DOCUMENT REVISION DISTRIBUTION SHEET - UNIT II OFF NORMAL (EMERGENCY) OPER. PROCEDURE

DOCUMENT TITLE Total Loss of AC Power

DOCUMENT FILE NUMBER 2-0030143

DOCUMENT REVISION NUMBER 1

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FLORIDA POWER & LIGHT COMPANY
ST. LUCIE PLANT UNIT 2
EMERGENCY PROCEDURE NUMBER 2-0030143
REVISION 1

TOTAL LOSS OF AC POWER
(TLOP)
MARCH 18, 1983

TOTAL NO. OF PAGES 9

EMERGENCY PROCEDURE NUMBER 2-0030143
REVISION 1

1.0 SCOPE:

This procedure is to be used in the event of a total loss of both offsite AC power, and loss of both Diesel Generators. R1

2.0 SYMPTOMS:

2.1 Loss of power to 2A1, 2B1 6.9 KV Bus.

2.2 Loss of power to 2A2, 2A3, 2B2, 2B3 and 2AB 4.16 KV Bus.

3.0 AUTOMATIC ACTIONS:

ACTION	INITIATING EVENT
3.1 Reactor Trip.	3.1 Low RCS Flow
3.2 Turbine Trip/Generator Lockout	3.2 Reactor Trip
3.3 Auxiliary Feedwater Auto Actuation.	3.3 Low S/G Level @ 39%
3.4 PORV's Operate.	3.4 Hi Pressurizer Press @ 2375 PSIA

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4.0 IMMEDIATE OPERATOR ACTIONS:

4.1 Ensure all CEA's on bottom, and reactor trip breakers open.	4.1 RTGB-204 and top of RPS panels.
4.2 Ensure 2C Auxiliary Feedwater Pump is restoring Steam Generator level.	4.2 RTGB-202.
4.3 Close HCV-08-1A and HCV-08-1B (Main Steam Insolation Valves).	4.3 RTGB-206.
4.4 Isolate letdown flow by closing V-2515, V-2516, and V-2522 (Letdown isol).	4.4 RTGB-205

R1

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5.0 SUBSEQUENT ACTIONS:

CHECK

5.1 Ensure Generator OCB's and field breaker open. ______

5.2 Open 2-30102 (S.U. Transformer to 2A1 6.9 KV bus). ______
Open 2-30202 (S.U. Transformer to 2B1 6.9 KV bus). ______
Open 2-20102 (S.U. Transformer to 2A2 4.16 KV bus). ______
Open 2-20302 (S.U. Transformer to 2B2 4.16 KV bus). ______

5.3 Ensure D/G breakers open.

2A D/G: 2-20211 ______
2B D/G: 2-20401 ______

5.4 Ensure 2AB 4.16KV bus feeders are open:

2-20208, 2-20505 (2A3 4.16KV to 2AB 4.16 KV bus). ______
2-20409, 2-20504 (2B3 4.16KV to 2AB 4.16 KV bus). ______

5.5 Open 2-40103 (2A2 4.16KV feed to 2A1 L.C. - Hi side). ______
Open 2-20110 (2A2 4.16KV feed to 2A1 L.C. - Lo side). ______
Open 2-40219 (2A3 4.16KV feed to 2A2 L.C. - Hi side). ______
Open 2-20210 (2A3 4.16KV feed to 2A2 L.C. - Lo side). ______

5.6 Open 2-40419 (2B2 4.16KV feed to 2B1 L.C. - Hi side). ______
Open 2-20310 (2B2 4.16KV feed to 2B1 L.C. - Lo side). ______
Open 2-40503 (2B3 4.16KV feed to 2B2 L.C. - Hi side). ______
Open 2-20402 (2B3 4.16KV feed to 2B2 L.C. - Lo side). ______

5.7 Ensure 2AB 480V Load Center Feeders are open:

2-40220, 2-40702 (2A2 480V L.C. to 2AB). ______
2-40706, 2-40504 (2B2 480V L.C. to 2AB). ______

5.8 Ensure the main steam isolation bypass valves both indicate closed or dispatch an operator to locally take control and close the valves. ______

> NOTE: The handwheels on these valves turn counterclockwise direction to close, opposite of most valve handwheels in the plant.

