.**

BHEL DOCUMENTS NO.: PE-TS-426-164-A001

VOLUME II-B

SECTION-C1

REV. NO. 01

DATE: 20.11.19

**ANNEXURE-VI
WATER ANALYSIS**



TITLE:
TECHNICAL SPECIFICATION FOR
EFFLUENT TREATMENT PLANT (ETP)
1X660 MW PANKI THERMAL POWER STATION EXT.

BHEL DOCUMENTS NO.: PE-TS-426-164-A001

VOLUME II-B

SECTION-C1

REV. NO. 01

DATE: 20.11.19

RAW WATER ANALYSIS

S. No.	Description	Unit	Parameter
1	Physical characteristics		
	pH at 250C		8
	Turbidity	Silica Scale	500
	Total Dissolved solids	ppm	250
	Total Suspended Solids	ppm	241
	Colour	Hazen	<5
2	Cations		
	Calcium Hardness	ppm as CaCO3	80
	Magnesium Hardness	ppm as CaCO3	40
	Sodium + Potassium	ppm as CaCO3	36
	Iron	ppm as CaCO3	1.5
	Total Cations		157.5
3	Anions		
	Bicarbonate	ppm as CaCO3	100
	Carbonate	ppm as CaCO3	0.95
	Hydroxyl	ppm as CaCO3	0.05
	Chlorides	ppm as CaCO3	20
	Sulphate	ppm as CaCO3	36
	Nitrate	ppm as CaCO3	0.5
	Total Anions		157.5
4	Carbon Di-oxide as CO2	ppm	1.97
5	Dissolved Silica	ppm as SiO2	10.0
6	Colloidal Silica	ppm as SiO2	0.5
7	Organic Matter	Ppm as O2	4.0

CLARIFIED WATER ANALYSIS (To be further derived/modified based on the chemical dosing as per Note-1) (FOR COOLING WATER(CW)/ACW MAKE-UP)

S. No.	Description	Unit	Parameter
1	Physical characteristics		
	pH at 250C		7.59
	Turbidity	NTU	<15
	Total Dissolved solids	ppm	285
	Total Suspended Solids	ppm	<15
2	Cations		
	Calcium Hardness	ppm as CaCO3	113.86
	Magnesium Hardness	ppm as CaCO3	40
	Sodium + Potassium	ppm as CaCO3	37.2
	Iron	ppm as CaCO3	0.3
	Total Cations		191.36
3	Anions		
	Bicarbonate	ppm as CaCO3	97
	Carbonate	ppm as CaCO3	0.34
	Hydroxyl	ppm as CaCO3	0.02
	Chlorides	ppm as CaCO3	27.1



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1X660 MW PANKI THERMAL POWER STATION EXT.

BHEL DOCUMENTS NO.: PE-TS-426-164-A001

VOLUME II-B

SECTION-C1

REV. NO. 01

DATE: 20.11.19

	Sulphate	ppm as CaCO ₃	66.4
	Nitrate	ppm as CaCO ₃	0.5
	Total Anions		191.36
4	Carbon Di-oxide as CO ₂	ppm	5.54
5	Dissolved Silica	ppm as SiO ₂	10.0
6	Colloidal Silica	ppm as SiO ₂	0.5

Residual chlorine – less than 0.1 mg/liter

Turbidity < 15 at overload

Note:

1. Clarified water is being used as cooling water make up. Clarified water analysis shall be derived by bidder based on Raw water analysis after modifying the continuous dosing of FeCl₃ – not less than 25 ppm, Lime as Ca(OH)₂ -25 ppm, Coagulant aid - 2ppm and chlorine dosing 5 ppm. Circulating water analysis shall be derived by bidder considering cycle of Concentration of Cooling water is 5 & also considering the dosing of CW Treatment Chemicals.

2. CHEMICALS USED FOR CW TREATMENT

- a) Biocide – not less than 3 ppm
- b) Sulphuric Acid – To maintain M-alkalinity in cooling water 150 ppm max
- c) Scale Inhibitor – Not less than 10 ppm.
- d) Corroding Inhibitor – Not less than 10 ppm

Influent water quality & frequency of incoming water to CMB (for design consideration)

