Kiewit Power Engineers -- SWPG Bowie
2x1 7FA.04 Combined Cycle
Estimated Performance -- Option A4 (New and Clean) with GE 7FA.04 CTGs -- updated Dec. 2012
Model Revision: GC561-12062012-1 BJScrivner
1997 Steam Tables

		10F			59F			102F			With Duct Firing		
Case Name		Case A4b-41	Case A4b-21	Case A4b-1	Case A4b-44	Case A4b-24	Case A4b-4	Case A4b-49	Case A4b-29	Case A4b-9	Case A4b-11	Case A4b-14	Case A4b-19
Ambient Temp (F)		10	10	10	59	59	59	102	102	102	10	59	102
% Full Load		64	80	100	50	80	100	61	80	100	100	100	100
HRSG Firing/DB Exit Temperature		Unfired	Unfired	Unfired	Unfired	Unfired	Unfired	Unfired	Unfired	Unfired	Fired	Fired	Fired
CTG Model		GE 7FA.04	GE 7FA.04	GE 7FA.04	GE 7FA.04	GE 7FA.04	GE 7FA.04	GE 7FA.04	GE 7FA.04	GE 7FA.04	GE 7FA.04	GE 7FA.04	GE 7FA.04
Gross CTG Output (each)	kW	112,200	141,400	176,700	79,200	126,800	161,856	80,800	106,300	148,000	176,700	161,856	148,000
Gross CTG Output (total)	kW	224,400	282,800	353,400	158,400	253,600	323,713	161,600	212,600	296,000	353,400	323,713	296,000
CTG Heat Input (HHV) (total)	MMBtu/h	2,516.42	2,895.28	3,469.12	2,041.60	2,670.88	3,231.74	2,041.62	2,386.46	3,023.86	3,469.12	3,231.74	3,023.86
Gross Cycle Heat Rate (LHV)	Btu/kWh	6,263	6,059	6,008	6,506	6,026	5,929	6,445	6,146	5,978	6,312	6,297	6,369
Gross Cycle Heat Rate (HHV)	Btu/kWh	6,947	6,721	6,664	7,216	6,684	6,576	7,149	6,817	6,631	7,002	6,984	7,064
Gross Cycle Efficiency (LHV)		54.5%	56.3%	56.8%	52.4%	56.6%	57.6%	52.9%	55.5%	57.1%	54.1%	54.2%	53.6%
Gross Cycle Efficiency (HHV)		49.1%	50.8%	51.2%	47.3%	51.1%	51.9%	47.7%	50.1%	51.5%	48.7%	48.9%	48.3%
Net Plant Output w/ Step-Up Xfmr Losses	kW	351,310	419,130	508,380	271,460	387,450	478,693	274,090	338,200	443,520	600,340	567,713	531,890
Net Plant Heat Rate (LHV) w/ Step-Up Xfmr Losse	Btu/kWh	6,458	6,228	6,152	6,780	6,215	6,087	6,715	6,362	6,147	6,471	6,466	6,549
Net Plant Heat Rate (HHV) w/ Step-Up Xfmr Losse	Btu/kWh	7,163	6,908	6,824	7,521	6,893	6,751	7,449	7,056	6,818	7,178	7,172	7,264
Net Plant Efficiency (LHV)		52.8%	54.8%	55.5%	50.3%	54.9%	56.1%	50.8%	53.6%	55.5%	52.7%	52.8%	52.1%
Net Plant Efficiency (HHV)		47.6%	49.4%	50.0%	45.4%	49.5%	50.5%	45.8%	48.4%	50.0%	47.5%	47.6%	47.0%
Circulating Water from Cooling Tower	Flow, lb/h	63,949,284	63,968,276	63,953,072	63,902,340	63,893,252	63,884,336	63,782,232	63,778,016	63,771,116	63,941,172	63,857,352	63,751,184
	Flow, gpm	127,815	127,811	127,814	127,825	127,827	127,829	127,853	127,854	127,855	127,817	127,836	127,860
Tower Blowdown	Flow, lb/h	16,623	17,332	20,924	25,273	28,964	32,843	42,123	44,608	48,921	31,400	46,508	63,547
	Flow, gpm	33	35	42	51	58	66	84	89	98	63	93	127
Cooling Tower Number of Fans		9	9	9	9	9	9	9	9	9	9	9	9
Duct Burner Heat Input	HC, MMBtu/h (LHV)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	378.65	378.65	378.65
	HC, MMBtu/h (HHV)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	420.00	420.00	420.00
Stack Exit	Flow, lb/h	2,447,000	2,808,000	3,397,000	2,102,000	2,605,000	3,155,633	2,145,000	2,369,000	2,961,000	3,415,302	3,173,935	2,979,302
	Flow, acfm	766,319	884,520	1,080,812	658,627	823,180	1,008,225	679,965	752,158	954,429	1,063,297	993,442	939,970
Stack Velocity	ft/s using 18' stack diameter	50	58	71	43	54	66	45	49	63	70	65	62
	Temperature, F	181.3	185.2	191.6	179.9	184.5	191.4	185.1	185.6	193.3	175.2	175.5	177.1
Stack Emissions (Uncontrolled)													
NOx	ppmvd@15% O2	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	11.6	11.7	11.9
CO	ppmvd@15% O2	7.2	7.2	7.3	7.6	7.2	7.2	7.7	7.3	7.1	14.7	15.1	15.5
VOC	ppmvd@15% O2	1.2	1.2	1.2	1.3	1.2	1.2	1.3	1.2	1.2	2.5	2.6	2.7
SO2	ppmvd@15% O2	0.415	0.415	0.415	0.415	0.415	0.415	0.415	0.415	0.415	0.375	0.372	0.370
NOx	lb/h as NO2	41.0	47.1	56.5	33.3	43.5	52.6	33.3	38.9	49.2	90.1	86.2	82.8
CO	lb/h	20.0	23.0	27.8	17.1	21.2	25.6	17.4	19.1	23.8	69.8	67.6	65.8
VOC	lb/h as CH4	1.9	2.2	2.7	1.7	2.1	2.5	1.7	1.9	2.4	6.9	6.7	6.6
SO2	lb/h	2.6	3.0	3.6	2.1	2.8	3.4	2.1	2.5	3.2	4.1	3.8	3.6
Stack Emissions													
NOx	ppmvd@15% O2	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
% NOx Reduction Required		77.8%	77.8%	77.8%	77.8%	77.8%	77.8%	77.8%	77.8%	77.8%	82.7%	82.9%	83.1%
CO	ppmvd@15% O2	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
% CO Reduction Required		72.3%	72.2%	72.5%	73.7%	72.2%	72.2%	74.1%	72.5%	72.0%	86.4%	86.7%	87.1%
VOC	ppmvd@15% O2										1.5	1.5	1.6
% VOC Reduction											41.0%	41.0%	42.0%
SO2 (UNCONTROLLED)	ppmvd@15% O2	0.415	0.415	0.415	0.415	0.415	0.415	0.415	0.415	0.415	0.375	0.372	0.370
NH3 Slip	ppmvd@15% O2	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
NOx	lb/h as NO2	9.1	10.5	12.6	7.4	9.7	11.7	7.4	8.6	10.9	15.6	14.7	14.0
CO	lb/h	5.5	6.4	7.6	4.5	5.9	7.1	4.5	5.3	6.7	9.5	9.0	8.5
VOC	lb/h as CH4										4.1	4.0	3.8
SO2 (UNCONTROLLED)	lb/h	2.6	3.0	3.6	2.1	2.8	3.4	2.1	2.5	3.2	4.1	3.8	3.6