5.9 Open 2A and 2B Atmospheric Dump Valves to reduce Steam Generator pressure below safety valve lift pressure. AC power to controllers will be lost, so DC operation of the valves will become necessary as below:

1. Take desired ADV auto/man switch to MANUAL. ______

2. Modulate the dump valve open or closed with direct DC power with the open/close control switch. ______

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5.0 SUBSEQUENT ACTIONS: (Cont.)

CHECK

5.10 Close FCV-23-3, 5, 4 and 6 (2A and 2B S/G Blowdown Isol). _____

5.11 Close FCV-23-7 and FCV-23-9 (2A and 2B S/G Blowdown Sample Isol). _____

5.12 Close AOV-5200, 5201, 5203, 5204 and 5205 (RCS Sample Isol). _____

5.13 Implement the Emergency Plan as necessary in accordance with EP 3100021E, "Duties of the Emergency Coordinator." _____

5.14 Minimize atmospheric steam dump use thereby ensuring minimum RCS heat loss; however, _____

1. Maintain S/G pressure less than S/G safety setpoint.

2. With decreasing RCS pressure, maintain hot leg temperature (Th) at least 20°F below the saturation temperature corresponding to the RCS pressure. _____

5.15 Verify by the following indications that natural circulation flow has been established within approximately 15 minutes after RCP's were stopped.

1. Loop Delta T less than normal full power Delta T (< 46°F). _____

2. Cold leg (Tc) constant or decreasing. _____

3. Hot leg (Th) stable (i.e., not steadily increasing). _____

5.16 If RCS pressure decreases to 1808 psia, verify receipt of block permissive annunciator R-6 and block SIAS. _____

5.17 Notify system dispatcher of plant conditions and request most urgent priority in restoring off-site power. _____

5.18 If 2C Auxiliary Feedwater Pump is stopped or flow is lost, then:

1. Reinitiate auxiliary feed flow as soon as possible; however, do not exceed a flow rate of 150 GPM per affected Steam Generator.

2. Limit feed flow rate to 150 GPM per affected Steam Generator until continuous feed flow to the affected Steam Generator has been maintained for five minutes.

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5.0 SUBSEQUENT ACTIONS: (Cont.)

CHECK

5.19 Use all available resources to restore one Emergency Diesel generator to operable status. ______

5.20 The following restoration sequence assumes "A" train power supply is restored first.

1. Strip all vital and non-vital load center breakers in preparation for a systematic power restoration. ______

2. Energize 2A3 4.16KV bus by either: ______

   A. Starting 2A D/G and closing D/G breaker. Adjust and maintain voltage and frequency at 4.16KV/60 HERTZ.

   or

   B. Close 2-20102 (S.U. Transformer to 2A2 4.16KV bus). Close 2-20109 (2A2 4.16KV to 2A3 4.16KV bus). Insert sync plug and close 20209 (2A2 4.16KV to 2A3 4.16KV bus).

3. Energize 2A2 and 2A5 480V load centers:

   A. Close 2-20210 2A3 4.16KV 2A2 & 2A5 480V L.C. ______

   B. Close 2-40219 Incoming Feeder to 2A2 480V L.C. ______

   C. Close 2-40361 Incoming Feeder to 2A5 480V L.C. ______

4. Energize 2AB 480V Load Center by closirg 2-40220 and 2-40702 (2A2 480V L.C. feed to 2AB L.C.) ______

5. Energize 2A5, 2A6, 2A7 and 2A8 480V MCC's as follows:

   A. Close 2-40203 (2A2 480V L.C. feed to 2A5 MCC). ______

   B. Close 2-40351 (2A5 480V L.C. feed to 2A6 MCC). ______

   C. Close 2-40202 (2A2 480V L.C. feed to 2A7 MCC). ______

   D. Close 2-40352 (2A5 480V L.C. feed to 2A8 MCC). ______

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5.0 SUBSEQUENT ACTIONS: (Cont.)

