ITEM # 2 COVER SHEET

-- INITIAL SUBMITTAL INFORMATION -ALL IN ONE ADAMS DOCUMENT

ST. LUCIE EXAM 2000-301 50-335 & 50-389

FEBRUARY 7 - 11, 2000

INITIAL SUBMITTAL

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INITIAL SUBMITTAL RO WRITTEN EXAMINATION

U.S. Nuclear Regulatory Commission Site-Specific Written Examination

Applicant Information						
Name:	Region: II					
Date:	Facility/Unit: St. Lucie Unit 1 and 2					
License Level: RO	Reactor Type: CE					
Start Time:	Finish Time:					
Instructions Use the answer sheets provided to document your answers. Staple this cover sheet on top of the answer sheets. The passing grade requires a final grade of at least 80.00 percent. Examination papers will be collected five hours after the examination starts.						
Applicant Certification All work done on this examination is my own. I have neither given nor received aid. Applicant's Signature						
Results						
Examination Value 100 Points						
Applicant's Score Points						
Applicant's Grade Percent						

Question 1

A Waste Gas Decay Tank is to be released.

Which of the following conditions would prohibit releasing the tank?

- A. The wind speed is varying by more than 5 mph.
- B. The Waste Gas Radiation Monitor is inoperable.
- C. The Waste Gas release flow meter is inoperable.
- D. Both RAB Exhaust Fans HVE-10A and HVE-10B, are stopped.

Question 2

The selected Unit 1 Pressurizer Pressure controller PIC-1100X fails low. With no Operator action, and all systems in automatic, which of the following actions will occur?

- A. Proportional and backup heaters full on, spray valves open, pressure decrease results in TMLP trip.
- B. Proportional and backup heaters full off, spray valves closed, pressure decrease results in TMLP trip.
- C. Proportional and backup heaters full on, spray valves closed, pressure increase results in high pressure reactor trip.
- D. Proportional and backup heaters full off, spray valves open, pressure increase results in high pressure reactor trip.

Question 3

A loss of offsite power occurred from 100% power 30 minutes ago.

The following conditions exist:

- Both S/Gs are available with AFW flow of 150 GPM per S/G.
- RCS subcooling is 60°F.
- Average of Qualified CETs is 540°F.
- Loop T-hots are 530°F and rising slowly.
- Loop T-colds are 528°F and steady.
- 2A and 2B Steam Generator Pressures are 895 psia and steady.

Which of the following actions should be taken to enhance natural circulation?

- A. Initiate Auxiliary Spray.
- B. Throttle open the Atmospheric Dump Valves.
- C. Throttle open the Auxiliary Feed Water control valves.
- D. Turn on available pressurizer heaters.

Question 4

Given the following conditions:

- Unit 1 is operating at 25% power.
- All controls are in Manual Sequential.
- Group 7 control rods are at 45 inches.
- The operator is withdrawing Group 7 control rods.
- When the "in/out" switch is released, outward rod motion continues.
- Placing the mode selector in OFF has no effect.

With **no** Operator action which of the following will automatically trip the reactor?

- A. Variable High Power
- B. High Start Up Rate
- C. Thermal Margin/Low Pressure
- D. High Pressurizer Pressure

Question 5

Given the following conditions:

- Unit 2 is in Mode 5 on SDC preparing to heatup the RCS.
- Both Personnel airlock doors are open.
- A loss of shutdown cooling occurs and the Unit inadvertently enters Mode 4.

Which one of the following statements describes the status of containment integrity?

Containment integrity is:

- A. not met. At least one airlock door must be maintained closed at all times.
- B. not met. Both airlock doors must be maintained closed at all times.
- C. not required in Mode 4.
- D. not required if Unit re-enters Mode 5 within one hour.

Question 6

Unit 2 is in Mode 4 with the following conditions:

- RCS pressure 270 PSIA
- Both SDC Loops in service
- 2B1 and 2B2 RCP's operating
- 2B HPSI pump in standby for boration flowpath
- PLP 101 (RM-26-1) CCW Header A Radiation monitor in alarm

Which of the following identifies the component that is the likely source of the high CCW activity?

- A. 2A LPSI Pump
- B. 2B HPSI Pump
- C. 2A Fuel pool Heat Exchanger
- D. 2B SDC Cooling Heat Exchanger

Question 7

Unit 2 is operating at 80% power, 5000 EFPH, with the following conditions:

- Two charging pumps are operating.
- RCS Boron Concentration is 850 PPM.
- 2A BAMT concentration of 5525 PPM.
- V2514 emergency borate valve is open.
- 2A BAM pump is being cycled to facilitate a 30 MWE/min rapid downpower.

The RCO runs the 2A BAM pump one time for one minute and then stops it. Excluding the effects of Xenon, which of the following identifies the approximate final Tave?

(REFERENCES PROVIDED)

- A. 565° F
- B. 560° F
- C. 553° F
- D. 546° F

Question 8

Given the following conditions:

- A reactor trip occurred several minutes ago.
- All RCPs are in operation.
- RCS temperature: 520°F and slowly lowering.
- Pressurizer pressure: 1980 psia and slowly lowering.
- Pressurizer level: 36% and trending slowly downward.
- Subcooling: 100°F and slowly rising.
- Both SG levels: 10% narrow range and slowly lowering.
- Both SG pressures: 740 psia and slowly lowering.

Which one of the following actions would promptly stabilize the plant?

- A. Raise the pressurizer level control setpoint.
- B. Raise the pressurizer pressure control setpoint.
- C. Increase Auxiliary Feedwater flow.
- D. Close the Main Steam Isolation valves.

Question 9

At 50% power Unit 2 received the following annunciators on RTGB 201:

- B-14 4.16 KV 2A3 ∆ current trip
- B-6 2A Emer. D/G Brk. Failure
- B-35 480V LC 2A5 UV/UV test/ground
- B-33 120V Vital Security/Fire Invtr. Trouble
- B-46 4.16 KV Emerg. SWGR. 2A3 UV/UV test
- B-28 480 V LC 2A2 UV/UV test ground
- B-48 4.16 KV SWGR./480V LC/MCC 2AB UV
- B-9
 Pzr. HTR XFMR 2A3 Trouble
- B-39 480V MCC 2A5/2A6/2A8 Non-Ess. Sect. Lockout

Which of the below describes the status of the Reactor and the 2A Diesel Generator?

- A. Reactor tripped and the 2A Diesel not start.
- B. Reactor tripped and the 2A Diesel start and energize the 2A3 4.16 KV bus.
- C. Reactor not tripped and the 2A Diesel not start
- D. Reactor not tripped and the 2A Diesel start but not energize the 2A3 4.16 KV bus.

Question 10

Unit 1 Control Room has been evacuated due to a fire and all immediate actions have been complete. Pressurizer Pressure is being controlled by the RCO from the Hot Shutdown Control Panel (HSDCP).

Which of the following describes the Pressurizer Pressure range and the method to maintain these ranges?

	Range	Method
A.	1800-2300 psia, trending to 2225-2275 psia auxiliary spray.	heaters and
В.	1800-2300 psia, trending to 2225-2275 psia auxiliary spray.	main spray or
C.	1850-2250 psia, trending to 2200-2300 psia	heaters and main. spray
D.	1850-2250 psia, trending to 2200-2300 psia	auxiliary spray or PORV's.

Question 11

The following annunciators are received on Unit 2:

- L-36 TMLP channel trip
- L-40 NI channel inoperative
- L-43 Reactor power ratio deviation
- L-34 Nuclear / ΔT power channel deviation
- L-9 Reactor power high channel trip

Which of the below Nuclear Instrumentation systems has malfunctioned?

- A. Startup Channel
- B. Linear Range Safety Channel
- C. Excore Neutron Monitoring
- D. Wide Range Monitoring

Question 12

A Nuclear and Delta T Power Calibration was performed at 100% power. Calorimetric, Nuclear, DDPS and Delta T all agree within 0.2 %.

If the Unit is downpowered to a stable 50% power level, which of the below statements describes the adjustment that will be required when a new Nuclear and Delta T Power Calibration is performed?

Nuclear power will have to be adjusted:

- A. upward to match DDPS power.
- B. downward to match manual Calorimetric.
- C. downward to null Nuclear Power-Delta T Power.
- D. upward to null Nuclear Power-Delta T Power.

Question 13

Which of the below statements describes the reason for closing the Unit 2 MSR Block values as part of Standard Post Trip Actions?

Prevent:

- A. overcooling the RCS
- B. losing condenser vacuum.
- C. damaging LP turbine seals.
- D. overpressurizing the MSR shell side

Question 14

A differential current lockout occurs on the 1A2 4.16KV bus at 32% power.

Which of the following describes the Plant response?

- A. The 1A and 1B Condenser will lose equal amount of Circulating water flow but the Unit will have to be tripped due high ΔT across the condensers.
- B. The 1A and 1B Condenser will lose equal amount of Circulating water flow, but due to reduced power, the Unit can remain operating.
- C. The 1A Condenser will be without Circulating water flow and the Unit will have to be tripped due to high differential pressure between condensers.
- D. The 1A Condenser will be without Circulating water flow, but due to reduced power the Unit can remain operating.

Question 15

Which of the following will immediately trip the reactor upon a loss of the 1A DC bus on Unit 1?

- A. Low Flow due to loss of two Reactor Coolant Pumps.
- B. SIAS signal, which opens the MG set output Breakers.
- C. Turbine trip due to loss of 20 ET and 20 AST.
- D. Two of four RPS channel trips opens 8 TCB's.

Question 16

Given the following conditions:

- Unit 1 tripped 15 minutes ago
- Pressurizer pressure is 2100 psia and slowly increasing
- Pressurizer level lowered to 25% and has slowly recovered to 29%

Which of the following is the condition of the Pressurizer heaters at this time? (ASSUME NO OPERATOR ACTION)

- A. All heaters are energized.
- B. All heaters are de-energized.
- C. Only the backup heaters are energized.
- D. Only the proportional heaters are energized.

Question 17

Unit 1 is in Mode 3. Which of the following will cause an actuation that will stop a running Containment purge fan (HVE 8A or 8B)?

- A. Containment temperature of 120°F.
- B. Containment pressure increases to 5.5 psig
- C. Containment high range radiation monitor fails to 500 Rem.
- D. Containment radiation monitors (CIAS) increases to 1 R/Hr.

Question 18

Unit 2 is operating at 100% power with ESFAS Channel D Containment Pressure in trip due to PT 07-2D failing high. A loss of the MA instrument bus occurs.

Which of the following statements describes the response of the Containment Spray Actuation System (CSAS) and why?

CSAS is:

- A. not actuated, only one of the four ESFAS channels will actuate.
- B. not actuated, CSAS is energize to actuate.
- C. actuated due to high containment pressure on two channels.
- D. actuated due to a loss of the Instrument bus alone.

Question 19

Given the following conditions:

- Unit 2 is in Mode 6 with fuel movement in progress.
- The only available Instrument air Compressor, 2C, has tripped and has been off line for 90 minutes.
- The Service Air Compressor has been lined up to Instrument air since the loss of the 2C Compressor.
- Current Instrument air pressure is 98 psig and steady.

In accordance with 2-1010030 Loss of Instrument Air, which of the following describes the action to be taken as a result of Service Air being lined up to Instrument Air?

- A. Stop fuel movement until a redundant source of instrument air can be established.
- B. Blowdown the Instrument air header drains to remove oil, water, and crud build-up.
- C. Install Diesel air compressor to augment the installed station air compressor.
- D. Manually cross tie Instrument air to Unit 1 and isolate the Station air to Instrument air cross tie.

Question 20

Unit 2 is ready to cooldown to Shutdown Cooling entry conditions due to a Steam Generator tube rupture. The following are the plant conditions.

• RCS temperature is 532 ° F and stable.

Which of the following are the minimum actions necessary to use the SBCS to cooldown the RCS to **SDC** entry conditions?

- A. Ensure the master controller (PIC 8010) in auto and the permissive switch is in auto. Open PCV 8805 by dialing down the setpoint from PIC 8010 to the desired cooldown rate.
- B. Ensure the master controller (PIC 8010) in auto, and the permissive switch in auto. Place HIC 8801-8804 in manual and closed. Dial the setpoint down on PCV 8010 to the desired cooldown rate.
- C. Place the permissive switch in manual, ensure the controller for PCV 8801 is in auto and dial the setpoint down on PCV 8801 to the desired cooldown rate.
- D. Place the permissive switch in manual, place the controller for PCV 8801 in manual and open PCV 8801 to the desired cooldown rate.

Question 21

Due to a DEH computer malfunction, the control has swapped from Operator Auto to Manual.

Which of the following statements describes how the Governor Valves will operate during a down power from 100% power?

The Governor valves will operate in:

- A. sequential, the same as in Operator Auto.
- B. individually mode, as selected by the Operator from the DEH control panel.
- C. single valve, with all the valves moving together.
- D. single valve, with valves 3, 2 and 1 closing together prior to #4 closing.

Question 22

Unit 1 is heating up the RCS with the following conditions:

- RCS pressure 1500 psia
- RCS temperature 505° F

RCP status:

	RCP 1A1	RCP 1A2	RCP 1B1	RCP 1B2
Status	Off	Running	Running	Running
RCP controlled	.8 GPM	.68 GPM	.9 GPM	.65 GPM
Middle cavity	1000 psia	1020 psia	970 psia	950 psia
Upper cavity pressure	510 psia	490 psia	500 psia	515 psia
Controlled Bleedoff pressure	80 psia	75 psia	80 psia	85 psia
Controlled Bleedoff Temperature	220°F	195°F	205°F	230°F

Which of the below statements describes how the RCPs will be configured based on the above indications? (REFERENCES PROVIDED)

- A. Parameters are normal, the fourth RCP may be started
- B. Stop the 1A2 RCP due to indications of seal failure.
- C. Stop the 1B1 due to high controlled bleedoff flow
- D. Stop the 1B2 within 10 minutes due to high Bleedoff temperature

Question 23

Given the following conditions:

- An unisolable ESDE has occurred outside the Containment on Unit 1
- The affected S/G has blown dry
- RCS temperature: 442° F
- RCS pressure: 1290 psia
- EOP-05 'Excess Steam Demand' is in use

Which of the following describes the operator actions required per 1-EOP-05 'Excess Steam Demand'?

- A. Secure all running RCP's
- B Stabilize RCS temperature and depressurize the RCS
- C. Reduce RCS temperature to establish 20° F subcooled
- D. Stabilize RCS pressure and temperature at current value

Question 24

Given the following conditions:

- 2-EOP-03 'Loss of Coolant Accident' has been implemented due to a small break LOCA and SIAS actuated
- All systems are operating as expected

Which of the following is the basis for maintaining a secondary heat sink?

- A. To minimize boron stratification of the RCS.
- B. RCS pressure may remain so high that cooling from the injection flow alone is inadequate to remove decay heat.
- C. Reflux boiling is the primary means of heat removal prior to voiding in the hot legs.
- D. To provide a means of RCS pressure control in the event main or auxiliary spray is not available.

Question 25

Unit 1 has implemented 1-EOP-04 'Steam Generator Tube Rupture'. Which of the following describes required S/G level control, if RCS pressure cannot be reduced to less than the affected S/G pressure?

- A. Align blowdown to the main condenser.
- B. Align blowdown to the Monitor Storage tanks.
- C. Open the Main Steam drains and drain to the condenser sump.
- D. Install drain hoses to the blowdown line and drain to RAB sumps.

Question 26

Which of the below statements descibes the instruments to be utilized to diagnose accident events and confirm safety functions?

- A. Use only the qualified White Bezel instruments.
- B. Use all instruments that suit the scale/range/response of the accident event that is occuring.
- C. Use all safety related instruments and use the White Bezel instruments only if a hostile environment is known to exist for greater than 15 minutes.
- D. Use the White Bezel instruments as a primary source of information and safety related instruments to confirm these indications.

Question 27

The crew brief is complete for the on coming RCO. In addition to the RCO chronological log, which other documents need to be reviewed?

- A. Out of spec log readings and Night order book
- B. Equipment out of service log and Operator status log
- C. Equipment out of service log and Night order book
- D. Out of spec log readings and Operator status log.

Question 28

In accordance with ADM. 0010120, 'Conduct of Operations' which of the following statements describes the policy for relief/turnover while performing a surveillance?

Relief/Turnover may only occur:

- A. after the surveillance has been complete.
- B. if the surveillance run will last >1 hour past turnover, and with approval of the ANPS.
- C. if the surveillance is in a steady state condition and with approval of the ANPS.
- D. if overtime guidelines will be exceeded for the individual responsible for the surveillance with approval of the ANPS.

Question 29

The following conditions exist on Unit 2 while at 70% power:

- 2A Main Feedwater Regulating valve (MFRV) is pinned open controlling S/G level at 65%.
- A transient occurs that results in Operators manually tripping the Unit due to high level in the 2A S/G

Which of the following should be performed IAW ONP 2-0700030, 'Main Feedwater' to control level in the 2A S/G?

- A. Manually actuate AFAS 1.
- B. Stop the 2A Main Feedwater pump.
- C. Close the Main Feedwater block valve on the 2A S/G
- D. Remove the pin and close the 2A Main Feedwater Regulating valve.

Question 30

Unit 1 is mitigating a LOCA and has implemented 1-EOP-03 Loss of Coolant Accident.

The following conditions exist:

- RCS pressure: 305 psia and stable
- RCS subcooling: 28 °F subcooled
- Pressurizer level: 45% and stable
- 1A and 1B S/G levels: 42% wide range
- Reactor vessel level: sensors 4-8 covered
- RCP's: secured

All Charging pumps are running and the HPSI and LPSI pumps have been secured.

Which of the following would require reinitiating LPSI flow?

- A. Both S/G levels decrease to 25% wide range.
- B. The ANPS has directed two RCP's be restarted.
- C. Pressurizer level decreases to 32%.
- D. RCS pressure decreases to 180 psia.

Question 31

Given the following conditions:

- Unit 2 is at 100% power when LOOP and inadvertent SIAS occurs
- Both Diesel Generators started and loaded on their respective bus
- When the 2A Diesel breaker closed the feeder breaker to the 2A5 Load Center tripped.

Which of the following describes the status of the containment cooling system?

- A. Four containment coolers in fast speed
- B. Four containment coolers in slow speed
- C. Three containment coolers in fast speed
- D. Three containment coolers in slow speed

Question 32

Operators have implemented 1-EOP-03 'Loss of Coolant Accident' with the following conditions:

- RCS pressure: 440 psia lowering
- Pressurizer level: 12% rising
- Core exit CET's: 398 °F
- Containment pressure: 1.5 psig slowly going down
- Containment Temperature: 110 °F and lowering

Which of the following describes the correct Operator response?

- A. Restart RCP's.
- B. Throttle HPSI pumps.
- C. Terminate Containment Spray.
- D. Isolate the Safety Injection Tanks.
Question 33

Unit 1 is operating at 100% power steady state, when a loss of all charging occurs.

Which of the following describes the response of the CVCS, assuming no Operator actions?

Pressurizer Level will decrease:

- A. with the letdown level control valves closing to minimum letdown flow at 2% deviation from setpoint.
- B. with the letdown backpressure control valves closing to minimum letdown flow.
- C. until letdown isolates on high Regenerative heat exchanger outlet temperature.
- D. until -3% deviation from setpoint, at which time the first backup charging pump will start.

Question 34

Given the following conditions on Unit 2:

- A Large Break LOCA is in progress
- RWT level is 4 feet

ECCS equipment status is as follows:

- 2A and 2B HPSI pumps running
- 2A and 2B LPSI pumps off
- 2A Mini Flow isolation valves 3495 and 3459 open
- 2B Mini Flow isolation valves 3496 and 3660 closed

Assuming no Operator action, which of the following ECCS equipment failed to position itself to the proper position?

- A. 2A and 2B HPSI pumps
- B. 2A and 2B LPSI pumps
- C. 2A Mini Flow isolation valves 3495 and 3459
- D. 2B Mini Flow isolation valves 3496 and 3660

Question 35

Unit 1 is Operating at 100% power with the following conditions:

- RCS boron concentration: 500 PPM.
- VCT level: 41%,
- RCO has requested permission to blend the VCT to a level of 60%.
- 1A BAMT boron concentration: 5995

Which of the following identifies the blend to raise the VCT level to 60% using the 1A BAMT?

(REFERENCES PROVIDED)

- A. 744 gallons water, 66 gallons boric acid
- B. 620 gallons water, 42 gallons boric acid
- C. 588 gallons water, 54 gallons boric acid
- D. 551 gallons water, 87 gallons boric acid

Question 36

Which of the following describes why pressures and temperatures are monitored on idle AFW piping and pump casings?

- A. AFW pump could be damaged due to casing material not designed for high temperatures.
- B. AFW piping could be damaged due to water hammer.
- C. AFW piping is not lagged and personnel could be injured
- D. AFW suction pressure instrumentation could be damaged by high pressure.

Question 37

Annunciator K-26, 'CEDS Trouble/Continuous Gripper Voltage High', alarmed on Unit 1. CEA 56 was put on the hold bus 8 minutes after the alarm came in.

Which of the following describes the status of CEA 56?

- A. CEA 56 will not de-energize on a reactor trip.
- B. Any attempt to move CEA 56 will cause CEA 56 to drop.
- C. Gripper coil damage has occurred due to the length of time to put the CEA 56 on the hold bus.
- D. CEA 56 must be removed from the hold bus within 60 minutes to comply with Tech. Specs.

Question 38

Which of the following events would require transition from 2-EOP-01, 'Standard Post Trip Actions', to 2-EOP-02 'Reactor Trip Recovery'?

- A. Pressurizer level stable at 18% with letdown isolated and all charging pumps running.
- B. A Main Steam Safety Valve (MSSV) stuck open and reseated at 575 psia while in EOP-01.
- C. MSIS has actuated for unknown reason with plant parameters normal.
- D. A trip from 50% power with 2A Main Feedwater pump OOS and loss of 2B1 6.9 KV bus.

Question 39

Unit 2 Operators are using EOP-03 'Loss of Coolant Accident' to mitigate a small break LOCA with the following conditions:

- 2A and 2B AFW pumps: feeding respective S/G's at 160 GPM
- 2C AFW pump: secured
- 2A S/G level: 12% narrow range
- 2B S/G level: 10% narrow range

A loss of offsite power occurs with the 2A and 2B Diesel Generator supplying their respective busses.

Assuming no Operator actions, which of the following describes the status of the AFW system?

2A and 2B AFW pumps:

- A. start immediately upon the Diesel breaker closing and the S/G's continue to be fed at 160 GPM.
- B. start immediately upon the Diesel breaker closing and the S/G's will be fed at full flow.
- C. start after a short time delay from the Diesel breaker closing and the S/G's continue to be fed at 160 GPM after the pumps start.
- D. start after a short time delay from the Diesel breaker closing and the S/G's will be fed at full flow.

Question 40

Unit 2 is on Shutdown Cooling with the following conditions:

- RCS pressure: 100 psia and in solid pressure control
- 2A charging pump running
- RCS temperature: 120 ° F
- 2A SDC train: in service

A loss of Instrument air occurs. Assuming no Operator action, which of the following describes the plant response?

- A. Shutdown cooling flow will be lost due to hot leg suction valve closure.
- B. Shutdown cooling flow will increase due to FCV 3306 (flow control valve) failing open
- C. RCS inventory will be lost due to SDC relief valves opening
- D. RCS temperature will decrease due to HCV 3657 (temperature control valve) failing open

Question 41

Unit 2 is in Mode 3 with Main Feedwater in service maintaining S/G levels. In preparation for Unit start up, the Main Turbine is latched and then manually tripped.

Which of the following describes the status of Main Feedwater flow?

- A. 15% bypass valves automatically controlling S/G levels.
- B. 15% bypass valves supplying constant 5% flow.
- C. Main Feed Reg. valves automatically controlling S/G levels.
- D. Main Feed Reg. valves supplying constant 5% flow.

Question 42

Unit 2 is in Mode 3 performing a Reactor startup. The following conditions exist:

- Steam Bypass Control (SBCS) in Auto maintaining Tave 532 ° F.
- Steam pressure regulator PCV 12-29 (to the SJAE) fails closed.
- Condenser vacuum goes to 15 inches HG before the regulator can be bypassed and vacuum is now 9 inches HG.

Which of the following describes the status of the SBCS?

- A. SBCS can maintain RCS temperature in manual only after depressing the 'Emergency off/Vacuum interlock pushbutton'
- B. SBCS will maintain RCS temperature in automatic, with no Operator action.
- C. SBCS permissive switch must be placed in manual, and the 'Emergency off/Vacuum interlock pushbutton' depressed to regain control of SBCS.
- D. SBCS cannot be used in any mode until vacuum has reached 5 inches HG.

Question 43

Which of the following plant conditions will automatically close the Main Feedwater Isolations Valves on Unit 2 but not on Unit 1?

- A. Steam Generator pressure decreases to 600 psia.
- B. Steam Generator levels decrease to 10% narrow range.
- C. RCS pressure decreases to 1500 psia.
- D. Containment pressure increases to 5.5 psig.

Question 44

Which of the following would require the Operator to perform a CONTIGENCY ACTION while in 2-EOP-01 'Standard Post Trip Actions'?

- A. CEA 24 is at 55 inches.
- B. Containment temperature is 123 ° F.
- C. The 2A Diesel is carrying the 2A3 4.16 KV bus.
- D. The 1A S/G 15% Main Feedwater bypass valve is fully closed.

Question 45

Which QSPDS display will be affected if the heater on the HJTC #3 fails?

- Reactor Vessel Level Α.
- Β. Core Exit Temperature
- C.
- Upper Head subcooling Reactor Coolant System subcooling D.

Question 46

Operators are conducting a heatup on Unit 2.

The following conditions exist:

- RCS pressure: 1700 psia.
- RCS temperature: 480 ° F.
- 2A1, 2B1 and 2B2 RCP's are operating.
- A loss of the 2B1 6.9 KV bus occurs.

Which of the following statements describes the status of Pressurizer pressure control?

Pressurizer Pressure can:

- A. only be controlled by the Auxiliary spray valves.
- B. only be controlled by Main spray valve PCV 1100E.
- C. be controlled by Main spray valves PCV 1100E and 1100F.
- D. be controlled by Main spray valve PCV 1100E and Auxiliary spray valves.

Question 47

Unit 1 has shut down the plant due to a Steam Generator tube leak on the 1B S/G. ONP 1-0830030 'Steam Generator Tube Leak' is being implemented. Given the following conditions:

- One RCP in each loop is stopped
- RCS pressure: 2230 psia
- Tave: 530 ° F

Which of the following statements explains why one RCP in each loop was stopped?

- A. To prevent fuel uplift.
- B. To reduce heat input into the RCS.
- C. To allow a greater cooldown rate.
- D. To minimize leak flow into the affected S/G.

Question 48

A loss of Feedwater accident has occurred at the end of core cycle. When the Operator depressed the Reactor Trip pushbuttons, all CEA's remained fully withdrawn.

Which of the following describes the Plant response to this event?

Pres	<u>Reactor Power</u> sure	Pressurizer Pressure	<u>S/G</u>
A.	Increasing	increasing,	increasing
B.	Increasing	decreasing	decreasing
C.	decreasing	increasing	increasing
D.	decreasing	decreasing	decreasing

Question 49

A Reactor Start-up is being performed on Unit 1. While withdrawing CEA's the RCO receives 2 pre-trips on High Start-up rate. CEA motion has stopped.

Which of the below interlocks has stopped CEA motion?

- A. Auto Withdrawal Prohibit
- B. CEA Withdrawal Prohibit
- C. CEA Motion Inhibit
- D. Low Power Automatic Withdrawal Prohibit

Question 50

An electrical transient has occurred on Unit 1 that caused four Reactor Trip Breakers to open. The Reactor has not tripped.

Which of the following components has de-energized and caused this transient?

- A. A CEA MG Set
- B. 120V Instrument Bus
- C. An RPS "K" relay
- D. 120V Vital AC bus

Question 51

Instrument air to 2A Component Cooling Water (CCW) Heat Exchanger temperature control valve, TCV-14-4A has been isolated.

Which ONE of the following correctly describes the response of the CCW system?

2A CCW Heat Exchanger outlet temperature will:

- A. decrease because TCV-14-4A fully opens.
- A. increase because TCV-14-4A fully closes.
- C, remain the same because TCV-14-4A movement is restricted by a mechanical stop.
- D. remain the same because TCV-14-4A actuator is pneumatically locked.

Question 52

On Unit 1, which of the below indications is indicative of fuel failure and will be seen on the letdown radiation monitor?

- A. Iodine increase that remains significantly above prior levels during steady state operations.
- B. An increase of 100/E bar.
- C. Iodine increase concurrent with a Gross activity increase during a load change.
- D. An increase in high energy gamma from N-16.

Question 53

Unit 1 is at 100% power. Pressurizer Code Safety valve V-1201 has been identified to be leaking and ONP 1-0120036, "Pressurizer Relief/Safety Valve" is being implemented.

Which of the following describes conditions that will require a controlled plant shutdown?

- A. Any LED lit on the PORV/Safety Valve acoustic leakage monitor.
- B. Leakage into the Pressurizer Quench Tank exceeds 10 GPM.
- C. Pressurizer boron concentration cannot be maintained within 25 PPM of the RCS boron concentration.
- D. More than four backup heaters are required to be on to maintain Pressurizer pressure.

Question 54

The following conditions exist on Unit 1:

- 1A Waste Monitor Tank is being released to the discharge canal
- Liquid Release monitor channel #43 is in high alarm
- FIC 6627X liquid release flow indicates full flow

Which of the following describes the immediate Operator action as addressed in ONOP 1-0510030, 'Uncontrolled Release of Radioactive Liquids'?

- A. Stop the 1A Waste Monitor Pump.
- B. Close the final effluent valve V-21462.
- C. Close FCV-6627X.
- D. Contact Chemistry to determine the validity of the alarm.

Question 55

The following conditions exist:

- Unit 2 has tripped from 100% power
- Multiple CEAs remain stuck out post trip
- A charging header rupture has occurred downstream of the Regen Heat Exchanger
- SIAS actuated

Which of the following describes the preferred method to regain the Reactivity Control Safety Function IAW 2-EOP-15, 'Functional Recovery'?

- A. LPSI supplied by the RWT.
- B. Depressurize to allow SIT discharge.
- C. Charging through the HPSI header
- D. Charging through the Auxiliary Spray Line

Question 56

Which of the following describes the significance of an asterisk (*) when used in an Emergency Operating Procedure?

An asterisk indicates a:

- A. step that may be performed out of sequence.
- B. step that requires a sign off or data sheet.
- C. management directive or vendor recommendation.
- D. regulatory commitment made by Technical Specifications.

Question 57

The following conditions exist on Unit 2 while at 100% power:

- A SGTR has occurred on 2A S/G
- 2A S/G has been isolated.
- The unit is cooling down on the 2B S/G.
- 2A S/G pressure: 850 psia.
- 2B S/G pressure: 575 psia.
- AFW automatically isolated to the 2B SG.

Which of the following is the correct method to re-establish feedwater flow to the 2B S/G?

- A. Initiate AFAS 2 from RTGB 202.
- B. Open the AFW valves to 2B S/G on RTGB 202.
- C. Override the Main Feedwater Isolation valves and use Main Feedwater.
- D. Actuate AFAS 2 from the AFAS panel.

Question 58

A Large Break LOCA occurred on Unit 2. The operators have secured two Reactor Coolant Pumps IAW 2-EOP-01, 'Standard Post Trip Actions'.

Which of the following parameters will require the securing of the two remaining Reactor Coolant Pumps after entering 2-EOP-03 'Loss of Coolant Accident'?

- A. RCS Pressure
- B. RCS Subcooled Margin
- C. Hot Leg Temperature
- D. Pressurizer level

Question 59

Unit 2 was shutdown due to an RCS leak estimated at 350 GPM. The crew has completed 2-EOP-01 'Standard Post trip Actions' and is reviewing the diagnostic flow chart to determine which EOP to implement. The following are the current plant conditions:

- 2A HPSI pump is out of service.
- 2B HPSI pump failed to start on SIAS or manually.
- All Charging pumps are operating.
- Pressurizer pressure: 900 slowly going down
- Thot: 529 ° F slowly going down
- Pressurizer level:15% slowly going up
- Pressure in both S/G's: 880 psia and both are steaming and feeding

Which of the following identifies the location of the loss of RCS inventory?