Sl NO	Influent Source	Quality	Quantity	Remarks/Frequency
1.	From Condenser waste water (cooling water)	The quality shall be considered same as circulation water analysis. TSS to be considered as 50 ppm.	Installed pump (each) capacity is 40 m ³ /h. Maximum the pump can operate for 15 Min in 24 hrs.	Operation is intermittent
2.	From DM and CPU regeneration water (N-pit water)	TDS of DM and CPU water shall be 10000 ppm, TSS-50 ppm (The detailed analysis shall be provided during detailed engineering).	100 M ³ / Hr for four hrs in 24 Hrs	Operation is intermittent
3.	TG Wash Water	Clarified water shall be used for TG wash. TSS to be considered as 500 ppm.	Pump capacity -50 M ³ / Hr, Expected for 1 hrs in 24 hrs.	Operation is intermittent
4.	From CT Blow Down	Cooling water analysis. TSS to be considered as 50 ppm.	250 M ³ /Hr	Operation is continuous
5.	A/C Plant Reject	Brine Water. TDS-10000 ppm. TSS to be considered as 50 ppm. (The detailed analysis shall be provided during detailed engineering).	25 M ³ /Hr	Operation is continuous
6.	Boiler Area Sump	Clarified water shall be used for Boiler area wash. TSS to be considered as 500 ppm.	100 M ³ / Hr, Expected for 30 Min. in 24 hrs	Operation is intermittent
7.	From SSF Back Wash	Circulating water. TSS of SSF backwash water is 6500 ppm	Capacity -100 M ³ /Hr. Operation In every two hrs. for 40 Min.	Operation is intermittent

TDS – Total Dissolved Solids

TSS - Total Suspended Solids

• Cooling Tower Parameters:

- Temperature difference across cooling tower : 10 degC



TITLE:

TECHNICAL SPECIFICATION FOR
EFFLUENT TREATMENT PLANT
1 X 660 MW PANKI TPS EXTENSION PROJECT

BHEL DOCUMENTS NO.: PE-TS-426-164-A001

VOLUME III

SECTION –

REV. NO. 01

DATE: 20.11.19

FORMAT FOR GUARANTEED AUXILIARY POWER CONSUMPTION (GPC) FIGURES
(TO BE FILLED BY THE BIDDER)

S.NO.	DESCRIPTION OF EQUIPMENT	NUMBER OF WORKING PUMPS TO BE CONSIDERED FOR CALCULATION OF GPC	Duty Factor of Drive	TOTAL GUARANTEED POWER CONSUMPTION FOR WORKING PUMPS AT MOTOR INPUT TERMINAL (IN KW)
1	CMB effluent transfer Pump	1	1	
2	DMF Feed Pump	2		
3	RO FEED PUMP	2		
4	HP PUMPS (1 ST STAGE)	2		
5	HP PUMPS (2 ND STAGE IF REQUIRED)	2		
6	RO PERMEATE TRANSFER PUMP	2		
	Total GPC (KW)			

Note-

Base auxiliary power consumption figure for the above listed Pumps of ETP system (for working pumps only) has been considered as **362 KW**. As long as bidder's quoted guaranteed power consumption (GPC) above remains within Base auxiliary power consumption figure, there will be no technical loading of bid on power consumption for evaluation. However, if bidder's quoted GPC exceeds base auxiliary power consumption figure, there shall be technical loading of bid for evaluation @ ₹ 2,46,000/- (Rupees Two Lacs forty six Thousand only) per KW of additional power over Base auxiliary power consumption figure.

Bidder's guaranteed power consumption as Quoted above shall be demonstrated by the successful bidder during performance testing at works/ site. In case power consumption is noted higher than Base auxiliary power consumption figure / bidder's quoted GPC whichever is higher, during inspection/ PG test, penalty @ ₹ 5, 84,000/- (Rupees Five lacs and eighty four thousand only) per additional KW shall be levied on bidder.

Hysteresis : Less than $\pm 1\%$ of full travel.

2.16.00 WATER SYSTEM RELATED SPECIAL INSTRUMENTS (CW plant, D M PLANT, CPU PLANT, PT PLANT, AWRS, Service water, Potable water, etc.)

2.16.01 ANALYSER INSTRUMENTS:

For Technical specification of Cation/Specific Conductivity, pH, Sodium, Silica, Turbidity, Total Dissolved Solids (TDS) and Concentration analysers, and other requirements, please refer Specification of Analysers, Vol.-V, Part A and Part-B, chapter 5, SWAS chapter of this specification.

2.16.02 Residual Chlorine Analyser

- (a) An automatic chlorine residual analyser of amperometric type shall be provided alongwith the chlorinating plant for monitoring the residual chlorine content of cooling water. The analyser shall be suitable for accurate residual measurement in open/closed systems. The measurement accuracy shall not be affected by presence of treatment chemicals as chromates, phosphates, de-former highly polluted water, change in temperature etc.
- (b) The analyser shall comply with the following specification requirements, as a minimum
- (i) Indicator : Provision of LC display in the panel of analyser.
 - (ii) Range : 0 to 20.0 mg/L (ppm)
 - (iii) Accuracy : 2% or better
 - (iv) Sensitivity : 0.01 mg/l
 - (v) Output signal : 4-20mA DC isolated output
 - (vi) Alarm annunciation : High and low alarms to be provided on panel and shall be field adjustable
 - (vii) Calibration : Zero and span adjustment facility to be provided. Final calibration adjustments of the analyser to be done at site and duly verified by titration. Temperature compensation range 0 to 50degC.
 - (viii) Mounting : The analyser shall be suitable for field mounting conform to protection class IP-65.
 - (ix) Electrodes : Platinum/Gold and copper electrodes shall be provided with cell cleaning system.
 - (x) Power Supply : 230 V AC, +/- 10%, 50 Hz. From UPS
- (c) Circulating water as sample to residual chlorine analyser shall be taken from hot circulating water pipe work before entry to cooling towers. Exact location and layout of sampling arrangement shall be finalised during detailed engg. stage. Bidder shall provide necessary pumping system (with 100% standby) for meeting the analyser requirements, if needed. All the

