DESIGN AND OPERATION OF A GEOPRESSURED-GEOTHERMAL HYBRID CYCLE POWER PLANT

FINAL REPORT

FEBRUARY 1991

**PREPARED FOR
EATON OPERATING COMPANY, INC.
AND
UNITED STATES DEPARTMENT OF ENERGY
UNDER
DOE CONTRACT NO. DE-AC07-85ID12578**

BY

**THE BEN HOLT CO.
PASADENA, CALIFORNIA**

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THE BEN HOLT CO.
FINAL REPORT

OF

THE HYBRID POWER SYSTEM (HPS)

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**DESIGN AND OPERATION OF A GEOPRESSURED-GEOTHERMAL
HYBRID CYCLE POWER PLANT**

FINAL REPORT

VOLUME II

February 1991

by

**Richard G. Campbell
and
Mai M. Hattar**

for

**EATON OPERATING COMPANY, INC.
AND
UNITED STATES DEPARTMENT OF ENERGY**

**The Ben Holt Co.
Pasadena, CA.**

**DOE Contract No. DE-AC07-85ID12578
Holt Project No. 30008**

D

THE BEN HOLT CO.

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APPENDIX A

PROCESS FLOW DIAGRAM

STREAM NO.	1	2	3	4	5	6	7	8	9
FLUID	BRINE&GAS	BRINE	BRINE	BRINE	BRINE	GAS	GAS	EXHAUST	EXHAUST
FLOW, MLBS/HR	341	170	170	170	170	.47	.47	6.6	6.6
BPD OR (SCFM)	-	10000	10000	10000	10000	(153)	(153)	-	-
TEMP., °F	278	278	278	220	164	278	278	1130	300
PRESS., PSIA	595	595	595	570	570	595	595	16	15
DENSITY, #/CF	-	64.4	64.4	66.5	66.5	1.50	1.50	.024	.054

STREAM NO.	10	11	12	13	14	15	16	17	18
FLUID	ISOBUTANE	ISOBUTANE	ISOBUTANE	ISOBUTANE	ISOBUTANE	ISOBUTANE	ISOBUTANE	CW MAKEUP	BLOWDOWN
FLOW, MLBS/HR	107	107	92	15	107	107	107	22	5.4
BPD OR (SCFM)	-	-	-	-	-	-	-	-	-
TEMP., °F	98	210	210	210	210	128	94	64	60
PRESS., PSIA	330	300	280	280	280	70	68	30	15
DENSITY, #/CF	33.6	27.1	3.3	3.3	3.3	.7	33.6	62.4	62.2

NOTE:
-N AFTER EQUIPMENT NUMBER
IS FOR NEW, -E IS FOR
EXISTING.

No.	DATE	ISSUE	BY	CHK	APP.
0	9/18/80	ISSUED FOR CONSTRUCTION	HOO		

THE BEN HOLT CO.	
GEOPRESSED PILOT PLANT	
PROCESS FLOW DIAGRAM	
U.S. DOE/EATON	PLEASANT BAYOU, TX.
DATE 8-18-80	SCALE NONE
JOB No. 30008	FILE No.
Draw. No. 30008-B-3203	REV 0

APPENDIX B

PIPING AND INSTRUMENTATION DIAGRAM

APPENDIX C

SPECIFICATIONS OF NEW EQUIPMENT

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- C- 1 Geothermal Brine to Isobutane Preheat Heat Exchanger, E-1-N**
- C- 2 Geothermal Brine to Boiling Isobutane Heat Exchanger, E-2-N**
- C- 3 Exhaust Gas to Boiling Isobutane Heat Exchanger, E-3-N**
- C- 4 Isobutane Separator, V-2-N**
- C- 5 Utility Cooler**
- C- 6 Gas-Freeing Compressor**
- C- 7 Cooling Water Controller**

CMCO

KRUEGER ENGINEERING & MFG. CO.

EXCHANGER SPECIFICATION SHEET

Revision	No.	Date

1	Customer		THE BEN HOLT CO.		Job No.	
2	Address		EPRI		Reference No.	
3	Plant Location				Proposal No.	
4	Service of Unit		Isobutane Preheater		Date	Rev.
5	Size	19-480	Type	NEN	Item No.	E-1-N
6			(Horizontal) Connected In		Parallel	Series
7	Surf./Unit	2,774	Sq. Ft./Shell/Unit	1	Surf./Shell	2,774
8	PERFORMANCE OF ONE UNIT					
9	Fluid Allocation		Shell Side		Tube Side	
10	Fluid Name		Comm. Isobutane		Geothermal Brine	
11	Fluid Quantity, Total		107,000		170,000	
12	Vapor (In/Out)					
13	Liquid		107,000		170,000	
14	Steam					
15	Water					
16	Noncondensable					
17	Temperature (In/Out)		96		210	
18	Specific Gravity				.99 avg.	
19	Viscosity, Liquid		Cp		.34 avg.	
20	Molecular Weight, Vapor					
21	Molecular Weight, Noncondensable					
22	Specific Heat		Btu/Lb °F			
23	Thermal Conductivity		Btu Ft./Hr Sq Ft °F		.36 avg.	
24	Latent Heat		Btu/Lb °F			
25	Inlet Pressure		Psig		315	
26	Velocity		Ft/S			
27	Pressure Drop, Allow./Calc.		Psi		20/ 20	
28	Fouling Resistance (Min.)				.0005	
29	Heat Exchanged		8,190,000		Btu/Hr; MTD (Corrected)	
30	Transfer Rate, Service		97.7		Clean	
31	CONSTRUCTION OF ONE SHELL				Sketch (Bundle/Nozzle Orientation)	
32			Shell Side		Tube Side	
33	Design/Test Pressure		Psig		350/525	
34	Design Temperature		°F		350	
35	No. Passes per Shell				1	
36	Corrosion Allowance		in.		1/16	
37	Connections		In		6" - 300# RF	
38	Size & Rating		Out		6" - 300# RF	
39			Intermediate		6" - 300# RF	
40	Tube No. 424 OD 5/8 In.; Thk (Min/Assd) .065 In.; Length 40 Ft; Pitch 13/16 In. 30 60 90 45					
41	Tube Type		Welded Bare		Material SA214	
42	Shell CS		ID OD		IN. Shell Cover (Integ.) (Remov.)	
43	Channel or Bonnet CS				Channel Cover CS	
44	Tubesheet-Stationary CS				Tubesheet-Floating	
45	Floating Head Cover				Impingement Protection	
46	Baffles-Cross CS		Type		% Cut (Diam) (Area) Spacing: c/c Inlet In.	
47	Baffles-Long				Seal Type	
48	Supports-Tube		U-Bend		Type	
49	Bypass Seal Arrangement				Tube-Tubesheet Joint Rolled	
50	Expansion Joint				Type	
51	DV ² -Inlet Nozzle		Bundle Entrance		Bundle Exit	
52	Gaskets-Shell Side				Tube Side	
53	-Floating Head					
54	Code Requirements		ASME Stamped		TEMA Class R	
55	Weights/Shell-Shipping		Filled with Water		Bundle Lb	
56	Remarks					
57						
58						

TEMA KRUEGER ENGINEERING & MFG. CO.

EXCHANGER SPECIFICATION SHEET

Revision	No.	Date

1	Customer		THE BEN HOLT CO.		Job No.	
2	Address		EPRI		Reference No.	
3	Plant Location				Proposal No.	
4	Service of Unit		Isobutane Reboiler		Date	Rev.
5	Size		26-40-240 Type CKU (Horizontal) Connected In		Item No.	E-2-N
6	Surf./Unit (G.P.S.)		1,813		Surf./Shell (G.P.S.)	1,813
7	Sq. Ft. Shells/Unit		1		Sq Ft	
8	PERFORMANCE OF ONE UNIT					
9	Fluid Allocation		Shell Side		Tube Side	
10	Fluid Name		Comm. Isobutane		Geothermal Brine	
11	Fluid Quantity, Total		Lb/Hr 92,000		170,000	
12	Vapor (In/Out)				92,000	
13	Liquid		92,000		170,000	
14	Steam				170,000	
15	Water					
16	Noncondensable					
17	Temperature (In/Out)		°F 210 210		278 220	
18	Specific Gravity		.43		.974 avg.	
19	Viscosity, Liquid		Cp		.23 avg.	
20	Molecular Weight, Vapor				58	
21	Molecular Weight, Noncondensable					
22	Specific Heat		Btu/Lb °F			
23	Thermal Conductivity		Btu Ft/Hr Sq Ft °F		.37 avg.	
24	Latent Heat		Btu/Lb °F			
25	Inlet Pressure		Psig 266		580	
26	Velocity		Ft/S		6.9	
27	Pressure Drop, Allow./Calc.		Psi 2 / NIL		25 / 25	
28	Fouling Resistance (Min.)		.0005		.0011	
29	Heat Exchanged		8,530,000 Btu/Hr; MTD (Corrected)		30.25 °F	
30	Transfer Rate, Service		156.0 Clean		Btu/Hr Sq Ft °F	
31	CONSTRUCTION OF ONE SHELL				Sketch (Bundle/Nozzle Orientation)	
32			Shell Side		Tube Side	
33	Design/Test Pressure		Psig 350/525		600/900	
34	Design Temperature		°F 350		350	
35	No. Passes per Shell		Kettle		8	
36	Corrosion Allowance		In. 1/16		1/16	
37	Connections		In 6" - 300# RF		6" - 300# RF	
38	Size & Rating		Out (2) 8"-300# RF		6" - 300# RF	
39			Intermediate			
40	Tube No. 220U OD 3/4 In.; Thk (Min/Ass) .065 In.; Length 44Max Ft; Pitch 15/16 In. 30 X 60 X 90 X 45					
41	Tube Type		Welded Bare		Material SA 214	
42	Shell CS ID		OD IN.		Shell Cover CS (Integ.)	
43	Channel or Bonnet CS				Channel Cover CS	
44	Tubesheet-Stationary CS				Tubesheet-Floating	
45	Floating Head Cover				Impingement Protection	
46	Baffles-Cross		Type		Cut (Diam/Aras) Spacing: c/c Inlet In.	
47	Baffles-Long		Seal Type			
48	Supports-Tube CS		U-Bend		Type	
49	Bypass Seal Arrangement				Tube-Tubesheet Joint Rolled	
50	Expansion Joint				Type	
51	PV ² Inlet Nozzle		Bundle Entrance		Bundle Exit	
52	Gaskets-Shell Side				Tube Side	
53	-Floating Head					
54	Code Requirements		ASME Stamped		TEMA Class R	
55	Weights/Shell-Shipping		Fitted with Water		Bundle Lb	
56	Remarks		Demister pads included.			
57						
58						

SIERRA INDUSTRIES

HEAT EXCHANGER SPECIFICATIONS

1	Job No.	
2	Customer BEN HOLT CO.	Reference No.
3	Address	Inquiry No. 20065-1300-3
4	Plant Location BRAZORIA, TX.	Date 8-18-91
5	Service of Unit EXHAUST Gases - BOILING ISOBUTANE	Item No. E-3-A1
6	Size and Type #34/21-916 CKU	
7	(Horiz) Vert. Stat. Hd.	
8	Surface per Unit 237 sq ft Shells per Unit 1 : Series : Parallel : Surface per Shell 237 sq ft	
9	PERFORMANCE OF ONE UNIT	
10	Fluid Circulated	COMM. I-C+H ₂ O EXHAUST GAS
11	Total Fluid Entering	15,000 lb per hr
12	Vapor	6,600 lb per hr
13	Liquid	15,000 lb per hr
14	Steam	6,600 lb per hr
15	Non-Condensables	6,600 lb per hr
16	Fluid Vaporized or Condensed	15,000 lb per hr
17	Steam Condensed	15,000 lb per hr
18	Gravity - Liquid	
19	Density @ Ave. Cond. IN/OUT	25.839/25.839 lb per cu ft
20	Viscosity IN	.021 Centipoises at 210 °F
21	Viscosity OUT	.023 Centipoises at 300 °F
22	Molecular Wt.	58.1
23	Conductivity	30.0
24	Specific Heat	.756 Btu per lb
25	Latent Heat - Vapors	.260 Btu per lb
26	Temperature In	210 °F
27	Temperature Out	1130 °F
28	Operating Pressure	266 psig
29	Number of Passes	0 psig
30	Velocity	2 fps
31	Pressure Drop ALLOW/CALL	175.98 fps
32	Heat Exchanged - Btu per hr	2.00/.00 psi
33	Transfer Rate - Service 16.86 Clean 18.44 Fouling Resistance: Shell .0005 Tubes .0005	1,430,000 MTD (Corrected) 357.06
34	CONSTRUCTION	
35	Design Pressure	350 psig
36	Test Pressure	525 psig
37	Design Temp. (Max. Metal Temp.)	7.5 psig
38	Tubes 304 S.S. No. 42-U's O.D. 1 1/4" BWG 18 Length 96" ST Pitch 19/16" TR 1	1200 °F
39	Shell 34" I.D. Mat'l C.S.	Tube Fins —
40	Shell Cover C.S.	Floating Head Cover —
41	Channel 304 S.S.	Channel Cover 304 S.S.
42	Tube Sheets—Stationary 304 S.S.	Floating —
43	Baffles—Cross Type Spacing Thickness Hole Dia.	
44	Baffle—Long Type Thickness Impact Baffle	
45	Tube Supports C.S. (FULL CUT) No. 2	Thickness
46	Gaskets	Gland Packing
47	Connections—Shell - In 2" Out 4"	Series 3004 RF Dome
48	Channel - In 10" Out 8"	Series 1504 RF
49	Corrosion Allowance—Shell Side .125	Tube Side .000
50	Weight 3100E Code ACME	Customer's Specifications
51	Length	Term Class R
52	Ref. Print	Inspection by whom
53	Based upon operating conditions as given, maximum temperature of tubes will not exceed °F	
54	Note: Indicate after each part whether stress relieved (S.R.) and whether radiographed (X-R)	
55	Remarks: A. SPLIT CHANNEL DESIGN C - 3	
	B. DEFLECTOR SHEETES IN TUBES	

ISOBUTANE SEPARATOR, V-2-N

**Anderson LUS-8-300 Receiver Type Separator similar
to Form Sheet Type LRU. Built to ASME Code & Stamped.**

Design: 300 PSIG 300°F

Physical Size: 16" O.D. X 59" Overall Height

Nozzles: Two 8"-300# RF Side Inlet & Top Outlet

One 2"-3000# NPT Bottom Drain

One 1 1/2"-3000# NPT Side-Drain

Material: Carbon Steel Throughout Except Type 304L

Stainless Steel Element Blades

Eff. 99%, Pressure Drop 1.14 PSI

Manufacturer: Anderson Separator Company

UTILITY COOLER

**Baltimore Aircoil Closed Circuit Industrial Fluid Cooler Model
VX1 36-3. Capacity to cool 275 GPM.**

**Furnished with one 15 HP, 230/460 volt, 3 phase, 60 cycle fan
motor.**

**Also furnished with one 1 HP, 230/460 volt, 3 phase, 60 cycle
spray water pump.**

**Approximate shipping weight of the unit is 5140 lbs. The unit
ships in two pieces, with the heaviest section being 3720 lbs.**

GAS-FREEING COMPRESSOR

One Corken model D390-109A two stage, base mounted, non lubricated gas compressor. The compressor is mounted on a base with the following equipment:

- 7.5 HP, 460 VAC, TEFC electric motor.
- V-belt drive with enclosed belt guard.
- Air cooled interstage cooler.
- Liquid trap on suction with explosion-proof high liquid level switch.
- Pressure Gauges.

COOLING WATER CONTROLLER

APPLICATIONS

Custom prefabricated package including a centrifugal separator. The separator operates on a bypass to remove suspended particles from the sample flow and the cooling water - heat exchanger loop. A motorized ball valve blows down the separator with the normal cooling water blowdown. The effectiveness of the separator depends on the suspended particle size and other factors. One installation in a steel plant effectively removed heavy sludge from the cooling water.

Another custom system included two Model 6100 modular controllers on a single floor supported wall rack. This saved floor space and the requirement for two sets of chemical drums. Two separate recirculation water loops could not be combined and space was limited. The custom prefabricated system reduced installation and chemical handling costs.

GENERAL SPECIFICATIONS

MODEL 21-412

Dimensions
Material

Enclosure
Shipping weight
Plumbing
Acid fitting

30"H x 48"W x 12"D
Epoxy coated steel

Window door with key lock

¾" Schedule 80 PVC
½" FNPT injector. CPVC

MODEL 25-412

31"H x 38"W x 12"D
UV stabilized polyethylene
316 SS hardware
Sliding plexiglass safety panels

¾" Schedule 80 PVC
½" FNPT injector. CPVC

MODELS 9301 — 9305

Dimensions

9301 64"H x 84"W x 15"D
9302 and 9303 64"H x 112"W x 15"D
9304 64"H x 142"W x 15"D
9305 64"H x 170"W x 15"D

Material
Finish
Plumbing
Acid fitting

1 ½" square welded tube
Epoxy coated
¾" Schedule 80 PVC
½" FNPT injector. CPVC

MODELS 9310 — 9312

9310, 30"H x 68"W x 12"D
9311, 30"H x 68"W x 12"D
9312, 30"H x 68"W x 12"D

12 gauge steel
Epoxy coated
¾" Schedule 80 PVC
½" FNPT injector. CPVC

250 W. Walnut St., Compton, California 90220 (213) 638-8786

APPENDIX D

MAIN SINGLE LINE DIAGRAM

- NOTES**
- INSIDE THE POWER TRAILER SKID LINE INDICATES NEW WORK BY CONTRACTOR. DASHED LINES INDICATE EXISTING EQUIPMENT. OUTSIDE THE POWER TRAILER, DASHED LINES INDICATE ONLY EXISTING WORK. ALL NEW CONNECTIONS ARE NEW.
 - FOR ADDITIONAL DETAIL OF PARALLING CONTROL PANEL SEE ELECTRICAL POWER EQUIPMENT CO. DWGS. #75-661-1 & 75-661-2.
 - SEE BARBER-NICHOLS DRAWING #LEOD-10-185 FOR CONTROL WIRING DIAGRAM.
 - REMOVE EXIST. WIRES FROM EXIST. C.B. COIL UP & TAPE ENDS. THIS WAS DONE TO EXIST. 250kW XPMR.
 - ELECTRICAL CONTRACTOR TO REPLACE EXIST. 20A STAPLE C.B. WITH A NEW 40A, 3P C.B.
 - ELECTRICAL CONTRACTOR TO FURNISH & INSTALL H.O.A. SELECTOR SWITCH ON STARTER COVER.
 - CONTRACTOR SHALL FURNISH AND INSTALL NEW SHUNT TRIP DEVICE, GE CAT. NO. TST10S, RATED FOR 125V DC.
 - CONNECT GRD. WIRE TO SWBD. GRD. BUS.
 - PRIOR TO GEN. OPERATION IN PARALLEL WITH UTILITY, ALL GEN. NEUTRAL GROUNDING SHALL BE DISCONNECTED.

No.	DATE	ISSUE	BY	CHK.	APP.
3	11/1/79	ADDED GRD. WIRES TO SERVICE CHASSIS	RS	RL	RS
2	10/1/79	ADDED FIREWATER PUMP, CND. NOTE, DELETED MODA FUSES, DELETED NOTES	RS	RL	RS
1	10/1/79	ADDED WATER WELL STARTER; FEEDER	RS	RL	RS
0	11/1/78	ISSUED FOR CONSTRUCTION	RS	RL	RS
C	11/1/78	ISSUED FOR BIDS/APPROVAL	RS	RL	RS
B	11/1/78	ISSUED FOR DESIGN REVIEW	RS	RL	RS
A	11/1/78	ISSUED FOR EQUIP. PURCHASE	RS	RL	RS
No. DATE ISSUE BY CHK. APP.					
THE BEN HOLT CO.					
U.S. DEPARTMENT OF ENERGY					
IDAHO FALLS, IDAHO					
EATON OPERATING CO. HOUSTON, TX.					
TITLE: GEOPRESSURED PILOT PLANT					
MAIN SINGLE LINE DIAGRAM					
ORN. F. DAVIS					
DATE 9-12-80					
JOB NO. 30008					
30008-D-3601					
REV. 3					

APPENDIX E

SHUTDOWN AND START-UP PROCEDURES

PLEASANT BAYOU HPS

SHUTDOWN AND STARTUP CHECKLIST PROCEDURES

TABLE OF CONTENTS

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3.0 SHUTDOWN AFTER ELECTRICAL TRIP.....	6
4.0 STARTUP AFTER ELECTRICAL TRIP.....	8

1.0. SHUTDOWN AFTER TURBINE TRIP

1.1. Silence only, Annunciator No. 1, left side alarm panel.

Acknowledge only, Annunciator No. 2, right side alarm panel if it alarms.

1.2. Monitor vibration monitor as turbine rolls down.
Step 1.3. should be in progress while monitoring vibrations.

1.3. Reduce brine rate until Pl-116 is between 270-280 psig. This should be 85-90 M lbs/hr if both Gas Engines are on line to E-3-N. Monitor E-3-N level while reducing brine rate.

1.4. Switch Level 1 Shutdown to OFF.

1.5. Switch Vanes PY-105 (PlC-109 Turbine Inlet Governor) to Manual and close to 0%.

1.6. Switch Bypass CV-100 (PlC-103 Turbine Inlet Bypass) to Manual and open to 100%.

1.7. Shut off Lube Oil cooling water outlet block valve HV-661 (Lower valve).

1.8. Switch Voltage Regulator to Manual.

1.9. Investigate cause of trip, log results, and report to supervisor the following items:

1.9.1. Generator and Utility breaker positions.

1.9.2. Lube Oil temperatures and pressures.

1.9.3. Vane position at turbine.

1.9.4. Trip valve position at turbine.

1.9.5. Gas Engines conditions.

1.9.6. Electrical Building breaker positions.

1.9.7. Annunciator alarm conditions.

1.9.8. Vibration monitor alert and danger conditions, and vibration during roll down if detected.

1.10. Lube Oil circulation can be maintained if start-up is anticipated within 2 hours. If Lube Oil circulation is to be shut down, ensure turbine has come to a complete stop.

1.11. Condenser fans and Utility Cooling system can remain running if start-up is anticipated within a few hours.

If turbine is to remain down, shut off condenser fans to maintain PI-104 (V-I-E contents) between 60-70 psig. Shutoff utility cooler fan, circulating pumps (P-106 and P-107) and water conditioner pH and conductivity controllers.

1.12. If the isobutane flow (FI-102) does not stabilize causing CV-117 (FIC-102 isobutane flow from P-1-E) to open, then put on Manual and open to 100%.

2.0. START-UP AFTER TURBINE TRIP

- 2.1. Prior to start-up the cause of turbine trip should have been determined and remedial action taken.
- 2.2. Turn on Utility Cooler pumps (P-106 and P-107), fan, and put water conditioner on control.
- 2.3. Turn on all condenser fans.
- 2.4. Turn on one Lube Oil pump and put the other one on standby.
- 2.5. Ensure that Voltage Regulator is on Manual.
- 2.6. Ensure that turbine vanes are closed at the turbine and turbine case is warm. Drain liquid from turbine to warm if required.
- 2.7. Ensure nitrogen pressure to Emergency Lube Oil Accumulator bladder is properly set and Air to Gearbox at 2 psig.
- 2.8. Ensure that cooling water is circulating properly to load banks.
- 2.9. Reset annunciator alarm panels, shutdown alarm (yellow button) and vibration monitor.
- 2.10. Adjust brine rate to maintain PI-116 at 275 psig.
- 2.11. Switch bypass CV-100 (PIC-103 Turbine Inlet Bypass) to Automatic. Set point should be at or near actual pressure (about 70%) so that bypass controller just begins to indicate closing. Immediately proceed to next step so that controller does not go to (or near) 0% causing overpressuring of system when Level 1 shutdown is enabled. Remember that bypass control valve only moves to controller position after enabling Level 1 Shutdown.

Note:

If next step is delayed or another start-up attempt is required, switch CV-100 to manual and open to 100%, then repeat step 2.11.

- 2.12. Switch Level 1 Shutdown to Enable.
- 2.13. Push Level 1 Shutdown "push button". This will enable Bypass Control Valve and open trip valve.

Note:

Turbine Speed (RPM) should bounce to a few hundred and return to zero. If not switch Level 1 Shutdown to OFF.

- 2.14. Begin opening vanes manually after Turbine Speed has returned to zero. Increase speed to about 22,000 PRM within 45 seconds.

- 2.15. Continue opening vanes at a slightly slower rate until governor controls speed at around 25,000 RPM.
- 2.16. Continue opening vanes increasing load on Generator until vibrations stabilize at a point below 3.0 mils (normally around 300 KW on J1-100).
- NEVER RE-ROLL TURBINE UNTIL SPEED HAS RETURNED TO ZERO
- 2.17. Adjust vanes to maintain PI-116 around 275 psig, then switch vanes controller PY-105 to Automatic with a set point around 67%.
Ensure pressure and vibrations have stabilized.
- 2.18. Open manual block valve HV-661 for cooling water to Lube Oil Cooler.
- 2.19. Parallel Turbine-Generator to HL & P.
 - 2.19.1. Switch Synchronizing knob to pos. 1 (Gen. to Util.)
 - 2.19.2. Adjust voltage to match HL & P.
 - 2.19.3. Adjust frequency to slowly rotate sync scope.
 - 2.19.4. Close generator breaker when scope at 12:00.
 - 2.19.5. Record synchronizing time.
- 2.20. Switch Voltage Regulator to Automatic, and ensure controlling at around 1.0 power factor.
- 2.21. Monitor Lube Oil temperatures and adjust as required.
- 2.22. Check Gas Engines power factors and adjust as required.
- 2.23. Increase brine rate and load Generator per orders.
- 2.24. Monitor vane position while loading generator, keeping T-1-E inlet pressure (PI-107) between 260 and 275 psig.
- 2.25. When vanes are 100% open (or per orders) adjust brine rate to maintain PI-107 between 260 and 270 psig.
- 2.26. Monitor and record vibrations as you load generator.
- 2.27. Manually close CV-117 (FIC-102 Isobutane Flow from P-1-E) and switch to Automatic with a set point of 30%.
- 2.28. Check Turbine area for isobutane leaks.

3.0. SHUTDOWN AFTER ELECTRICAL TRIP

- 3.1. Silence Annunciator alarm panels.
- 3.2. Switch Level 1 Shutdown to OFF.
- 3.3. Manually close CV-632 (Exhaust Gas to E-3-N) to 0%.
- 3.4. Switch vanes PY-105 (PIC-109 Turbine Inlet Governor) to Manual and close to 0%.
- 3.5. Switch Bypass CV-100 (PIC-103 Turbine Inlet Bypass) to Manual and open to 100%.
- 3.6. Switch CV-104 (LIC-604 Isobutane Level E-3-N) to Manual and close to 0%.
- 3.7. Switch CV-116 (FIC-601 Brine Flow Out) to Manual and close to 0%. Needle Valve on half inch tubing bypass to be closed if extended shutdown anticipated.
- 3.8. Switch CV-117 (FIC-102 Isobutane Flow P-1-E) to Manual and open to 100%.
- 3.9. Shut off Lube Oil Cooling Water outlet block valve HV-661 (lower valve).
- 3.10. Switch Voltage Regulator to Manual.
- 3.11. Investigate cause of trip, log results and report to supervisor the following:
 - 3.11.1. Turbine Generator breaker position.
 - 3.11.2. Turbine Utility breaker position.
 - 3.11.3. Power Trailer outside breaker position.
 - 3.11.4. Gas Engine Generator breakers positions.
 - 3.11.5. Electrical Building breakers positions.
 - Main Breaker
 - Power Trailer Switchgear Breaker
 - MCC-A Breaker
 - Gas Engines Breaker
 - 3.11.6. Main Breaker Fault Trip Annunciator positions.
 - 3.11.7. 86 Lockout relay position.

3.11.8. Flags on any relays on Westinghouse Panel.

3.11.9. Line Voltage from HL & P.

3.12. If no line voltage from HL & P, call to have them reset their Reclosure Switch. Our Main Breaker must be open (the OFF position) prior to HL & P resetting their Reclosure Switch.

NEVER HAVE HL & P CLOSE THEIR RECLOSURE WHEN OUR MAIN BREAKER IS CLOSED (ON POSITION).

NEVER CLOSE OUR MAIN BREAKER WHEN ANY PART OF PLANT IS IN OPERATION.

4.0. START-UP AFTER ELECTRICAL TRIP

NEVER HAVE HL & P CLOSE THEIR RECLOSURE WHEN OUR MAIN BREAKER IS CLOSED (ON POSITION).

NEVER CLOSE OUR MAIN BREAKER WHEN ANY PART OF PLANT IS IN OPERATION.

- 4.1. Prior to start-up the cause of electrical trip should have been determined and remedial action taken.
- 4.2. Shut off all fans and pump motor switches in power trailer (including Lube Oil pumps) with the exception of Instrument Air. Switch Water Conditioners controllers to off and unplug chlorine pump.
- 4.3. HL & P should have reset their reclosure switch if necessary. Ensure our Main Breaker is open.
- 4.4. Ensure that Turbine Generator, Gas Engine No. 1 and No. 2 Generator breakers are open.
- 4.5. Reset relay flags.
- 4.6. Close any tripped breakers except Main Breaker, three Generator Breakers or Power Trailer Utility Breakers.
- 4.7. Reset Main Breaker fault buttons.
- 4.8. Close Main Breaker.
- 4.9. Close Power Trailer Utility Breaker,
- 4.10. Ensure Instrument Air Compressor operating properly.
- 4.11. When Instrument Air Pressure builds up enough pressure (about 40 psig) to open CV-612 (Gas Engine Gas Valve), start up and parallel Gas Engines.
- 4.12. When Instrument Air pressure builds up to normal (80-100 psig), check Isobutane Loop for normal line up.
- 4.13. Reset FV-636 and ensure CV-123 is open 100%.
- 4.14. Open CV-130 for isobutane heat up.
- 4.15. Start all condenser pumps and single fans, and put water conditioner on control. Plug in chlorine pump.

- 4.16. Start-up Isobutane pump until level re-established in E-2-N. E-3-N Level can also be re-established at this time.
- 4.17. Shut down Isobutane pump.
- 4.18. Re-open CV-116 (Brine Control Valve) bypass needle valve if closed. Continue this slow heat-up until E-2-N has warmed up. Re-establish E-2-N level with isobutane pump as required.
- 4.19. E-3-N can also be slowly heated up at this time. CV-104 (LIC-604 Isobutane Level E-3-N) should be on Automatic control.
- 4.20. When E-2-N heat-up is re-established, start up isobutane pump, slowly open CV-116 (Brine Control Valve) and slowly establish normal turbine bypass conditions. When brine flow rate is near normal rates, line up set point to process flow and switch to Automatic.
- 4.21. When isobutane is at normal temperatures, close CV-130.
- 4.22. Check isobutane system for isobutane leaks.
- 4.23. Check V-I-E, E-1-N and E-2-N for water. (Minimize Isobutane losses).

PROCEED TO 2.0 START-UP AFTER TURBINE TRIP.