- A. RCS vessel head
- B. Letdown line in Containment.
- C. Pressurizer surge line sample line
- D. Pressurizer steam space sample line

Question 60

The following conditions exist:

- A total loss of feedwater has occurred on Unit 2.
- 2A S/G level: 15% WR.
- 2B S/G level: 15% WR.
- The ANPS has directed the implementation of RCS and Core Heat Removal, Success Path 4, 'Once-Through-Cooling' from 2-EOP-15 'Functional Recovery'

Which of the following describes the reason for implementing this Success Path?

15% Wide Range Level is minimum inventory to:

- A. depressurize the RCS and allow the admission of safety injection flow.
- B. depressurize the RCS and prevent a PTS event after re-pressurization following dryout.
- C. maintain RCS temperature at current value in preparation for system lineup to once through cooling.
- D. prevent dry out of S/G's to preclude feeding a dry S/G when feedwater is recovered.

Question 61

Given the following conditions:

- Unit 2 tripped, concurrent with a Loss of Offsite power
- Both Diesel Generators started and loaded on their respective bus.

Which of the following identifies the Safety Function that **CANNOT** be directly confirmed from the control room?

- A. Reactivity control
- B. Containment Isolation
- C. Maintenance of Vital Auxiliaries
- D. Containment Temperature, Pressure and Combustible gas

Question 62

Unit 1 is stable at 100% power with all systems in normal alignment. The ANPS has directed the RCO to perform an RCS leak rate surveillance IAW OP 1-0010125A, Data Sheet 1 'Reactor Coolant System Water Inventory Balance.'

Which of the following conditions will invalidate this surveillance once it has been started?

- A. The RCO performs a 150 gallon blend to the VCT
- B. The RCO drains the Quench tank from 60% to 57%
- C. Charging pump seal leakage increases to 0.5 GPM
- D. RCS cold leg temperature increases 2 degrees

Question 63

Which of the following Unit 1 events would automatically align a radiological release path to the liquid waste management system?

- A. Failed Fuel
- B. Steam Generator tube leak
- C. RCP seal heat exchanger leak
- D. Regenerative heat exchanger leak

Question 64

When performing a reactor startup on Unit 2, which of the following occurs at \geq 10,000 cps?

- A. Startup Rate Trip is enabled
- B. Zero Power Mode Bypass is enabled
- C. Startup Channels automatically de-energize
- D. Wide Range Log Safety Channel shifts to Extended Range

Question 65

Unit 2 is at 100% power with all systems in normal configuration. A large tube leak occurs in the 2A1 RCP shaft seal heat exchanger.

Which of the following annunciators would **INITIALLY** be expected for this condition?

- A. J-2, RCP 2A1 SEAL TROUBLE
- B. J-11, RCP 2A1 COOLING WATER LOW FLOW
- C. J-33, RCP SEAL COOLER VALVE CLOSED / PWR FAILURE
- E. LA-10, CCW SURGE TANK COMPARTMENT A LEVEL LOW

Question 66

The loss of instrument air Off Normal Procedure (ONP 1-1010030, 'Loss of Instrument Air') directs the RCO to trip the Unit at what pressure?

- A. 85 psig
- B. 74 psig
- C. 65 psig
- D. 59 psig

Question 67

In preparations for entry into Mode 4, you have been requested to perform a lineup on the AFW system. Which of the below methods describes how to verify the 1A AFW discharge value to be in the correct position?

- A. Physical hands on check, slightly moving the valve closed then open, then back to the closed direction 1/4 to 1/2 turn.
- B. Physical hands on check, rotating the valve at least one turn fully closed, then fully open against the backseat.
- C. Visual observation of the valve stem position.
- D. Visual observation of the valve position mechanical pointer.

Question 68

I/C has requested a clearance to de-energize a component by removing of its fuses. Which of the following statements describes how the fuses are controlled according to ADM-09.08, 'Operations In-Plant Equipment Clearance Orders'?

- A. By direction of the I/C work order.
- B. Equipment clearance order tags placed on the fuses.
- C. A non-tagged step in the Equipment clearance order.
- D. Equipment clearance order tags placed on or close to the fuse holders.
Question 69

The 1A Diesel surveillance is being completed. As you are unloading the diesel, the KW chart recorder fails, indicating '0' KW.

Which of the following indication will be used to determine the Diesel Generator output prior to opening the generator output breaker?

- A Ammeter on 1A3 4.16 KV bus.
- B. Megawatt meter on the local Diesel panel.
- C. Remote shutdown megawatt indication.
- D. Red, Green, Amber light indication on RTGB Governor control switch.

Question 70

Unit 1 is at in hot standby with a vacuum in the condenser. The Condensate recirc regulator, FCV 12-1, goes full closed.

If FCV 12-1 remained closed, which of the following statements describes the plant response?

- A. The running condensate pump will trip on low flow.
- B. Degrading of condenser vacuum due to loss of condensate flow through the air ejector condenser.
- C. Degrading of condenser vacuum due to loss of exhaust hood sprays.
- D. Water hammer in the MSR reheater drain piping due to loss of quench water.

Question 71

Unit 2 is at 54% power and increasing at 2 MWe/min. Both Main Feedwater pumps and both Condensate pumps are in service, when the 2B Condensate pump trips.

Which of the following will be the initial plant response?

- A. The 2B Main Feedwater pump trips on low suction pressure.
- B. The 2B Main Feedwater pump trips on low suction flow.
- C. Alarms only, capacity of one condensate pump is 55% power
- D. The 2B Main Feedwater pump trips as a direct result of 2B Condensate pump trip.

Question 72

If occupied during activation of its respective fire suppression system, which of the following areas would be considered a life threatening environment?

- A. Unit 1 Cable Spreading Room
- B. Unit 1 Transformer Bay
- C. Unit 2 Cable Spreading Room
- D. Unit 2 Emergency Diesel Generator Building

Question 73

The following conditions exist:

- Unit 1 is at 80% power.
- The 1A Main Feedwater controller fails to control in Auto and the Operators have taken manual control of 1A Main Feedwater controller.

Which of the following conditions is the minimum requirement for the execution of a manual reactor and turbine trip?

- A. Two of four narrow range steam generator level indications are \leq 40% and decreasing.
- B. Two of four wide range steam generator level indications are \geq 80% and increasing.
- C. Three of four RPS Steam Generator Water Low pretrips are illuminated.
- D. Three of four narrow range Steam Generator level indications have reached the high level override setpoint.

Question 74

The following conditions exist at 0700:

- Unit 1 is cooling down for a refueling outage
- RCS temperature: 195°F
- Pressurizer pressure: 300 psia
- Both HPSI pumps have been disabled

If the maximum allowable Tech Spec cooldown rate is used during the remainder of the evolution, which of the following times is the earliest that RCS temperature can be at 125°F?

(REFERENCES PROVIDED)

- A. 0745
- B. 0800
- C. 0845
- D. 0900

Question 75

During a LOCA inside containment, which of the following chemicals is responsible for the production of hydrogen due to corrosion of containment structural metals?

- A. Lithium
- B. Boric acid
- C. Trisodium Phosphate dodecahydrate
- D. Sodium hydroxide/hydrazine

Question 76

During a LOCA, which of the following parameters monitored in EOP-03 'Loss of Coolant Accident' would provide positive indication that core uncovery was occurring?

- A. Incore Neutron Flux
- B. Excore Neutron Flux
- C. Core Exit Thermocouples
- D. Reactor Vessel Level

Question 77

The following conditions exist:

- 1B AFW Pump is OOS.
- Unit 1 tripped from 100% power.
- Two minutes after the trip the 1AB 125 VDC bus de-energized due to an electrical fault.
- Both Main Feedwater pumps tripped on low flow and will not restart.

Which of the following are Contingency Action steps that must be taken?

- A. Close the PORV valves.
- B. Secure one RCP in each loop.
- C. Manually control Pressurizer heaters and spray.
- D. Secure all RCPs within 10 minutes of the electrical fault

Question 78

Which of the following RPS reactor trip signals is specifically designed to prevent fuel centerline melting?

- A. Local Power Density
- B. Variable High Power
- C. High Rate of Change
- D. Thermal Margin/Low Pressure

Question 79

An off shift RCO is performing JPM's on the Diesel Generator as part of the annual Licensed Operator Requalification, when an ALERT EPIP classification on Unit 2 is declared.

Where will the RCO report to as a result of this Alert condition?

- A. Training building
- B. Operations support center
- C. Jaycee park
- D. Unit 2 Control room

Question 80

Unit 2 is in Mode 1 when the ANPO notifies the RCO that HVE-41A Intake Structure Ventilation Fan motor is smoking and the breaker has tripped.

What is the status of the 2A ICW pump, **immediately** upon discovery of the failed ventilation fan?

- A. Operable as long as HVE-41B remains Operable
- B. Operable as long as the ICW room temperature remains less than design temperature.
- C. Inoperable until ICW room temperature can be proven to be maintained less than design temperature.
- D. Inoperable until a temporary air moving system can be installed.

Question 81

A Steam Generator tube rupture has occurred on the 1A Steam Generator and Operators are performing a rapid downpower on Unit 1.

Which of the following Radiation Monitors will trend down, in proportion to the Reactor power decrease? (Assume S/G tube leak remains constant during the downpower)

- A. Plant Vent
- B. Main steam Line
- C. Condenser Air Ejector
- D. Steam Generator Blowdown

Question 82

A Reactor startup is being performed on Unit 1. The RO is withdrawing group 5 CEA's which are at 124 inches when CEA #10 stops moving.

Assuming the RO continues to withdraw group 5 and performs no other actions, which of the following interlocks will eventually stop CEA motion?

- A. Upper Electrical Limit
- B. Group Out of Sequence
- C. Group Deviation
- D. Upper Group Stop

Question 83

Given the following conditions:

- RCS Boron concentration: 654 PPM
- Pressurizer Boron concentration: 686 PPM
- Time (in min) to correct mismatch = [(Pzr ppm RCS ppm) 25 ppm] x 3
- All backup heaters are available
- PIC-1100X: selected

Which of the below statements describes the method and the minimum time to equalize the Pressurizer boron concentration to within 25 ppm of the RCS boron concentration.

Energize all backup heaters and

- A. maintain PIC-1100X in auto at the current setpoint. Recirc for 32 minutes.
- B. maintain PIC-1100X in auto at the current setpoint. Recirc for 21 minutes.
- C. reduce setpoint on PIC-1100X . Recirc for 32 minutes.
- D. reduce setpoint on PIC-1100X. Recirc for 21 minutes.

Question 84

Both Unit's have experienced a Station Blackout.

Which of the following is the minimum designed time each Unit's station batteries are capable of supporting the expected loads?

A. 4 hours

- B. 10 hours
- C. 14 hours
- D. 24 hours

Question 85

The following conditions exist on Unit 2:

- Unit tripped from 80% power
- 2A and 2B S/G levels decreased to 10% narrow range and have recovered to 30% narrow range on all channels.

Assuming no operator action, which of the following describes the status of the Auxiliary Feedwater system?

- A. The 2A, 2B and 2C Auxiliary Feedwater pumps are feeding at full flow.
- B. The 2A and 2B Auxiliary Feedwater pumps are feeding at 150 gpm each.
- C. The 2A, 2B and 2C Auxiliary Feedwater pumps have stopped and their discharge valves closed.
- D, The 2A, 2B and 2C Auxiliary Feedwater pumps are running and their discharge valves closed.

Question 86

Unit 1 is at 100% steady state power. While performing the Area Radiation Monitoring Periodic Test, the Check Source pushbutton on the MA CIS channel readout module is depressed.

Which of the following correctly describes the response, of the system, if any?

- A. The alarm setpoint is displayed.
- B. Various A train CIS components actuate.
- C. Containment Evacuation alarm actuates.
- D. No response, check source is disabled during testing.

Question 87

Grid frequencies have dipped to 59.8 Hertz, and all four RPS low flow pre-trips are locked in.

Which of the following describes the effect on RCS parameters?

	DNBR	<u>Delta T</u>
A.	Decrease	Increase
В.	Decrease	Decrease
C.	Increase	Decrease
D.	Increase	Increase

Question 88

Which of the following describes the basis for the size difference between the Unit 1 and Unit 2 Condensate Storage Tanks (CST)?

Unit 2 CST volume:

- A. was designed to supply a specified amount of makeup to Unit 1 in the event of total loss of AC power to Unit 1.
- B. was designed to supply a specified amount of makeup to Unit 1 in the event of damage to Unit 1 CST.
- C. is analyzed for a 8 hour hot standby period following a Loss of Offsite Power, Unit 1 is analyzed for a 4 hour period.
- D. is analyzed for a cooldown to shutdown cooling entry conditions following a period of hot standby, Unit 1 is analyzed for hot standby only.

Question 89

The following conditions exist on Unit 2:

- The Unit has experienced a Safety Injection Actuation
- The SIAS signal has been reset

Which of the following describes the configuration of the Intake Cooling Water System (ICW) at this time?

MV-21-2 and MV-21-3 (Intake Cooling water valves to the TCW heat exchangers) are:

- A. open and ICW flow is being supplied to the essential and non-essential headers.
- B. open and ICW flow is being supplied to the essential header only.
- C. closed and ICW flow is being supplied to the essential and non-essential headers.
- D. closed and ICW flow is being supplied to the essential header only.

Question 90

A 35 gpm RCS leak is occurring on Unit 2. Which of the following describes the instrumentation available to determine the change in leak rate and possible location of the RCS leak?

	<u>Change in leak rate</u>	Location
A.	RCS leakage flow recorder FR-07-3	comparing the CIAS radiation monitor readings.
В.	RCS leakage flow recorder FR-07-3	sampling different atmospheric atmospheric locations in the Containment
C.	Cavity sump level, LI-07-6	sampling different atmospheric locations in the Containment.
D.	Cavity sump level LI-07-6	comparing the CIAS radiation monitor readings

Question 91

Unit 2 has experienced Loss of Coolant Accident concurrent with a Loss of Offsite power

Which of the following are the minimum actions necessary to reset the nonessential sections of 2B5, 2B6 and 2B8 MCC's?

- A. Resetting SIAS.
- B. Resetting CIAS.
- C. Restoration of offsite power.
- D. Restoration of offsite power and opening the Diesel output breaker.

Question 92

The fire computer is out of service on Unit 2.

In accordance with 0-ONP-79.01 'Fire Detection System' which of the following is the preferred method to monitor the status of Unit 2 fire alarms?

- A. Monitor Unit 2 fire alarms using Unit 1 fire computer.
- B. Assign an Operator to monitor Unit 2 local fire panels.
- C. Notify the roving fire watch to monitor Unit 2 fire alarms.
- D. Station an Operator at the Unit 2 master local fire alarm panel.

Question 93

Unit 2 is in mode 6, fuel movement in progress, when Shutdown Cooling is lost.

2-ONP-01.05, Plant Condition 5 - ,Shutdown Cooling in Service, Rx Head Removed, has been implemented.

If Shutdown Cooling cannot be restored, which of the following method of cooling the core will be implemented?

- A. Steam Generator heat removal.
- B. Feed and bleed to the RWT.
- C. Cooling through the Fuel Pool Heat Exchanger.
- D. Cooling through the Letdown Heat Exchanger.

Question 94

The following conditions exist:

- A 37 year old itinerant mechanic has arrived on site from Turkey Point
- He will work at St. Lucie for the remainder of the year
- His total lifetime effective dose equivalent (TEDE) is 33.5 REM
- His dose for this year is 0.5 REM

Which of the following is the MAXIMUM additional total effective dose equivalent (PSL limits) that he will be permitted to receive at PSL this year? (Assume no extensions)

A. 0.5 REM

- B. 2.0 REM
- C. 3.5 REM
- D. 4.5 REM

Question 95

Unit 2 is at 100% power, steady state. A major leak has developed in the reference leg for the selected Pressurizer level transmitter LT-1110X

Which of the following describes the immediate indicated Pressurizer level indications and the response of the CVCS system?

	Indicated Pressuirzer level	CVCS response
A.	High	Letdown flow will decrease
В.	High	Letdown flow will increase
C.	Low	Letdown flow will decrease
D.	Low	Letdown flow will increase

Question 96

Unit 2 Reactor Vessel Level is at Mid Loop with the following conditions:

- The Unit has been shutdown 4 days
- RCS temperature: 130° F

Both SDC cooling trains are lost

Which of the following is the time to boil and the required makeup rate for boil off?

(REFERENCES PROVIDED, Fig. 1 and 2 from 2-0440030)

- A. 8 minutes to boil, 90 GPM makeup rate
- B. 8 minutes to boil, 75 GPM makeup rate
- C. 11 minutes to boil, 60 GPM makeup rate
- D. 11 minutes to boil, 40 GPM makeup rate

Question 97

When processing an RWP, which of the following is the MINIMUM criteria that requires pre-job ALARA review?

- A. Dose estimate of the job exceeds one (1) Manrem.
- B. Any work to be performed in a high radiation area.
- C. Dose estimate of the job exceeds five (5) Manrem.
- D. Any work that requires the use of a full-face respirator.

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Question 98

At 100% power, which of the following conditions require a manual Reactor trip on

Unit 2?

- A. Two CEA's have dropped to the bottom of the core.
- B. Main Feedwater Regulating valve malfunction results in 2A S/G level increase to 75%.
- C. Reactor Support Cooling fans HVE-3A and HVE-3B have been out of service for 60 minutes.

D. Containment temperature is 110°F with two Containment Coolers out of service.

Question 99

Unit 1 is at 100% steady state power. The RCO is preparing to start the 1A EDG from the RTGB for a semi-annual surveillance run.

Which of the following parameters must be timed by the RCO to ensure the 1A EDG meets operability requirements?

- A. KW loading
- B. Output breaker closure
- C. Current and Voltage
- D. Frequency and Voltage

Question 100

 1305 Contraction

Which of the following is the MAXIMUM total dose equivalent (TEDE) that an RCO can receive per 10CFR20 in a year? (Assume no emergencies)

- A. 1 REM
- B. 2.5 REM
- C. 3.5 REM
- D. 5 REM

INITIAL SUBMITTAL

ST. LUCIE EXAM 2000-301 50-335/2000-301 & 50-389/2000-301

FEBRUARY 7 - 11, 2000

INITIAL SUBMITTAL SRO WRITTEN EXAMINATION

U.S. Nuclear Regulatory Commission Site-Specific Written Examination

Applicant Information				
Name:	Region: II			
Date:	Facility/Unit: St. Lucie Unit 1 and 2			
License Level: SRO	Reactor Type: CE			
Start Time:	Finish Time:			
Instructions Use the answer sheets provided to document your answers. Staple this cover sheet on top of the answer sheets. The passing grade requires a final grade of at least 80.00 percent. Examination papers will be collected five hours after the examination starts.				
Applicant Certification All work done on this examination is my own. I have neither given nor received aid. Applicant's Signature				
Results				
Examination Value 100 Point	S			
Applicant's Score Point	S			
Applicant's Grade Percer	nt			

St. Lucie USNRC Senior Reactor Operator Exam Question 1

A Waste Gas Decay Tank is to be released.

Which of the following conditions would prohibit releasing the tank?

- A. The wind speed is varying by more than 5 mph.
- B. The Waste Gas Radiation Monitor is inoperable.
- C. The Waste Gas release flow meter is inoperable.
- D. Both RAB Exhaust Fans HVE-10A and HVE-10B, are stopped.

Question 2

A loss of offsite power occurred from 100% power 30 minutes ago.

The following conditions exist:

- Both S/Gs are available with AFW flow of 150 GPM per S/G.
- RCS subcooling is 60°F.
- Average of Qualified CETs is 540°F.
- Loop T-hots are 530°F and rising slowly.
- Loop T-colds are 528°F and steady.
- 2A and 2B Steam Generator Pressures are 895 psia and steady.

Which of the following actions should be taken to enhance natural circulation?

- A. Initiate Auxiliary Spray.
- B. Throttle open the Atmospheric Dump Valves.
- C. Throttle open the Auxiliary Feed Water control valves.
- D. Turn on available pressurizer heaters.
Question 3

Given the following conditions:

- Unit 1 is operating at 25% power.
- All controls are in Manual Sequential.
- Group 7 control rods are at 45 inches.
- The operator is withdrawing Group 7 control rods.
- When the "in/out" switch is released, outward rod motion continues.
- Placing the mode selector in OFF has no effect.

With **no** Operator action which of the following will automatically trip the reactor?

- A. Variable High Power
- B. High Start Up Rate
- C. Thermal Margin/Low Pressure
- D. High Pressurizer Pressure

Question 4

Given the following conditions:

- Unit 2 is in Mode 5 on SDC preparing to heatup the RCS.
- Both Personnel airlock doors are open.
- A loss of shutdown cooling occurs and the Unit inadvertently enters Mode 4.

)

Which one of the following statements describes the status of containment integrity?

Containment integrity is:

- A. not met. At least one airlock door must be maintained closed at all times.
- B. not met. Both airlock doors must be maintained closed at all times.
- C. not required in Mode 4.
- D. not required if Unit re-enters Mode 5 within one hour.

Question 5

Unit 2 is in Mode 4 with the following conditions:

- RCS pressure 270 PSIA
- Both SDC Loops in service
- 2B1 and 2B2 RCP's operating
- 2B HPSI pump in standby for boration flowpath
- PLP 101 (RM-26-1) CCW Header A Radiation monitor in alarm

Which of the following identifies the component that is the likely source of the high CCW activity?

- A. 2A LPSI Pump
- B. 2B HPSI Pump
- C. 2A Fuel pool Heat Exchanger
- D. 2B SDC Cooling Heat Exchanger

Question 6

Unit 2 is operating at 80% power, 5000 EFPH, with the following conditions:

- Two charging pumps are operating.
- RCS Boron Concentration is 850 PPM.
- 2A BAMT concentration of 5525 PPM.
- V2514 emergency borate valve is open.
- 2A BAM pump is being cycled to facilitate a 30 MWE/min rapid downpower.

The RCO runs the 2A BAM pump one time for one minute and then stops it. Excluding the effects of Xenon, which of the following identifies the approximate final Tave?

(REFERENCES PROVIDED)

- A. 565° F
- B. 560° F
- C. 553° F
- D. 546° F

Question 7

Given the following conditions:

- A reactor trip occurred several minutes ago.
- All RCPs are in operation.
- RCS temperature: 520°F and slowly lowering.
- Pressurizer pressure: 1980 psia and slowly lowering.
- Pressurizer level: 36% and trending slowly downward.
- Subcooling: 100°F and slowly rising.
- Both SG levels: 10% narrow range and slowly lowering.
- Both SG pressures: 740 ps
- 740 psia and slowly lowering.

Which one of the following actions would promptly stabilize the plant?

- A. Raise the pressurizer level control setpoint.
- B. Raise the pressurizer pressure control setpoint.
- C. Increase Auxiliary Feedwater flow.
- D. Close the Main Steam Isolation valves.

Question 8

Unit 1 Control Room has been evacuated due to a fire and all immediate actions have been complete. Pressurizer Pressure is being controlled by the RCO from the Hot Shutdown Control Panel (HSDCP).

Which of the following describes the Pressurizer Pressure range and the method to maintain these ranges?

	Range	<u>Method</u>
A.	1800-2300 psia, trending to 2225-2275 psia	heaters and auxiliary spray.
B.	1800-2300 psia, trending to 2225-2275 psia	main spray or auxiliary spray.
C.	1850-2250 psia, trending to 2200-2300 psia	heaters and main spray
D.	1850-2250 psia, trending to 2200-2300 psia	auxiliary spray or

PORV's.

Question 9

The following annunciators are received on Unit 2:

- L-36 TMLP channel trip
- L-40 NI channel inoperative
- L-43 Reactor power ratio deviation
- L-34 Nuclear $\dot{/} \Delta T$ power channel deviation
- L-9 Reactor power high channel trip

Which of the below Nuclear Instrumentation systems has malfunctioned?

- A. Startup Channel
- B. Linear Range Safety Channel
- C. Excore Neutron Monitoring
- D. Wide Range Monitoring

Question 10

A Nuclear and Delta T Power Calibration was performed at 100% power. Calorimetric, Nuclear, DDPS and Delta T all agree within 0.2 %.

If the Unit is downpowered to a stable 50% power level, which of the below statements describes the adjustment that will be required when a new Nuclear and Delta T Power Calibration is performed?

Nuclear power will have to be adjusted:

- A. upward to match DDPS power.
- B. downward to match manual Calorimetric.
- C. downward to null Nuclear Power-Delta T Power.
- D. upward to null Nuclear Power-Delta T Power.

Question 11

Which of the below statements describes the reason for closing the Unit 2 MSR Block values as part of Standard Post Trip Actions?

Prevent:

A. overcooling the RCS

B. losing condenser vacuum.

C. damaging LP turbine seals.

D. overpressurizing the MSR shell side

Question 12

A differential current lockout occurs on the 1A2 4.16KV bus at 32% power.

Which of the following describes the Plant response?

- A. The 1A and 1B Condenser will lose equal amount of Circulating water flow but the Unit will have to be tripped due high ΔT across the condensers.
- B. The 1A and 1B Condenser will lose equal amount of Circulating water flow, but due to reduced power, the Unit can remain operating.
- C. The 1A Condenser will be without Circulating water flow and the Unit will have to be tripped due to high differential pressure between condensers.
- D. The 1A Condenser will be without Circulating water flow, but due to reduced power the Unit can remain operating.

Question 13

Given the following conditions:

- Unit 1 tripped 15 minutes ago
- Pressurizer pressure is 2100 psia and slowly increasing
- Pressurizer level lowered to 25% and has slowly recovered to 29%

Which of the following is the condition of the Pressurizer heaters at this time? (ASSUME NO OPERATOR ACTION)

- A. All heaters are energized.
- B. All heaters are de-energized.
- C. Only the backup heaters are energized.
- D. Only the proportional heaters are energized.

Question 14

Unit 1 is in Mode 3. Which of the following will cause an actuation that will stop a running Containment purge fan (HVE 8A or 8B)?

- A. Containment temperature of 120°F.
- B. Containment pressure increases to 5.5 psig
- C. Containment high range radiation monitor fails to 500 Rem.
- D. Containment radiation monitors (CIAS) increases to 1 R/Hr.

Question 15

Unit 2 is ready to cooldown to Shutdown Cooling entry conditions due to a Steam Generator tube rupture. The following are the plant conditions.

• RCS temperature is 532 ° F and stable.

Which of the following are the minimum actions necessary to use the SBCS to cooldown the RCS to **SDC** entry conditions?

- A. Ensure the master controller (PIC 8010) in auto and the permissive switch is in auto. Open PCV 8805 by dialing down the setpoint from PIC 8010 to the desired cooldown rate.
- B. Ensure the master controller (PIC 8010) in auto, and the permissive switch in auto. Place HIC 8801-8804 in manual and closed. Dial the setpoint down on PCV 8010 to the desired cooldown rate.
- C. Place the permissive switch in manual, ensure the controller for PCV 8801 is in auto and dial the setpoint down on PCV 8801 to the desired cooldown rate.
- D. Place the permissive switch in manual, place the controller for PCV 8801 in manual and open PCV 8801 to the desired cooldown rate.

Question 16

Unit 1 is heating up the RCS with the following conditions:

- RCS pressure 1500 psia
- RCS temperature 505° F

RCP status:

	RCP 1A1	RCP 1A2	RCP 1B1	RCP 1B2
	Off	Running	Running	Running
Status				
	.8 GPM	.68 GPM	.9 GPM	.65 GPM
RCP				
controlled				
bleedoff flow				
Middle cavity	1000 psia	1020 psia	970 psia	950 psia
pressure				
Upper cavity	510 psia	490 psia	500 psia	515 psia
pressure				
Controlled	80 psia	75 psia	80 psia	85 psia
Bleedoff				
pressure				
Controlled	220°F	195°F	205°F	230°F
Bleedoff				
Temperature				<u> </u>

Which of the below statements describes how the RCPs will be configured based on the above indications? (REFERENCES PROVIDED)

- A. Parameters are normal, the fourth RCP may be started
- B. Stop the 1A2 RCP due to indications of seal failure.
- C. Stop the 1B1 due to high controlled bleedoff flow
- D. Stop the 1B2 within 10 minutes due to high Bleedoff temperature

Question 17

Given the following conditions:

- An unisolable ESDE has occurred outside the Containment on Unit 1
- The affected S/G has blown dry
- RCS temperature: 442° F
- RCS pressure: 1290 psia
- EOP-05 'Excess Steam Demand' is in use

Which of the following describes the operator actions required per 1-EOP-05 'Excess Steam Demand'?

- A. Secure all running RCP's
- B Stabilize RCS temperature and depressurize the RCS
- C. Reduce RCS temperature to establish 20° F subcooled
- D. Stabilize RCS pressure and temperature at current value

Question 18

Given the following conditions:

- 2-EOP-03 'Loss of Coolant Accident' has been implemented due to a small break LOCA and SIAS actuated
- All systems are operating as expected

Which of the following is the basis for maintaining a secondary heat sink?

- A. To minimize boron stratification of the RCS.
- B. RCS pressure may remain so high that cooling from the injection flow alone is inadequate to remove decay heat.
- C. Reflux boiling is the primary means of heat removal prior to voiding in the hot legs.
- D. To provide a means of RCS pressure control in the event main or auxiliary spray is not available.

Question 19

Unit 1 has implemented 1-EOP-04 'Steam Generator Tube Rupture'. Which of the following describes required S/G level control, if RCS pressure cannot be reduced to less than the affected S/G pressure?

- A. Align blowdown to the main condenser.
- B. Align blowdown to the Monitor Storage tanks.
- C. Open the Main Steam drains and drain to the condenser sump.
- D. Install drain hoses to the blowdown line and drain to RAB sumps.

Question 20

Which of the below statements describes the instruments to be utilized to diagnose accident events and confirm safety functions?

- A. Use only the qualified White Bezel instruments.
- B. Use all instruments that suit the scale/range/response of the accident event that is occuring.
- C. Use all safety related instruments and use the White Bezel instruments only if a hostile environment is known to exist for greater than 15 minutes.
- D. Use the White Bezel instruments as a primary source of information and safety related instruments to confirm these indications.

Question 21

In accordance with ADM. 0010120, 'Conduct of Operations' which of the following statements describes the policy for relief/turnover while performing a surveillance?

Relief/Turnover may only occur:

- A. after the surveillance has been complete.
- B. if the surveillance run will last >1 hour past turnover, and with approval of the ANPS.
- C. if the surveillance is in a steady state condition and with approval of the ANPS.
- D. if overtime guidelines will be exceeded for the individual responsible for the surveillance with approval of the ANPS.

Question 22

Given the following conditions:

- Unit 2 is in day 5 of a refueling outage.
- The first stud and nut on the Reactor Vessel Head is less than fully tensioned.
- Channel A Startup Range Neutron Flux Monitor was just declared Out of Service.

Based on the above conditions, what is the mode of the Unit and what action is required?

- A. Unit is in Mode 5, no action required.
- B. Unit is in Mode 5, suspend Reactor Vessel head disassembly
- C. Unit is in Mode 6, suspend Reactor Vessel Head disassembly.
- D. Unit is in Mode 6, no action required.

Question 23

The Reactor Cavity sump flow is being monitored using Reactor Cavity Detection alarm N-46, 'Reactor Cavity Leakage High', due to Reactor Cavity FT 07-03 declared out of service.

If N-46 then goes into alarm due to a 2 GPM CCW leak in containment, which of the following statements describes the status of the reactor Cavity Flow Monitoring system?

- A. Inoperable, confirmed leakage of any rate, disallows use of N-46 for Reactivity Cavity sump flow monitoring.
- B. Inoperable, with the flow detection alarm N-46 in an alarm state, credit cannot be taken for this flow monitoring device.
- C. Operable, as long as the leak rate remains below 10 GPM (High/High reflash alarm of N-46), N-46 can be used to satisfy the flow monitoring requirement.
- D. Operable, as long as annunciator N-29, 'Rx Cavity sump level High', is operable

Question 24

Which of the following situations would require implementation of AP-0010124, Temporary System Alteration?

- A. Reactor Engineering has installed a reactivity computer in preparation for Low Power Physics testing.
- B. A nuisance alarm on RTGB 203 is intentionally disabled for 10 days for the purpose of silencing it.
- C. Electrical Department has lifted leads in RTGB 204 in order to make repairs to a Gland Steam regulator as directed by his NPWO.
- D. I&C has lifted leads in the ESFAS cabinet to initiate a SIAS while assisting Operations in the performance of the Engineered Safeguards Test.

