Table 3.4-3 Heat and Material Balances – Case 2

		97 °F, 21% RH					97 °F, 21% RH					97 °F, 21% RH				
GTG Load:		100%					75%					50%				
Duct Burner Status:		On					Off					Off				
Fogger Status:		On					Off					Off				
Stream No	Description	Flow, kpph Per Train	Flow, kpph Plant Total	Temp. °F	Pressure psia	Enthalpy Btu/lbm	Flow, kpph Per Train	Flow, kpph Plant Total	Temp. °F	Pressure psia	Enthalpy Btu/lbm	Flow, kpph Per Train	Flow, kpph Plant Total	Temp. °F	Pressure psia	Enthalpy Btu/lbm
C1	Condensate from Condenser	—	1,399	110	260	78	—	902	97	278	65	—	768	93	279	62
C2	Condensate to HRSG Boundary Limit	739	—	112	256	80	487	—	100	274	69	414	—	97	275	65
C3	FW from LP Drum to HP/IP FW Pump	676	—	321	90	291	452	—	297	64	1,179	387	—	287	55	1,176
C4	HP FW Pump Discharge	623	—	324	2,168	298	398	—	300	1,420	273	342	—	290	1,244	261
C5	IP FW Pump Bleed	54	—	321	626	292	54	—	298	448	268	45	—	287	401	257
C6	Hot IP FW to Fuel Gas Preheater	40	—	462	490	444	36	—	415	321	391	30	—	402	274	377
C7	Cold IP FW from Fuel Gas Preheater	40	—	145	281	114	36	—	145	299	114	30	—	145	300	114
C8	Demin Water Makeup Into Condenser	—	24	60	30	28	—	16	60	30	28	—	13	60	30	28
G1	Gas Turbine Inlet Air	3,369	—	97	14	—	2,616	—	97	14	—	2,216	—	97	14	—
G2	Gas Turbine Exhaust	3,467	—	1,130	15	—	2,674	—	1,196	15	—	2,262	—	1,200	15	—
G3	After HRSG Duct Burners	3,478	—	1,296	15	—	2,674	—	1,068	15	—	2,262	—	1,059	15	—
G4	HRSG Stack Exit	3,478	—	186	14	—	2,674	—	178	14	—	2,262	—	170	14	—
F1	Cold Natural Gas Fuel to Plant	—	152	60	564	—	—	115	60	564	—	—	92	60	564	—
F2	Cold Natural Gas Fuel to Each GTG	76	—	60	564	—	58	—	60	564	—	46	—	60	564	—
F3	Hot Natural Gas Fuel to Gas Turbine	76	—	365	514	—	58	—	365	514	—	46	—	365	514	—
F4	Cold NG Fuel to HRSG Duct Burners	11	22	60	564	—	0	0	60	564	—	0	0	60	564	—
S1	HRSG HP Superheater Exit	583	1,166	1,038	1,966	1,500	362	724	1,054	1,248	1,530	312	624	1,054	1,078	1,535
S2	HRSG Hot RH Exit	668	1,335	1,048	461	1,548	415	830	1,048	288	1,553	354	707	1,046	246	1,553
S3	HRSG IP Superheater Exit	54	107	634	491	1,320	54	108	565	309	1,295	45	90	548	264	1,289
S4	HRSG LP Superheater Exit	15	30	637	90	1,349	25	51	558	62	1,311	21	42	541	53	1,304
S5	Cold RH to HRSG from STG	—	1,154	677	491	1,345	—	717	698	309	1,367	—	618	697	264	1,369
S6	Mixed RH Steam Into HRSG Reheater	630	—	673	484	1,343	412	—	680	303	1,358	354	—	678	259	1,359
S7	HP STG Throttle Steam	—	1,166	1,033	1,890	1,499	—	724	1,050	1,200	1,529	—	624	1,050	1,037	1,534
S8	STG HP Exhaust as Cold Reheat	—	1,154	677	507	1,344	—	717	698	318	1,366	—	618	697	272	1,369
S9	Hot Reheat Steam Into STG	—	1,335	1,045	439	1,547	—	830	1,045	275	1,551	—	707	1,044	234	1,552
S10	LP Superheated Steam Into STG	—	30	635	89	1,348	—	51	555	57	1,310	—	42	538	49	1,303
S11	STG LP Exhaust Steam to Condenser	—	1,374	110	1	1,109	—	887	97	1	1,103	—	754	93	1	1,102
W1	Not Used	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
W2	Not Used	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
W3	Not Used	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
W4	Not Used	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
W5	Not Used	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
W6	Not Used	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
W7	Not Used	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
W8	Hot Closed Loop CW	—	1,566	102	9	70	—	1,024	98	9	66	—	762	97	9	65
W9	Not Used	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Performance Summary	Per Train	Plant Total	Per Train	Plant Total	Per Train	Plant Total
CTG Heat Input, NG [1,4] mm Btu/h, LHV	1,537	6,147	1,166	4,666	929	3,717
HRSG Duct Burners mm Btu/h, LHV	240	962	0	0	0	0
Total Heat Consumption mm Btu/h, LHV	1,777	7,109	1,166	4,666	929	3,717
Gas Turbine Gross Output kW	162,100	648,400	108,300	433,200	72,200	288,800
Steam Turbine Gross Output kW	—	491,966	—	311,764	—	265,712
Gross Power Output kW	—	1,140,366	—	744,964	—	554,512
Auxiliary Power kW	—	26,776	—	21,851	—	20,253
Net Power kW	—	1,113,590	—	723,113	—	534,259
Net Plant Heat Rate Btu/kWh, LHV	—	6,384	—	6,452	—	6,957
Net Plant Heat Rate Btu/kWh, HHV	—	7,079	—	7,155	—	7,715

Notes:

1. GTG data from or implied by GE-GTG.
2. HRSG data from GTMaster.
3. STG data from GTMaster.
4. Fuel gas LHV based on 20,248 BTU/lb.
5. The above heat and material balance is an estimate. All values are subject to change pending detailed design development.