APPENDIX 2B

Heat and Mass Balance Calculations

Performance By: **PELLETIER**
Project Info: **MMC Chula Vista**

Engine: **LM6000 PC-SPRINT w/ FIGV at -5 Degrees**
Deck Info: **G0125O - 8dz.scp**
Generator: **BDAX 290ERT 60Hz, 13.8kV, 0.9PF (14839)**
Fuel: **Site Gas Fuel#900-774T, 20950 Btu/lb,LHV**

Date: **12/21/2006**
Time: **12:46:37 PM**
Version: **3.5.0**

1 CTG Running

Case #	**100**	**101**	**102**	**200**	**201**	**202**	**300**	**301**	**302**	**400**	**401**	**402**	**500**	**501**	**502**
Ambient Conditions	Guarantee			Summer Avg.			Historical Max			Historical Min			Annual Avg.		
Dry Bulb, °F	75.0	75.0	75.0	69.0	69.0	69.0	111.0	111.0	111.0	29.0	29.0	29.0	63.8	63.8	63.8
Wet Bulb, °F	65.3	65.3	65.3	60.1	60.1	60.1	71.3	71.3	71.3	25.4	25.4	25.4	58.4	58.4	58.4
RH, %	60.0	60.0	60.0	60.0	60.0	60.0	13.0	13.0	13.0	60.0	60.0	60.0	73.0	73.0	73.0
Altitude, ft	54.0	54.0	54.0	54.0	54.0	54.0	54.0	54.0	54.0	54.0	54.0	54.0	54.0	54.0	54.0
Ambient Pressure, psia	14.667	14.667	14.667	14.667	14.667	14.667	14.667	14.667	14.667	14.667	14.667	14.667	14.667	14.667	14.667
Engine Inlet															
Comp Inlet Temp, °F	66.8	66.8	66.8	61.4	61.4	61.4	77.2	77.2	77.2	29.0	29.0	29.0	59.2	59.2	59.2
RH, %	92.7	92.7	92.7	92.8	92.8	92.8	75.1	75.1	75.1	60.0	60.0	60.0	95.4	95.4	95.4
Conditioning	Fogger	Fogger	Fogger	Fogger	Fogger	Fogger	Fogger	Fogger	Fogger	NONE	NONE	NONE	Fogger	Fogger	Fogger
Tons or kBtu/hr	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pressure Losses															
Inlet Loss, inH20	4.50	4.50	4.50	4.50	4.50	4.50	4.50	4.50	4.50	4.00	4.00	4.00	4.50	4.50	4.50
Volute Loss, inH20	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
Exhaust Loss, inH20	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
Partload %	**100**	**75**	**50**	**100**	**75**	**50**	**100**	**75**	**50**	**100**	**75**	**50**			
kW, Unit Gross	**47460**	**35602**	**23742**	**48440**	**36337**	**24231**	**45475**	**34114**	**22750**	**50598**	**37955**	**25310**	**48835**	**36856**	**24577**
kW, Facility Gross	**47460**	**35602**	**23742**	**48440**	**36337**	**24231**	**45475**	**34114**	**22750**	**50598**	**37955**	**25310**	**48835**	**36856**	**24577**
kW, Facility Net-Low Side of GSU	**46311**	**34453**	**22593**	**47291**	**35188**	**23082**	**44326**	**32965**	**21601**	**49449**	**36806**	**24161**	**47686**	**35707**	**23428**
kW, Facility Net-High Side of GSU	**46116**	**34308**	**22498**	**47092**	**35040**	**22985**	**44140**	**32827**	**21510**	**49241**	**36651**	**24060**	**47486**	**35557**	**23330**
Btu/kW-hr, LHV - Unit Gross	**8612**	**9134**	**10402**	**8591**	**9084**	**10322**	**10322**	**10322**	**10322**	**8473**	**8949**	**10193**	**8582**	**9045**	**10259**
Btu/kW-hr, HHV - Facility Net, High Side	**9827**	**10510**	**12172**	**9799**	**10445**	**12066**	**9907**	**10664**	**12400**	**9654**	**10276**	**11889**	**9786**	**10396**	**11984**
Fuel Flow															
MMBtu/hr, LHV	408.7	325.2	247.0	416.1	330.1	250.1	394.4	315.7	240.6	428.7	339.7	258.0	419.1	333.4	252.1
lb/hr	19509	15522	11789	19864	15756	11939	18825	15070	11482	20464	16213	12314	20005	15913	12035
NOx Control	**Water**	**Water**	**Water**	**Water**	**Water**	**Water**	**Water**	**Water**	**Water**	**Water**	**Water**	**Water**	**Water**	**Water**	**Water**
Water Injection															
lb/hr	17077	10840	9257	17904	11406	9621	16106	10329	8870	22364	14802	10423	18121	11629	9786
Temperature, °F	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
SPRINT	**LPC**	**LPC**	**OFF**	**LPC**	**LPC**	**OFF**	**LPC**	**LPC**	**OFF**	**HPC**	**HPC**	**OFF**	**LPC**	**LPC**	**OFF**
lb/hr	9388	9388	0	9523	9523	0	9114	9114	0	3794	3794	0	9579	9579	0
Control Parameters															
HP Speed, RPM	10512	10108	9848	10492	10077	9818	10540	10159	9901	10323	9940	9585	10484	10072	9811
LP Speed, RPM	3600	3600	3600	3600	3600	3600	3600	3600	3600	3600	3600	3600	3600	3600	3600
PS3 - CDP, psia	440.2	385.8	321.2	446.5	391.8	326.4	428.0	374.0	311.7	469.6	412.5	346.3	449.0	395.3	329.5
T3CRF - CDT, °F	981	904	907	978	897	900	991	917	920	958	882	845	976	895	899
T48IN, °R	2038	1896	1816	2038	1889	1807	2038	1909	1832	1994	1849	1733	2038	1888	1803
T48IN, °F	1578	1436	1357	1578	1430	1347	1578	1449	1372	1535	1390	1274	1578	1429	1344
Exhaust Parameters															
Temperature, °F	854.2	786.1	772.3	850.2	777.0	761.6	861.6	803.3	790.9	804.8	733.4	695.0	848.8	774.0	756.9
lb/sec	285.4	260.5	222.8	289.6	265.1	227.1	277.5	251.5	215.2	309.4	283.5	246.4	291.3	267.6	229.5
lb/hr	1027585	937638	801946	1042647	954379	817489	999022	905416	774619	1113827	1020632	887140	1048607	963236	826104
Energy, Btu/s- Ref 0 °R	97771	83606	69912	98772	84316	70484	95716	82048	68731	100569	85898	71499	99194	84855	70907
Energy, Btu/s- Ref T2 °F	59724	49133	40717	60605	49635	41076	57949	48042	39918	62727	51482	41820	60984	50013	41328
Cp, Btu/lb-R	0.2792	0.2739	0.2702	0.2787	0.2732	0.2693	0.2797	0.2751	0.2713	0.2739	0.2685	0.2645	0.2785	0.2730	0.2690
Emissions (NOT FOR USE IN ENVIRONMENTAL PERMITS)															
NOx ppmvd Ref 15% O2	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25
NOx as NO2, lb/hr	41	33	25	42	33	25	40	32	24	43	34	26	42	33	25
CO ppmvd Ref 15% O2	8	8	12	10	10	15	6	6	9	41	39	44	11	11	16
CO, lb/hr	8.15	6.40	7.30	10.38	8.43	9.22	6.00	4.66	5.39	42.68	32.09	27.77	11.07	9.15	9.97
CO2, lb/hr	53169.28	42359.82	32228.37	54132.60	42996.42	32638.62	51312.84	41125.66	31389.44	55751.14	44238.54	33656.86	54516.59	43426.23	32902.41
HC ppmvd Ref 15% O2	2	2	2	2	2	2	2	2	2	5	4	6	2	2	2