APPENDIX F

DATA SHEETS FOR TESTS

GEOPRESSURED HYBRID POWER SYSTEM - MANAGEMENT REPORT DATA
TEST #1

November

	UNITS	INST.#	12-Nov	12-Nov	12-Nov	12-Nov						
			7:30	7:45	8:00	8:15						
AMBIENT TEMP	°F		68	68	69	71						
WET BULB TEMP	°F		66	66	66	68						
POWER												
T-1-N GROSS	KW	JI-100	464	463	467	459						
GE-1-N GROSS	KW		310	310	310	310						
GE-2-N GROSS	KW		310	310	310	310						
PARASITIC	KW	JI-101	234	234	235	223						
NET SALE TO HL&P	KW		780	780	780	780						
NET SALE TO HL&P	FDG		259	259	0259	0259						
	KW-HR											
BRINE												
TO E-2-N	PSIG	PI-606	510	510	510	510						
TO E-1-N	PSIG	PI-611	510	510	510	510						
FROM E-1-N	PSIG	PI-106	510	510	510	510						
ISOBUTANE												
IN V-1-E	PSIG	PG-130	52	54	54	55						
OUT OF P-1-E	PSIG	PI-105	314	316	313	315						
OUT OF E-1-N	PSIG	PI-602	290	290	290	290						
OUT OF E-2-N	PSIG	PG-114	285	285	285	285						
OUT OF E-3-N	PSIG	PI-615	295	295	295	295						
INTO T-1-E	PSIG	PI-107	265	265	265	265						
OUT OF T-1-E	PSIG	PI-108	59	59	59	59						
TO OR 102	PSIG	PG-104	310	310	310	310						
FROM OR 102	PSIG	PG-105	150	150	150	150						
GAS												
TO E-3-N	PSIG	PI-614	0.4	0.4	0.4	0.4						
BRINE												
TO E-2-N	°F	TI-101	297	297	297	297						
TO E-1-N	°F	TR-113	207	207	207	206						
FROM E-1-N	°F	TR-102	148	148	148	148						

**GEOPRESSURED HYBRID POWER SYSTEM - MANAGEMENT REPORT DATA
TEST #1**

November

	UNITS	INST.#	12-Nov	12-Nov	12-Nov	12-Nov						
			7:30	7:45	8:00	8:15						
ISOBUTANE												
IN V-1-E	°F	TI-104	94.6	94.6	94.6	95.0						
OUT OF P-1-E	°F	TI-105	96	96.1	95.8	96.5						
OUT OF E-1-N	°F	TR-112	208	208	208	208						
OUT OF E-2-N	°F	TI-111	214	214	214	214						
OUT OF E-3-N	°F	TI-603	210	210	210	210						
INTO T-1-E	°F	TI-107	215	215	215	216						
OUT OF T-1-E	°F	TI-108	130	130	130	131						
GAS												
TO E-3-N	°F	TI-601	977	977	977	977						
FROM E-3-N	°F	TI-602	302	302	303	302						
BRINE	M#/HR	FI-100	125.8	126.9	126.5	125.8						
IC4 FROM P-1-E	M#/HR	FI-102	131	130.3	130.5	129.3						
IC4 TO T-1-E	M#/HR	FI-101	106	105.0	105.6	104.9						
IC4 TO E-3-N	M#/HR	FR-627	8.5	8.3	8.4	008.6						
SEP FLOW	GALS	FQI-633	0	0								
GAS TO GE-1-N	#/HR	FR-607	475.9	468.7	468.7	465.6						
V-1-E	INCHES	LG-105										
REMARKS												

**GEOPRESSURED HYBRID POWER SYSTEM - MANAGEMENT REPORT DATA
TEST #3**

December 29, 1989

	UNITS	INST.#	29-Dec 1900	29-Dec 1915	29-Dec 1930	29-Dec 2000	29-Dec 2015	29-Dec 2030	29-Dec 2045	29-Dec 2100	29-Dec 2115
AMBIENT TEMP	°F		63	62	61	60	61	61	61	61	
WET BULB TEMP	°F		62	61	61	60	60	60	61	61	
POWER											
T-1-N GROSS	KW	J1-100	502	501	504	501	499	496	494	494	
GE-1-N GROSS	KW		5	5	5	5	5	5	15	15	
GE-2-N GROSS	KW		260	260	260				15	15	
PARASITIC	KW	J1-101	242	242	252	243	242	242	252	242	
NET SALE TO HL&P	KW		200	500	500	300	300	300	240	240	
NET SALE TO HL&P	FDG		813	0813	0813	0813	0813	0813	0813	0813	
	KW-HR										
BRINE											
TO E-2-N	PSIG	PI-606	500	500	500	500	500	500	500	500	
TO E-1-N	PSIG	PI-611	490	490	490	490	490	490	490	490	
FROM E-1-N	PSIG	PI-106	491	490	490	490	489	489	490	488	
ISOBUTANE											
IN V-1-E	PSIG	PG-130	56	56	55	54	54	54	54	53	
OUT OF P-1-E	PSIG	PI-105	357	362	362	363	361	364	365	364	
OUT OF E-1-N	PSIG	PI-602	290	290	290	290	290	290	290	290	
OUT OF E-2-N	PSIG	PG-114	275	275	275	270	275	272	275	278	
OUT OF E-3-N	PSIG	PI-615	290	290	290	290	290	290	292	290	
INTO T-1-E	PSIG	PI-107	261	262	261	262	262	261	261	262	
OUT OF T-1-E	PSIG	PI-108	58	57	57	56	56	56	55	55	
TO OR 102	PSIG	PG-104	62	61	61	60	60	60	60	61	
FROM OR 102	PSIG	PG-105	48	45	45	45	45	45	45	45	
GAS											
TO E-3-N	PSIG	PI-614	0.6	0.1	0.1	0.1	0.1	0.1	0	0	
BRINE											
TO E-2-N	°F	TI-101	297	297	297	297	297	297	297	297	
TO E-1-N	°F	TR-113	214	214	214	214	214	214	214	214	
FROM E-1-N	°F	TR-102	150	150	150	150	151	151	152	151	

GEOPRESSURED HYBRID POWER SYSTEM - MANAGEMENT REPORT DATA
TEST #3

December 29, 1989

	UNITS	INST.#	29-Dec 1900	29-Dec 1915	29-Dec 1930	29-Dec 2000	29-Dec 2015	29-Dec 2030	29-Dec 2045	29-Dec 2100	29-Dec 2115
ISOBUTANE											
IN V-1-E	°F	TI-104	91.8	91.5	91.2	90.6	90.4	90.4	90.2	90.1	
OUT OF P-1-E	°F	TI-105	93.3	92.9	92.8	91.9	92.1	92.2	91.7	91.8	
OUT OF E-1-N	°F	TR-112	211	209	209	210	211	210	210	210	
OUT OF E-2-N	°F	TI-111	216	216	216	217	216	216	216	216	
OUT OF E-3-N	°F	TI-603	210	210	210	210	210	210	210	210	
INTO T-1-E	°F	TI-107	217	211	211	212	212	212	211	212	
OUT OF T-1-E	°F	TI-108	116	102	119	115	128	127	127	115	
GAS							720				
TO E-3-N	°F	TI-601	910	892	886	780	207	701	621	567	
FROM E-3-N	°F	TI-602	239	238	238	217	320	206	120	90	
BRINE	M#/HR	FI-100	144.1	144.7	144.8	144.1	144.3	144.6	144.5	145	
IC4 FROM P-1-E	M#/HR	FI-102	109.7	109.3	109.9	107.2	107.4	106.6	105.7	106.5	
IC4 TO T-1-E	M#/HR	FI-101	114	114.2	113.7	112	110.8	110.2	108.8	109.1	
IC4 TO E-3-N	M#/HR	FR-627	0	0.1	0	0.1	0.1	0.1	0	0.1	
SEP FLOW	GALS	FQI-633	709	875	108.7	1414	1575.0	1714.0	1929	2050	
GAS TO GE-1-N	#/HR	FR-607	234	235.9	240	156.6	154.5	161.7	127.7	0	
V-1-E	INCHES	LG-105	37	37	38.5	38	38.5	38.5	38	38	

REMARKS

GEOPRESSURED HYBRID POWER SYSTEM - MANAGEMENT REPORT DATA
TEST #3

January 3, 1990

	UNITS	INST.#	3-Jan 10:30	3-Jan 11:00	3-Jan 11:30	3-Jan 12:00						
AMBIENT TEMP	°F		64	64	64	64						
WET BULB TEMP	°F		64	64	64	64						
POWER												
T-1-N GROSS	KW	JI-100	513	513	509	508						
GE-1-N GROSS	KW		340	340	340	340						
GE-2-N GROSS	KW		340	340	340	340						
PARASITIC	KW	JI-101	241	252	253	253						
NET SALE TO HL&P	KW		910	920	920	920						
NET SALE TO HL&P	PDG		0919	0920	0920	0921						
	KW-HR											
BRINE												
TO E-2-N	PSIG	PI-606	500	500	505	500						
TO E-1-N	PSIG	PI-611	490	495	495	495						
FROM E-1-N	PSIG	PI-106	490	495	489	495						
ISOBUTANE												
IN V-1-E	PSIG	PG-130	56	56	56	56						
OUT OF P-1-E	PSIG	PI-105	365	361	354	358						
OUT OF E-1-N	PSIG	PI-602	295	295	295	295						
OUT OF E-2-N	PSIG	PG-114	280	280	280	280						
OUT OF E-3-N	PSIG	PI-615	295	295	295	295						
INTO T-1-E	PSIG	PI-107	265	264	265	265						
OUT OF T-1-E	PSIG	PI-108	59	59	59	59						
TO OR 102	PSIG	PG-104	65	65	65	65						
FROM OR 102	PSIG	PG-105	45	45	45	45						
GAS												
TO E-3-N	PSIG	PI-614	0.7	0.7	0.7	0.7						
BRINE												
TO E-2-N	°F	TI-101	296	296	296	296						
TO E-1-N	°F	TR-113	216	217	215	215						
FROM E-1-N	°F	TR-102	151	151	151	152						

GEOPRESSURED HYBRID POWER SYSTEM - MANAGEMENT REPORT DATA
TEST #3

January 3, 1990

	UNITS	INST.#	3-Jan 10:30	3-Jan 11:00	3-Jan 11:30	3-Jan 12:00						
ISOBUTANE												
IN V-1-E	°F	TI-104	93.2	93.9	93.8	93.9						
OUT OF P-1-E	°F	TI-105	95.1	95.6	95.4	95.7						
OUT OF E-1-N	°F	TR-112	210	211	210	210						
OUT OF E-2-N	°F	TI-111	221	221	222	222						
OUT OF E-3-N	°F	TI-603	211	212	211	211						
INTO T-1-E	°F	TI-107	215	215	214	215						
OUT OF T-1-E	°F	TI-108	122	117	119	118						
GAS												
TO E-3-N	°F	TI-601	977	997	992	992						
FROM E-3-N	°F	TI-602	322	322	320	321						
BRINE	M#/HR	FI-100	144.9	145	144.5	144						
IC4 FROM P-1-E	M#/HR	FI-102	110.3	110.8	110.9	110.4						
IC4 TO T-1-E	M#/HR	FI-101	116	116.0	116.0	115.9						
IC4 TO E-3-N	M#/HR	FR-627	9.7	9.5	10.1	009.6						
SEP FLOW	GALS	FQI-633	69826.0	70110	70433	70772						
GAS TO GE-1-N	#/HR	FR-607	488.2	488.3	488.3	448.3						
V-1-E	INCHES	LG-105	18.5	18.5	18.5	18.5						
REMARKS												

**LOW EXHAUST GAS TEST
GEOPRESSURED HYBRID POWER SYSTEM - MANAGEMENT REPORT DATA
TEST 4**

May 9, 1990

	UNITS	INST.#		05:00	07:00	08:00		09:00	09:30	10:00			
				100%	100%	100%		75%	75%	75%			
AMBIENT TEMP	°F			64	65	72		78	82	80			
WET BULB TEMP	°F			63	63	68		73	72	73			
POWER													
T-1-N GROSS	KW	J1-100		529	528	500		500	495	500			
GE-1-N GROSS	KW			310	310	300		100	100	100			
GE-2-N GROSS	KW			340	340	340		340	340	340			
PARASITIC	KW	J1-101		242	252	238		250	248	249			
NET SALE TO HL&P	KW			900	900	870		650	650	645			
NET SALE TO HL&P	FDG			3169	3171	3172		3172	3173	3163			
	KW-HR												
BRINE													
TO E-2-N	PSIG	PI-606		505	505	505		505	505	509			
TO E-1-N	PSIG	PI-611		495	495	500		495	495	492			
FROM E-1-N	PSIG	PI-106		482	479	480		490	490	475			
ISOBUTANE													
IN V-1-E	PSIG	PG-130		60	60	62		62	62	63			
OUT OF P-1-E	PSIG	PI-105		340	340	347		356	358	355			
OUT OF E-1-N	PSIG	PI-602		310	310	310		309	310	309			
OUT OF E-2-N	PSIG	PG-114		280	280	280		280	280	280			
OUT OF E-3-N	PSIG	PI-615		290	290	290		285	285	288			
INTO T-1-E	PSIG	PI-107		268	267	266		261	262	262			
OUT OF T-1-E	PSIG	PI-108		54	54	57		55	57	57			
TO OR 102	PSIG	PG-104		60	60	60		60	60	61			
FROM OR 102	PSIG	PG-105		60	60	60		60	60	61			
GAS													
TO E-3-N	PSIG	PI-614		.2	.2	.2		.2	.2	.2			
BRINE													
TO E-2-N	°F	TI-101		298	298	298		297	297	297			
TO E-1-N	°F	TR-113		218	218	218		216	216	217			
FROM E-1-N	°F	TR-102		150	149	151		151	152	152			

May 9, 1990

REMARKS

**LOW EXHAUST GAS TEST
GEOPRESSURED HYBRID POWER SYSTEM - MANAGEMENT REPORT DATA
TEST 4**

May 9, 1990

	INST.#	11:00	11:30	12:00	01:00	01:30	02:00	15:00	15:30	16:00
		50%	50%	50%	25%	25%	25%	0%	0%	0%
AMBIENT TEMP		82	82	85	86	85	86	86	88	89
WET BULB TEMP		73	74	76	76	76	76	76	78	77
POWER										
T-1-N GROSS	J1-100	490	489	482	472	465	471	462	462	462
GE-1-N GROSS		0	0	0	0	0	0	0	0	0
GE-2-N GROSS		340	340	340	95	90	90	0	0	0
PARASITIC	J1-101	248	238	247	246	246	247	245	236	247
NET SALE TO HL&P		560	560	570	320	310	320	220	220	220
NET SALE TO HL&P		3174	3174	3174	3175	3175	3175	3175	3176	3176
BRINE										
TO E-2-N	PI-606	505	505	505	505	502	505	510	510	510
TO E-1-N	PI-611	495	492	492	495	490	495	495	492	492
FROM E-1-N	PI-106	490	490	476	490	485	490	490	490	490
ISOBUTANE										
IN V-1-E	PG-130	62	63	63	64	64	64	64	64	65
OUT OF P-1-E	PI-105	366	361	361	370	362	372	367	373	375
OUT OF E-1-N	PI-602	310	309	310	305	310	310	310	310	310
OUT OF E-2-N	PG-114	282	280	280	280	280	280	280	280	280
OUT OF E-3-N	PI-615	290	285	285	283	285	265	260	240	225
INTO T-1-E	PI-107	265	266	264	264	264	265	266	267	267
OUT OF T-1-E	PI-108	58	59	59	60	62	62	62	59	59
TO OR 102	PG-104	61	61	61	61	61	65	65	65	65
FROM OR 102	PG-105	61	61	61	16	61	65	65	65	65
GAS										
TO E-3-N	PI-614	.0	.0	.0	.0	.0	.0	.0	.0	.0
BRINE										
TO E-2-N	TI-101	297	297	297	297	297	297	297	297	297
TO E-1-N	TR-113	217	216	217	216	216	216	216	216	216
FROM E-1-N	TR-102	153	154	153	154	154	156	156	156	155

**LOW EXHAUST GAS TEST
GEOPRESSURED HYBRID POWER SYSTEM - MANAGEMENT REPORT DATA
TEST 4**

May 9, 1990

	UNITS	11:00	11:30	12:00	01:00	01:30	02:00	15:00	15:30	16:00
		50%	50%	50%	25%	25%	25%	0%	0%	0%
ISOBUTANE										
IN V-1-E	°F	97.1	97.5	97.8	98.3	98.7	98.7	99.1	99.2	99.2
OUT OF P-1-E	°F	100.2	100.9	101	101.3	101.6	101.5	102.0	102.0	102.0
OUT OF E-1-N	°F	213	213	212	212	212	213	213	213	212
OUT OF E-2-N	°F	220	221	220	220	220	220	220	221	221
OUT OF E-3-N	°F	211	211	211	211	211	211	212	194	190
INTO T-1-E	°F	215	215	215	215	215	215	216	215	216
OUT OF T-1-E	°F	138	139	139	140	139	139	140	139	141
GAS					769					
TO E-3-N	°F	937	936	936	235	729	717	518	414	365
FROM E-3-N	°F	288	287	287	282	233	231	104	95	94
BRINE	M#/HR	149.9	148	148.2	149.4	148.3	150	149.8	149.1	150.2
IC4 FROM P-1-E	M#/HR	114.6	113	116.3	113.8	108.0	108.3	112	106.8	111
IC4 TO T-1-E	M#/HR	117.5	117.2	117.5	115.0	114.2	114.0	112	111.4	112
IC4 TO E-3-N	M#/HR	1.3	0.4	0.3	0.1	0.1	0.0	0.0	0.0	0.0
SEP FLOW	GALS	8031880	8046268	8064592	8091587	8107310	8121748	81473371	8165492	8175894
GAS TO GE-1-N	#/HR	270.9	268.8	270.9	134.9	134.9	133.9	5.2	2.1	77.3
V-1-E	INCHES	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5

REMARKS

GEOPRESSURED HYBRID POWER SYSTEM - MANAGEMENT REPORT DATA TEST 5

DATE BEGINNING

NOVEMBER

5A

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TEST 5C

	UNITS	INST.#	4-Nov	4-Nov	4-Nov	4-Nov	4-Nov	4-Nov	4-Nov	4-Nov	4-Nov	4-Nov	6-Nov	6-Nov	6-Nov	6-Nov
			14:00	14:30	15:00	15:30	16:00	18:30	19:00	19:30	20:00	20:30	13:30	14:00	14:30	15:00
AMBIENT TEMP	°F		77	78	77	76	75	70	72	70	69	69	85	86	85	85
WET BULB TEMP	°F		69	70	69	69	69	68	67	67	67	66	78	78	77	77
POWER																
T-1-N GROSS	KW	J1-100	430	423	411	418	418	239	239	239	239	239	118	118	118	78
GE-1-N GROSS	KW		200	200	200	200	205	140	140	150	150	150	O.S.	O.S.	O.S.	O.S.
GE-2-N GROSS	KW		200	205	205	200	205	140	140	150	140	140	220	220	220	150
PARASITIC	KW	J1-101	233	234	234	233	233	190	189	197	186	196	177	177	179	177
NET SALE TO HL&P	KW		525	530	540	525	525	300	300	300	300	300	100	100	100	40
NET SALE TO HL&P	FDG		0139	0139	0140	0141	0141	0142	0142	0142	0142	0143	0171	0171	0171	0171
	KW-HR															
PRESSURES																
BRINE																
TO E-2-N	PSIG	PI-606	478	478	475	478	480	475	475	0475	475	475	510	509	508	508
TO E-1-N	PSIG	PI-611	475	472	471	472	474	480	480	475	475	480	510	510	511	510
FROM E-1-N	PSIG	PI-106	465	470	470	470	470	470	470	472	472	470	500	501	499	500
ISOBUTANE																
IN V-1-E	PSIG	PG-130	52	51	52	52	53	50	52	50	50	50	51	51	52	52
OUT OF P-1-E	PSIG	PI-105	348	335	337	333	330	434	428	422	424	424	424	420	420	424
OUT OF E-1-N	PSIG	PI-602	282	282	281	281	281	270	275	275	275	275	280	275	280	276
OUT OF E-2-N	PSIG	PG-114	286	286	286	286	286	275	280	280	280	280	285	282	282	280
OUT OF E-3-N	PSIG	PI-615	291	292	291	291	292	290	290	290	290	290	298	297	297	295
INTO T-1-E	PSIG	PI-107	266	267	268	267	267	261	264	262	263	264	266	270	267	271
OUT OF T-1-E	PSIG	PI-108	57	57	57	57	57	57	57	56	54	54	54	54	55	55
TO OR 102	PSIG	PG-104	330	328	329	329	326	70	70	70	70	70	410	410	408	408
FROM OR 102	PSIG	PG-105	155	152	152	152	152	60	60	60	60	60	180	182	185	185
GAS																
TO E-3-N	PSIG	PI-614	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0	0	1002	1002
TEMPERATURES																
BRINE																
TO E-2-N	°F	TI-101	296	296	296	296	296	132	297	297	297	297	296	296	295	295
TO E-1-N	°F	TR-113	207	207	207	207	207	203	203	202	203	203	204	202	201	202
FROM E-1-N	°F	TR-102	150	149	151	150	149	149	150	149	149	149	155	155	151	151
										</						

TEST 5

NOVEMBER

REMARKS

**GEOPRESSURED HYBRID POWER SYSTEM - MANAGEMENT REPORT DATA
TEST 6**

January 4, 1990

	UNITS	INST.#	4-Jan 8:30	4-Jan 9:00	4-Jan 9:30	4-Jan 10:30	4-Jan 11:00	4-Jan 12:00	4-Jan 1:00	4-Jan 2:15
AMBIENT TEMP	°F		62	62	63	64	64	66	66	67
WET BULB TEMP	°F		56	56	55	54	53	54	54	55
POWER										
T-1-N GROSS	KW	JI-100	508	520	532	539	541	531	527	542
GE-1-N GROSS	KW		340	340	340	340	340	340	340	340
GE-2-N GROSS	KW		340	340	340	340	340	340	340	340
PARASITIC	KW	JI-101	244	242	243	242	242	253	241	253
NET SALE TO HL&P	KW		939	939	940	941	941	942	943	944
NET SALE TO HL&P	PDG		1150	1150	1200	1200	1175	1200	1200	1200
	KW-HR									
BRINE										
TO E-2-N	PSIG	PI-606	500	500	502	500	500	500	500	500
TO E-1-N	PSIG	PI-611	498	498	495	495	495	495	495	495
FROM E-1-N	PSIG	PI-106	492	493	495	492	491	495	493	492
ISOBUTANE										
IN V-1-E	PSIG	PG-130	51	51	51	52	52	52	52	52
OUT OF P-1-E	PSIG	PI-105	360	354	348	346	347	349	353	340
OUT OF E-1-N	PSIG	PI-602	293	295	298	298	300	295	295	300
OUT OF E-2-N	PSIG	PG-114	278	275	280	280	280	278	278	282
OUT OF E-3-N	PSIG	PI-615	292	292	292	296	296	300	2905	295
INTO T-1-E	PSIG	PI-107	265	263	265	266	265	263	264	267
OUT OF T-1-E	PSIG	PI-108	54	54	55	54	54	54	53	54
TO OR 102	PSIG	PG-104	58	58	58	58	58	58	550	58
FROM OR 102	PSIG	PG-105	40	45	45	43	42	42	40	42
GAS										
TO E-3-N	PSIG	PI-614	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
BRINE										
TO E-2-N	°F	TI-101	297	297	297	297	296	297	297	297
TO E-1-N	°F	TR-113	214	215	216	215	216	215	215	216
FROM E-1-N	°F	TR-102	147	148	148	148	148	147	147	148

**GEOPRESSURED HYBRID POWER SYSTEM - MANAGEMENT REPORT DATA
TEST 6**

January 4, 1990

	UNITS	INST.#	4-Jan	4-Jan	4-Jan	4-Jan	4-Jan	4-Jan	4-Jan	4-Jan	
			8:30	9:00	9:30	10:30	11:00	12:00	1:00	2:15	
ISOBUTANE											
IN V-1-E	°F	TI-104	89.9	88.7	89	88.7	88.5	88	88	88.4	
OUT OF P-1-E	°F	TI-105	91.0	90.5	90.8	90.3	90	89.7	89.6	90.1	
OUT OF E-1-N	°F	TR-112	209	209	210	210	211	209	209	211	
OUT OF E-2-N	°F	TI-111	218	220	220	220	221	219	220	221	
OUT OF E-3-N	°F	TI-603	210	210	211	212	212	211	211	212	
INTO T-1-E	°F	TI-107	214	215	214	214	215	213	214	215	
OUT OF T-1-E	°F	TI-108	122	123	123	125	129	126	126	128	
GAS											
TO E-3-N	°F	TI-601	1005	998	1001	1001	999	999	1000	999	
FROM E-3-N	°F	TI-602	330	326	328	327	326	326	326	328	
BRINE											
IC4 FROM P-1-E	M#/HR	FI-100	134.7	138.9	142.7	144.6	145.2	142.1	139.9	145.3	
IC4 FROM P-1-E	M#/HR	FI-102	104.7	108.2	110.9	111.4	111.1	110	108.2	112	
IC4 TO T-1-E	M#/HR	FI-101	109.6	113.0	115.7	116.2	116.2	115.6	113.5	116.2	
IC4 TO E-3-N	M#/HR	FR-627	9.4	9.3	9.6	009.7	9.7	9.3	009.7	009.4	
SEP FLOW	GALS	FQI-633	83854.0	84199	84523	85157	85525	86191	86827	87631	
GAS TO GE-1-N	#/HR	FR-607	501.6	514	509.9	514.0	513	505.8	507.8	504.7	
V-1-E											
	INCHES	LG-105	16.5	21	26	27.5	2750%	27.5	27	27	
REMARKS											

GAS ENGINE TEST DATA

TEST #8

GEOPRESSURED HYBRID POWER SYSTEM - MANAGEMENT REPORT DATA

DATE BEGINNING

0700

October 25, 1989

OPERATORS

	UNITS	INST.#	1000	1030	1100	1130	1200	1700	1900	2100	2300	0100	0300	0500
AMBIENT TEMP	°F		72	75	75	76	77							
WET BULB TEMP	°F		69	70	70	70	70							
POWER														
T-1-N GROSS	KW	JI-100	0	0	0	0	0							
GE-1-N GROSS	KW		320	325	325	325	325							
GE-2-N GROSS	KW		325	325	320	320	315							
PARASITIC	KW	JI-101	179	180	182	182	172							
NET SALE TO HL&P	KW		390	395	390	395	390							
NET SALE TO HL&P	KW-HR		8	9	9	9	9							
PRESSURES														
BRINE														
TO E-2-N	PSIG	PI-606	522	523	523	522	520							
TO E-1-N	PSIG	PI-611	524	525	525	523	523							
FROM E-1-N	PSIG	PI-106	519	520	519	519	518							
ISOBUTANE														
IN V-1-E	PSIG	PG-130	62	64	62	63	63							
OUT OF P-1-E	PSIG	PI-105	357	357	377	360	358							
OUT OF E-1-N	PSIG	PI-602	300	295	300	298	300							
OUT OF E-2-N	PSIG	PG-114	280	280	277	281	280							
OUT OF E-3-N	PSIG	PI-615	290	287	284	286	285							
INTO T-1-E	PSIG	PI-107	29	29	33	35	36							
OUT OF T-1-E	PSIG	PI-108	30	30	34	36	37							
TO OR 102	PSIG	PG-104	345	345	358	348	349							
FROM OR 102	PSIG	PG-105	160	160	165	163	162							
GAS														
TO E-3-N	PSIG	PI-614	0	0	0	0	0							
TEMPERATURES														
BRINE														
TO E-2-N	°F	TI-101	295	295	295	295	295							
TO E-1-N	°F	TR-113	206	206	205	204	204							
FROM E-1-N	°F	TR-102	145	147	149	148	149							

GAS ENGINE TEST DATA

TEST #8

GEOPRESSURED HYBRID POWER SYSTEM - MANAGEMENT REPORT DATA

DATE BEGINNING 0700 October 25, 1989

OPERATORS _____

	UNITS	INST.#	1000	1030	1100	1130	1200	1700	1900	2100	2300	0100	0300	0500
ISOBUTANE														
IN V-1-E	°F	TI-104	101.4	101.3	101.5	101.4	101.6							
OUT OF P-1-E	°F	TI-105	103.5	103.6	103.6	103.7	104.1							
OUT OF E-1-N	°F	TR-112	203	204	203	203	203							
OUT OF E-2-N	°F	TI-111	216	216	214	215	215							
OUT OF E-3-N	°F	TI-603	149	148	147	147	146							
INTO T-1-E	°F	TI-107	74	75	77	78	79							
OUT OF T-1-E	°F	TI-108	86	85	86	87	87							
GAS														
TO E-3-N	°F	TI-601	665	665	663	659	655							
FROM E-3-N	°F	TI-602	162	160	159	159	157							
FLOWRATES														
BRINE	M#/HR	FI-100	87.7	95.4	93.9	91.7	91.6							
IC4 FROM P-1-E	M#/HR	FI-102	117.2	117.1	113.1	115.2	113.6							
IC4 TO T-1-E	M#/HR	FI-101	0	0	0	0	0							
SEP FLOW	GALS	FQI-633	779.8	779.8	779.8	779.8	779.8							
GAS TO GE-1-N	#/HR	FR-607	496	520	513	501	511							
LEVEL														
V-1-E	INCHES	LG-105	32	31	32.5	31.5	31.5							

REMARKS

APPENDIX G

PLANT OUTAGES

PLANT OUTAGES

<u>Date</u>	<u>Turbine</u>		<u>Gas Engines</u>		<u>Problem</u>
	<u>Off</u>	<u>On</u>	<u>Off</u>	<u>On</u>	
10-19-89	Rolled turbine for 1st time		8:00	14:00	Not logged.
10-20					Grid power outage 11:25-13:00.
10-21			14:45	17:00	Not logged.
10-24					Grid power trip 09:30. Back on 13:00. Not logged.
			13:30	15:30	
10-25	17:37	13:00 18:30		15:30	Cold lube oil.
10-26	09:30	10:30			Removal of generator neutral ground
10-27	13:00		13:00		Turbine generator paralleled with grid. Turbine trip. Governor power supply burnt. DC power supply failure.
				13:10	
10-28			09:00	11:35	Power shut down to work on turbine. Turbine seal & assembly sent to B.N. for mod.
10-31			09:55	10:10	Work on reverse power relay.
			12:19	12:25	Power blip.
11-02		08:45	19:25		Gas engine down. reverse power.
11-03				17:15	
11-08	10:45	15:45	10:45	11:20	HL&P-Mustang switch station.
11-09			12:15 15:19 17:46	15:00 16:00	Turbine test. Turbine test. GE-1 Shut off, wouldn't stay running.

PLANT OUTAGES

<u>Date</u>	<u>Turbine</u>		<u>Gas Engines</u>		<u>Problem</u>
	<u>Off</u>	<u>On</u>	<u>Off</u>	<u>On</u>	
11-10	11:50 16:10	14:17 19:00	16:10	17:00	Work on vibration probes. Grid trip.
11-12-89			09:00		Shut both engines off for Test 4B.
				11:00	GE-1 started 50% gas flow. GE-2 still down.
				17:50	GE-2 started.
11-15	08:35 14:10 16:00	12:45 14:30	08:35	09:55	Grid trip. Operator closed wrong valve. Level 1 shutdown. Turbine apart.
11-16			14:00		Replace orifice plate. Plant down until 11-24-89. IGT-working on well.
11-24				11:53	GE-2 on. Paralled at 01:00.
11-25				08:52	Plant Mgr. decision.
11-28				09:10	Both gas engines started.
			10:10 11:30	10:25 16:00	Grid shut down. Mustang working on both engines.
11-29			14:00	16:30	Mustang working on both engines.
11-30			06:07	08:30	Grid trip. Shut off "toner" switch.
12-01			13:40	14:00	Mustang working on GE-1
12-03			19:30	21:00	Grid trip.
12-07			15:25	15:40	While starting turbine, tripped utility breaker.
		17:00			Turbine back together & running.

PLANT OUTAGES

<u>Date</u>	<u>Turbine</u>		<u>Gas Engines</u>		<u>Problem</u>
	<u>Off</u>	<u>On</u>	<u>Off</u>	<u>On</u>	
12-09	09:57	16:30	09:57 14:50	10:25 15:40	Grid Liverpool trip. Grid trip.
12-11-89	12:00	12:08			Low instrument air; running on load banks.
12-12	10:20	14:40	10:20	11:40	HL&P checking re- closure.
12-13	05:00		05:00		Scheduled shutdown repair 86 Lockout relay.
12-14		15:45		15:40	
12-15	08:12	08:45			Check vanes.
	09:45	10:00			Vibration check.
	12:00	12:25			Check vibration probes.
	18:48	19:05			Low instrument air; relight flare pilot (windy).
	20:36	20:50			Liquid entrainment separator.
12-16	22:04	23:20			Liquid entrainment cold wind.
	00:41	01:00			Liquid entrainment, cold wind.
	10:00	11:00			Lost level in E-2 & E-3-N. Level controller.
	14:30	14:45			Instrument air pressure low.
12-17	16:33	17:22	16:33	16:45	86 Lockout relay.
	17:25	17:50	17:25	17:30	86 Lockout relay.
	17:57		17:50	18:00	86 Lockout relay.
12-18		09:50			
	13:25	13:50			Low instrument air.
12-19	10:20	12:15	10:20	11:15	Grid shut down.
12-21	14:20	14:30			Freezing weather conditions causing some operational failures.
	14:30				Wind chill 9°F.
	14:35	14:39			

PLANT OUTAGES

<u>Date</u>	<u>Turbine</u>		<u>Gas Engines</u>		<u>Problem</u>
	<u>Off</u>	<u>On</u>	<u>Off</u>	<u>On</u>	
12-22		16:45			Not recorded. Gas engines OK.
	17:30	18:30			Lost cooling water.
	22:10	22:30			Low instrument air.
12-23	03:10	03:30			Low instrument air; freezing.
12-23	03:35				Instrument air closed down due to freezing conditions. Gas engines continued to run.
12-26			09:25	10:45	Grid.
			11:30	11:45	Mustang repair.
			17:45	22:10	Mustang repair.
12-29	09:45	07:40			Bentley Nevada probe test.
	X				Tripped turbine twice for Bentley Nevada test.
	X				Time not logged.
			18:00		GE-1 down from 19:00 until 12-30 @ 13:00.
					GE-2 down 21:00 Test.
1-03			13:08	16:10	GE-1E Re-running Test 4A.
			15:00	16:15	GE-2.
1-05			19:00		GE-1E not running right.
1-06			12:35	12:00	Replaced magneto.
			12:55	12:55	
				13:30	
1-08			11:45	15:40	GE-1 Mustang repair; oil change.
			15:40	17:10	GE-2.
1-09			10:35	13:50	GE-1 Mustang repair value adjustment.
			13:55	17:10	GE-2 " " "
1-10			13:40	23:07	Not running right.

