Table 3.4-5 Heat and Material Balances – Case 4

		62 °F, 70% RH					62 °F, 70% RH					62 °F, 70% 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	—	1,398	102	318	71	—	921	89	253	58	—	797	85	256	54
C2	Condensate to HRSG Boundary Limit	740	—	105	314	73	499	—	93	249	62	431	—	90	252	58
C3	FW from LP Drum to HP/IP FW Pump	684	—	321	90	291	465	—	299	66	1,180	404	—	288	56	258
C4	HP FW Pump Discharge	627	—	324	1,288	296	407	—	302	2,169	276	357	—	291	1,644	264
C5	IP FW Pump Bleed	57	—	321	413	292	57	—	299	627	270	47	—	288	513	259
C6	Hot IP FW to Fuel Gas Preheater	41	—	461	500	443	39	—	417	328	394	32	—	405	286	381
C7	Cold IP FW from Fuel Gas Preheater	41	—	145	339	114	39	—	145	274	114	32	—	145	277	114
C8	Demin Water Makeup Into Condenser	—	25	60	30	28	—	16	60	30	28	—	14	60	30	28
G1	Gas Turbine Inlet Air	3,487	—	62	14	—	2,769	—	62	14	—	2,306	—	62	14	—
G2	Gas Turbine Exhaust	3,569	—	1,117	15	—	2,832	—	1,166	15	—	2,356	—	1,200	15	—
G3	After HRSG Duct Burners	3,580	—	1,280	15	—	2,832	—	1,065	15	—	2,356	—	1,062	15	—
G4	HRSG Stack Exit	3,580	—	186	14	—	2,832	—	179	14	—	2,356	—	169	14	—
F1	Cold Natural Gas Fuel to Plant	—	156	60	564	—	—	125	60	564	—	—	100	60	564	—
F2	Cold Natural Gas Fuel to Each GTG	78	—	60	564	—	63	—	60	564	—	50	—	60	564	—
F3	Hot Natural Gas Fuel to Gas Turbine	78	—	365	514	—	63	—	365	514	—	50	—	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	586	1,172	1,027	1,966	1,493	369	737	1,054	1,270	1,530	325	649	1,054	1,121	1,534
S2	HRSG Hot RH Exit	667	1,334	1,048	461	1,548	423	846	1,048	294	1,552	369	737	1,048	256	1,553
S3	HRSG IP Superheater Exit	57	114	633	491	1,319	57	115	567	315	1,295	47	94	553	275	1,291
S4	HRSG LP Superheater Exit	15	30	637	90	1,349	27	53	561	64	1,313	20	41	547	54	1,307
S5	Cold RH to HRSG from STG	—	1,160	669	491	1,340	—	730	698	315	1,366	—	643	697	275	1,368
S6	Mixed RH Steam Into HRSG Reheater	637	—	665	483	1,338	422	—	680	309	1,357	368	—	679	270	1,359
S7	HP STG Throttle Steam	—	1,172	1,022	1,890	1,492	—	737	1,050	1,221	1,529	—	649	1,050	1,078	1,533
S8	STG HP Exhaust as Cold Reheat	—	1,160	669	506	1,339	—	730	698	324	1,366	—	643	697	284	1,368
S9	Hot Reheat Steam Into STG	—	1,334	1,045	439	1,547	—	846	1,045	280	1,551	—	737	1,045	244	1,552
S10	LP Superheated Steam Into STG	—	30	635	88	1,348	—	53	558	59	1,312	—	41	544	51	1,305
S11	STG LP Exhaust Steam to Condenser	—	1,373	102	1	1,106	—	905	89	1	1,100	—	783	85	1	1,098
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	—	1,609	93	9	62	—	1,128	90	9	58	—	843	88	9	56
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	1,581	6,323	1,270	2,540	1,016	4,064
HRSG Duct Burners mm Btu/h, LHV	236	942	0	0	0	0
Total Heat Consumption mm Btu/h, LHV	1,816	7,265	1,270	2,540	1,016	4,064
Gas Turbine Gross Output kW	168,600	674,400	124,500	249,000	83,000	332,000
Steam Turbine Gross Output kW	—	495,718	—	160,977	—	280,504
Gross Power Output kW	—	1,170,118	—	409,977	—	612,504
Auxiliary Power kW	—	23,985	—	24,411	—	21,353
Net Power kW	—	1,146,133	—	385,566	—	591,151
Net Plant Heat Rate Btu/kWh, LHV	—	6,338	—	6,587	—	6,874
Net Plant Heat Rate Btu/kWh, HHV		7,029		7,305		7,623

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.