SCRUTINY OF TECHNICAL PROPOSAL OF NEW BOILER

Minor changes in words, which are added purposefully, shall change the whole scenario in project execution stage, when things go wrong. Later both SELLER & PURCHASER tries to save money on behalf of the terms in SIGNED CONTRACT.

Awakened & Technically Strong PURCHASER saves Time-Money-Energy-Resources while others just trying to wash-off foot-prints left behind due to negligence.

I have seen most of the PURCHASERS believing in CONSULTANT to help them. Definitely they help PURCHASER by highlighting a highly negligible issues and points of erection fault and physically verified points like welding, alignment, aesthetics during project execution.

Self experienced in my Professional Career that Critical Issues and Design Failures NEVER highlighted / disclosed by CONSULTANT, purposefully, just to maintain business relationship with Seller.

Seller act on Common Market Principles:

"IF PURCHASER knows the things, we know. If nobody knows the things, we do not know"

"Do not try to Educate Purchaser, Otherwise Project will never close"

"One year Contractual Guarantee tenure will pass in communication and operational team fault"

SCRUNITY OF TECHNICAL PROPOSAL FOR CFBC BOILER - UNDER EXECUTION

Read the Comparison on Technical Proposal of CFBC Boiler given to Purchaser by Seller

S.N.	Technical Description	REMARKS on SELLER No.1 / No.2 / No.3
1	Deaerator Outlet Feed water temperature 130 degC Economizer Inlet Feed water Temperature 130 degC Boiler Feed Pump Design Temp. 130 degC Chemical dosing at Outlet of deaerator	Is it Possible as Good Engineering Practice? No temperature drop from Deaerator Outlet to Economiser Inlet. BFP design & operating water temperature is same. Ensure a margin / correction of temperature by at least 10 degc. Ensure mechanical deaeration, add guarantees as residual O2 content / dissolved oxygen at deaerator outlet before adding chemical, It will save direct money in terms of reduce chemical consumption and failures.
2	Peak load 110% trial for ½ Hour in every 08 hours.	Boiler Auxiliaries always design on 100% MCR while Boiler Guarantees for 110% peak MCR trial run. Ensure base value as 110% for all auxiliaries and add safety design margin over and above of this value.
3	Metallurgy of Super heater Headers (selected after spray water temperature). FSH coil is SA213T91 / SA213 TP304H for 545 degC but FSH Header is SA335P22 for 545 degC	Superheater Headers metallurgy should meet the maximum metal temperature limit criteria after all fluctuations & unbalance. Keep same as Superheater outlet coils to Header inlet, to handle superheater design abnormalities, fuel abnormalities and operation disturbances
4	Air Pre Heater (APH) bypass arrangement. No value given for %age of Air flow Bypass	Ensure %age of air flow considered for APH Bypass. Keep minimum 50% total air flow in bypass.
5	Minimum safe duration (Storage capacity between NWL to LWL) for Deaerator / Steam drum	Ensure NWL and LWL elevation at Peak load @110% of MCR. Minimum safe duration adjusted by changing elevation of NWL and LWL (Normal water level and Low water level)
6	ESP outlet dust concentration 30 mg/Nm3 @ wet at actual Oxygen (O2) Level	Ensure No correction shall apply for O2 level. Due to Leakage / air ingress, O2 level will change. Ensure ESP's emission dust guarantee based on Inlet dust concentration. Measure 03 nos. IDC sample & 03 nos. ODC sample during testing.
7	Oxygen Analyzer at the inlet of APH / Economiser Outlet CO Analyzer at the inlet of ESP	Ensure Oxygen and CO Analyzer at Economiser Inlet for root cause analysis. Oxygen and CO monitoring is essential for combustion zone only. Inlet of APH / ESP as well as Economiser is not comes under combustion zone and value comes with leakages / air ingresses.

8	ESP's Gas operating temperature 140-150 degC	Ensure minimum flue gas operating temperature 150degC. Design flue gas temperature 160 degC.
9	Boiler Capacity (MCR) in Net / Gross	Always Select only Net MCR of Boiler. Gross means you do not know the Net output from Boiler & higher steam consumption of auxiliaries like soot blowers, deaerator, HP & LP heater is direct loss
10	Fluidization velocity in Furnace and Gas velocity in other zones	Ensure Fluidization Velocity in lower range to control erosion. Keep in between 4.2 to 4.9 m/s. Higher the velocities, more pressure drops and high erosion rate.
11	Economiser tube thickness 3.66 mm for OD 38.1 mm	Ensure 4.0 mm thickness for OD 38.1 mm to get economizer coil life span. Do not accept 3.66 mm thickness as value engineering.
12	Spray Water Quantity for steam temperature control range of 60-100% MCR OR 50 -100% MCR	Limit to less than 3 % of MCR Flow. Take Curve for spray water flow range. Specific curve for individual spray water flow circuit for temperature control
13	Saturation Steam Purity (Steam drum outlet to Primary Superheater Inlet) for Steam drum internals performance	Ensure steam purity as guarantees parameters. It will reduce turbine deposition / superheater tubes internal deposition / tubes failures / water carryover.
14	Life of Air Pre heater tubes in both designs Air through tubes OR Gas through tubes	Expected Guaranteed life is more than 3.5years because dew point corrosion, air bypass arrangement, air inlet temperature & humidity, tube thickness calculation, margin everything is considered in design. Ensure the life span.
15	Requirement of Bed material, Lime stone, Startup fuel, Primary fuel for One cold startup of boiler	Ensure detailed consumption value for each consumable input per cold startup of boiler during contract stage. Limit the commissioning & consumable inputs in guarantees to avoid wastage of resources.
16	Design pressure (+ve /-ve) and operating pressure for Furnace / ducts / casing / bellows	Ensure the value for design and operation. During failures, it may help to find root cause.
17	Boiler Design and Operational data on 30% MCR, 50% MCR, 70% MCR & 100% MCR.	Ensure the Boiler Design and Operational data on various loads. It will help to operate boiler as per SELLER and reduce failures on the name of operation fault.
18	Startups vent arrangement with Silencer in Main stream line before MSSV. No value given for %age of Steam flow.	Ensure %age of Steam flow considered for Startups vent. Keep minimum 30% of MCR.
19	Water Chemistry Sellers own standards	Ensure water chemistry as per International code like VGB, BS Do not Agree on guaranteed TDS, agree only on Conductivity of water/steam as TDS calculation factor is variable.

