ANNEXURE 4

STEAM BOILER DESIGN, SIZING & OPERATION

Input Cell
Result

Unit Conversions:	*Conventinal Unit to SI Unit and Visa Versa*	
TEMPERATURE		
Enter °F	⇨	Conversion to °C
32	=	0.000
Enter °C	⇨	Conversion to °F
164.70	=	328.460
Enter °F	⇨	Conversion to °R
200.00	=	659.670
Enter °C	⇨	Conversion to °K
482.20	=	755.350

Unit Conversions:	*Conventinal Unit to SI Unit and Visa Versa*	
PRESSURE		
Enter psig	⇨	Conversion to Bar
315.00	=	21.718
Enter Bar	⇨	Conversion to psig
5.93	=	85.994
Enter Bar	⇨	Conversion to Mpa
20.20	=	2.020
Enter MPa	⇨	Conversion to psig
0.80	=	116.000

Unit Conversions:	*Conventinal Unit to SI Unit and Visa Versa*	
ENERGY		
Enter kJ/kg	⇨	Conversion to btu/lb
2440.00	=	1049.011
Enter btu/lb	⇨	Conversion to kj/kg
299.1	=	2625.100
Enter MMBtu/hr	⇨	Conversion to GJ/hr
44.55	=	47.003
Enter kJ/kg.K	⇨	Conversion to btu/lb.°R
5.71	=	1.364

Input Data

Input Cell	Result

Inlet (External Connection)

Inlet Properties

Deaerator Pressure*	0.1	MPa
Combustion Efficiency*		%
Blowdown Rate*		%

Steam Inlet

Steam Properties

Pressure	6.0	MPa

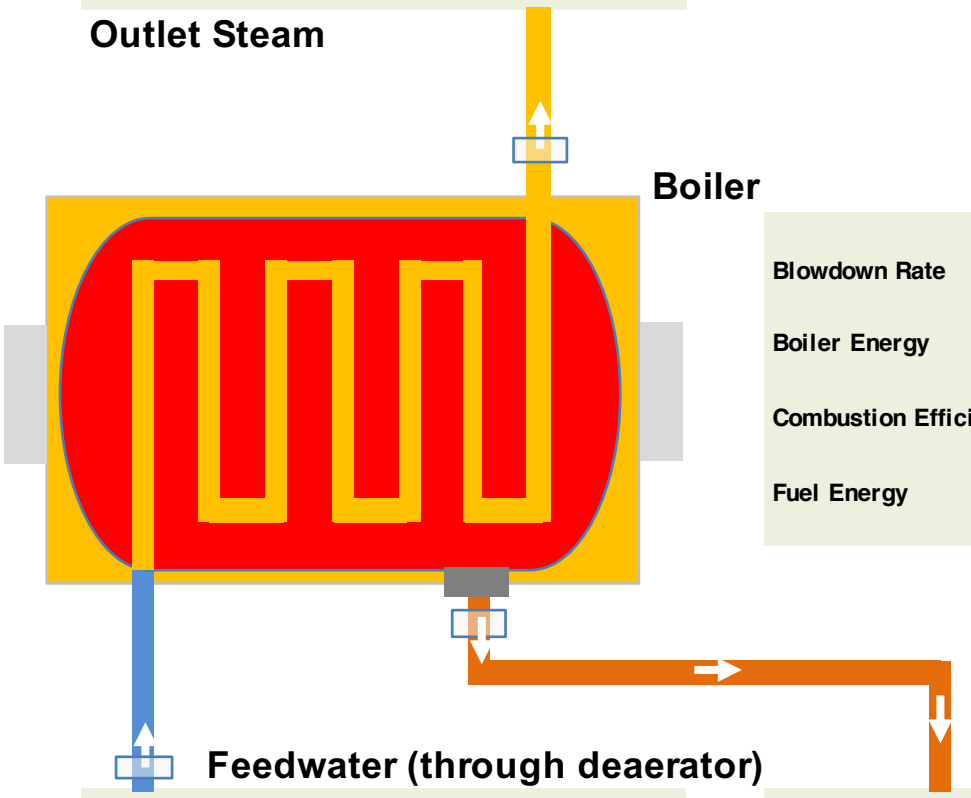
Temperature *	482.00	°C
Specific Enthalpy *		kJ/kg
Specific Entropy *		kJ/kg.K
Saturated Quality *		

Steam Mass Flow	5.5	kg/hr

Calculated Data

Pressure	6.3	MPa
Temperature	482	°C
Phase / Quality	Gas	
Mass Flow	1.04	kg/hr
Sp. Enthalpy	3,378.80	J/kg
Sp. Entropy	6.8233	J/kg/K
Energy Flow	12.60	GJ/hr

Outlet Steam



Boiler

Blowdown Rate	5%
Boiler Energy	107.04
Combustion Efficiency	85%
Fuel Energy	125.92

Feedwater (through deaerator)

Phase	0.00	
Temperature	164.70	°C
Pressure	0.60	MPa
Mass Flow	11.39	kg/s
Sp. Enthalpy	695.93	kJ/kg
Sp. Entropy	1.94	J/kg/K
Energy Flow	27.10	GJ/hr

Blowdown

Saturated / Qualit	0.00	
Temperature	275.59	°C
Pressure	6.3	MPa
Mass Flow	0.57	kg/s
Sp. Enthalpy	1,213.8	kJ/kg
Sp. Entropy	3.0375	J/kg/K
Energy Flow	2.5	GJ/hr