HC, lb/hr	1.17	0.93	0.71	1.19	0.95	0.72	1.13	0.90	0.69	2.93	2.08	2.09	1.20	0.95	0.72
SOX as SO2, lb/hr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Exh Wght % Wet (NOT FOR USE IN ENVIRONMENTAL PERMITS)															
AR	1.2140	1.2233	1.2381	1.2159	1.2256	1.2407	1.2124	1.2210	1.2355	1.2314	1.2413	1.2525	1.2164	1.2260	1.2413
N2	71.1914	71.7345	72.6005	71.3033	71.8671	72.7518	71.0961	71.5989	72.4514	72.2079	72.7892	73.4444	71.3308	71.8948	72.7873
O2	14.4512	15.5606	16.5425	14.4599	15.6190	16.6263	14.4766	15.4841	16.4490	15.0008	16.1437	17.1210	14.4580	15.6228	16.6510
CO2	5.1742	4.5177	4.0188	5.1918	4.5052	3.9925	5.1363	4.5422	4.0522	5.0054	4.3344	3.7939	5.1990	4.5084	3.9828
H20	7.9655	6.9608	5.5970	7.8251	6.7798	5.3853	8.0752	7.1509	5.8089	6.5477	5.4857	4.3829	7.7919	6.7445	5.3341
SO2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
CO	0.0008	0.0007	0.0009	0.0010	0.0009	0.0011	0.0006	0.0005	0.0007	0.0038	0.0031	0.0031	0.0011	0.0009	0.0012
HC	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0003	0.0002	0.0002	0.0001	0.0001	0.0001
NOX	0.0027	0.0024	0.0021	0.0028	0.0024	0.0021	0.0027	0.0024	0.0021	0.0027	0.0023	0.0020	0.0028	0.0024	0.0021
Exh Mole % Dry (NOT FOR USE IN ENVIRONMENTAL PERMITS)															
AR	0.9675	0.9629	0.9592	0.9676	0.9627	0.9590	0.9673	0.9631	0.9595	0.9659	0.9612	0.9575	0.9676	0.9627	0.9589
N2	80.9069	80.5153	80.2103	80.9124	80.5037	80.1914	80.8892	80.5337	80.2332	80.7719	80.3786	80.0638	80.9154	80.5045	80.1851
O2	14.3785	15.2907	16.0009	14.3656	15.3176	16.0447	14.4199	15.2479	15.9478	14.6907	15.6073	16.3403	14.3587	15.3156	16.0595
CO2	3.7431	3.2278	2.8263	3.7503	3.2124	2.8013	3.7199	3.2521	2.8565	3.5641	3.0468	2.6326	3.7541	3.2135	2.7930
H20	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
SO2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
CO	0.0009	0.0008	0.0010	0.0011	0.0010	0.0012	0.0007	0.0006	0.0008	0.0043	0.0035	0.0034	0.0012	0.0011	0.0013
HC	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0005	0.0004	0.0005	0.0002	0.0002	0.0002
NOX	0.0028	0.0024	0.0021	0.0028	0.0024	0.0021	0.0027	0.0024	0.0021	0.0026	0.0022	0.0019	0.0028	0.0024	0.0021
Exh Mole % Wet (NOT FOR USE IN ENVIRONMENTAL PERMITS)															
AR	0.8481	0.8586	0.8751	0.8502	0.8610	0.8780	0.8464	0.8560	0.8723	0.8672	0.8785	0.8913	0.8507	0.8616	0.8786
N2	70.9230	71.7930	73.1741	71.0954	72.0005	73.4147	70.7773	71.5808	72.9371	72.5130	73.4588	74.5265	71.1376	72.0437	73.4714
O2	12.6042	13.6343	14.5973	12.6226	13.6997	14.6889	12.6173	13.5528	14.4975	13.1886	14.2637	15.2102	12.6236	13.7060	14.7149
CO2	3.2812	2.8781	2.5784	3.2952	2.8731	2.5646	3.2549	2.8906	2.5968	3.1996	2.7845	2.4506	3.3004	2.8758	2.5591
H20	12.3400	10.8331	8.7722	12.1329	10.5625	8.4507	12.5009	11.1170	9.0936	10.2250	8.6089	6.9161	12.0839	10.5097	8.3727
SO2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
CO	0.0008	0.0007	0.0009	0.0010	0.0009	0.0011	0.0006	0.0005	0.0007	0.0038	0.0032	0.0032	0.0011	0.0010	0.0012
HC	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0005	0.0004	0.0004	0.0002	0.0002	0.0002
NOX	0.0024	0.0021	0.0019	0.0024	0.0021	0.0019	0.0024	0.0021	0.0019	0.0024	0.0020	0.0018	0.0024	0.0021	0.0019
Aero Energy Fuel Number	**900-774 (MRP)**			**900-774 (MRP)**			**900-774 (MRP)**			**900-774 (MRP)**			**900-774 (MRP)**		
	Volume %	**Weight %**		**Volume %**	**Weight %**		**Volume %**	**Weight %**		**Volume %**	**Weight %**		**Volume %**	**Weight %**	
Hydrogen	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	
Methane	96.9360	93.5728		96.9360	93.5728		96.9360	93.5728		96.9360	93.5728		96.9360	93.5728	
Ethane	1.7450	3.1572		1.7450	3.1572		1.7450	3.1572		1.7450	3.1572		1.7450	3.1572	
Ethylene	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	
Propane	0.2980	0.7907		0.2980	0.7907		0.2980	0.7907		0.2980	0.7907		0.2980	0.7907	
Propylene	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	
Butane	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	
Butylene	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	
Butadiene	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	
Pentane	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	
Cyclopentane	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	
Hexane	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	
Heptane	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	
Carbon Monoxide	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	
Carbon Dioxide	0.7860	2.0815		0.7860	2.0815		0.7860	2.0815		0.7860	2.0815		0.7860	2.0815	
Nitrogen	0.2360	0.3978		0.2360	0.3978		0.2360	0.3978		0.2360	0.3978		0.2360	0.3978	
Water Vapor	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	
Oxygen	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	
Hydrogen Sulfide	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	
Ammonia	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	
Btu/lb, LHV	20950			20950			20950			20950			20950		
Btu/scf, LHV	920			920			920			920			920		
Btu/scf, HHV	1020			1020			1020			1020			1020		
Btu/lb, HHV	23230			23230			23230			23230			23230		
Fuel Temp, °F	77.0			77.0			77.0			77.0			77.0		
NOx Scalar	0.993			0.993			0.993			0.993			0.993		
Specific Gravity	0.57			0.57			0.57			0.57			0.57		
Engine Exhaust															
Exhaust MW	27.9	28.0	28.2	27.9	28.1	28.3	27.9	28.0	28.2	28.1	28.3	28.4	27.9	28.1	28.3
Inlet Flow Wet, pps	276.2	273.4	267.5	280.1	276.9	270.2	268.9	267.2	261.4	300.3	295.9	295.5	281.7	278.4	270.7
Inlet Flow Dry, pps	272.6	269.8	264.0	277.1	273.9	267.3	264.8	263.1	257.5	299.7	295.3	294.9	278.8	275.5	267.9