PLANT OUTAGES

<u>Date</u>	<u>Turbine</u>		<u>Gas Engines</u>		<u>Problem</u>
	<u>Off</u>	<u>On</u>	<u>Off</u>	<u>On</u>	
1-11			04:20	14:40	GE-1 suspect magneto problem.
			16:05	16:10	GE-1 Mustang repair.
1-12			17:45	18:20	GE-1 Magneto problems.
			20:20	21:05	GE-1 Magneto problems.
			21:30	22:00	GE-1.
1-17	03:47	10:15	03:47	07:30	Turbine shaft speed high-high.
1-22	09:25				Seal repair.
1-28			23:00	23:15	Electrical storm.
2-03			12:30		Ground fault trip.
2-06				15:15	Both gas engines running again.
2-19	19:25				Turbine repaired & running.
2-21	05:30	02:20			Instrument air to trip valve.
2-22		05:35	05:35	07:15	GE-1 & GE-2 plant trip
				15:15	GE-1 won't run. Mustang called. Turbine seal sent to B.N.
2-28	07:55				Turbine up and running.
3-03		10:05			Lost water well pump.
3-04		10:08			Well pump repaired.
3-05			06:00	15:30	Both gas engines down for oil change. Hydro cleaning of E-3-N.
3-06	10:46	08:10	11:30	12:42	High vibration "A" only. Valve adjustment by Mustang.

PLANT OUTAGES

<u>Date</u>	<u>Turbine</u>		<u>Gas Engines</u>		<u>Problem</u>
	<u>Off</u>	<u>On</u>	<u>Off</u>	<u>On</u>	
3-07		10:25	17:19	17:39	GE-2 Mustang checking engine.
3-12	20:50	18:40	18:40		GE-2 engine voltage bouncing; also shut down turbine.
3-13	09:30	09:00 09:50			High vibrations again. Found front bearing bad.
3-14					Mustang repair power factor meter.
3-19			14:00	14:10	GE-2 throttle stuck- Restarted ok.
3-21	18:10		15:30		Electrical problem. Both gas engines turbine bearings were replaced.
3-22			13:45		Negative wire burned.
3-23		20:05			High vibrations.
		22:10			Shut down. High vibrations; sent seal assembly to B.N.
3-29	13:50 16:22	15:50			Turbine repaired.
3-30	10:24	23:30	10:24	11:35	Lightning strike; Grid shut down. Liquid entrainment separator shut down. Cleaned out sand.
4-02			17:30 20:30	21:40 21:40	GE-1 Test 4 repeated. GE-2 " " "
4-03	02:59	09:45	02:59 10:30	04:15 16:32	Power trailer circuit breaker tripped. GE-2 down for oil leak repair.

PLANT OUTAGES

<u>Date</u>	<u>Turbine</u>		<u>Gas Engines</u>		<u>Problem</u>
	<u>Off</u>	<u>On</u>	<u>Off</u>	<u>On</u>	
4-05			06:30		GE-1 electrical problem.
4-06	16:30	12:05 17:45	12:05 16:30	13:35 16:45	Grid outage. Electrical trip grid.
4-08	10:10	13:40	10:10	11:30	Grid Shutdown.
4-09	05:00 16:25	07:30 21:10			Water in oil. " " "
4-10	13:50	18:15	13:50	14:30	Lightning.
4-12	19:20	20:05			Suspect instrument air supply.
4-17	11:50				Leak in B condenser.
4-19		08:10			
4-22	11:30	13:30			Generator speed low.
4-24			09:30 13:00	12:00 15:15	Mustang oil change. " " "
4-27			11:30 16:00 23:15	13:45 19:05	GE-2 Mustang working. " " " GE-1 generator ground; Mustang working on it.
4-28			12:30	13:00	Under voltage trip; reset.
5-04				18:50	GE-1 generator repaired.
5-06	10:35 12:45	12:35 13:15			Generator speed low. " " "
5-09			10:15 14:00	16:20 16:20	Both gas engines shut down for low exhaust gas test.
5-22	13:01 13:24	15:29	13:01 13:24	13:50	Lightning strike. " "

PLANT OUTAGES

<u>Date</u>	<u>Turbine</u>		<u>Gas Engines</u>		<u>Problem</u>
	<u>Off</u>	<u>On</u>	<u>Off</u>	<u>On</u>	
5-23			05:30		GE-1 generator problem power factor.
5-24			12:15	13:00	Repair regulators by Mustang.
5-26	20:00				Suspect brine leak in E-2-N.
5-31	07:00		07:00		Plant shut down. No brine or natural gas.

END OF PROJECT

APPENDIX H

PRINCIPAL EQUATIONS FOR PROCESS CALCULATIONS

Appendix H

PRINCIPAL EQUATIONS FOR PROCESS CALCULATIONS

Heat Exchanger Duty:

$$Q = M \Delta h$$

(can be approximated as $Q = MC_p \Delta T$ for single-phase fluids)

Isobutane enthalpy is calculated from measured pressure and temperature using the Starling¹ equation of state. Brine enthalpy is calculated from the measured pressure and temperature for a 13% salinity solution using equations from Dittman, "Calculation of Brine Properties".²

Measured Overall Heat Transfer Coefficient:

$$U_{o,meas} = Q / A(\Delta T_{LM})$$

$$\Delta T_{LM} = \frac{(T_h - t_N) - (T_c - t_d)}{\ln \frac{(T_h - t_N)}{(T_c - t_d)}}$$

(Note that the LMTD correction factor is unity for all three heat exchangers in this plant: E-1-N is a counter-current exchanger, and E-2-N and E-3-N have an isothermal fluid on the shellside.)

Calculated Overall Heat Transfer Coefficient:

$$U_o = \left[\frac{1}{h_i} \times \frac{d_o}{d_i} + \frac{d_o}{2k} \ln \frac{d_o}{d_i} + \frac{1}{h_o} + ff_i \times \frac{d_o}{d_i} + ff_o \right]^{-1}$$

Film heat transfer coefficients are calculated for the tube and shell side of each exchanger as follows:

Tubeside:

$$Nu = h_i d_i / k_f = 0.023 Re^{0.8} Pr^{0.3}$$

This correlation for Nusselt number is recommended for fully developed turbulent flow in smooth tubes.³ Brine density was evaluated at the mean fluid temperature using Dittman's correlation. Brine transport properties were evaluated at bulk fluid temperatures using correlations found in Phillips, "A Technical Databook for Geothermal Energy Utilization."⁴

Shellside:

$$Nu = h_o d_o / k_o = C Re^n Pr^{1/3}$$

heater:

C and n are constants from a table in Holman⁵ for flow across tube banks based on tube spacing and pitch

boilers:

C and n are constants evaluated based on correlations in Holman.⁵

Since the heat transfer coefficient for a boiling fluid varies greatly depending on the boiling regime, these coefficients were adjusted so that they fit the overall heat transfer coefficients as supplied by the manufacturer.

Fouling Factor:

$$f f_{oa} = 1/U_{o,meas} - 1/U_{o,calc}$$

Nomenclature:

A	Area (based on outside surface), sq. ft.
C _p	Heat capacity at constant pressure, Btu/lb - °F
d _i	Inside diameter, inches
d _o	Outside diameter, inches
f _i	Inside fouling factor, hr - sq ft - °F/Btu
f _o	Outside fouling factor, hr - sq ft - °F/Btu
f _{oA}	Overall fouling factor, hr - sq ft - °F/Btu
h _i	Inside film heat transfer coefficient, Btu/hr - sq ft - °F
h _o	Outside film heat transfer coefficient, Btu/hr - sq ft - °F
Δh	Enthalpy change of fluid through a heat exchanger, Btu/lb
k	Thermal conductivity of tube metal, Btu/hr - ft - °F
k _i	Thermal conductivity of fluid inside tubes, Btu/hr - ft - °F
k _o	Thermal conductivity of fluid outside tubes, Btu/hr - ft - °F
M	Mass flow rate, lb/hr
Nu	Nusselt number, dimensionless
Pr	Prandtl number, dimensionless
Q	Duty, Btu/hr
Re	Reynolds number, dimensionless
T _c	Temperature of hot fluid leaving heat exchanger, °F
t _c	Temperature of cold fluid entering heat exchanger, °F
T _h	Temperature of hot fluid entering heat exchanger, °F
t _h	Temperature of cold fluid leaving heat exchanger, °F
ΔT	Temperature change of a fluid in a heat exchanger, °F
ΔT _{LM}	Logarithmic mean temperature difference (LMTD), °F
U _{o,meas}	Measured overall heat transfer coefficient (based on outside surface area), Btu/hr - sq ft - °F
U _{o,calc}	Calculated overall heat transfer coefficient (based on outside surface area), Btu/hr - sq ft - °F

References:

1. Starling, K., Fluid Thermodynamic Properties for Light Petroleum Systems, Gulf Publishing Co., Houston, 1973.
2. Dittman, G., "Calculation of Brine Properties", Lawrence Livermore Laboratory, UCID-17406, February 1977.
3. Holman, Heat Transfer, McGraw-Hill, New York, 1981, pp. 226-227.
4. Phillips, S., "A Technical Databook for Geothermal Energy Utilization", Lawrence-Berkeley Laboratory, LBL-12810, June 1981.

APPENDIX I

COMPUTER PROGRAM AND SAMPLE OUTPUT

**PROGRAM WRITTEN IN MICROSOFT QUICK BASIC VERSION 1.0
FOR MACINTOSH SE**

```

DIM k(20),G(20),H(20),c(6),V(6),R(6),P(6),U(6),W(6),M(20),a(6),B(6),E(21)
REM K-TEMP, G-PRESS, H-ENTHALPY, M-FLOW, C-TH CONDUCTIVITY
REM V-VISCOSITY, R-RE NUMBER, P-SKIN HEAT TRANS
REM U-OVERALL HEAT TRANSFER COEFF, W-FOULING FACTOR
REM SAMPLE TEMP, PRESS AND FLOW ENTERED
LPRINT "RUN DATE IS ",DATE$
OPEN "CLIP:" FOR INPUT AS #1
INPUT #1,DATE1$
INPUT #1,TIME1$
FOR KK=1 TO 12:INPUT#1,DUM:NEXT KK
INPUT #1, G(1)
INPUT #1, G(2)
INPUT #1, G(3)
INPUT #1, DUM
INPUT #1, G(14)
INPUT #1, G(15)
INPUT #1, G(16)
INPUT #1, G(19)
INPUT #1, G(20)
INPUT #1, G(11)
INPUT #1, G(12)
INPUT #1, GOR1
INPUT #1, GOR2
INPUT #1, DUM
INPUT #1, G(8)
INPUT #1, DUM
INPUT #1, DUM
    INPUT #1, k(1)
    PRINT k(1)
INPUT #1, k(2)
INPUT #1, k(3)
FOR KK=1 TO 9: INPUT #1, DUM:NEXT KK
INPUT #1, k(14)
PRINT k(14)
INPUT #1, k(15)
INPUT #1, k(16)
INPUT #1, k(19)
INPUT #1, k(20)
INPUT #1, k(11)
INPUT #1, k(12)
INPUT #1, DUM
INPUT #1, k(8)
PRINT k(8)
INPUT #1, k(9)
INPUT #1, DUM
INPUT #1, M(3)
PRINT M(3)
INPUT #1, M(15)
INPUT #1, M(11)
INPUT #1, M(17)
INPUT #1, DUM
INPUT #1, M(6)
PRINT M(6)
PRINT G(1)
PRINT G(12)
PRINT k(3)

```

```

PRINT "temp in and out pump",k(15),k(14)
PRINT M(3)
PRINT M(6)
PRINT M(15)
M(3)=M(3)*1000
M(15)=M(15)*1000
M(11)=M(11)*1000
M(17)=M(17)*1000
'M(17)=M(17)*1.2
'k(16)=k(16)-5
k(17)=k(16)
k(18)=k(16)
k(13)=k(14)
M(18)=M(11)-M(17)
M(8)=6600!*M(6)/470!
REM CALCULATE ENTHALPY
H(1)=.33*k(1)^1.1609
H(2)=.344*k(2)^1.1609
H(3)=.344*k(3)^1.1609
H(11)=-567.42-1.4328*k(11)+.0092117*k(11)^2-1.6663E-05*k(11)^3
H(12)=.469*k(12)-696.58+.09*(75-G(12))
H(13)=-847.07+.72259*k(13)-.001895*k(13)^2+8.3415E-06*k(13)^3
H(14)=-847.07+.72259*k(14)-.001895*k(14)^2+8.3415E-06*k(14)^3
H(15)=(-843.31+.0034*G(16))+(.57725-.00002*G(16))*k(15)
H(16)=.755*k(16)-869.53-.0077*(G(16)-300!)
'H(19)=.5175*K(17)-711.63-.099*(G(17)-150)
H(17)=H(16)
H(18)=H(16)
H(19)=-567.42-1.4328*k(19)+.0092117*k(19)^2-1.6663E-05*k(19)^3
'H(19)=-567!-1.43*K(19)+.009211*K(19)^2-1.6663E-05*K(19)^3
H(20)=-567.42-1.4328*k(20)+.0092117*k(20)^2-1.6663E-05*k(20)^3
H(10)=H(19)
LPRINT DATE1$,TIME1$
LPRINT
FOR X=1 TO 10
    LPRINT "H(";X;")",H(X),"H(";X+10;")",H(X+10)
NEXT X
REM MASS BALANCE
LPRINT
LPRINT "MASS BALANCE"
LPRINT "BRINE FLOWRATE ",M(3),"LB/HR"
LPRINT "GAS FLOWRATE",M(6),"LB/HR"
LPRINT "ISOBUTANE FLOWRATE"
LPRINT "AVERAGE=", (M(11)+M(15))/2!
LPRINT "DIFFERENCE=",100*(M(11)-M(15))*2/(M(11)+M(15)),"%
REM
REM INDIVIDUAL ENERGY BALANCES
LPRINT
LPRINT "INDIVIDUAL ENERGY BALANCES"
    LPRINT "E-1-N"
    E(1)=-M(3)*(H(3)-H(2))
    E(2)=M(11)*(H(16)-H(15))
    PRINT M(15),H(16),H(15)
    E(3)=(E(2)+E(1))/2!
    E(4)=(E(1)-E(2))/E(3)*100
    LPRINT "BRINE",E(1),"BTU/HR"

```

```

LPRINT "ISOBUTANE", E(2), "BTU/HR"
LPRINT "AVERAGE=", E(3)
LPRINT "DIFFERENCE=", E(4), "%"
LPRINT "E-2-N"
E(5) = -M(3) * (H(2) - H(1))
E(6) = M(18) * (H(19) - H(18))
E(7) = (E(5) + E(6)) / 2!
E(8) = (E(5) - E(6)) / E(7) * 100
LPRINT "BRINE", E(5), "BTU/HR"
LPRINT "ISOBUTANE", E(6), "BTU/HR"
LPRINT "AVERAGE=", E(7)
LPRINT "DIFFERENCE=", E(8), "%"
LPRINT "E-3-N"
IF M(17) < 2000 THEN
E(9) = 0!
E(10) = 0!
E(11) = 0!
E(12) = 0!
ELSE
E(9) = -M(8) * .24 * (k(9) - k(8))
E(10) = M(17) * (H(20) - H(17))
E(11) = (E(9) + E(10)) / 2!
E(12) = (E(9) - E(10)) / E(11) * 100!
END IF
LPRINT "EXHAUST", E(9), "BTU/HR"
LPRINT "ISOBUTANE", E(10), "BTU/HR"
LPRINT "AVERAGE=", E(11)
LPRINT "DIFFERENCE=", E(12), "%"
REM OVERALL ENERGY BALANCE
LPRINT
LPRINT "OVERALL ENERGY BALANCE"
E(13) = -M(3) * (H(3) - H(1))
E(14) = E(9)
E(15) = M(15) * (H(15) - H(14))
E(16) = E(13) + E(14) + E(15)
E(17) = -M(11) * (H(13) - H(12))
E(18) = -M(11) * (H(12) - H(11))
E(19) = E(17) + E(18)
E(20) = (E(16) + E(19)) / 2!
E(21) = (E(16) - E(19)) / E(20) * 100!
LPRINT "ENERGY FROM BRINE", E(13), "BTU/HR"
LPRINT "ENERGY FROM EXHAUST", E(14), "BTU/HR"
LPRINT "ENERGY FROM PUMP", E(15), "BTU/HR"
LPRINT "TOTAL ENERGY INTO ISOBUTANE", E(16), "BTU/HR"
LPRINT "ENERGY TO COOLING WATER", E(17), "BTU/HR"
LPRINT "ENERGY TO TURBINE", E(18), "BTU/HR"
LPRINT "TOTAL ENERGY OUT OF ISOBUTANE", E(19), "BTU/HR"
LPRINT "AVERAGE", E(20), "BTU/HR"
LPRINT "DIFFERENCE", E(21), "%"
REM H CALCULATIONS FOR E-1-N
REM
REM TUBE SIDE BRINE
REM PROPERTY CALCULATION
a(1) = ((k(2) + k(3)) / 2! - 32) / 1.8
V(1) = 1.0613 + .0004309 * a(1)
D = (a(1) + 273.15) / 273.15

```

```

D=-.92247+2.8395*D-1.8007*D^2+.52557*D^3-.07344*D^4
c(1)=(.9713+9.963E-05*a(1)-5.1032E-07*a(1)^2)*D*.5778
R(1)=.0729*M(3)/V(1)
P(1)=.6887*c(1)*R(1)^.8
REM - SHELLSIDE ISOBUTANE FOR E-1-N
a(2)=(k(15)+k(16))/2!
V(2)=.5484-.0015073*a(2)
c(2)=.0737-1.7153E-04*a(2)
R(2)=M(15)/V(2)*.2
P(2)=10.11*c(2)*R(2)^.569
REM - E-2-N
REM - TUBESIDE BRINE
a(3)=(k(2)+k(1))/2!-32)/1.8
V(3)=1.0613+.0004309*a(3)
D=(a(3)+273.15)/273.15
D=-.92247+2.8395*D-1.8007*D^2+.52557*D^3-.07344*D^4
c(3)=(.9713+9.963E-05*a(3)-5.1032E-07*a(3)^2)*D*.5778
R(3)=.1119*M(3)/V(3)
P(3)=.5014*c(3)*R(3)^.8
REM - SHELLSIDE ISOBUTANE
R(4)=M(18)*2.8606
P(4)=.4*R(4)^.556
REM - E-3-N
REM - TUBESIDE EXHAUST
R(5)=M(8)*3.3956
P(5)=.00732*R(5)^.8
REM - SHELLSIDE ISOBUTANE
R(6)=42.94*M(17)
P(6)=.146*R(6)^.54
LPRINT
LPRINT "                RE                h"
FOR X = 1 TO 6
    LPRINT X,R(X),P(X)
NEXT X
LPRINT
REM CALCULATE U
REM B-LOG MEAN TEMPERATURE DIFFERENCE
PRINT k(2),k(16),k(3),k(15)
B(1)=((k(2)-k(16))-(k(3)-k(15)))/LOG((k(2)-k(16))/(k(3)-k(15)))
PRINT k(1),k(19),k(2),k(18)
B(2)=((k(1)-k(19))-(k(2)-k(18)))/LOG((k(1)-k(19))/(k(2)-k(18)))
B(3)=((k(8)-k(20))-(k(9)-k(17)))/LOG((k(8)-k(20))/(k(9)-k(17)))
REM U CALCULATED
U(4)=1/(1.2615/P(1)+.0002413+1/P(2))
U(5)=1/(1.0832/P(3)+9.2488E-05+1/P(4))
U(6)=1/(1.0854/P(5)+1.5816E-04+1/P(6))
REM U MEASURED
'    U(1)=e(3)/2728/B(1)
'    U(2)=E(7)/1738/B(2)
' base on brine
'    U(1)=E(1)/2728/B(1)
'    U(2)=e(5)/1738/B(2)

U(3)=E(9)/237/B(3)
REM FOULING FACTOR
W(1)=1/U(1)-1/U(4)

```

```

W(2)=1/U(2)-1/U(5)
W(3)=1/U(3)-1/U(6)
LPRINT "E-X-N","UMEAS","UCALC","LMTD","Fouling Factor"
FOR X= 1 TO 3
  LPRINT X,U(X),U(X+3),B(X),W(X)
NEXT X
PRINT "X","UMEAS","UCALC","DTLM","FF"
FOR X= 1 TO 3
  PRINT X,U(X),U(X+3),B(X),W(X)
NEXT X

STOP

```

PUH DATE IS 00-25-1000
5/4/1000 100

H(1)	245.9414	H(11)	-615.2643
H(2)	177.4004	H(12)	-631.844
H(3)	114.6596	H(13)	-790.7794
H(4)	0	H(14)	-790.7794
H(5)	0	H(15)	-789.3196
H(6)	0	H(16)	-709.5471
H(7)	0	H(17)	-709.5471
H(8)	0	H(18)	-709.5471
H(9)	0	H(19)	-614.4199
H(10)	-614.4199	H(20)	-615.9301

MASS BALANCE

BRINE FLOWRATE	149100	LB/HR
GAS FLOWRATE	493.4	LB/HR
ISOBUTANE FLOWRATE		
AVERAGE=	120800	
DIFFERENCE=	2.317881	%

INDIVIDUAL ENERGY BALANCES

E-1-N

BRINE	9354653	BTU/HR
ISOBUTANE	9748210	BTU/HR
AVERAGE=	9551432	
DIFFERENCE=	-4.120398	%

E-2-N

BRINE	1.021946E+07	BTU/HR
ISOBUTANE	1.059716E+07	BTU/HR
AVERAGE=	1.040831E+07	
DIFFERENCE=	-3.62883	%

E-3-N

EXHAUST	1107467	BTU/HR
ISOBUTANE	1011063	BTU/HR
AVERAGE=	1059265	
DIFFERENCE=	9.101005	%

OVERALL ENERGY BALANCE

ENERGY FROM BRINE	1.957412E+07	BTU/HR
ENERGY FROM EXHAUST	1107467	BTU/HR
ENERGY FROM PUMP	174297.5	BTU/HR
TOTAL ENERGY INTO ISOBUTANE	2.085588E+07	BTU/HR
ENERGY TO COOLING WATER	1.942191E+07	BTU/HR
ENERGY TO TURBINE	2026041	BTU/HR
TOTAL ENERGY OUT OF ISOBUTANE	2.144795E+07	BTU/HR
AVERAGE	2.115191E+07	BTU/HR
DIFFERENCE	-2.799123	%

	RE	h
1	9904.243	410.4125
2	74914.63	285.5545
3	14959.7	424.6619
4	318670.8	459.1116
5	23526.74	23.00173
6	463752	167.5511

E-X-N	UMEAS	UCALC	LMTD	Fouling Factor
1	161.8478	146.6922	21.18735	-6.383494E-04
2	223.3621	207.4111	26.8115	-3.443076E-04
3	12.71399	18.75672	367.5365	2.533928E-02

APPENDIX J

CHEMICAL ANALYSIS, SCANNING ELECTRON MICROSCOPY AND LUBE OIL ANALYSIS RESULTS

Report No.: 6971

Date: July 12, 1990

Prepared For: Ms. Mai Hattar
Ben Holt Company
201 S. Lake Ave. Suite 308
Pasadena, CA 91101

P.O. No.: 30008-258

PURPOSE OF ANALYSIS:

To elementally characterize the deposits on the inside and outside surfaces of six tubes. Also, to determine the minimum remaining wall thickness of each tube.

SAMPLES:

Six (6) tubes:

A:E-2-N, 4th pass tube.

B:E-2-N, tube #2, 1st pass.

C:E-3-N, tube #6.

D:E-2-N, ferrule on 1st pass inlet.

E:E-2-N, ferrule on 5th pass inlet.

F:Condenser tube.

METHODS OF ANALYSIS:Scanning Electron Microscopy (SEM).
Energy Dispersive X-ray Spectroscopy (EDS).**RESULTS:**

The material and operating environments for the tubes was reported as follows.

E-2-N	:geothermal brine inside tube. :isobutane outside tube. :carbon steel.
E-3-N	:engine exhaust gas inside tube (fuel:natural gas). :isobutane outside tube. :304 S.S..
Condenser	:isobutane inside tube. :water and air outside tube.

The inside (I.D.) and outside (O.D.) of each tube was analyzed with EDS to determine the elemental nature of the corrosion product/deposit (see spectra 1 through 12).

A sample of tube wall from each sample was encapsulated in clear epoxy and cross-sectioned using standard metallographic techniques. The samples were gold coated for SEM documentation of the minimum tube wall thickness. The dimensions can be seen in table 1.

The enclosed micrographs and spectra further present the results of this analysis.

Paul R. Reidel
Metallurgist

PRR:cp

Enclosures: Samples (6)
 Micrographs (6)
 Spectra (12)

Table 1

<u>Sample</u>	<u>Minimum Remaining Wall Thickness</u>
A	0.074 inches
B	0.074 inches
C	0.069 inches
D	0.013 inches
E	0.035 inches
F	0.054 inches

PHOTOMETRICS

OP.

ID

M-1

00

ID

M-2

J - 4

PHOTOMETRICS

OD

ID

M-3

OD

ID

M-4

J - 5

M-5

M-6

12-Jul-1990 08:33:46

SAMPLE A:I.D.

Vert= 6891 counts Disp= 1

Preset=

100 secs

Elapsed=

73 secs

12-Jul-1990 08:36:31

SAMPLE A:O.D.

Vert= 6454 counts Disp= 1

Preset=

100 secs

Elapsed=

74 secs

12-Jul-1990 08:41:14

SAMPLE B:I.D.

Vert= 5884 counts Disp= 1

Preset=

100 secs

Elapsed=

67 secs

12-Jul-1990 08:38:36

SAMPLE B:O.D.

Vert= 4277 counts Disp= 1

Preset=

100 secs

Elapsed=

53 secs

15 KV

12-Jul-1990 08:43:56

SAMPLE C:I.D.

Vert= 3276 counts Disp= 1

Preset= 100 secs

Elapsed= 100 secs

12-Jul-1990 08:46:30

SAMPLE C:O.D.

Vert= 6101 counts Disp= 1

Preset=

100 secs

Elapsed=

59 secs

15 KV

12-Jul-1990 09:59:57

SAMPLE D:I.D.

Vert= 1852 counts Disp= 1

Preset= 100 secs

Elapsed= 100 secs

12-Jul-1990 09:54:27

SAMPLE D:O.D.

Vert= 3957 counts Disp= 1
Ca

Preset= 100 secs
Elapsed= 100 secs

15 KV

12-Jul-1990 10:02:17

SAMPLE E:I.D.

Vert= 1739 counts Disp= 1

Preset=

100 secs

Elapsed=

82 secs

12-Jul-1990 10:04:55

SAMPLE E:O.D.

Vert= 2009 counts Disp= 1

Preset=

100 secs

Elapsed=

88 secs

12-Jul-1990 10:10:47

SAMPLE F:I.D.

Vert= 4978 counts Disp= 1

Preset=

100 secs

Elapsed=

41 secs

15 KV

12-Jul-1990 10:08:53

SAMPLE F:O.D.

Vert= 6704 counts Disp= 1

Preset= 100 secs

Elapsed= 100 secs

CHEMICAL ANALYSIS

SAMPLES:

- A: E-1-N TUBESIDE INLET**
- B: E-1-N TUBESIDE OUTLET**
- C: E-2-N SHELLSIDE**
- D: E-3-N SHELLSIDE**
- E: E-3-N TUBESIDE OUTLET**
- F: E-3-N TUBESIDE INLET**

AmeriChem Testing Laboratory

1761 N. Batavia
Orange, CA 92665
(714) 921-1550
FAX: (714) 921-4770

REPORT NUMBER: AL-1879
CLIENT:
The Ben Holt Co.
201 S. Lake Ave.
Pasadena CA 91101-3094

REPORT ON:
Solid Sample A
E-I-N tube side inlet

DATE REPORTED: 7-10-90
DATE RECEIVED: 7-03-90

ANALYSIS

Moisture
Oil
Identification of oil by IR
Ash
Color of ash
Magnetics
Siliceous matter-soil, dirt
Chloride
Nitrate
Sulfate
Carbonate
Bicarbonate
Phosphate
Sodium
Calcium
Magnesium
Cadmium
Lead
Zinc
Cobalt
Nickel
Manganese
Copper
Chromium
Iron, as iron oxide

REST RESULT

1.17%
51.37%
Petroleum oil
47.46%
Light brown
Yes
0.72%
0.20%
<0.01%
<0.01%
<0.1%
<0.005%
0.06%
0.281%
7.31%
0.237%
0.0169%
6.11%
4.18%
N.D.
N.D.
0.321%
0.205%
N.D.
4.63%

Peter T. Wu
Lab Director

AmeriChem Testing Laboratory

1761 N. Batavia
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REPORT NUMBER: AL-1879

CLIENT:

The Ben Holt Co.
201 S. Lake Ave.
Pasadena CA 91101-3094

REPORT ON:

Solid Sample B
E-N residue marker

DATE REPORTED: 7-10-90

DATE RECEIVED: 7-03-90

ANALYSIS

TEST RESULT

Moisture	2.51%
Oil	21.96%
Identification of oil by IR	Petroleum oil
Ash	75.52%
Color of ash	Light yellow
Magnetics	Slightly
Siliceous matter-soil, dirt	2.63%
Chloride	0.16%
Nitrate	0.01%
Sulfate	<0.01%
Carbonate	0.41%
Bicarbonate	<0.005%
Phosphate	0.10%
Sodium	0.259%
Calcium	3.52%
Magnesium	0.155%
Cadmium	0.0380%
Lead	10.35%
Zinc	11.94%
Cobalt	N.D.
Nickel	0.0040%
Manganese	0.171%
Copper	0.076%
Chromium	0.040%
Iron, as iron oxide	10.35%

Peter T. Wu
Lab Director

AmeriChem Testing Laboratory

REPORT NUMBER: AL-1879

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Orange, CA 92665
(714) 921-1550
FAX: (714) 921-4770

REPORT ON:

Solid Sample C
E-2-N Shell Side

DATE REPORTED: 7-10-90

DATE RECEIVED: 7-03-90

ANALYSIS

Moisture
Oil
Identification of oil by IR
Ash
Color of ash
Magnetics
Siliceous matter-soil, dirt
Chloride
Nitrate
Sulfate
Carbonate
Bicarbonate
Phosphate
Sodium
Calcium
Magnesium
Cadmium
Lead
Zinc
Cobalt
Nickel
Manganese
Copper
Chromium
Iron, as iron oxide

REST RESULT

3.40%
37.11%
Petroleum oil
59.48%
Rust brown
Strongly magnetic
3.72%
0.81%
0.01%
<0.01%
0.07%
<0.005%
<0.01%
0.183%
0.93%
0.105%
N.D.
0.0055%
0.278%
0.055%
0.0164%
0.149%
0.079%
N.D.
49.27%

N.D. = Not detected

The main ingredient is iron rust and oil.

Peter T. Wu
Lab Director

AmeriChem Testing Laboratory

1761 N. Batavia
Orange, CA 92665
(714) 921-1550
FAX: (714) 921-4770

REPORT NUMBER: AL-1879

CLIENT:

The Ben Holt Co.

201 S. Lake Ave.

Pasadena CA 91101-3094

REPORT ON:

Solid Sample D

DATE REPORTED: 7-10-90

DATE RECEIVED: 7-03-90

ANALYSIS

Moisture
Oil
Identification of oil by IR
Ash
Color of ash
Magnetics
Siliceous matter-soil, dirt
Chloride
Nitrate
Sulfate
Carbonate
Bicarbonate
Phosphate
Sodium
Calcium
Magnesium
Cadmium
Lead
Zinc
Cobalt
Nickel
Manganese
Copper
Chromium
Iron, as iron oxide

REST RESULT

1.11%
15.40%
Petroleum oil
83.49%
Rust brown
Strongly magnetic
6.63%
0.02%
0.04%
<0.01%
<0.1%
<0.005%
<0.01%
0.289%
1.37%
0.068%
N.D.
0.0105%
0.319%
0.088%
0.0248%
6.830%
0.093%
0.035%
75.06%

N.D. = Not detected

The main ingredient is iron rust and oil.

