

Revision Summary

Project: Shuqaiq Steam Power Plant

Doc. No. / Rev. No. / Title: S-00-TA_-S-21-001-001/ Rev. 2/ HEAT BALANCE DIAGRAM

No.	Before Revision	After Revision	Reasons	Remarks
1		Page 2 “MSL” is added on Remarks column for case no. 108.	OE Comment	
2		Page 10 “Minimum stable load” is added on condition description of drawing title.	OE Comment	
3				
4				
5				
6				
7				

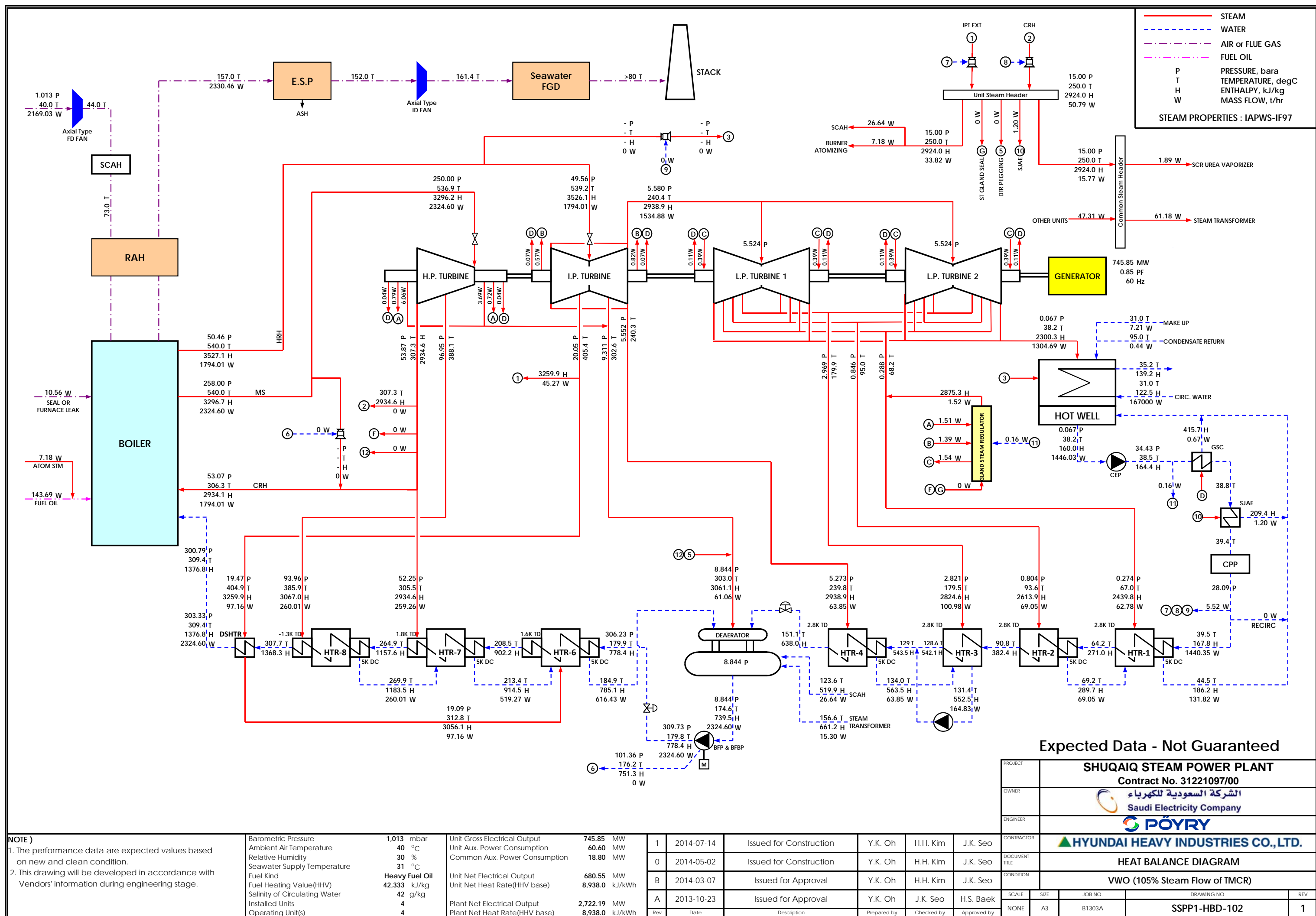
2	30.JUN.2017	ISSUED FOR CONSTRUCTION	B.G. PARK	T.H. LIM	C.Y. KIM		
1	14.JUL.2014	ISSUED FOR CONSTRUCTION	Y.K. OH	H.H. KIM	J.K. SEO		
0	2.MAY.2014	ISSUED FOR CONSTRUCTION	Y.K. OH	H.H. KIM	J.K. SEO		
B	7.MAR.2014	ISSUED FOR APPROVAL	Y.K. OH	H.H. KIM	J.K. SEO		
A	23.OCT.2013	ISSUED FOR APPROVAL	Y.K. OH	J.K. SEO	H.S. BAEK		
REV.	DATE	DESCRIPTION	DESIGNED	CHECKED	APPROVED		
OWNER  الشركة السعودية للكهرباء Saudi Electricity Company							
PROJECT SHUQAIQ STEAM POWER PLANT							
ENGINEER 							
CONTRACTOR  HYUNDAI HEAVY INDUSTRIES CO.,LTD.							
SUBCONTRACTOR				VENDOR INTERNAL DOC.NO			
				N/A			
THIS DOCUMENT IS NOT TO BE USED FOR CONSTRUCTION OR FOR ORDERING MATERIAL UNTIL CERTIFIED AND DATED.THE CONTRACTOR HHI CONFIRMS FULLY COMPLIANCE WITH THE O/E'S COMMENTS. NO OTHER CHANGES HAD BEEN MADE ON THE DOCUMENT. THE CONTRACTOR MAY SUBMIT THE DOCUMENTS AS "FOR CONSTRUCTION"			APPROVAL/CERTIFICATION INFORMATION DOC. NO : POY-HHI-T-02677 REV. NO : 1 Date : 30.JUL.2014 STATUS : 1 				
DOCUMENT TITLE HEAT BALANCE DIAGRAM							
CONTRACT NO.	DOCUMENT NO		NO. OF PAGES	REV.			
31221097/00	S-00-TA_-S-21-001-001 (Old No. : S-10-TA_-S-21-001-001)		30	2			