Shaft HP	64769	48693	32656	66100	49688	33317	62074	46679	31316	69033	51879	34774	66637	50391	33784
Generator Information															
Capacity kW	59705	59705	59705	61401	61401	61401	48244	48244	48244	71414	71414	71414	62829	62829	62829
Efficiency	0.983	0.980	0.975	0.983	0.981	0.975	0.982	0.980	0.974	0.983	0.981	0.976	0.983	0.981	0.976
Inlet Temp, °F	75.0	75.0	75.0	69.0	69.0	69.0	111.0	111.0	111.0	29.0	29.0	29.0	63.8	63.8	63.8
Gear Box Loss	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
TRQ48, Torque Limit Cold End	116079	93314	70329	118264	95108	71712	111802	89730	67724	125000	100932	76051	119143	96267	72619
Correct Control Parameters															
PS3JQA, psia	445.134	390.124	324.800	451.505	396.192	330.059	432.797	378.192	315.194	474.273	416.605	349.746	454.033	399.731	333.193
XN25R3, rpm	6332	6243	6063	6329	6239	6057	6329	6245	6068	6250	6170	6028	6328	6240	6056
8th Stage Bleed															
Flow, pps	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pressure, psia	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Temperature, °R	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CDP Bleed															
Flow, pps	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pressure, psia	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Est. Gas Pressure at Baseplate, psia	**572.3**	**486.8**	**396.1**	**581.0**	**493.9**	**401.9**	**555.4**	**472.7**	**385.3**	**605.1**	**515.1**	**421.9**	**584.5**	**498.4**	**405.4**
CardPack	**8dz**	**8dz**	**8dz**	**8dz**	**8dz**	**8dz**	**8dz**	**8dz**	**8dz**	**8dz**	**8dz**	**8dz**	**8dz**	**8dz**	**8dz**
Exhaust CardPack	**7f5**	**7f5**	**7f5**	**7f5**	**7f5**	**7f5**	**7f5**	**7f5**	**7f5**	**7f5**	**7f5**	**7f5**	**7f5**	**7f5**	**7f5**
NSI	**304**	**0**	**439**	**304**	**0**	**439**	**304**	**0**	**439**	**323**	**0**	**439**	**304**	**0**	**439**
NSI	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1716**	**0**	**0**	**0**	**0**	**0**
NSI	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
													0	**0**	**0**
XNENG				**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**0**	**0**	**0**