	NALCO 4221 specially recommended	Always use Base Chemicals to maintain boiler water chemistry for All Volatile Treatment / Non Volatile treatment
20	Boiler Performance 1. Air temperature rise due to Fan shall be considered 2. Guarantees with Manufacturer's curve and corrections 3. Radiation loss will be as per Old outdated PTC 4.1 while PG test will be New PTC 4.0 4. ESP's Emission Guarantees on 60 - 100% MCR and daily average basis. 5. Boiler performance Test on low load operation with correction curve. 6. Duration of PG test 04 Hours. 7. Instruments tolerance, calibration & testing	1. Ensure the value of fan rise and it will be act as final ambient temperature for all calculation. 2. Ensure all correction curves and correction, need to be applied during contract stage only. 3. Do not allow to record Radiation loss as per outdated PTC 4.1/ ABMA chart, try to keep same use for boiler efficiency (PTC 4.0) with latest amendment. It will spoil the insulation and cladding application and design quality. 4. ESP is independent equipment based on gas flow rate and inlet dust loading. ESP guarantees should work for complete flow rate range 0-100% MCR. 5. Ensure boiler efficiency curve on low load operation range OR 30-100% range 6. Ensure duration minimum 08 hours and as per PTC only. 7. Ensure tolerances as per relevant PTC only.
21	Guarantees on Refractory failures / Pressure parts failures / Thermal Expansion related failures / Design failures / Higher spray water flow for temperature control / Ash recirculation blockage / Bed material shifting in furnace and non-uniform bed temperatures	Specify each type of failures with number of frequency per year and Plant stoppage with production loss. Recently lots of failures happened but no firm conclusion, running in fears. Normally, Experiment s carried out on Purchaser's Cost (direct or indirect)
22	Air flow and temperature distribution for Primary & Secondary air	Ensure APH Performance for designed Air flow. Variation in APH exit Air and Gas temperature need to monitor.
23	Un-burnt Carbon in Ash, Ash collection Raito and Ash outlet Temperature	It is a part of Boiler Efficiency calculation and Ash cooler performance. Ensure the value.
24	SOx / NOx emission 95 mg/Nm3 at 6% Oxygen (O2) dry volume basis	Ensure No correction shall apply for O2 level Give attention on specifically written as %age by weight on dry basis OR %age by weight on weight basis OR %age by weight as actual received
25	Fuel Mixing Ratio for multiple fuel on Heat Basis	Ensure mixing ratio on both, Heat basis and Weight basis.

26	ESP's interlock, protection, control and monitoring in DCS	Ensure DCS operation for ESP
27	Deaerator overflow line connected to IBD tank	Do not waste DM water. Take it back in Feed water storage tank
28	Target Plate for Steam Blowing	Correct with Target plate material OR as per Turbine requirement. Everybody wants to clear with Aluminum Target Plates
29	Instrument Air requirement for Boiler Operation & Control	Purchaser Scope, No responsibility of Seller for more than desired flow
30	Service Air requirement for Boiler Operation & Control	Purchaser Scope, No responsibility of Seller for more than desired flow
31	S.S.409, Lining in Fuel Bunker & ESP Ash Hopper.	S.S. 309 / 304 Lining min 3.0mm thk for Fuel Bunker & min 2.0mm thk for ESP ash Hopper
32	Safety Guards & Canopy on Equipments	MS Plate 1.5mm thk, Ventilated Canopy
33	Each & Every Equipments GA Drawings, Performance Curve, MTC, Technical data sheet, spare parts details in PDF	Take a Note of it. If not recorded you will get only highlights OR No technical documents for individual equipments.
34	Technical details may change during Detail Engineering	DO NOT ALLOW without PRIOR APPROVAL and JUSTIFICATION. Record as Contract Amendment. Normally, After Award of Contract, Value engineering start for changes based on contractual language.

M/s Unite Energy Corporation LLP is keen to provide the Spares, Sales & Services, Retrofit & Site Repairs, Consultancy & troubleshooting support to mitigate the irregularities in the plant, minimize breakdown & downtime and improvise design & system performance to improve the overall plant's health and performance.

Regards

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