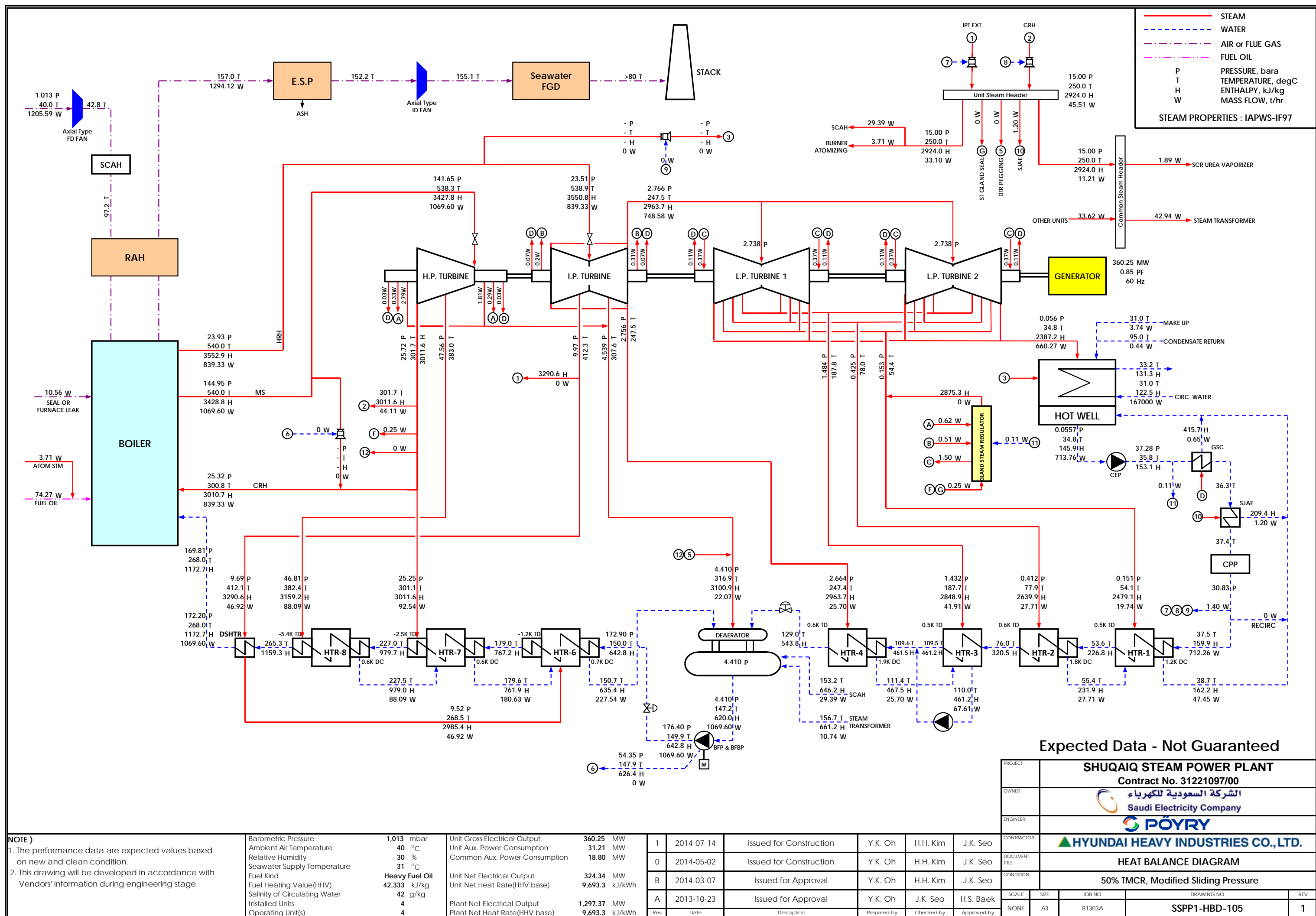
SHUQAIQ STEAM POWER PLANT / SUMMARY OF PLANT OPERATING CONDITIONS

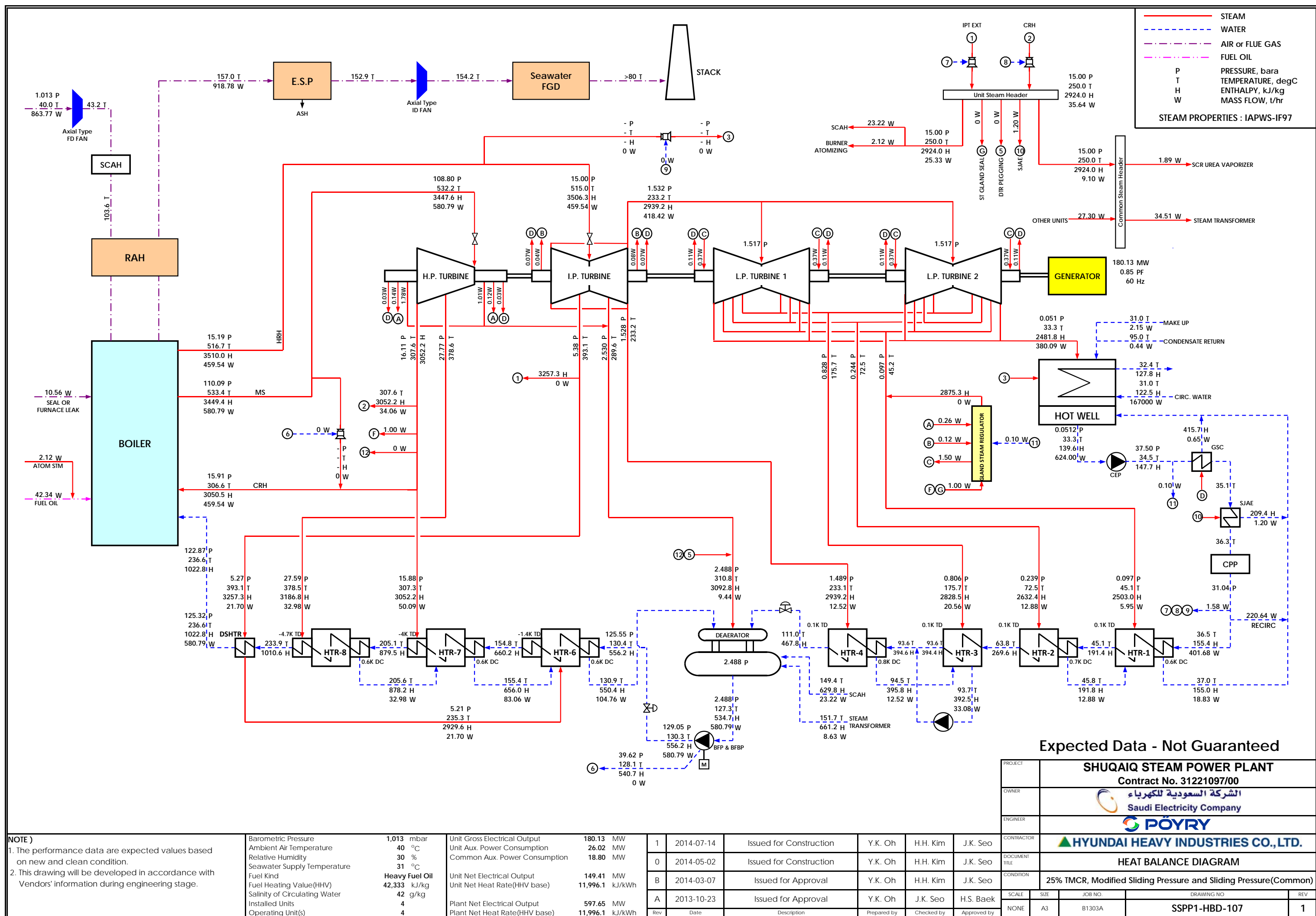
2014-7-14

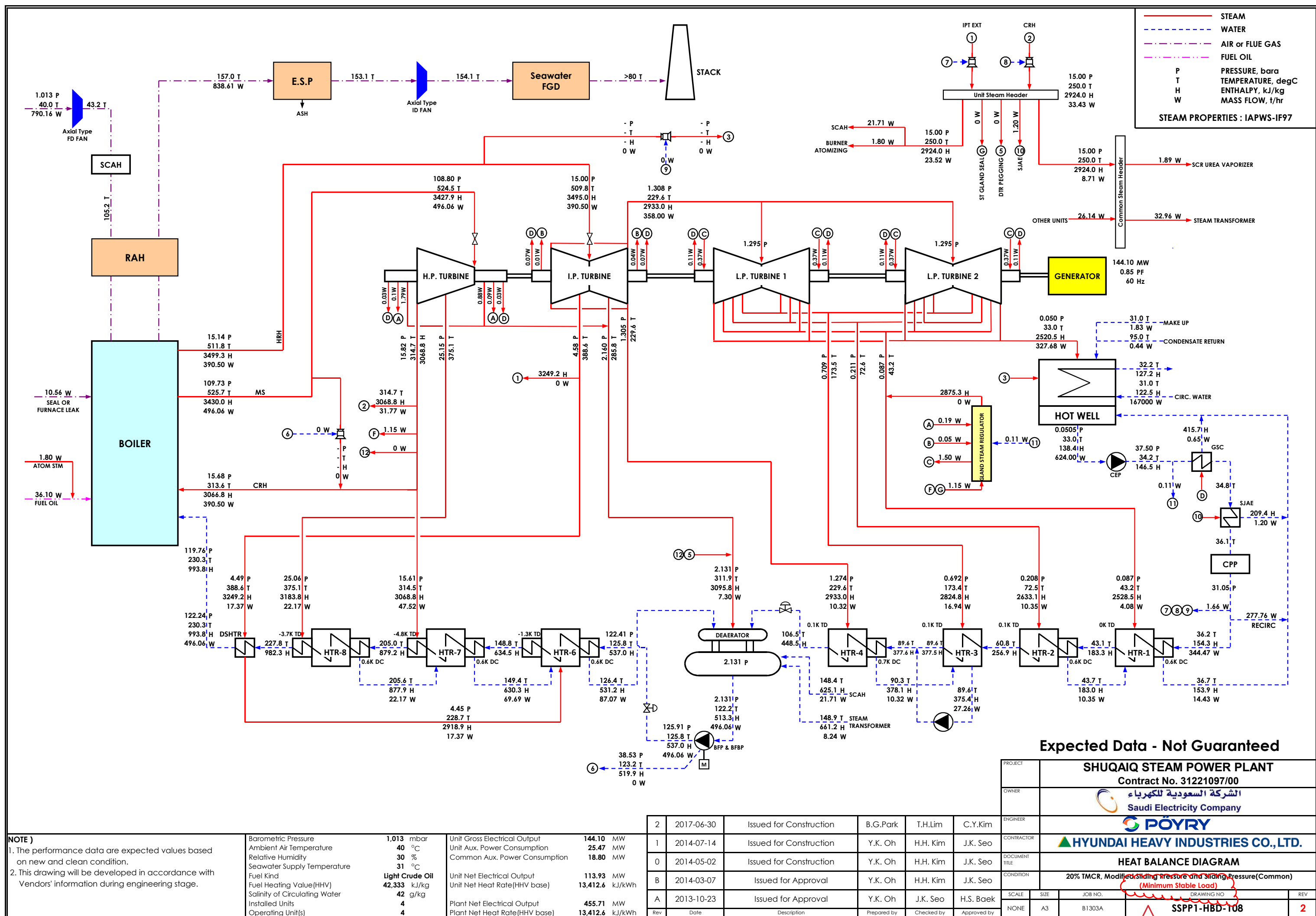
Drawing No.	Description	Barometric Pressure (mbar)	Ambient Air Temp (°C)	Relative Humidity (%)	Seawater Supply Temp (°C)	No. of Operating Units	Unit Electrical Output (MW)	Unit Auxiliary Power Consumption (MW)	Common Auxiliary Power Consumption (MW)	Unit Net Electrical Output (MW)	Unit Net Heat Rate (HHV Base) (kJ/kWh)	Plant Net Electrical Output (MW)	Plant Net Heat Rate (HHV Base) (kJ/kWh)	Rev No.	Remarks
SSPP1-HBD-101	100% TMCR, Guarantee Condition	1013	40	30	31	4	720.50	55.80	18.80	660.00	8885.0	2640.00	8885.0	1	Guarantee
SSPP1-HBD-102	VWO (105% Steam Flow of TMCR)	1013	40	30	31	4	745.85	60.60	18.80	680.55	8938.0	2722.19	8938.0	1	BMCR
SSPP1-HBD-103	90% TMCR, Modified Sliding Pressure	1013	40	30	31	4	648.45	50.57	18.80	593.18	8975.5	2372.71	8975.5	1	
SSPP1-HBD-104	75% TMCR, Modified Sliding Pressure	1013	40	30	31	4	540.37	41.41	18.80	494.26	9115.3	1977.03	9115.3	1	
SSPP1-HBD-105	50% TMCR, Modified Sliding Pressure	1013	40	30	31	4	360.25	31.21	18.80	324.34	9693.3	1297.37	9693.3	1	
SSPP1-HBD-106	38% TMCR, Modified Sliding Pressure and Sliding Pressure(Common)	1013	40	30	31	4	271.10	27.86	18.80	238.54	10343.4	954.18	10343.4	1	
SSPP1-HBD-107	25% TMCR, Modified Sliding Pressure and Sliding Pressure(Common)	1013	40	30	31	4	180.13	26.02	18.80	149.41	11996.1	597.65	11996.1	1	
SSPP1-HBD-108	20% TMCR, Modified Sliding Pressure and Sliding Pressure(Common)	1013	40	30	31	4	144.10	25.47	18.80	113.93	13412.6	455.71	13412.6	2	MSL
SSPP1-HBD-109	All HP FW Heaters Out of Service	1013	40	30	31	4	720.50	50.56	18.80	665.24	9370.6	2660.95	9370.6	1	
SSPP1-HBD-110	HP FW Heater #8 & HP External Desuperheater Out of Service	1013	40	30	31	4	504.35	38.00	18.80	461.65	9465.3	1846.61	9465.3	1	
SSPP1-HBD-111	HP FW Heater #7 & #6 Out of Service	1013	40	30	31	4	504.35	39.40	18.80	460.25	9584.9	1840.98	9584.9	1	
SSPP1-HBD-112	90% TMCR, Sliding Pressure	1013	40	30	31	4	648.45	48.61	18.80	595.14	8924.6	2380.58	8924.6	1	