Question 25

Unit 1 ANPS has taken the turnover during a refueling outage with the following conditions:

- Mode 3 performing a controlled cooldown
- RCS Tave: 450° F.
- S/G pressure: 413 psia
- RCS pressure: 1280 psia

Fifteen minutes after the turnover a transient occurs that results in RCS pressure, temperature and S/G pressure falling rapidly.

What procedure and mitigation strategy should be implemented?

- A. ONP-01.01, 'Plant Condition 1', 'S/G Heat Removal LTOP not in effect.' Attempt to isolate the affected S/G, maintain RCS subcooling 20-200° F.
- B. ONP-01.02, 'Plant Condition 2', 'S/G Heat Removal LTOP in effect' Manually actuate MSIS and SIAS. Stabilize RCS temperature and pressure after the affected S/G has blown dry.
- C. EOP-05, 'Excess Steam Demand' Manually actuate MSIS and SIAS. Stabilize RCS temperature and pressure after the affected S/G has blown dry.
- D. EOP-15, 'Functional Recovery', Emergency borate, attempt to isolate the affected S/G, stabilize RCS temperature and pressure after the affected S/G has blown dry.

Question 26

Unit 1 is at 100% steady state power. Defective fuel has caused RCS activity to increase. The following are the results of Chemistry sampling over the past few days:

1-18-00 / 0700	.9 Uci/gram DE 131
1-20-00 / 0700	1.2 Uci/gram DE 131
1-22-00 / 0700	.8Uci/gram DE131
1-24-00 / 0700	75Uci/gram DE 131

Which of the following is the required operator response?

(REFERENCES REQUIRED)

- A. Place the Unit in Hot Standby with Tave <500 °F by 1700 1-24-00.
- B. Place the Unit in Hot Standby with Tave <500 °F by 1300 1-24-00.
- C. Continue 100% power operation for up to 100 hours.
- D. Reduce power to <76% and continue power operation indefinitely.

Question 27

Which of the following is the maximum number of consecutive days which may elapse between plant vital area access before unescorted access may be denied due to badge NON-use?

- A. 14 days
- B. 21 days
- C. 30 days
- D. 45 days

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Question 28

Unit 1 Operators are responding to a dual event using 1-EOP-15 'Functional Recovery'. The following conditions exist:

- All CEA's: inserted
- 1A3 4.16 KV bus: powered by 1A diesel.
- 1B3 4.16 KV bus: powered from offsite
- Pressurizer level:
- Pressurizer pressure: 850 psia
- CET temperature highest per quadrant: 560 °F

0

- ECCS flow: 850 GPM
- Containment pressure: 2.5 psig.
- 1A S/G level: 10% Narrow range, steaming, with feed available.
- 1B S/G: isolated due to being faulted.

Which of the following identifies the Safety Function that should be addresses next?

(REFERENCES PROVIDED, Figure 2 EOP-99)

- A. Maintenance of Vital Auxiliaries
- B. RCS and Core Heat Removal
- C. RCS pressure control
- D. Containment Isolation.

Question 29

Unit 1 is mitigating a LOCA and has implemented 1-EOP-03 Loss of Coolant Accident.

The following conditions exist:

- RCS pressure: 305 psia and stable
- RCS subcooling: 28 °F subcooled
- Pressurizer level: 45% and stable
- 1A and 1B S/G levels: 42% wide range
- Reactor vessel level: sensors 4-8 covered
- RCP's: secured

All Charging pumps are running and the HPSI and LPSI pumps have been secured.

Which of the following would require reinitiating LPSI flow?

- A. Both S/G levels decrease to 25% wide range.
- B. The ANPS has directed two RCP's be restarted.
- C. Pressurizer level decreases to 32%.
- D. RCS pressure decreases to 180 psia.

Question 30

Operators have implemented 1-EOP-15 'Functional Recovery' on Unit 1 due to a stuck open Main Steam Safety valve (MSSV) on the 1A S/G and a SGTR on the 1B S/G.

Which of the following describes the required Operator actions?

- A. Isolate the 1A S/G. Use the 1B S/G for heat removal
- B. Isolate the 1B S/G. Use the 1A S/G for heat removal
- C. Isolate both S/G's. ECCS flow will be used for heat removal.
- D. Do not isolate either S/G until the MSSV is gagged closed. Then isolate the 1B S/G and use the 1A S/G for heat removal.

Question 31

Operators have implemented 1-EOP-03 'Loss of Coolant Accident' with the following conditions:

- RCS pressure: 440 psia lowering
- Pressurizer level: 12% rising
- Core exit CET's: 398 °F
- Containment pressure: 1.5 psig slowly going down
- Containment Temperature: 110 °F and lowering

Which of the following describes the correct Operator response?

- A. Restart RCP's.
- B. Throttle HPSI pumps.
- C. Terminate Containment Spray.
- D. Isolate the Safety Injection Tanks.

Question 32

Unit 1 is operating at 100% power steady state, when a loss of all charging occurs.

Which of the following describes the response of the CVCS, assuming no Operator actions?

Pressurizer Level will decrease:

- A. with the letdown level control valves closing to minimum letdown flow at 2% deviation from setpoint.
- B. with the letdown backpressure control valves closing to minimum letdown flow.
- C. until letdown isolates on high Regenerative heat exchanger outlet temperature.
- D. until –3% deviation from setpoint, at which time the first backup charging pump will start.

Question 33

Given the following conditions on Unit 2:

- A Large Break LOCA is in progress
- RWT level is 4 feet

ECCS equipment status is as follows:

- 2A and 2B HPSI pumps running
- 2A and 2B LPSI pumps off
- 2A Mini Flow isolation valves 3495 and 3459 open
- 2B Mini Flow isolation valves 3496 and 3660 closed

Assuming no Operator action, which of the following ECCS equipment failed to position itself to the proper position?

- A. 2A and 2B HPSI pumps
- B. 2A and 2B LPSI pumps
- C. 2A Mini Flow isolation valves 3495 and 3459
- D. 2B Mini Flow isolation valves 3496 and 3660

Question 34

Annunciator K-26, 'CEDS Trouble/Continuous Gripper Voltage High', alarmed on Unit 1. CEA 56 was put on the hold bus 8 minutes after the alarm came in.

Which of the following describes the status of CEA 56?

- A. CEA 56 will not de-energize on a reactor trip.
- B. Any attempt to move CEA 56 will cause CEA 56 to drop.
- C. Gripper coil damage has occurred due to the length of time to put the CEA 56 on the hold bus.
- D. CEA 56 must be removed from the hold bus within 60 minutes to comply with Tech. Specs.

Question 35

Which of the following events would require transition from 2-EOP-01, 'Standard Post Trip Actions', to 2-EOP-02 'Reactor Trip Recovery'?

- A. Pressurizer level stable at 18% with letdown isolated and all charging pumps running.
- B. A Main Steam Safety Valve (MSSV) stuck open and reseated at 575 psia while in EOP-01.
- C. MSIS has actuated for unknown reason with plant parameters normal.
- D. A trip from 50% power with 2A Main Feedwater pump OOS and loss of 2B1 6.9 KV bus.

Question 36

Unit 2 Operators are using EOP-03 'Loss of Coolant Accident' to mitigate a small break LOCA with the following conditions:

- 2A and 2B AFW pumps: feeding respective S/G's at 160 GPM
- 2C AFW pump: secured
- 2A S/G level: 12% narrow range
- 2B S/G level: 10% narrow range

A loss of offsite power occurs with the 2A and 2B Diesel Generator supplying their respective busses.

Assuming no Operator actions, which of the following describes the status of the AFW system?

2A and 2B AFW pumps:

- A. start immediately upon the Diesel breaker closing and the S/G's continue to be fed at 160 GPM.
- B. start immediately upon the Diesel breaker closing and the S/G's will be fed at full flow.
- C. start after a short time delay from the Diesel breaker closing and the S/G's continue to be fed at 160 GPM after the pumps start.
- D. start after a short time delay from the Diesel breaker closing and the S/G's will be fed at full flow.

Question 37

Unit 2 is on Shutdown Cooling with the following conditions:

- RCS pressure: 100 psia and in solid pressure control
- 2A charging pump running
- RCS temperature: 120 ° F
- 2A SDC train: in service

A loss of Instrument air occurs. Assuming no Operator action, which of the following describes the plant response?

- A. Shutdown cooling flow will be lost due to hot leg suction valve closure.
- B. Shutdown cooling flow will increase due to FCV 3306 (flow control valve) failing open
- C. RCS inventory will be lost due to SDC relief valves opening
- D. RCS temperature will decrease due to HCV 3657 (temperature control valve) failing open

Question 38

Unit 2 is in Mode 3 with Main Feedwater in service maintaining S/G levels. In preparation for Unit start up, the Main Turbine is latched and then manually tripped.

Which of the following describes the status of Main Feedwater flow?

- A. 15% bypass valves automatically controlling S/G levels.
- B. 15% bypass valves supplying constant 5% flow.
- C. Main Feed Reg. valves automatically controlling S/G levels.
- D. Main Feed Reg. valves supplying constant 5% flow.
Question 39

Which of the following plant conditions will automatically close the Main Feedwater Isolations Valves on Unit 2 but not on Unit 1?

- A. Steam Generator pressure decreases to 600 psia.
- B. Steam Generator levels decrease to 10% narrow range.
- C. RCS pressure decreases to 1500 psia.
- D. Containment pressure increases to 5.5 psig.

Question 40

Which of the following would require the Operator to perform a CONTIGENCY ACTION while in 2-EOP-01 'Standard Post Trip Actions'?

- A. CEA 24 is at 55 inches.
- B. Containment temperature is 123 ° F.
- C. The 2A Diesel is carrying the 2A3 4.16 KV bus.
- D. The 1A S/G 15% Main Feedwater bypass valve is fully closed.

Question 41

Which QSPDS display will be affected if the heater on the HJTC #3 fails?

- A. Reactor Vessel Level
- B. Core Exit Temperature
- C. Upper Head subcooling
- D. Reactor Coolant System subcooling

Question 42

Operators are conducting a heatup on Unit 2.

The following conditions exist:

- RCS pressure: 1700 psia.
- RCS temperature: 480 ° F.
- 2A1, 2B1 and 2B2 RCP's are operating.
- A loss of the 2B1 6.9 KV bus occurs.

Which of the following statements describes the status of Pressurizer pressure control?

Pressurizer Pressure can:

- A. only be controlled by the Auxiliary spray valves.
- B. only be controlled by Main spray valve PCV 1100E.
- C. be controlled by Main spray valves PCV 1100E and 1100F.
- D. be controlled by Main spray valve PCV 1100E and Auxiliary spray valves.

Question 43

Unit 1 is experiencing a duel event with the following conditions:

- All Charging Pumps are inoperable
- RCS Temperature: 520 °F
- RCS Pressure: 980 psia
- Pressurizer Level: 25%
- Safety Injection flow: meeting Figure 2
- Both S/G's are at 40% Wide Range Level and are steaming and feeding

Which of the following Success Path will be implemented to meet the RCS Pressure Control Safety Function in accordance with 1-EOP-15 'Functional Recovery?'

- A. Heaters and Spray
- B. Safety Injection
- C. Steam Generator Heat Removal
- D. PORVs

Question 44

The 2B1 RCP seal bleedoff line has automatically isolated and is indicating '0' gpm flow. All other RCP's indicate normal seal bleedoff flow.

Which of the following describes what may have caused this no flow condition?

- A. High flow in the bleedoff line.
- B. High pressure in the bleedoff line.
- C. An inadvertent CIAS.
- D. High pressure in the Volume Control Tank.

Question 45

Which of the following conditions would require the Unit 1 operators to perform an Emergency Boration while in Mode 1?

- A. Two CEA's are found to be mechanically bound and untrippable.
- B. Two CEA's drop to the bottom of the core resulting in a violation of PDIL.
- C. RCS temperature increases 2° F after placing a new CVCS Ion Exchanger in service.
- D. RCS temperature decreases 4° F due to a leaking steam bypass control valve .

Question 46

Unit 1 is performing a downpower due to a loss of vacuum and has implemented ONP-1-0610031 Loss of Condenser Vacuum. As the downpower is progressing, vacuum is steady at 5.1 inches Hg. If vacuum is maintained at the current level during the downpower, when should the Turbine be manually tripped?

A. When 3 of 4 RPS channels Nuclear power indicate <11%.

B. When DMW-871 'Net Megawatts' on RTGB 101 indicate '0' net Megawatts.

C When ΔT power indicates 35%.

D. When NIS power indicates 30%

Question 47

Unit 1 has shut down the plant due to a Steam Generator tube leak on the 1B S/G. ONP 1-0830030 'Steam Generator Tube Leak' is being implemented. Given the following conditions:

- One RCP in each loop is stopped
- RCS pressure: 2230 psia
- Tave: 530 ° F

Which of the following statements explains why one RCP in each loop was stopped?

- A. To prevent fuel uplift.
- B. To reduce heat input into the RCS.
- C. To allow a greater cooldown rate.
- D. To minimize leak flow into the affected S/G.

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Question 48

A loss of Feedwater accident has occurred at the end of core cycle. When the Operator depressed the Reactor Trip pushbuttons, all CEA's remained fully withdrawn.

Which of the following describes the Plant response to this event?

	Reactor Power	P <u>essurizer Pressure</u>	<u>S/G Pressure</u>
A.	Increasing	increasing,	increasing
B.	Increasing	decreasing	decreasing
C.	decreasing	increasing	increasing
D.	decreasing	decreasing	decreasing

Question 49

Unit 2 is performing a controlled gaseous batch release of the 2A Gas Decay tank.

The following conditions are noted during the release.

- 2A Gas Decay Tank pressure slowly decreasing
- 2B Gas Decay Tank pressure slowly decreasing
- 2C Gas Decay Tank pressure stable

In accordance with Off-Normal Operating Procedure 2-0530030 'Waste Gas System', which of the following identifies the immediate Operator action?

- A. Isolate the 2B Gas Decay tank.
- B. Stop the Waste Gas compressors.
- C. Terminate the 2A Gas Decay Tank release.
- D. Check the waste gas valve line-up to the 2B Gas Decay Tank.

Question 50

Unit 2 has received the following Instrument air alarms:

- F-30 Unit 1 & 2 Inst. Air Tie Open
- F-5 Inst. Air Press Hi/Lo
- F-21 Inst. Air Compressor Auto start

Unit 1 has informed you they have an Instrument air leak and their Instrument air header pressure is 72 psig and slowly decreasing. Unit 2 Instrument air pressure is currently 78 psig and slowly decreasing.

Which of the following describes the status of the Instrument air cross-tie valve(s)?

- A. PCV 18-5, Unit 1 supply from Unit 2 has not reached the pressure at which it should close.
- B. PCV18-6, Unit 2 supply from Unit 1 has not reached the pressure at which it should close.
- C. PCV 18-5, Unit 1 supply from Unit 2 and PCV 18-6, Unit 2 supply from Unit 1, have failed open due to low Instrument air pressure.
- D. PCV 18-5, Unit 1 supply from Unit 2 has failed to close.
- C. PCV 18-5, Unit 1 supply from Unit 2 and PCV 18-6, Unit 2 supply from Unit 1, have failed open due to low Instrument air pressure.

Question 51

An electrical transient has occurred on Unit 1 that caused four Reactor Trip Breakers to open. The Reactor has not tripped.

Which of the following components has de-energized and caused this transient?

- A. A CEA MG Set
- B. 120V Instrument Bus
- C. An RPS "K" relay
- D. 120V Vital AC bus

Question 52

During the implementation of 1-EOP-06, Total Loss of Feedwater, which of the following parameters would require **DIRECT** entry into RCS and Core Heat Removal, Success Path 4 (Once Through Cooling) of 1-EOP-15, 'Functional Recovery'?

- A. RCS Cold Leg temperature
- B. RCS subcooling
- C. Reactor Vessel level
- D. Steam Generator pressure

Question 53

Instrument air to 2A Component Cooling Water (CCW) Heat Exchanger temperature control valve, TCV-14-4A has been isolated.

Which ONE of the following correctly describes the response of the CCW system?

2A CCW Heat Exchanger outlet temperature will:

- A. decrease because TCV-14-4A fully opens.
- B. increase because TCV-14-4A fully closes.
- C, remain the same because TCV-14-4A movement is restricted by a mechanical stop.
- D. remain the same because TCV-14-4A actuator is pneumatically locked.

Question 54

On Unit 1, which of the below indications is indicative of fuel failure and will be seen on the letdown radiation monitor?

- A. Iodine increase that remains significantly above prior levels during steady state operations.
- C. An increase of 100/E bar.
- D. Iodine increase concurrent with a Gross activity increase during a load change.
- D. An increase in high energy gamma from N-16.

Question 55

The following conditions exist:

- Unit 2 has tripped from 100% power
- Multiple CEAs remain stuck out post trip
- A charging header rupture has occurred downstream of the Regen Heat Exchanger
- SIAS actuated

Which of the following describes the preferred method to regain the Reactivity Control Safety Function IAW 2-EOP-15, 'Functional Recovery'?

- A. LPSI supplied by the RWT.
- B. Depressurize to allow SIT discharge.
- C. Charging through the HPSI header
- D. Charging through the Auxiliary Spray Line

Question 56

Which of the following describes the significance of an asterisk (*) when used in an Emergency Operating Procedure?

An asterisk indicates a:

- A. step that may be performed out of sequence.
- B. step that requires a sign off or data sheet.
- C. management directive or vendor recommendation.
- D. regulatory commitment made by Technical Specifications.

Question 57

A Large Break LOCA occurred on Unit 2. The operators have secured two Reactor Coolant Pumps IAW 2-EOP-01, 'Standard Post Trip Actions'.

Which of the following parameters will require the securing of the two remaining Reactor Coolant Pumps after entering 2-EOP-03 'Loss of Coolant Accident'?

- A. RCS Pressure
- B. RCS Subcooled Margin
- C. Hot Leg Temperature
- D. Pressurizer level

Question 58

The following conditions exist:

- A total loss of feedwater has occurred on Unit 2.
- 2A S/G level: 15% WR.
- 2B S/G level: 15% WR.
- The ANPS has directed the implementation of RCS and Core Heat Removal, Success Path 4, 'Once-Through-Cooling' from 2-EOP-15 'Functional Recovery'

Which of the following describes the reason for implementing this Success Path?

15% Wide Range Level is minimum inventory to:

- A. depressurize the RCS and allow the admission of safety injection flow.
- B. depressurize the RCS and prevent a PTS event after re-pressurization following dryout.
- C. maintain RCS temperature at current value in preparation for system lineup to once through cooling.
- D. prevent dry out of S/G's to preclude feeding a dry S/G when feedwater is recovered.

Question 59

Given the following conditions:

- Unit 2 tripped, concurrent with a Loss of Offsite power
- Both Diesel Generators started and loaded on their respective bus.

Which of the following identifies the Safety Function that **CANNOT** be directly confirmed from the control room?

- A. Reactivity control
- B. Containment Isolation
- C. Maintenance of Vital Auxiliaries
- D. Containment Temperature, Pressure and Combustible gas

Question 60

Which of the following Unit 1 events would automatically align a radiological release path to the liquid waste management system?

- A. Failed Fuel
- B. Steam Generator tube leak
- C. RCP seal heat exchanger leak
- D. Regenerative heat exchanger leak

Question 61

When performing a reactor startup on Unit 2, which of the following occurs at \geq 10,000 cps?

- A. Startup Rate Trip is enabled
- B. Zero Power Mode Bypass is enabled
- C. Startup Channels automatically de-energize
- D. Wide Range Log Safety Channel shifts to Extended Range

Question 62

Unit 2 is at 100% power with all systems in normal configuration. A large tube leak occurs in the 2A1 RCP shaft seal heat exchanger.

Which of the following annunciators would **INITIALLY** be expected for this condition?

- A. J-2, RCP 2A1 SEAL TROUBLE
- B. J-11, RCP 2A1 COOLING WATER LOW FLOW
- C. J-33, RCP SEAL COOLER VALVE CLOSED / PWR FAILURE
- E. LA-10, CCW SURGE TANK COMPARTMENT A LEVEL LOW

Question 63

In preparations for entry into Mode 4, you have been requested to perform a lineup on the AFW system. Which of the below methods describes how to verify the 1A AFW discharge value to be in the correct position?

- A. Physical hands on check, slightly moving the valve closed then open, then back to the closed direction 1/4 to 1/2 turn.
- B. Physical hands on check, rotating the valve at least one turn fully closed, then fully open against the backseat.
- C. Visual observation of the valve stem position.
- D. Visual observation of the valve position mechanical pointer.

Question 64

The 1A Diesel surveillance is being completed. As you are unloading the diesel, the KW chart recorder fails, indicating '0' KW.

Which of the following indication will be used to determine the Diesel Generator output prior to opening the generator output breaker?

- A Ammeter on 1A3 4.16 KV bus.
- B. Megawatt meter on the local Diesel panel.
- C. Remote shutdown megawatt indication.
- D. Red, Green, Amber light indication on RTGB Governor control switch.

Question 65

According to Unit 2 Technical Specifications, which of the following would require a Unit Shutdown? (assume Mode 1)

- A. Letdown isolation valve 2515 packing leakage of 1.5 gpm.
- B. 2A1 RCP bleedoff cavity leakage of 3 gpm to the VCT.
- C. Primary to secondary leakage in the 2A Steam Generator of .52 gpm.
- D RCS inventory balance data sheets indicate 2.5 gpm leakage into the guench tank

Question 66

The following conditions exist:

- Steam Generator Tube Rupture exists
- Affected S/G not yet isolated.

Which of the following conditions would require a Site Area Emergency declaration?

- A. Increasing leak flow
- B. Loss of offsite power
- C. Increasing secondary radiation levels
- D. Loss of a 120 VAC Instrument bus

Question 67

In accordance with ADM-11.03 "Temporary Change to Procedures" which of the below procedures may have a Temporary Change initiated?

- A. Quality Instruction (QI).
- B. Administrative Procedure (ADM).
- C. Emergency Operating Procedure (EOP).
- D. Off-Normal Operating Procedure (ONP)

Question 68

The Unit 1 SNPO has been designated as the fire team leader

Which of the following is the Operations Policy concerning the Unit 1 SNPO entering containment?

The Unit 1 SNPO can enter containment:

- A. if a fire occurs inside containment
- B. during day shift hours only
- C. for a period of up to one hour
- D. if no other non-brigade members are available

Question 69

Unit 1 is at in hot standby with a vacuum in the condenser. The Condensate recirc regulator, FCV 12-1, goes full closed.

If FCV 12-1 remained closed, which of the following statements describes the plant response?

- A. The running condensate pump will trip on low flow.
- B. Degrading of condenser vacuum due to loss of condensate flow through the air ejector condenser.
- C. Degrading of condenser vacuum due to loss of exhaust hood sprays.
- D. Water hammer in the MSR reheater drain piping due to loss of quench water.

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Question 70

If occupied during activation of its respective fire suppression system, which of the following areas would be considered a life threatening environment?

- A. Unit 1 Cable Spreading Room
- B. Unit 1 Transformer Bay
- C. Unit 2 Cable Spreading Room
- D. Unit 2 Emergency Diesel Generator Building

Question 71

During a LOCA inside containment, which of the following chemicals is responsible for the production of hydrogen due to corrosion of containment structural metals?

- A. Lithium
- B. Boric acid
- C. Trisodium Phosphate dodecahydrate
- D. Sodium hydroxide/hydrazine

Question 72

The following conditions exist:

- 1B AFW Pump is OOS.
- Unit 1 tripped from 100% power.
- Two minutes after the trip the 1AB 125 VDC bus de-energized due to an electrical fault.
- Both Main Feedwater pumps tripped on low flow and will not restart.

Which of the following are Contingency Action steps that must be taken?

- A. Close the PORV valves.
- B. Secure one RCP in each loop.
- C. Manually control Pressurizer heaters and spray.
- D. Secure all RCPs within 10 minutes of the electrical fault

Question 73

Which of the following RPS reactor trip signals is specifically designed to prevent fuel centerline melting?

- A. Local Power Density
- B. Variable High Power
- C. High Rate of Change
- D. Thermal Margin/Low Pressure

Question 74

Unit 2 is in Mode 1 when the ANPO notifies the RCO that HVE-41A Intake Structure Ventilation Fan motor is smoking and the breaker has tripped.

What is the status of the 2A ICW pump, **immediately** upon discovery of the failed ventilation fan?

- A. Operable as long as HVE-41B remains Operable
- B. Operable as long as the ICW room temperature remains less than design temperature.
- C. Inoperable until ICW room temperature can be proven to be maintained less than design temperature.
- D. Inoperable until a temporary air moving system can be installed.
Question 75

Q100

The following conditions exist:

- A small break LOCA has occurred on Unit 1.
- 1-EOP-03, 'Loss of Coolant Accident' is being implemented.

Containment parameters are as follows:

- Temperature: 182°F
- Pressure: 12 psig
- Two Containment Coolers operating.
- One Containment spray Header is in service with 3000 gpm flow

Which of the following describes the status of Containment Temperature and Pressure safety function?

- A. Containment Temperature and Pressure safety function is met.
- B. Containment Temperature and Pressure safety function is not met. Start one additional Containment Cooler to meet the Safety Function.
- C. Containment Temperature and Pressure safety function is not met. Increase spray header flow to 3200 gpm to meet the Safety Function.
- D. Containment Temperature and Pressure safety function is not met. Place the other Containment spray header in service to meet the Safety function.

Question 76

Unit 2 has tripped from 60% power due to a Loss of Offsite power (LOOP). The following conditions exist:

Both Diesel Generators started and loaded on their respective bus.

- Pressurizer level has stabilized at 30%.
- The transient caused Pressurizer Pressure PIC 1100Y (non-selected) to fail high.

Which of the following describe the minimum action(s) necessary to regain the Pressurizer backup heaters?

- A. Reset all the 480V backup heaters on RTGB 203.
- B. Close A and B 4160 V Pressurizer heater transformer breakers and reset all the 480V backup heaters on RTGB 203.
- C. Close A and B 4160 V Pressurizer heater transformer breakers and reset B1 and B4 480V backup heaters on RTGB 203.
- D. Take the Pressurizer interlock bypass keyswitch to the 'Pressure' position and reset all the 480V backup heaters on RTGB 203.

Question 77

The following conditions exist:

- Unit 1 has tripped from 100% power due to a LOOP.
- Pressurizer Code safety valve, V-1202, was partially stuck open and is currently closed
- Both trains of SIAS has actuated and SI flow meets Figure 2 requirements
- Pressurizer pressure: 1025 psia.
- CET temperature: 539° F
- Pressurizer level: 80% and slowly going up

Which of the following describes the correct mitigation strategy in accordance with 1-EOP-03 'Loss of Coolant Accident'?

- A. Maintain RCS temperature constant and take the pressurizer solid if necessary.
- B. Maintain RCS temperature constant while reducing Pressurizer level to 27-35%.
- C. Cooldown the RCS, but do not let the Pressurizer go solid.
- D Cooldown the RCS and take the pressuirzer solid if necessary.

Question 78

A Steam Generator tube rupture has occurred on the 1A Steam Generator and Operators are performing a rapid downpower on Unit 1.

Which of the following Radiation Monitors will trend down, in proportion to the Reactor power decrease? (Assume S/G tube leak remains constant during the downpower)

- A. Plant Vent
- B. Main steam Line
- C. Condenser Air Ejector
- D. Steam Generator Blowdown

Question 79

Given the following conditions:

- RCS Boron concentration: 654 PPM
- Pressurizer Boron concentration: 686 PPM
- Time (in min) to correct mismatch = [(Pzr ppm RCS ppm) 25 ppm] x 3
- All backup heaters are available
- PIC-1100X: selected

Which of the below statements describes the method and the minimum time to equalize the Pressurizer boron concentration to within 25 ppm of the RCS boron concentration.

Energize all backup heaters and

- A. maintain PIC-1100X in auto at the current setpoint. Recirc for 32 minutes.
- B. maintain PIC-1100X in auto at the current setpoint. Recirc for 21 minutes.
- C. reduce setpoint on PIC-1100X . Recirc for 32 minutes.
- D. reduce setpoint on PIC-1100X. Recirc for 21 minutes.

Question 80

Both Unit's have experienced a Station Blackout.

Which of the following is the minimum designed time each Unit's station batteries are capable of supporting the expected loads?

A. 4 hours

- B. 10 hours
- C. 14 hours
- D. 24 hours

Question 81

The following conditions exist on Unit 2:

- Unit tripped from 80% power
- 2A and 2B S/G levels decreased to 10% narrow range and have recovered to 30% narrow range on all channels.

Assuming no operator action, which of the following describes the status of the Auxiliary Feedwater system?

- A. The 2A, 2B and 2C Auxiliary Feedwater pumps are feeding at full flow.
- B. The 2A and 2B Auxiliary Feedwater pumps are feeding at 150 gpm each.
- C. The 2A, 2B and 2C Auxiliary Feedwater pumps have stopped and their discharge valves closed.
- D, The 2A, 2B and 2C Auxiliary Feedwater pumps are running and their discharge valves closed.

Question 82

Unit 1 is at 100% steady state power. While performing the Area Radiation Monitoring Periodic Test, the Check Source pushbutton on the MA CIS channel readout module is depressed.

Which of the following correctly describes the response, of the system, if any?

- A. The alarm setpoint is displayed.
- B. Various A train CIS components actuate.
- C. Containment Evacuation alarm actuates.
- D. No response, check source is disabled during testing.

Question 83

Which of the following describes the basis for the size difference between the Unit 1 and Unit 2 Condensate Storage Tanks (CST)?

Unit 2 CST volume:

- A. was designed to supply a specified amount of makeup to Unit 1 in the event of total loss of AC power to Unit 1.
- B. was designed to supply a specified amount of makeup to Unit 1 in the event of damage to Unit 1 CST.
- C. is analyzed for a 8 hour hot standby period following a Loss of Offsite Power, Unit 1 is analyzed for a 4 hour period.
- D. is analyzed for a cooldown to shutdown cooling entry conditions following a period of hot standby, Unit 1 is analyzed for hot standby only.

Question 84

The following conditions exist on Unit 2:

- The Unit has experienced a Safety Injection Actuation
- The SIAS signal has been reset

Which of the following describes the configuration of the Intake Cooling Water System (ICW) at this time?

MV-21-2 and MV-21-3 (Intake Cooling water valves to the TCW heat exchangers) are:

- A. open and ICW flow is being supplied to the essential and non-essential headers.
- B. open and ICW flow is being supplied to the essential header only.
- C. closed and ICW flow is being supplied to the essential and non-essential headers.
- D. closed and ICW flow is being supplied to the essential header only.

Question 85

A 35 gpm RCS leak is occurring on Unit 2. Which of the following describes the instrumentation available to determine the change in leak rate and possible location of the RCS leak?

	<u>Change in leak rate</u>	Location
A.	RCS leakage flow recorder FR-07-3	comparing the CIAS radiation monitor readings.
В.	RCS leakage flow recorder FR-07-3	sampling different atmospheric locations in Containment
C.	Cavity sump level, LI-07-6	sampling different atmospheric locations the Containment
D.	Cavity sump level LI-07-6	Comparing the CIAS radiation monitor readings

Question 86

Unit 2 has experienced Loss of Coolant Accident concurrent with a Loss of Offsite power

Which of the following are the minimum actions necessary to reset the nonessential sections of 2B5, 2B6 and 2B8 MCC's?

- A. Resetting SIAS.
- B. Resetting CIAS.
- C. Restoration of offsite power.
- D. Restoration of offsite power and opening the Diesel output breaker.

Question 87

The fire computer is out of service on Unit 2.

In accordance with 0-ONP-79.01 'Fire Detection System' which of the following is the preferred method to monitor the status of Unit 2 fire alarms?

- A. Monitor Unit 2 fire alarms using Unit 1 fire computer.
- B. Assign an Operator to monitor Unit 2 local fire panels.
- C. Notify the roving fire watch to monitor Unit 2 fire alarms.
- D. Station an Operator at the Unit 2 master local fire alarm panel.

Question 88

Unit 2 is in mode 6, fuel movement in progress, when Shutdown Cooling is lost.

2-ONP-01.05, Plant Condition 5 - ,Shutdown Cooling in Service, Rx Head Removed, has been implemented.

If Shutdown Cooling cannot be restored, which of the following method of cooling the core will be implemented?

- A. Steam Generator heat removal.
- B. Feed and bleed to the RWT.
- C. Cooling through the Fuel Pool Heat Exchanger.
- D. Cooling through the Letdown Heat Exchanger.