GSU Transformer Losses: Estimate Only

Assumed Xformer Efficiency (%)	99.6	99.6	99.6	99.6	99.6	99.6	99.6	99.6	99.6	99.6	99.6	99.6	99.6	99.6	99.6
Assumed Power Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Net Power on Low Side (MW)	46311	34453	22593	47291	35188	23082	44326	32965	21601	49449	36806	24161	47686	35707	23428
Calculated Power Loss	195	145	95	199	148	97	187	139	91	208	155	102	201	150	99

AUXILIARY LOAD CALCULATIONS: ESTIMATE ONLY, EXCLUDES GSU TRANSFORMER

Equipment	Qty	Normal Operation - 2 CTG's running	Normal Operation - 1 CTG running	Preliminary Electrical Sizing (Each - hp)	2 CTG's Preliminary Normal Operating Load (hp)	1 CTG Preliminary Normal Operating Load (hp)	2 CTG's Preliminary Normal Operating Load (kW)	1 CTG Preliminary Normal Operating Load (kW)	
CTG Auxiliaries	2	2	1	359.2	718	359	536	268	268 kW per CTG, including Water Injection and Sprint pumps
Gas Compressors: 3x50%	3	2	1	700	1400	700	1044	522	
Gas Compressor Discharge Cooler	3	2	1	7.5	15	8	11	6	
SCR Tempering Air Fan - CTG Unit 1	2	1	1	125	125	125	93	93	
SCR Tempering Air Fan - CTG Unit 2	2	1	0	125	125	0	93	0	
Ammonia Skid - Exhaust Gas Blower or Vaporizor - CTG Unit 1	2	1	1	15	15	15	11	11	
Ammonia Skid - Exhaust Gas Blower or Vaporizor - CTG Unit 2	2	1	0	15	15	0	11	0	
Ammonia Skid 1 - Heater	1	1	1				100	100	Rated for 135, assume operates at 100 kw
Ammonia Skid 2 - Heater	1	1	0				100	0	Rated for 135, assume operates at 100 kw
Ammonia Forwarding Pumps	2	1	1	1	1	1	1	1	
Demin Water Pumps	2	1	1	15	15	15	11	11	
Air Compressors - Air Cooled, 2x100%	2	1	1	100	100	100	75	75	
Fogger Water Injection Pumps (estimated)	8	4	2	15	60	30	45	22	
Misc. Pumps (Sump pumps, etc)	8	2	2	3	6	6	4	4	
AC Fire Pump	1	0	0	20	0	0	0	0	
Control system							25	25	
Other Power - Lighting							10	10	
Total:							**2171**	**1149**	