SSPP1-HBD-113	75% TMCR, Sliding Pressure	1013	40	30	31	4	540.38	40.19	18.80	495.49	9078.5	1981.96	9078.5	1	
SSPP1-HBD-114	50% TMCR, Sliding Pressure	1013	40	30	31	4	360.25	30.68	18.80	324.87	9672.7	1299.46	9672.7	1	
SSPP1-HBD-115	42% TMCR, Sliding Pressure	1013	40	30	31	4	304.10	28.53	18.80	270.87	10037.1	1083.46	10037.1	1	
SSPP1-HBD-116	Half Condenser Out of Service, Modified Sliding Pressure	1013	40	30	31	4	432.30	30.98	18.80	396.62	9470.9	1586.46	9470.9	1	
SSPP1-HBD-117	Half Condenser Out of Service, Sliding Pressure	1013	40	30	31	4	432.30	30.15	18.80	397.45	9431.8	1589.80	9431.8	1	
SSPP1-HBD-118	Steam Turbine Bypass Operation	1013	40	30	31	4	0	45.39	18.80	-	-	-	-	1	ST BYPASS
SSPP1-HBD-201	TMCR at min. Ambient & Circulating Water Temperature	1013	5	70	19	4	712.28	55.20	18.80	652.38	9063.0	2609.51	9063.0	1	
SSPP1-HBD-202	VWO at min. Ambient & Circulating Water Temperature	1013	5	70	19	4	736.89	59.97	18.80	672.22	9124.0	2688.88	9124.0	1	
SSPP1-HBD-301	TMCR at max. Ambient & Circulating Water Temperature	1013	50	30	34	4	718.06	56.13	18.80	657.23	8908.4	2628.91	8908.4	1	HCO FIRING
SSPP1-HBD-302	VWO at max. Ambient & Circulating Water Temperature	1013	50	30	34	4	743.55	60.97	18.80	677.88	8960.6	2711.52	8960.6	1	HCO FIRING
SSPP1-HBD-401	TMCR with HCO firing at RSC	1013	40	30	31	4	722.26	56.13	18.80	661.43	8972.4	2645.71	8972.4	1	HCO FIRING
SSPP1-HBD-402	VWO with HCO firing at RSC	1013	40	30	31	4	747.43	60.98	18.80	681.75	9030.1	2727.00	9030.1	1	HCO FIRING
SSPP1-HBD-501	TMCR with HCO Firing at min. Ambient & Circulating Water Temperature	1013	5	70	19	4	713.24	55.51	18.80	653.03	9162.6	2612.13	9162.6	1	HCO FIRING
SSPP1-HBD-502	VWO with HCO Firing at min. Ambient & Circulating Water Temperature	1013	5	70	19	4	738.02	60.31	18.80	673.01	9220.9	2692.06	9220.9	1	HCO FIRING
SSPP1-HBD-601	TMCR with HCO Firing at max. Ambient & Circulating Water Temperature	1013	50	30	34	4	720.01	56.48	18.80	658.83	8994.5	2635.30	8994.5	1	HCO FIRING
SSPP1-HBD-602	VWO with HCO Firing at max. Ambient & Circulating Water Temperature	1013	50	30	34	4	745.55	61.37	18.80	679.48	9047.7	2717.90	9047.7	1	HCO FIRING