Peter T. Wu
Lab Director

AmeriChem Testing Laboratory

1761 N. Batavia
Orange, CA 92665
(714) 921-1550
FAX: (714) 921-4770

REPORT NUMBER: AL-1879
CLIENT:
The Ben Holt Co.
201 S. Lake Ave.
Pasadena CA 91101-3094

REPORT ON:
Solid Sample E

DATE REPORTED: 7-12-90
DATE RECEIVED: 7-03-90

ANALYSIS

Moisture
Charcoal particles
Oil
Identification of oil by IR
Ash
Color of ash
Magnetics
Siliceous matter-soil, dirt
Chloride
Nitrate
Sulfate
Carbonate
Bicarbonate
Phosphate
Sodium
Calcium
Magnesium
Cadmium
Lead
Zinc
Cobalt
Nickel
Manganese
Copper
Chromium
Iron, as iron oxide

TEST RESULT

17.31%
38.02%
N.D.
-
44.65%
Brown
Strongly magnetic
1.81%
<0.01%
0.02%
<0.01%
<0.1%
<0.005%
0.14%
0.076%
0.24%
0.159%
N.D.
0.181%
0.798%
0.072%
0.0361%
0.155%
1.084%
N.D.
65.06% of ash=29.05%

N.D. = Not detected

The main ingredient is iron rust, charcoal particles and moisture.

Peter T. Wu
Lab Director

AmeriChem Testing Laboratory

1781 N. Batavia
Orange, CA 92665
(714) 921-1550
FAX: (714) 921-4770

REPORT NUMBER: AL-1879

CLIENT:

The Ben Holt Co.

201 S. Lake Ave.

Pasadena CA 91101-3094

REPORT ON:

Solid Sample F

DATE REPORTED: 7-10-90

DATE RECEIVED: 7-03-90

ANALYSIS

TEST RESULT

Moisture	1.68%
Oil	N.D.
Identification of oil by IR	-
Ash	95.53%
Color of ash	Gray
Magnetics	Magnetic
Siliceous matter-soil, dirt	66.75%
Chloride	<0.01%
Fiber	0.3%
Nitrate	0.012%
Sulfate	<0.01%
Carbonate	0.11%
Bicarbonate	<0.005%
Phosphate	0.13%
Sodium	0.224%
Calcium	0.20%
Magnesium	0.075%
Cadmium	N.D.
Lead	0.007%
Zinc	1.291%
Cobalt	N.D.
Nickel	0.0298%
Manganese	0.067%
Copper	0.094%
Chromium	N.D.
Iron, as iron oxide	17.53%

N.D. = Not detected

The main ingredient is iron rust and siliceous dirt.

Peter T. Wu
Lab Director

AmeriChem Testing Laboratory

1761 N. Batavia
Orange, CA 92665
(714) 921-1550
FAX: (714) 921-4770

REPORT NUMBER: AL-1879
CLIENT:
The Ben Holt Co.
201 S. Lake Ave.
Pasadena CA 91101-3094

REPORT ON:
Solid Sample E-2-N, SHELL

DATE REPORTED: 7-10-90
DATE RECEIVED: 7-03-90

ANALYSIS

Moisture
Oil
Identification of oil by IR
Ash
Color of ash
Magnetics
Siliceous matter-soil, dirt
Chloride
Nitrate
Sulfate
Carbonate
Bicarbonate
Phosphate
Sodium
Calcium
Magnesium
Cadmium
Lead
Zinc
Cobalt
Nickel
Manganese
Copper
Chromium
Iron, as iron oxide

REST RESULT

41.54%
12.09%
Petroleum oil
46.37%
Rust beown
Strongly magnetic
9.92%
3.31%
<0.01%
<0.01%
1.60%
<0.005%
0.01%
0.697%
0.75%
0.045%
N.D.
0.006%
0.155%
0.047%
0.0134%
0.148%
0.049%
N.D.
33.48%

N.D. = Not detected

The main ingredient is iron rust , oil and water.

Peter T. Wu
Lab Director

AmeriChem Testing Laboratory

1761 N. Batavia
Orange, CA 92665
(714) 921-1550
FAX: (714) 921-4770

REPORT NUMBER: AL-1879

REPORT ON:

CLIENT:

Oil in E-3-N Shell

The Ben Holt Co.

201 S. Lake Ave.

Pasadena CA 91101-3094

DATE REPORTED: 7-10-90

DATE RECEIVED: 7-03-90

ANALYSIS

REST RESULT

Moisture	<0.1%
Ash	0.017%
Magnetic particles	82.2 ppm
Dirt particles	2.6 ppm
Sodium	0.0014%
Calcium	0.0010%
Magnesium	0.00034%
Cadmium	N.D.
Lead	0.00033%
Zinc	0.00233%
Cobalt	N.D.
Nickel	0.0055%
Manganese	N.D.
Copper	N.D.
Chromium	N.D.
Iron	0.0086%

Viscosity, 100 F

232 Seconds

N.D. = Not detected

The contamination came from rust and dirt particles.

Peter T. Wu
Lab Director

AmeriChem Testing Laboratory

1761 N. Batavia
Orange, CA 92665
(714) 921-1550
FAX: (714) 921-4770

REPORT NUMBER: AL-1879

CLIENT:

The Ben Holt Co.
201 S. Lake Ave.
Pasadena CA 91101-3094

REPORT ON:

Solid Sample CT-113-E
From Tube Cut Out

DATE REPORTED: 7-10-90

DATE RECEIVED: 7-03-90

ANALYSIS

Moisture
Oil
Identification of oil by IR
Ash
Color of ash
Magnetics
Siliceous matter-soil, dirt
Chloride
Nitrate
Sulfate
Carbonate
Bicarbonate
Phosphate
Sodium
Calcium
Magnesium
Cadmium
Lead
Zinc
Cobalt
Nickel
Manganese
Copper
Chromium
Iron, as iron oxide

TEST RESULT

26.19%
<0.1%
-
73.52%
Rust beown
Strongly magnetic
<0.1%
<0.1%
0.02%
<0.01%
1.60%
<0.1%
<0.01%
0.033%
0.04%
0.032%
N.D.
0.004%
0.072%
0.099%
0.0066%
0.144%
0.015%
0.027%
68.21%

N.D. = Not detected

The main ingredient is iron rust and water.

Peter T. Wu
Lab Director

**AmeriChem
Testing
Laboratory**

1761 N. Batavia
Orange, CA 92665
(714) 921-1550
FAX: (714) 921-4770

REPORT NUMBER: AL-1879
CLIENT:
The Ben Holt Co.
201 S. Lake Ave.
Pasadena CA 91101-3094

REPORT ON:
Solid Sample

DATE REPORTED: 7-12-90
DATE RECEIVED: 7-03-90

SAMPLE ID.

CHARCOAL PARTICLES

A	<0.5%
B	<0.5%
C	1.6%
D	2.3%
F	<0.5%
E-2-N, SHELL	1.2%
CT-113-E	<0.5%

For adjustment of calculation, please include the above % in the oil content reported on July 10, 1990.

Peter T. Wu
Lab Director

Mustang

7777 WASHINGTON AVE.
P.O. BOX 1373
HOUSTON, TEXAS 77251-1373
(713) 861-4832

RECEIVED

JUN 14 1990

PROCUREMENT DIV.

MUSTANG TRACTOR & EQUIPMENT
POWER SYSTEMS DIVISION
CONSTRUCTION MACHINERY DIV.
INDUSTRIAL EQUIPMENT DIV.

SHOP JOB NUMBER	
JOB SEGMENT NUMBER	
UNIT NUMBER	7380766
JOB SITE	NEW ENG.RENT.#2
UNIT MANUFACTURER	CAT
UNIT MODEL	6398
UNIT SERIAL NUMBER	7380766
COMPARTMENT	NATURAL GAS
OIL BRAND/WEIGHT	/
WAS OIL CHANGED AT THIS SAMPLE TIME?	
CUSTOMER PURCHASE ORDER NO.	ELLISOR
SAMPLE LABEL NUMBER	MJ 0937
LAB CONTROL NUMBER	0F06058
OVERALL SAMPLE EVALUATION CODE	4

WEAR METAL RESULTS APPEAR NORMAL. NO EVIDENCE OF CONTAMINATION.

TAKEN	Am'l of Add Oil	SMU/ Odom. on Unit	SMU/ Odom. on Oil
253898			

REC'D	
268198	35211

Feedback:

TAKEN	Am'l of Add Oil	SMU/ Odom. on Unit	SMU/ Odom. on Oil
242498			

REC'D	
242598	34365 1115

Feedback:

TAKEN	Am'l of Add Oil	SMU/ Odom. on Unit	SMU/ Odom. on Oil
230598			

REC'D	
231298	33253

Feedback:

TAKEN	Am'l of Add Oil	SMU/ Odom. on Unit	SMU/ Odom. on Oil
228698			

REC'D	
228798	32613

Feedback:

Lab Report Date	Elements Concentrations in PPM:								Oil condition/Contaminants:								VIS
	CU	FE	CR	PB	AL	SI	MO	NA	W	F	A	ST	OXI	NIT	SUL	APP	
268198	2	18	8	1	8	1		18	NEG			82					
242598	2	28	1	3	1	3		19	NEG								
231298	2	16	1	3	1	1		25	NEG								
228798	2	14	1	4	2	1		22	NEG								

ABBREVIATIONS

Al - ALUMINUM
Cr - CHROMIUM
Fe - IRON

Cu - COPPER
Pb - LEAD
Mo - MOLYBDENUM

Si - SILICON
Na - SODIUM
TR - TRACE

W - WATER
F - FUEL
A - ANTIFREEZE

ST - SOOT
SUL - SULFUR
VIS - VISCOSITY

OXI - OXIDATION
NIT - NITRATION
APP - APPEARANCE

Mustang

7777 WASHINGTON AVE.
P.O. BOX 1373
HOUSTON, TEXAS 77251-1373
(713) 861-4832

MUSTANG TRACTOR & EQUIPMENT
POWER SYSTEMS DIVISION
CONSTRUCTION MACHINERY DIV.
INDUSTRIAL EQUIPMENT DIV.

SCHEDULED OIL SAMPLING

SHOP JOB NUMBER	
JOB SEGMENT NUMBER	
UNIT NUMBER	7380766
JOB SITE	NEW ENG.RENT.#2
UNIT MANUFACTURER	CAT
UNIT MODEL	6398
UNIT SERIAL NUMBER	73800766
COMPARTMENT	NATURAL GAS
OIL BRAND/WEIGHT	/
WAS OIL CHANGED AT THIS SAMPLE TIME?	Y
CUSTOMER PURCHASE ORDER NO.	
SAMPLE LABEL NUMBER	ELLISOR
LAB CONTROL NUMBER	0A00227
OVERALL SAMPLE EVALUATION CODE	A

KEN	Am'l. of Add Oil	SMU/ Odom. on Unit	SMU/ Odom. on Oil
898			

ALL ELEMENTS APPEAR ACCEPTABLE.

CD	198	32812	1645

Feedback:

KEN

CD

Feedback:

KEN

CD

Feedback:

KEN

CD

Feedback:

Lab
Report
Date

Elements
Concentrations in PPM:

Oil condition/Contaminants:

	CU	FE	CR	PB	AL	SI	MO	NA		W	F	A	ST	OXI	NIT	SUL	APP	VIS
198	4	13	8	5	5	1		24		NEG				18%	27%	50%	40%	

ABBREVIATIONS

Al - ALUMINUM
Cr - CHROMIUM
Fe - IRON

Cu - COPPER
Pb - LEAD
Mo - MOLYBDENUM

Si - SILICON
Na - SODIUM
TR - TRACE

W - WATER
F - FUEL
A - ANTIFREEZE

ST - SOOT
SUL - SULFUR
VIS - VISCOSITY

OXI - OXIDATION
NIT - NITRATION
APP - APPEARANCE

Mustang

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RECEIVED

JUN 14 1990

PROCUREMENT DIV.

MUSTANG TRACTOR & EQUIPMENT
POWER SYSTEMS DIVISION
CONSTRUCTION MACHINERY DIV.
INDUSTRIAL EQUIPMENT DIV.

SHOP JOB NUMBER	
JOB SEGMENT NUMBER	
UNIT NUMBER	7388535
JOB SITE	NEW ENG.RENT.#1
UNIT MANUFACTURER	CAT
UNIT MODEL	G398
UNIT SERIAL NUMBER	7388535
COMPARTMENT	NATURAL GAS
OIL BRAND/WEIGHT	/
WAS OIL CHANGED AT THIS SAMPLE TIME?	
CUSTOMER PURCHASE ORDER NO.	ELLISOR
SAMPLE LABEL NUMBER	MJ 0936
LAB CONTROL NUMBER	8F06057
OVERALL SAMPLE EVALUATION CODE	

TAKEN 353898	Am't. of Add Oil	SMU/ Odom. on Unit	SMU/ Odom. on Oil	UNKNOWN HOURS ON OIL SAMPLE. IRON IS SLIGHTLY HIGH. IT IS DIFFICULT TO INTERPRET RESULTS WITHOUT INFO.
REC'D 368198		475		Feedback:
TAKEN 342498				COPPER IS SLIGHTLY HIGH. IRON IS HIGH. THIS MAY BE DUE TO AN EXTENDED OIL CHANGE PERIOD. RECOMMEND OIL CHANGE RESAMPLE AFTER 520 HOURS
REC'D 342598		3918	1138	Feedback:
TAKEN 338598				UNKNOWN HOURS ON OIL SAMPLE. SILICON IS SLIGHTLY HIGH. MODERATE DIRT ENTRY EVIDENT THIS SAMPLE CONTAINS A SLIGHT WATER CONTAMINATION. RECOMMEND OIL CHANGE
REC'D 231298		2779		Feedback:
TAKEN 328698				UNKNOWN HOURS ON OIL SAMPLE. ELEMENTS APPEAR AVERAGE
REC'D 328798		2149		Feedback:

Lab Report Date	Elements Concentrations in PPM:								Oil condition/Contaminants:								VIS
	CU	FE	CR	PB	AL	SI	MO	NA	W	F	A	ST	OXI	NIT	SUL	APP	
362192	18	24	1	1	1	1		11	NEG		NEG	10%					
342598	23	31	2	3	1	2		17	NEG								
231298	13	18	2	3	1	18		23	TR								
228798	18	18	2	5	2	2		24	NEG								

ABBREVIATIONS

Al - ALUMINUM
Cr - CHROMIUM
Fe - IRON

Cu - COPPER
Pb - LEAD
Mo - MOLYBDENUM

Si - SILICON
Na - SODIUM
TR - TRACE

W - WATER
F - FUEL
A - ANTIFREEZE

ST - SOOT
SUL - SULFUR
VIS - VISCOSITY

OXI - OXIDATION
NIT - NITRATION
APP - APPEARANCE

Mustang

7777 WASHINGTON AVE.
P.O. BOX 1373
HOUSTON, TEXAS 77251-1373
(713) 861-4832

MUSTANG TRACTOR & EQUIPMENT
POWER SYSTEMS DIVISION
CONSTRUCTION MACHINERY DIV.
INDUSTRIAL EQUIPMENT DIV.

SCHEDULED OIL SAMPLING

SHOP JOB NUMBER	
JOB SEGMENT NUMBER	
UNIT NUMBER	7388535
JOB SITE	NEW ENG.RENT.#1
UNIT MANUFACTURER	CAT
UNIT MODEL	6398
UNIT SERIAL NUMBER	73888535
COMPARTMENT	NATURAL GAS
OIL BRAND/WEIGHT	/
WAS OIL CHANGED AT THIS SAMPLE TIME?	Y
CUSTOMER PURCHASE ORDER NO.	
SAMPLE LABEL NUMBER	ELLISOR
LAB CONTROL NUMBER	8A88226
OVERALL SAMPLE EVALUATION CODE	X

KEN	Am't. of Add Oil	SMU/ Odom. on Unit	SMU/ Odom. on Oil	
898				
C'D				
198	1553	1553		Feedback:
KEN				
C'D				Feedback:
KEN				
C'D				Feedback:
KEN				
C'D				Feedback:

COPPER IS HIGH. IRON IS HIGH. ALUMINUM IS EXTREMELY HIGH.

POSSIBLE ROD/MAIN BEARING WEAR. RESAMPLE IMMEDIATELY TO CHECK.

Lab Report Date	Elements Concentrations in PPM:								Oil condition/Contaminants:								
	CU	FE	CR	PB	AL	SI	MO	NA	W	F	A	ST	OXI	NIT	SUL	APP	VIS
198	38	38	1	12	13	2		23	NEG			22%	48%	75%	57%		

ABBREVIATIONS

Al - ALUMINUM
Cr - CHROMIUM
Fe - IRON

Cu - COPPER
Pb - LEAD
Mo - MOLYBDENUM

Si - SILICON
Na - SODIUM
TR - TRACE

W - WATER
F - FUEL
A - ANTIFREEZE

ST - SOOT
SUL - SULFUR
VIS - VISCOSITY

OXI - OXIDATION
NIT - NITRATION
APP - APPEARANCE

APPENDIX K

MANAGEMENT REPORT DATA SHEETS

JANUARY 5, 1990 - MAY 29, 1990

GEOPRESSURED HYBRID POWER SYSTEM - MANAGEMENT REPORT DATA

January 5-8, 1990

	UNITS	INST.#	5-Jan	5-Jan	5-Jan	6-Jan	6-Jan	6-Jan	7-Jan	7-Jan	7-Jan	8-Jan	8-Jan	8-Jan
			900	1700	100	900	1700	100	900	1700	100	900	1700	100
AMBIENT TEMP	°F		51	56	52	49	50	48	47	58	42	52	60	48
WET BULB TEMP	°F		50	54	50	49	50	48	47	50	40	50	52	46
POWER														
T-1-N GROSS	KW	J1-100	555	551	543	542	566	563	570	563	580	571	545	563
GE-1-N GROSS	KW		340	340	0.5	5	340	260	290	330	280	280	340	340
GE-2-N GROSS	KW		340	340	340	340	340	340	350	355	340	340	0	340
PARASITIC	KW	J1-101	246	254	245	243	246	257	247	243	247	256	254	245
NET SALE TO HL&P	KW		900	940	600	600	955	820	910	960	860	880	580	940
NET SALE TO HL&P	FDG		0963	0972	0977	0983	0990	0998	1005	1013	1021	1029	1035	1043
	KW-HR													
BRINE														
TO E-2-N	PSIG	PI-606	500	500	500	501	500	500	502	500	500	505	500	500
TO E-1-N	PSIG	PI-611	495	495	495	493	490	490	497	490	495	495	495	500
FROM E-1-N	PSIG	PI-106	494	489	490	492	492	490	492	489	500	490	490	500
ISOBUTANE														
IN V-1-E	PSIG	PG-130	49	50	50	47	49	48	47	49	46	48	50	50
OUT OF P-1-E	PSIG	PI-105	356	359	367	372	360	360	357	351	352	356	363	354
OUT OF E-1-N	PSIG	PI-602	295	300	295	295	300	290	288	305	300	300	295	300
OUT OF E-2-N	PSIG	PG-114	280	280	275	278	280	275	280	280	280	280	280	28
OUT OF E-3-N	PSIG	PI-615	295	298	290	285	290	300	305	300	300	300	295	300
INTO T-1-E	PSIG	PI-107	264	267	264	265	268	266	265	270	268	268	266	268
OUT OF T-1-E	PSIG	PI-108	50	52	50	50	57	49	49	51	48	50	52	51
TO OR 102	PSIG	PG-104	52	55	55	52	55	55	38	40	315	55	55	60
FROM OR 102	PSIG	PG-105	40	40	40	40	40	40	52	55	50	38	40	40
GAS														
TO E-3-N	PSIG	PI-614	0.7	0.7	0.4	0.4	0.7	1	0.7	0.7	1.5	1.5	0.5	0.8
BRINE														
TO E-2-N	°F	TI-101	297	297	297	297	297	297	297	297	297	297	297	297
TO E-1-N	°F	TR-113	216	217	215	216	217	216	216	217	217	216	214	216
FROM E-1-N	°F	TR-102	146	148	149	149	147	147	147	148	145	147	149	148

January 5-8, 1990

REMARKS

GEOPRESSURED HYBRID POWER SYSTEM - MANAGEMENT REPORT DATA

January 9-10, 1990

	UNITS	INST.#	9-Jan	9-Jan	9-Jan	10-Jan	10-Jan	10-Jan			
			900	1700	100	900	1700	100			
AMBIENT TEMP	°F		59	70	50	58	58	58			
WET BULB TEMP	°F		56	63	50	57	56	57			
POWER											
T-1-N GROSS	KW	J1-100	554	504	555	549	504	508			
GE-1-N GROSS	KW		340	330	340	340	15	340			
GE-2-N GROSS	KW		340	0.5	340	340	15	340			
PARASITIC	KW	J1-101	257	242	257	253	252	253			
NET SALE TO HL&P	KW		940	560	920	940	260	900			
NET SALE TO HL&P	PDG		1051	1057	1065	1073	1079	1082			
	KW-HR										
BRINE											
TO E-2-N	PSIG	PI-606	500	505	500	500	500	500			
TO E-1-N	PSIG	PI-611	495	495	495	495	490	495			
FROM E-1-N	PSIG	PI-106	489	489	490	490	487	500			
ISOBUTANE											
IN V-1-E	PSIG	PG-130	51	56	52	50	52	52			
OUT OF P-1-E	PSIG	PI-105	352	371	361	362	368	376			
OUT OF E-1-N	PSIG	PI-602	300	295	300	300	295	290			
OUT OF E-2-N	PSIG	PG-114	280	275	280	280	270	270			
OUT OF E-3-N	PSIG	PI-615	300	295	300	300	300	300			
INTO T-1-E	PSIG	PI-107	270	263	269	270	260	258			
OUT OF T-1-E	PSIG	PI-108	54	58	53	53	55	53			
TO OR 102	PSIG	PG-104	55	60	60	40	60	60			
FROM OR 102	PSIG	PG-105	40	50	40	55	45	40			
GAS											
TO E-3-N	PSIG	PI-614	0.7	0.5	0.7	0.8	0.4	0			
BRINE											
TO E-2-N	°F	TI-101	297	297	297	297	297	297			
TO E-1-N	°F	TR-113	217	212	216	216	213	211			
FROM E-1-N	°F	TR-102	148	175	147	148	151	151			

January 9-10, 1990

4

GEOPRESSURED HYBRID POWER SYSTEM - MANAGEMENT REPORT DATA

January 11-14, 1990

	UNITS	INST.#	11-Jan 900	11-Jan 1700	11-Jan 100	12-Jan 900	12-Jan 60	12-Jan 100	13-Jan 900	13-Jan 1700	13-Jan 100	14-Jan 900	14-Jan 1700	14-Jan 100
AMBIENT TEMP	°F		64	66	60	55	0.5	42	48	51	52	63	65	62
WET BULB TEMP	°F		63	62	59	53	50	36	43	46	50	60	62	60
POWER												537		
T-1-N GROSS	KW	JI-100	528	526	532	562	566	583	574	558	555	340	521	528
GE-1-N GROSS	KW		240	330	340	340	320	340	340	340	340	340	340	340
GE-2-N GROSS	KW		340	330	340	340	340	340	340	340	340	243	340	340
PARASITIC	KW	JI-101	253	251	254	254	244	256	246	254	243	900	252	253
NET SALE TO HL&P	KW		820	880	920	940	900-940	940	940	906	930	1160	910	920
NET SALE TO HL&P	PDG		1089	1095	1103	1111	1119	1126	1135	1143	1151	1029	1168	1175
	KW-HR													
BRINE														
TO E-2-N	PSIG	PI-606	500	510	500	501	500	500	500	500	500	500	500	500
TO E-1-N	PSIG	PI-611	498	495	495	495	495	490	495	490	490	490	490	490
FROM E-1-N	PSIG	PI-106	494	491	490	491	487	490	490	490	490	487	485	490
ISOBUTANE														
IN V-1-E	PSIG	PG-130	54	57	56	46	49	44	44	49	50	54	56	56
OUT OF P-1-E	PSIG	PI-105	369	347	358	359	348	346	352	361	358	363	367	360
OUT OF E-1-N	PSIG	PI-602	300	300	295	295	300	300	300	300	295	300	300	300
OUT OF E-2-N	PSIG	PG-114	280	280	275	280	280	280	280	280	280	280	280	280
OUT OF E-3-N	PSIG	PI-615	295	300	300	300	300	300	300	300	300	300	300	300
INTO T-1-E	PSIG	PI-107	267	270	268	262	268	266	266	266	269	269	268	269
OUT OF T-1-E	PSIG	PI-108	58	59	56	49	51	46	50	50	52	56	58	58
TO OR 102	PSIG	PG-104	60	62	60	50	50	50	50	50	30	60	60	60
FROM OR 102	PSIG	PG-105	50	50	45	35	40	35	35	40	55	45	50	45
GAS														
TO E-3-N	PSIG	PI-614	0.7	0.7	0.8	0.5	0.7	.5-1.0	0.1	0.8	.5-1.0	0.8	0.8	0.8
BRINE														
TO E-2-N	°F	TI-101	297	297	297	296	297	297	296	296	296	297	297	297
TO E-1-N	°F	TR-113	0.5	217	0.5	216	0.3	0.5	216	216	216	15	216	215
FROM E-1-N	°F	TR-102	0.5	147	0.5	147	0.5	0.5	146	148	148	15	151	150

January 11-14, 1990

REMARKS

January 15-17, 1990

	INST.#	15-Jan	15-Jan	15-Jan	16-Jan	16-Jan	16-Jan	17-Jan	17-Jan	17-Jan
		900	1700	100	900	1700	100	900	1700	100
AMBIENT TEMP		65	67	60	67	68	64	69	70	67
WET BULB TEMP		62	63	60	65	66	64	67	68	67
POWER										
T-1-N GROSS	J1-100	517	519	525	515	505	514	0	500	514
GE-1-N GROSS		340	340	340	340	340	340	340	340	340
GE-2-N GROSS		340	340	340	340	340	340	340	340	340
PARASITIC	J1-101	252	240	251	241	251	241	224	248	249
NET SALE TO HL&P		920	910	910	900	900	900	460	900	900
NET SALE TO HL&P		1184	1192	1200	1207	1215	1223	1227	1234	1242
BRINE										
TO E-2-N	PI-606	500	500	500	500	500	500	500	500	500
TO E-1-N	PI-611	490	490	490	490	490	490	510	490	490
FROM E-1-N	PI-106	475	485	490	487	488	490	507	489	490
ISOBUTANE										
IN V-1-E	PG-130	56	57	56	58	59	58	46	60	60
OUT OF P-1-E	PI-105	364	357	363	368	351	355	404	364	260
OUT OF E-1-N	PI-602	300	300	300	300	300	300	185	295	300
OUT OF E-2-N	PG-114	280	285	280	280	285	280	185	280	280
OUT OF E-3-N	PI-615	300	300	300	300	300	300	190	300	300
INTO T-1-E	PI-107	267	264	270	269	268	269	43	265	267
OUT OF T-1-E	PI-108	58	59	58	60	62	60	44	64	61
TO OR 102	PG-104	60	60	60	65	70	65	380	70	65
FROM OR 102	PG-105	45	50	50	50	50	50	140	50	50
GAS										
TO E-3-N	PI-614	0.8	0.8	0.8	0.8	0.8	0.8	0	0.8	5-1.0
BRINE										
TO E-2-N	TI-101	297	297	297	297	296	297	297	297	298
TO E-1-N	TR-113	15		216	15	0.5	0.5	216	215	215
FROM E-1-N	TR-102	15	1	151	15	0.5	0.5	152	152	157

January 15-17, 1990

[illegible]

REMARKS

GEOPRESSURED HYBRID POWER SYSTEM - MANAGEMENT REPORT DATA

January 18-21, 1990

	UNITS	INST.#	18-Jan	18-Jan	18-Jan	19-Jan	19-Jan	19-Jan	20-Jan	20-Jan	20-Jan	21-Jan	21-Jan	21-Jan
			900	1700	100	900	1700	100	900	1700	100	900	1700	100
AMBIENT TEMP	°F		70	70	66	70	70	57	50	59	52	55	61	48
WET BULB TEMP	°F		69	68	66	68	69	57	49	52	48	47	50	45
POWER														
T-1-N GROSS	KW	J1-100	502	508	516	510	512	534	574	563	573	582	568	579
GE-1-N GROSS	KW		340	340	340	340	345	340	345	345	345	345	350	345
GE-2-N GROSS	KW		340	340	340	340	340	345	345	345	345	345	345	345
PARASITIC	KW	J1-101	248	257	258	257	247	260	252	260	252	262	261	264
NET SALE TO HL&P	KW		900	900	900	900	900	920	940	970	960	970	960	980
NET SALE TO HL&P	FDG		1250	1258	1266	1274	1282	1290	1298	1307	1315	1323	1332	1341
	KW-HR													
BRINE														
TO E-2-N	PSIG	PI-606	500	496	500	500	501	500	501	501	500	500	501	500
TO E-1-N	PSIG	PI-611	495	495	490	490	495	495	492	491	490	490	492	490
FROM E-1-N	PSIG	PI-106	488	487	490	485	488	486	486	488	487	487	487	485
ISOBUTANE														
IN V-1-E	PSIG	PG-130	61	60	60	60	60	54	49	52	49	49	50	48
OUT OF P-1-E	PSIG	PI-105	361	359	350	350	357	349	352	348	352	345	356	338
OUT OF E-1-N	PSIG	PI-602	295	300	300	300	300	300	299	300	300	302	305	300
OUT OF E-2-N	PSIG	PG-114	280	280	280	280	280	280	283	285	280	283	285	285
OUT OF E-3-N	PSIG	PI-615	300	300	300	300	295	300	300	301	300	300	300	300
INTO T-1-E	PSIG	PI-107	265	267	216	268	268	267	269	270	270	269	271	270
OUT OF T-1-E	PSIG	PI-108	63	63	61	62	63	55	52	54	51	51	53	50
TO OR 102	PSIG	PG-104	65	65	65	65	69	60	56	52	55	54	55	55
FROM OR 102	PSIG	PG-105	50	50	50	50	51	45	41	42	40	40	45	40
GAS														
TO E-3-N	PSIG	PI-614	0.8	0.8	0.5-1.0	0.8	0.8	0.8	0.7	0.9	0.9	0.9	0.9	0.9
BRINE														
TO E-2-N	°F	TI-101	298	297	297	297	297	297	297	298	298	297	298	298
TO E-1-N	°F	TR-113	214.3	215	215	201	212	216	216	217	216	216	217	216
FROM E-1-N	°F	TR-102	152	148	152	152	150	147	147	149	147	147	151	146

January 18-21, 1990

REMARKS

January 22-24, 1990

	INST.#	22-Jan 900	22-Jan 1700	22-Jan 100	23-Jan 900	23-Jan 1700	23-Jan 100	24-Jan 900	24-Jan 1700	24-Jan 100
AMBIENT TEMP		56	62	53	65	68	67	73	71	56
WET BULB TEMP		52	54	52	63	66	66	71	69	48
POWER										
T-1-N GROSS	JI-100	575	16	1	1	1	1	1	2	2
GE-1-N GROSS		340	345	345	345	340	340	340	340	340
GE-2-N GROSS		340	345	345	345	340	340	340	340	350
PARASITIC	JI-101	252	16	6	6	16	16	18	8	7
NET SALE TO HL&P		940	640	610	630	620	625	620	620	640
NET SALE TO HL&P		1349	1354	1360	1365	1371	1376	1381	1387	1392
BRINE										
TO E-2-N	PI-606	500	510	510	510	510	510	510	510	510
TO E-1-N	PI-611	490	520	520	515	520	520	515	518	515
FROM E-1-N	PI-106	486	515	519	518	520	519	516	518	515
ISOBUTANE										
IN V-1-E	PG-130	51	30	27	28	34	34	35	34	33
OUT OF P-1-E	PI-105	342	35	27	31	36	33	35	35	27
OUT OF E-1-N	PI-602	305	45	25	30	30	30	35	35	25
OUT OF E-2-N	PG-114	285	30	25	25	25	30	35	35	25
OUT OF E-3-N	PI-615	300	54	55	55	50	40	35	35	40
INTO T-1-E	PI-107	271	-24	-24	-24	-24	-24	-24	-24	-24
OUT OF T-1-E	PI-108	53	-11	-11	-11	-11	-11	-11	-11	-11
TO OR 102	PG-104	55	30	30	30	25	25	35	40	40
FROM OR 102	PG-105	40	20	20	15	35	35	25	25	25
GAS										
TO E-3-N	PI-614	0.8	0.5	0.6	0.5	0.6	0.6	0.6	0.6	0.5
BRINE										
TO E-2-N	TI-101	298	231	181	160	0	140	132	128	127
TO E-1-N	TR-113		0.5	0.5	15	0.5	0.5	15	15	0.5
FROM E-1-N	TR-102		0.5	0.5	15	0.5	0.5	15	15	0.5