Performance By: **PELLETIER**
Project Info: **MMC Chula Vista**

Engine: **LM6000 PC-SPRINT w/ FIGV at -5 Degrees**
Deck Info: **G0125O - 8dz.scp**
Generator: **BDAX 290ERT 60Hz, 13.8kV, 0.9PF (14839)**
Fuel: **Site Gas Fuel#900-774T, 20950 Btu/lb,LHV**

Date: **12/21/2006**
Time: **12:46:37 PM**
Version: **3.5.0**

2 CTG's Running

Case #	100	101	102	200	201	202	300	301	302	400	401	402	500	501	502
Ambient Conditions	Guarantee			Summer Avg.			Historical Max			Historical Min			Annual Avg.		
Dry Bulb, °F	75.0	75.0	75.0	69.0	69.0	69.0	111.0	111.0	111.0	29.0	29.0	29.0	63.8	63.8	63.8
Wet Bulb, °F	65.3	65.3	65.3	60.1	60.1	60.1	71.3	71.3	71.3	25.4	25.4	25.4	58.4	58.4	58.4
RH, %	60.0	60.0	60.0	60.0	60.0	60.0	13.0	13.0	13.0	60.0	60.0	60.0	73.0	73.0	73.0
Altitude, ft	54.0	54.0	54.0	54.0	54.0	54.0	54.0	54.0	54.0	54.0	54.0	54.0	54.0	54.0	54.0
Ambient Pressure, psia	14.667	14.667	14.667	14.667	14.667	14.667	14.667	14.667	14.667	14.667	14.667	14.667	14.667	14.667	14.667
Engine Inlet															
Comp Inlet Temp, °F	66.8	66.8	66.8	61.4	61.4	61.4	77.2	77.2	77.2	29.0	29.0	29.0	59.2	59.2	59.2
RH, %	92.7	92.7	92.7	92.8	92.8	92.8	75.1	75.1	75.1	60.0	60.0	60.0	95.4	95.4	95.4
Conditioning	Fogger	Fogger	Fogger	Fogger	Fogger	Fogger	Fogger	Fogger	Fogger	NONE	NONE	NONE	Fogger	Fogger	Fogger
Tons or kBtu/hr	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pressure Losses															
Inlet Loss, inH20	4.50	4.50	4.50	4.50	4.50	4.50	4.50	4.50	4.50	4.00	4.00	4.00	4.50	4.50	4.50
Volute Loss, inH20	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
Exhaust Loss, inH20	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
Partload %	**100**	**75**	**50**	**100**	**75**	**50**	**100**	**75**	**50**	**100**	**75**	**50**	**100**	**75**	**50**
kW, Unit Gross	**47460**	**35602**	**23742**	**48440**	**36337**	**24231**	**45475**	**34114**	**22750**	**50598**	**37955**	**25310**	**48835**	**36856**	**24577**
kW, Facility Gross	**94920**	**71204**	**47484**	**96880**	**72674**	**48462**	**90950**	**68228**	**45500**	**101196**	**75910**	**50620**	**97670**	**73712**	**49154**
kW, Facility Net-Low Side of GSU	**93771**	**70055**	**46335**	**95731**	**71525**	**47313**	**89801**	**67079**	**44351**	**100047**	**74761**	**49471**	**96521**	**72563**	**48005**
kW, Facility Net-High Side of GSU	**93377**	**69760**	**46140**	**95328**	**71224**	**47114**	**89423**	**66797**	**44165**	**99626**	**74447**	**49263**	**96115**	**72258**	**47803**
Btu/kW-hr, LHV - Unit Gross	**8612**	**9134**	**10402**	**8591**	**9084**	**10322**	**10322**	**10322**	**10322**	**8473**	**8949**	**10193**	**8582**	**9045**	**10259**
Btu/kW-hr, HHV - Facility Net, High Side	**9707**	**10338**	**11871**	**9681**	**10278**	**11773**	**9781**	**10482**	**12079**	**9543**	**10118**	**11613**	**9670**	**10232**	**11697**
Fuel Flow															
MMBtu/hr, LHV	408.7	325.2	247.0	416.1	330.1	250.1	394.4	315.7	240.6	428.7	339.7	258.0	419.1	333.4	252.1
lb/hr	19509	15522	11789	19864	15756	11939	18825	15070	11482	20464	16213	12314	20005	15913	12035
NOx Control	**Water**	**Water**	**Water**	**Water**	**Water**	**Water**	**Water**	**Water**	**Water**	**Water**	**Water**	**Water**	**Water**	**Water**	**Water**
Water Injection															
lb/hr	17077	10840	9257	17904	11406	9621	16106	10329	8870	22364	14802	10423	18121	11629	9786
Temperature, °F	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
SPRINT	**LPC**	**LPC**	**OFF**	**LPC**	**LPC**	**OFF**	**LPC**	**LPC**	**OFF**	**HPC**	**HPC**	**OFF**	**LPC**	**LPC**	**OFF**
lb/hr	9388	9388	0	9523	9523	0	9114	9114	0	3794	3794	0	9579	9579	0
Control Parameters															
HP Speed, RPM	10512	10108	9848	10492	10077	9818	10540	10159	9901	10323	9940	9585	10484	10072	9811
LP Speed, RPM	3600	3600	3600	3600	3600	3600	3600	3600	3600	3600	3600	3600	3600	3600	3600
PS3 - CDP, psia	440.2	385.8	321.2	446.5	391.8	326.4	428.0	374.0	311.7	469.6	412.5	346.3	449.0	395.3	329.5
T3CRF - CDT, °F	981	904	907	978	897	900	991	917	920	958	882	845	976	895	899
T48IN, °R	2038	1896	1816	2038	1889	1807	2038	1909	1832	1994	1849	1733	2038	1888	1803
T48IN, °F	1578	1436	1357	1578	1430	1347	1578	1449	1372	1535	1390	1274	1578	1429	1344
Exhaust Parameters															
Temperature, °F	854.2	786.1	772.3	850.2	777.0	761.6	861.6	803.3	790.9	804.8	733.4	695.0	848.8	774.0	756.9
lb/sec	285.4	260.5	222.8	289.6	265.1	227.1	277.5	251.5	215.2	309.4	283.5	246.4	291.3	267.6	229.5
lb/hr	1027585	937638	801946	1042647	954379	817489	999022	905416	774619	1113827	1020632	887140	1048607	963236	826104
Energy, Btu/s- Ref 0 °R	97771	83606	69912	98772	84316	70484	95716	82048	68731	100569	85898	71499	99194	84855	70907
Energy, Btu/s- Ref T2 °F	59724	49133	40717	60605	49635	41076	57949	48042	39918	62727	51482	41820	60984	50013	41328
Cp, Btu/lb-R	0.2792	0.2739	0.2702	0.2787	0.2732	0.2693	0.2797	0.2751	0.2713	0.2739	0.2685	0.2645	0.2785	0.2730	0.2690
Emissions (NOT FOR USE IN ENVIRONMENTAL PERMITS)															
NOx ppmvd Ref 15% O2	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25
NOx as NO2, lb/hr	41	33	25	42	33	25	40	32	24	43	34	26	42	33	25
CO ppmvd Ref 15% O2	8	8	12	10	10	15	6	6	9	41	39	44	11	11	16
CO, lb/hr	8.15	6.40	7.30	10.38	8.43	9.22	6.00	4.66	5.39	42.68	32.09	27.77	11.07	9.15	9.97
CO2, lb/hr	53169.28	42359.82	32228.37	54132.60	42996.42	32638.62	51312.84	41125.66	31389.44	55751.14	44238.54	33656.86	54516.59	43426.23	32902.41
HC ppmvd Ref 15% O2	2	2	2	2	2	2	2	2	2	5	4	6	2	2	2