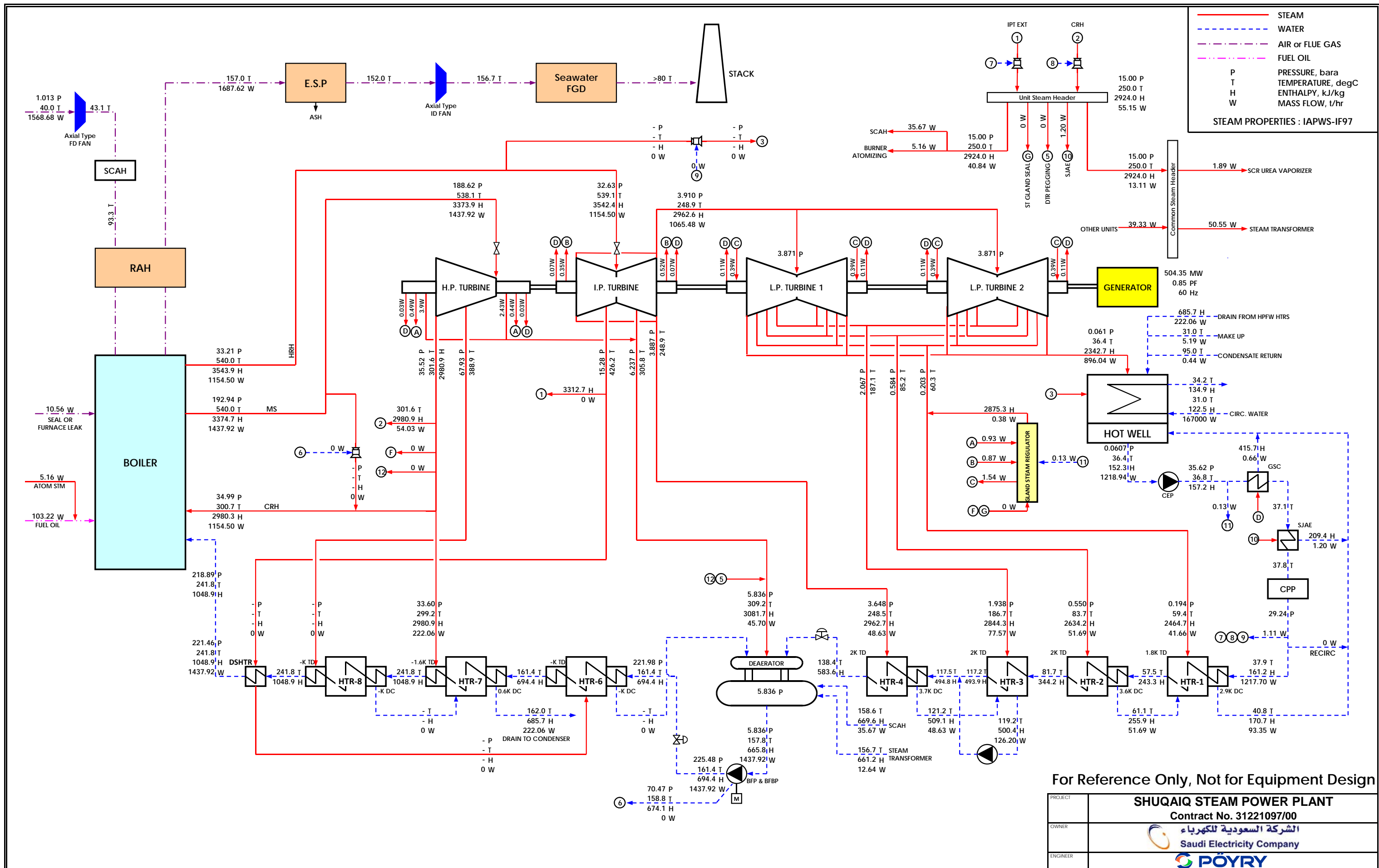
2











For Reference Only, Not for Equipment Design

PROJECT	SHUQAIQ STEAM POWER PLANT			
	Contract No. 31221097/00			
OWNER	الشركة السعودية للكهرباء Saudi Electricity Company			
ENGINEER	POYRY			
CONTRACTOR	HYUNDAI HEAVY INDUSTRIES CO.,LTD.			
DOCUMENT TITLE	HEAT BALANCE DIAGRAM			
CONDITION	HP FW Heater #8 & HP External Desuperheater Out of Service			
SCALE	SIZE	JOB NO.	DRAWING NO.	REV
NONE	A3	B1303A	SSPP1-HBD-110	1

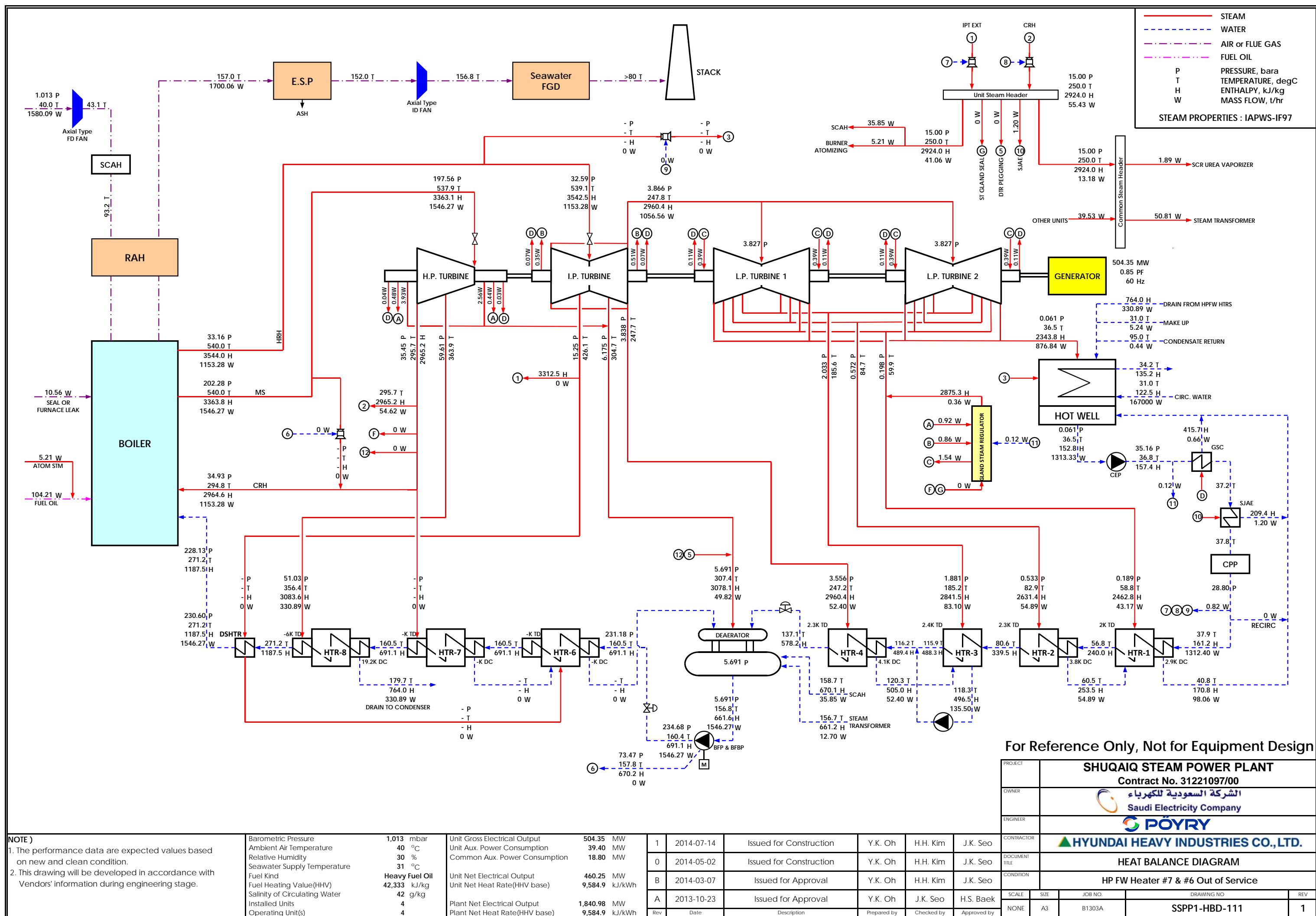
NOTE)

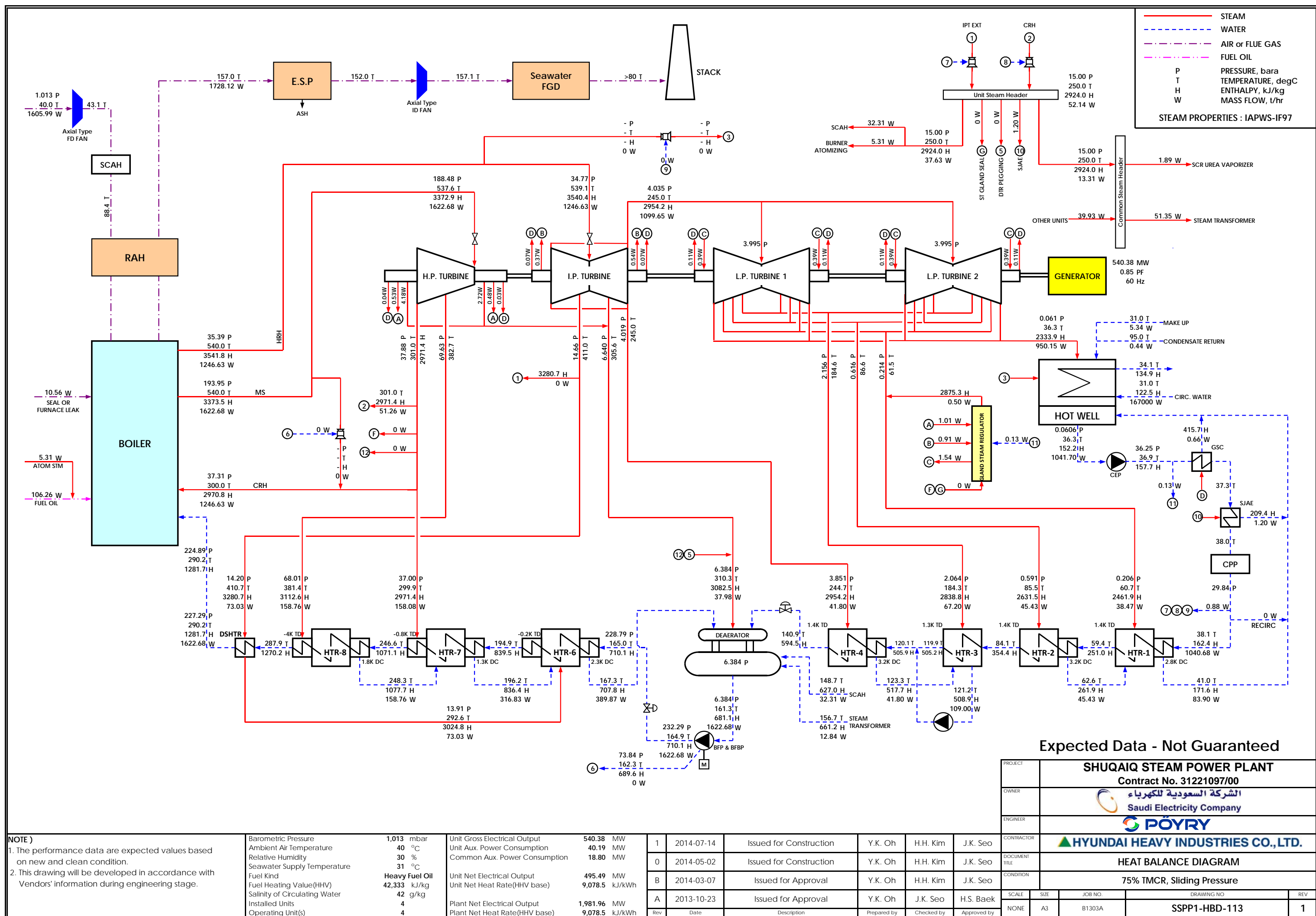
- The performance data are expected values based on new and clean condition.
- This drawing will be developed in accordance with Vendors' information during engineering stage.