January 22-24, 1990

	UNITS	22-Jan	22-Jan	22-Jan	23-Jan	23-Jan	23-Jan	24-Jan	24-Jan	24-Jan
		900	1700	100	900	1700	100	900	1700	100
ISOBUTANE										
IN V-1-E	°F	84.9	64.5	59.7	59.6	63.5	64.4	66.6	68.8	65.3
OUT OF P-1-E	°F	87.2	75.8	55	58.2	64.6	63.7	68.2	69.6	59.4
OUT OF E-1-N	°F		0.5	0.5	15	0.5	0.5	15	15	0.5
OUT OF E-2-N	°F	221	116	91	84	80	78	77	78	70
OUT OF E-3-N	°F	214	102	100	104	110	110	110	110	88
INTO T-1-E	°F	216	70	65	68	71	70	73	73	60
OUT OF T-1-E	°F				15	0.5	0.5	15	15	0.5
GAS										
TO E-3-N	°F	1014	745	795	795	795	800	795	791	698
FROM E-3-N	°F	343	212	285	288	286	285	281	269	202
BRINE	M#/HR	148	0.3	0.4	0.4	0.3	0.3	000.3	0.3	0.3
IC4 FROM P-1-E	M#/HR	112.4	-0.1	0.1	0	0	0	0	26.9	0.1
IC4 TO T-1-E	M#/HR	119.2	2.5	2.4	2.4	2.5	2.4	2.4	2.4	2.4
IC4 TO E-3-N	M#/HR		0.5	0.00	15	15	0.5	15	15	0.5
SEP FLOW	GALS	288333	288430	288405	288405	288406	288406	288406	288406	288406
GAS TO GE-1-N	#/HR	507	509.6	509.6	517.8	509.6	509.6	517.8	509.6	493.2
V-1-E	INCHES	18	32 3/4	33	36	38	36.5	39.5	39.5	33

REMARKS

GEOPRESSURED HYBRID POWER SYSTEM - MANAGEMENT REPORT DATA

January 25-28, 1990

	UNITS	INST.#	25-Jan	25-Jan	25-Jan	26-Jan	26-Jan	26-Jan	27-Jan	27-Jan	27-Jan	28-Jan	28-Jan	28-Jan
			900	1700	100	900	1700	100	900	1700	100	900	1700	100
AMBIENT TEMP	°F		48	59	41	56	61	58	64	67	64	64	65	47
WET BULB TEMP	°F		42	45	37	50	52	55	60	62	62	63	66	49
POWER														
T-1-N GROSS	KW	JI-100	2	1	1	1	1	1	1	0	0	0	1	1
GE-1-N GROSS	KW		340	345	350	350	345	350	350	350	350	350	345	350
GE-2-N GROSS	KW		350	345	350	350	345	350	350	350	350	350	345	350
PARASITIC	KW	JI-101	7	11	17	6	6	17	6	23	16	16	16	6
NET SALE TO HL&P	KW		620	635	620	640	640	640	640	640	640	640	615	20
NET SALE TO HL&P	FDG		1397	1403	1408	1414	1419	1425	1430	1436	1441	1447	1452	1458
	KW-HR													
BRINE														
TO E-2-N	PSIG	PI-606	505	510	510	510	511	510	510	515	510	510	511	510
TO E-1-N	PSIG	PI-611	515	322	520	520	521	520	520	520	520	520	521	520
FROM E-1-N	PSIG	PI-106	517	512	515	517	514	516	520	520	520	520	516	516
ISOBUTANE														
IN V-1-E	PSIG	PG-130	24	26	21	20	29	25	26	36	32	30	30	22
OUT OF P-1-E	PSIG	PI-105	25	24	16	16	26	4	25	32	27	27	30	14
OUT OF E-1-N	PSIG	PI-602	20	28	20	20	31	28	30	30	30	30	30	20
OUT OF E-2-N	PSIG	PG-114	20	28	20	20	30	28	30	0	28	30	28	20
OUT OF E-3-N	PSIG	PI-615	35	38	40	35	32	35	35	35	35	35	35	35
INTO T-1-E	PSIG	PI-107	-25	5	-95	-95	-95	-95	-95	-95	-95	-95	-95	-95
OUT OF T-1-E	PSIG	PI-108	-12	5	-49	-49	-49	-49	-49	-49	-49	-49	-49	-49
TO OR 102	PSIG	PG-104	25	29	28	25	30	30	30	40	35	35	34	25
FROM OR 102	PSIG	PG-105	15	18	12	0	11	20	20	30	25	25	22	15
G/S														
TO E-3-N	PSIG	PI-614	0.5	0.55	0.6	0.6	0.5	0.6	0.6	0.6	0.6	0.6	0.4	0.5
BRINE														
TO E-2-N	°F	TI-101	128	129	130	129	128	126	125	125	119	116	113	101
TO E-1-N	°F	TR-113	015		0.5	015		015	0.5	0.5	015	0.5		015
FROM E-1-N	°F	TR-102	015		0.5	015		015	0.5	0.5	015	0.5		015

January 25-28, 1990

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January 29-31, 1990

	INST.#	29-Jan	29-Jan	29-Jan	30-Jan	30-Jan	30-Jan	31-Jan	31-Jan	31-Jan
		900	1700	100	900	1700	100	900	1700	100
AMBIENT TEMP		47	59	49	63	67	54	65	68	66
WET BULB TEMP		43	51	47	59	59	53	62	66	65
POWER										
T-1-N GROSS	J1-100	1	1	1	1	1	1	1	1	1
GE-1-N GROSS		350	345	345	340	348	345	340	345	345
GE-2-N GROSS		350	35	345	340	345	345	340	340	340
PARASITIC	J1-101	6	169	159	169	182	182	181	188	187
NET SALE TO HL&P		620	520	500	50	500	500	500	490	480
NET SALE TO HL&P		1463	1468	1472	1476	1481	1485	1490	1494	1499
BRINE										
TO E-2-N	PI-606	510	501	500	500	502	500	500	500	500
TO E-1-N	PI-611	520	502	510	505	501	505	505	500	510
FROM E-1-N	PI-106	520	493	497	494	491	494	495	495	495
ISOBUTANE										
IN V-1-E	PG-130	20	59	58	62	61	58	62	61	60
OUT OF P-1-E	PI-105	15	372	352	364	379	375	379	370	372
OUT OF E-1-N	PI-602	25	279	280	285	274	278	275	270	270
OUT OF E-2-N	PG-114	25	269	270	275	266	265	260	260	260
OUT OF E-3-N	PI-615	35	299	295	295	292	285	290	285	285
INTO T-1-E	PI-107	-30	-95	-95	015	-95	-95	015	15	-95
OUT OF T-1-E	PI-108	-53	-49	-49	015	-49	-49	015	15	-49
TO OR 102	PG-104	15	342	340	340	351	350	350	350	350
FROM OR 102	PG-105	0	140	140	140	139	140	140	140	140
G/S										
TO E-3-N	PI-614	0.4	0.8	1	0.8	0.8	0.7	0.8	0.9	1
BRINE										
TO E-2-N	TI-101	269	297	297	297	297	297	297	297	297
TO E-1-N	TR-113	0.5		0.15	015		0.15	015	0.5	015
FROM E-1-N	TR-102	0.5		0.15	015		0.15	015	0.5	015

January 29-31, 1990

	UNITS	29-Jan	29-Jan	29-Jan	30-Jan	30-Jan	30-Jan	31-Jan	31-Jan	31-Jan
		900	1700	100	900	1700	100	900	1700	100
ISOBUTANE										
IN V-1-E	°F	46.2	94.5	92.8	94.5	95.3	94.8	96.4	95.8	95.6
OUT OF P-1-E	°F	44.8	96.8	96	96.9	97.8	96.7	98.7	97.1	97.4
OUT OF E-1-N	°F	0.5		015	015		0.15	015	0.5	015
OUT OF E-2-N	°F	56	217	216	218	216	213	215	213	215
OUT OF E-3-N	°F	68	207	208	208	207	206	206	205	205
INTO T-1-E	°F	-30		-29	531	531	533	015	0.5	-29
OUT OF T-1-E	°F	-53		-54	015	-52	-53	015	0.5	-54
GAS										
TO E-3-N	°F	776	1010	1019	1021	1013	1015	1013	1003	1004
FROM E-3-N	°F	200	300	310	313	309	314	312	311	312
BRINE	M#/HR	0	85.2	85.3	85.3	85.4	85.5	085.1	85.3	85.3
IC4 FROM P-1-E	M#/HR	0.1	107.7	109.5	109.3	116.1	111.0	109.9	109.4	109.2
IC4 TO T-1-E	M#/HR	0.2	0.1	0.1	0	0.2	0.2	0.3	0.3	0.2
IC4 TO E-3-N	M#/HR	015		015	015		015	015	0.5	015
SEP FLOW	GALS	290296	290296	0	0	0	0	0	0	0
GAS TO GE-1-N	#/HR	510	501.4	509.6	509.6	534.3	534.3	517.8	534.3	534.3
V-1-E	INCHES	42	50 3/4	4.5	45	41 1/2	42.5	41	42 1/4	41
REMARKS										

GEOPRESSURED HYBRID POWER SYSTEM - MANAGEMENT REPORT DATA

February 1-7, 1990

	UNITS	INST.#	1-Feb	1-Feb	1-Feb	2-Feb	2-Feb	2-Feb	3-Feb	6-Feb	6-Feb	7-Feb	7-Feb	7-Feb
			900	1700	100	900	1700	100	900	1700	100	900	1700	100
AMBIENT TEMP	°F		68	70	60	68	70	68	70	64	57	61	64	62
WET BULB TEMP	°F		67	63	59	68	69	68	70	63	57	97	61	62
POWER														
T-1-N GROSS	KW	JI-100	1	1	1	1	1	1	1	1	1	1	1	1
GE-1-N GROSS	KW		340	340	340	340	340	340	335	340	340	340	345	340
GE-2-N GROSS	KW		345	340	340	340	340	340	335	340	340	340	345	340
PARASITIC	KW	JI-101	188	177	178	177	180	176	187	171	173	171	17	180
NET SALE TO HL&P	KW		520	500	480	500	490	490	495	510	500	500	510	500
NET SALE TO HL&P	FDG		1503	1507	1511	1516	1520	1526	1528	1532	1535	1540	1544	1548
	KW-HR													
BRINE														
TO E-2-N	PSIG	PI-606	500	500	500	500	505	500	504	500	500	500	505	500
TO E-1-N	PSIG	PI-611	505	500	510	505	505	510	518	500	500	505	505	500
FROM E-1-N	PSIG	PI-106	495	495	495	494	496	500	497	494	510	495	496	500
ISOBUTANE														
IN V-1-E	PSIG	PG-130	61	59	58	62	64	58	61	60	58	60	61	60
OUT OF P-1-E	PSIG	PI-105	371	366	361	362	430	437	439	429	414	360	358	365
OUT OF E-1-N	PSIG	PI-602	275	275	275	275	270	270	277	270	280	305	305	305
OUT OF E-2-N	PSIG	PG-114	265	260	260	262	260	260	266	270	265	270	267	265
OUT OF E-3-N	PSIG	PI-615	285	285	285	275	265	265	270	270	275	275	271	270
INTO T-1-E	PSIG	PI-107	---	---	---	---	---	---	---	---	---	---	---	---
OUT OF T-1-E	PSIG	PI-108	---	---	---	---	---	---	---	---	---	---	---	---
TO OR 102	PSIG	PG-104	350	340	340	350	60	60	60	60	60	330	332	330
FROM OR 102	PSIG	PG-105	140	150	150	150	60	60	60	60	55	140	145	145
GAS														
TO E-3-N	PSIG	PI-614	0.9	0.9	0.9	0.6	0.9	1.0	0.9	0.9	1.0	1.0	1.0	1.0
BRINE														
TO E-2-N	°F	TI-101	297	297	298	129	297	297	298	298	298	297	297	297
TO E-1-N	°F	TR-113	---	---	---	---	---	---	---	---	---	---	---	---
FROM E-1-N	°F	TR-102	---	---	---	---	---	---	---	---	---	---	---	---

GEOPRESSURED HYBRID POWER SYSTEM - MANAGEMENT REPORT DATA

February 1-7, 1990

	UNITS	INST.#	1-Feb 900	1-Feb 1700	1-Feb 100	2-Feb 900	2-Feb 1700	2-Feb 100	3-Feb 900	6-Feb 1700	6-Feb 100	7-Feb 900	7-Feb 1700	7-Feb 100
ISOBUTANE														
IN V-1-E	°F	TI-104	97.0	94.6	93.9	98.3	99.7	95.8	97.3	96.8	93.9	95.0	96.2	96.3
OUT OF P-1-E	°F	TI-105	98.6	96.2	95.4	100.8	101.9	98.3	100.1	98.2	96.7	96.7	97.9	97.9
OUT OF E-1-N	°F	TR-112	---	---	---	---	---	---	---	---	---	---	---	---
OUT OF E-2-N	°F	TI-111	214	213	216	214	213	216	213	216	214	213	214	213
OUT OF E-3-N	°F	TI-603	205	205	205	205	205	204	206	205	208	206	207	206
INTO T-1-E	°F	TI-107	---	---	---	---	---	---	---	---	---	---	---	---
OUT OF T-1-E	°F	TI-108	---	---	---	---	---	---	---	---	---	---	---	---
GAS														
TO E-3-N	°F	TI-601	1015	1002	1010	1011	1007	1007	1010	1016	1019	1012	1013	1018
FROM E-3-N	°F	TI-602	319	314	318	320	318	320	323	285	294	295	297	302
BRINE														
IC4 FROM P-1-E	M#/HR	FI-100	85.2	84.7	85.3	85.2	85.2	85.0	85.2	87	87.2	86.9	872	86.8
IC4 FROM P-1-E	M#/HR	FI-102	110.4	109.7	108.7	109.6	68.2	68.2	67	107.5	54.9	112.9	112.4	112.3
IC4 TO T-1-E	M#/HR	FI-101	0.2	.3	.3	.2	.3	.2	0.2	.3	.2	0.3	.3	.3
IC4 TO E-3-N	M#/HR	FR-627	---	---	---	---	---	---	---	---	---	---	---	---
SEP FLOW	GALS	FQI-633	0	0	0	0	0	0	0	0	0	0		0
GAS TO GE-1-N	#/HR	FR-607	534.3	534.3	517.8	526.08	534.3	517.9	509.6	501.4	501.4	501.4	509.6	509.6
V-1-E	INCHES	LG-105	41	42	40	40.5	40.5	42	41.5	49.0	48	47	39.75	42

REMARKS

February 1-7 1990

	INST.#	29-Jan	29-Jan	29-Jan	30-Jan	30-Jan	30-Jan	31-Jan	31-Jan	31-Jan
		900	1700	100	900	1700	100	900	1700	100
AMBIENT TEMP		47	59	49	63	67	54	65	68	66
WET BULB TEMP		43	51	47	59	59	53	62	66	65
POWER										
T-1-N GROSS	JI-100	1	1	1	1	1	1	1	1	1
GE-1-N GROSS		350	345	345	340	348	345	340	345	345
GE-2-N GROSS		350	35	345	340	345	345	340	340	340
PARASITIC	JI-101	6	169	159	169	182	182	181	188	187
NET SALE TO HL&P		620	520	500	50	500	500	500	490	480
NET SALE TO HL&P		1463	1468	1472	1476	1481	1485	1490	1494	1499
BRINE										
TO E-2-N	PI-606	510	501	500	500	502	500	500	500	500
TO E-1-N	PI-611	520	502	510	505	501	505	505	500	510
FROM E-1-N	PI-106	520	493	497	494	491	494	495	495	495
ISOBUTANE										
IN V-1-E	PG-130	20	59	58	62	61	58	62	61	60
OUT OF P-1-E	PI-105	15	372	352	364	379	375	379	370	372
OUT OF E-1-N	PI-602	25	279	280	285	274	278	275	270	270
OUT OF E-2-N	PG-114	25	269	270	275	266	265	260	260	260
OUT OF E-3-N	PI-615	35	299	295	295	292	285	290	285	285
INTO T-1-E	PI-107	-30	-95	-95	015	-95	-95	015	15	-95
OUT OF T-1-E	PI-108	-53	-49	-49	015	-49	-49	015	15	-49
TO OR 102	PG-104	15	342	340	340	351	350	350	350	350
FROM OR 102	PG-105	0	140	140	140	139	140	140	140	140
GAS										
TO E-3-N	PI-614	0.4	0.8	1	0.8	0.8	0.7	0.8	0.9	1
BRINE										
TO E-2-N	TI-101	269	297	297	297	297	297	297	297	297
TO E-1-N	TR-113	0.5		0.15	015		0.15	015	0.5	015
FROM E-1-N	TR-102	0.5		0.15	015		0.15	015	0.5	015

February 1-7 1990

[illegible]

REMARKS

GEOPRESSURED HYBRID POWER SYSTEM - MANAGEMENT REPORT DATA

February 8-11, 1990

	UNITS	INST.#	8-Feb	8-Feb	8-Feb	9-Feb	9-Feb	9-Feb	10-Feb	10-Feb	10-Feb	11-Feb	11-Feb	11-Feb
			900	1700	100	900	1700	100	900	1700	100	900	1700	100
AMBIENT TEMP	°F		67	68	67	72	70	58	58	62	49	58	73	52
WET BULB TEMP	°F		67	68	67	70	69	54	54	55	49	55	59	52
POWER														
T-1-N GROSS	KW	JI-100	1	2	0	0	1	1	1	1	1	1	1	1
GE-1-N GROSS	KW		340	340	340	340	340	340	350	340	340	350	340	350
GE-2-N GROSS	KW		340	340	340	340	340	340	350	350	340	350	340	350
PARASITIC	KW	JI-101	180	193	193	187	187	189	183	181	173	182	181	182
NET SALE TO HL&P	KW		500	485	480	480	485	500	520	510	480	520	510	500
NET SALE TO HL&P	FDG		1553	1556	1561	1566	1570	1574	1579	1583	1587	1592	1596	1601
	KW-HR													
BRINE														
TO E-2-N	PSIG	PI-606	500	500	510	505	500	500	510	500	500	500	500	505
TO E-1-N	PSIG	PI-611	505	500	510	510	500	500	520	500	510	510	500	510
FROM E-1-N	PSIG	PI-106	495	497	500	490	492	500	495	495	500	491	490	500
ISOBUTANE														
IN V-1-E	PSIG	PG-130	62	59	60	60	62	56	54	58	56	56	59	58
OUT OF P-1-E	PSIG	PI-105	368	365	364	370	365	349	350	336	349	357	366	365
OUT OF E-1-N	PSIG	PI-602	305	305	305	305	305	300	305	305	300	310	310	300
OUT OF E-2-N	PSIG	PG-114	265	270	265	265	265	260	265	270	265	270	270	260
OUT OF E-3-N	PSIG	PI-615	275	275	275	275	270	270	275	275	270	270	275	270
INTO T-1-E	PSIG	PI-107	---	---	---	-095	---	---	---	---	---	---	---	---
OUT OF T-1-E	PSIG	PI-108	---	---	---	-048	---	---	---	---	---	---	---	---
TO OR 102	PSIG	PG-104	330	330	330	340	335	330	330	330	330	330	340	330
FROM OR 102	PSIG	PG-105	145	150	140	140	145	140	140	140	145	140	150	140
GAS														
TO E-3-N	PSIG	PI-614	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
BRINE			297											
TO E-2-N	°F	TI-101	297	297	297	297	297	297	297	298	298	298	297	298
TO E-1-N	°F	TR-113	---	---	---	---	---	---	---	---	---	---	---	---
FROM E-1-N	°F	TR-102	---	---	---	---	---	---	---	---	---	---	---	---

February 8-11, 1990

REMARKS

February 12-14 1990

	INST.#	12-Feb	12-Feb	12-Feb	13-Feb	13-Feb	13-Feb	14-Feb	14-Feb	14-Feb
		900	1700	100	900	1700	100	900	1700	100
AMBIENT TEMP		64	66	58	71	68	64	70	71	68
WET BULB TEMP		61	60	56	66	65	64	68	69	67
POWER										
T-1-N GROSS	JI-100	1	1	1	0	1	1	1	1	1
GE-1-N GROSS		340	340	340	340	340	340	340	335	340
GE-2-N GROSS		340	340	340	340	340	340	340	335	340
PARASITIC	JI-101	172	202	202	200	206	187	186	205	205
NET SALE TO HL&P		500	480	480	480	470	480	500	480	460
NET SALE TO HL&P		1605	1609	1613	1618	1622	1626	1630	1635	1639
BRINE										
TO E-2-N	PI-608	505	500	500	505	500	500	505	501	500
TO E-1-N	PI-611	510	505	510	505	500	505	505	502	510
FROM E-1-N	PI-106	497	493	500	494	491	500	496	493	500
ISOBUTANE										
IN V-1-E	PG-130	59	64	62	65	58	60	59	59	58
OUT OF P-1-E	PI-105	348	364	361	372	363	360	357	369	365
OUT OF E-1-N	PI-602	310	305	300	300	305	305	305	280	280
OUT OF E-2-N	PG-114	270	265	260	265	265	265	265	265	270
OUT OF E-3-N	PI-615	275	275	275	270	275	275	270	272	275
INTO T-1-E	PI-107	---	---	---	---	---	---	---	---	---
OUT OF T-1-E	PI-108	---	---	---	---	---	---	---	---	---
TO OR 102	PG-104	330	330	340	335	330	330	340	332	330
FROM OR 102	PG-105	140	150	150	145	145	140	145	142	140
GAS										
TO E-3-N	PI-614	1.0	1.0	1.0	1.2	1.2	1.2	1.2	1.4	1.2
BRINE										
TO E-2-N	TI-101	298	297	297	297	297	297	297	298	298
TO E-1-N	TR-113	---	---	---	---	207	207	207	210	207
FROM E-1-N	TR-102	---	---	---	---	145	144	144	144	144

February 12-14, 1990

	UNITS	12-Feb	12-Feb	12-Feb	13-Feb	13-Feb	13-Feb	14-Feb	14-Feb	14-Feb
		900	1700	100	900	1700	100	900	1700	100
ISOBUTANE										
IN V-1-E	°F	94.0	99.2	97.0	100.0	91.3	95.0	95.3	94.2	93.6
OUT OF P-1-E	°F	96.5	101.5	99.1	102.5	91.0	96.8	97.1	96.1	95.4
OUT OF E-1-N	°F	---	---	---	---	199	199	199	199	199
OUT OF E-2-N	°F	214	215	216	219	214	213	213	215	214
OUT OF E-3-N	°F	207	206	206	205	206	206	206	207	206
INTO T-1-E	°F	---	---	---	---	---	---	---	---	---
OUT OF T-1-E	°F	---	---	---	---	---	---	---	---	---
GAS										
TO E-3-N	°F	1018	1005	1013	1012	1009	1013	1012	1008	1012
FROM E-3-N	°F	328	322	328	330	327	332	329	329	335
BRINE	M#/HR	86.6	86.8	86.9	86.7	86.9	87.1	86.9	87	87.1
IC4 FROM P-1-E	M#/HR	113.6	111.9	111.9	109.3	110.4	113.6	110.3	110	113.2
IC4 TO T-1-E	M#/HR	.3	.9	.4	.4	.4	.4	.3	.4	.3
IC4 TO E-3-N	M#/HR	---	---	---	---	6.9	7.6	5.3	9.3	10.2
SEP FLOW	GALS	0	0	0	0	0	0	0	---	0
GAS TO GE-1-N	#/HR	550.7	542.5	542.5	534.3	545.4	539.8	544.9	539.8	545.9
V-1-E	INCHES	37	35	35	35	39	38	38.5	37	37

REMARKS

GEOPRESSURED HYBRID POWER SYSTEM - MANAGEMENT REPORT DATA

February 15-18, 1990

	UNITS	INST.#	15-Feb 900	15-Feb 1700	15-Feb 100	16-Feb 900	16-Feb 1700	16-Feb 100	17-Feb 900	17-Feb 1700	17-Feb 100	18-Feb 900	18-Feb 1700	18-Feb 100
AMBIENT TEMP	°F		69	76	70	57	63	54	51	54	52	51	53	54
WET BULB TEMP	°F		68	72	69	47	51	47	45	46	46	49	53	53
POWER														
T-1-N GROSS	KW	JI-100	1	1	1	0	1	1	1	1	1	1	1	1
GE-1-N GROSS	KW		340	330	335	350	350	350	350	350	350	350	350	350
GE-2-N GROSS	KW		340	330	330	350	350	350	350	350	350	350	350	350
PARASITIC	KW	JI-101	194	194	204	168	168	158	168	171	181	181	158	168
NET SALE TO HL&P	KW		470	470	460	510	530	500	515	510	470	490	520	500
NET SALE TO HL&P	FDG		1643	1647	1651	1656	1660	1664	1669	1673	1678	1682	1687	1691
	KW-HR													
BRINE														
TO E-2-N	PSIG	PI-606	505	505	505	502	520	510	504	505	500	502	500	500
TO E-1-N	PSIG	PI-611	505	510	505	508	520	510	508	510	500	503	505	510
FROM E-1-N	PSIG	PI-106	496	493	494	496	493	494	496	493	492	496	498	495
ISOBUTANE														
IN V-1-E	PSIG	PG-130	58	60	59	58	60	59	57	56	56	55	62	62
OUT OF P-1-E	PSIG	PI-105	362	358	354	342	342	354	349	346	352	354	357	358
OUT OF E-1-N	PSIG	PI-602	280	285	285	278	280	230	274	285	280	280	280	285
OUT OF E-2-N	PSIG	PG-114	260	270	265	265	270	365	261	270	265	266	268	270
OUT OF E-3-N	PSIG	PI-615	270	275	270	271	280	280	269	285	275	273	275	280
INTO T-1-E	PSIG	PI-107	---	-95	---	---	-95	---	---	-95	---	-95	-95	---
OUT OF T-1-E	PSIG	PI-108	---	-49	---	---	-49	---	---	49	---	-49	-49	---
TO OR 102	PSIG	PG-104	335	335	330	332	330	330	334	325	330	328	330	330
FROM OR 102	PSIG	PG-105	145	145	145	148	150	150	148	140	140	141	140	140
GAS														
TO E-3-N	PSIG	PI-614	1.2	1.2	1.2	1.5	1.5	1.5	1.5	1.6	1.3	1.6	1.6	1.6
BRINE														
TO E-2-N	°F	TI-101	297	297	297	297	298	298	297	297	298	297	297	298
TO E-1-N	°F	TR-113	207	208	206	207	208	206	206	206	206	206	206	211
FROM E-1-N	°F	TR-102	144	145	140	144	147	---	143	143	---	113	143	147

February 15-18, 1990

[illegible]

February 19-21, 1990

	INST.#	19-Feb 900	19-Feb 1700	19-Feb 100	20-Feb 900	20-Feb 1700	20-Feb 100	21-Feb 900	21-Feb 1700	21-Feb 100
AMBIENT TEMP		56	62	53	54	59	60	64	54	50
WET BULB TEMP		54	57	50	54	55	50	64	53	49
POWER										
T-1-N GROSS	JI-100	1	1	430	431	539	523	514	547	564
GE-1-N GROSS		350	350	350	350	350	350	350	350	30
GE-2-N GROSS		350	350	350	350	350	350	340	350	350
PARASITIC	JI-101	168	180	237	238	242	253	251	263	245
NET SALE TO HL&P		500	520	840	820	950	930	920	950	980
NET SALE TO HL&P		1696	1700	1707	1714	1722	1730	1739	1747	1755
BRINE										
TO E-2-N	PI-606	500	500	500	505	490	490	500	500	505
TO E-1-N	PI-611	505	505	500	505	490	490	490	495	495
FROM E-1-N	PI-106	496	494	485	496	484	482	480	485	484
ISOBUTANE										
IN V-1-E	PG-130	61	59	45	44	51	55	58	51	50
OUT OF P-1-E	PI-105	361	358	410	413	356	361	361	355	347
OUT OF E-1-N	PI-602	285	290	285	285	310	310	310	315	315
OUT OF E-2-N	PG-114	270	275	265	270	280	280	280	280	280
OUT OF E-3-N	PI-615	275	285	275	275	305	290	285	285	290
INTO T-1-E	PI-107	---	---	---	262	267	265	265	266	268
OUT OF T-1-E	PI-108	---	---	---	---	56	58	60	55	52
TO OR 102	PG-104	330	330	40	40	50	50	55	50	50
FROM OR 102	PG-105	145	145	40	40	50	50	55	50	50
GAS										
TO E-3-N	PI-614	1.6	1.4	1.4	1.4	1.5	1.4	1.4	1.4	1.4
BRINE										
TO E-2-N	TI-101	298	298	297	297	297	297	297	297	298
TO E-1-N	TR-113	211	211	211	211	216	216	216	215	215
FROM E-1-N	TR-102	147	147	---	142	147	147	147	145	143

February 19-21, 1990

	UNITS	19-Feb	19-Feb	19-Feb	20-Feb	20-Feb	20-Feb	21-Feb	21-Feb	21-Feb
		900	1700	100	900	1700	100	900	1700	100
ISOBUTANE										
IN V-1-E	°F	96.9	96.2	81.9	080.3	89.5	91.5	93.8	88.0	85.7
OUT OF P-1-E	°F	99.7	98	83.2	81.6	90.7	92.9	95.4	89.8	86.6
OUT OF E-1-N	°F	201	206	191	201	211	211	206	210	209
OUT OF E-2-N	°F	215	221	216	217	220	221	220	220	218
OUT OF E-3-N	°F	208	210	207	207	210	210	211	210	212
INTO T-1-E	°F	- - -	- - -	- - -	- - -	219	221	220	220	219
OUT OF T-1-E	°F	- - -	- - -	123	123	132	134	135	130	127
GAS										
TO E-3-N	°F	1021	1016	1007	1007	1008	1009	1001	1012	1018
FROM E-3-N	°F	350	350	346	346	348	350	345	354	361
BRINE										
IC4 FROM P-1-E	M#/HR	90.3	90.8	100.3	100.1	142.5	142.3	143.3	141.8	142.5
IC4 TO T-1-E	M#/HR	112.8	112	63.8	70.7	114.4	111.5	112.1	112.3	114.4
IC4 TO T-1-E	M#/HR	.3	.3	83.7	83.0	118.3	118.2	118.0	118.1	118.5
IC4 TO E-3-N	M#/HR	10.4	10.0	9.3	9.6	9.3	11.1	9.8	12.0	9.6
SEP FLOW	GALS	0	0	- - -	0	- - -	- - -	0	0	0
GAS TO GE-1-N	#/HR	494.4	494.4	556.2	545.9	535.6	535.6	525.3	537.7	535.6
V-1-E	INCHES	35	36	37	37	37	36.25	36.25	35.5	35
REMARKS										

GEOPRESSURED HYBRID POWER SYSTEM - MANAGEMENT REPORT DATA

February 22-25, 1990

	UNITS	INST.#	22-Feb 900	22-Feb 1700	22-Feb 100	23-Feb 900	23-Feb 1700	23-Feb 100	24-Feb 900	24-Feb 1700	24-Feb 100	25-Feb 900	25-Feb 1700	25-Feb 100
AMBIENT TEMP	°F		59	67	48	51	67	49	60	75	53	58	69	61
WET BULB TEMP	°F		56	54	45	44	66	44	54	58	49	54	56	59
POWER														
T-1-N GROSS	KW	J1-100	542	537	579	0	0	1	1	0	1	0	0	0
GE-1-N GROSS	KW		350	350	350	0	345	350	350	345	350	350	340	350
GE-2-N GROSS	KW		340	345	350	335	345	350	350	345	350	350	340	350
PARASITIC	KW	J1-101	254	253	257	178	157	157	156	183	171	170	170	170
NET SALE TO HL&P	KW		950	945	950	200	525	520	540	505	520	520	515	520
NET SALE TO HL&P	FDG		1762	1769	1778	1784	1786	1790	1795	1799	1803	1808	1812	1818
	KW-HR													
BRINE														
TO E-2-N	PSIG	PI-606	500	507	500	505	508	505	510	506	500	500	505	500
TO E-1-N	PSIG	PI-611	490	497	500	515	511	515	510	509	510	510	505	505
FROM E-1-N	PSIG	PI-106	486	485	486	506	494	497	505	496	494	500	494	497
ISOBUTANE														
IN V-1-E	PSIG	PG-130	52	52	46	54	61	58	62	57	54	56	57	59
OUT OF P-1-E	PSIG	PI-105	351	354	340	399	352	355	354	355	356	356	368	366
OUT OF E-1-N	PSIG	PI-602	310	308	310	155	270	285	280	283	282	280	279	280
OUT OF E-2-N	PSIG	PG-114	280	276	280	150	259	270	270	272	270	270	267	270
OUT OF E-3-N	PSIG	PI-615	285	283	285	155	266	280	275	277	282	280	272	275
INTO T-1-E	PSIG	PI-107	267	265	265	45	2	0	3	4	0	2	2	1
OUT OF T-1-E	PSIG	PI-108	55	55	47	47	11	11	14	12	11	14	11	11
TO OR 102	PSIG	PG-104	50	50	50	380	338	330	335	330	330	330	332	330
FROM OR 102	PSIG	PG-105	50	50	50	160	148	150	150	141	145	140	142	145
GAS														
TO E-3-N	PSIG	PI-614	1.4	1.4	1.4	1.1	1.4	1.5	1.4	.5	.4	.6	.4	.4
BRINE														
TO E-2-N	°F	TI-101	298	297	298	297	297	296	297	298	298	298	297	297
TO E-1-N	°F	TR-113	215	214	214	154	013	211	209	210	209	209	208	209
FROM E-1-N	°F	TR-102	142	145	140	116	193	146	148	143	142	142	145	146