5.20 (Cont.)

CHECK

6. Energize non-essential sections of 2A5, 2A6 and 2A8 MCC's as follows:

   A. Close 2-41230 (MCC 2A5 non-essential breaker). ______

   B. Close 2-41325 (MCC 2A6 non-essential breaker). ______

   C. Close 2-41513 (MCC 2A8 non-essential breaker). ______

7. Ensure 2A Battery Charger is "ON LINE" supplying the 2A DC bus by observing 2A DC bus voltage on RTGB-201 to be greater than 120V DC. ______

8. Align and start emergency cooling water to the Instrument Air Compressor. Start the 2A Instrument Air Compressor and observe restoration of instrument air pressure. ______

9. Start the 2A Charging Pump to reestablish Pressurizer level. When the CCW system has been restored per Step 15, then 2A HPSI Pump can also be started to augment refilling of the Pressurizer. ______

   A. Evaluate RCS temperature, pressure, and level instrumentation to determine if a bubble exists other than in the Pressurizer.

   B. If evaluation confirms, then continue charging to increase RCS pressure.

   C. When greater than 20°F subcooled, operate Charging and/or HPSI pumps to maintain Pressurizer level greater than 30% level.

10. Ensure closed 2-20204 (Pressurizer heater transformer 2A 4.16V feed). ______

11. When Pressurizer level indicates > 30%, energize Pressurizer heaters B-1, B-2, B-3 and P-1. ______

12. Ensure ICW seal water from Unit 1 Domestic Water System is available. ______

5.0 SUBSEQUENT ACTIONS: (Cont.)

5.20 (Cont.)

CHECK

13. Reestablish "A" train Intake Cooling Water System as follows:

    A. Establish seal water. ______

    B. Throttle 2A ICW pump discharge valve. ______

    C. Start 2A ICW pump; pressurize and vent "A" ICW header. ______

    D. After venting, open 2A ICW pump discharge valve. ______

14. Reestablish "A" train Component Cooling Water System as follows:

    A. Isolate CCW to RCP's by closing HCV-14-1, 2, 6 and 7 (to prevent thermal shocking RCP seals. ______

    B. Throttle 2A CCW pump discharge valve. ______

    C. Ensure surge tank at normal level. ______

    D. Start 2A CCW pump; pressurize and slowly open 2A CCW pump discharge valve. ______

15. Reestablish CVCS letdown to maintain Pressurizer level at normal operating level. ______

16. Commence boration to Cold Shutdown boron concentration. ______

17. Start one set of cavity and support cooling fans. ______

18. Proceed to EOP #2-0120040, "Natural Circulation/Cooldown", Step 5.10, and perform in conjunction with the balance of this procedure. ______

19. Restore balance of secondary plant in accordance with EOP 2-0030140, "Blackout Operation". ______

R1

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6.0 DISCUSSION:

The "Total Loss of AC Power" event consists of a loss of off-site power in conjunction with failure of the Emergency Diesel Generators to provide emergency power. This results in a loss of all AC electrical power except that provided by inverters powered from the vital DC busses. The termination of AC power causes a loss of forced reactor coolant flow, main feedwater flow, steam flow to the Turbine and Pressurizer pressure control. The reactor trips on either low reactor coolant flow, high Reactor Coolant System pressure or low Steam Generator level depending on initial conditions.