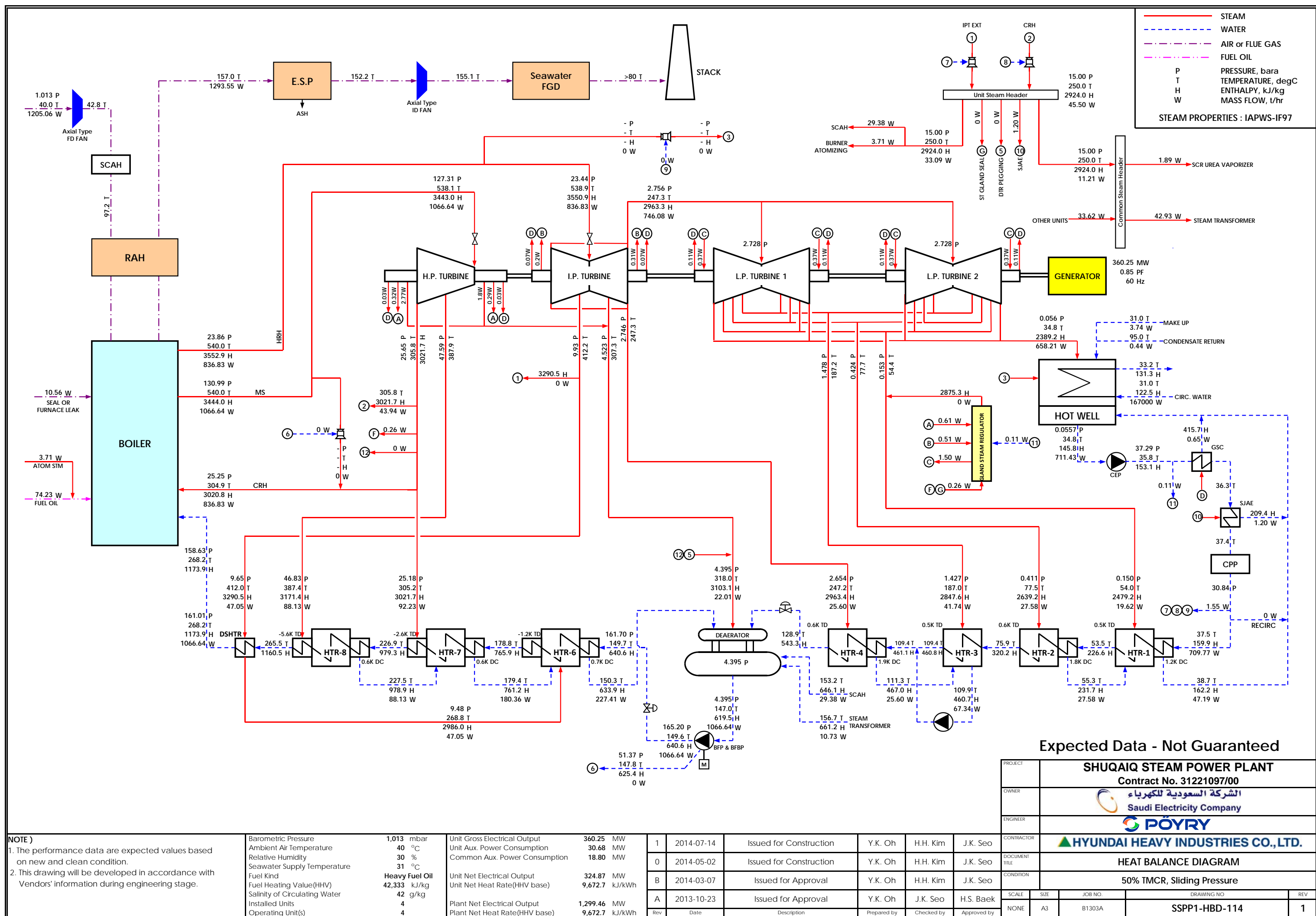
Barometric Pressure	1,013	mbar
Ambient Air Temperature	40	°C
Relative Humidity	30	%
Seawater Supply Temperature	31	°C
Fuel Kind	Heavy Fuel Oil	
Fuel Heating Value(HHV)	42,333	kJ/kg
Salinity of Circulating Water	42	g/kg
Installed Units	4	
Operating Unit(s)	4	

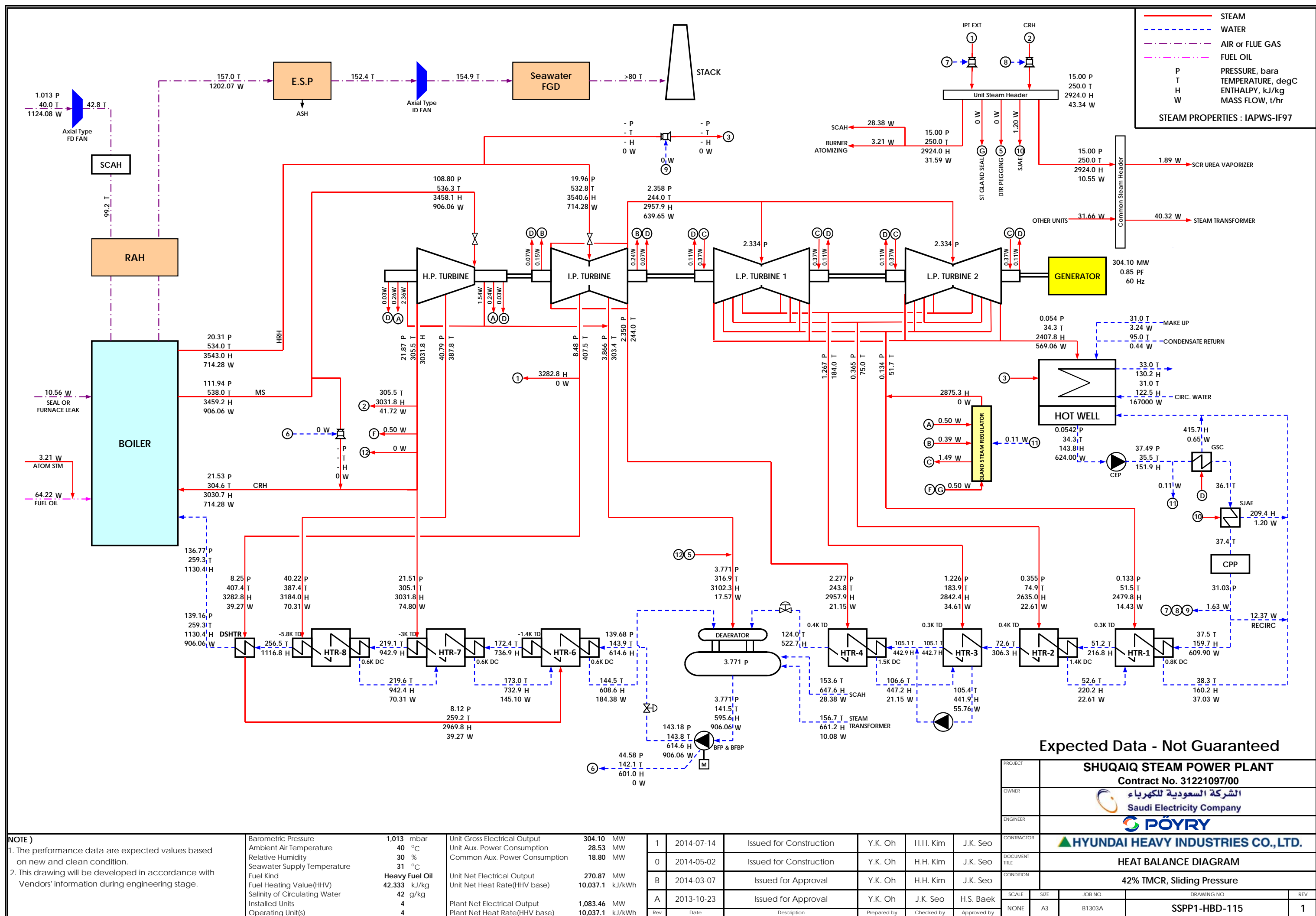
Unit Gross Electrical Output	504.35	MW
Unit Aux. Power Consumption	38.00	MW
Common Aux. Power Consumption	18.80	MW
Unit Net Electrical Output	461.65	MW
Unit Net Heat Rate(HHV base)	9,465.3	kJ/kWh
Plant Net Electrical Output	1,846.61	MW
Plant Net Heat Rate(HHV base)	9,465.3	kJ/kWh