February 22-25, 1990

REMARKS

February 26-28, 1990

	INST.#	26-Feb 900	26-Feb 1700	26-Feb 100	27-Feb 900	27-Feb 1700	27-Feb 100	28-Feb 900	28-Feb 1700	28-Feb 100
AMBIENT TEMP		66	67	60	68	67	64	70	68	53
WET BULB TEMP		60	62	58	64	63	63	67	66	51
POWER										
T-1-N GROSS	JI-100	0	0	0	0	0	0	483	516	551
GE-1-N GROSS		350	350	350	350	350	350	350	340	350
GE-2-N GROSS		350	350	350	350	350	350	350	345	350
PARASITIC	JI-101	169	180	181	169	180	190	240	252	256
NET SALE TO HL&P		520	535	510	510	520	152	900	900	960
NET SALE TO HL&P		1821	1826	1831	1835	1840	1844	1849	1857	1865
BRINE										
TO E-2-N	PI-606	505	502	502	505	505	505	500	505	500
TO E-1-N	PI-611	505	503	505	505	505	505	500	490	490
FROM E-1-N	PI-106	500	497	495	496	495	497	487	481	485
ISOBUTANE										
IN V-1-E	PG-130	60	60	59	62	62	60	56	59	48
OUT OF P-1-E	PI-105	368	367	359	367	364	354	378	353	341
OUT OF E-1-N	PI-602	280	279	278	275	280	260	285	315	310
OUT OF E-2-N	PG-114	265	266	265	265	265	270	265	280	280
OUT OF E-3-N	PI-615	275	274	278	270	275	270	270	290	290
INTO T-1-E	PI-107	2	2	1	3	2	44	276	269	264
OUT OF T-1-E	PI-108	12	11	11	13	12	46	58	61	52
TO OR 102	PG-104	330	335	335	335	335	330	55	60	50
FROM OR 102	PG-105	145	142	150	145	145	150	55	60	50
GAS										
TO E-3-N	PI-614	.4	.4	.4	.4	.4	.4	.4	.4	.4
BRINE										
TO E-2-N	TI-101	297	297	297	297	297	297	297	297	297
TO E-1-N	TR-113	208	208	208	209	209	206	216	215	214
FROM E-1-N	TR-102	145	146	146	148	148	145	148	149	145

February 26-28, 1990

	UNITS	26-Feb	26-Feb	26-Feb	27-Feb	27-Feb	27-Feb	28-Feb	28-Feb	28-Feb
		900	1700	100	900	1700	100	900	1700	100
ISOBUTANE										
IN V-1-E	°F	95.5	95.8	96.4	97.7	98.0	97.3	92.5	95.4	86.2
OUT OF P-1-E	°F	97.1	97.4	97.9	99.7	99.8	98.9	94.2	96.8	88
OUT OF E-1-N	°F	200	199	199	201	200	197	211	210	209
OUT OF E-2-N	°F	218	217	217	220	218	213	222	220	221
OUT OF E-3-N	°F	206	207	206	206	2106	204	2106	214	211
INTO T-1-E	°F	72	73	66	74	73	75	218	214	214
OUT OF T-1-E	°F	71	73	68	73	74	87	133	134	130
GAS										
TO E-3-N	°F	1010	1005	1013	1008	1007	1007	1004	1007	1007
FROM E-3-N	°F	317	325	331	329	330	330	337	340	343
BRINE	M#/HR	84.4	84.2	84.1	84.2	84.3	84.2	123.5	141	141.4
IC4 FROM P-1-E	M#/HR	80.6	90.6	95.4	86.2	094.7	097.6	62.9	110.2	104
IC4 TO T-1-E	M#/HR	.3	.3	.2	.3	.2	.9	100.7	117.1	116.0
IC4 TO E-3-N	M#/HR	10.1	10.3	10.6	9.8	10.3	10.2	10.6	11.1	10.9
SEP FLOW	GALS	0	---	---	---	---	---	0	0	0
GAS TO GE-1-N	#/HR	502.7	514.0	509.9	514.0	513.0	523.3	515.0	517.1	516.1
V-1-E	INCHES	32	32.25	32	32	32	31.75	33	32.5	32.5

REMARKS

GEOPRESSURED HYBRID POWER SYSTEM - MANAGEMENT REPORT DATA

March 1-4, 1990

	UNITS	INST.#	1-Mar 900	1-Mar 1700	1-Mar 100	2-Mar 900	2-Mar 1700	2-Mar 100	3-Mar 900	3-Mar 1700	3-Mar 100	4-Mar 900	4-Mar 1700	4-Mar 100
AMBIENT TEMP	°F		47	49	46	46	58	50	51	67	48	57	67	58
WET BULB TEMP	°F		47	49	44	44	51	47	47	58	48	53	59	54
POWER														
T-1-N GROSS	KW	JI-100	566	555	571	569	559	569	561	0	0	0	0	520
GE-1-N GROSS	KW		350	350	350	350	350	350	350	340	350	350	345	345
GE-2-N GROSS	KW		350	350	350	350	350	350	350	340	350	350	345	340
PARASITIC	KW	JI-101	246	245	246	29	244	244	245	6	16	16	36	253
NET SALE TO HL&P	KW		980	950	960	950	975	960	945	630	640	650	625	920
NET SALE TO HL&P	FDG		1874	1882	1890	1899	1907	1915	1925	1930	1934	1941	1947	1953
	KW-HR													
BRINE														
TO E-2-N	PSIG	PI-606	500	505	500	500	500	500	501	518	515	517	520	500
TO E-1-N	PSIG	PI-611	490	490	490	495	490	490	498	527	520	522	530	490
FROM E-1-N	PSIG	PI-106	483	487	480	485	482	480	487	516	520	521	517	481
ISOBUTANE														
IN V-1-E	PSIG	PG-130	48	47	46	46	50	50	47	31	24	22	28	52
OUT OF P-1-E	PSIG	PI-105	313	353	349	351	349	352	357	30	18	16	25	350
OUT OF E-1-N	PSIG	PI-602	310	285	290	290	295	290	284	35	25	25	30	285
OUT OF E-2-N	PSIG	PG-114	280	275	280	280	285	280	278	30	25	25	30	275
OUT OF E-3-N	PSIG	PI-615	290	285	290	290	290	290	285	36	25	25	5	10
INTO T-1-E	PSIG	PI-107	266	264	267	266	270	271	264	29	21	22	29	266
OUT OF T-1-E	PSIG	PI-108	49	51	49	48	53	51	50	29	21	23	29	55
TO OR 102	PSIG	PG-104	45	45	45	45	50	50	46	31	20	20	25	50
FROM OR 102	PSIG	PG-105	45	45	45	45	50	50	46	31	20	20	25	50
GAS														
TO E-3-N	PSIG	PI-614	0.4	0.4	0.4	0.3	0.4	0.8	0.4	.0	.0	.0	.0	.0
BRINE														
TO E-2-N	°F	TI-101	297	297	297	297	297	298	298	271	267	267	265	298
TO E-1-N	°F	TR-113	215	214	215	215	214	215	92	77	66	60	64	213
FROM E-1-N	°F	TR-102	145	143	142	142	144	143	91	75	68	68	65	149

GEOPRESSURED HYBRID POWER SYSTEM - MANAGEMENT REPORT DATA

March 1-4, 1990

	UNITS	INST.#	1-Mar 900	1-Mar 1700	1-Mar 100	2-Mar 900	2-Mar 1700	2-Mar 100	3-Mar 900	3-Mar 1700	3-Mar 100	4-Mar 900	4-Mar 1700	4-Mar 100
ISOBUTANE														
IN V-1-E	°F	TI-104	83.0	83.5	82.1	81.5	84.8	94.5	83.2	68.9	55.5	53.3	62.7	88.7
OUT OF P-1-E	°F	TI-105	84.7	85	84	83.3	86.4	96.5	85.2	74	51.1	52.5	81.7	90.1
OUT OF E-1-N	°F	TR-112	209	209	211	209	210	202	208	068	055	060	074	211
OUT OF E-2-N	°F	TI-111	219	219	219	220	219	216	219	103	62	60	77	218
OUT OF E-3-N	°F	TI-603	211	212	212	212	214	208	211	121	118	113	95	74
INTO T-1-E	°F	TI-107	213	212	213	214	214	053	213	73	54	57	069	212
OUT OF T-1-E	°F	TI-108	127	127	126	128	126	053	127	86	55	57	071	130
GAS														
TO E-3-N	°F	TI-601	1010	999	1006	1007	1016	1023	1018	783	799	797	768	754
FROM E-3-N	°F	TI-602	346	343	351	352	361	298	360	261	309	313	292	212
BRINE														
IC4 FROM P-1-E	M#/HR	FI-100	141.1	141.0	140.2	140.8	140.8	88.1	137.1	.2	.0	.0	.1	147.6
IC4 TO T-1-E	M#/HR	FI-102	108.4	109.6	111.6	112.1	115.1	110.8	111.1	21.2	.2	.1	.0	107.8
IC4 TO T-1-E	M#/HR	FI-101	116.0	115.6	115.8	115.6	116.2	.2	115.1	.4	.5	1.2	.3	112.8
IC4 TO E-3-N	M#/HR	FR-627	10.3	10.1	10.6	10.6	10.8	11.1	10.2	0.0	0.0	0.0	0.0	0.0
SEP FLOW	GALS	FQI-633	0	0	0	0	0	0	0	0	0	0	0	0
GAS TO GE-1-N	#/HR	FR-607	521.2	516.1	515.0	515.0	515.0	506.8	508.9	513.0	525.3	522.2	510.9	513.0
V-1-E	INCHES	LG-105	32	32	31.5	31.75	31.5	33.5	31.25	32	36	42	44-45	33.5

REMARKS

March 5-6, 1990

	INST.#	5-Mar 900	5-Mar 1700	5-Mar 2100	5-Mar 100	5-Mar 500	6-Mar 900	6-Mar 1300	6-Mar 1700	6-Mar 2100	6-Mar 100	6-Mar 500
AMBIENT TEMP		66	67	62	63	63	69	73	69	68	68	67
WET BULB TEMP		60	62	60	60	61	66	69	66	66	66	66
POWER												
T-1-N GROSS	J1-100	527	515	520	510	519	0	491	0	499	0	0
GE-1-N GROSS		0	340	340	345	340	340	345	345	340	340	340
GE-2-N GROSS		0	340	340	340	340	345	0	340	345	340	320
PARASITIC	J1-101	252	249	252	242	251	233	249	230	241	223	231
NET SALE TO HL&P		305	910	920	900	900	640	595	460	890	460	430
NET SALE TO HL&P		1958	1962	1965	1970	1973	1977	1980	1981	1985	1987	1989
BRINE												
TO E-2-N	PI-606	505	500	500	500	500	502	502	500	505	505	505
TO E-1-N	PI-611	490	490	490	490	490	502	489	500	490	505	505
FROM E-1-N	PI-106	481	483	481	480	480	493	481	492	481	494	494
ISOBUTANE												
IN V-1-E	PG-130	55	56	56	56	56	53	58	54	60	59	54
OUT OF P-1-E	PI-105	353	353	344	342	334	287	376	435	358	430	430
OUT OF E-1-N	PI-602	290	285	285	290	290	276	295	285	295	275	275
OUT OF E-2-N	PG-114	280	275	275	280	280	270	277	215	275	265	265
OUT OF E-3-N	PI-615	0	280	280	290	290	276	282	285	285	275	270
INTO T-1-E	PI-107	267	263	266	263	268	53	268	54	264	58	53
OUT OF T-1-E	PI-108	57	58	59	59	60	53	61	54	63	59	54
TO OR 102	PG-104	52	55	55	55	55	49	57	50	60	55	500
FROM OR 102	PG-105	52	55	50	55	55	0	57	50	60	55	500
GAS												
TO E-3-N	PI-614	.0	.3	.3	.3	.3	.2	.1	.1	.1	.2	0.2
BRINE												
TO E-2-N	TI-101	298	297	297	297	297	297	297	297	297	297	297
TO E-1-N	TR-113	215	213	213	214	214	210	213	210	213	209	200
FROM E-1-N	TR-102	152	146	145	146	146	143	150	148	148	145	144

March 5-6, 1990

	UNITS	5-Mar	5-Mar	5-Mar	5-Mar	5-Mar	6-Mar	6-Mar	6-Mar	6-Mar	6-Mar	6-Mar
		900	1700	2100	100	500	900	1300	1700	2100	100	500
ISOBUTANE												
IN V-1-E	°F	90.6	92.1	92.1	92.3	93.4	88.9	96.1	89.7	95.8	94.4	89.4
OUT OF P-1-E	°F	92.3	93.3	93.5	93.8	94.8	90.7	94.4	91.3	97.4	97.0	91.6
OUT OF E-1-N	°F	217	213	208	210	209	213	210	205	209	200	200
OUT OF E-2-N	°F	221	219	218	217	219	218	221	215	219	216	216
OUT OF E-3-N	°F	- - -	210	210	210	210	228	210	210	210	206	206
INTO T-1-E	°F	214	212	212	211	213	96	213	103	212	100	96
OUT OF T-1-E	°F	133	133	131	132	133	171	135	168	135	164	163
GAS												
TO E-3-N	°F	154	993	1014	1018	1017	1016	949	938	1009	1007	991
FROM E-3-N	°F	64	266	279	283	288	316	257	236	295	294	294
BRINE	M#/HR	153.4	139.1	139	136.6	140.8	91.3	141.2	97.2	141.8	88.5	88.7
IC4 FROM P-1-E	M#/HR	111.7	113.3	114.9	113.8	114.7	66.2	109.5	87.8	115.4	82.1	74.4
IC4 TO T-1-E	M#/HR	116.2	118.4	118.8	118.2	119.1	1.0	113.0	1.3	120.6	.9	1.2
IC4 TO E-3-N	M#/HR	0.0	0.0	11.4	11.0	11.1	8.7	0.5	.1	10.9	9.8	10.4
SEP FLOW	GALS	0	0	0	0	0	0	0	0	0	0	0
GAS TO GE-1-N	#/HR	126.7	414.4	485.2	490.3	485.2	486.2	249.3	502.7	498.6	490	499
V-1-E	INCHES	33.5	31.5	31	31	31	32	30.25	31.5	30.5	28	32
FLOW												
REMARKS												

March 7, 1990

	INST.#	7-Mar	7-Mar	7-Mar	7-Mar	7-Mar	7-Mar					
		900	1300	1700	2100	100	500					
AMBIENT TEMP		70	75	71	69	69	69					
WET BULB TEMP		68	71	68	67	67	68					
POWER												
T-1-N GROSS	JI-100	0	482	494	497	502	507					
GE-1-N GROSS		340	340	345	345	345	340					
GE-2-N GROSS		340	340	345	350	350	340					
PARASITIC	JI-101	213	239	250	251	240	240					
NET SALE TO HL&P		470	850	900	900	900	900					
NET SALE TO HL&P		1991	1994	1998	2002	2006	2010					
BRINE												
TO E-2-N	PI-606	505	500	502	502	500	500					
TO E-1-N	PI-611	502	495	491	492	485	490					
FROM E-1-N	PI-106	493	482	481	482	480	482					
ISOBUTANE												
IN V-1-E	PG-130	56	58	60	60	60	60					
OUT OF P-1-E	PI-105	442	359	354	355	356	352					
OUT OF E-1-N	PI-602	275	297	298	295	300	300					
OUT OF E-2-N	PG-114	265	280	280	277	280	280					
OUT OF E-3-N	PI-615	270	294	286	282	285	285					
INTO T-1-E	PI-107	57	270	267	264	265	266					
OUT OF T-1-E	PI-108	60	63	63	63	63	64					
TO OR 102	PG-104	50	55	60	60	60	60					
FROM OR 102	PG-105	50	55	60	60	60	60					
GAS												
TO E-3-N	PI-614	.1	.4	.2	.3	.2	.2					
BRINE												
TO E-2-N	TI-101	297	297	297	297	298	298					
TO E-1-N	TR-113	208	214	216	213	214	214					
FROM E-1-N	TR-102	143	147	154	147	148	147					

March 7, 1990

	UNITS	7-Mar	7-Mar	7-Mar	7-Mar	7-Mar	7-Mar					
		900	1300	1700	2100	100	500					
ISOBUTANE												
IN V-1-E	°F	82.0	93.1	96.6	96.5	96.8	96.5					
OUT OF P-1-E	°F	94.9	96.7	98.1	98.1	98.3	98.2					
OUT OF E-1-N	°F	200	210	210	209	209	210					
OUT OF E-2-N	°F	217	221	220	219	219	219					
OUT OF E-3-N	°F	206	211	211	211	211	211					
INTO T-1-E	°F	101	214	213	212	213	212					
OUT OF T-1-E	°F	165	136	135	135	135	135					
GAS												
TO E-3-N	°F	1013	1016	1007	1010	1021	1019					
FROM E-3-N	°F	302	307	305	307	315	318					
BRINE	M#/HR	88.4	132.4	140.4	142.3	142.1	141.8					
IC4 FROM P-1-E	M#/HR	71.5	109.7	112.8	115.2	115.0	116.8					
IC4 TO T-1-E	M#/HR	1.4	110.6	116.3	120.2	120.3	120.4					
IC4 TO E-3-N	M#/HR	10.5	11.3	11.0	11.0	11.2	11.1					
SEP FLOW	GALS	0	0	0	0	0	0					
GAS TO GE-1-N	#/HR	494.4	493.4	30.25	500.6	499.6	500.6					
V-1-E	INCHES	32	33.5	30.25	29.75	29.5	29.5					

REMARKS

GEOPRESSURED HYBRID POWER SYSTEM - MANAGEMENT REPORT DATA

March 8-11, 1990

	UNITS	INST.#	8-Mar	8-Mar	8-Mar	9-Mar	9-Mar	9-Mar	10-Mar	10-Mar	10-Mar	11-Mar	11-Mar	11-Mar
			900	1700	100	900	1700	100	900	1700	100	900	1700	100
AMBIENT TEMP	°F		75	72	67	71	73	69	74	74	69	74	73	70
WET BULB TEMP	°F		71	70	67	70	70	69	71	70	67	71	70	69
POWER														
T-1-N GROSS	KW	J1-100	500	491	501	499	498	501	501	493	500	501	491	499
GE-1-N GROSS	KW		340	340	340	340	340	340	340	340	340	340	340	340
GE-2-N GROSS	KW		340	330	340	340	340	335	340	340	340	340	340	340
PARASITIC	KW	J1-101	240	240	252	248	239	252	250	239	250	240	241	240
NET SALE TO HL&P	KW		890	880	900	890	880	890	900	880	895	900	900	890
NET SALE TO HL&P	FDG		2014	2022	2029	2037	2045	2053	2061	2069	2076	2084	2092	2100
	KW-HR													
BRINE														
TO E-2-N	PSIG	PI-606	500	500	500	500	500	500	505	505	500	505	510	500
TO E-1-N	PSIG	PI-611	495	490	490	492	490	490	495	490	490	495	490	490
FROM E-1-N	PSIG	PI-106	482	480	480	479	476	480	480	479	481	479	478	478
ISOBUTANE														
IN V-1-E	PSIG	PG-130	60	60	60	58	63	61	60	62	60	61	62	61
OUT OF P-1-E	PSIG	PI-105	355	356	343	348	356	346	345	363	345	334	358	355
OUT OF E-1-N	PSIG	PI-602	300	295	300	298	300	300	298	295	300	298	300	300
OUT OF E-2-N	PSIG	PG-114	280	280	275	280	280	280	280	280	280	280	280	280
OUT OF E-3-N	PSIG	PI-615	290	275	290	290	285	290	292	285	290	295	285	290
INTO T-1-E	PSIG	PI-107	266	265	264	263	266	266	266	264	264	265	264	267
OUT OF T-1-E	PSIG	PI-108	65	64	63	64	65	64	65	65	64	65	66	65
TO OR 102	PSIG	PG-104	60	60	60	60	60	60	60	60	60	60	60	60
FROM OR 102	PSIG	PG-105	60	60	60	60	60	60	60	60	60	60	60	60
GAS														
TO E-3-N	PSIG	PI-614	.4	.4	.1	.4	.3	.2	.4			.4	.1	.1
BRINE														
TO E-2-N	°F	TI-101	298	297	298	297	297	297	297	297	297	297	297	298
TO E-1-N	°F	TR-113	214	214	214	214	214	214	214	214	213	213	214	215
FROM E-1-N	°F	TR-102	197	152	148	153	150	149	151	150	150	149	150	149

GEOPRESSURED HYBRID POWER SYSTEM - MANAGEMENT REPORT DATA

March 8-11, 1990

	UNITS	INST.#	8-Mar	8-Mar	8-Mar	9-Mar	9-Mar	9-Mar	10-Mar	10-Mar	10-Mar	11-Mar	11-Mar	11-Mar
			900	1700	100	900	1700	100	900	1700	100	900	1700	100
ISOBUTANE														
IN V-1-E	°F	TI-104	97.5	98.0	96.5	97.5	98.7	97.5	98.3	98.3	97.2	97.5	98.1	98.0
OUT OF P-1-E	°F	TI-105	99.4	99.3	98	98.9	99.9	99.0	100.0	99.8	98.7	99.2	99.5	99.5
OUT OF E-1-N	°F	TR-112	212	209	209	209	210	210	210	210	210	210	209	210
OUT OF E-2-N	°F	TI-111	220	219	219	221	219	219	223	221	220	222	220	221
OUT OF E-3-N	°F	TI-603	212	210	210	210	211	211	212	211	210	211	211	211
INTO T-1-E	°F	TI-107	213	212	212	214	214	212	215	214	213	214	213	214
OUT OF T-1-E	°F	TI-108	137	136	135	137	136	135	140	138	136	138	137	138
GAS														
TO E-3-N	°F	TI-601	1020	1008	1014	1016	1014	1010	1010	1006	1007	1013	1005	1017
FROM E-3-N	°F	TI-602	321	315	322	325	328	329	333	331	334	340	339	346
BRINE	M#/HR	FI-100	142.2	142.2	142.4	142.5	144	144.0	143.5	143.7	144.4	144.1	144.6	144.0
IC4 FROM P-1-E	M#/HR	FI-102	116.1	116.0	115.3	113.2	116.3	116.0	14.4	114.5	114.3	115.2	114.7	115.0
IC4 TO T-1-E	M#/HR	FI-101	120.6	120.1	120.3	120.0	120.5	120.6	120.2	119.6	119.7	120.0	119.6	120.1
IC4 TO E-3-N	M#/HR	FR-627	11.5	10.3	10.5	11.0	10.2	10.3	11.0	10.0	10.1	10.7	10.1	10.3
SEP FLOW	GALS	FQI-633	0	0	0	0	0	0	---	---	---	---	---	---
GAS TO GE-1-N	#/HR	FR-607	501.6	494.4	494.4	497.5	496.5	496.5	496.5	496.5	499.6	501.6	504.7	507.8
V-1-E	INCHES	LG-105	30	30	29	29.5	29	28.75	29	29	10.1	28.5	28	28

REMARKS

March 12-14, 1990

	INST.#	12-Mar	12-Mar	12-Mar	13-Mar	13-Mar	13-Mar	14-Mar	14-Mar	14-Mar		
		900	1700	100	900	1700	100	900	1700	100		
AMBIENT TEMP		75	67	68	74	71	70	70	73	59		
WET BULB TEMP		71	67	67	71	69	69	68	71	56		
POWER												
T-1-N GROSS	JI-100	488	501	482	1	0	0	0	0	0		
GE-1-N GROSS		340	340	340	340	340	340	345	345	340		
GE-2-N GROSS		340	340	0	---	---	---	0	140	330		
PARASITIC	JI-101	239	241	251	236	181	191	191	193	192		
NET SALE TO HL&P		890	160	570	150	160	170	180	280	470		
NET SALE TO HL&P		2108	2115	2120	2125	2126	2128	2129	2131	2135		
BRINE												
TO E-2-N	PI-606	500	500	500	509	505	500	502	510	500		
TO E-1-N	PI-611	490	490	490	505	500	500	502	510	505		
FROM E-1-N	PI-106	477	478	480	479	492	494	493	495	493		
ISOBUTANE												
IN V-1-E	PG-130	60	60	59	58	60	61	60	61	56		
OUT OF P-1-E	PI-105	349	349	361	421	359	370	362	360	350		
OUT OF E-1-N	PI-602	298	295	300	280	275	275	275	280	290		
OUT OF E-2-N	PG-114	280	280	280	270	265	265	266	265	275		
OUT OF E-3-N	PI-615	290	290	285	275	270	270	269	272	285		
INTO T-1-E	PI-107	265	266	264	55	1	1	1	1	0		
OUT OF T-1-E	PI-108	65	63	61	56	8	9	9	9	8		
TO OR 102	PG-104	60	60	60	55	140	145	339	330	320		
FROM OR 102	PG-105	60	60	60	55	330	330	148	140	140		
GAS												
TO E-3-N	PI-614	.4	.1	.1	.4	.1	.1	.1	.1	.2		
BRINE												
TO E-2-N	TI-101	297	296	297	297	297	297	297	297	298		
TO E-1-N	TR-113	214	215	213	223	207	208	208	209	212		
FROM E-1-N	TR-102	151	140	146	156	148	149	148	164	145		

March 12-14, 1990

[illegible]

REMARKS

GEOPRESSURED HYBRID POWER SYSTEM - MANAGEMENT REPORT DATA

March 15-18, 1990

	UNITS	INST.#	15-Mar	15-Mar	15-Mar	16-Mar	16-Mar	16-Mar	17-Mar	17-Mar	17-Mar	18-Mar	18-Mar	18-Mar
			900	1700	100	900	1700	100	900	1700	100	900	1700	100
AMBIENT TEMP	°F		52	62	53	57	64	54	60	72	55	69	71	58
WET BULB TEMP	°F		51	57	71	55	58	52	54	57	53	65	61	55
POWER														
T-1-N GROSS	KW	J1-100	0	0	0	0	0	0	0	0	0	0	0	0
GE-1-N GROSS	KW		340	345	345	350	350	350	350	340	340	345	345	345
GE-2-N GROSS	KW		330	345	345	350	350	350	350	340	340	345	345	345
PARASITIC	KW	J1-101	170	179	180	169	180	1770	169	178	179	168	169	170
NET SALE TO HL&P	KW		480	515	520	505	520	500	520	500	500	515	520	510
NET SALE TO HL&P	FDG		2138	2143	2146	2152	2157	2161	2166	2170	2174	2179	2183	2188
	KW-HR													
BRINE														
TO E-2-N	PSIG	PI-606	500	501	500	501	502	500	508	505	500	503	505	500
TO E-1-N	PSIG	PI-611	505	501	505	502	502	510	511	505	500	509	505	500
FROM E-1-N	PSIG	PI-106	494	491	492	493	490	496	496	492	494	493	493	494
ISOBUTANE														
IN V-1-E	PSIG	PG-130	57	60	58	58	58	58	58	58	58	61	58	58
OUT OF P-1-E	PSIG	PI-105	348	341	345	344	346	341	351	356	360	358	365	354
OUT OF E-1-N	PSIG	PI-602	285	286	285	286	285	290	286	290	285	287	286	285
OUT OF E-2-N	PSIG	PG-114	275	275	275	276	275	280	277	280	280	279	280	275
OUT OF E-3-N	PSIG	PI-615	285	283	285	283	285	290	283	290	285	284	290	285
INTO T-1-E	PSIG	PI-107	0	1	0	0	1	0	2	1	0	1	1	0
OUT OF T-1-E	PSIG	PI-108	8	8	8	8	7	8	11	7	8	10	7	8
TO OR 102	PSIG	PG-104	330	330	330	328	330	320	330	330	330	330	325	325
FROM OR 102	PSIG	PG-105	145	144	145	148	140	145	148	150	150	147	145	145
GAS														
TO E-3-N	PSIG	PI-614	.2	.2	.2	.2	.2	.2	.2	.2	.2	.2	.2	.2
BRINE														
TO E-2-N	°F	TI-101	298	297	298	298	297	298	298	298	298	298	297	298
TO E-1-N	°F	TR-113	212	212	211	212	211	211	212	212	212	212	212	212
FROM E-1-N	°F	TR-102	145	145	144	145	148	146	179	147	178	212	148	147

GEOPRESSURED HYBRID POWER SYSTEM - MANAGEMENT REPORT DATA

March 15-18, 1990

	UNITS	INST.#	15-Mar	15-Mar	15-Mar	16-Mar	16-Mar	16-Mar	17-Mar	17-Mar	17-Mar	18-Mar	18-Mar	18-Mar
			900	1700	100	900	1700	100	900	1700	100	900	1700	100
ISOBUTANE														
IN V-1-E	°F	TI-104	93.8	95.8	93.8	93.6	95.8	94.0	94.6	96.4	94.9	97.2	96.1	96.0
OUT OF P-1-E	°F	TI-105	95.8	97.2	95.5	95.3	97.2	95.9	96.7	98.3	96.6	99.5	97.7	97.3
OUT OF E-1-N	°F	TR-112	203	204	201	204	204	209	208	205	205	215	205	204
OUT OF E-2-N	°F	TI-111	216	218	217	216	217	217	220	219	217	221	222	217
OUT OF E-3-N	°F	TI-603	210	210	210	210	210	211	211	211	211	210	210	210
INTO T-1-E	°F	TI-107	58	65	58	57	66	57	63	74	56	67	71	62
OUT OF T-1-E	°F	TI-108	60	67	60	59	68	59	63	75	57	67	73	67
GAS														
TO E-3-N	°F	TI-601	1022	1015	1020	1024	1017	1025	1024	1018	1020	1023	1022	1020
FROM E-3-N	°F	TI-602	346	345	351	354	351	361	359	360	365	370	372	373
BRINE	M#/HR	FI-100	90.1	90.1	90.1	90.1	89.8	90.0	89.4	89.6	90.1	90	90	89.6
IC4 FROM P-1-E	M#/HR	FI-102	113.8	115.1	116.1	112.7	114.8	115.7	115.6	112.3	116.3	111.3	113.4	116.9
IC4 TO T-1-E	M#/HR	FI-101	.2	.3	.2	.3	.2	.2	.4	.2	.1	.2	.1	.2
IC4 TO E-3-N	M#/HR	FR-627	10.2	10.3	9.8	9.8	9.5	10.4	10.7	9.7	9.6	10.4	10.0	10.2
SEP FLOW	GALS	FQI-633	---	---	---	---	---	---	---	---	---	---	---	---
GAS TO GE-1-N	#/HR	FR-607	491.3	496.5	497.5	499.6	497.5	509.9	498.6	491.3	499.6	502.7	493.4	503.7
V-1-E	INCHES	LG-105	24.5	24.5	24.5	24.25	24.5	24	24.5	24.5	24	24.25	24.5	23.5

REMARKS

March 19-21, 1990

[illegible]

March 19-21, 1990

	UNITS	19-Mar	19-Mar	19-Mar	20-Mar	20-Mar	20-Mar	21-Mar	21-Mar	21-Mar		
		900	1700	100	900	1700	100	900	1700	100		
ISOBUTANE												
IN V-1-E	°F	97.0	94.8	95.4	96.7	97.4	97.3	94.7	96.3	87.0		
OUT OF P-1-E	°F	99.2	96.5	97.4	98.5	99.0	98.8	96.3	98.9	88.8		
OUT OF E-1-N	°F	208	205	204	212	205	204	205	204	209		
OUT OF E-2-N	°F	221	220	216	222	219	216	221	219	219		
OUT OF E-3-N	°F	211	210	210	209	210	210	208	210	116		
INTO T-1-E	°F	69	71	57	59	64	52	69	85	209		
OUT OF T-1-E	°F	69	71	59	61	66	53	69	167	129		
GAS												
TO E-3-N	°F	1024	1015	1027	1023	1016	1026	1017	434	63		
FROM E-3-N	°F	377	377	390	392	386	395	388	75	76		
BRINE	M#/HR	90	90.2	89.7	90.3	90.1	90.2	090.0	104.1	132.8		
IC4 FROM P-1-E	M#/HR	116.0	111.2	116.2	115.3	111.1	114.4	115.2	118.3	100.4		
IC4 TO T-1-E	M#/HR	.3	.1	.2	.3	.1	.2	.3	1.2	100.4		
IC4 TO E-3-N	M#/HR	9.2	09.4	9	9.6	9	9	9.3	0.0	0		
SEP FLOW	GALS	---	---	---	---	---	---	---	---	---		
GAS TO GE-1-N	#/HR	498.6	498.6	509.9	517.1	500.6	509.9	502.7	128.8	75.2		
V-1-E	INCHES	24	23.5	24	24.25	24.5	24	23.75	23	23.5		