The "Total Loss of AC power" event also causes a loss of all Reactor Coolant System makeup capability which includes charging and safety injection flow. Inventory losses through leakage, Reactor Coolant Pump controlled bleedoff, and primary relief valve releases are the major contributors to the degradation of pressure and level control during the event. The other contributor to coolant system shrinkage and pressure reduction is system heat loss, primarily through the Pressurizer walls.

Core heat removal is accomplished through natural circulation. Reactor Coolant System heat removal is accomplished using Atmospheric Pump Valves and the steam-driven Auxiliary Feedwater Pump.

7.0 REFERENCES:

7.1 CE Emergency Procedure Guidelines, CEN-152

7.2 St. Lucie #1 Off-Normal Operating Procedures

8.0 RECORDS REQUIRED:

8.1 Normal Log Entries

9.0 APPROVAL:

Reviewed by the Facility Review Group ~~MARCH 23~~ Oct. 26 emw 19~~83~~ 82
Approved by [signature] Plant Manager April 13, 1983
JH Barrow emw
Rev. 1 Reviewed by FRG March 23, 1983
Approved by [signature] Plant Manager April 13, 1983

"L A S T P A G E"

DOCUMENT REVISION DISTRIBUTION SHEET - UNIT II OFF NORMAL & EMERGENCY OPER. PROCEDURE

DOCUMENT TITLE Reactor Coolant Gas Vent System Off-Normal Operation

DOCUMENT FILE NUMBER 2-0120037

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				C. Burns - CE	

PROCESSED BY: [signature] DATE 4-13-83

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FLORIDA POWER & LIGHT COMPANY
ST. LUCIE PLANT UNIT NO. 2
EMERGENCY OFF-NORMAL OPERATING PROCEDURE NO. 2-0120037
REVISION 1

1. TITLE: REACTOR COOLANT GAS VENT SYSTEM OFF-NORMAL OPERATION
2. PREPARED BY: M. G. Altermatt 3/23 1983
3. SUBCOMMITTEE REVIEW BY: D. A. Sager for FP&L PR 3/24 1983
4. REVIEWED BY FRG ON: 3/17 1982
5. APPROVED BY: C. M. Wethy Plant Manager 3/17 1982
6. REVISION 1 REVIEWED BY FRG ON: March 25, 1983
7. APPROVED BY: J H Barrow Plant Manager April 6 1983

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FLORIDA POWER & LIGHT COMPANY
ST. LUCIE UNIT NO. 2
OFF-NORMAL OPERATING PROCEDURE NUMBER 2-0120037
REVISION 1

2

1.0 TITLE:

REACTOR COOLANT GAS VENT SYSTEM OFF-NORMAL OPERATION

2.0 REVIEW AND APPROVAL:

Reviewed by Facility Review Group ______ March 17, 1982
Approved by C. M. Wethy ______ Plant Manager March 17, 1982

Revision 1 Reviewed by F R G ______ March 25, 1983
Approved by J. H. Barrow ______ Plant Manager April 6 1983

3.0 PURPOSE AND DISCUSSION:

3.1 The purpose of this procedure is to provide a method of venting non-condensible gases from the Reactor Coolant System (RCS) which may inhibit core cooling during natural circulation.

3.2 Guidance and precautions are also provided for use in determining when to initiate venting, and termination of venting operations.

4.0 SYMPTOMS:

4.1 Abnormal RCS conditions such as large variations in Pressurizer level during normal charging and spraying operations have occurred.

4.2 Reactor vessel level display less than 100% and reactor vessel head temperatures equal to or greater than saturation temperature, as indicated by QSPDS Display System.

4.3 Plant events have occurred (such as Safety Injection Tank [SIT] discharge, rapid RCS cooldown, or core uncovery events) that may result in the presence of a gaseous void in the vessel head.

4.4 Loss of Pressurizer pressure control during normal Pressurizer conditions (i.e., bubble established, normal heaters/spray capabilities).