Question 89

The following conditions exist:

- A 37 year old itinerant mechanic has arrived on site from Turkey Point
- He will work at St. Lucie for the remainder of the year
- His total lifetime effective dose equivalent (TEDE) is 33.5 REM
- His dose for this year is 0.5 REM

Which of the following is the MAXIMUM additional total effective dose equivalent (PSL limits) that he will be permitted to receive at PSL this year? (Assume no extensions)

A. 0.5 REM

- B. 2.0 REM
- C. 3.5 REM
- D. 4.5 REM

Question 90

Unit 2 is at 100% power, steady state. A major leak has developed in the reference leg for the selected Pressurizer level transmitter LT-1110X

Which of the following describes the immediate indicated Pressurizer level indications and the response of the CVCS system?

	Indicated Pressuirzer level	CVCS response
A.	High	Letdown flow will decrease
В.	High	Letdown flow will increase
C.	Low	Letdown flow will decrease
D.	Low	Letdown flow will increase

Question 91

Unit 2 Reactor Vessel Level is at Mid Loop with the following conditions:

- The Unit has been shutdown 4 days
- RCS temperature: 130° F

Both SDC cooling trains are lost

Which of the following is the time to boil and the required makeup rate for boil off?

(REFERENCES PROVIDED, Fig. 1 and 2 from 2-0440030)

- A. 8 minutes to boil, 90 GPM makeup rate
- B. 8 minutes to boil, 75 GPM makeup rate
- C. 11 minutes to boil, 60 GPM makeup rate
- D. 11 minutes to boil, 40 GPM makeup rate

Question 92

When processing an RWP, which of the following is the MINIMUM criteria that requires pre-job ALARA review?

- A. Dose estimate of the job exceeds one (1) Manrem.
- B. Any work to be performed in a high radiation area.
- C. Dose estimate of the job exceeds five (5) Manrem.
- D. Any work that requires the use of a full-face respirator.

Question 93

Unit 1 is at 100% steady state power. The RCO is preparing to start the 1A EDG from the RTGB for a semi-annual surveillance run.

Which of the following parameters must be timed by the RCO to ensure the 1A EDG meets operability requirements?

- A. KW loading
- B. Output breaker closure
- C. Current and Voltage
- D. Frequency and Voltage

Question 94

Which of the following area radiation levels is the maximum which is allowed to be unlocked?

- A. 900 mrem/hr at 30 cm (12 inches)
- B. 1200 mrem/hr at 30 cm (12 inches)
- C. 900 mrem/hr at 100 cm (39 inches)
- D. 1200 mrem/hr at 100 cm (39 inches)

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Question 95

Which of the following is the MAXIMUM total dose equivalent (TEDE) that an RCO can receive per 10CFR20 in a year? (Assume no emergencies)

- A. 1 REM
- B. 2.5 REM
- C. 3.5 REM
- D. 5 REM

Question 96

Unit 1 is at 100% power when the following cabinets simutaneously lose power:

- A Channel RPS
- A Channel ESFAS
- A Channel AFAS

Which of the following identifies the equipment that has been de-energized?

- A. Vital AC Bus
- B. Instrument Bus
- C. SAS Inverter
- D. QSPDS Inverter

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Question 97

Unit 1 has implemented 1-EOP-03.'LOCA.' Which of the following describes the criteria for securing Containment Spray following a large break LOCA?

In accordance with 1-EOP-03, which of the following criteria can Containment Spray may be secured.

Containment pressure is less than:

- A. 10 psig, with the Engineering Manager concurrence.
- B. 5.5 psig, with the Nuclear Plant Supervisor concurrence.
- C. 5 psig, with Technical Support Center concurrence.
- D. 3.5 psig, with Recovery Manager concurrence.

Question 98

Given the following conditions on Unit 1:

• 1B and 1BB Battery chargers are both in service tied to the 1B DC bus.

If the 1B Battery charger is then removed from service, which of the following is correct response of the 1BB Battery charger's voltage and amps?

	<u>Voltage</u>	<u>Amps</u>
A.	decrease	decrease.
В.	increase	remain the same
C.	remain the same	increase
D.	remain the same	remain the same

Question 99

Which of the following describes the criteria that meets Reactivity Control safety function upon entering 1-EOP-10 'Station Blackout'?

Reactor power less than $5X10^{-4}$ %, stable or decreasing and:

- A. all CEA's fully inserted
- B. maximum of 1 CEA not fully inserted.
- C. startup rate negative or zero.
- D. emergency boration in progress.

Question 100

Unit 2 is in Mode 3 with the following conditions:

- Pressurizer pressure is 2250 psia.
- 2A iodine removal pump was recently declared out of service due to a burned motor.
- 2B Diesel Generator has just been declared out of service due to a broken oil line.

In accordance with Technical Specifications which of the following describes the status of the iodine removal system.

- A. The iodine removal system is inoperable, but not required until Mode 2.
- B. With the 2B iodine removal pump available, the iodine removal system is considered operable.
- C. The iodine removal system can be declared operable when the 2A Diesel Generator is run for operability check.
- D. The iodine removal system can be declared operable when the 2A iodine removal pump is returned to service.

INITIAL SUBMITTAL

ST. LUCIE EXAM 2000-301 50-335/2000-301 & 50-389/2000-301

FEBRUARY 7 - 11, 2000

INITIAL DRAFT OUTLINE SUBMITTAL LETTER FROM J A STALL, VP, ST. LUCIE TO HAROLD O CHRISTENSE ES-201-2 - Exam Outline Quality Checklist Scenarios 1, 2, and 3 Security Agreements ES-301-5 - Transient & Event Checklist ES-301-1 - Administrative Topics Outline ES-301-2 Control Room Systems & Facility Walk-Through Test Outline ES-401-3 - PWR SRO Examination Outline ES-401-5 Generic Knowledge & Abilities Outline ES-401-5 - Generic Knowledge & Abilities Outline

Charlie Royne



Florida Power & Light Company, 6351 S. Ocean Drive, Jensen Beach, FL 34957

November 24, 1999

L-99-249 10 CFR 55.40 10 CFR55.5

Regional Administrator, Region II U. S. Nuclear Regulatory Commission Attn: Mr. Harold O. Christensen Chief, Operator Licensing and Human Performance Branch Atlanta, GA 30303

Re: St. Lucie Units 1 and 2 Docket Nos. 50-335 and 50-389 February 2000 Initial License Operator Examination Outline

This letter documents approval of the proposed Florida Power & Light Company (FPL) examination outline and examination quality checklists as requested by NRC letter dated October 7, 1999. I am the authorized representative of the facility licensee. The examination outline is for the initial operator license examination that is scheduled to be administered in February 2000. To ensure examination security, the information will be shipped via Federal Express directly to the NRC Senior License Examiner by the St. Lucie Training Department Exam Coordinator on November 24, 1999.

Should you require any additional information, please contact Mr. Mark Shepherd at (561) 467-7093.

Very truly yours,

J. A. Stall Vice President St. Lucie Plant

JAS/GRM

ES-	201

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Examination Outline Quality Checklist

Facility	St. Lucie (00-301) Date of Examination:	2-10	<u>)-a</u>	S		
		Initials				
item	lask Description	а	b*	c		
1.	a. Verify that the outline(s) fit(s) the appropriate model per ES-401.	Thy	L			
W R	b. Assess whether the outline was systematically prepared and whether all knowledge and ability categories are appropriately sampled.					
Ť	c. Assess whether the outline over-emphasizes any systems, evolutions, or generic topics.	Thy	1			
E N	d. Assess whether the repetition from previous examination outlines is excessive.	Thy	L	_		
2.	a. Using Form ES-301-5, verify that the proposed scenario sets cover the required number of normal evolutions, instrument and component failures, and major transients.	Th	1			
S I M	b. Assess whether there are enough scenario sets (and spares) to test the projected number and mix of applicants in accordance with the expected crew composition and rotation schedule without compromising exam integrity; ensure each applicant can be tested using at least one new or significantly modified scenario, that no scenarios are duplicated from the applicants' audit test(s)*, and scenarios will not be repeated over successive days.	Th	L			
	c. To the extent possible, assess whether the outline(s) conform(s) with the qualitative and quantitative criteria specified on Form ES-301-4 and described in Appendix D.	Th	1			
3. W / T	 a. Verify that: (1) the outline(s) contain(s) the required number of control room and in-plant tasks, (2) no more than 30% of the test material is repeated from the last NRC examination, (3)* no tasks are duplicated from the applicants' audit test(s), and (4) no more than 80% of any operating test is taken directly from the licensee's exam banks. 	B	L			
	 b. Verify that: (1) the tasks are distributed among the safety function groupings as specified in ES-301, (2) one task is conducted in a low-power or shutdown condition, (3) 40% of the tasks require the applicant to implement an alternate path procedure, (4) one in-plant task tests the applicant's response to an emergency or abnormal condition, and (5) the in-plant walk-through requires the applicant to enter the RCA. 	乃	Ł			
	c. Verify that the required administrative topics are covered, with emphasis on performance-based activities.	Th	12			
	d. Determine if there are enough different outlines to test the projected number and mix of applicants and ensure that no items are duplicated on successive days.	Th	1			
4.	a. Assess whether plant-specific priorities (including PRA and IPE insights) are covered in the appropriate exam section.	Thy	1			
G	b. Assess whether the 10 CFR 55.41/43 and 55.45 sampling is appropriate.	13	1			
N E	c. Ensure that K/A importance ratings (except for plant-specific priorities) are at least 2.5.	Th	14			
R	d. Check for duplication and overlap among exam sections.	13	14			
î	e. Check the entire exam for balance of coverage.	11/3	14			
	f. Assess whether the exam fits the appropriate job level (RO or SRO).	113	12			
a. Aut b. Fac c. Chi d. NR	thor <u>TIM BOLANDEN / Printed None Signature</u> cility Reviewer(*) <u>Ron Lauver / Ris J. The</u> ief Examiner RC Supervisor		Da 11-24 11-24	1.44		
(*) Not	t applicable for NRC-developed examinations.					

Facility: St. Lucie

Op-Test No.: 1

Objectives: To evaluate the students ability to implement the ONOPs for various instrument and component failures; perform a normal plant power reduction; and to execute the EOPs for a Small Break LOCA combined with a Loss of Offsite Power and subsequent total loss of High Pressure Safety Injection. (Functional Recovery)

Initial Conditions: Unit 2 is at 100% power MOC

Turnover: The plant is operating at 100% power, MOC. The 2B Heater Drain Pump has developed a discharge flange leak and management has made the decision to reduce power to 90% in order to facilitate repairs. 2A Emergency Diesel Generator is out of service for relay replacement, expected back in four hours. 2A Auxiliary Feedwater Pump is out of service for bearing replacement, not expected back this shift. Chemistry reports a .5 GPD tube leak in the 2A Steam Generator. Severe thunderstorms have been forcasted for St. Lucie and Martin counties. Instructions to the shift is to reduce power to 90% and remove the 2B Heater Drain Pump from service.

Preexisting Malfunctions: 2B HPSI pump becomes air bound 10 minutes after SIAS

Malf. No.	Event Type*	Event Description
0	R-RO N-BOP	Power decrease from 100% to 90% Place Pressurizer on Recirc
1	C-BOP	DEH power supply failure, turbine control swaps to manual, 2B heater drain pump trips two minutes later
2	I-RO	PT-1100X setpoint (selected pressurizer pressure controller) drifts high
3	I-BOP	LT-9011(2A steam generator level controller) fails high
4	C-RO	Reference leg for LT-1110X ruptures (common leg failure)
5	M-RO M-BOP	Small break LOCA, Loss of Offsite Power on reactor trip
6	с	2B HPSI pump becomes air bound 10 minutes after SIAS, loss of all High Pressure Safety Injection
	Maif. No. 0 1 2 3 4 5 6	Maif. No.Event Type*0R-RO N-BOP1C-BOP2I-RO3I-BOP4C-RO5M-RO M-BOP6C

* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor

Facility: St. Lucie

Objectives: To evaluate the students ability to implement the ONOPs for various instrument and component failures; perform a normal plant power reduction; and to execute the EOPs for an Excess Steam Demand combined with loss of two of three Auxiliary Feedwater Pumps and total loss of Instrument Air.

Initial Conditions: Unit 2 is at 100% power MOC

Turnover: The plant is operating at 100% power, MOC. The 2B Main Feedwater Pump has developed a crack in an oil line and is leaking approximately .3 GPM. Maintenance is standing by and adding oil as needed. Management is in the process of evaluating the problem and will make a decision within the next hour whether or not to reduce power and repair the leak. 2B Auxiliary Feedwater Pump is out of service for bearing replacement, not expected back this shift. The Steam Jet Air Ejector Radiation Monitor is out of service, not expected back this shift. Chemistry reports a .5 GPD tube leak in the 2A Steam Generator. Severe thunderstorms have been forcasted for St. Lucie and Martin counties. Instructions to the shift are to maintain 100% power.

Preexisting Malfunctions:

2C Auxiliary Feedwater pump trips 10 minutes after AFAS actuation.

Event No.	Malf. No.	Event Type*	Event Description
1	1	C-BOP	PCV-8801 (Steam bypass control valve) drifts open
2	0	R-RO N-BOP	Power reduction to 45% Place Pressurizer on Recirc
3	2	I-RO	HIC-1100 (pressurizer spray controller) input fails high
4	3	C-RO	LCV-2110P (pressurizer level control valve) fails open, V 2515 fails to close on high temperature
5	0	N-BOP	Restoration of charging and letdown
6	4	I-BOP	PT-10-8 (condenser vacuum pressure transmitter) sensing line failure
7	5	M-RO M-BOP	Reactor trip on loss of vacuum, V-8201 and V-8202 (2A S/G main steam safety valves) stick fully open on the reactor trip
8	6	с	Loss of instrument air on reactor trip
9	7	С	2C Auxiliary Feedwater pump trips 10 minutes after AFAS

HCV-09-1A and HCV-09-1B fail to close on AFAS/MSIS

* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor

Appendix D

Facility: St. Lucie Scenario No.: Backup 3

Op-Test No.: 3

Objectives: To evaluate the students ability to implement the ONOPs and take manual control of systems due to various instrument and component failures; perform a normal plant power increase; and to execute the EOPs for a Loss of Offsite Power with loss of both Emergency Diesel Generators (Station Blackout)

Initial Conditions: Unit 2 is at 30% power BOC

Turnover: The plant is operating at 30% power, BOC. The unit is returning from a 30 day refueling outage and has been on a chemistry hold. Chemistry has given the approval to continue the power ascension to 100%. 2A Emergency Diesel Generator has just been taken out of service to replace a defective relay, expected back in four hours. Reactor Reg #2 is out of service, I&C is troubleshooting. Instructions to the shift is to increase power to 100%.

Preexisting Malfunctions:

2B EDG trips 15 minutes after LOOP FCV-9021 failed as is (manual control available)

Event No.	Malf. No.	Event Type*	Event Description
1	0	R-RO N-BOP	Power increase from 30% to 100% Place MSR's in service
2	1	I-RO	TE-1111Y (Rx Reg Thot input) fails high
3	2	C-BOP	LCV-9006 (2B 15% bypass valve) drifts open
4	3	I-BOP	FR-8011 (2A steam generator steam flow transmitter) drifts high
5	4	C-RO	PCV-1100E (Pressurizer spray valve) fails open
6	5	M-RO M-BOP	Loss of offsite power
7	6	С	2B EDG trips 15 minutes after LOOP (Station Blackout)
8		N	Crosstie 4.16 KV power with Unit 1

* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor

ES-201

Examination Security Agreement

Form ES-201-3

1. Pre-Examination

I acknowledge that I have acquired specialized knowledge about the NRC licensing examinations scheduled for the week(s) of $\frac{6-28}{99}$ as of the date of my signature. I agree that I will not knowingly divulge any information about these examinations to any persons who have not been authorized by the NRC chief examiner. I understand that I am not to participate in any instruction, evaluation, or other training-related activities involving those applicants scheduled to be administered these licensing examinations from this date until completion of examination administration. I further understand that violation of the conditions of this agreement may result in cancellation of the examinations and/or an enforcement action against me or the facility licensee. I will immediately report to facility management or the NRC chief examiner any indications or suggestions that examination security may have been compromised.

2. Post-Examination

To the best of my knowledge, I did not divulge to any unauthorized persons any information concerning the NRC licensing examinations administered during the week(s) of ______. From the date that I entered into this security agreement until the completion of examination administration, I did not participate in any training-related activities involving those applicants who were administered these licensing examinations.

PRINTED NAME	JOB TITLE / RESPONSIBILITY	SIGNATURE (1)	DATE	SIGNATURE (2)	DATE
1. K. KORTH	ANPS from exan review	7/7/15	5-7-89	#965ª	
2. Winston A. Ryley	RCO/Validation	WARK	5-7-99	6	
3. Adam J. Scales	ASST OPS Supervisor / Review	Car Dean	5=10-59		
4. Jeff Folden	ANRS/Review	1/m OA	5-10-41		<u> </u>
5. C.D. LADD	OPS SUPV / REVIEW APPROVE	- Conton	_5/10/99		
6. M.H.Alla	ous mer / Review exam	- coogt @	_ \$/io/9\$ _		
7. Gam Hollinger	Asst. Tran day. 1 Operation Tom Oversides	1 affollin	5/12/99		<u> </u>
8. Jim Nichting	SPEAKONT		08/04/99		
-9. Ron Lauver	Training	Allatons	9-16 99		
10.	J	V			

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ES-201

Examination Security Agreement

1. Pre-Examination

I acknowledge that I have acquired specialized knowledge about the NRC licensing examinations scheduled for the week(s) of <u>6-28</u> <u>99</u> as of the date of my signature. I agree that I will not knowingly divulge any information about these examinations to any persons who have not been authorized by the NRC chief examiner. I understand that I am not to participate in any instruction, evaluation, or other training-related activities involving those applicants scheduled to be administered these licensing examinations from this date until completion of examination administration. I further understand that violation of the conditions of this agreement may result in cancellation of the examinations and/or an enforcement action against me or the facility licensee. I will immediately report to facility management or the NRC chief examiner any indications or suggestions that examination security may have been compromised.

2. Post-Examination

To the best of my knowledge, I did not divulge to any unauthorized persons any information concerning the NRC licensing examinations administered during the week(s) of ______. From the date that I entered into this security agreement until the completion of examination administration, I did not participate in any training-related activities involving those applicants who were administered these licensing examinations.

PRINTED NAME	JOB TITLE / RESPONSIBILITY	SIGNATURE (1)	DATE	SIGNATURE (2)	DATE
1. T. BOLANDER	Autiton	T. Munhu	1-4.49		
2. R.A. WALKER		L.A. Wallin	2-10-99		
3.4.C. Miller	Reviewer	W.S. Fully	2-11-99_		
4. JEFFREY Fox	REVSEWER	Akia	11 FEA 99		
5. GEORGE LORCE	Simulator STASS	- Fortan	12/10 77		<u> </u>
6. C.D Marple	Reviewer,	- Masple-	3/31/99		
7. Jim Fiori	WRITTEN EXAM RO	Jan g. Ow	<u> </u>		
8. Carlos de la Guar	di <u>e</u>	Saladale Juarba	<u>4-22-94</u> _		
9. L. C. hurch (Laward)	OPS RTTL / OPENIUM	Segge Ch	<u>4/32/99</u> _		
10 LALRY KICH	OPS TRANSN'6 SUPV.	- Herry Re-	_4/22/99_		
t			/ /		

Examination Security Agreement

1. <u>Pre-Examination</u>

ES-201

I acknowledge that I have acquired specialized knowledge about the NRC licensing examinations scheduled for the week(s) of 2/7/05 as of the date of my signature. I agree that I will not knowingly divulge any information about these examinations to any persons who have not been authorized by the NRC chief examiner. I understand that I am not to instruct, evaluate, or provide performance feedback to those applicants scheduled to be administered these licensing examinations from this date until completion of examination administration, except as specifically noted below and authorized by the NRC.Furthermore, I am aware of the physical security measures and requirements (as documented in the facility licensee's procedures) and understand that violation of the conditions of this agreement may result in cancellation of the examinations and/or an enforcement action against me or the facility licensee. I will immediately report to facility management or the NRC chief examiner any indications or suggestions that examination security may have been compromised.

2. <u>Post-Examination</u>

To the best of my knowledge, I did not divulge to any unauthorized persons any information concerning the NRC licensing examinations administered during the week(s) of ______. From the date that I entered into this security agreement until the completion of examination administration, I did not instruct, evaluate, or provide performance feedback to those applicants who were administered these licensing examinations, except as specifically noted below and authorized by the NRC.

PRINTED NAME	JOB TITLE / RESPONSIBILITY	ŞIGNATURE (1)	DATE	SIGNATURE (2)	DATE	NOTE
1 JEFFREY Fox	INTRACTOR EXAM REVIEW	Mar I	18-60199			
2. Richard Bretton	Instructor / Exam Review		<u></u>			
3. W.C. Miller	Instructor/Erkan Review	/WWC Millin	<u> 11-18-99 </u>			<u> </u>
4						
5						
6						
7						
8						
9						
10						
11						
12		······································				
13						
14						
15						

NOTES:

FS-201	Examination Security Agreement
20-201	Examination occurry Agreement

11-18-99

2-7-001

1. Pre-Examination

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I acknowledge that I have acquired specialized knowledge about the NRC licensing examinations scheduled for the week(s) of <u>2-10-24</u> as of the date of my signature. I agree that I will not knowingly divulge any information about these examinations to any persons who have not been authorized by the NRC chief examiner. I understand that I am not to instruct, evaluate, or provide performance feedback to those applicants scheduled to be administered these licensing examinations from this date until completion of examination administration, except as specifically noted below and authorized by the NRC.Furthermore, I am aware of the physical security measures and requirements (as documented in the facility licensee's procedures) and understand that violation of the conditions of this agreement may result in cancellation of the examinations and/or an enforcement action against me or the facility licensee. I will immediately report to facility management or the NRC chief examiner any indications or suggestions that examination security may have been compromised.

2. Post-Examination

To the best of my knowledge, I did not divulge to any unauthorized persons any information concerning the NRC licensing examinations administered during the week(s) of ______. From the date that I entered into this security agreement until the completion of examination administration, I did not instruct, evaluate, or provide performance feedback to those applicants who were administered these licensing examinations, except as specifically noted below and authorized by the NRC.

PRINTED NAME	JOB TITLE / RESPONSIBILITY	SIGNATURE (1)	DATE	SIGNATURE (2)	DATE NOTE
1. M. D.Shephend	Ops Trny Supr	milpfl	9.29.99		
2. Ron Lauver	Ops Trag Instructor	- Multi	9-30-59		
3. Robert Wilindsky	Training Manager	- harty minden	10/21/93		
4. Brun Nichly	SILLOW	In philip (11/2/99	···· · · ·	·
5. Andres Terezakis	ANPS		_ <u>11/4/99</u>		- <u> </u>
6. JEFF McKenzre	RLO	Ing/hom	_ <u>11/4/99</u>		·
7. KG Wist	PGM				
8. JA STALL		- solder	il/il/m	·····	
9. J.CHARLES CONTURE	OPS TRAINING INSTRUCTUR	The Leopus	<u>23Nov 99</u>		
10. JAMUES MARTIN	TAND SIMULATIA SULV	Jan Marta	1/23/99	•	
11	ADMIN. OLEKE / COPY				
12	OPS INSTRUCTOR / VALID	ATE	·····		
13	OPS MANAGER/YALIDAT	2			
14					
15					

NOTES:
Transient and Event Checklist

Form ES-301-5

OPERATING TEST NO: 1 SRO-U1

							· · · · · · · · · · · · · · · · · · ·
	Applicant	Evolution	Minimum	Sc	enari	o Num	ber
	Туре	Гуре	Number	1	2	3	4
		Reactivity	1				
		Normal	1				
	RO	Instrument	2				
		Component	2				
		Major	1				
		Reactivity	1				
		Normal	0				
	As RO	Instrument	1				
I		Component	1				
		Major	1				
	SRO-I						
		Reactivity	0				
		Normal	1				
	As SRO	Instrument	1				
		Component	1				
		Major	1				
		Reactivity	0	1			
		Normal	1	1			
	SRO-U	Instrument	1	3,4			
		Component	1	2,5,7			
		Major	1	6			
Instru	ictions:	(1) Enter the numbers for each (2) Reactivity	operating test evolution type manipulations	number e. s may be	and F	Form E lucted	S-D-1 ev under no

ent mal or *controlled* abnormal conditions (refer to Section D.4.d) but must be significant per Section C.2.a of Appendix D.

Author:

Chief Examiner:

Transient and Event Checklist

Form ES-301-5

OPERATING TEST NO: 1 SRO-I

Applicant	Evolution	Minimum	S	<u>cenario</u>	Number 3 4	
'Type	Туре	Number	_1	2	3	4
	Reactivity	1				
	Normal	11				
RO	Instrument	2				
	Component	2				
	Major	1				
<u></u>	Reactivity	1	1			
	Normal	0				
As RO	Instrument	1	3			
AS NO	Component	1	5			
	Major	1	6			
SRO-I					<u> </u>	r
	Reactivity	0		2	 	
	Normal	1	<u> </u>	2,5		<u> </u>
As SRO	Instrument	1	L	3,6		
	Component	1		1,4, 8,9		
	Major	1		7		
<u> </u>	Reactivity	0				
	Normal	1	<u> </u>		<u> </u>	
SRO-U	Instrument	11				
	Component	<u> </u>				
	Major	1				

 (1) Enter the operating test number and ronn LS-D-revent numbers for each evolution type.
 (2) Reactivity manipulations may be conducted under normal or *controlled* abnormal conditions (refer to Section D.4.d) but must be significant per Section C.2.a of Appendix D.

Author:

Chief Examiner:

Transient and Event Checklist

Form ES-301-5

OPERATING TEST NO: 1 SRO-U2

Applicant	Evolution	Minimum	Sc	Scenario Number					
Type	Туре	Number	1	2	3	4			
	Reactivity	1							
	Normal	1							
RO	Instrument	2							
	Component	2							
	Major	1							
	Reactivity	1							
	Normal	0							
As RO	Instrument	1							
	Component	1							
	Major	1							
SRO-I									
	Reactivity	0							
	Normal	11							
As SRO	Instrument	1							
	Component	1							
	Major	1							
	Reactivity	0	1						
	Normal	1	1						
SRO-U	Instrument	1	3,4						
	Component	1	2,5,7						
	Major	1	6						

 Reactivity manipulations may be conducted under normal or *controlled* abnormal conditions (refer to Section D.4.d) but must be significant per-Section C.2.a of Appendix D.

Author:

Chief Examiner:

Transient and Event Checklist

Form ES-301-5

OPERATING TEST NO: 1 RCO

Γ	Annlicant	Evolution	Minimum	Scenario Number						
	Type	Type	Number	1	2	3	4			
ľ		Reactivity	1	1						
		Normal	1		2,5					
	RO	Instrument	2	3	6					
		Component	2	5	8					
		Major	1	6	7					
	<u>,,</u>	Reactivity	1							
		Normal	0							
	As RO	Instrument	1							
	,	Component	1							
		Major	1							
	SRO-I									
		Reactivity	0	ļ		ļ				
		Normal	1							
	As SRO	Instrument	1	ļ		<u> </u>				
		Component	1							
		Major	1							
		Reactivity	0							
		Normal	1	-	_					
	SRO-U	Instrument	1			ļ				
		Component	1							
		Major	1							
nstru	ictions	(1) Enter the numbers for each (2) Reactivity or <i>controlled</i> abn be significant per	operating test n evolution typ manipulation ormal condition r Section C.2.6	t numbe be. s may t ons (refe a of App	er and f be conc er to Se bendix	Form E ducted ection [D.	S-D-1 ever under norn 0.4.d) but n			
Autho	or:	_K/a								
Chief	Examiner:									

Facility: St. Lucie (00-301) Date of Exam: 2/7-9-00 Scenario No.: 1

Op-Test No.: 1

Objectives: To evaluate the students ability to implement the ONOPs for various instrument and component failures; perform a normal plant power reduction; and to execute the EOPs for a Small Break LOCA combined with a Loss of Offsite Power and subsequent total loss of High Pressure Safety Injection. (Functional Recovery)

Initial Conditions: Unit 2 is at 100% power MOC

Turnover: The plant is operating at 100% power, MOC. The 2B Heater Drain Pump has developed a discharge flange leak and management has made the decision to reduce power to 90% in order to facilitate repairs. 2A Emergency Diesel Generator is out of service for relay replacement, expected back in four hours. 2A Auxiliary Feedwater Pump is out of service for bearing replacement, not expected back this shift. Chemistry reports a .5 GPD tube leak in the 2A Steam Generator. Severe thunderstorms have been forcasted for St. Lucie and Martin counties. Instructions to the shift is to reduce power to 90% and remove the 2B Heater Drain Pump from service.

Preexisting Malfunctions: 2B HPSI pump becomes air bound 10 minutes after SIAS

Event No.	Malf. No.	Event Type*	Event Description
1	0	R-RO N-BOP N-BOP	Power decrease from 100% to 90% Place Pressurizer on Recirc Start Second Charging Pump
2	1	C-BOP C-BOP	DEH power supply failure, turbine control swaps to manual, 2B heater drain pump trips two minutes later
3	2	I-RO	PT-1100X setpoint (selected pressurizer pressure controller) drifts high
4	3	I-BOP	LT-9011(2A steam generator level controller) develops noise signal causing the valve to cut-off feedwater flow
5	4	C-RO	Reference leg for LT-1110X ruptures (common leg failure) Starts RCS leak
6	5	M-RO M-BOP	Small break LOCA, Loss of Offsite Power on reactor trip
7	6	С	2B HPSI pump becomes air bound 10 minutes after SIAS, loss of all High Pressure Safety Injection until vented.

* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor

Facility: St. Lucie (00-301) Date of Exam: 2/7-9-00 Scenario No.: 2

Objectives: To evaluate the students ability to implement the ONOPs for various instrument and component failures; perform a normal plant power reduction; and to execute the EOPs for an Excess Steam Demand combined with loss of two of three Auxiliary Feedwater Pumps and total loss of Instrument Air.

Initial Conditions: Unit 2 is at 100% power MOC

Turnover: The plant is operating at 100% power, MOC. The 2B Main Feedwater Pump has developed a crack in an oil line and is leaking approximately .3 GPM. Maintenance is standing by and adding oil as needed. Management is in the process of evaluating the problem and will make a decision within the next hour whether or not to reduce power and repair the leak. 2B Auxiliary Feedwater Pump is out of service for bearing replacement, not expected back this shift. The Steam Jet Air Ejector Radiation Monitor is out of service, not expected back this shift. Chemistry reports a .5 GPD tube leak in the 2A Steam Generator. Severe thunderstorms have been forcasted for St. Lucie and Martin counties. Instructions to the shift are to maintain 100% power.

Preexisting Malfunctions:

Event No.	Malf. No.	Event Type*	Event Description
1	1	C-BOP	PCV-8801 (Steam bypass control valve) drifts open
2	0	R-RO N-BOP	Power reduction to 45% Place Pressurizer on Recirc
3	2	C-RO	LCV-2110P)pressurizer level control valve) fails open. V2515 (letdown isolation valve) does not close automatically on high temperature* *(high temperature may not reach setpoint, may be transparent, not counted)
4	3	N-BOP	Restoration of Charging and letdown
5	0	I-RO	HIC-1100 (pressurizer spray controller) input fails high
6	4	I-BOP	PT-10-8 (condenser vacuum pressure transmitter) sensing line failure
7	5	M-RO M-BOP	Reactor trip on loss of vacuum, V-8201 and V-8202 (2A S/G main steam safety valves) stick fully open on the reactor trip
8	6	С	Loss of instrument air on reactor trip. Loss of CCW to RCP's, all must be tripped in 10 minutes
9	7	С	2C Auxiliary Feedwater pump trips 10 minutes after AFAS

HCV-09-1A and HCV-09-1B fail to close on AFAS/MSIS

2C Auxiliary Feedwater pump trips 10 minutes after AFAS

* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor

actuation.