REMARKS

March 22-25, 1990

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March 22-25, 1990

[illegible]

March 26-28, 1990

	INST.#	26-Mar	26-Mar	26-Mar	27-Mar	27-Mar	27-Mar	28-Mar	28-Mar	28-Mar		
		900	1700	100	900	1700	100	900	1700	100		
AMBIENT TEMP		58	67	55	59	64	65	70	71	68		
WET BULB TEMP		54	59	51	54	60	63	67	68	67		
POWER												
T-1-N GROSS	JI-100	0	0	0	0	0	0	0	0	0		
GE-1-N GROSS		340	340	345	345	345	340	335	335	330		
GE-2-N GROSS		340	340	345	345	345	345	345	340	345		
PARASITIC	JI-101	187	184	174	187	181	192	186	191	196		
NET SALE TO HL&P		500	510	510	500	495	500	495	480	480		
NET SALE TO HL&P		2293	2297	2301	2306	2310	2314	2319	2323	2328		
BRINE												
TO E-2-N	PI-606	505	502	505	505	501	500	502	505	505		
TO E-1-N	PI-611	510	502	505	505	501	505	502	500	505		
FROM E-1-N	PI-106	500	493	493	492	494	496	495	493	494		
ISOBUTANE												
IN V-1-E	PG-130	56	58	56	61	57	58	61	62	60		
OUT OF P-1-E	PI-105	340	350	350	361	360	360	363	361	355		
OUT OF E-1-N	PI-602	275	275	275	270	274	275	275	275	275		
OUT OF E-2-N	PG-114	265	267	268	265	265	265	266	265	265		
OUT OF E-3-N	PI-615	280	275	280	275	271	275	271	275	280		
INTO T-1-E	PI-107	---	---	---	---	---	---	---	---	---		
OUT OF T-1-E	PI-108	---	---	---	---	---	---	---	---	---		
TO OR 102	PG-104	325	330	330	330	334	330	330	330	330		
FROM OR 102	PG-105	145	142	140	145	140	145	142	145	145		
GAS												
TO E-3-N	PI-614	.2	.2	.2	.2	.2	.2	.2	.2	.2		
BRINE												
TO E-2-N	TI-101	298	298	298	298	297	298	297	297	297		
TO E-1-N	TR-113	210	209	208	209	209	208	209	210	209		
FROM E-1-N	TR-102	145	145	146	147	144	145	146	146	146		

March 26-28, 1990

	UNITS	26-Mar	26-Mar	26-Mar	27-Mar	27-Mar	27-Mar	28-Mar	28-Mar	28-Mar		
		900	1700	100	900	1700	100	900	1700	100		
ISOBUTANE												
IN V-1-E	°F	92.3	95.2	94.1	97.9	92.7	95.2	96.4	96.2	97.1		
OUT OF P-1-E	°F	94.6	96.2	96.3	99.6	94.0	96.9	98.2	98.1	99.0		
OUT OF E-1-N	°F	199	201	199	199	199	199	200	201	200		
OUT OF E-2-N	°F	217	216	214	217	216	216	217	216	215		
OUT OF E-3-N	°F	206	207	206	206	206	206	206	206	206		
INTO T-1-E	°F	61	72	59	61	67	69	70	73	72		
OUT OF T-1-E	°F	62	73	60	63	67	67	70	72	71		
GAS												
TO E-3-N	°F	1009	1008	1022	1012	1012	1010	1008	1009	1007		
FROM E-3-N	°F	325	336	341	342	343	342	340	345	347		
BRINE	M#/HR	83.9	85.1	85.5	82.4	85.7	84.2	085.6	85.5	85.6		
IC4 FROM P-1-E	M#/HR	109.5	108.9	114.7	113.1	109.0	113.2	111.7	113	113.2		
IC4 TO T-1-E	M#/HR	.3	.3	.3	.2	.3	.2	.3	.2	.2		
IC4 TO E-3-N	M#/HR	9.1	9.9	9.4	9.9	9.4	10.1	9.4	9.3	9		
SEP FLOW	GALS	---	---	---	---	---	---	---	---	---		
GAS TO GE-1-N	#/HR	494.4	493.4	493.4	497.5	494.4	491.3	495.5	494.4	492.4		
V-1-E	INCHES	22	22	21.5	23.5	32	32	32.5	32.5	32		

REMARKS

GEOPRESSURED HYBRID POWER SYSTEM - MANAGEMENT REPORT DATA

March 29-April 1, 1990

	UNITS	INST.#	29-Mar	29-Mar	29-Mar	30-Mar	30-Mar	30-Mar	31-Mar	31-Mar	31-Mar	1-Apr	1-Apr	1-Apr
			900	1700	100	900	1700	100	900	1700	100	900	1700	100
AMBIENT TEMP	°F		70	60	63	65	73	64	65	74	67	69	68	67
WET BULB TEMP	°F		69	60	63	65	68	62	61	69	66	67	68	66
POWER														
T-1-N GROSS	KW	JI-100	1	449	515	508	0	518	514	504	516	508	495	512
GE-1-N GROSS	KW		335	325	325	335	320	340	335	335	335	325	320	320
GE-2-N GROSS	KW		345	335	340	345	340	340	345	345	340	345	340	340
PARASITIC	KW	JI-101	203	239	240	249	130	252	251	249	251	240	239	252
NET SALE TO HL&P	KW		490	830	880	895	500	900	900	885	902	885	880	875
NET SALE TO HL&P	FDG		2332	2337	2344	2352	2356	2362	2370	2378	2386	2392	2400	2408
	KW-HR													
BRINE														
TO E-2-N	PSIG	PI-606	503	505	490	501	530	500	500	500	500	501	500	500
TO E-1-N	PSIG	PI-611	505	500	490	491	530	490	489	484	485	490	490	490
FROM E-1-N	PSIG	PI-106	494	500	475	477	529	480	479	475	478	477	475	475
ISOBUTANE														
IN V-1-E	PSIG	PG-130	60	52	57	59	36	60	59	63	60	62	62	61
OUT OF P-1-E	PSIG	PI-105	363	308	352	352	39	345	341	358	353	352	360	359
OUT OF E-1-N	PSIG	PI-602	275	285	297	297	110	300	296	300	300	299	300	300
OUT OF E-2-N	PSIG	PG-114	264	270	276	277	35	280	278	281	280	280	280	280
OUT OF E-3-N	PSIG	PI-615	270	280	300	282	160	290	285	287	290	286	282	290
INTO T-1-E	PSIG	PI-107	- - -	268	264	264	33	265	263	267	268	267	265	267
OUT OF T-1-E	PSIG	PI-108	- - -	54	60	62	36	62	61	65	64	65	66	64
TO OR 102	PSIG	PG-104	328	290	55	59	35	60	59	62	60	61	60	60
FROM OR 102	PSIG	PG-105	142	130	55	59	35	60	59	61	60	61	60	60
GAS														
TO E-3-N	PSIG	PI-614	.2	.2	.2	.2	.0	.2	.2	.2	.2	.2	.2	.2
BRINE														
TO E-2-N	°F	TI-101	297	297	297	298	291	298	298	297	298	298	298	298
TO E-1-N	°F	TR-113	209	212	215	214	074	215	214	215	215	214	214	215
FROM E-1-N	°F	TR-102	154	143	147	148	103	143	143	143	145	146	145	145

March 29-April 1, 1990

[illegible]

April 2-4, 1990

	INST.#	2-Apr 900	2-Apr 1700	2-Apr 100	3-Apr 900	3-Apr 1700	3-Apr 100	4-Apr 900	4-Apr 1700	4-Apr 100		
AMBIENT TEMP		70	76	64	60	73	57	64	76	60		
WET BULB TEMP		69	69	60	53	62	55	60	66	59		
POWER												
T-1-N GROSS	J1-100	511	498	524	544	535	544	0	509	525		
GE-1-N GROSS		325	120	330	330	335	330	335	330	330		
GE-2-N GROSS		345	333	340	345	340	340	340	345	340		
PARASITIC	J1-101	250	250	242	253	240	254	238	239	243		
NET SALE TO HL&P		895	650	900	922	920	900	450	900	900		
NET SALE TO HL&P		2415	2423	2428	2436	2444	2452	2456	2462	2470		
BRINE												
TO E-2-N	PI-606	500	504	500	501	500	500	505	510	500		
TO E-1-N	PI-611	490	492	490	491	490	490	509	495	490		
FROM E-1-N	PI-106	475	478	477	479	405	483	493	478	483		
ISOBUTANE												
IN V-1-E	PG-130	63	64	59	55	57	58	48	58	56		
OUT OF P-1-E	PI-105	351	372	349	365	363	343	348	375	334		
OUT OF E-1-N	PI-602	304	300	300	299	300	300	278	295	300		
OUT OF E-2-N	PG-114	284	280	280	281	280	280	270	275	280		
OUT OF E-3-N	PI-615	289	290	290	284	290	290	278	285	290		
INTO T-1-E	PI-107	268	269	268	263	266	267	49	260	264		
OUT OF T-1-E	PI-108	65	65	60	55	58	56	51	60	59		
TO OR 102	PG-104	61	61	60	61	55	55	325	60	55		
FROM OR 102	PG-105	61	60	60	61	55	55	135	60	55		
GAS												
TO E-3-N	PI-614	.2	.2	.2	.2	.2	.2	.2	.1	.2		
BRINE												
TO E-2-N	TI-101	298	298	298	298	298	298	298	298	298		
TO E-1-N	TR-113	215	215	215	214	215	215	210	214	214		
FROM E-1-N	TR-102	145	146	145	144	144	144	138	143	159		

April 2-4, 1990

[illegible]

GEOPRESSURED HYBRID POWER SYSTEM - MANAGEMENT REPORT DATA

April 5-8, 1990

	UNITS	INST.#	5-Apr 900	5-Apr 1700	5-Apr 100	6-Apr 900	6-Apr 1700	6-Apr 100	7-Apr 900	7-Apr 1700	7-Apr 100	8-Apr 900	8-Apr 1700	8-Apr 100
AMBIENT TEMP	°F		72	77	68	65	61	50	53	62	54	60	67	65
WET BULB TEMP	°F		68	71	67	64	56	49	53	51	41	56	62	62
POWER														
T-1-N GROSS	KW	J1-100	482	507	513	517	0	550	555	540	553	536	523	521
GE-1-N GROSS	KW		---	---	---	0	340	340	340	340	340	340	340	340
GE-2-N GROSS	KW		340	340	340	340	340	340	340	340	340	340	340	340
PARASITIC	KW	J1-101	244	250	250	252	248	255	243	252	261	252	251	251
NET SALE TO HL&P	KW		570	580	580	590	450	920	950	940	940	930	915	920
NET SALE TO HL&P	FDG		2477	2482	2486	2492	2495	2503	2512	2520	2528	2537	2542	2550
	KW-HR													
BRINE														
TO E-2-N	PSIG	PI-606	505	505	505	500	505	500	500	505	500	500	505	500
TO E-1-N	PSIG	PI-611	495	490	490	490	512	490	495	490	490	490	490	490
FROM E-1-N	PSIG	PI-106	476	475	479	475	503	484	482	481	479	480	480	480
ISOBUTANE														
IN V-1-E	PSIG	PG-130	61	63	60	60	52	52	48	53	52	55	58	60
OUT OF P-1-E	PSIG	PI-105	366	363	350	349	385	344	360	368	331	325	357	355
OUT OF E-1-N	PSIG	PI-602	295	300	300	305	185	300	295	295	295	298	295	300
OUT OF E-2-N	PSIG	PG-114	275	280	280	285	180	275	280	280	280	280	280	280
OUT OF E-3-N	PSIG	PI-615	285	290	290	290	170	290	285	285	290	295	290	290
INTO T-1-E	PSIG	PI-107	260	266	267	268	48	265	263	266	264	265	264	265
OUT OF T-1-E	PSIG	PI-108	64	64	64	61	57	53	51	54	55	58	62	63
TO OR 102	PSIG	PG-104	60	61	60	60	150	55	45	50	50	50	55	55
FROM OR 102	PSIG	PG-105	60	60	60	60	360	55	45	50	50	50	55	55
GAS														
TO E-3-N	PSIG	PI-614	.2	.2	.2	.2	.1	.2	.2	.2	.2	.2	.2	.2
BRINE														
TO E-2-N	°F	TI-101	298	297	298	298	297	298	297	298	298	298	297	298
TO E-1-N	°F	TR-113	213	215	216	217	177	215	215	214	215	216	216	216
FROM E-1-N	°F	TR-102	149	148	190	149	114	142	142	143	143	147	---	147

GEOPRESSURED HYBRID POWER SYSTEM - MANAGEMENT REPORT DATA

April 5-8, 1990

	UNITS	INST.#	5-Apr	5-Apr	5-Apr	6-Apr	6-Apr	6-Apr	7-Apr	7-Apr	7-Apr	8-Apr	8-Apr	8-Apr
			900	1700	100	900	1700	100	900	1700	100	900	1700	100
ISOBUTANE														
IN V-1-E	°F	TI-104	93.4	93.5	93.4	91.5	76.9	81.3	80.6	84.1	84.7	93.2	90.9	95.5
OUT OF P-1-E	°F	TI-105	95.2	94.7	94.9	93.7	79.3	82.8	81.5	84.8	86.0	94.6	91.8	97.0
OUT OF E-1-N	°F	TR-112	209	211	211	211	161	209	209	209	209	116	176	210
OUT OF E-2-N	°F	TI-111	219	222	220	218	187	218	220	221	218	222	221	222
OUT OF E-3-N	°F	TI-603	209	212	212	212	196	211	210	211	212	211	210	211
INTO T-1-E	°F	TI-107	214	217	215	214	161	215	217	217	215	217	125	217
OUT OF T-1-E	°F	TI-108	138	138	136	133	130	128	130	132	130	138	171	139
GAS														
TO E-3-N	°F	TI-601	941	935	941	944	844	1010	991	1007	1018	1002	992	1000
FROM E-3-N	°F	TI-602	270	270	274	276	147	294	293	302	313	299	298	305
BRINE														
IC4 FROM P-1-E	M#/HR	FI-100	143.4	151.0	150.4	149.3	70.1	140.7	139.3	140.6	143.2	144.1	93.0	146.1
IC4 TO T-1-E	M#/HR	FI-102	112.4	112.2	115.0	114.4	103.5	109.6	105.3	110.4	113.7	114.5	117.5	116.3
IC4 TO T-1-E	M#/HR	FI-101	117.6	118.5	118.6	118.7	2.4	116.9	116.3	116.4	123.0	119.6	1.5	123.1
IC4 TO E-3-N	M#/HR	FR-627	2.4	1.4	2.1	7.9	6.5	11.2	10.2	10.6	11.3	11.1	08.5	10.4
SEP FLOW	GALS	FQI-633	---	---	---	---	---	---	---	---	---	---	---	---
GAS TO GE-1-N	#/HR	FR-607	299.8	297.7	298.7	348.2	493.4	493.4	488.3	490.3	484.1	339.9	442.9	493.4
V-1-E														
	INCHES	LG-105	28	29	28	28	27	27.5	27	27.5	26.75	26	30	30

REMARKS

April 9-11, 1990

	INST.#	9-Apr 900	9-Apr 1700	9-Apr 100	10-Apr 900	10-Apr 1700	10-Apr 100	11-Apr 900	11-Apr 1700	11-Apr 100		
AMBIENT TEMP		71	78	71	73	71	65	59	72	60		
WET BULB TEMP		68	74	69	71	71	61	55	61	58		
POWER												
T-1-N GROSS	JI-100	503	0	499	507	0	535	543	527	551		
GE-1-N GROSS		340	340	340	330	335	340	345	345	340		
GE-2-N GROSS		340	335	340	340	335	340	340	340	340		
PARASITIC	JI-101	251	234	251	250	192	252	244	239	254		
NET SALE TO HL&P		920	420	890	880	460	900	940	920	940		
NET SALE TO HL&P		2557	2564	2570	2577	2583	2590	2596	2606	2615		
BRINE												
TO E-2-N	PI-606	505	505	505	502	505	500	501	505	500		
TO E-1-N	PI-611	495	505	490	495	515	490	491	490	490		
FROM E-1-N	PI-106	482	494	480	481	503	480	482	474	478		
ISOBUTANE												
IN V-1-E	PG-130	58	58	62	62	61	58	55	58	56		
OUT OF P-1-E	PI-105	360	362	351	351	422	347	345	265	340		
OUT OF E-1-N	PI-602	295	285	295	295	150	300	295	295	300		
OUT OF E-2-N	PG-114	280	275	280	284	145	280	280	280	280		
OUT OF E-3-N	PI-615	297	285	285	297	150	290	284	290	290		
INTO T-1-E	PI-107	266	58	265	268	56	268	264	265	268		
OUT OF T-1-E	PI-108	65	59	66	67	60	62	59	61	59		
TO OR 102	PG-104	60	320	60	60	375	58	52	55	57		
FROM OR 102	PG-105	60	135	60	60	155	58	52	55	57		
GAS												
TO E-3-N	PI-614	.2	.2	.2	.2	.0	.2	.2	.2	.2		
BRINE												
TO E-2-N	TI-101	298	297	298	298	297	298	298	298	298		
TO E-1-N	TR-113	216	211	215	215	154	215	216	215	216		
FROM E-1-N	TR-102	72	125	149	150	118	146	145	158	147		

April 9-11, 1990

	UNITS	9-Apr	9-Apr	9-Apr	10-Apr	10-Apr	10-Apr	11-Apr	11-Apr	11-Apr		
		900	1700	100	900	1700	100	900	1700	100		
ISOBUTANE												
IN V-1-E	°F	93.2	90.9	95.5	96.5	92.2	90.3	87.1	90.9	88.8		
OUT OF P-1-E	°F	94.6	91.8	97	97.9	94.7	92.0	88.8	92.2	90.1		
OUT OF E-1-N	°F	116	176	210	211	148	208	209	210	210		
OUT OF E-2-N	°F	222	221	222	211	153	219	220	223	219		
OUT OF E-3-N	°F	211	210	211	212	153	212	211	211	212		
INTO T-1-E	°F	217	105	217	217	98	215	216	213	215		
OUT OF T-1-E	°F	138	171	140	139	126	133	133	138	132		
GAS												
TO E-3-N	°F	1002	992	995	1005	570	1004	999	1003	1011		
FROM E-3-N	°F	299	298	300	310	151	299	299	307	314		
BRINE												
IC4 FROM P-1-E	M#/HR	144.1	93	145.7	147.4	.9	145.7	146.3	146.8	146.9		
IC4 TO T-1-E	M#/HR	114.5	117.5	116.9	117.0	65.9	119.4	117.7	114.3	116.1		
IC4 TO E-3-N	M#/HR	119.6	1.5	123.1	123.3	2.9	123.1	112.5	121.7	123.1		
SEP FLOW	GALS	11.1	8.5	10.2	11	0.2	10.5	11.2	11.0	10.9		
GAS TO GE-1-N	#/HR	339.9	442.9	493.4	492.4	485.2	489.3	492.4	492.4	501.6		
V-1-E												
	INCHES	26	30.25	26	25.5	21	32	27.25	29	30		

REMARKS

GEOPRESSURED HYBRID POWER SYSTEM - MANAGEMENT REPORT DATA

April 12-15, 1990

	UNITS	INST.#	12-Apr	12-Apr	12-Apr	13-Apr	13-Apr	13-Apr	14-Apr	14-Apr	14-Apr	15-Apr	15-Apr	15-Apr
			900	1700	100	900	1700	100	900	1700	100	900	1700	100
AMBIENT TEMP	°F		62	70	62	72	70	66	74	74	61	77	79	64
WET BULB TEMP	°F		58	60	57	65	60	64	70	66	60	68	71	62
POWER														
T-1-N GROSS	KW	JI-100	535	528	529	516	519	516	523	518	535	526	516	526
GE-1-N GROSS	KW		340	345	335	345	340	340	340	340	340	335	335	335
GE-2-N GROSS	KW		340	345	340	345	340	340	340	340	340	335	340	340
PARASITIC	KW	JI-101	253	252	252	240	251	251	241	249	242	251	250	253
NET SALE TO HL&P	KW		940	920	920	910	910	900	905	900	920	900	900	900
NET SALE TO HL&P	PDG		2623	2631	2639	2647	2655	2663	2671	2679	2687	2695	2703	2711
	KW-HR													
BRINE														
TO E-2-N	PSIG	PI-606	500	505	500	505	505	505	503	509	510	503	510	505
TO E-1-N	PSIG	PI-611	490	490	490	491	490	490	492	490	500	494	495	495
FROM E-1-N	PSIG	PI-106	490	481	479	482	479	481	477	478	483	480	477	480
ISOBUTANE														
IN V-1-E	PSIG	PG-130	56	55	57	59	60	60	61	59	58	59	60	60
OUT OF P-1-E	PSIG	PI-105	313	350	353	354	350	358	357	330	340	353	360	331
OUT OF E-1-N	PSIG	PI-602	295	295	295	294	298	300	299	301	300	289	300	300
OUT OF E-2-N	PSIG	PG-114	280	278	275	277	280	280	282	285	280	283	280	280
OUT OF E-3-N	PSIG	PI-615	290	285	285	280	290	290	289	290	290	289	290	290
INTO T-1-E	PSIG	PI-107	264	263	263	262	265	266	267	266	269	265	265	266
OUT OF T-1-E	PSIG	PI-108	60	60	60	62	64	64	65	63	62	62	64	62
TO OR 102	PSIG	PG-104	50	55	55	58	60	60	60	60	60	58	60	60
FROM OR 102	PSIG	PG-105	50	55	55	57	60	60	60	60	60	58	60	60
GAS														
TO E-3-N	PSIG	PI-614	.2	.2	.2	.2	.2	.2	.2	.2	.2	.2	.2	.2
BRINE														
TO E-2-N	°F	TI-101	298	297	298	298	298	298	298	298	298	298	298	298
TO E-1-N	°F	TR-113	215	215	215	215	216	216	216	216	216	216	216	...
FROM E-1-N	°F	TR-102	148	146	147	147	173	151	151	201	150	201	220	...

April 12-15, 1990

REMARKS

April 16-18, 1990

	INST.#	16-Apr	16-Apr	16-Apr	17-Apr	17-Apr	17-Apr	18-Apr	18-Apr	18-Apr		
		900	1700	100	900	1700	100	900	1700	100		
AMBIENT TEMP		77	80	68	81	82	69	65	67	68		
WET BULB TEMP		69	70	67	74	72	68	63	64	66		
POWER												
T-1-N GROSS	JI-100	517	515	512	513	0	0	0	0	0		
GE-1-N GROSS		335	330	335	330	330	330	330	330	335		
GE-2-N GROSS		335	335	335	335	330	330	340	340	335		
PARASITIC	JI-101	250	248	250	238	25	26	6	6	115		
NET SALE TO HL&P		895	880	890	885	60	600	620	620	600		
NET SALE TO HL&P		2719	2727	2735	2743	2749	2753	2759	2764	2769		
BRINE												
TO E-2-N	PI-606	504	509	505	504	515	510	510	510	510		
TO E-1-N	PI-611	490	492	495	492	520	520	520	520	520		
FROM E-1-N	PI-106	479	476	482	481	520	514	512	511			
ISOBUTANE												
IN V-1-E	PG-130	60	61	61	62	52	46	48	45	46		
OUT OF P-1-E	PI-105	350	362	355	355	52	32	41	42	439		
OUT OF E-1-N	PI-602	297	298	300	300	35	0	0	0	50		
OUT OF E-2-N	PG-114	281	280	280	282	30	0	0	0	50		
OUT OF E-3-N	PI-615	286	290	290	289	35	10	0	0	50		
INTO T-1-E	PI-107	265	266	266	268	32	2	0	0	45		
OUT OF T-1-E	PI-108	64	65	66	68	38	14	6	9	48		
TO OR 102	PG-104	58	60	60	60	50	45	46	45	165		
FROM OR 102	PG-105	58	60	60	60	50	45	46	45	400		
GAS												
TO E-3-N	PI-614	.2	.2	.2	.2	.0	.0	.0	.0	.0		
BRINE												
TO E-2-N	TI-101	298	297	298	298	272	269	262	261	284		
TO E-1-N	TR-113	216	217	216	217	123	98	83	74	83		
FROM E-1-N	TR-102	151	181	150	155	121	103	90	82	87		

April 16-18, 1990

	UNITS	16-Apr	16-Apr	16-Apr	17-Apr	17-Apr	17-Apr	18-Apr	18-Apr	18-Apr		
		900	1700	100	900	1700	100	900	1700	100		
ISOBUTANE												
IN V-1-E	°F	95.4	96.7	96.2	97.2	81.2	76.6	72.5	71.3	86.5		
OUT OF P-1-E	°F	97.2	98.3	98.1	98.2	90.0	67.4	65.2	68.4	89.7		
OUT OF E-1-N	°F	211	211	211	212	110	75	68	70	88		
OUT OF E-2-N	°F	221	223	219	221	166	119	90	88	92		
OUT OF E-3-N	°F	211	211	213	211	140	118	91	94	90		
INTO T-1-E	°F	216	217	215	216	85	70	68	70	80		
OUT OF T-1-E	°F	137	139	135	137	81	70	69	70	92		
GAS												
TO E-3-N	°F	1001	998	1002	1006	771	812	765	768	170		
FROM E-3-N	°F	322	324	327	329	265	341	292	279	89		
BRINE	M#/HR	145.8	147	146.6	146.6	.0	.0	.0	0	0.2		
IC4 FROM P-1-E	M#/HR	115.3	116.5	117.3	116.7	.0	.0	.0	0	6.5		
IC4 TO T-1-E	M#/HR	121.5	121.5	121.5	121.3	1.7	2.8	3.4	3.3	.0		
IC4 TO E-3-N	M#/HR	10.2	10.9	10.7	10.4	0.0	0.0	0.1	0.0	0.0		
SEP FLOW	GALS	50581	54919	59154	64056	65732	65747	65750	65750	66047		
GAS TO GE-1-N	#/HR	495.5	492.4	494.4	496.5	493.4	495.5	497.5	499.6	492.4		
V-1-E	INCHES	21	21.5	20.75	20.5	34	37	42.5	42.5	34		

REMARKS

GEOPRESSURED HYBRID POWER SYSTEM - MANAGEMENT REPORT DATA

April 19-22, 1990

	UNITS	INST.#	19-Apr	19-Apr	19-Apr	20-Apr	20-Apr	20-Apr	21-Apr	21-Apr	21-Apr	22-Apr	22-Apr	22-Apr
			900	1700	100	900	1700	100	900	1700	100	900	1700	100
AMBIENT TEMP	°F		76	79	71	75	83	72	76	87	72	77	82	70
WET BULB TEMP	°F		72	73	70	72	76	70	73	77	70	73	75	69
POWER														
T-1-N GROSS	KW	JI-100	490	492	494	492	490	495	499	494	499	493	492	501
GE-1-N GROSS	KW		330	335	340	540	340	340	335	330	335	335	335	335
GE-2-N GROSS	KW		340	340	340	340	340	340	340	340	340	340	335	335
PARASITIC	KW	JI-101	239	251	250	250	249	240	250	249	250	239	248	250
NET SALE TO HL&P	KW		890	875	890	880	875	890	880	860	880	870	880	870
NET SALE TO HL&P	PDG		2774	2782	2790	2798	2805	2813	2821	2828	2836	2844	2852	2860
	KW-HR													
BRINE														
TO E-2-N	PSIG	PI-606	500	504	505	505	506	509	505	503	505	505	506	505
TO E-1-N	PSIG	PI-611	490	490	490	490	491	493	490	489	495	490	490	495
FROM E-1-N	PSIG	PI-106	480	479	482	482	477	481	481	476	481	481	479	481
ISOBUTANE														
IN V-1-E	PSIG	PG-130	63	65	64	64	66	63	64	64	63	64	67	62
OUT OF P-1-E	PSIG	PI-105	360	358	362	366	351	358	359	365	376	365	363	345
OUT OF E-1-N	PSIG	PI-602	305	305	305	305	305	305	310	308	310	310	309	310
OUT OF E-2-N	PSIG	PG-114	275	278	280	280	278	280	280	280	280	280	280	280
OUT OF E-3-N	PSIG	PI-615	285	282	288	285	284	285	290	287	290	290	287	290
INTO T-1-E	PSIG	PI-107	263	263	263	263	264	264	265	264	265	265	265	265
OUT OF T-1-E	PSIG	PI-108	67	68	68	69	69	69	68	69	65	363	63	63
TO OR 102	PSIG	PG-104	65	63	60	65	66	65	65	64	65	65	65	65
FROM OR 102	PSIG	PG-105	65	63	60	65	65	65	65	64	65	65	65	65
GAS														
TO E-3-N	PSIG	PI-614	.2	.2	.2	.2	.2	.2	.2	.2	.2	.2	.2	.2
BRINE														
TO E-2-N	°F	TI-101	297	297	297	297	292	298	298	297	298	298	297	298
TO E-1-N	°F	TR-113	215	215	215	215	215	215	216	216	216	216	216	216
FROM E-1-N	°F	TR-102	149	149	149	158	149	207	192	149	224	149	149	149

April 19-22, 1990

[illegible]

April 23-25, 1990

	INST.#	23-Apr	23-Apr	23-Apr	24-Apr	24-Apr	24-Apr	25-Apr	25-Apr	25-Apr		
		900	1700	100	900	1700	100	900	1700	100		
AMBIENT TEMP		79	81	70	76	80	74	76	79	73		
WET BULB TEMP		73	73	69	62	74	71	72	74	70		
POWER												
T-1-N GROSS	JI-100	500	498	497	492	494	495	488	483	488		
GE-1-N GROSS		335	335	335	335	340	340	335	330	335		
GE-2-N GROSS		335	335	340	340	340	340	305	305	295		
PARASITIC	JI-101	239	238	250	248	249	249	250	249	249		
NET SALE TO HL&P		870	870	880	870	880	880	845	840	840		
NET SALE TO HL&P		2867	2874	2882	2890	2895	2903	2910	2918	2925		
BRINE												
TO E-2-N	PI-606	505	508	505	505	503	505	508	505	505		
TO E-1-N	PI-611	490	492	490	490	489	490	492	490	490		
FROM E-1-N	PI-106	481	478	479	474	478	479	481	477	281		
ISOBUTANE												
IN V-1-E	PG-130	64	65	62	64	65	64	65	66	64		
OUT OF P-1-E	PI-105	345	355	348	354	341	356	353	361	350		
OUT OF E-1-N	PI-602	310	305	310	310	309	310	307	310	305		
OUT OF E-2-N	PG-114	280	279	280	280	280	280	279	280	280		
OUT OF E-3-N	PI-615	290	282	290	290	282	290	285	285	280		
INTO T-1-E	PI-107	265	263	265	263	263	264	264	264	265		
OUT OF T-1-E	PI-108	61	63	- - -	- - -	63	64	64	65	64		
TO OR 102	PG-104	65	63	60	65	65	65	64	65	65		
FROM OR 102	PG-105	65	63	60	65	65	65	64	65	65		
GAS												
TO E-3-N	PI-614	.2	.2	.2	.2	.2	.2	.2	.2	.2		
BRINE												
TO E-2-N	TI-101	298	297	298	297	297	297	297	297	297		
TO E-1-N	TR-113	216	216	217	216	216	216	216	215	215		
FROM E-1-N	TR-102	149	149	205	150	151	151	151	150	174		

April 23-25, 1990

[illegible]