2

5.0 INSTRUCTIONS:

5.1 Immediate Automatic Actions:

None

5.2 Immediate Operator Actions:

None

5.3 Subsequent Operator Actions:

Note: Asterisked steps are not applicable if safety injection has been initiated.

5.3.1 If any of the above listed symptoms have occurred or it is suspected that there is a non-condensible void formation present in the RCS by other detection means, then any changes being made to the primary system should be terminated and a steady state condition established.

5.3.2 Attempt to recombine any condensible gases by increasing RCS pressure through the use of Pressurizer Back-up heaters. If this step is successful in condensing the gas volume in the vessel head (as indicated by a return to normal readings in those parameters used to determine the presence of the gases) then return to the appropriate operating procedures.

5.3.3 Coordinate with appropriate on-site technical resources. (Technical Support Center [TSC] Supervisor, if manned; Chemistry Department representative if TSC is not manned).

5.3.4 Determine the recommended venting time required per Appendix A, if possible.

5.3.5 Increase the RCS sub-cooling to 50°F + inaccuracies by either pressurizing via Pressurizer Backup heaters or decreasing RCS temperature via dumping steam.

5.3.6 Terminate Containment purge, if in progress. Start all available Containment Fan Coolers.

5.3.7 Ensure that all available Hydrogen Recombiners are in service.

5.3.8 Verify that Chemistry Department is prepared for monitoring the Containment atmosphere for hydrogen via the hydrogen analyzer and/or grab sample.

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OFF-NORMAL OPERATING PROCEDURE NUMBER 2-0120037, REVISION 1
REACTOR COOLANT GAS VENT SYSTEM OFF-NORMAL OPERATION

5.0 INSTRUCTIONS: (continued)

5.3 (Cont.)

* 5.3.9 Increase Pressurizer level to 80-85% in preparation for venting. This should provide inventory to displace approximately 900 ft^3 before reaching Pressurizer heater level.

* 5.3.10 If not already performed, manually block SIAS if the permissive is energized during the venting process.

5.3.11 Restore power to the Reactor Coolant Gas Vent System (RCGVS) solenoid operated valves by inserting fuses.

PLANT AUXILIARY CONTROL BOARD NO. 2

SA DC F1 & F2	SB DC F1 & F2
V-1462	V-1463
V-1461	V-1460
V-1465	V-1464
	V-1466

5.3.12 Monitor Pressurizer pressure and level and QSPDS reactor vessel display during the venting period. Minimize the pressure and level decrease by selective use of Charging Pump combinations and letdown flow.

PRECAUTIONS

1. This venting procedure should be used as the primary means to mitigate an inadequate core cooling event.
2. Venting operations should be performed prior to the initiation of safety injection flow throttling during a Post-LOCA cooldown and depressurization. During venting "full flow" SI capabilities must be maintained if needed.
3. Do not trip any running or start any non-operating Reactor Coolant Pumps during venting operations.
4. Containment purge should be isolated to prevent the relase of any radioactive gases to the environment.
5. All available Containment air circulation equipment should be started to prevent any hydrogen from forming a gas pocket and to ensure a representative hydrogen concentration is obtained during sampling.
6. Appendix A "Venting Time Period" determines the maximum allowable time period for venting which will limit the Containment hydrogen concentration to < 3 volume percent.

5.0 INSTRUCTIONS: (continued)

5.3 (Cont.)

5.3.13 Destination of the gas when venting is optional. The decision as to which is used should be based on quantity of gas to be released. If recovery and processing to the waste gas system is desired, then vent to quench tank. If quantity is large then vent to containment atmosphere via the goose neck or via accumulator to ventilation system.

5.3.14 Under no circumstances should both vent valves in the venting flowpath be powered from the same electrical train. The reactor vessel head and pressurizer should not be vented simultaneously.