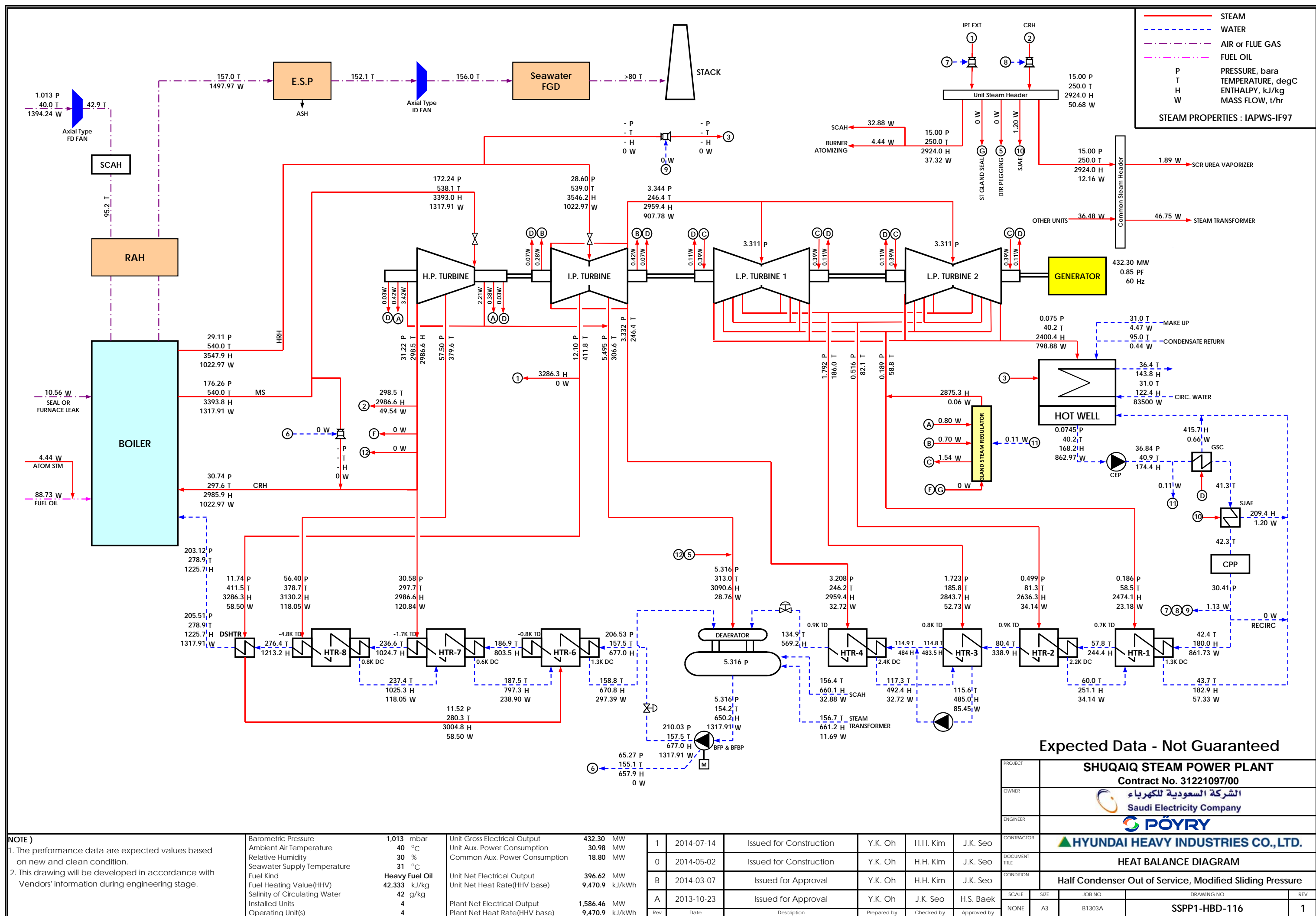
1	2014-07-14	Issued for Construction	Y.K. Oh	H.H. Kim	J.K. Seo
0	2014-05-02	Issued for Construction	Y.K. Oh	H.H. Kim	J.K. Seo
B	2014-03-07	Issued for Approval	Y.K. Oh	H.H. Kim	J.K. Seo
A	2013-10-23	Issued for Approval	Y.K. Oh	J.K. Seo	H.S. Baek
Rev	Date	Description	Prepared by	Checked by	Approved by