GEOPRESSURED HYBRID POWER SYSTEM - MANAGEMENT REPORT DATA

April 26-29, 1990

	UNITS	INST.#	26-Apr 900	26-Apr 1700	26-Apr 100	27-Apr 900	27-Apr 1700	27-Apr 100	28-Apr 900	28-Apr 1700	28-Apr 100	29-Apr 900	29-Apr 1700	29-Apr 100
AMBIENT TEMP	°F		76	62	68	73	82	64	67	82	74	79	80	76
WET BULB TEMP	°F		72	62	65	69	76	63	60	76	71	77	76	62
POWER														
T-1-N GROSS	KW	JI-100	494	525	515	504	476	533	533	493	493	497	479	491
GE-1-N GROSS	KW		335	335	340	340	335	0	0	0	0	0	0	0
GE-2-N GROSS	KW		315	305	320	280	0	340	345	340	330	340	330	335
PARASITIC	KW	JI-101	248	251	238	237	248	252	249	248	248	239	247	247
NET SALE TO HL&P	KW		855	870	880	835	560	600	615	580	580	585	570	560
NET SALE TO HL&P	FDG		2932	2940	2947	2957	2962	2968	2972	2978	2982	298	2992	2997
	KW-HR													
BRINE														
TO E-2-N	PSIG	PI-606	508	505	505	505	505	505	500	505	505	503	508	505
TO E-1-N	PSIG	PI-611	492	490	492	492	490	490	488	470	490	490	490	490
FROM E-1-N	PSIG	PI-106	481	478	479	480	478	477	480	475	477	476	477	477
ISOBUTANE														
IN V-1-E	PSIG	PG-130	65	62	62	63	65	58	57	64	64	66	67	66
OUT OF P-1-E	PSIG	PI-105	359	347	343	358	350	333	344	364	351	354	357	357
OUT OF E-1-N	PSIG	PI-602	307	310	310	307	305	310	309	310	310	312	310	310
OUT OF E-2-N	PSIG	PG-114	279	280	280	281	275	280	282	280	280	283	280	280
OUT OF E-3-N	PSIG	PI-615	285	285	290	287	282	290	289	285	290	289	290	290
INTO T-1-E	PSIG	PI-107	264	266	267	264	259	270	264	265	265	265	265	265
OUT OF T-1-E	PSIG	PI-108	64	61	62	62	64	62	68	64	65	65	66	66
TO OR 102	PSIG	PG-104	63	65	60	61	65	60	52	65	65	62	65	65
FROM OR 102	PSIG	PG-105	62	65	60	61	65	60	52	65	65	62	65	65
GAS														
TO E-3-N	PSIG	PI-614	.2	.2	.2	.2	.2	.2	.2	.2	.2	.2	.2	.2
BRINE														
TO E-2-N	°F	TI-101	297	297	297	297	297	297	298	297	297	297	297	297
TO E-1-N	°F	TR-113	216	217	218	216	214	216	218	217	217	217	216	216
FROM E-1-N	°F	TR-102	151	149	150	151	151	151	149	152	154	153	153	153

GEOPRESSURED HYBRID POWER SYSTEM - MANAGEMENT REPORT DATA

April 26-29, 1990

	UNITS	INST.#	26-Apr	26-Apr	26-Apr	27-Apr	27-Apr	27-Apr	28-Apr	28-Apr	28-Apr	29-Apr	29-Apr	29-Apr
			900	1700	100	900	1700	100	900	1700	100	900	1700	100
ISOBUTANE														
IN V-1-E	°F	TI-104	97.2	92.0	94.8	95.3	96.3	92.1	89.3	97.2	97.7	97.6	99.1	98.1
OUT OF P-1-E	°F	TI-105	98.8	93.4	96.2	96.7	97.9	94.2	91.5	99	99.4	99.4	100.9	99.8
OUT OF E-1-N	°F	TR-112	211	211	212	211	209	211	211	212	212	213	212	212
OUT OF E-2-N	°F	TI-111	219	218	220	220	217	219	219	222	220	221	220	219
OUT OF E-3-N	°F	TI-603	211	211	212	211	210	211	211	211	213	213	212	214
INTO T-1-E	°F	TI-107	214	214	215	215	211	215	215	216	214	215	215	214
OUT OF T-1-E	°F	TI-108	138	134	137	137	136	134	134	140	138	138	139	137
GAS														
TO E-3-N	°F	TI-601	983	978	983	440	943	907	939	928	935	942	931	929
FROM E-3-N	°F	TI-602	318	323	324	328	204	268	292	272	276	280	279	279
BRINE	M#/HR	FI-100	147.1	181.9	149.7	148.2	147.2	160.7	151.7	159.8	154.5	153.7	154.9	154.4
IC4 FROM P-1-E	M#/HR	FI-102	117.0	119.6	119.3	117.0	117.2	120.2	118.9	111.5	118.4	117.9	116.9	117.4
IC4 TO T-1-E	M#/HR	FI-101	121.2	112.4	122.1	121.6	120.6	123.0	1220.0	122.0	121.9	122.1	121.7	121.6
IC4 TO E-3-N	M#/HR	FR-627	9.7	10.6	10.5	10.6	.6	0.7	4.5	0.7	0.7	1.4	1.2	.5
SEP FLOW	GALS	FQI-633	161320	165734	170441	174841	180110	183926	188098	192733	196480	40361		90953
GAS TO GE-1-N	#/HR	FR-607	487.2	486.2	490.3	486.2	253.4	278.1	345.1	275	303.9	302.8	301.8	304.9
V-1-E	INCHES	LG-105	27.25	32.25	32	32.25	32.25	32	31.5	32	31.5	26.5	31	31

REMARKS

April 30-May 2, 1990

[illegible]

April 30-May 2, 1990

[illegible]

GEOPRESSURED HYBRID POWER SYSTEM - MANAGEMENT REPORT DATA

May 3-6, 1990

	UNITS	INST.#	3-May	3-May	3-May	4-May	4-May	4-May	5-May	5-May	5-May	6-May	6-May	6-May
			900	1700	100	900	1700	100	900	1700	100	900	1700	100
AMBIENT TEMP	°F		77	75	68	71	73	68	61	67	64	70	76	64
WET BULB TEMP	°F		74	75	68	67	65	61	53	62	61	60	61	59
POWER														
T-1-N GROSS	KW	JI-100	485	484	499	501	503	535	545	533	535	538	523	531
GE-1-N GROSS	KW		0	0	0	0	0	320	320	320	320	310	300	310
GE-2-N GROSS	KW		340	340	340	340	345	340	340	340	340	340	340	340
PARASITIC	KW	JI-101	238	238	249	246	250	253	252	250	253	253	251	252
NET SALE TO HL&P	KW		560	570	580	580	600	905	900	905	905	890	880	900
NET SALE TO HL&P	FDG		3045	3050	3055	3060	3065	3073	3081	3089	3097	3105	3111	3119
	KW-HR													
BRINE														
TO E-2-N	PSIG	PI-606	505	505	505	505	510	505	505	510	505	505	510	505
TO E-1-N	PSIG	PI-611	490	490	490	495	495	490	490	495	495	490	495	495
FROM E-1-N	PSIG	PI-106	477	478	479	475	478	478	481	475	481	480	476	480
ISOBUTANE														
IN V-1-E	PSIG	PG-130	65	65	64	62	62	58	55	58	58	55	58	57
OUT OF P-1-E	PSIG	PI-105	360	363	341	339	352	339	348	349	340	342	354	340
OUT OF E-1-N	PSIG	PI-602	310	310	310	310	310	310	305	310	310	310	307	310
OUT OF E-2-N	PSIG	PG-114	280	278	280	280	280	280	280	280	280	280	280	280
OUT OF E-3-N	PSIG	PI-615	290	285	290	290	285	290	290	290	290	290	285	290
INTO T-1-E	PSIG	PI-107	264	263	265	265	265	267	263	266	268	267	264	263
OUT OF T-1-E	PSIG	PI-108	64	62	59	58	56	54	51	56	54	53	51	50
TO OR 102	PSIG	PG-104	65	65	65	65	60	60	55	55	55	55	55	60
FROM OR 102	PSIG	PG-105	56	65	65	65	60	60	55	55	55	55	55	60
GAS														
TO E-3-N	PSIG	PI-614	.2	.2	.1	.1	.1	.2	.2	.2	.2	.2	.2	.2
BRINE														
TO E-2-N	°F	TI-101	297	297	298	298	298	298	297	298	298	298	298	298
TO E-1-N	°F	TR-113	217	217	218	216	214	217	217	217	217	219	217	217
FROM E-1-N	°F	TR-102	155	158	153	153	152	149	148	149	149	149	148	148

GEOPRESSURED HYBRID POWER SYSTEM - MANAGEMENT REPORT DATA

May 3-6, 1990

	UNITS	INST.#	3-May	3-May	3-May	4-May	4-May	4-May	5-May	5-May	5-May	6-May	6-May	6-May
			900	1700	100	900	1700	100	900	1700	100	900	1700	100
ISOBUTANE														
IN V-1-E	°F	TI-104	99.4	98.7	96.7	95.6	94.2	90.9	87.3	91.5	91.7	91.3	92.3	90.9
OUT OF P-1-E	°F	TI-105	100.9	100.2	98.6	97.8	96.1	92.7	89.4	93.2	93.3	93.0	93.6	92.1
OUT OF E-1-N	°F	TR-112	212	212	213	212	212	212	211	212	212	212	212	211
OUT OF E-2-N	°F	TI-111	220	219	218	218	218	219	218	221	219	219	220	219
OUT OF E-3-N	°F	TI-603	212	211	211	212	212	212	212	214	212	212	210	212
INTO T-1-E	°F	TI-107	215	214	214	213	213	215	214	216	215	215	215	214
OUT OF T-1-E	°F	TI-108	140	139	136	136	135	134	132	135	134	134	137	134
GAS														
TO E-3-N	°F	TI-601	941	928	938	938	942	1008	1001	1017	1014	1011	996	1003
FROM E-3-N	°F	TI-602	291	288	296	294	296	342	342	354	353	352	345	352
BRINE														
IC4 FROM P-1-E	M#/HR	FI-100	155.0	154.9	154.6	153.4	153.6	149.1	150	148.4	147.4	147.5	149.3	148.8
IC4 FROM P-1-E	M#/HR	FI-102	117.3	117.8	116.6	119.4	118.2	119.4	117.7	116.3	118.6	118.3	116.8	117.5
IC4 TO T-1-E	M#/HR	FI-101	121.4	121.4	121.7	121.7	121.6	122.2	121.7	122.0	122.0	122	122.3	122.5
IC4 TO E-3-N	M#/HR	FR-627	1.4	0.4	1.1	0.3	.9	10.8	9.3	10.4	10.8	11.2	9.4	9.6
SEP FLOW	GALS	FQI-633	3459881	267781	298730	422875	448559	473928	5043271	527681	545837	5821591	601865	618412
GAS TO GE-1-N	#/HR	FR-607	260.6	263.7	263.7	258.5	261.6	493.4	491.3	496.5	492.4	489.3	478.0	479
V-1-E														
	INCHES	LG-105	29.5	29.5	29.5	28.75	27.5	28	16	30	30.5	30	32	30.5

REMARKS

May 7-9, 1990

	INST.#	7-May 900	7-May 1700	7-May 100	8-May 900	8-May 1700	8-May 100	9-May 900	9-May 1700	9-May 100		
AMBIENT TEMP		73	76	70	69	71	67	77	91	74		
WET BULB TEMP		66	66	70	68	69	66	72	80	72		
POWER												
T-1-N GROSS	J1-100	509	511	510	515	503	516	502	461	497		
GE-1-N GROSS		310	315	310	310	305	310	100	200	305		
GE-2-N GROSS		340	340	340	340	340	340	335	220	340		
PARASITIC	J1-101	249	250	249	250	250	251	251	237	239		
NET SALE TO HL&P		880	878	880	870	875	880	655	590	860		
NET SALE TO HL&P		3127	3134	3142	3150	3157	3165	3172	3176	3183		
BRINE												
TO E-2-N	PI-606	505	508	505	505	505	505	502	508	505		
TO E-1-N	PI-611	495	490	490	495	490	495	492	490	495		
FROM E-1-N	PI-106	479	478	479	480	480	479	479	475	478		
ISOBUTANE												
IN V-1-E	PG-130	60	62	62	62	64	61	63	67	66		
OUT OF P-1-E	PI-105	350	349	355	341	349	354	351	373	356		
OUT OF E-1-N	PI-602	305	305	305	310	208	310	305	305	310		
OUT OF E-2-N	PG-114	280	276	280	280	280	280	277	278	280		
OUT OF E-3-N	PI-615	295	285	290	290	290	290	283	285	290		
INTO T-1-E	PI-107	264	265	265	267	266	267	263	268	268		
OUT OF T-1-E	PI-108	62	55	55	56	59	52	56	63	51		
TO OR 102	PG-104	60	60	60	60	61	60	61	65	65		
FROM OR 102	PG-105	60	60	60	60	60	60	61	65	65		
GAS												
TO E-3-N	PI-614	.2	.2	.2	.2	.2	.2	.2	.0	.2		
BRINE												
TO E-2-N	TI-101	298	297	297	298	297	298	297	297	298		
TO E-1-N	TR-113	217	217	217	218	218	218	216	216	218		
FROM E-1-N	TR-102	150	151	151	151	153	150	151	155	152		

May 7-9, 1990

	UNITS	7-May	7-May	7-May	8-May	8-May	8-May	9-May	9-May	9-May		
		900	1700	100	900	1700	100	900	1700	100		
ISOBUTANE												
IN V-1-E	°F	94.2	94.7	95.8	96.6	97.3	95.1	96.1	99.9	98.8		
OUT OF P-1-E	°F	96.2	96.9	98.3	99.4	100.1	97.9	099.1	102.7	101.9		
OUT OF E-1-N	°F	212	211	212	212	212	212	211	213	212		
OUT OF E-2-N	°F	221	220	220	220	220	217	219	221	219		
OUT OF E-3-N	°F	212	210	211	212	211	212	211	192	212		
INTO T-1-E	°F	216	215	215	215	215	215	214	216	215		
OUT OF T-1-E	°F	139	137	137	137	139	136	137	141	138		
GAS												
TO E-3-N	°F	1004	995	997	1008	1084	1005	990	472	1009		
FROM E-3-N	°F	353	346	350	360	358	360	328	155	358		
BRINE	M#/HR	149	150.2	148.4	148.1	148.5	150.5	150.9	149.9	149.6		
IC4 FROM P-1-E	M#/HR	117.1	117.5	117.6	120.4	117.8	119.9	114.8	111.1	117.0		
IC4 TO T-1-E	M#/HR	122.1	122.1	122.5	122.7	122.7	122.6	122.2	122.2	121.7		
IC4 TO E-3-N	M#/HR	9.8	9.2	9.8	11	9.6	10.6	6.4	0.0	9.3		
SEP FLOW	GAS	6475920	672206	694498	7223514	747182	770285	7967680	821750	844349		
GAS TO GE-1-N	#/HR	486.2	482.1	488.3	491.3	492.4	495.4	363.6	292.5	476.9		
V-1-E	INCHES	23.75	31	30.75	22.5	23	29.5	22.5	21	22.5		

REMARKS

GEOPRESSURED HYBRID POWER SYSTEM - MANAGEMENT REPORT DATA

May 10-13, 1990

	UNITS	INST.#	10-May 900	10-May 1700	10-May 100	11-May 900	11-May 1700	11-May 100	12-May 900	12-May 1700	12-May 100	13-May 900	13-May 1700	13-May 100
AMBIENT TEMP	°F		69	80	70	79	80	76	77	82	77	77	88	77
WET BULB TEMP	°F		59	66	68	76	75	74	74	76	75	76	79	75
POWER														
T-1-N GROSS	KW	JI-100	527	526	517	491	491	486	490	484	486	495	482	486
GE-1-N GROSS	KW		325	325	325	320	320	320	320	310	300	316	315	300
GE-2-N GROSS	KW		345	345	340	345	335	340	335	320	320	325	320	330
PARASITIC	KW	JI-101	251	249	250	250	249	238	249	239	248	238	250	250
NET SALE TO HL&P	KW		905	900	900	860	850	860	845	820	810	840	840	830
NET SALE TO HL&P	FDG		3191	3198	3207	3214	3222	3230	3237	3244	3251	3259	3266	3272
	KW-HR													
BRINE														
TO E-2-N	PSIG	PI-606	503	510	505	502	505	505	505	505	510	507	510	510
TO E-1-N	PSIG	PI-611	492	490	490	489	490	490	492	490	495	494	490	490
FROM E-1-N	PSIG	PI-106	480	475	480	479	477	477	476	478	480	479	480	479
ISOBUTANE														
IN V-1-E	PSIG	PG-130	57	58	60	65	65	66	66	68	68	67	69	68
OUT OF P-1-E	PSIG	PI-105	346	348	348	347	355	359	358	358	356	347	361	359
OUT OF E-1-N	PSIG	PI-602	306	307	310	309	310	308	309	310	312	311	310	310
OUT OF E-2-N	PSIG	PG-114	279	280	280	281	280	280	280	280	283	284	284	280
OUT OF E-3-N	PSIG	PI-615	284	289	290	287	290	285	285	290	290	291	290	290
INTO T-1-E	PSIG	PI-107	263	266	265	265	266	265	265	261	268	270	268	267
OUT OF T-1-E	PSIG	PI-108	52	55	53	59	59	58	68	60	61	63	62	59
TO OR 102	PSIG	PG-104	52	60	60	64	65	65	65	68	68	68	69	69
FROM OR 102	PSIG	PG-105	53	60	60	347	65	65	65	68	68	68	69	69
GAS														
TO E-3-N	PSIG	PI-614	.2	.2	.2	.3	.2	.2	.3	.3	.2	.3	.2	.3
BRINE														
TO E-2-N	°F	TI-101	297	297	297	297	297	297	297	297	297	298	297	297
TO E-1-N	°F	TR-113	217	219	218	219	219	219	219	219	219	220	219	218
FROM E-1-N	°F	TR-102	149	151	152	155	155	155	155	157	155	155	181	156

May 10-13, 1990

REMARKS

May 14-16, 1990

[illegible]

May 14-16, 1990

	UNITS	14-May	14-May	14-May	15-May	15-May	15-May	16-May	16-May	16-May		
		900	1700	100	900	1700	100	900	1700	100		
ISOBUTANE												
IN V-1-E	°F	102.9	102.0	102.7	101.9	101.9	103.4	101.2	103.1	103.0		
OUT OF P-1-E	°F	105.3	104.8	105.7	104.8	104.5	106.6	104.1	105.7	105.7		
OUT OF E-1-N	°F	214	212	213	23	212	212	213	213	213		
OUT OF E-2-N	°F	222	222	221	223	222	221	222	223	222		
OUT OF E-3-N	°F	213	212	212	211	211	210	210	211	212		
INTO T-1-E	°F	216	215	215	215	215	215	215	216	215		
OUT OF T-1-E	°F	143	142	142	142	142	142	141	143	142		
GAS												
TO E-3-N	°F	963	997	997	997	787	992	993	996	1001		
FROM E-3-N	°F	367	367	367	370	366	368	373	574	376		
BRINE	M#/HR	152.4	148.2	148.2	148	149.5	148.0	147.1	148.8	147.1		
IC4 FROM P-1-E	M#/HR	116.4	112.4	112.4	115.0	109.3	110.7	110.4	112.7	114.7		
IC4 TO T-1-E	M#/HR	121.4	121.5	121.5	121.0	120.9	121.0	120.9	121.5	121.5		
IC4 TO E-3-N	M#/HR	9.6	9.4	9.4	9.4	10.2	9.8	9.2	9.0	9.9		
SEP FLOW	GALS	163624	212944	212944	2370971	2623050	2869002	312669	3377700	3610036		
GAS TO GE-1-N	#/HR	557.3	548.0	552.1	542.8	551.1	551.1	552.1	508.9	517.1		
V-1-E	INCHES	19.5	19.25	19.25	18.5	30.75	30.25	30	30.25	29.5		

REMARKS

GEOPRESSURED HYBRID POWER SYSTEM - MANAGEMENT REPORT DATA

May 17-23, 1990

	UNITS	INST.#	17-May 900	17-May 1700	17-May 100	18-May 900	18-May 1700	18-May 100	19-May 900	19-May 1700	19-May 100	20-May 900	20-May 1700	20-May 100
AMBIENT TEMP	°F		81	83	77	80	87	77	82	90	78	86	87	79
WET BULB TEMP	°F		76	77	74	75	79	74	76	81	75	78	80	75
POWER														
T-1-N GROSS	KW	JI-100	473	462	465	468	463	473	470	475	470	472	464	471
GE-1-N GROSS	KW		310	315	315	320	315	320	310	310	310	315	315	320
GE-2-N GROSS	KW		320	325	325	320	325	335	330	320	320	325	325	330
PARASITIC	KW	JI-101	243	242	241	233	244	244	242	232	244	244	242	233
NET SALE TO HL&P	KW		820	830	830	840	815	840	840	820	830	830	820	825
NET SALE TO HL&P	FDG		3346	3353	3361	3368	3374	3382	3390	3397	3404	3411	3419	3427
	KW-HR													
BRINE														
TO E-2-N	PSIG	PI-606	510	502	505	505	502	504	510	505	505	505	502	505
TO E-1-N	PSIG	PI-611	500		490	485	480	482	485	480	485	480	478	485
FROM E-1-N	PSIG	PI-106	485	477	480	485	477	480	476	475	478	477	473	476
ISOBUTANE														
IN V-1-E	PSIG	PG-130	70	69	68	68	69	68	68	69	68	68	69	69
OUT OF P-1-E	PSIG	PI-105	360	355	365	358	357	359	363	356	361	356	351	358
OUT OF E-1-N	PSIG	PI-602	310	305	310	305	306	306	305	305	305	310	306	310
OUT OF E-2-N	PSIG	PG-114	275	278	280	275	276	278	279	280	280	280	279	280
OUT OF E-3-N	PSIG	PI-615	285	278	290	280	277	278	279	280	285	282	280	285
INTO T-1-E	PSIG	PI-107	269	263	264	263	264	264	264	266	266	265	265	266
OUT OF T-1-E	PSIG	PI-108	67	62	64	61	62	60	77	78	79	79	80	80
TO OR 102	PSIG	PG-104	70	69	70	70	69	69	68	69	70	68	70	70
FROM OR 102	PSIG	PG-105	70	69	70	69	69	69	68	69	70	68	70	70
GAS														
TO E-3-N	PSIG	PI-614	.2	.2	.2	.3	.2	.2	.2	.2	.2	.2	.2	.2
BRINE														
TO E-2-N	°F	TI-101	298	298	298	297	297	297	297	297	297	297	297	297
TO E-1-N	°F	TR-113	217	217	219	217	218	218	218	218	218	219	218	219
FROM E-1-N	°F	TR-102	154	155	155	155	156	155	155	155	156	155	156	156

GEOPRESSURED HYBRID POWER SYSTEM - MANAGEMENT REPORT DATA

May 17-23, 1990

	UNITS	INST.#	17-May	17-May	17-May	18-May	18-May	18-May	19-May	19-May	19-May	20-May	20-May	20-May
			900	1700	100	900	1700	100	900	1700	100	900	1700	100
ISOBUTANE														
IN V-1-E	°F	TI-104	103.2	102.5	102.1	102.0	102.7	101.8	102.3	102.4	102.7	102.4	103.5	103.2
OUT OF P-1-E	°F	TI-105	105.9	105.2	104.6	104.6	105.4	104.5	104.8	105.1	105.5	105.4	106.1	106.0
OUT OF E-1-N	°F	TR-112	212	212	212	212	212	212	212	213	213	213	213	212
OUT OF E-2-N	°F	TI-111	223	221	221	222	222	221	222	223	221	222	223	221
OUT OF E-3-N	°F	TI-603	212	211	211	211	213	213	213	212	212	213	213	212
INTO T-1-E	°F	TI-107	216	214	214	215	215	214	215	216	215	215	216	215
OUT OF T-1-E	°F	TI-108	142	142	141	142	143	583	143	143	141	142	144	142
GAS														
TO E-3-N	°F	TI-601	1008	998	1001	996	990	998	1001	1000	995	1004	988	1003
FROM E-3-N	°F	TI-602	383	374	374	372	371	376	374	378	376	383	373	383
BRINE	M#/HR	FI-100	149.3	146.8	146.7	148.3	148.5	147.9	149	150	150.2	150.5	149.0	149.1
IC4 FROM P-1-E	M#/HR	FI-102	114.9	114.2	112.5	114.5	112.3	146.3	117.3	117.6	117.3	116	117.3	116.8
IC4 TO T-1-E	M#/HR	FI-101	121.5	120.6	121.0	121.0	120.8	121.0	120.8	121.4	121.2	121.4	121.2	121.4
IC4 TO E-3-N	M#/HR	FR-627	9.9	9.4	9.6	8.8	9.3	9.1	10.2	9	9.5	10.6	10.0	10.3
SEP FLOW	GALS	FQI-633	3809555	4110779	440972	4666666	4853826	5097412	5355400	5602750	585389	6099600	6343670	657349
GAS TO GE-1-N	#/HR	FR-607	586.7	544.9	542.8	535.6	534.6	552.1	520.2	497.5	518.1	508.9	513.0	539.8
V-1-E	INCHES	LG-105	29	29.25	30	29	29	28.5	28.5	28.5	28	27.5	28	27.5
REMARKS														

May 21-23, 1990

	INST.#	21-May 900	21-May 1700	21-May 100	22-May 900	22-May 1700	22-May 100	23-May 900	23-May 1700	23-May 100		
AMBIENT TEMP		86	93	78	92	70	72	73	85	74		
WET BULB TEMP		79	82	75	80	69	68	67	75	70		
POWER												
T-1-N GROSS	JI-100	470	455	467	457	485	482	497	488	483		
GE-1-N GROSS		310	312	315	300	325	300	0	0	0		
GE-2-N GROSS		320	315	325	330	340	300	345	340	340		
PARASITIC	JI-101	242	242	244	241	245	243	243	242	243		
NET SALE TO HL&P		820	790	810	800	860	800	595	575	570		
NET SALE TO HL&P		3433	3940	3448	3454	3460	3468	3474	3479	3484		
BRINE												
TO E-2-N	PI-606	505	502	510	503	509	505	504	505	505		
TO E-1-N	PI-611	485	478	485	482	488	485	479	478	480		
FROM E-1-N	PI-106	480	475	477	478	480	480	476	473	480		
ISOBUTANE												
IN V-1-E	PG-130	70	71	69	69	64	66	64	67	68		
OUT OF P-1-E	PI-105	356	355	363	371	361	364	359	351	356		
OUT OF E-1-N	PI-602	305	305	310	310	277	305	310	317	310		
OUT OF E-2-N	PG-114	280	269	280	280	305	275	278	280	280		
OUT OF E-3-N	PI-615	280	278	285	285	278	280	278	283	280		
INTO T-1-E	PI-107	266	266	265	264	265	263	264	267	266		
OUT OF T-1-E	PI-108	81	78	77	82	72	75	75	77	77		
TO OR 102	PG-104	69	70	70	69	62	65	61	65	65		
FROM OR 102	PG-105	65	70	70	69	61	60	60	65	62		
GAS												
TO E-3-N	PI-614	.2	.2	.2	.2	.2	.2	.2	.2	.2		
BRINE												
TO E-2-N	TI-101	297	298	298	298	297	298	297	298	298		
TO E-1-N	TR-113	219	217	218	218	218	218	220	219	218		
FROM E-1-N	TR-102	155	156	154	155	154	154	155	157	157		

May 21-23, 1990

	UNITS	21-May	21-May	21-May	22-May	22-May	22-May	23-May	23-May	23-May		
		900	1700	100	900	1700	100	900	1700	100		
ISOBUTANE												
IN V-1-E	°F	102.6	105.1	102.8	103.2	97.8	98.9	97.3	100.5	100.9		
OUT OF P-1-E	°F	109.6	107.6	105.3	106.2	100.9	101.4	099.8	103.1	103.4		
OUT OF E-1-N	°F	213	212	212	214	212	212	214	216	214		
OUT OF E-2-N	°F	223	222	220	222	220	222	222	223	222		
OUT OF E-3-N	°F	213	213	212	213	213	214	214	214	214		
INTO T-1-E	°F	216	215	214	215	214	216	216	217	216		
OUT OF T-1-E	°F	143	144	141	143	139	142	142	144	143		
GAS												
TO E-3-N	°F	1002	993	1007	1000	1000	996	918	919	922		
FROM E-3-N	°F	383	376	383	381	289	297	270	276	280		
BRINE												
IC4 FROM P-1-E	M#/HR	149.7	147.2	146.4	146.6	147.4	147.6	155.4	156.3	156.5		
IC4 TO T-1-E	M#/HR	116.5	115.6	117.4	114.2	114.9	111.6	115.7	116.3	144.4		
IC4 TO E-3-N	M#/HR	121.5	121.3	121.2	120.8	122.3	122.8	123.6	123.8	124.1		
SEP FLOW	GALS	10.4	9.7	9.1	9.9	11.0	10.6	7.3	2.4	2.3		
GAS TO GE-1-N	#/HR	6840706	7074068	731786	7570000	7756395	8014290	82416249	84936	8753060		
		534.6	494.4	534.6	501.6	527.4	551.1	363.6	363.6	369.8		
V-1-E	INCHES	27.5	27.5	26.5	26.75	26.125	26.5	28	27	25		
REMARKS												

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GEOPRESSURED HYBRID POWER SYSTEM - MANAGEMENT REPORT DATA

May 24-27, 1990

	UNITS	INST.#	24-May	24-May	24-May	25-May	25-May	25-May	26-May	26-May	26-May	27-May	27-May	27-May
			900	1700	100	900	1700	100	900	1700	100	900	1700	100
ISOBUTANE														
IN V-1-E	°F	TI-104	102.4	102.7	100.9	101.4	101.2	100.2	101	103.0	84.2	82.9	85.9	84.6
OUT OF P-1-E	°F	TI-105	105.0	105.2	103.7	104.3	103.5	102.5	104.0	105.5	81.9	88.5	94.7	80.4
OUT OF E-1-N	°F	TR-112	214	213	213	212	213	212	212	213	223	143	118	086
OUT OF E-2-N	°F	TI-111	222	224	224	225	224	221	223	223	217	208	206	115
OUT OF E-3-N	°F	TI-603	214	214	214	214	214	213	214	214	240	165	144	148
INTO T-1-E	°F	TI-107	216	217	217	218	216	214	215	214	89	80	86	79
OUT OF T-1-E	°F	TI-108	144	146	0	0	143	139	142	141	127	81	86	78
GAS														
TO E-3-N	°F	TI-601	925	994	997	997	993	994	997	994	787	807	813	812
FROM E-3-N	°F	TI-602	284	315	320	321	324	326	331	332	188	314	342	334
BRINE	M#/HR	FI-100	156.3	147.4	150.7	148.2	146.5	148.4	148.2	148.1	.2	.1	.1	.1
IC4 FROM P-1-E	M#/HR	FI-102	117.8	112.5	115.6	114.6	114.8	114.7	112.2	116.3	0	.0	.1	.0
IC4 TO T-1-E	M#/HR	FI-101	122.4	121.9	122.5	122.0	121.6	121.9	112.6	122.0	3.7	4.4	.9	4.2
IC4 TO E-3-N	M#/HR	FR-627	5.0	11.0	11.6	10.3	11.3	11.2	10.0	11.1	3.6	0.1	0.0	0.0
SEP FLOW	GALS	FQI-633	8986530	9249004	9502455	9745880	2301	229393	503448	769490	845507	0	0	845507
GAS TO GE-1-N	#/HR	FR-607	366.7	517.1	521.2	523.3	523.3	519.2	518.1	522.2	517.1	525.3	523.3	517.1
V-1-E	INCHES	LG-105	23.5	34	31	26.25	25.75	28	26.5	24.75	37	39.5	42	41.5

REMARKS

May 28-30, 1990

	INST.#	28-May	28-May	28-May	29-May	29-May	29-May	30-May	30-May	30-May		
		900	1700	100	900	1700	100	900	1700	100		
AMBIENT TEMP		86	95	75	80	85	78					
WET BULB TEMP		78	86	72	75	78	74					
POWER												
T-1-N GROSS	JI-100	0	0	0	0	0	0					
GE-1-N GROSS		335	320	320	335	335	330					
GE-2-N GROSS		335	330	320	335	335	330					
PARASITIC	JI-101	34	19	19	6	29	29					
NET SALE TO HL&P		565	550	575	610	580	590					
NET SALE TO HL&P		3565	3570	3574	3580	3585	3589					
BRINE												
TO E-2-N	PI-606	0	0	525	530	0	0					
TO E-1-N	PI-611	0	0	525	530	0	0					
FROM E-1-N	PI-106	0	0	529	529	17	535					
ISOBUTANE												
IN V-1-E	PG-130	57	63	54	47	60	60					
OUT OF P-1-E	PI-105	56	61	53	47	62	60					
OUT OF E-1-N	PI-602	0	0	40	40	60	0					
OUT OF E-2-N	PG-114	0	0	40	40	45	0					
OUT OF E-3-N	PI-615	59	60	60	50	0	50					
INTO T-1-E	PI-107	36	44	21	45	45	25					
OUT OF T-1-E	PI-108	37	38	21	44	41	23					
TO OR 102	PG-104	54	60	60	50	60	55					
FROM OR 102	PG-105	57	55	55	50	60	55					
GAS												
TO E-3-N	PI-614	.0	.0	.0	.0	.0	.0					
BRINE												
TO E-2-N	TI-101	208	118	222	206	274	270					
TO E-1-N	TR-113	124	97	86	85	97	103					
FROM E-1-N	TR-102	96	113	102	92	94	92					

May 28-30, 1990

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