Appendix D	I		Scenario Outline	Form ES-D-1								
Facility: S Date of E	St. Lucie (0 Exam: 2/7-§	0-301) 9-00	Scenario No.: Backup 3 Op-Test No.	: 1								
Objectives: To evaluate the students ability to implement the ONOPs and take manual control of systems due to various instrument and component failures; perform a normal plant power increase; and to execute the EOPs for a Loss of Offsite Power with loss of both Emergency Diesel Generators (Station Blackout)												
Initial Conditions: Unit 2 is at 30% power BOC												
Turnover: The plant is operating at 30% power, BOC. The unit is returning from a Plant trip four days ago after reaching 100% power. Plant power has just been secured at 300 MW to prepare for placing MSRs inservice. 2A Emergency Diesel Generator has just been taken out of service to replace a defective relay, expected back in four hours. Reactor Reg #2 is out of service, I&C is troubleshooting. Instructions to the shift is to increase power to 100%. Preexisting Malfunctions: 2B EDG trips 15 minutes after LOOP												
Event No.	Malf. No.	Event Type*	Event Description									
1	0	R-RO N-BOP	Power increase from 30% to 100% Initiate placing MSR's in service									
2	1	I-RO	TE-1111Y (Rx Reg Thot input) fails high									
3	2	C-BOP	LCV-9006 (2B 15% bypass valve) drifts open									
4	3	I-BOP	FR-8011 (2A steam generator steam flow transn high requiring placing FIC-9011 in Manual to avo trip	nitter) drifts vid a plant								
5	4	C-RO	PCV-1100E (Pressurizer spray valve) fails open									
6	5	M-RO M-BOP	Loss of offsite power Manually open ADV's, start AFW flow to S/G's									
7	6	С	2B EDG trips 15 minutes after LOOP (Station Bl	ackout)								
8		N	SBO Crosstie 4.16 KV power with Unit 1									

* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor

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Administrative Topics Outline

Form ES-301-1

Facility Exami	r: St. Lucie nation Level (circle c	one): RO / SRO	Date of Examination: 2/7/00 Operating Test Number: 1					
٦	dministrative Topic/Subject Description	Describe method of evaluation: 1. ONE Administrative JPM, OR 2. TWO Administrative Questions						
A.1	Plant Parameter Verification K2.17 - 3.7 / 4.4	JPM / Perform Estimated C	critical Condition Calculation Unit 1					
	Overtime	Question 1/ Evalu	ate Overtime Guidelines					
	K2.1.1 - 3.7/3.8	Question 2/ Minimum level of approval for deviation						
A.2	Surveillance Procedures K2.2.12 - 3.0/3.4	JPM / Verify Boric Ac	cid Makeup Tank Operability					
A.3	A.3 Knowledge of 10 CFR 20 and facility radiation control requirements K2.3.1 - 2.6 / 3 0	Question 1 / Determine Pos	sting Requirements from a Survey					
		Question 2 / When an area	is posted for Airborne Radioactivity					
A.4	Knowledge of the emergency plan K2 4 29 - 2 6/4 0	JPM / Complete the Sta	ate of Florida Notification Form					
	(RO Only)							
A.4	Knowledge of the Emergency Plan. K2.4.44-2.1/4.0 (SRO Only)	JPM / Determine Protec	ctive Action Recommendations					

ES-301 Control Room Systems and Facility Walk-Through Test Outline

Form ES-301-2

Facility: St. Lucie Date Exam Level (circle one): RO / SRO(I) / SRO(U) Oper	of Examination: rating Test No.:	2/7/00 1								
B.1 Control Room Systems										
System / JPM Title	Type Code⁺	Safety Function								
a. RPS 012 / Perform a Logic Matrix Test Unit 2 (15 minutes)	M, S, A	07								
 ECCS 006 / Fill a Safety Injection Tank Unit 2 (15 minutes) 	N, S	03								
c. RHRS 005 / Respond to an "A" SDC Loop Suction Valve Closure while on SDC (20 minutes) (SRO-U)	D, S, L	04P								
d. AFW 061 / Manually Actuate AFAS Unit 2 (10 minutes)	D, S, A	04S								
e. CRDS 001 / Recover a Slipped CEA Unit 2 (15 minutes) (SRO-U)	N, S, A	01								
 f. HRPS 028 / Operate the Hydrogen Recombiner Unit 1 (10 minutes) 	N, C	05								
 g. ECCS 006 / Initiate Hot and Cold Leg Injection Unit 1 (20 minutes) (SRO-U) 	N, C	02								
B.2 Facility Walk-Through										
a. HRPS 028 / Hydrogen Purge System Operation Unit 1 (20 Minutes) (SRO-U)	D, R	05								
 b. SFPCS 033 / Makeup to the Spent Fuel Pool Unit 1 (20 minutes) 	N, R	08								
 c. EDG 064 / Locally Start the 1B EDG During a Station Blackout (15 minutes) (SRO-U) 	M, A	06								
* Type Codes: (D)irect from bank, (M)odified from bank, (N)ew, room, (S)imulator, (L)ow-Power, (R)CA	(A)Iternate path,	(C)ontrol								

ES-401PWR SRO Examination OutlineForm ES-401-3Facility:St. LucieDate of Exam: 2-10-00Exam Level:SRO													
			K/A Category Points										
Tier	Group	К 1	К 2	К 3	К 4	K 5	К 6	A 1	A 2	A 3	A 4	G *	Point Total
1.	1	4	5	2				4	5			4	24
Emergency & Abnormal Plant Evolutions	2	1	2	3				2	4			4	16
	3	1						1				1	3
	Tier Totals	6	7	5				7	9			9	43
	1	2	1	2	2	1	2	2	2	2	2	1	19
2. Plant	2	2	1	2	1	2	1	2	1	2	2	1	17
Systems	3	1		1			1			1			4
	Tier Totals	4	2	5	3	4	4	4	2	5	5	2	40
3. Generic K	nowledge ar	nd Ab	oilities		Cat 1		Ca	Cat 2 C		Cat 3 Ca		at 4	47
					5 4		4		4				
 Note: 1. Ensure that at least two topics from every K/A category are sampled within each tier (i.e., the "Tier Totals" in each K/A category shall not be less than two). 2. Actual point totals must match those specified in the table. 3. Select topics from many systems; avoid selecting more than two or three K/A topics from a given system unless they relate to plant-specific priorities. 4. Systems/evolutions within each group are identified on the associated outline. 5. The shaded areas are not applicable to the category/tier. 6.* The generic K/As in Tiers 1 and 2 shall be selected from Section 2 of the K/A Catalog, but the topics must be relevant to the applicable evolution or system. 7. On the following pages, enter the K/A numbers, a brief description of each topic, the topics' importance ratings for the RO license level, and the point totals for each system and category. K/As below 2.5 should be justified on the basis of plant-specific priorities. 													

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ES-401 PWR SRO Examination OutlineForm ES-401-3 Emergency and Abnormal Plant Evolutions - Tier 1/Group 1												
E/APE # / Name / Safety Function	к 1	к 2	K 3	A 1	A 2	G	K/A Topic(s)	lmp.	Exam			
000001 Continuous Rod Withdrawal / I	x						AK1.20 - Operational implications of Cont. Rod Withdrawal to rod worth	3.3	В			
000003 Dropped Control Rod / I		x					AK2.05 - Interrelations between dropped rod and CR power supplies	2.8	В			
000005 Inoperable/Stuck Control Rod / I						х	G2.4.11 - Knowledge of abnormal condition procedures	3.6	S			
000011 Large Break LOCA / III				х			EA1.03 - Ability to monitor the securing of RCPs as it applies to LBLOCA	4.0	в			
000015/17 RCP Malfunctions / IV		x			х		AK2.07-Interrelations between RCP malfunctions and RCP seals AA2.01 - Ability to determine cause of RCP failure	2.9 3.5	B S			
BW/E09; CE/A13; W/E09&E10 Natural Circ. / IV			х			х	AK3.2 - Knowledge of Natural Circulation procedures G2.4.6 - Knowledge of symptom based EOP strategies	3.4 4.0	B S			
000024 Emergency Boration / I				х			AA1.16 - Ability to monitor Tavg meters during EB	3.2	В			
000026 Loss of Component Cooling Water / VIII					x		A2.01 - ability to interpret location of CCW leak	3.5	В			
000029 Anticipated Transient w/o Scram / t	x						EK1.01 - Knowledge of operational imlications of reactor nucleonics and thermodynamics during an ATWS	3.1	В			
000040 (BW/E05; CE/E05; W/E12) Steam Line Rupture - Excessive Heat Transfer / IV	x					x	AK1.01 - Operational implications: steam line rupture / PTS G2.4.9 - Knowledge of low power mitigation strategies	4.4 3.9	B S			
CE/A11; W/E08 RCS Overcooling - PTS / IV		x					AK1.2 - Knowledge of procedures associated with RCS overcooling	3.3	В			
000051 Loss of Condenser Vacuum / IV					x		AA2.02 - Reactor trip requirements due to Loss of Condenser Vacuum	4.1	s			
000055 Station Blackout / VI			x				EK3.01 - Length of time for which battery capacity is designed	3.4	В			
000057 Loss of Vital AC Elec. Inst. Bus / VI					x		AA2.15 - Ability to determine that a loss of AC has occurred	4.1	s			
000062 Loss of Nuclear Service Water / IV				x			AA1.06 - Ability to monitor control of flow rate by components cooled by SWS	2.9	В			
000067 Plant Fire On-site / IX						x	G2.4.27 - Knowledge of Fire in the Plant procedures	3.5	В			
000068 (BW/A06) Control Room Evac. / VIII	<u> </u>			x			AA1.28 - Ability to monitor pressurizer pressure during control room evac.	4.0	В			
000069 (W/E14) Loss of CTMT Integrity / V		x				L	AK2.03 - Knowledge of interrelations between loss of integrity and containment airlocks	2.9	В			
000074 (W/E06&E07) Inad. Core Cooling / IV	x						EK1.03 - Knowledge of processes of removing decay heat from the core.	4.9	В			
000076 High Reactor Coolant Activity / IX		x			x		AK2.01 - Knowledge of interrelations between high RCS activity and process monitors AA2.02 - Ability to determine corrective actions required for high activity	3.0 3.4	B S			
K/A Category Totals:	4	5	2	4	5	4	Group Point Total:		24			

ES-401 PWR SRO Examination Outline Form ES-401-3 Emergency and Abnormal Plant Evolutions - Tier 1/Group 2									
E/APE # / Name / Safety Function	К1	К2	Кз	A 1	A 2	G	K/A Topic(s)	lmp.	Exam
000007 (BW/E02&E10 CE/E02) Reactor Trip - Stabilization - Recovery / I				x			EA1.3 - ability to monitor desired operating results as they apply to RTR	3.8	В
000008 Pressurizer Vapor Space Accident / III					x		AA2.14 - ability to monitor RCS saturation monitor during vapor space accident	4.4	s
000009 Small Break LOCA / III						x	G2.4.21 - Knowledge of parameters and logic used to assess safety functions	4.3	S
000022 Loss of Reactor Coolant Makeup / II			x				AK3.02 - Knowledge of actions contained in EOP for loss of charging	3.8	В
000025 Loss of RHR System / IV		х					AK2.02 - Knowledge of interrelation between loss of RHR and LPSI pump	3.2	В
000027 Pressurizer Pressure Control System Malfunction / III					X		AA2.10 - Ability to interpret PZR heater de-energized condition	3.6	s
000032 Loss of Source Range NI / VII		х					Ak2.01 - Knowledge of power supplies at it applies to loss of SR NI	3.1	В
000033 Loss of Intermediate Range NI / VII									
000037 Steam Generator Tube Leak / III			x				AK3.08 - Knowledge of the reason for securing RCPs during a SGTL	4.3	В
000038 Steam Generator Tube Rupture / III				x			EA1.39 - Ability to operate feed and bleed as it applies to SGTR	3.7	В
000054 (CE/E06) Loss of Main Feedwater / IV						x	G2.4.6 - Knowledge of symptom based EOP strategies	4.0	s
000058 Loss of DC Power / VI						x	G2.4.18 - Knowledge of the specific bases for EOPs	3.6	в
000060 Accidental Gaseous Radwaste Rel. / IX					x		AA2.05 - Automatic safety actions have occurred as a result of a high ARM signal	4.2	s
000061 ARM System Alarms / VII	x						AK1.01 - Knowledge of detector limitations	2.9	в
000065 Loss of Instrument Air / VIII					x		AA2.01 - Ability to interpret cause and effect of I/A low pressure alarm	3.2	S
CE/E09 Functional Recovery			x			x	EA2.2 - Facilities heat removal systems during FR G2.4.22 - Knowledge of prioritizing safety functions during emergency ops	4.2 4.0	B S
	<u> </u>			ļ					
K/A Category Point Totals:	1	2	3	2	4	4	Group Point Total:		16

ES-401 PWR SRO Examination OutlineForm ES-401 Emergency and Abnormal Plant Evolutions - Tier 1/Grou	-3 p 3								
E/APE # / Name / Safety Function	K 1	К 2	K 3	Ą	A 2	G	K/A Topic(s)	Imp.	Exam
000028 Pressurizer Level Malfunction / II	x						AK1.01 - Knowledge of operational implications of PZR reference leak abnormalities	3.1	В
000036 (BW/A08) Fuel Handling Accident / VIII									ļ
000056 Loss of Off-site Power / VI				x			AA1.10 - Ability to monitor motor driven AFW pumps during Loss of Offsite Power	4.3	В
CE/A16 Excess RCS Leakage / II						x	G2.1.12 - Ability to apply Tech Specs for a system	4.0	S
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K/A Category Point Totals:	<u> </u> 1		<u></u>	1	+	1	Group Point Total:		3

ES-401 PWR SRO Examination OutlineForm ES Plant Systems - Tier 2/Group 1	-401-3	<u>julikas, su si s</u>							,	-				
System # / Name	К1	К 2	КЗ	К4	К5	K6	A1	A2	A3	A4	G	K/A Topic(s)	Imp	Exa m
001 Control Rod Drive						x						K6.03 - Knowledge of effect of loss of TCBs	4.2	в
003 Reactor Coolant Pump		x										K2.01 - Knowledge of RCP power supplies	3.1	в
004 Chemical and Volume Control			х									K3.07 - Knowledge of CVCS malfunction effect on PZR level and pressure	4.1	В
013 Engineered Safety Features Actuation				x						х		K4.05 - Knowledge of spray actuation reset A4.03 - Ability to monitor ESFAS initiation	4.2 4.7	B B
014 Rod Position Indication	_	ļ						x				A2.02 – Loss of power to the RPSI	3.6	s
015 Nuclear Instrumentation					x				×			K5.19 - Operational implications / NIs and heat balance A3.02 - Ability to monitor annunciator and alarm signals	3.2 3.9	B B
017 In-core Temperature Monitor						x						K6.01 - Knowledge of effect of sensor or detector malfunction	3.0	в
022 Containment Cooling							x					A1.01 - ability to monitor changes in containment temperature associated with operation of CCS	3.7	В
026 Containment Spray								x				A2.08 Safe securing of containment spray when it can be done	3.7	s
056 Condensate											x	G2.1.12 - Ability to apply Tech Specs to systems	4.0	в
059 Main Feedwater				x					x			K4.18 - Knowledge of automatic reduction of FW on	3.0	в
							ļ					A3.06 - Ability to monitor feedwater isolation	3.3	В
061 Auxiliary/Emergency Feedwater		<u> </u>		<u> </u>	 		X					A1.01 - Ability to predict changes in S/G levels	4.2	B
063 DC Electrical Distribution	x	ļ		ļ		ļ	ļ					K1-03 – Battery charger and battery	3.5	s
068 Liquid Radwaste	x	<u> </u>	ļ					ļ				K1.07 - Knowledge of sources liquid wastes to LRS	2.9	В
071 Waste Gas Disposal			x	 								K3.04 - Knowledge of loss or malfunction of WGS will have on ventilation systems	2.9	8
072 Area Radiation Monitoring		ļ	Ļ	ļ	Ļ	ļ	<u> </u>			x		A4.03 - Ability to operate check source for operability	3.1	в
K/A Category Point Totals:	2	1	2	2	1	2	2	2	2	2	1	Group Point Total:		19

ES-401 PWR SRO Examination OutlineForm ES- Plant Systems - Tier 2/Group 2	401-3													
System # / Name	К1	К2	кз	К4	K5	K6	A1	A2	A3	A4	G	K/A Topic(s)	Imp.	Exa m
002 Reactor Coolant									x			A3.01 - Ability to monitor auto operation of RCS leakage detection system	3.9	В
006 Emergency Core Cooling										x		A4.07- Ability to manually operate ECCS pumps and valves	4.4	В
010 Pressurizer Pressure Control							x					A1.01 - Ability to predict changes in RCS and PZR boron conc. when operating PCS	2.9	В
011 Pressurizer Level Control						х						K6.03 - Knowledge of relationship between PZR level and heater control circuit	3.3	В
012 Reactor Protection					x							K5.02 - Knowledge of operational implications of power density	3.3	В
027 Containment lodine Removal											x	G2.1.12 – Ability to Apply TS to a system	4.0	s
028 Hydrogen Recombiner and Purge Control	<u> </u>				x							K5.03 - Knowledge / sources of H2 in containment	3.6	в
029 Containment Purge	x											K1.03 - Knowledge of relationship between CPS and Engineered Safeguards	3.8	В
033 Spent Fuel Pool Cooling	x											K1.02 - Knowledge of relationship between RHRS and SFPCS	2.7	в
035 Steam Generator								x				A2.01 - Ability to predict impacts and mitigate consequences of faulted steam generators	4.6	s
039 Main and Reheat Steam			х									K3.05 - Knowledge /MRSS malfunction on RCS	3.7	в
055 Condenser Air Removal			x									K3.01 - Knowledge / loss of CARS on condenser	2.7	в
062 AC Electrical Distribution				x								K4.04 - Knowledge / DC bus designed trips	2.9	в
064 Emergency Diesel Generator							x					A1.08 - Ability / maintain minimum load on EDG to prevent motoring	3.4	в
073 Process Radiation Monitoring										x		A4.01 - Ability / monitor effluent release	3.9	в
075 Circulating Water		x										K2.03 - Knowledge / bus power supplies to SWS	2.7	в
079 Station Air														
086 Fire Protection									x			A3.02 - Ability / monitor actuation of FPS	3.3	в
103 Containment														
K/A Category Point Totals:	2	1	2	1	2	1	2	1	2	2	1	Group Point Total:		17

ES-401 PWR SRO Examination OutlineForm ES- Plant Systems - Tier 2/Group 3	401-3													
System # / Name	К1	К2	кз	К4	К5	К6	A1	A2	A3	A 4	G	K/A Topic(s)	Imp	Exa m
005 Residual Heat Removal	x											K1.04 - Knowledge / Interrelations between RHRS and CVCS	3.1	в
007 Pressurizer Relief/Quench Tank													ļ	
008 Component Cooling Water			x									K3.03 - Knowledge / loss of CCW effect on RCPs	4.2	В
041 Steam Dump/Turbine Bypass Control						x						K6.03 - Knowledge / controllers and positioners	2.9	в
045 Main Turbine Generator	Ι													
076 Service Water									x			A3.02 - Ability / monitor auto operation of SWS regarding emergency heat loads	3.7	В
078 Instrument Air								[
			1											
		1												
	1							1						
	1													
K/A Category Point Totals:	1		1			1			1			Group Point Total:		4

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ES-401 Facility: St. Lucie	C	Generic Knowledge and Abilities Outline (Tier 3) Date of Exam: 2-10-99 Exam Level: SRO	Form ES-40	1-5
Category	K/A #	Торіс	Imp.	Exam
	2.1.13	Knowledge of facility requirements for controlling vital access	2.9	s
Conduct of	2.1.22	Ability to determine Mode of Operation	3.3	S
Operations	2.1.12	Ability to apply Technical specifications to a system	4.0	s
	2.1.29	Knowledge of how to conduct and verify valve lineups	3.3	В
	2.1.3	Knowledge of Shift Turnover practices	3.4	В
	Total			
	2.2.17	Knowledge of the process of managing maintenance activities	3.5	s
	2.2.11	Knowledge of the process for controlling temporary changes	3.4	s
Equipment Control	2.2.3	Knowledge between differences in Units	3.3	В
	2.2.12	Knowledge of surveillance procedures	3.4	В
	Total			
	2.3.2	Knowledge of facility ALARA program	2.9	<u> </u>
	2.3.1	Knowledge of 10CFR20 and related facility requirements	3.0	s
Radiation Control	2.3.4	Knowledge of exposure limits	3.1	В
	2.3.1	Knowledge of 10CFR20 and related facility requirements	3.0	В
				<u>. </u>
	Total	• · · · · · · · · · · · · · · · · · · ·		
	2.4.26	Knowledge of facility fire protection requirements (fire brigade)	3.3	S
Emergenov	2.4.41	Knowledge of the EAL thresholds and classifications	4.1	S
Procedures and Plan	2.4.3	Ability to identify post-accident instrumentation	3.8	В
	2.4.19	Knowledge of EOP layout, symbols and icons	3.7	В
	Total			17
Tier 1 Target Point	Total (RO/SR	0)		13/17

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Facility: St. Lucie		 	Date	of Ex	<u>am: 2</u>	2-10-	00		1	Exam	<u>ı Lev</u>	<u>el: R(</u>	5
					K/	A Cat	legor	y Poi	nts				
lier	Group	К 1	к 2	К 3	К 4	K 5	к 6	A 1	A 2	A 3	A 4	G *	Point Total
1.	1	2	4	3				3	2			2	16
Emergency & Abnormal Plant	2	3	3	3				3	3			2	17
Evolutions	3	1						1				1	3
	Tier Totals	6	7	6				7	5			5	36
	1	3	2	2	2	3	2	2	1	2	3	1	23
2. Plant	2	2	2	2	2	1	1	2	2	2	2	2	20
System s	3	1		1		1	1		1	1	1	1	8
	Tier Totals	6	4	. 5	4	5	4	4	4	5	6	4	51
3. Generic K	nowledge an	d Ab	ilities		Са	t 1	Са	t 2	Са	it 3	Са	it 4	
					4	<u>ا</u>		3	3	3		3	13
Note: 1. Er ea 2. Ac 3. Se to 4. Sy 5. Th 6.* Th Ca 7. Or to ba ta	asure that at ach tier (i.e., ctual point to elect topics fr pics from a g stems/evolu- te shaded an e generic K/ atalog, but th the followin pic, the topic tals for each asis of plant- ble above.	least the T als n om n given tions eas a As in g pag s' im syste speci	two f fier Tonust r nany syste withi are no Tiers bics n ges, e porta em ar fic pr	topics otals match syste of app of app s 1 ar nust l enter nce r nce r nd ca	s from in ea in those ms; a hless ch groo blicab nd 2 s be rel the k ating tegor es. E	n eve ch K se sp avoid they bup a le to shall evan (/A no s for y. K nter f	ry K// A ca selectifie relate relate the c be se the c the to the F /As b the tie	A cat tegor d in t cting to p entifie atego electe ne ap ers, a CO lic elow er tot	egony y sha he ta more lant- ed on ory/tie plica brief ense 2.5 s als fo	y are all not ble. that speci the a er. desc leve hould r eac	samp t be k ific pr assoc ction voluti criptic l, and d be j ch cat	oled v ess th or th ioritie iated 2 of on or on of 4 the iustific	vithin nan two). ree K/A es. outline. the K/A system. each point ed on the y in the

ES-401 PWR RO Examination OutlineForm ES-401 Emergency and Abnormal Plant Evolutions - Tier 1/Grou	-4 .p 1								
E/APE # / Name / Safety Function	к 1	к 2	K 3	A 1	A 2	G	K/A Topic(s)	lmp.	Exam
000005 Inoperable/Stuck Control Rod / I									
000015/17 RCP Malfunctions / IV		x		L			K2.07 - Interrelations between RCP malfunctions and RCP seals	2.9	В
BW/E09; CE/A13; W/E09&E10 Natural Circ. / IV			x				AK3.2 - Knowledge of Natural Circulation procedures	2.9	В
000024 Emergency Boration / I				x			AA1.16 - Ability to monitor Tavg meters during EB	3.3	В
000026 Loss of Component Cooling Water / VIII					x		A2.01 - ability to interpret location of CCW leak	2.9	R
000027 Pressurizer Pressure Control System Malfunction / III						х	G2.1.28 - Knowledge of the purpose and function of major system controls	3.2	R
000040 (BW/E05; CE/E05; W/E12) Steam Line Rupture - Excessive Heat Transfer / IV	x						AK1.01 - Operational implications: steam line rupture / PTS	4.1	В
CE/A11; W/E08 RCS Overcooling - PTS / IV		x					AK1.2 - Knowledge of procedures associated with RCS overcooling	3.0	в
000051 Loss of Condenser Vacuum / IV			x				K3.01 - Knowledge of loss of steam dump capability on loss of vacuum	2.8	R
000055 Station Blackout / VI			x				EK3.01 - Length of time for which battery capacity is designed	2.7	в
000057 Loss of Vital AC Elec. Inst. Bus / VI					x		AA2.19 - Auto actions that occur on loss of electrical bus	4.0	R
000062 Loss of Nuclear Service Water / IV				x			AA1.06 - Ability to monitor control of flow rate by components cooled by SWS	2.9	В
000067 Plant Fire On-site / IX						x	G2.4.27 - Knowledge of Fire in the Plant procedures		R
000068 (BW/A06) Control Room Evac. / VIII				x			AA1.28 - Ability to monitor pressurizer pressure during control room evac.	3.8	В
000069 (W/E14) Loss of CTMT Integrity / V		x					AK2.03 - Knowledge of interrelations between loss of integrity and containment airlocks	2.8	В
000074 (W/E06&E07) Inad. Core Cooling / IV	x						EK1.03 - Knowledge of processes of removing decay heat from the core.	4.5	В
000076 High Reactor Coolant Activity / IX		x					AK2.01 - Knowledge of interrelations between high RCS activity and process monitors	2.6	В
K/A Category Totals:	2	4	3	3	2	2	Group Point Total:		16

ES-401 PWR RO Examination OutlineForm ES-401 Emergency and Abnormal Plant Evolutions - Tier 1/Grou	-4 .p2								
E/APE # / Name / Safety Function	K 1	к 2	кз	A 1	A 2	G	K/A Topic(s)	Imp.	Exam
000001 Continuous Rod Withdrawal / I	x						AK1.20 - Operational implications of Cont. Rod Withdrawal to rod worth	3.1	В
000003 Dropped Control Rod / I		x					AK2.05 - Interrelations between dropped rod and CR power supplies	2.5	В
000007 (BW/E02&E10 CE/E02) Reactor Trip - Stabilization - Recovery / I				х			EA1.3 - ability to monitor desired operating results as they apply to RTR	3.3	В
000008 Pressurizer Vapor Space Accident / III						X	GG2.4.4 - Ability to recognize entry conditions to ONPs and EOPs	4.0	R
000009 Small Break LOCA / III					х		EA2.02 - Ability to interpret possible leak paths as they apply to SBLOCA	3.5	R
000011 Large Break LOCA / III				x			EA1.03 - Ability to monitor the securing of RCPs as it applies to LBLOCA	4.0	B
000022 Loss of Reactor Coolant Makeup / II			x				AK3.02 - Knowledge of actions contained in EOP for loss of charging	3.5	В
000025 Loss of RHR System / IV		x					AK2.02 - Knowledge of interrelation between loss of RHR and LPSI pump	3.2	В
000029 Anticipated Transient w/o Scram / I	x						EK1.01 - Knowledge of operational imlications of reactor nucleonics and thermodynamics during an ATWS	2.8	В
000032 Loss of Source Range NI / VII		x					Ak2.01 - Knowledge of power supplies at it applies to loss of SR NI	2.7	В
000037 Steam Generator Tube Leak / III			x				AK3.08 - Knowledge of the reason for securing RCPs during a SGTL	4.1	В
000038 Steam Generator Tube Rupture / III				x			EA1.39 - Ability to operate feed and bleed as it applies to SGTR	3.6	В
000054 (CE/E06) Loss of Main Feedwater / IV					x		AA2.01 - Ability to determine reactor trip in regard to loss of MFW	4.3	R
000058 Loss of DC Power / VI						x	G2.4.18 - Knowledge of the specific bases for EOPs	2.7	В
000059 Accidental Liquid RadWaste Rel. / IX					x		AA2.05 - Ability to monitor auto actions as a result of high PRM alarm	3.6	R
000060 Accidental Gaseous Radwaste Rel. / IX									
000061 ARM System Alarms / VII	x						AK1.01 - Knowledge of detector limitations	2.5	В
CE/E09 Functional Recovery			x				EA2.2 - Facilities heat removal systems during FR	3.7	В
	1								
	1	1	1	1					
K/A Category Point Totals:	3	3	3	3	3	2	Group Point Total:		17

E/ABE # / Name / Safet/ Eurotion	Тк	к	к	Α	A	G	K/A Topic(s)	Imp.	Exam
E/APE # / Name / Salety Function	<u> 1</u>	2	3	7	2				•
000028 Pressurizer Level Malfunction / II	X						AK1.01 - Knowledge of operational implications of PZR reference leak abnormalities	2.8	B
000036 (BW/A08) Fuel Handling Accident / VIII									
000056 Loss of Off-site Power / VI				x			AA1.10 - Ability to monitor motor driven AFW pumps during Loss of Offsite Power	4.3	В
000065 Loss of Instrument Air / VIII								<u> </u>	
CE/A16 Excess RCS Leakage / II						x	G2.2.12 - Knowledge of surveillance procedures	3.0	R
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K/A Category Point Totals:	1			1		1	Group Point Total:		3

ES-401 PWR RO Examination OutlineForm ES-4 Plant Systems - Tier 2/Group 1	01-4													
System # / Name	К1	К2	кз	К4	К5	K6	A1	A2	A3	A4	G	K/A Topic(s)	lmp	exam
001 Control Rod Drive	x					х						K1.05 - CRDS interface with NIs and RPS K6.03 - Knowledge of effect of loss of TCBs	3.2 3.7	R B
003 Reactor Coolant Pump		x			x							K2.01 - Knowledge of RCP power supplies K5.01 - Relationship of RCS flow rate and core operating parameters	3.1 3.3	B R
004 Chemical and Volume Control			x							x		K3.07 - Knowledge of CVCS malfunction effect on PZR level and pressure A4.04 - Ability / calculation of boron concentration change	3.8 3.2	B R
013 Engineered Safety Features Actuation				х						x		K4.05 - Knowledge of spray actuation reset A4.03 - Ability to monitor ESFAS initiation	4.0 4.5	B B
015 Nuclear Instrumentation					x				x			K5.19 - Operational implications / NIs and heat balance A3.02 - Ability to monitor annunciator and alarm signals	2.9 3.7	B B
017 In-core Temperature Monitor						x		x				K6.01 - Knowledge of effect of sensor or detector malfunction A2.02 - Ability to predict core damage (ICM)	2.7 3.6	B R
022 Containment Cooling		x					x					A1.01 - ability to monitor changes in containment temperature associated with operation of CCS K2.01 - Knowledge of power supply to coolers	3.6 3.0	B R
056 Condensate	x										x	K1.03 - Knowledge of interrelations with MFW G2.1.12 - Ability to apply Tech Specs to systems	2.6 2.9	R B
059 Main Feedwater				x					x			K4.18 - Knowledge of automatic reduction of FW on plant trip A3.06 - Ability to monitor feedwater isolation	2.8 3.2	B B
061 Auxiliary/Emergency Feedwater					x		x					K5.05 - Knowledge of implications of water hammer A1.01 - Ability to predict changes in S/G levels	2.7 3.9	R B
068 Liquid Radwaste	x											K1.07 - Knowledge of sources liquid wastes to LRS	2.7	в
071 Waste Gas Disposal			x									K3.04 - Knowledge of loss or malfunction of WGS will have on ventilation systems	2.7	в
072 Area Radiation Monitoring										x		A4.03 - Ability to operate check source for operability	3.1	в
K/A Category Point Totals:	3	2	2	2	3	2	2	1	2	3	1	Group Point Total:	1	23