HC, lb/hr	1.17	0.93	0.71	1.19	0.95	0.72	1.13	0.90	0.69	2.93	2.08	2.09	1.20	0.95	0.72
SOX as SO2, lb/hr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Exh Wght % Wet (NOT FOR USE IN ENVIRONMENTAL PERMITS)															
AR	1.2140	1.2233	1.2381	1.2159	1.2256	1.2407	1.2124	1.2210	1.2355	1.2314	1.2413	1.2525	1.2164	1.2260	1.2413
N2	71.1914	71.7345	72.6005	71.3033	71.8671	72.7518	71.0961	71.5989	72.4514	72.2079	72.7892	73.4444	71.3308	71.8948	72.7873
O2	14.4512	15.5606	16.5425	14.4599	15.6190	16.6263	14.4766	15.4841	16.4490	15.0008	16.1437	17.1210	14.4580	15.6228	16.6510
CO2	5.1742	4.5177	4.0188	5.1918	4.5052	3.9925	5.1363	4.5422	4.0522	5.0054	4.3344	3.7939	5.1990	4.5084	3.9828
H20	7.9655	6.9608	5.5970	7.8251	6.7798	5.3853	8.0752	7.1509	5.8089	6.5477	5.4857	4.3829	7.7919	6.7445	5.3341
SO2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
CO	0.0008	0.0007	0.0009	0.0010	0.0009	0.0011	0.0006	0.0005	0.0007	0.0038	0.0031	0.0031	0.0011	0.0009	0.0012
HC	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0003	0.0002	0.0002	0.0001	0.0001	0.0001
NOX	0.0027	0.0024	0.0021	0.0028	0.0024	0.0021	0.0027	0.0024	0.0021	0.0027	0.0023	0.0020	0.0028	0.0024	0.0021
Exh Mole % Dry (NOT FOR USE IN ENVIRONMENTAL PERMITS)															
AR	0.9675	0.9629	0.9592	0.9676	0.9627	0.9590	0.9673	0.9631	0.9595	0.9659	0.9612	0.9575	0.9676	0.9627	0.9589
N2	80.9069	80.5153	80.2103	80.9124	80.5037	80.1914	80.8892	80.5337	80.2332	80.7719	80.3786	80.0638	80.9154	80.5045	80.1851
O2	14.3785	15.2907	16.0009	14.3656	15.3176	16.0447	14.4199	15.2479	15.9478	14.6907	15.6073	16.3403	14.3587	15.3156	16.0595
CO2	3.7431	3.2278	2.8263	3.7503	3.2124	2.8013	3.7199	3.2521	2.8565	3.5641	3.0468	2.6326	3.7541	3.2135	2.7930
H20	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
SO2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
CO	0.0009	0.0008	0.0010	0.0011	0.0010	0.0012	0.0007	0.0006	0.0008	0.0043	0.0035	0.0034	0.0012	0.0011	0.0013
HC	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0005	0.0004	0.0005	0.0002	0.0002	0.0002
NOX	0.0028	0.0024	0.0021	0.0028	0.0024	0.0021	0.0027	0.0024	0.0021	0.0026	0.0022	0.0019	0.0028	0.0024	0.0021
Exh Mole % Wet (NOT FOR USE IN ENVIRONMENTAL PERMITS)															
AR	0.8481	0.8586	0.8751	0.8502	0.8610	0.8780	0.8464	0.8560	0.8723	0.8672	0.8785	0.8913	0.8507	0.8616	0.8786
N2	70.9230	71.7930	73.1741	71.0954	72.0005	73.4147	70.7773	71.5808	72.9371	72.5130	73.4588	74.5265	71.1376	72.0437	73.4714
O2	12.6042	13.6343	14.5973	12.6226	13.6997	14.6889	12.6173	13.5528	14.4975	13.1886	14.2637	15.2102	12.6236	13.7060	14.7149
CO2	3.2812	2.8781	2.5784	3.2952	2.8731	2.5646	3.2549	2.8906	2.5968	3.1996	2.7845	2.4506	3.3004	2.8758	2.5591
H20	12.3400	10.8331	8.7722	12.1329	10.5625	8.4507	12.5009	11.1170	9.0936	10.2250	8.6089	6.9161	12.0839	10.5097	8.3727
SO2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
CO	0.0008	0.0007	0.0009	0.0010	0.0009	0.0011	0.0006	0.0005	0.0007	0.0038	0.0032	0.0032	0.0011	0.0010	0.0012
HC	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0005	0.0004	0.0004	0.0002	0.0002	0.0002
NOX	0.0024	0.0021	0.0019	0.0024	0.0021	0.0019	0.0024	0.0021	0.0019	0.0024	0.0020	0.0018	0.0024	0.0021	0.0019
Aero Energy Fuel Number	**900-774 (MRP)**			**900-774 (MRP)**			**900-774 (MRP)**			**900-774 (MRP)**			**900-774 (MRP)**		
	Volume %	**Weight %**		**Volume %**	**Weight %**		**Volume %**	**Weight %**		**Volume %**	**Weight %**		**Volume %**	**Weight %**	
Hydrogen	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	
Methane	96.9360	93.5728		96.9360	93.5728		96.9360	93.5728		96.9360	93.5728		96.9360	93.5728	
Ethane	1.7450	3.1572		1.7450	3.1572		1.7450	3.1572		1.7450	3.1572		1.7450	3.1572	
Ethylene	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	
Propane	0.2980	0.7907		0.2980	0.7907		0.2980	0.7907		0.2980	0.7907		0.2980	0.7907	
Propylene	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	
Butane	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	
Butylene	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	
Butadiene	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	
Pentane	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	
Cyclopentane	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	
Hexane	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	
Heptane	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	
Carbon Monoxide	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	
Carbon Dioxide	0.7860	2.0815		0.7860	2.0815		0.7860	2.0815		0.7860	2.0815		0.7860	2.0815	
Nitrogen	0.2360	0.3978		0.2360	0.3978		0.2360	0.3978		0.2360	0.3978		0.2360	0.3978	
Water Vapor	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	
Oxygen	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	
Hydrogen Sulfide	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	
Ammonia	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	
Btu/lb, LHV	20950			20950			20950			20950			20950		
Btu/scf, LHV	920			920			920			920			920		
Btu/scf, HHV	1020			1020			1020			1020			1020		
Btu/lb, HHV	23230			23230			23230			23230			23230		
Fuel Temp, °F	77.0			77.0			77.0			77.0			77.0		
NOx Scalar	0.993			0.993			0.993			0.993			0.993		
Specific Gravity	0.57			0.57			0.57			0.57			0.57		
Engine Exhaust															
Exhaust MW	27.9	28.0	28.2	27.9	28.1	28.3	27.9	28.0	28.2	28.1	28.3	28.4	27.9	28.1	28.3
Inlet Flow Wet, pps	276.2	273.4	267.5	280.1	276.9	270.2	268.9	267.2	261.4	300.3	295.9	295.5	281.7	278.4	270.7
Inlet Flow Dry, pps	272.6	269.8	264.0	277.1	273.9	267.3	264.8	263.1	257.5	299.7	295.3	294.9	278.8	275.5	267.9