5.3.15 Commence venting as follows:

5.3.15.1 Venting pressurizer and/or reactor vessel head to containment via goose neck.

________ Open V1460 to vent pressurizer
________ Open V1463 to vent reactor vessel head
________ Open V1465 gooseneck isolation to commence venting

5.3.15.2 Venting pressurizer and/or reactor vessel head to quench tank.

________ Open V1461 to vent pressurizer
________ Open V1462 to vent reactor vessel head
________ Open V1464 quench vent isolation to commence venting

5.3.15.3 Venting pressurizer and/or reactor vessel head to accumulator.

________ Open V1461 to vent pressurizer
________ Open V1462 to vent reactor vessel head
________ Open V1466 accumulator isolation to commence venting R1

2

5.0 INSTRUCTIONS: (continued)

5.3 (Cont.)

5.3.16 Terminate venting by closing destination valve and then closing source valve when: R1

1. TIME PERIOD DETERMINED IN STEP 5.3.4 IS MET,

   OR

2. PRESSURIZER PRESSURE DECREASES BY 200 PSI,

   OR

3. PRESSURIZER LEVEL DECREASES BELOW 25% LEVEL,

   OR

4. REACTOR COOLANT SUBCOOLING is < 20°F + INACCURACIES,

   OR

5. THE REACTOR VESSEL HEAD IS REFILLED AS INDICATED BY QSPDS REACTOR VESSEL LEVEL DISPLAY.

5.3.17 Re-establish Pressurizer level and evaluate the response and trend of the Pressurizer level to determine if a gas bubble existed in the head. If a gas bubble existed and the venting was terminated prior to the vessel being completely refilled, then return to Step 5.3.13.

Note:	If multiple venting operations are required and the Containment hydrogen concentration is $\geq$ 3 volume percent, then provisions must be made to remove or reduce the volume of hydrogen from the Containment prior to re-opening the reactor vessel head vent.

5.3.18 Return to the appropriate operating procedures following successful completion of venting of the reactor vessel head.

6.0 REFERENCES:

6.1 C-E "Final Report on the Reactor Coolant Gas Vent System".

7.0 RECORDS:

7.1 Completed Appendix A work sheets shall be retained in the plant file in accordance with QI-17/PSL-1.

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OFF-NORMAL OPERATING PROCEDURE NUMBER 2-0120037, REVISION 1
REACTOR COOLANT GAS VENT SYSTEM OFF-NORMAL OPERATION

APPENDIX A

VENTING TIME PERIOD

1. During a core uncovery event, there exists the potential for a significant amount of hydrogen to be generated in the reactor core which could be trapped in the reactor vessel and released to the Containment atmosphere during the venting operation. The Containment hydrogen concentration is limited to <4 volume percent to prevent a potential explosive mixture with oxygen; therefore, the amount of hydrogen that can be vented to the Containment is restricted. A maximum allowable time period for venting is determined to limit the Containment hydrogen concentration.

2. This guide assumes that Containment conditions are near normal.

3. Convert the Containment free-volume to Containment volume at standard temperature and pressure conditions as follows:

$$\text{Containment Volume } (ft^3 \text{ @ STP}) = (2.5 \times 10^6\ ft^3) \times \left[\frac{\text{Containment Pressure}^{a}}{14.7}\right] \times \left[\frac{492^{o}R}{(\text{Containment Temperature}^{b}}\right]$$

Notes:	a. Delete term if Containment pressure is < 2 PSIG.
	b. Temperature in degrees Rankine (° F + 460)

Containment Volume (ft^3 @ STP) = ______________________.

4. Determine Containment hydrogen concentration in volume percent units.

   A. Obtain value from Chemistry Department.

   B. If there has been no leakage from the RCS into the Containment, assume a value of zero.

   C. Containment Hydrogen Concentration = ______________%.

5. Calculate the maximum hydrogen volume that can be vented to the Containment which will result in a Containment hydrogen concentration of ≤ 3 volume percent.

$$\text{Maximum Hydrogen Volume } (ft^3) = \frac{(3.0\%\text{-Cont.}H_2\text{ Conc\% [Step 4.C]})\text{X(Cont. Vol.@ STP [Step 3])}}{100\%}$$

Maximum Hydrogen Volume (ft^3) = ______________.