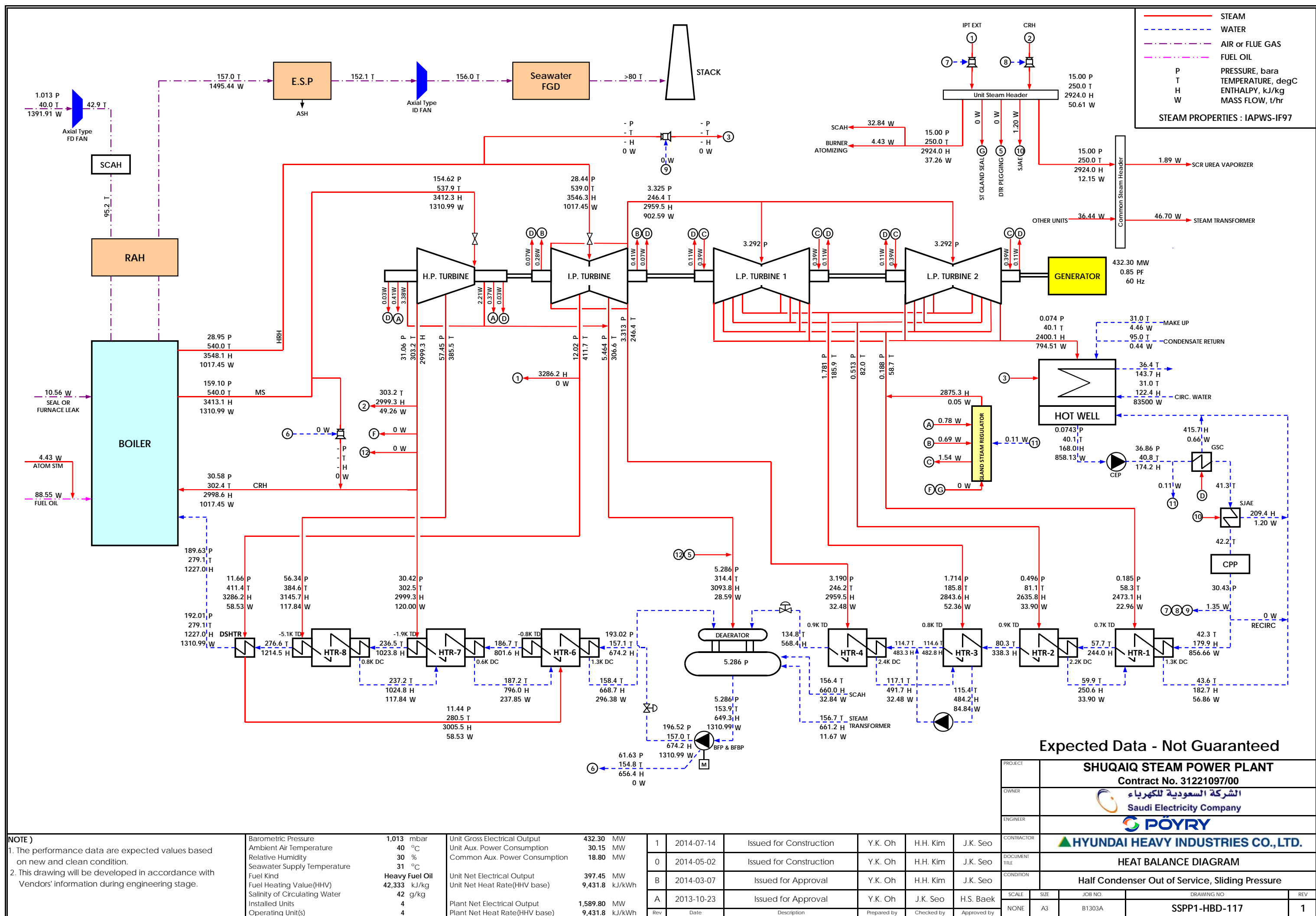


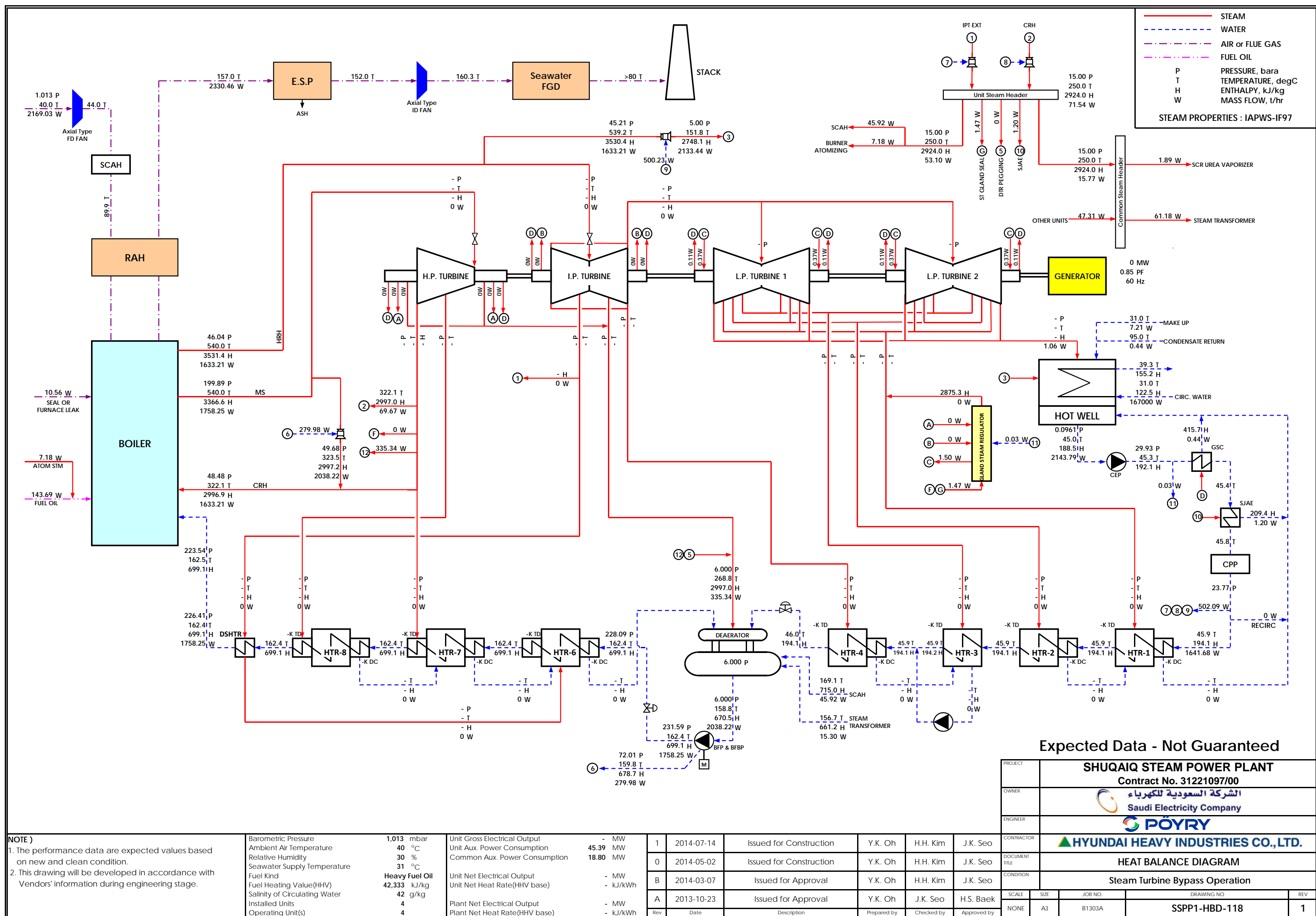


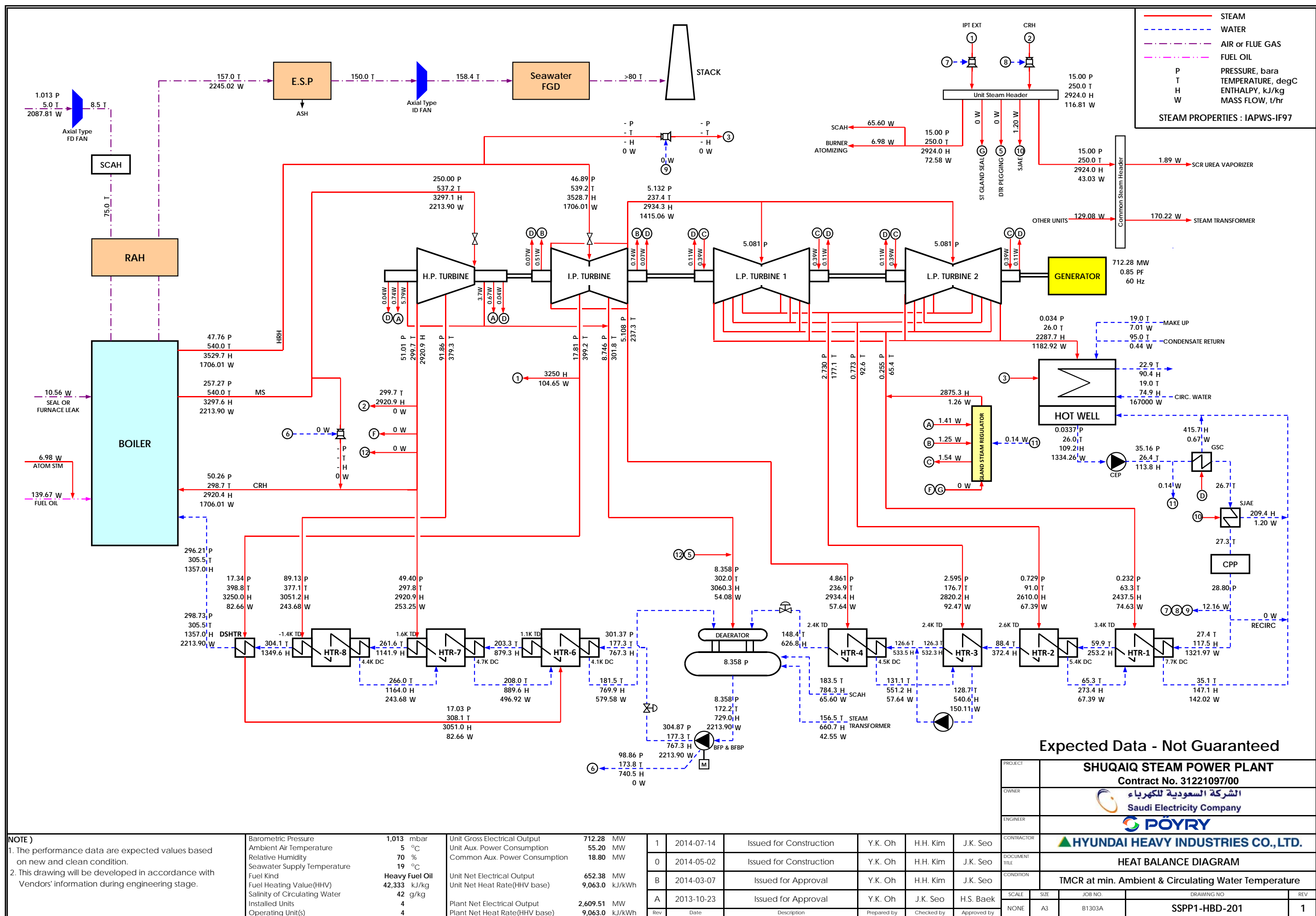


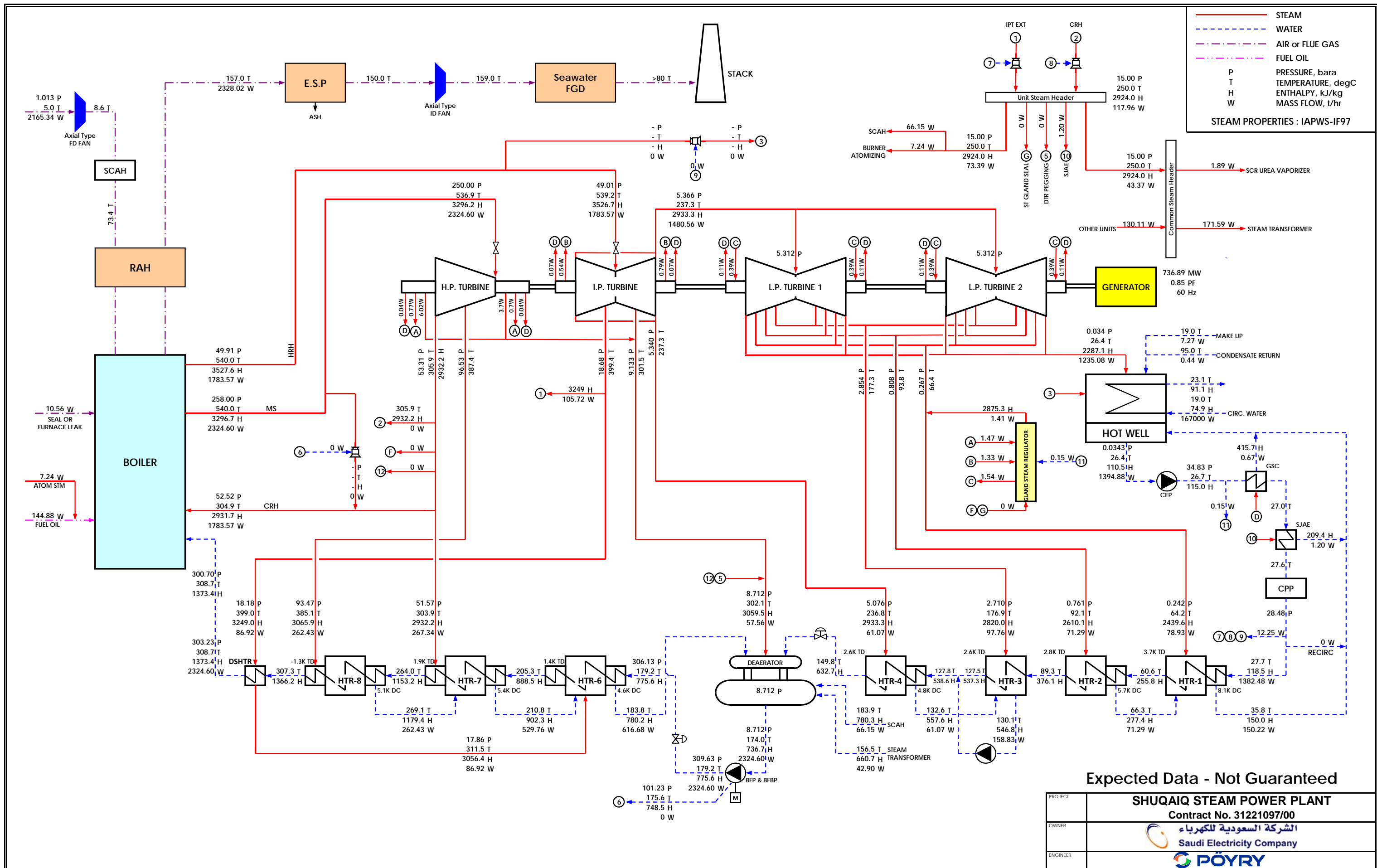










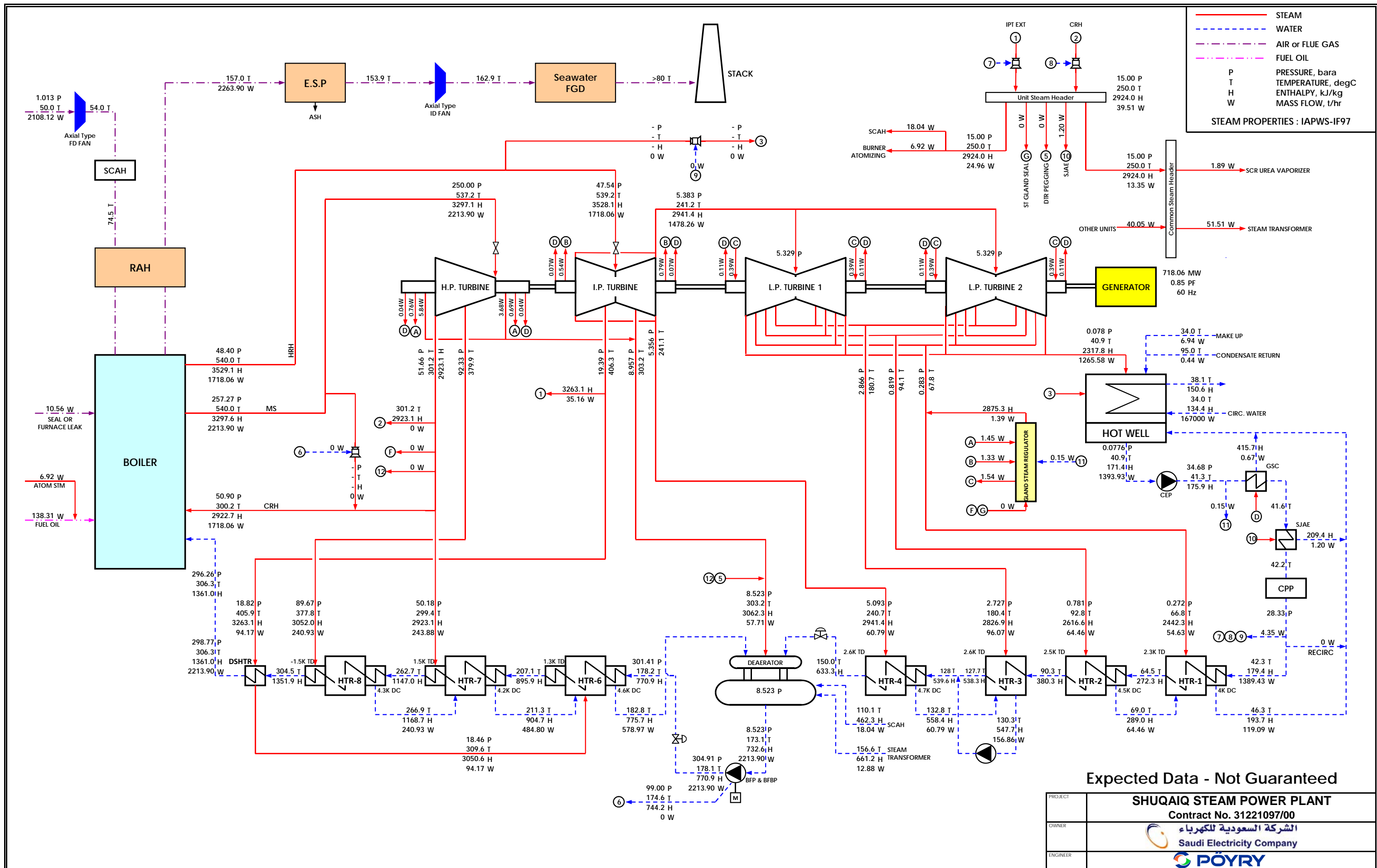


NOTE)
 1. The performance data are expected values based on new and clean condition.
 2. This drawing will be developed in accordance with Vendors' information during engineering stage.

Barometric Pressure	1,013	mbar
Ambient Air Temperature	5	°C
Relative Humidity	70	%
Seawater Supply Temperature	19	°C
Fuel Kind	Heavy Fuel Oil	
Fuel Heating Value(HHV)	42,333	kJ/kg
Salinity of Circulating Water	42	g/kg
Installed Units	4	
Operating Unit(s)	4	

Unit Gross Electrical Output	736.89	MW
Unit Aux. Power Consumption	59.97	MW
Common Aux. Power Consumption	18.80	MW
Unit Net Electrical Output	672.22	MW
Unit Net Heat Rate(HHV base)	9,124.0	kJ/kWh
Plant Net Electrical Output	2,688.88	MW
Plant Net Heat Rate(HHV base)	9,124.0	kJ/kWh

1	2014-07-14	Issued for Construction	Y.K. Oh	H.H. Kim	J.K. Seo
0	2014-05-02	Issued for Construction	Y.K. Oh	H.H. Kim	J.K. Seo
B	2014-03-07	Issued for Approval	Y.K. Oh	H.H. Kim	J.K. Seo