ES-401 PWR RO Examination OutlineForm ES Plant Systems - Tier 2/Group 2	-401-4													
System # / Name	К1	К2	K 3	K 4	К5	K6	A1	A2	A3	A4	G	K/A Topic(s)	Imp	exam
002 Reactor Coolant									x		x	A3.01 - Ability to monitor auto operation of RCS leakage detection system G2.1.12 - Ability to apply TS to a system	3.7 2.9	B R
006 Emergency Core Cooling										x		A4.07- Ability to manually operate ECCS pumps and valves	4.4	В
010 Pressurizer Pressure Control							x					A1.01 - Ability to predict changes in RCS and PZR boron conc. when operating PCS	2.8	в
011 Pressurizer Level Control						x						K6.03 - Knowledge of relationship between PZR level and heater control circuit	2.9	В
012 Reactor Protection					x							K5.02 - Knowledge of operational implications of power density	3.1	в
014 Rod Position Indication				x								K4.05 - Knowledge of rod block interlocks	3.1	R
026 Containment Spray		x										K2.01 - Knowledge of power supplies to CSS	3.4	R
029 Containment Purge	x											K1.03 - Knowledge of relationship between CPS and Engineered Safeguards	3.6	В
033 Spent Fuel Pool Cooling	x											K1.02 - Knowledge of relationship between RHRS and SFPCS	2.5	в
035 Steam Generator											x	G2.4.24 - Knowledge /loss of CW procedures	3.3	R
039 Main and Reheat Steam			x									K3.05 - Knowledge /MRSS malfunction on RCS	3.6	в
055 Condenser Air Removal			x								<u> </u>	K3.01 - Knowledge / loss of CARS on condenser	2.5	в
062 AC Electrical Distribution								x			L	A2.04 - Ability /impact of deenergizing a bus	3.1	R
063 DC Electrical Distribution				x								K4.04 - Knowledge / DC bus designed trips	2.6	в
064 Emergency Diesel Generator							x					A1.08 - Ability / maintain minimum load on EDG to prevent motoring	3.1	В
073 Process Radiation Monitoring										x		A4.01 - Ability / monitor effluent release	3.9	В
075 Circulating Water		x										K2.03 - Knowledge / bus power supplies to SWS	2.6	в
079 Station Air								x				A2.01 - Ability / predict impacts of crosstie to IA	2.9	R
086 Fire Protection									x			A3.02 - Ability / monitor actuation of FPS	2.9	в
K/A Category Point Totals:	2	2	2	2	1	1	2	2	2	2	2	Group Point Total:		20

System # / Name	К1	K 2	K 3	K 4	K 5	К 6	A 1	A 2	A 3	A 4	G	K/A Topic(s)	Imp
005 Residual Heat Removal	x											K1.04 - Knowledge / Interrelations between RHRS and CVCS	2.9
007 Pressurizer Relief/Quench Tank													
008 Component Cooling Water			x					ļ				K3.03 - Knowledge / loss of CCW effect on RCPs	4.1
027 Containment Iodine Removal					x			<u> </u>				K5.03 - Knowledge / sources of H2 in containment	2.9
028 Hydrogen Recombiner and Purge Control								<u> </u>					
034 Fuel Handling Equipment			<u> </u>										
041 Steam Dump/Turbine Bypass Control						x						K6.03 - Knowledge / controllers and positioners	2.7
045 Main Turbine Generator			<u> </u>	<u> </u>				X				A2.17 - Ability / predict impacts of DEH malfunction	2.7
076 Service Water									x			A3.02 - Ability / monitor auto operation of SWS regarding emergency heat loads	3.7
078 Instrument Air										x		A4.01 - Ability to monitor instrument air in the control room	3.1
103 Containment											x	G2.1.7 - ability to make operational judgements based on operating characteristics and instrument interpretation	3.7
												Our Delet Table	

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Generic Knowledge and Abilities Outline (Tier 3)

Form ES-401-5

Facility: St. Lucie	Dat	e of Exam: 2-10-00 Exam Level: RO		
Category	K/A #	Торіс	Imp.	Exam
	2.1.1	Knowledge of Conduct of Operations		R
Conduct of Operations	2.1.29	Knowledge of how to conduct and verify valve lineups	3.4	В
	2.1.3	Knowledge of Shift Turnover practices 3.0		R
	2.1.3	Knowledge of Shift Turnover practices	3.0	В
	Total			
	2.2.3	Knowledge between differences in Units	3.1	В
	2.2.13	Knowledge of clearance and tagging procedures	3.6	R
Equipment Control	2.2.12	Knowledge of surveillance procedures	3.0	В
			_	
	Total	· · · · · · · · · · · · · · · · · · ·		
	2.3.4	Knowledge of exposure limits	2.5	В
	2.3.1	Knowledge of 10 CFR 20 and facility related requirements	2.6	В
Radiation Control	2.3.2	Knowledge of facility ALARA program	2.5	В
	Total			
	2.4.3	Ability to identify post-accident instrumentation	3.5	В
Emergency	2.4.19	Knowledge of EOP layout, symbols and icons	2.7	В
Procedures and Plan	2.4.29	Knowledge of the emergency plan	2.6	R
	Total			13
Tier 1 Target Point Total (RO/SRO)				

8

INITIAL SUBMITTAL

ST. LUCIE EXAM 2000-301 50-335/2000-301 & 50-389/2000-301

FEBRUARY 7 - 11, 2000

INITIAL SUBMITTAL JPMS

ADMINISTRATIVE JPMs/QUESTIONS SIMULATOR JPMs IN-PLANT JPMs

St. Lucie Plant USNRC Initial License Exam

Administrative JPM's/Questions

Simulator JPM's

In-Plant JPM's

Administrative Topics Outline

Form ES-301-1

Facility Examiı	r: St. Lucie 00-301 nation Level (circle c	ine): RO/SRO (Date of Examination: 2/7-9-00 Operating Test Number: 1
م ۲ ا	\dministrative ⁻ opic/Subject Description	Describe method of evaluation: 1. ONE Administrative JPM, OF 2. TWO Administrative Question	የ ns
A.1	Plant Parameter Verification K2.17 - 3.7 / 4.4	JPM / Perform Estimated Criti	ical Condition Calculation Unit 1
	Overtime	Question 1/ Evaluate	e Overtime Guidelines
	Guidelines K2.1.1 - 3.7/3.8	Question 2/ Minimum lev	el of approval for deviation
A.2	Surveillance Procedures K2.2.12 - 3.0/3.4	JPM / Verify Boric Acid	Makeup Tank Operability
A.3	Knowledge of 10 CFR 20 and	Question 1 / Determine Posti	ng Requirements from a Survey
	facility radiation control requirements K2.3.1 - 2.6 / 3.0	Question 2 / When an area is	posted for Airborne Radioactivity
A.4	Knowledge of the emergency plan K2.4.29 - 2.6/4.0	JPM / Complete the State	of Florida Notification Form
A.4	Knowledge of the Emergency Plan. K2.4.44-2.1/4.0 (SRO Only)	JPM / Determine Protecti	ve Action Recommendations

ES-301 Control Room Systems and Facility Walk-Through Test Outline F

Form ES-301-2

Facility:St. LucieDateExam Level (circle one):RO / SRO(I) / SRO(U)Oper	of Examination ating Test No.:	: 2/7-9-00 1
B.1 Control Room Systems		
System / JPM Title	Type Code*	Safety Function
a. RPS 012 / Perform a Logic Matrix Test Unit 2 (15 minutes)	M, S, A	07
 b. ECCS 006 / Fill a Safety Injection Tank Unit 2 (15 minutes) 	N, S	03
 c. RHRS 005 / Respond to an "A" SDC Loop Suction Valve Closure while on SDC (20 minutes) (SRO-U) 	D, S, L	04P
d. AFW 061 / Manually Actuate AFAS Unit 2 (10 minutes)	D, S, A	04S
e. CRDS 001 / Recover a Slipped CEA Unit 2 (15 minutes) (SRO-U)	N, S, A	01
 f. HRPS 028 / Operate the Hydrogen Recombiner Unit 1 (10 minutes) 	N, C	05
g. ECCS 006 / Initiate Hot and Cold Leg Injection Unit 1 (20 minutes) (SRO-U)	N, C	02
B.2 Facility Walk-Through		
a. CONTAINMENT 103 / Reopen Primary Sample Valves U-2 (15 Minutes) (SRO-U) OR CONTAINMENT103 / Restore CCW to RCP's U-1 (10 Minutes) (SBO-U)	D, R	05
b. SFPCS 033 / Makeup to the Spent Fuel Pool Unit 1 (20 minutes)	N, R	08
c. EDG 064 / Locally Start the 1B EDG During a Station Blackout (15 minutes) (SRO-U)	М, А	06
* Type Codes: (D)irect from bank, (M)odified from bank, (N)ew, room, (S)imulator, (L)ow-Power, (R)CA	(A)Iternate path	i, (C)ontrol

REGION II INITIAL LICENSE EXAMINATION ADMINISTRATIVE JOB PERFORMANCE MEASURE ST. LUCIE NUCLEAR PLANT

PERFORM AN ECC UNIT 1

CANDIDATE _____

EXAMINER

REGION II INITIAL LICENSE EXAMINATION ADMINISTRATIVE JOB PERFORMANCE MEASURE ST LUCIE NUCLEAR PLANT

- **KA Statement:** Ability to evaluate plant performance and make operational judgements based on operating characteristics, reactor behavior and instrument interpretation
- **KA #:** K2.1.7 3.7 / 4.4
- Facility JPM #: New

Task Standard: Using the conditions provided, perform an Estimated Critical Condition calculation

Preferred Evaluation Location:

Simulator _____ Control Room _ X ___ NTC _ X

Preferred Evaluation Method:

Perform X Simulate

References: NOP-1-0030122, "Reactor Startup", Appendix C, St. Lucie Unit 1 Plant Physics Curves

Validation Time 20 minutes	
Candidate:Name	Time Start Time Finish
Performance Rating: Sat Unsat	
Examiner: Reference Material Needed:	Signature: Name

ST. LUCIE TRAINING DEPT. JOB PERFORMANCE MEASURE PAGE 2 ECC worksheet, St. Lucie Unit 1 Plant Physics Curves

Read to Candidate

Directions to candidate for Administrative JPMs:

I will explain the initial conditions and state the task to be performed. You will be allowed the use of any reference needed to complete the task. Ensure you indicate to me when you finish your assigned task by returning the material needed for the task that I provided you.

- Initial Conditions: Unit 1 is in hot standby (NOT/NOP) at 1000 EFPH. The reactor tripped from 100% power, ARO, 14 hours ago. Boron concentration at the time of the trip was 997 ppm, present boron concentration is 1040 ppm.
- Initiating Cues: The ANPS has directed you to perform an ECC for a reactor startup that will take place in 4 hours. (Assume 60" on Group 7)

ST. LUCIE TRAINING DEPT. JOB PERFORMANCE MEASURE PAGE 3

CANDIDATE CUE SHEET

(TO BE RETURNED TO THE EXAMINER UPON COMPLETION OF TASK)

INITIAL CONDITIONS:

Unit 1 is in hot standby (NOT/NOP) at 1000 EFPH. The reactor tripped from 100% power, ARO, 14 hours ago. Boron concentration at the time of the trip was 997 ppm, present boron concentration is 1040 ppm.

INITIATING CUE:

The ANPS has directed you to perform an ECC for a reactor startup that will take place in 4 hours. (Assume 60" on Group 7)

ST. LUCIE TRAINING DEPT. JOB PERFORMANCE MEASURE PAGE 4

Answer Key

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	Column 1 values	<u>Column 2 values</u>	Difference
Power Defect	1390 PCM	N/A	+1390 PCM
Xenon Worth	2427 PCM	2703 PCM	-276 PCM
Sam/Nep Worth	754 PCM	770 PCM	-16 PCM
Boron Worth	8514 PCM	8881 PCM	367 PCM
CEA Reactivity	8139 PCM	7292 PCM	- 347 PCM
Net Reactivity			+384 PCM
Total Change in Bo	pron	<u> </u>	+45 PPM
ECC Boron Conce	ntration		+1085 PPM
CEA position at -10 CEA position at +5 CEA position at -50	000 PCM (mode 2 entry) 00 PCM 00 PCM	30" 137' 60"	on group 5 on group 7 (ARO) on group 6

	PROCEDURE TIT	LE:				PAGE:	
12B		R					
OCEDURE NO.:						62 01 68	
1_00201	122		ST. LUCIE UNIT	1			
06-1-0030	124		APPENDIX C	-	, <u> </u>		
ESTIMATE		ONDI	TIONS AND INVE	ERSE C	OUNT F	ATE RATIO	
	······································		(Page 8 of 9)				
	FCC			(SHEE)	Г		
	200	UALU	•=				
			Data -1 500	, ,	Exposure:	FFPH	
Unit No.:	Startup No.:		Date of ECC:	//			
	COLUMN 1	R TO	COLUMN 2 ESTIMATED CRIT	ICAL	D.((Sign	
PARAMETER	SHUTDOWN	SHUTDOWN		; 	Difference (PCM)	Sign Determination	
	TIME 1: Date:/ Time:	/	TIME 2: Date:/_ Time:				
POWER	At% power Figure A.1	PCM	N/A	N/A	(+) PCM	(+) Always	
Xenon	From DDPS PID 746	- PCM	From Figure A.4 or as	PCM	() PCM		
Worth Samarium	or rigure A.4		provided by the.			(+) If Column 1 is	
and	From Figure A.5	PCM	From Figure A.5 or as provided by R.E.	PCM	() PCM	greater than Column 2	
Worth			Dresent Dresen Conc			(-) If Column 1 is less	
Boron Worth	PPM times Boron Worth		Present Boron Conc PPM times		()	man Column 2	
(Note 1)	From Figure A 8	PCM	From Figure A.8	PCM	PCM		
CEA	Groupwithdraw		Group			(-) If Column 1 is	
Reactivity Worth	toinches		withdrawn to inches	PCM	() PCM		
,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	Use Figure A.6 or A.7	PCM	Use Figure A.6 or A.7 (Note 2)			(+) If Column 1 is less than Column 2	
Net	Total up the reactivities	s in the Di	fference column and ente	r the value	()	-	
Reactivity	here. Observe signs.						
Total Change in Boron	Net Reactivity Col. 2 Boron Worth	= () (P (PCM/I	PCM) PPM)		PPM	If sign is +, Borate If sign is -, Dilute	
		Present RCS Boron ⁺ () →				(Note 3)	

REVISION NO .	PROC	EDURE TITLE:		PAGE:
12B		REACTOR START		
DEOCEDURE NO :	_		63 of 68	
PROCEDURE NO				
NOP-1-003012	22	ST. LUCIE UNIT	1	
		APPENDIX C		
ESTIMATE	<u>d Cri</u>	FICAL CONDITIONS AND INVI	ERSE COUNT RATE	RATIO
		(Page 9 01 9)		
		ECC CALCULATION WORK	(SHEET	
		(continued)		
		the difference in time between when	the boron sample was di	rawn and the
NOTES:	1. II ti	me of shutdown exceeds 24 hours, co	ontact Reactor Engineerir	ng.
			Had to be above PDII	
	2. T	The critical CEA position has been ver COLR Figure 3.1-2. Plant Physics Cul	rve Book, Appendix E)	(initials).
	(and an averaged the hores	concentration
-	3.]	The ECC Boron Concentration must m	neet of exceed the bolon n CEAs at Column 2 posi	tion in
	ı ع	accordance with 1-NOP-100.04, "Surve	eillance Requirements for	Shutdown /R12E
	١	Margin, Modes 2, 3, 4 and 5, Subcritic	al."	
Prepared by: _		200	ACTUAL CRITICAL	CONDITIONS
to do no no do mático		RCO	Date of Criticality	/
Verified by:			Time (24 hour clock)	es)
Beviewed by:		Reactor Engineering	RCS Boron Concentration	(PPM)
		Reactivity Manager	T-avg (°F)	
Approved by:		NPS or ANPS	Reactor Power (%)	
		END OF APPENDI	(C	


Date Of Update 10/ 7 / 99 References: PSL-1FJF-99-122 Rev. 0 Attach. 1 Page 1 PSL-ENG-SEFJ-99-014 Rev. 0 Attach. 1 Page 2

Figure A.1 Rev. 1 Page 1 of 5 St. Lucie Unit 1 Cycle 16

Power Defect vs Burnup

HOURS	100%	75%	50%	25%
200	1362	1033	699	358
300	1367	1036	702	359
400	1372	1040	705	360
500	1378	1045	708	362
600	1382	1049	711	364
700	1385	1052	713	365
800	1388	1054	715	366
900	1389	1055	716	367
1000	1390	1056	716	367
1100	1389	1055	716	366
1200	1387	1054	714	365
1300	1385	1051	712	364
1400	1383	1049	710	362
1500	1381	1046	707	360
1600	1378	1043	704	358
1700	1376	1040	701	357
1800	1375	1038	699	355
1900	1374	1036	697	354
2000	1374	1036	696	353
2100	1376	1036	696	353
2200	1378	1037	697	353
2300	1382	1039	698	353
2400	1386	1042	700	354
2500	1391	1046	702	355
2600	1397	1050	705	357
2700	1402	1054	708	358
2800	1408	1059	711	360
2900	1414	1063	714	361
			i	

References: PSL-1FJF-99-122 Rev. 1 Attach. 1 Page 2 PSL-ENG-SEFJ-99-014 Rev. 1 Attach. 1 Page 3 •

Figure A.1 Rev. 1 Page 2 of 5 St. Lucie Unit 1 Cycle 16

Power Defect vs Burnup

HOURS	100%	75%	50%	25%
3000	1421	1068	717	363
3100	1426	1072	720	364
3200	1432	1076	722	366
3300	1438	1080	725	367
3400	1443	1084	727	368
3500	1448	1088	730	369
3600	1454	1092	732	370
3700	1459	1096	735	372
3800	1464	1099	737	373
3900	1469	1103	739	374
4000	1475	1107	742	375
4100	1480	1111	744	376
4200	1486	1115	747	378
4300	1491	1119	750	379
4400	1497	1123	752	380
4500	1503	1127	755	382
4600	1508	1132	758	383
4700	1514	1136	761	384
4800	1520	1140	764	386
4900	1526	1145	767	387
5000	1532	1149	770	389
5100	1538	1154	773	390
5200	1544	1158	776	392
5300	1550	1163	778	393
5400	1556	1167	781	395
5500	1562	1172	784	396
5600	1568	1176	787	398
5700	1574	1181	790	399
5800	1580	1185	793	401
5900	1586	1190	796	402

References: PSL-1FJF-99-122 Rev. 1 Attach. 1 Page 3 PSL-ENG-SEFJ-99-014 Rev. 1 Attach. 1 Page 4 •

Figure A.1 Rev. 1 Page 3 of 5 St. Lucie Unit 1 Cycle 16

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Power Defect vs Burnup

HOURS	100%	75%	50%	25%
6000	1593	1194	799	404
6100	1599	1199	803	406
6200	1605	1203	806	407
6300	1612	1208	809	409
6400	1618	1213	812	411
6500	1625	1218	815	413
6600	1632	1223	819	414
6700	1639	1228	822	416
6800	1646	1233	826	418
6900	1653	1238	830	420
7000	1660	1244	833	423
7100	1668	1249	837	425
7200	1675	1255	841	427
7300	1683	1261	845	429
7400	1691	1267	850	432
7500	1699	1273	854	434
7600	1708	1280	859	437
7700	1717	1286	863	440
7800	1726	1293	868	443
7900	1735	1300	873	446
8000	1744	1307	879	449
8100	1754	1315	884	452
8200	1764	1322	889	455
8300	1774	1330	895	459
8400	1785	1338	901	462
8500	1795	1346	907	466
8600	1806	1355	913	470
8700	1817	1363	920	473
8800	1829	1372	926	477
8900	1840	1381	933	481
	1	1	1	1

References: PSL-1FJF-99-122 Rev. 1 Attach. 1 Page 4 PSL-ENG-SEFJ-99-014 Rev. 1 Attach. 1 Page 5

Figure A.1 Rev. 1 Page 4 of 5 St. Lucie Unit 1 Cycle 16

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Power Defect vs Burnup

HOURS	100%	75%	50%	25%
9000	1852	1390	939	485
9100	1864	1399	946	489
9200	1876	1409	953	494
9300	1888	1418	960	498
9400	1901	1428	967	502
9500	1913	1437	974	506
9600	1926	1447	981	511
9700	1938	1457	989	515
9800	1951	1467	996	519
9900	1964	1477	1003	524
10000	1977	1487	1010	528
10100	1990	1497	1018	532
10200	2003	1507	1025	537
10300	2015	1517	1032	541
10400	2028	1527	1039	545
10500	2041	1536	1046	549
10600	2054	1546	1053	553
10700	2067	1556	1060	558
10800	2079	1566	1067	562
10900	2092	1575	1074	566
11000	2105	1585	1081	570
11100	2117	1594	1088	573
11200	2129	1604	1095	577
11300	2142	1613	1101	581
11400	2154	1622	1108	585
11500	2166	1631	1114	588
11600	2178	1641	1120	592
11700	2190	1650	1127	595
11800	2202	1659	1133	599
11900	2214	1667	1139	602
1	1	1	1	1

References: PSL-1FJF-99-122 Rev. 1 Attach. 1 Page 5 PSL-ENG-SEFJ-99-014 Rev. 1 Attach. 1 Page 6

Figure A.1 Rev. 1 Page 5 of 5 St. Lucie Unit 1 Cycle 16

Power Defect vs Burnup

1		1000/	750/	509/	25%	
	HOURS	100%	75%	50%	23%	
	12000	2226	1676	1145	605	
	12100	2238	1685	1151	609	
	12200	2249	1694	1157	612	
	12300	2261	1702	1163	615	
	12400	2273	1711	1169	618	
	12480	2282	1719	1174	621	
	1					
]
Date Of U	pdate /0 / 7 /	99	References:	PSL-1FJ	F-99-122 Rev. 1	Attach. 1 Page 6

PSL-ENG-SEFJ-99-014 Rev. 1 Attach. 1 Page 7

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Date Of Update

References: PSL-1FJF-99-014 Rev. 0 Attach. 1 Page 6 PSL-ENG-SEFJ-99-014 Rev. 0 Attach. 1 Page 13

Rev. 2 Page 1 of 4 St. Lucie Unit 1 Cycle 16

Xenon Buildup to Equilibrium (1000 EFPH)

HOURS	100%	75%	50%	25%
0	0	0	0	0
1	99	78	53	28
2	202	160	111	59
3	310	248	174	95
4	425	343	244	134
5	547	445	321	179
6	677	555	406	229
7	810	669	495	282
8	943	783	586	337
9	1071	895	676	392
10	1190	1000	762	446
11	1299	1099	844	499
12	1399	1191	921	549
13	1491	1277	993	598
14	1576	1356	1062	645
15	1654	1430	1126	689
16	1726	1498	1186	731
17	179 1	1561	1242	771
18	1852	1619	1293	808
19	1906	1672	1341	843
20	1956	1721	1386	877
21	2002	1765	1427	908
22	2042	1805	1464	937
23	2079	1842	1499	964
24	2112	1875	1531	990
25	2142	. 1905	1560	1013
26	2169	1932	1587	1035
27	2193	1957	1611	1056
28	2214	1979	1633	1075
29	2234	1999	1654	1092

References: PSL-1FJF-99-114 Rev. 0 Attach. 1 Page 7 PSL-ENG-SEFJ-99-014 Rev. 0 Attach. 1 Page 14 .

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Rev. 2 Page 2 of 4 St. Lucie Unit 1 Cycle 16

Xenon Buildup to Equilibrium (1000 EFPH)

HOURS	100%	75%	50%	25%
30	2251	2017	1672	1108
31	2267	2034	1689	1123
32	2281	2049	1704	1136
33	2295	2062	1718	1149
34	2306	2075	1731	1160
35	2317	2086	1742	1170
36	2327	2096	1753	1180
37	2336	2105	1762	1188
38	2344	2113	1770	1196
39	2351	2120	1778	1203
40	2357	2127	1785 ,	1210
41	2363	2133	1791	1216
42	2368	2138	1797	1222
43	2373	2143	1802	1227
44	2377	2148	1807	1232
45	2381	2152	1811	1236
46	2384	2155	1815	1240
47	2387	2158	1818	1244
48	2390	2161	1822	1247
49	2393	2164	1824	1250
50	2395	2166	1827	1253
51	2397	2168	1829	1256
52	2399	2170	1832	1258
53	2401	2172	1834	1261
54	2402	2174	1836	1263
55	2404	2175	1837	1265
56	2405	2176	1839	1267
57	2406	2178	1840	1268
58	2407	2179	1842	1270
59	2408	2180	1843	1271

References: PSL-1FJF-99-114 Rev. 0 Attach. 1 Page 8 PSL-ENG-SEFJ-99-014 Rev. 0 Attach. 1 Page 15

Rev. 2 Page 3 of 4 St. Lucie Unit 1 Cycle 16

Xenon Buildup to Equilibrium (1000 EFPH)

HOURS	100%	75%	50%	25%
60	2409	2180	1844	1273
61	2410	2181	1845	1274
62	2410	2182	1846	1275
63	2411	2182	1846	1276
64	2411	2183	1847	1276
65	2412	2183	1847	1277
66	2412	2184	1848	1278
67	2412	2184	1848	1278
68	2413	2184	1849	1278
69	2413	2185	1 849	1279
70	2413	2185	1849	1279
71	2413	2185	1849	1279
72	2413	2185	1849	1279
73	2413	2186	1849	1279
74	2413	2186	1850	1279
75	2414	2186	1850	1279
76	2414	2186	1850	1279
77	2414	2187	1850	1279
78	2414	2187	1850	1279
79	2414	2187	1850	1279
80	2414	2187	1850	1279
81	2414	2187	1850	1279
82	2414	2187	1850	1279
83	2414	2187	1850	1279
84	2414	2188	1850	1279
85	2415	2188	1851	1279
86	2415	2188	1851	1280
87	2415	2188	1851	1280
88	2415	2188	1851	1280
89	2415	2188	1851	1280

PSL-1FJF-99-114 Rev. 0 Attach. 1 Page 9 **References:** PSL-ENG-SEFJ-99-014 Rev. 0 Attach. 1 Page 16

Rev. 2 Page 4 of 4 St. Lucie Unit 1 Cycle 16

Xenon Buildup to Equilibrium (1000 EFPH)

HOURS	100%	75%	50%	25%
90	2415	2188	1851	1280
91	2415	2188	1851	1280
92	2415	2188	1851	1280
93	2415	2188	1851	1280
94	2415	2188	1851	1280
95	2415	2188	185 1	1280
96	2415	2188	1851	1280
97	2415	2188	1851	1280
98	2415	2188	1851	1280
99	2415	2188	1851	1280
100	2415	2188	1851	1280

Date Of Update

References: PSL-1FJF-99-114 Rev. 0 Attach. 1 Page 10 PSL-ENG-SEFJ-99-014 Rev. 0 Attach. 1 Page 17



Date Of Update

References: PSL-1FJF-99-114 Rev. 0 Attach. 2 Page 6 PSL-ENG-SEFJ-99-014 Rev. 0 Attach. 1 Page 53

	JI. LUVIC	Since Of		
ו Worth vs. Re	actor Power (Shutdowi	n and Equilibrium)	1000 EFPH
	RX Power	S/D Xe	Equil Xe	
	0	0	0	
		66	66	
	2	130	131	
	3	194	195	
	4	258	208	
	5	320	320	
	07	302 112	441	
	2 / A	443 502	500	
	a l	562	557	
	10	621	613	
		678	668	
	12	735	722	
	13	790	775	
	14	845	826	
	15	899	876	
		952	925	
		1004	9/2	
	18	1055	1019	
	19	1100	1107	
	20	1202	1149	
	22	1249	1190	
	23	1295	1229	
	24	1340	1267	
	25	1384	1304	
	26	1427	1339	
	27	1469	1373	
	28	1509	1405	·
	29	1549	1436	

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Rev	FIGURE A.3	Page 2 of 4	
St. Luc	ie Unit 1 Cy	/cle 16	
orth vs. Reactor Powe	r (Shutdow	n and Equilibriun	n) 1000 EFPH
RX Powe	r S/D Xe	Equil Xe	
30	1588	1466	
31	1626	1495	
32	1663	1522	
33	1699	1549	
34	1735	1574	
35	1770	1599	
36	1804	1622	
37	1838	1645	
38	1871	1667	
39	1904	1687	
40	1936	1708	
41	1967	1727	
42	1999	1746	
43	2029	1764	
44	2060	1782	
45	2090	1799	
46	2120	1816	
47	2150	1833	
48	2180	1849	
	2209	1804	
50	2239	1995	
51	2200	1095	
52	2290	1971	
53	2327	1920	
55	2386	1955	
50	2415	1969	
57	2445	1984	
58	2474	1998	
59	2503	2012	
55 56 57 58 59	2386 2415 2445 2474 2503	1955 1969 1984 1998 2012	



Figure	A.3	
ev 2		Pa

Rev. 2Page 4 of 4St. Lucie Unit 1 Cycle 16

Xenon Worth vs. Reactor Power (Shutdown and Equilibrium)

1000 EFPH

.

RX Power	S/D Xe	Equil Xe
90	3342	2353
91	3366	2361
92	3391	2369
93	3415	2377
94	3439	2385
95	3464	2392
96	3487	2400
97	3511	2407
98	3535	2414
99	3559	2420
100	3582	2427

Date Of Update _____ 24 | 99

References: PSL-1FJF-99-114 Rev. 0 Attach. 2 Page 10 PSL-ENG-SEFJ-99-014 Rev. 0 Attach. 1 Page 57



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Date Of Update

References: PSL-1FJF-99-114 Rev. 0 Attach. 3 Page 6 PSL-ENG-SEFJ-99-014 Rev. 0 Attach. 1 Page 93

Rev. 2 Page 1 of 4 St. Lucie Unit 1 Cycle 16

Xenon Worth Following Shutdown (1000 EFPH)

			Power			
HOURS S	/D 100%	HOURS S/D	75%	50%	25%	
0	2427	0	2209	1880	1304	
1	2746	1	2428	1999	1340	
2	3015	2	2609	2094	1365	
3	3232	3	2754	2167	1380	
4	3397	4	2860	2215	1384	
5	3507	5	2926	2239	1376	
6	3565	6	2954	2239	1357	
7	3582	7	2952	2220	1331	
8	3572	8	2929	2188	1300	
9	3540	9	2889	2145	1266	
10	3488	10	2835	2095	1228	
11	3419	11	2771	2038	1188	
12	3336	12	2696	1976	1146	
13	3242	13	2615	1910	1102	
14	3141	14	2528	1841	1058	
15	3034	15	2438	1771	1013	
16	2925	16	2347	1701	969	
17	2814	17	2255	1630	925	
18	2703	18	2162	1560	882	
19	2590	19	2070	1490	840	
20	2478	20	1977	1421	799	
21	2366	21	1885	1353	759	
22	2254	22	1795	1286	719	
23	2144	23	1705	1220	681	
24	2035	24	1617	1156	644	
25	1929	25	1531	1093	608	
26	1825	26	1447	1032	573	
27	1724	27	1366	973	539	
28	1626	28	1288	917	507	
29	1532	29	1213	862	477	
1	1		1		1	

References: PSL-1FJF-99-114 Rev. 0 Attach. 3 Page 7 PSL-ENG-SEFJ-99-014 Rev. 0 Attach. 1 Page 94 .

Figure A.4 ev. 2 Page 2 of

Rev. 2 Page 2 of 4 St. Lucie Unit 1 Cycle 16

Xenon Worth Following Shutdown (1000 EFPH)

	Power			
HOURS S/D	100%	75%	50%	25%
30	1443	1142	811	448
31	1358	1075	762	421
32	1278	1011	717	395
33	1203	951	673	371
34	1131	894	633	348
35	1064	841	594	327
36	1000	790	558	306
37	940	743	524	287
38	883	698	492	270
39	829	655	462	253
40	778	615	433	237
41	730	577	406	222
42	684	541	380	208
43	641	506	356	195
44	600	474	333	182
45	561	443	312	171
46	525	415	292	160
47	490	387	273	149
48	458	362	255	140
49	428	338	238	131
50	399	315	222	122
51	372	294	207	114
52	347	274	193	106
53	323	255	180	99
54	301	237	167	92
55	280	221	156	86
56	260	206	145	80
57	242	192	135	75
58	225	178	125	70
59	209	166	117	65

References: PSL-1FJF-99-114 Rev. 0 Attach. 3 Page 8 PSL-ENG-SEFJ-99-014 Rev. 0 Attach. 1 Page 95 Figure A.4 Rev. 2 Page 3 of 4 St. Lucie Unit 1 Cycle 16

Xenon Worth Following Shutdown (1000 EFPH)

	Power			
HOURS S/D	100%	75%	50%	25%
60	195	155	108	60
61	181	144	101	56
62	169	134	94	52
63	157	125	87	49
64	146	117	81	46
65	136	109	76	43
66	127	102	70	40
67	118	95	66	37
68	110	89	61	34
69	103	83	57	32
70	96	78	53	30
71	89	73	49	28
72	83	68	46	26
73	77	64	43	24
74	72	59	40	22
75	67	55	37	21
76	62	51	34	19
77	57	48	32	18
78	53	44	29	17
79	49	41	27	15
80	45	38	25	14
81	41	35	23	13
82	38	32	21	12
83	34	30	19	11
84	31	27	17	10
85	28	25	16	9
86	25	23	14	8
87	23	21	13	7
88	20	19	12	6
89	18	17	10	6
	l '	1		

References: PSL-1FJF-99-114 Rev. 0 Attach. 3 Page 9 PSL-ENG-SEFJ-99-014 Rev. 0 Attach. 1 Page 96 . .