2

APPENDIX A

6. Obtain from Curve #1 the hydrogen flow rate which will result at the predicted RCS pressure at time of venting.

   A. Predicted RCS pressure = __________psia

   B. Hydrogen flow rate = __________SCFM

7. The maximum allowable venting time period which will limit the Containment hydrogen concentration to $\leq$ 3 volume percent is determined by:

$$\text{Venting period (min)} = \frac{\text{Max. } H_2 \text{ Volume [Step 5]}}{H_2 \text{ Flow rate [Step 6]}}$$

Venting period = ____________________ minutes

2

APPENDIX A

Page 3 of 3

CURVE #1
HYDROGEN FLOW RATE vs. PRESSURE

ST. LUCIE UNIT 2
OFF-NORMAL OPERATING PROCEDURE NUMBER 2-0120037, REVISION 1
REACTOR COOLANT GAS VENT SYSTEM OFF-NORMAL OPERATION

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FIGURE 1

PRESSURIZER VENT
HYDROGEN FLOW RATE vs PRESSURE

2

FIGURE 2

REACTOR VENT
STEAM FLOW RATE vs PRESSURE

2

FIGURE 3

PRESSURIZER VENT
STEAM FLOW RATE vs. PRESSURE

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REACTOR COOLANT GAS VENT SYSTEM OFF-NORMAL OPERATION

2

FACT SHEET
SOURCES OF NON-CONDENSABLES

	Source	Volume (STP)	Mass
1.	Complete oxidation of clad (hydrogen)	448000 ft3	2514.9 lbs[a]
2.	Fuel rod fill gas (helium)	1140 ft^3	12.7 lbs[a]
3.	Fission gases (Xe, Kr, I_2)	26 ft^3	9.0 lbs[a]
4.	Safety Injection Tanks (nitrogen)		
	A. Cover gas	51820 ft^3	4042.2 lbs[b]
	B. Dissolved gas	690 ft^3	53.8 lbs[b]
5.	Dissolved in Refueling Water Tank (air)	1360 ft^3	109.7 lbs[c]
6.	Dissolved in primary coolant (hydrogen)	384 ft^3	2.2 llbs
7.	Pressurizer vapor space (hydrogen)	793 ft^3	4.6 lbs

NOTES:

a. For breaks requiring the return to natural circulation no fuel rod rupture or oxidation is predicted. Numbers are based on 36924 fuel rods.

b. For breaks requiring the return to natural circulation the SIT's do not inject water.

c. The largest amount of liquid injected from the Refueling Water Tank (RWT) during the boiling phase for breaks that return to natural circulation is approximately 40% of the RWT volume.

Pressurizer

Volume of Top Spherical Head = 134 ft^3

Volume of Bottom Spherical Head = 114 ft^3

Volume of Cylinder Section = 1252 ft^3

Level Span = 350 inches

Volume vs. % Span = 15 ft^3 per %

Inches vs. % = 3.6" per %

Volume Required to Cover Heaters = 266 ft^3

Pressurizer O.D. = 106.5 inches

Pressurizer I.D. = 96 inches

Pressurizer Cross Sectional Area = 50.27 ft^2

Steam Generators

Total Volume of U-Tubes = 1147 ft^3

Volume of Steam Generator Cold Plenum = 250 ft^3

Volume of Steam Generator Hot Plenum = 258 ft^3

ST. LUCIE UNIT 2
OFF-NORMAL OPERATING PROCEDURE NUMBER 2-0120037, REVISION 1
REACTOR COOLANT GAS VENT SYSTEM OFF-NORMAL OPERATION

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PRESSURIZER LEVEL (%) VS. VOLUME (Cu Ft)

PRESSURIZER at 2250 psia/653° F.