Shaft HP	64769	48693	32656	66100	49688	33317	62074	46679	31316	69033	51879	34774	66637	50391	33784
Generator Information															
Capacity kW	59705	59705	59705	61401	61401	61401	48244	48244	48244	71414	71414	71414	62829	62829	62829
Efficiency	0.983	0.980	0.975	0.983	0.981	0.975	0.982	0.980	0.974	0.983	0.981	0.976	0.983	0.981	0.976
Inlet Temp, °F	75.0	75.0	75.0	69.0	69.0	69.0	111.0	111.0	111.0	29.0	29.0	29.0	63.8	63.8	63.8
Gear Box Loss	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
TRQ48, Torque Limit Cold End	116079	93314	70329	118264	95108	71712	111802	89730	67724	125000	100932	76051	119143	96267	72619
Correct Control Parameters															
PS3JQA, psia	445.134	390.124	324.800	451.505	396.192	330.059	432.797	378.192	315.194	474.273	416.605	349.746	454.033	399.731	333.193
XN25R3, rpm	6332	6243	6063	6329	6239	6057	6329	6245	6068	6250	6170	6028	6328	6240	6056
8th Stage Bleed															
Flow, pps	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pressure, psia	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Temperature, °R	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CDP Bleed															
Flow, pps	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pressure, psia	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Est. Gas Pressure at Baseplate, psia	**572.3**	**486.8**	**396.1**	**581.0**	**493.9**	**401.9**	**555.4**	**472.7**	**385.3**	**605.1**	**515.1**	**421.9**	**584.5**	**498.4**	**405.4**
CardPack	**8dz**	**8dz**	**8dz**	**8dz**	**8dz**	**8dz**	**8dz**	**8dz**	**8dz**	**8dz**	**8dz**	**8dz**	**8dz**	**8dz**	**8dz**
Exhaust CardPack	**7f5**	**7f5**	**7f5**	**7f5**	**7f5**	**7f5**	**7f5**	**7f5**	**7f5**	**7f5**	**7f5**	**7f5**	**7f5**	**7f5**	**7f5**
NSI	**304**	**0**	**439**	**304**	**0**	**439**	**304**	**0**	**439**	**323**	**0**	**439**	**304**	**0**	**439**
NSI	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1716**	**0**	**0**	**0**	**0**	**0**
NSI	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
													0	**0**	**0**
XNENG				**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**0**	**0**	**0**
GSU Transformer Losses: Estimate Only							**1**	**1**	**1**				**1**	**1**	**1**
Assumed Xformer Efficiency (%)	99.6	99.6	99.6	99.6	99.6	99.6	99.6	99.6	99.6	99.6	99.6	99.6	99.6	99.6	99.6
Assumed Power Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Net Power on Low Side (MW)	93771	70055	46335	95731	71525	47313	89801	67079	44351	100047	74761	49471	96521	72563	48005
Calculated Power Loss	395	295	195	403	301	199	378	282	187	421	315	208	406	306	202