provided with a phenolic name plate engraved with a legend acceptable to the owner.

5.03.10 Grab samples

Grab samples valves on the front of SWAS panel shall be provided to direct grab samples to tough through grab sample nozzles or to the drain header. Approximately 300mm of flexible tubing shall be provided for each sample to allow grab sample collection and prevent splashing. Grab sample nozzles shall be provided with adapter and panel mounting flanges. All these items i.e. nozzles, adapter and flanges shall be owner approved make.

5.03.11 Sample Sink

A continuous sink, located at the place of grab sample analysis, shall be provided. The sink shall be SS 316, 14 gauge minimum. The sample sink shall be connected to waste drain header. Sample sink shall contain an integral SS ledge to accommodate sample container. DM water connection shall be provided for cleaning of sample containers.

5.04.00 SPECIFICATION OF ANALYSERS

Field proven reputed international make microprocessor based monitors/analysers with LCD/TFT display and with necessary fault diagnostic features shall be employed. All analysers shall provide 4-20 mA output signal capable of driving a load impedance of 500 Ohms minimum. The type, size, capacity, material, make, model and other specification details of the rest of the SWAS system like coolers, gauges/switches, sample pipes, filter, pressure reducing elements, grab sampling arrangement, valves & fittings, panels etc shall be as decided during detailed Engineering stage in line with technical specification and shall be subject to owner's approval. The power supply to all analysers/monitors shall be supplied by bidder from plant UPS system with redundant feeders & auto changeover, all necessary switches, 2 Pole MCB, fuses, wiring/cabling and other required accessories etc for distribution to individual requirements.

5.04.01 Minimum specification of Analyzers:

Measurement	Type	Accuracy	Response time (90 % of full scale)
Conductivity / TDS / Concentration	Continuous flow through type	$\leq \pm 1\%$	≤ 5 Sec
pH	Cell flow through sample	$\leq \pm 1\%$	≤ 5 Sec
Chloride	Continuous flow through type with chloride & sulphate responsive electrodes	$\leq \pm 5\%$	≤ 5 Min

Turbidity	Light reflection principle	$\leq \pm 2\%$ for 0-50 NTU $\leq \pm 5\%$ for 50-200 NTU	≤ 5 Min
Hydrazine	Automatic continuous electrochemical type	$\leq \pm 5\%$	≤ 3 Min
Si	Continuous colorimetric type	$\leq \pm 5\%$	≤ 15 min
Na	Continuous flow through type with sodium responsive electrode and reference electrode having pH adjustment facility.	$\leq \pm 10\%$	≤ 4 Min
DO2	Continuous flow through type	$\leq \pm 5\%$	≤ 30 Sec

The measuring range for the above analysers shall be suitable for the process requirement. Automatic temperature compensation shall be provided for all the analysers.

All the analysers/cells shall have open corrosion resistant drain to waste header.

Dual Cation exchange column shall be provided for cation conductivity.

Conductivity analyser shall be provided with automatic ammonia (NH₃) removal facility.

Silica Analyser shall be provided with auto reagent shut off solenoid valve feature (in case of sample loss or power loss) and built in phosphate inhibition feature.

Hydrazine Analyser shall be provided with auto reagent shut off solenoid valve feature (in case of sample loss or power loss).

For Hot well conductivity measurement, direct insertion/withdrawal type conductivity cells shall be provided, whereas for all other samples it shall be flow through type. Monitors for hot well conductivity shall be suitable for field mounting.

Make of complete assembly including sensor, analyser & monitor shall be same.

5.04.02 The sample points and the type of measurement for each sample shall be as per, Appendix-I to Part-A, Vol. V of technical specification.

5.04.03 All analysers shall be supplied with chemicals/reagents required for 12 months operation in phased manner depending on shelf life, in addition to that indicated under mandatory spares. Bidder shall also provide start up kits, buffer solution for pH and conductivity analyzer. The analyser supplier shall submit the preparation procedure / formula of the reagent to be used in analyser solution.

~~5.05.00 SAMPLE PIPING SYSTEM~~



1 x 660 MW - Panki Thermal Power Station

Bidding Doc. No. : 14A14-SPC-G-0001