Figure A.4 Rev. 2 Page 4 of 4 St. Lucie Unit 1 Cycle 16

Xenon Worth Following Shutdown (1000 EFPH)

		Po	wer	
HOURS S/D	100%	75%	50%	25%
90	16	15	9	5
91	14	14	8	5
92	13	13	7	4
93	11	12	7	4
94	10	11	6	3
95	9	10	6	3
96	9	9	5	3
97	8	9	5	3
98	8	9	5	3
99	8	9	5	3
100	8	9	5	3

Date Of Update // / 24 / 99

References: PSL-1FJF-99-114 Rev. 0 Attach. 3 Page 10 PSL-ENG-SEFJ-99-014 Rev. 0 Attach. 1 Page 97



Reference: Attachment 1 PSL-1FJF-99-137 Rev. 0 Page 10

PSL-ENG-SEFJ-99-014 Rev. 0 Attachment 1 Page 137

Rev. 2 Page 1 of 4 St. Lucie Unit 1 Cycle 16

Sm/Np/Transient Fission Product Worth Contribution Following Shutdown (1000 EFPH)

HOURS S/D	WORTH (PCM)
0	754
5	757
10	761
15	766
20	772
25	777
30	781
35	785
40	788
45	790
50	793
55	796
60	800
65	803
70	807
75	810
80	812
85	814
90	816
95	818
100	819
105	820
110	822
115	824
120	825
125	827
130	829
135	831
140	833
145	834
	l

Reference:

Attachment 1 PSL-1FJF-99-137 Rev. 0

Page 6

PSL-ENG-SEFJ-99-014 Rev. 0 Attachment 1 Page 133

Rev. 2 Page 2 of 4

St. Lucie Unit 1 Cycle 16

Sm/Np/Transient Fission Product Worth Contribution Following Shutdown (1000 EFPH)

HOURS S/D	WORTH (PCM)
150	836
155	838
160	839
165	841
170	842
175	843
180	845
185	846
190	847
195	848
200	849
205	850
210	851
215	852
220	852
225	853
230	854
235	854
240	855
245	855
250	856
255	856
260	856
265	857
270	857
275	857
280	000
285	000
290	000
290	609

Reference:

Attachment 1 PSL-1FJF-99-137 Rev. 0 Page 7

PSL-ENG-SEFJ-99-014 Rev. 0 Attachment 1 Page 134 \int

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Rev. 2 Page 3 of 4 St. Lucie Unit 1 Cycle 16

Sm/Np/Transient Fission Product Worth Contribution Following Shutdown (1000 EFPH)

HOURS S/D	WORTH (PCM)
300	859
305	859
310	860
315	860
320	860
325	861
330	861
335	861
340	862
345	862
350	862
355	863
360	863
365	864
370	864
375	864
380	865
385	865
390	865
395	866
400	866
405	866
410	867
415	867
420	867
425	868
430	868
435	868
440	869
445	869

Reference:

Attachment 1 PSL-1FJF-99-137 Rev. 0

Page 8

PSL-ENG-SEFJ-99-014 Rev. 0 Attachment 1 Page 135

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Rev. 2 Page 4 of 4 St. Lucie Unit 1 Cycle 16

Sm/Np/Transient Fission Product Worth Contribution Following Shutdown (1000 EFPH)

HOURS S/D	WORTH (PCM)
450	869
455	869
460	870
465	870
470	870
475	871
480	871
485	871
490	871
495	872
500	872

Reference:

Attachment 1 PSL-1FJF-99-137 Rev. 0 Page 9

PSL-ENG-SEFJ-99-014 Rev. 0 Attachment 1 Page 136

Date of Update: 11/24/99

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1000 EFPH, Rev 2



Reference: PSL-1FJF-99-136 Rev 0 Attachment 1 Page 4

> PSL-ENG-SEFJ-99-014 Rev. 0 Attachment 1 Page 171

Date of Update: _// / 24/ 99

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Figure A.6 St. Lucie Unit 1 Cycle 16 HZP Sequential Integral CEA Worth 1000 EFPH, Rev. 2, Page 1 of 1

ſ	Group	Position (Inches	Group	Position (Inches	Integral	
		Withdrawn)	•	Withdrawn)	worth (pcm)	
Γ	Α	0			0	
	Α	17			231	
	Α	37			1516	
l	Α	57			2134	
ļ	Α	77			2446	
	Α	97			2643	
	Α	117			2835	
	Α	137	В	0	2971	
ĺ			В	17	2986	
			В	37	3049	
			В	57	3159	
			В	77	3268	
l			В	97	3372	
l			В	117	3489	
	1	0	В	137	3557	
I	1	17			3589	
	1	37			3697	
	1	57			3840	
	1	77			3972	
	1	95	2	0	4077	
	1	112	2	17	4291	
	1	132	2	37	4662	
	1	137	2	57	4933	
			2	77	5120	
	3	0	2	95	5246	
	3	17	2	112	5392	

				the second s
Group	Position (Inches Withdrawn)	Group	Position (Inches Withdrawn)	Integral Worth (pcm)
3	37	2	132	5542
3	57	2	137	5602
3	77			5670
3	95	4	0	5732
3	112	4	17	5844
3	132	4	37	6055
3	137	4	57	6268
		4	77	6438
5	0	4	95	6560
5	17	4	112	6695
5	37	4	132	6822
5	57	4	137	6884
5	77			6954
5	95	6	0	7019
5	112	6	17	7108
5	132	<u>\</u> 6	37	7211
5	137	6	57	7284
		6	77	7367
7	0	6	95	7442
7	17	6	112	7540
7	37	6	132	7662
7	57	6	137	7775
7	77			7889
7	97			7998
7	117			8104
7	137			8139

Reference: PSL-1FJF-99-136 Rev. 0 Attachment 1 Page 3

Date of Update: // / 24 / 99

PSL-ENG-SEFJ-99-014 Rev. 0 Attachment 1 Page 170

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Reference :PSL-1FJF-99-136 Rev. 0 Attachment 2 Page 6

> PSL-ENG-SEFJ-99-014 Rev. 0 Attachment 1 Page 189

Date of Update: // /24/99

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	Figure	A.7	
	Page I	012	
	St. Lucie Offi	ci cycle io	
HZP Integral	Worth of CEA	Lead Group	(55 in. to ARO)
······································	(1000 EFPH, No	Xenon, Rev. 2)	· · · · · · · · · · · · · · · · · · ·
	Inches	Desetivity	
	Inches	Reactivity	
	Withdrawn	(pcm)	
	55	7760	
	50	7709	
	57	7781	
	50	7786	
	60	7792	
	61	7798	
	62	7804	
	63	7809	
	64	7815	
	65	7821	
	66	7827	
	67	7832	
	68	7838	
	69	7844	
	70	7850	
	71	7855	
	72	7861	
	73	7867	
	74	7872	
	75	7878	
	76	7883	
	77	7889	
	78	7894	
	/9	7900	
	0U Q1	7900	1
	22	7916	
	83	7922	
	84	7927	
	85	7932	
	86	7938	
	87	7943	
	88	7948	
	89	7954	
	90	7959	
	91	7965	
	92	7970	
	93	7976	
	94	7981	
	95	7987	
	96	7992	
	97	7998	
·	98	8004	

Reference: PSL-1FJF-99-136 Rev. 0 Attachment 2 Page 4

> PSL-ENG-SEFJ-99-014 Rev. 0 Attachment 1 Page 187

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Figure A.7 Page 2 of 2					
	St. Lucie Un	it 1 Cycle 16			
	tearal Worth of CEA	l ead Group (55 in. to ABO)		
(1000 EFPH, No Xenon, Rev. 2)					
	Inches	Reactivity			
	Withdrawn	(pcm)			
	99	8010			
	100	8015			
	101	8021			
	102	8027			
	103	8033			
	104	8039			
	105	8044 8050			
	100	8056			
	107	8061			
	109	8067			
	110	8072			
	111	8077			
	112	8082			
	113	8087			
	114	8091			
	115	8096			
	116	8100			
	118	8104			
	119	8111			
	120	8115			
	121	8118			
	122	8120			
	123	8123			
	124	8125			
	125	8127			
	126	8129			
	12/	8131			
	120	8134			
	130	8135			
	131	8136			
	132	× 8137			
	133	8138			
	134	8138			
	135	8139			
	136	8139			
	137	8139			
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Date of Update: // 124/99

Reference: PSL-1FJF-99-136 Rev. 0 Attachment 2 Page5

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St. Lucie Unit 1 Cycle 16

HZP Differential Boron Worth vs Burnup



Date Of Update

References: PSL-1FJF-99-122 Rev. 0 Attach. 1 Page 7 PSL-ENG-SEFJ-99-014 Rev. 0 Attach. 1 Page 208

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Figure A.8 Rev. 1 Page 1 of 5

St. Lucie Unit 1 Cycle 16

HZP Differential Boron Worth vs Burnup

Burnup (EFPH)	Boron Worth
<u></u>	(beun bhu)
200	848
300	8 49
400	8.50
500	8.51
600	8.51
700	8.52
800	8.52
900	8.53
1000	8.54
1100	8.55
1200	8.56
1300	8.56
1400	8.57
1500	8.58
1600	8.59
1700	8.60
1800	8.61
1900	8.62
2000	8.64
2100	8.65
2200	8.66
2300	8.67
2400	8.68
2500	8.69
2600	8.70
2700	8.71
2800	8.72
2900	8.73

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Figure A.8 Rev. 1 Page 2 of 5

St. Lucie Unit 1 Cycle 16

HZP Differential Boron Worth vs Burnup

Burnun	Boron
/EEDU)	Worth
	(pcm/ppm)
3000	8.74
3100	8.76
3200	8.77
3300	8.78
3400	8.80
3500	8.81
3600	8.82
3700	8.84
3800	8.85
3900	8.87
4000	8.88
4100	8.89
4200	8.91
4300	8.92
4400	8.93
4500	8.94
4600	8.96
4700	8.97
4800	8.98
4900	8.99
5000	9.01
5100	9.02
5200	9.03
5300	9.04
5400	9.06
5500	9.07
5600	9.08
5700	9.09
5800	9.11
5900	9.12

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Figure A.8 Rev. 1 Page 3 of 5

St. Lucie Unit 1 Cycle 16

HZP Differential Boron Worth vs Burnup

Dummer	Boron
Burnup	Worth
(EFPN)	(pcm/ppm)
6000	9.14
6100	9.15
6200	9.17
6300	9.18
6400	9.20
6500	9.21
6600	9.23
6700	9.25
6800	9.26
6900	9.28
7000	9.30
7100	9.31
7200	9.33
7300	9.35
7400	9.36
7500	9.38
7600	9.40
7700	9.42
7800	9.44
7900	9.46
8000	9.48
8100	9.49
8200 -	9.52
8300	9.54
8400	9.50
0000	9.50
8000	9.00
0/00	9.02
8900	9.67

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Figure A.8 Rev. 1 Page 4 of 5

St. Lucie Unit 1 Cycle 16

HZP Differential Boron Worth vs Burnup

	Boron
Burnup	Worth
(EFPH)	(pcm/ppm)
9000	9.69
9100	9.71
9200	9.73
9300	9.76
9400	9.78
9500	9.80
9600	9.82
9700	9.85
9800	9.87
9900	9.89
10000	9.92
10100	9.94
10200	9.97
10300	9.99
10400	10.02
10500	10.04
10600	10.07
10700	10.09
10800	10.12
10900	10.14
11000	10.17
11100	10.19
11200	10.22
11300	10.25
11400	10.27
11500	10.30
11600	10.32
11700	10.35
11800	10.37
11900	10.40

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Figure A.8 Rev. 1 Page 5 of 5

St. Lucie Unit 1 Cycle 16

HZP Differential Boron Worth vs Burnup

Date Of Update 10, 7, 99 References: PSL-1FJF-99-122 Rev. 0 Attach. 1 Page 12 PSL-ENG-SEFJ-99-014 Rev. 0 Attach. 1 Page 213 -

	Inve	rse Count	Rate Rati	o Data Sh	eet			
		1000	EFPH , Re	v. 2				
ate:////////_	- Count Rate (CPS):	Time of Co	mpletion: _			EFPH		
Count Count	Time (sec) Channel		Channel					
2	120							
Total C	Counts>		· · · · · · · · · · · · · · · · · · ·		(Base Cour	nts)		
					-			
SUGGESTE	D CEA HEIGHT	ACTUAL	. HEIGHT	% POWER RA	t or COUNT	IC	RR	
Group	Inches	Group	Inches	Сн	СН	СН	сн	
	0	1	0	Base Count	Base Count	1.0	1.0	4
1			1					
1	92				<u> </u>			-
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REGION II ST. LUCIE NUCLEAR PLANT INITIAL LICENSE EXAMINATION ADMINISTRATIVE SECTION A1 QUESTIONS

CANDIDATE _____

EXAMINER

REGION II INITIAL LICENSE EXAMINATION ADMINISTRATIVE SECTION A1 QUESTIONS ST LUCIE NUCLEAR PLANT

KA Statement: Knowledge of Conduct of Operations Requirements

KA #: K2.1.1 - 3.7 / 3.8

References: ADM-09.07, "Overtime Limitations for Plant Personnel", Operations Policy 403, "Overtime Administration"

Candidate:	Name	Time Start Time Finish
Performance Rating:	Question 1 Sat Question 2 Sat	Unsat Unsat
Examiner:		Signature: Name
	Commen	ts

Question #1 (Reference allowed)

Operator # 1	Operator # 2	Operator # 3
Mon. 0700-1700	Mon. 1500-0300	Mon. 2300-0700
Tues. 0300-1500	Tues. 1200-2300	Tues. OFF
Wed. 0700-2300	Wed. 1500-0500	Wed. OFF
Thurs. 0500-1500	Thurs. 1300-0000	Thurs. 0700-2300
Fri. 0700-1500	Fri. OFF	Fri. 0700-1500
Sat. OFF	Sat. 2300-0900	Sat. 2230-0800
Sun. OFF	Sun. 2300-1200	Sun. 1500-2300

The following are the schedules for three operators. Determine if overtime guidelines have been exceeded. The Overtime Limit Tracker is not available.

Question #1 Expected Response

Operator #1 - 3 Violations: >16 in a 24 hour period (Wed-Thurs) > 24 hrs in a 48 hr period (Tues-Wed, Wed-Thurs), <8 hrs rest Thursday morning

Operator #2 - 1 violation: > 24 in a 48 hour period (Wed-Fri)

Operator #3 - 1 Violation: < 8 hrs rest on Sat and Sun

GRADING CRITERIA ?

Question #2 (No Reference allowed)

Who is the MINIMUM authority that is required to approve deviation from the plant overtime guidelines?

Question #2 Expected Response

The Site Vice President. (In emergency cases, the Department Head may approve the request provided the Site VP is notified the next day)

Question #1 CANDIDATE COPY

REFERENCE ALLOWED: _

X YES NO

(TO BE RETURNED TO THE EXAMINER UPON COMPLETION OF ANSWER)

The following are the schedules for three operators. Determine if overtime guidelines have been exceeded. The Overtime Limit Tracker is not available.

N	Operator # 1	Operator # 2	Operator # 3
М	ion. 0700-1700 10	Mon. 1500-0300	Mon. 2300-0700
Т	ues. 0300-1500 /2	Tues. 1200-2300	Tues. OFF
w	/ed. 0700-2300 រሬ	ア ^{てん} Wed. 1500-0500	Wed. OFF
T	hurs. 0500-1500 / //	Thurs. 1300-0000	Thurs. 0700-2300
F	ri. 0700-1500	Fri. OFF	Fri. 0700-1500
s	at. OFF	Sat. 2300-0900	Sat. 2230-0800
s	un. OFF	Sun. 2300-1200	Sun. 1500-2300

Question #2 CANDIDATE COPY

REFERENCE ALLOWED: _____X

(TO BE RETURNED TO THE EXAMINER UPON COMPLETION OF ANSWER)

Who is the MINIMUM authority that is required to approve deviation from the plant overtime guidelines?

ST. LUCIE PLANT OPERATIONS DEPARTMENT



OPERATIONS POLICY

OVERTIME ADMINISTRATION

The Operations Department recognizes the need for time off away from work. The routine use of overtime for shift staffing takes away from this necessary rest period. The policy of the Operations Department in support of the Nuclear Division and St. Lucie Plant objectives is to minimize the use of overtime. When the minimum shift crew complement can NOT be maintained, within the guidance of the Filling Shift Vacancies policies, overtime can be utilized. Consult the specific guidance contained in AP 0010119, Overtime Limitations for Plant Personnel, and Nuclear Policy NP-306, Overtime.

- 1. In order to keep overtime usage to a minimum the following guidelines should be followed:
 - A. Overtime will be used to fill shift vacancies only after all other options listed in the Filling of Shift Vacancies policies have been tried first.
 - B. Only the Operations Supervisor can authorize overtime to augment shift staffing above the minimum shift crew complement.
 - C. Special jobs requiring extra operators should be scheduled in advance to utilize available Relief Shift or Operations Support personnel. The Work Control Center Supervisor should coordinate this with the Operations Administrative Assistant.
- 2. Under normal conditions employees should work no more than 12 consecutive hours. The following guidelines should be adhered to when meeting overtime needs:
 - A. Overtime should be offered for 4 hour periods.
 - B. Overtime should be offered to coincide with the 4 hour periods immediately preceding or following an employee's regularly scheduled shift.
 - C. Employees shall have a minimum of 8 hours rest time between all periods worked regardless of the duration of the work period.
 - D. Overtime on an employee's rest day should NOT exceed 12 consecutive hours, excluding travel time.

ST. LUCIE PLANT OPERATIONS DEPARTMENT



OPERATIONS POLICY

OVERTIME ADMINISTRATION (continued)

- * E. All hours worked (excluding travel time) over 12 consecutive hours shall be paid at twice the rate of normal pay (double time).
 - F. With the exception of rest days, employees should NOT be offered or charged * for any available overtime that does NOT immediately precede or follow their normally scheduled shift.
- * Bargaining Unit Employees only.
- 3. It is each employees responsibility to ensure that they do NOT exceed any overtime limits as a result of working overtime or by shift trade.
 - A. Each individual shall fill out the SHIFT TRADE/OVERTIME CHECKLIST for each work period which involves a shift trade or overtime work.
 - B. The "Over the Limit Tracker" shall be used and have a copy attached to the SHIFT TRADE/OVERTIME CHECKLIST, unless the computer system is unavailable.
 - C. The SHIFT TRADE/OVERTIME CHECKLIST shall be signed and reviewed prior to working the shift trade or overtime hours.
- 4. The individual offering the overtime hours shall ensure that no overtime limits will be exceeded as a result of those hours being worked.
- 5. The Operations Supervisor will approve all overtime prior to it being worked to ensure that no overtime limits will be exceeded as a result of those hours being worked. This approval will be based on input from the NPS/ANPS.

Reference: Memorandum of Agreement. AP 0010119, Overtime Limitations for Plant Personnel. Nuclear Policy NP-306, Overtime. St. Lucie Plant Policy PSL-202, Overtime.

Approved:

Operations Supervisor - St. Lucie Plant

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REGION II INITIAL LICENSE EXAMINATION ADMINISTRATIVE JOB PERFORMANCE MEASURE ST. LUCIE NUCLEAR PLANT

VERIFY BAM TANK OPERABILITY

EXAMINER

REGION II INITIAL LICENSE EXAMINATION ADMINISTRATIVE JOB PERFORMANCE MEASURE ST LUCIE NUCLEAR PLANT

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KA Statement: Ability to interpret graphs which contain plant performance data

KA #: K2.1.25 - 2.8 / 3.1

Facility JPM #: New

Task: Using the information provided, verify BAM tank operability

Preferred Evaluation Location:

Simulator _____ Control Room _ X ___ NTC _ X ___

Preferred Evaluation Method:

Perform X Simulate _____

References: OP 1-0010125A, Data Sheet 4, "Verification of Boration Flow Paths"

Validation Time 15 minutes

Candidate:	Nome			Time Start
	Name			
Performance Rating:	Sat	Unsat	<u>. </u>	
Examiner:	Name	<u></u>	Signature:	

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Reference Material Needed:

OP 1-0010125A, Data Sheet 4, "Verification of Boration Flow Paths"

Read to Candidate

· ·

Directions to candidate for Administrative JPMs:

I will explain the initial conditions and state the task to be performed. You will be allowed the use of any reference needed to complete the task. Ensure you indicate to me when you finish your assigned task by returning the material needed for the task that I provided you.

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Initial Conditions: Unit 2 is at 100% power. The following are the current BAM tank parameters:

	Level	Temperature	Boron Concentration
2A BAMT	75%	110°F	5675 ppm
2B BAMT	92%	115⁰F	4140 ppm

Initiating Cues: The ANPS has directed you to verify BAM tank operability IAW OP 2-0010125A Data Sheet 4

ANSWER KEY

2A BAMT Volume = 7425 gal.

2B BAMT Volume = 9108 gal.

2A BAMT Volume Concentration = 42136875 gal ppm

2B BAMT Volume Concentration = 37707120 gal ppm

Combined Volume = 16533 gal.

Combined Concentration = 4829.37 ppm

Combined Concentration weight % = 2.76

COMBINED BAM TANK VOLUME AND CONCENTRATION MEETS REQUIREMENTS OF FIGURE 3.1-1.

CANDIDATE CUE SHEET

(TO BE RETURNED TO THE EXAMINER UPON COMPLETION OF TASK)

Initial Conditions: Unit 2 is at 100% power. The following are the current BAM tank parameters:

	Level	<u>Temperature</u>	Boron Concentration
2A BAMT	75%	110°F	5675 ppm
2B BAMT	92%	115°F	4140 ppm

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Initiating Cues: The ANPS has directed you to verify BAM tank operability IAW OP 2-0010125A Data Sheet 4

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INITIAL

ST. LUCIE UNIT 2 OPERATING PROCEDURE NO. OP-2-0010125A, REVISION 36 SURVEILLANCE DATA SHEETS

DATA SHEET 4 WEEKLY CVCS BORATION FLOW PATHS AND SOURCES

(Page 3 of 8)

1. (continued)

B. (continued)

- 3. <u>If a Charging Pump from the RWT is used, Then VERIFY the</u> following valves are in the required position:
 - a. V2504 RWT to Charging Pumps Open _____
 - b. V2523 Charging Line Open

NOTE

These valves may be in different positions during RCP seal injection, PZR cooldown, when the charging system is shut down and other plant evolutions at the discretion of the NPS/ANPS.

с.	V2598	RCP Seal Injection Charging Line	Open#	
d.	V2185	RCP Seal Injection Actuation	Closed#	
e.	SE-02-01	Loop 2B1 Charging Isol	Closed#	
f.	SE-02-02	Loop 2A2 Charging Isol	Closed#	

2. VERIFY the following borated water source parameters:

- A. Modes 1, 2, 3 & 4
 - 1. *VERIFY the RWT meets Technical Specification requirements by the following:

a. Level: Channel MA____ft. Channel MC____ft.

Channel MB____ft. Channel MD____ft.

Criteria: Level greater than or equal to 28'5"

- b. Boron concentration____ppm
 Criteria: Greater than 1720 but less than 2100 PPM
- c. Temperature_____°F Criteria: Greater than 55 but less than 100°F

DATA SHEET 4 WEEKLY CVCS BORATION FLOW PATHS AND SOURCES

(Page 4 of 8)

2. (continued)

A. (continued)

2. *2A BAM Tank

Level____% (Figure 3.1-1)

Temperature_____°F (greater than 55°F)

Concentration____PPM (4371 to 6119 ppm)

2A BAM Tank meets requirements of Figure 3.1-1

3. *2B BAM Tank

Level____% (Figure 3.1-1)

Temperature_____°F (greater than 55°F)

Concentration____PPM (4371 to 6119 ppm)

2B BAM Tank meets requirements of Figure 3.1-1

4. *Combined BAM Tanks

NOTE

If either BAM Tank boron concentration is greater than 6119 PPM, then the combined tank calculation cannot be used for Tech. Spec. compliance.

2A BAM Tank 2B BAM Tank

Level____% Level____%

Concentration____ppm

Temperature____°F

Concentration	ppm
---------------	-----

Temperature____°F

INITIAL

DATA SHEET 4 WEEKLY CVCS BORATION FLOW PATHS AND SOURCES (Page 5 of 8)

2. (continued)

INITIAL

- A. (continued)
 - 4. (continued)

Perform the following calculations:

_____X 99 gal./% = _____ gal. 2A Level 2A Volume

____ X 99 gal./% = ____ gal. 2B Level 2B Volume

_____gal. X ____ppm = ____gal. ppm 2A Volume 2A Conc. 2A Volume Conc.

_____gal. X ____ppm = ____gal. ppm 2B Volume 2B Conc. 2B Volume Conc.

gal. + gal. = gal. = gal. = gal.

(_____gal. ppm +____gal. ppm) ÷____gal. = ____ppm 2A Volume 2B Volume Combined Combined Conc. Conc. Volume Conc.

_____ppm ÷ 1748.3 ppm/weight % =_____weight % Combined Conc.

The combined BAM Tanks volume and concentration meets the requirements of Figure 3.1-1 and both tank temperatures are greater than 55°F.

* Satisfactory compliance of either the RWT and the combined BAM Tanks <u>or</u> 2 of the following 3: RWT, 2A or 2B BAM Tank assures compliance to the applicable Technical Specifications.

DATA SHEET 4 WEEKLY CVCS BORATION FLOW PATHS AND SOURCES (Page 6 of 8)

2. (continued)

INITIAL

- B. Modes 5 & 6:
 - 1. *RWT

Level: Channel MA_____ft. Channel MC_____ft.

Channel MB_____ft. Channel MD_____ft.

(level greater than or equal to 8'-7")

Boron Concentration____ppm

(greater than or equal to 1720 PPM)

Temperature_____°F (greater than 40 but less than 120°F)

RWT meets Tech. Spec. requirements

2. *2A Boric Acid Make-Up Tank

Level____% (greater than or equal to 37%)

Concentration____PPM (4371 to 6119 ppm)

Temperature_____°F (greater than 55°F)

2A BAM Tank meets Tech. Spec. requirements.

DATA SHEET 4 WEEKLY CVCS BORATION FLOW PATHS AND SOURCES (Page 7 of 8)

2. (continued)

INITIAL

- B. (continued)
 - 3. *2B Boric Acid Make-Up Tank

Level____% (greater than or equal to 37%)

Concentration_____PPM (4371 to 6119 ppm)

Temperature_____°F (greater than 55°F)

2B BAM Tank meets Tech. Spec. requirements.

*Satisfactory compliance with 1 out of 3 of above requirements assures conformance to the applicable Technical Specifications.

Remarks:

*Satisfactory performance of the above asterisked steps assures conformance with applicable Technical Specification.

NPS/ANPS

DATA SHEET 4 WEEKLY CVCS BORATION FLOW PATHS AND SOURCES (Page 8 of 8)

FIGURE 3.1-1 ST. LUCIE 2 MIN BAMT



VOLUME vs STORED BAMT CONCENTRATION

(0125A-B.WPG)

ST. LUCIE - UNIT 2

3/4 1-15

Amendment No. 40

REGION II ST. LUCIE NUCLEAR PLANT INITIAL LICENSE EXAMINATION ADMINISTRATIVE SECTION A3 QUESTIONS

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CANDIDATE _____

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EXAMINER

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REGION II INITIAL LICENSE EXAMINATION ADMINISTRATIVE SECTION A3 QUESTIONS ST LUCIE NUCLEAR PLANT

KA Statement: Knowledge of 10 CFR 20 and facility radiation control requirements

KA #: K2.3.1 - 2.6 / 3.0

References: HP-02, "FPL Health Physics Manual"

Qu	estion 2 Sat	Unsat
Performance Rating: Qu	estion 1 Sat	Unsat
Candidate:	Name	Time Start Time Finish

Question #1

Health Physics has performed a survey of the Unit 2 Charging Pump hallway and rooms.. Using the provided survey map, determine the posting requirements for the hallway and each room.

Question #1 Expected Response

Hallway - Radiation Area, Contaminated Area.

2A Charging Pump Room - Radiation Area, Contaminated Area.

2B Charging Pump Room - High Radiation Area, Hot Spot.

2C Charging Pump Room - Radiation Area.

Question #2

What is the criteria that would require Health Physics to post an area as an "Airborne Radioactivity Area"?

Question #2 Expected Response

25% of the DAC (derived air concentration)

Question #1

CANDIDATE COPY

REFERENCE ALLOWED: _____ X____ YES NO

(TO BE RETURNED TO THE EXAMINER UPON COMPLETION OF ANSWER)

Health Physics has performed a survey of the Unit 2 Charging Pump hallway and rooms.. Using the provided survey map, determine the posting requirements for the hallway and each room.

Question #2

CANDIDATE COPY

(TO BE RETURNED TO THE EXAMINER UPON COMPLETION OF ANSWER)

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What is the criteria that would require Health Physics to post an area as an "Airborne Radioactivity Area"?



DEPT/HP/910283

		Nuclear Business Services	NBS-NPS-HP-WP-001
		NUCLEAR DIVISION	Rev. 4
			Date: 10/16/98
FPL		Radiation Protection Manual	Page 40 of 74
	e.	Periodically in the RCA where the for airborne radioactivity exist	he potential ts; and
	f.	Any time intakes are being estin control internal radiation doses	mated to s.
4.4.4	Radi	oactive Contamination Surveys	
1.	The radi	quantity that should be measured oactivity per unit of surface ar	is the ea.
2.	Surv cond	veys for radioactive contamination Nucted as follows:	n should be
	a.	Periodically in areas frequently where radioactive materials are stored or where contamination by postings are located;	y accessed handled or oundaries or
	b.	During initial entry into a know suspected contaminated area, an thereafter, to determine if con changed;	wn or d periodically ditions have
	c.	Periodically at control points contaminated areas, areas used protective clothing, and step-o in use.	to to dress in ff pads when
	d.	During work involving the openi radioactive system or the weldi or grinding on equipment contai radioactive materials;	ng of any ng, burning, ning
	e.	After a leak or spill of radioa materials or any time contamina conditions could change in a wo	ctive tion rk area;
	f.	Periodically in some areas outs (e.g., offices, shops and stora	ide of the RCA ge areas);
	g.	Periodically in areas within th eating, drinking and smoking ar	e RCA where e permitted;
	h.	All materials leaving the RCA.	
	i.	Respiratory protection equipmen protective clothing following c	t and leaning; and

		_	
	Nuclear Business Services	NBS-NPS-HP-WP-001	
	NUCLEAR DIVISION	Rev. 4	
		Date: 10/16/98	
FPL	Radiation Protection Manual	Page 41 of 74	
	k. For radioactive sources requiring.	ng periodic	
3.	The following should be considered when surveying areas or jobs with the potential for contamination from hot particles:		
	a. Surveys should be performed periodically when no work is being performed.		
	b. Survey frequency should be based on work in progress, contamination history (including activity content), current survey results and trends, and the dose expended to perform these surveys.		
4.	Tools and equipment used in contaminated areas should be surveyed prior to removal from the area or should be considered as contaminated and placed in plastic bags and tagged with a radioactive material tag until they can be surveyed and released, or decontaminated.		
5.	Potentially contaminated materials should be surveyed and properly labeled.		
6.	Personal articles which are either w on the body are surveyed by the whol when the individual performs a whole All other items shall be frisked by personnel before removing them from	orn or carried e body monitor body frisk. Health Physics the RCA.	
	a. Individuals who have completed Radiation Worker Training may r that have not been in Contamina	Enhanced elease items ted Areas.	
7.	Waste volumes should be sampled befor released from the RCA.	re they are	
8.	Materials and equipment brought in b have previously been in contact with and have a potential for being conta be surveyed when the containers are	y vendors that hot particles minated should opened.	
9.	Radioactive materials indicating the radioactivity (other than naturally- should be released only with special the Health Physics Supervisor. A re maintained for each item released.	e presence of occurring) permission of cord should be	

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		Nuclear Business Services	NBS-NPS-HP-WP-001
;		NUCLEAR DIVISION	Rev. 4
			Date: 10/16/98
	FPL	Radiation Protection Manual	Page 42 of 74

10. Packaging, surveying, labeling and documentation for shipment of radioactive materials should be performed in accordance with applicable procedures. Shipping nuclear fuel is addressed in separate plant procedures.