A	2013-10-23	Issued for Approval	Y.K. Oh	J.K. Seo	H.S. Baek
Rev	Date	Description	Prepared by	Checked by	Approved by



NOTE)

1. The performance data are expected values based on new and clean condition.

2. This drawing will be developed in accordance with Vendors' information during engineering stage.

Barometric Pressure	1,013	mbar
Ambient Air Temperature	50	°C
Relative Humidity	30	%
Seawater Supply Temperature	34	°C
Fuel Kind	Heavy Fuel Oil	
Fuel Heating Value(HHV)	42,333	kJ/kg
Salinity of Circulating Water	42	g/kg
Installed Units	4	
Operating Unit(s)	4	

Unit Gross Electrical Output	718.06	MW
Unit Aux. Power Consumption	56.13	MW
Common Aux. Power Consumption	18.80	MW
Unit Net Electrical Output	657.23	MW
Unit Net Heat Rate(HHV base)	8,908.4	kJ/kWh
Plant Net Electrical Output	2,628.91	MW
Plant Net Heat Rate(HHV base)	8,908.4	kJ/kWh

1	2014-07-14	Issued for Construction	Y.K. Oh	H.H. Kim	J.K. Seo
0	2014-05-02	Issued for Construction	Y.K. Oh	H.H. Kim	J.K. Seo
B	2014-03-07	Issued for Approval	Y.K. Oh	H.H. Kim	J.K. Seo
A	2013-10-23	Issued for Approval	Y.K. Oh	J.K. Seo	H.S. Baek
Rev	Date	Description	Prepared by	Checked by	Approved by

