Table 3.4-4 Heat and Material Balances – Case 3

		97 °F, 21% RH					97 °F, 21% RH					97 °F, 21% RH				
GTG Load:		100%					75%					50%				
Duct Burner Status:		Off					Off					Off				
Fogger Status:		On					On					On				
Stream No	Description	Flow, lpph Per Train	Flow, lpph Plant Total	Temp. °F	Pressure psia	Enthalpy Btu/lbm	Flow, lpph Per Train	Flow, lpph Plant Total	Temp. °F	Pressure psia	Enthalpy Btu/lbm	Flow, lpph Per Train	Flow, lpph Plant Total	Temp. °F	Pressure psia	Enthalpy Btu/lbm
C1	Condensate from Condenser	—	1,084	102	277	70	—	902	97	278	65	—	768	93	279	62
C2	Condensate to HRSG Boundary Limit	586	—	105	273	74	487	—	100	274	69	414	—	97	275	65
C3	FW from LP Drum to HP/IP FW Pump	541	—	313	81	1,184	452	—	297	64	1,179	387	—	287	55	1,176
C4	HP FW Pump Discharge	469	—	316	1,643	289	398	—	300	1,420	273	342	—	290	1,244	261
C5	IP FW Pump Bleed	72	—	313	510	284	54	—	298	448	268	45	—	287	401	257
C6	Hot IP FW to Fuel Gas Preheater	44	—	431	383	409	36	—	415	321	391	30	—	402	274	377
C7	Cold IP FW from Fuel Gas Preheater	44	—	145	298	114	36	—	145	299	114	30	—	145	300	114
C8	Demin Water Makeup Into Condenser	—	18	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	3,467	—	1,064	15	—	2,674	—	1,068	15	—	2,262	—	1,059	15	—
G4	HRSG Stack Exit	3,467	—	197	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	0	0	60	564	—	0	0	60	564	—	0	0	60	564	—
S1	HRSG HP Superheater Exit	424	849	1,054	1,458	1,525	362	724	1,054	1,248	1,530	312	624	1,054	1,078	1,535
S2	HRSG Hot RH Exit	492	985	1,045	341	1,550	415	830	1,048	288	1,553	354	707	1,046	246	1,553
S3	HRSG IP Superheater Exit	72	144	583	365	1,300	54	108	565	309	1,295	45	90	548	264	1,289
S4	HRSG LP Superheater Exit	37	75	575	77	1,319	25	51	558	62	1,311	21	42	541	53	1,304
S5	Cold RH to HRSG from STG	—	840	698	365	1,364	—	717	698	309	1,367	—	618	697	264	1,369
S6	Mixed RH Steam Into HRSG Reheater	492	—	681	359	1,355	412	—	680	303	1,358	354	—	678	259	1,359
S7	HP STG Throttle Steam	—	849	1,050	1,402	1,524	—	724	1,050	1,200	1,529	—	624	1,050	1,037	1,534
S8	STG HP Exhaust as Cold Reheat	—	840	698	376	1,363	—	717	698	318	1,366	—	618	697	272	1,369
S9	Hot Reheat Steam Into STG	—	985	1,043	325	1,549	—	830	1,045	275	1,551	—	707	1,044	234	1,552
S10	LP Superheated Steam Into STG	—	75	571	69	1,317	—	51	555	57	1,310	—	42	538	49	1,303
S11	STG LP Exhaust Steam to Condenser	—	1,066	102	1	70	—	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	—	1,399	100	9	68	—	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	0	0	0	0	0	0
Total Heat Consumption mm Btu/h, LHV	1,537	6,147	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	—	370,364	—	311,764	—	265,712
Gross Power Output kW	—	1,018,764	—	744,964	—	554,512
Auxiliary Power kW	—	24,250	—	21,851	—	20,253
Net Power kW	—	994,514	—	723,113	—	534,259
Net Plant Heat Rate Btu/kWh, LHV	—	6,181	—	6,452	—	6,957
Net Plant Heat Rate Btu/kWh, HHV	—	6,854	—	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.