AUXILIARY LOAD CALCULATIONS: ESTIMATE ONLY, EXCLUDES GSU TRANSFORMER

Equipment	Qty	Normal Operation - 2 CTG's running	Normal Operation - 1 CTG running	Preliminary Electrical Sizing (Each - hp)	2 CTG's Preliminary Normal Operating Load (hp)	1 CTG Preliminary Normal Operating Load (hp)	2 CTG's Preliminary Normal Operating Load (kW)	1 CTG Preliminary Normal Operating Load (kW)	
CTG Auxiliaries	2	2	1	359.2	718	359	536	268	268 kW per CTG, including Water Injection and Sprint pumps
Gas Compressors: 3x50%	3	2	1	700	1400	700	1044	522	
Gas Compressor Discharge Cooler	3	2	1	7.5	15	8	11	6	
SCR Tempering Air Fan - CTG Unit 1	2	1	1	125	125	125	93	93	
SCR Tempering Air Fan - CTG Unit 2	2	1	0	125	125	0	93	0	
Ammonia Skid - Exhaust Gas Blower or Vaporizor - CTG Unit 1	2	1	1	15	15	15	11	11	
Ammonia Skid - Exhaust Gas Blower or Vaporizor - CTG Unit 2	2	1	0	15	15	0	11	0	
Ammonia Skid 1 - Heater	1	1	1				100	100	Rated for 135, assume operates at 100 kw
Ammonia Skid 2 - Heater	1	1	0				100	0	Rated for 135, assume operates at 100 kw
Ammonia Forwarding Pumps	2	1	1	1	1	1	1	1	
Demin Water Pumps	2	1	1	15	15	15	11	11	
Air Compressors - Air Cooled, 2x100%	2	1	1	100	100	100	75	75	
Fogger Water Injection Pumps (estimated)	8	4	2	15	60	30	45	22	
Misc. Pumps (Sump pumps, etc)	8	2	2	3	6	6	4	4	
AC Fire Pump	1	0	0	20	0	0	0	0	
Control system							25	25	
Other Power - Lighting							10	10	
Total:							**2171**	**1149**	