4.4.5 Posting

NOTE

In practice, area posting is based on the measurement of the deep dose equivalent rate and not on the measurement of the deep dose equivalent integrated over one hour as defined in 10CFR20. For example, a radiation area will be posted as such if the deep dose equivalent rate exceeds 5 mrem/hour measured at 30 centimeters (12 inches) from the radiation source. Basing the posting on dose equivalent rate ensures that the dose equivalent limit will not be exceeded.

1. Areas shall be posted as follows:

- a. An area, accessible to individuals, in which radiation levels could result in an individual receiving a dose equivalent in excess of 5 mrem in 1 hour at 30 centimeters from the radiation source or from any surface that the radiation penetrates shall be posted with a conspicuous sign bearing the radiation symbol and the words "CAUTION, RADIATION AREA"
- b. An area, accessible to individuals, in which radiation levels from radiation sources external to the body could result in an individual receiving a dose equivalent in excess of 100 mrem in 1 hour at 30 centimeters from the radiation source or from any surface that the radiation penetrates shall be posted with a conspicuous sign bearing the radiation symbol and the words "CAUTION, HIGH RADIATION AREA."
- c. An area, accessible to individuals, in which radiation levels from radiation sources external to the body could result in an individual receiving a dose equivalent in excess of 1,000 mrem in 1 hour at 30
| | | Nuclear Business Services | NBS-NPS-HP-WP-001 |
|----|----|--|--|
| | | NUCLEAR DIVISION | Rev. 4 |
| | | | Date: 10/16/98 |
| FP | | Radiation Protection Manual | Page 43 of 74 |
| | | centimeters from the radiation any surface that the radiation p
shall be posted with a conspicu-
bearing the radiation symbol and
"CAUTION, LOCKED HIGH RADIATION | source or from
penetrates
ous sign
d the words
AREA." |
| | d. | An area, accessible to individual
radiation levels from radiation
external to the body could resu-
individual receiving an absorbed
excess of 500 rads in 1 hour at
the radiation source or from any
the radiation penetrates shall
a conspicuous sign bearing the
symbol and the words "GRAVE DANG
RADIATION AREA." | als, in which
sources
lt in an
d dose in
1 meter from
y surface that
be posted with
radiation
GER, VERY HIGH |
| | e. | An area, room or enclosure in wiconcentration of airborne radio
materials exist in excess of the
such a degree that an individua
the area without respiratory prequipment could exceed, during
individual is present in a week
0.6 percent of the ALI or 12 DA
be posted with a conspicuous si
radiation symbol and the words
AIRBORNE RADIOACTIVITY AREA ."
with the airborne radioactivity
requirement will be accomplished
the area when the measured airb
radioactivity is greater than 0
DAC. | hich the
active
e DAC's or to
l present in
otective
the hours an
, an intake of
C-hours shall
gn bearing the
"CAUTION,
Compliance
posting
d by posting
orne
.25 of the |
| | f. | An area, accessible to individu
contamination levels exist in e
surface area contamination guid
specified in Table 4.2 shall be
conspicuous sign bearing the ra
and the words "CONTAMINATED ARE | als, in which
excess of the
elines
posted with a
diation symbol
A. " |
| | g. | An area, accessible to individu
radioactive contamination in th
particles exist shall be posted | als, in which
e form of hot
l with a |

conspicuous sign bearing the radiation symbol and the words "CONTAMINATED AREA, HOT PARTICLE AREA."

Ī		Nuclear Business Services	NBS-NPS-HP-WP-001
		NUCLEAR DIVISION	Rev. 4
			Date: 10/16/98
	FPL	Radiation Protection Manual	Page 44 of 74
		h. An area or room in which license stored in an amount exceeding 10 quantity of such material specie applicable regulations shall be conspicuous sign bearing the rac and the words "CAUTION, RADIOAC" MATERIAL(S)."	ed material is) times the fied in the posted with a diation symbol FIVE
	2.	In addition to the information special section 1 above, warning signs may con- additional information on specific ra- conditions, requirements for entry and special precautions.	fied in ontain adiological nd other
	3.	Hot spots should be identified on compiping having contact deep dose equip greater than 300 mrem / hour and the levels are greater than 5 times the of equivalent rate measured at 30 cention hot spot.	nponents or valent rates contact deep dose meter from the
	4.	Transitory high radiation areas creat a large activity source through the be posted if continuous Health Physic provided.	ted by moving RCA need not cs coverage is
	5.	Portable equipment, tools or materia inside the RCA which has contamination of the contamination guidelines spec 4.2 should be identified as radioact	l stored on in excess ified in Table ive material.
	4.5 Radiologi	cal Work Practices	
	4.5.1	Supervision and Monitoring of Radiol	ogical Work
	1.	Radiation workers should be monitore by their supervision and HP personne that the workers are following prope work practices at the work site. Im radiological work practices should b immediately at the work location.	d periodically l to ensure r radiological proper e corrected
	2.	Depending on the nature of the job, should perform the following functio	HP personnel ns:
		a. Brief workers on the actual and radiological conditions and ha may be present during the job.	. potential zards which

5- X

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			·····						
		т	ABLE 4.2						
		CONTAMIN	ATION GUIDELNES						
	QUANTITY	"LOOSE" CONTAMIN	IATION	"FIXED" CONTAMINA	ATION				
		BETA-GAMMA ^(*) ACTIVIY	ALPHA [®] ACTIVITY	BETA-GAMMA ^(*) ACTIVITY	ALPHA ⁽⁵⁾ ACTIVITY				}
1.	Surface Area	$1000 dpm/100 cm^2$	$20 \text{ dpm}/100 \text{ cm}^2$	N/A	N/A	T			
2.	Personnel Contamination (Skin and clothing)	$5000 \text{ dpm}/100 \text{ cm}^2$	$300 \text{ dpm}/100 \text{ cm}^2$	N/A	N/A	ř			
3.	Material Unconditional Release							1.	
	a. Materials, Tools, Equpment and Solid Waste	1000 dpm/100 cm ² (indirect)	$20 \text{ dpm}/100 \text{ cm}^2$	5000 dpm/100 cm ² (direct)	100 dpm/100 cm ²				
	b. Waste Volume(s) ^(e) (e.g., Liquids)						5		
4.	Protective Clothing	N/A	N/A	5000 cpm/probe area (direct)	N/A		•		
5.	Tools and Equipment (For use in RCA)	1000 dpm/100 cm ²	$20 \text{ dpm}/100 \text{ cm}^2$	10 mrem/hr	300 dpm/100 cm ²	auo	•	NUC	Nuc
6.	Respiratory Protective Devices	1000 dpm/100 cm ²	$20 \text{ dpm}/100 \text{ cm}^2$	0.2 mrad/hr	N/A	n ri	J	CLEA	lear H
(*) Co ec le fo (^{b)} M l (^{c)} W I	ontamination guidelines are bas guipment and methods. If monit evel that can be detected with ollowed with counting, the limi conitoring for alpha activity ma beta-gamma to alpha ratios. aste volumes such as oil, dirt meets the sensitivity requireme	eed on detection levels that oring is performed directly manual frisking using a par t is based on the detection ay not be necessary if it c and sediment shall contain nts of the plant's Technica	c can be achieved with pre y on the item (direct meth hoake type GM detector. I h level that can be achiev an be demonstrated that th no detectable activity wa al Specifications nad proc	esent state-of-the-art dec nod), the detection level of monitoring is performed red with this counting met he beta-gamma activity is hen counted on a detection redures.	stection specified is the d using smears thod. limiting using n system, that			DIVISION	siness Services
						Page 74 of 74	Date: 10/16/98	Rev. 4	NBS-NPS-HP-WP-001

REGION II INITIAL LICENSE EXAMINATION ADMINISTRATIVE JOB PERFORMANCE MEASURE ST. LUCIE NUCLEAR PLANT

COMPLETE THE STATE OF FLORIDA NOTIFICATION FORM

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CANDIDATE _____

EXAMINER

REGION II INITIAL LICENSE EXAMINATION ADMINISTRATIVE JOB PERFORMANCE MEASURE ST. LUCIE NUCLEAR PLANT

COMPLETE THE STATE OF FLORIDA NOTIFICATION FORM

CANDIDATE

EXAMINER _____

REGION II INITIAL LICENSE EXAMINATION ADMINISTRATIVE JOB PERFORMANCE MEASURE ST LUCIE NUCLEAR PLANT

KA Statement: Knowledge of the Emergency Plan

KA<u>#:</u> K2.4.29 - 2.6 / 4.0

Facility JPM #: New

<u>Task Standard:</u> Complete the State of Florida Notification Form during a Site Area Emergency

Preferred Evaluation Location:

Simulator _____ Control Room _ X ___ NTC __X

Preferred Evaluation Method:

Perform X Simulate ____

References: EPIP-02, "Duties and Responsibilities of the Emergency Coordinator", Attachment 2 and Attachment 4, EPIP-01, "Classification of Emergencies"

Validation Time 20 minutes

Candidate:	Name	<u></u>	Time Start Time Finish	
Performance Rating:	Sat	Unsat		
Examiner:			Signature:Name	

Reference Material Needed:

EPIP-02, "Duties and Responsibilities of the Emergency Coordinator", Attachment 2 and Attachment 4, EPIP-01, "Classification of Emergencies"

Read to Candidate

Directions to candidate for Administrative JPMs:

I will explain the initial conditions and state the task to be performed. You will be allowed the use of any reference needed to complete the task. Ensure you indicate to me when you finish your assigned task by returning the material needed for the task that I provided you.

Initial Conditions: A SGTR (2A)/LOOP has occurred on Unit 2. Chemistry has not yet reported release data. All plant equipment is operable, there are no injuries and a plant cooldown is in progress. The following meteorological conditions exist:

May need some	Wind Speed:	6 mph
t- of for events	60 moter temp :	20 86.3 ⁰
I (me) Jon Even	oo merer remp.	00.0
	10 meter temp.:	87.5°

Initiating Cues: Complete the State of Florida Notification Form for a Site Area Emergency.

ANSWER KEY

This is an ACTUAL EMERGENCY box checked

- 1A. Time/date: current time
- 1B Reported by: Candidate/title
- 1C. Message number: 1
- 1D. From: Control Room
- 2. Site: St. Lucie Unit 2
- 3. Accident Classification: Site Area Emergency

7 How deal we set this

- 4. Current Emergency Declaration Time: 10 minutes ago, Date: today
- 5. Incident description: Steam Ge enerator Tube Rupture/Loss of Offsite Power
- 6. Injuries: None
- 7. Release Status: C Release occurring expected duration: Unknown
- 8. Need not be filled out at this time.
- 9. Need not be filled out at this time.
- 10. Need not be filled out at this time.
- 11A. Wind direction: 56°, 11B. Sectors affected: KLMN
- 11C. Wind Speed: 6 MPH, 11D. Stability Class: D
- 12. Utility Recommended Protective Actions: No Recommendations at this time
- 13. Has Event been terminated? No
- 14. Message Received By: State of Florida responder, current time, date.

CANDIDATE CUE SHEET

(TO BE RETURNED TO THE EXAMINER UPON COMPLETION OF TASK)

INITIAL CONDITIONS:

A SGTR (2A)/LOOP has occurred on Unit 2. Chemistry has not yet reported release data. All plant equipment is operable, there are no injuries and a plant cooldown is in progress. The following meteorological conditions exist:

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Wind Speed:	6 mph
Wind direction:	56°
60 meter temp.:	86.3°
10 meter temp.:	87.5°

INITIATING CUE:

Complete the State of Florida Notification Form.

REVISION NO .:		PROCEDURE TITLE	:			PAGE:	
4			ES AND RES		TIES OF	45 of 65	
PRO	CEDURE NO .:		THE EMERGENCE COORDINATC				
	EPIP-02		ST. LUC	IE PLANT			
			ATTACHN	IENT 4			
	DETERMI	NATION OF SE	ECTORS AFI	ECTED AN	ID STABILITY C	LASS	
			(Page 1	ot 1)			
A.	A. Affected Sectors						
	1. Using the guide below, determine the Affected Sectors and enter in line 11B of the State Notification form.						
	If the win	d direction is d	Ne lirectly on the	DTE edge of two	o sectors (e.g., 1	1°, 33°,	
	56°, etc.)	, an additional	sector should	d be added t	to the Protective	Action	
	Recomm	endation (PAR). For examp	ole, if the will	nd direction is fr	om 78°,	
	then the	affected sector	s for the PAP	r snould be			
	Wind	Affected	Wind	Affected	Wind	Affected	
	From	Sectors	<u>From</u>	POR	<u>From</u> 236 - 258	CDE	
	348 - 11 11 - 33	JKL	146 - 168	QRA	258 - 281	DEF	
	33 - 56	KLM	168 - 191	RAB	281 - 303	EFG	
	56 - 78	LMN	191 - 213	ABC	303 - 326	FGH	
	78 - 101 101 - 123		213 - 236 there is no	O sector	there is no	l sector	
В.	Stability C 1. Ente	Class er Delta-T (60 n	neter minus 1	0 meter ten	nperatures)	deg. F	
	2. Usin and	ig Delta-T (Δ T) enter in line 11	and the guid D of the Stat	e below, det te Notificatio	termine the Stab n form.	ility Class	
		ΔΤ		<u></u>	Stability	Class	
	- <u> </u>	∆T less than or	equal to -1.7		A		
	-1.7 less than ∆T less than or equal to -1.5		В				
	-1.5 less than ΔT less than or equal to -1.4			С			
	-1.4 less than ΔT less than or equal to -0.5			D			
	-0.5 les	ss than ∆T less t	han or equal t	0 +1.4	E		
	+1.4 le:	ss than ∆T less	than or equal	to +3.6	F		
		+3.6 less	than ∆T		G		
		E	ND OF ATT	ACHMENT 4	L .		

BEVISION NO	PROCEDURE TITLE:			PAGE:
1	DUTIES AND RE			
4				40 of 65
PROCEDURE NO .:				
0.7		MENIZ		
<u>51</u>	ATE OF FLORIDA NOTIF		ITC	
	FOR NUCLEAR F	OWER PLAN	115	
	(Page	I OF I)		
		IS IS AN ACTUAL E		
1. A. Time/Date	(Initiated)			
C. Message I	Number:	D. From: L Co		
2. SITE: S	T. LUCIE UNIT 1 LI ST. LUCIE L	JNIT 2		
3. ACCIDENT CL.	ASSIFICATION			
Notification	n of Unusual Event	🔲 Site Area Emerg	ency	
L Alert		General Emerge	ncy	
4. CURRENT EM	ERGENCY DECLARATION Time:		Date:/	
5. INCIDENT DES	SCRIPTION OR UPDATE*			
			ontaminated	
6. INJURIES A.L	Contaminated			
7. RELEASE STA			ated dynation	
A. L. Nore	ease (Go to Item 11) C. L A Relea	ase is occurringexp	need duration	
B. L. Poten	tial (Possible) Release D. 🗖 A Relea	ase occurred, but sto		
8.** RELEASE RAT	E (calculated as per EPIP-09)			
A. 📙 NOBL	E GASES:	Curies per seco	nd 🛄 Measured	Default
	IES:	Curies per seco	nd 🛄 Measured 🛄	Default
C. 🔟 Relea	se within normal operating limits	. Kayalahla in 14	101 Co 197 oto)	
	EASE IS (Blanks are for specific rucide		astivo liquide	
A. LI Hadio	active gases			<u></u>
	DEESITE DOSE BATE (calculated as pe	D: Outon	·····	
DISTANCE	THYROID DOSE RATE (CDE) то	TAL DOSE RATE (TEDE	Ξ)
1 Mile (Site bo	undary)	mrem/hr mrem/hr		mrem/hr mrem/hr
5 Miles		mrem/hr		mrem/hr
10 Miles		mrem/hr		mrem/hr
A. Wind dire	ction (from) degrees	C. Wind speed		mph
B. Sectors a	ffected	D. Stability class	6	nent ()
	(from Attachment 4)		(IIOIII Attacili	
12. UTILITY RECO	MMENDED PROTECTIVE ACTIONS (from EPIP-02)		
A. L. Nore	commendations at this time.		use the word ALL und	der sectors.
B. L. Notify	the public to take the following protection	ve acuons:	L	
MILES NO A	CTION SHELTER/SECTORS	EVACUATE/SEC	CTORS	
02				
510				
		VES Time	Date [.]	
13. HAS EVENTE				
EC Approval:		1in 	ne:Date: ne:Date:	
14. MESSAGE RE	icable checklist (UE. ALERT, SITE ARE	A/GENERAL) and st	art from last completed s	
* If Emergency Class	escalation is known to be necessary, <u>T</u>	<u>hen</u> add, "A new not	fication form will be trans	smitted within
15 minutes; go to L	ne 14."			
This information ma	ay not be available on initial notifications			
	END OF AT	ACHMENT 2		

REGION II INITIAL LICENSE EXAMINATION ADMINISTRATIVE JOB PERFORMANCE MEASURE ST. LUCIE NUCLEAR PLANT

MAKE PROTECTIVE ACTION RECOMMENDATIONS (SRO)

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CANDIDATE _____

EXAMINER _____

REGION II INITIAL LICENSE EXAMINATION ADMINISTRATIVE JOB PERFORMANCE MEASURE ST LUCIE NUCLEAR PLANT

KA Statement: Knowledge of the Emergency Plan

KA #: K2.4.29 - 2.6 / 4.0

Facility JPM #: New

<u>Task Standard:</u> Make protective action recommendations based on a set of conditions.

Preferred Evaluation Location:

Simulator _____ Control Room __X NTC __X

Preferred Evaluation Method:

Perform X Simulate _____

References: EPIP-02, "Duties and Responsibilities of the Emergency Coordinator", Attachment 4, 5, 6

 Validation Time
 20 minutes

 Candidate:
 Time Start

 Name
 Time Finish

 Performance Rating:
 Sat
 Unsat

 Examiner:
 Signature:
 Name

Reference Material Needed:

EPIP-02, "Duties and Responsibilities of the Emergency Coordinator", Attachment 4, 5, 6.

Read to Candidate

Directions to candidate for Administrative JPMs:

I will explain the initial conditions and state the task to be performed. You will be allowed the use of any reference needed to complete the task. Ensure you indicate to me when you finish your assigned task by returning the material needed for the task that I provided you.

Initial Conditions: A General Emergency has been declared with the following plant conditions:

A large break LOCA in progress CET temperature is 600°F Wind direction is 146 degrees Wind speed is 15 mph. Chemistry reports offsite dose calculations as follows:

Distance	TEDE	CDE
1 mile	3500 mrem	13000 mrem
2 miles	1400 mrem	3000 mrem
5 miles	650 mrem	1100 mrem
10 miles	300 mrem	500 mrem

Initiating Cues: Make the appropriate Protective Action Recommendations for this event

Expected Response: 0-2 miles (Evacuate CR), 2-5 miles (Evacuate sectors PQRA and shelter remaining sectors), 5-10 miles (shelter sectors PQRA), 10 miles-TBD (None).

CANDIDATE CUE SHEET

(TO BE RETURNED TO THE EXAMINER UPON COMPLETION OF TASK)

Initial Conditions: A General Emergency has been declared with the following plant conditions:

A large break LOCA in progress CET temperature is 600°F Wind direction is 146 degrees Wind speed is 15 mph. Chemistry reports offsite dose calculations as follows:

Distance	TEDE	CDE	٦
1 mile	3500 mrem	13000 mrem	
2 miles	1400 mrem	3000 mrem	
5 miles	650 mrem	1100 mrem	
10 miles	300 mrem	500 mrem	

Initiating Cues:

Make the appropriate Protective Action Recommendations for this event

REVI	REVISION NO.: PROCEDURE TITLE:			PAGE:				
	4 DUTIES AND RESPONSIBILITIE			TIES OF	15 (05			
PRO	THE EMERGENCY COORDINA				NATOR	45 of 65		
			ST LUC					
		1		IENT 4				
	DETERMI	NATION OF SE	CTORS AF	ECTED AN	ID STABILITY C	LASS		
			(Page 1	of 1)				
А.	A. Affected Sectors							
	1 Using the guide below, determine the Affected Sectors and enter in							
	line	11B of the State	e Notification	form.				
			N	<u>DTE</u>		40.000		
	If the wir	nd direction is d	irectly on the	edge of two	o sectors (e.g., 1 to the Protective	1°, 33°, Action		
	Boomm	, an additional	Sector Should	be added	nd direction is from	om 78°.		
	then the	affected sector	s for the PAF	R should be	L, M, N and P.			
					<u> </u>			
) A ('	Affected	Wind	Affected	Wind	Affected		
	From	Sectors	From	Sectors	From	<u>Sectors</u>		
	348 - 11	HJK	123 - 146	PQR	236 - 258	CDE		
	11 - 33	JKL	146 - 168	QRA	258 - 281	DEF		
	33 - 56	KLM	168 - 191		303 - 326	FGH		
	56 - 78 78 - 101	MNP	213 - 236	BCD	326 - 348	GHJ		
	101 - 123	NPQ	there is no	O sector	there is no	I sector		
		<u></u>						
	Otobility C							
В.	Stability C	1855						
	1. Ente	er Delta-T (60 n	neter minus 1	0 meter ten	nperatures)	deg. F		
			مريم مالا مريناه	a halaw da	torming the Stah	ility Class		
1	2. Usin	ig Delta-1 (Δ 1)	D of the Stat	e below, de le Notificatio	iennine ine Stat	anty Oldss		
	anu							
		ΔΤ			Stability	Class		
		∆T less than or	equal to -1.7		A			
├	-1.7 le:	ss than ∆T less	han or equal	to -1.5	В			
	-1.5 le	ss than ∆T less	than or equal	to -1.4	C			
	-1 4 less than AT less than or equal to -0.5			D				
	-0.5 le:	ss than ∆T less t	han or equal t	to +1.4	E			
	+1.4 le	ss than ∆T less	than or equal	to +3.6	F			
		+3.6 less	than ∆T		G	i		
			<u> </u>					
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REVISION NO.:		.:		
4 PROCEDURE NO.:			THE EMERGENCY COORDINATOR	46 of 65
PROCEDURE NO.:				
	EPIP-0			
			ATTACHMENT 5	(m = m)
D	ETER	<u>/INA</u>	TION OF PROTECTIVE ACTION RECOMMENDATIONS	(PARs)
			(Page 1 of 6)	
А.	Guid Auth	elines orities	for Protective Action Recommendation (PARs) to Off-site	9
	1.	FPL with durin	is required to provide county and state governmental auth recommendations for protective action to be taken by the g radiological emergencies at the St. Lucie Nuclear Powe	norities public er Plant.
	2.	The i Emei Depa	responsible authorities are the State of Florida Division of rgency Management (DEM) and St. Lucie and Martin Cou artments of Public Safety.	unty
	3.	PAR: plant The	s should be made utilizing all of the available data. This conditions, off-site dose projections and/or field monitorin more conservative PARs should be made.	includes ng data.
	4.	Due recor and	to the large political and legal ramifications of these mmendations and the potential impact on FPL, the follow content should be used:	ing format
		a. 	If any case where a GENERAL EMERGENCY has been the minimum PAR shall be: Shelter all people within a 2 radius and out to 5 miles in the affected sectors. (Affecte are the downwind sector plus the two adjacent sectors, th total.)	declared, mile ed sectors nree in
		b.	If a GENERAL EMERGENCY has been declared due to physical control of the plant to intruders, including the Co Room or any other area(s) vital to the operation of the re system (as defined in the Security Plan), the minimum PA be: Evacuate all people within a 2 mile radius from the p out to 5 miles in the downwind sectors. Shelter all peopl remaining sectors from 2 to 5 miles and from 5 to 10 mile plant.	loss of ntrol actor AR shall plant and e in the es from the
		C.	If the emergency has not been classified as a GENERAL EMERGENCY and the offsite doses are LESS THAN 500 Total Dose (TEDE) and 1000 mrem Thyroid Dose (CDE) over the projected duration of the release, no protective a recommended. This should be reported to DEM and oth agencies who inquire as:) mrem at 1 mile action is er outside

				PAGE			
REV	ISION NO	D.:	PROCEDURE TILE:	i naz.			
4			DUTIES AND RESPONSIBILITIES OF				
PRO	CEDURE	NO.:		47 01 00			
EPIP-02 ST LUCIE			ST. LUCIE PLANT				
		02	ATTACHMENT 5	<u></u>			
D	ETER	MINA	TION OF PROTECTIVE ACTION RECOMMENDATIO	NS (PARs)			
=			(Page 2 of 6)				
	(1	-1)				
А.	(con	tinue	u)				
	4.	(cor	itinued)				
		0	(continued)				
		С.	(commed)				
			Based on our current assessment of all the information	n now			
			available to us, Florida Power & Light Company recom				
			You consider taking the following protective actions (in	e cannot now			
			say when it may change or what it may change to.				
В.	Determining Protective Action Recommendations (PARs)						
							
NOTE							
If a controlled release is necessary to stabilize plant conditions of an uncontrolled release is anticipated, determine the approximate source ter and duration of the release and the projected off-site doses prior to maki							
						and duration of the release and the projected on site doocd phor to matting any PARs.	
1 In determining PARs, both plant conditions AND off-site doses must be							
considered. However, if a release has not occurred, then determine							
PARs based on plant conditions.							
	•		De Deced on Plant Conditions				
	2.	PA	As Based on Plant Conditions				
		a.	Refer to Attachment 6, Protective Action Recommend	ations.			
h Basin with the Constal Emorgency question and proceed through							
		D.	the flowchart answering the questions at each prompt				
		C.	Upon completion of the flowchart, enter the PAR table determine the PAR for each downwind distance.	e and			
		d.	Enter PARs into Line 1 of the table in Section C below	w.			
		<i>ч</i> .					
1							

		and the second	PAGE:					
REVIS	SION NO.:		FAGE.					
4			48 of 65					
PROC	PROCEDURE NO.:							
E	EPIP-02 ST. LUCIE PLANT							
		ATTACHMENT 5						
DE	TERMINA	TION OF PROTECTIVE ACTION RECOMMENDATIONS	(PARs)					
-		(Page 3 of 6)						
В.	(continued	()						
		Design Design Dreightigen						
	3. PAH	s Based on Off-site Dose Projections						
		NOTE						
	For purp	oses of this procedure and when discussing dose calculat	tions, the					
	terms pr	ojected and forecasted can be, and are used, interchange	ably.					
	L							
	a.	Refer to Attachment 6, Protective Action Recommendation	าร.					
	h	PARs are based on the Thyroid Dose (line 7) and/or the	Fotal Dose					
	b. PARs are based on the Thyroid Dose (line 7) and/or the Total Dose (line 18) from the Dose Calculation Worksheet in EPIP-09, Off-Site							
	Dose Calculations. This same information is available, when using							
the Class A Model dose program, on the 10 Mile Standard Report								
in the Forecast Mode.								
c. For each downwind distance, enter the PAR table at the								
		appropriate dose level and determine the PAR for that dis	stance.					
	d	Enter PARs into Lines 2a and 2b of the table in Section C	C below.					
	u.							
1								

	NO :	PROCEDURE TITLE: PAGE:	_
EVISION	NU.: 1	DI ITIES AND RESPONSIBILITIES OF	
		THE EMERGENCY COORDINATOR 49 of	65
PROCEDORE NO.			
EPI	P-02		
DETE		ATTACHMENT 5 TION OF PROTECTIVE ACTION RECOMMENDATIONS (PARs)	
	NIVIINA	(Page 4 of 6)	
3. (c	ontinued	3)	
;·····			
A 22 is a fi fi	A release 22 degree 5 10,000 at 5 miles projected ollowing	e has occurred at the St. Lucie Plant. The wind direction is from es and the projected off-site integrated (2 hr) Thyroid Dose (CDE) mrem at 1 mile, 2000 mrem at 2 miles and less than 1000 mrem s. The plant is in a GENERAL EMERGENCY with no actual or I core damage and no loss of physical control of the plant. The PAR should be made:	
E F f	Based or Florida P following	n our current assessment of all the information now available to us, Power & Light Company recommends that you consider taking the protective actions:	
i. i.	. Evacu i. Shelta in sec ii. No pr from t	uate all people between a 0 and 2 mile radius from the plant. er all people between a 2 and 5 mile radius from the plant who are ctors J, K and L. rotective action is recommended between a 5 and 10 mile radius the plant.	<u>.</u>
-	This reco when it r	ommendation may change in the future, but we cannot now say may change or what it may change to.	
¶ ₁₂ 4	. PAP	s Based on Field Monitoring Data	
	a.	Refer to Attachment 6, Protective Action Recommendations.	
	b.	PARs are based on Thyroid Dose Rate and/or the Total Dose Rate measured in the field. Field monitoring dose rates need to be multiplied times the expected duration of the release (default value is 2 hours) in order to determine projected doses.	e
		 Thyroid Dose (CDE) = Field measured thyroid dose rate x expected duration of release. 	
		 Total Dose Rate (TEDE) = Field measured Deep Dose Equivalent (DDE) + (0.04 x Thyroid Dose (CDE)). 	

				DAGE.				
REVI	SION NC	D.:	PROCEDURE TITLE:	PAGE:				
	4 DUTIES AND RESPONSIBILITIES OF			50 of 05				
PROC	PROCEDURE NO.: THE EMERGENCY COORDINATOR		50 01 65					
		00						
<u> </u>								
				(PARs)				
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			(1 490 0 01 0)					
В.	(con	tinued)					
	4.	(cont	inued)					
		c. F a t c t	Field monitoring results from near site sample locations nadjusted/extrapolated to the 1 mile distance. Sample resubetween 1 to 2 miles need to be adjusted/extrapolated to distance and results between 2 to 5 miles adjusted/extrapolated he 5 mile distance.	eed to be ults the 2 mile olated to				
	d. For each downwind distance, enter the PAR table at the appropriate dose level and determine the PAR for that distance.							
	<u>CAUTION</u> Do NOT mix doses based on dose calculations with doses based on field measurements when determining PARs.							
	5.	Whe shou exist <u>Ther</u> appr	n available, both plume calculations and off-site monitorin Id be evaluated when making PARs. <u>If</u> significant discre between field monitoring results and plume dispersion can an evaluation of the discrepancy should be made, and to opriate value should be selected in the determination of t	ng results pancies alculations, he PARs.				
	6.	PAR Vol.	s have been developed based on guidance in NUREG/B 1 and EPA 400-R-92-001.	R-0150,				
				/R4				

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REVISION N	0.:	PROCEDURE IIILE:			FAGE.
4		DUTIES AND	RESPONSIBILI		Et of GE
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EPIP-	02	ST. I	LUCIE PLANT		
		ATTA	CHMENT 5		
DETER		TION OF PROTECTIVE	ACTION RECO	MMENDATIONS	<u>S (PARs)</u>
		(Pag	e 6 of 6)		
C. Prot	ective	Action Recommendatio	ns (PAHs)		
			NOTE		
Ac	tual PA	ARs shall be the most o	onservative PAF	Rs based on plan	t
CO	ndition	s or off-site doses.			
بير يكا					
1.	Com	plete the table below:			
					8 11
	Step	1. Determine PARs ba	sed on Attachm	ent 6, Protective	Action
		Recommendations,	and enter into II	ne I.	
	Ctor	0 Determine BARs ba	cod on Attachm	ont 6 Protective	Action
	Step	2. Determine PARS Da	and enter into li	nes 2a and 2b	Addon
		necommendations,	and enter into it		
	<u></u>		Distance	From Plant/Recor	nmendation
Protec	tive Act	tion Recommendations	0 - 2 Mile	2 - 5 Mile	5 - 10 Mile
Line 1	Plant	Conditions			
Line 2a	Total	Dose (TEDE)	· · · · · · · · · · · · · · · · · · ·		
Line 2h	Thur	vid Dose (CDE)			
Line 20.	illyic			<u> </u>	<u> </u>
2	Choo	ose the most conservati	ve PARs and re	cord in Section 1	2 of the
L .	State	of Florida Notification	Message Form.		
	0		U U		

END OF ATTACHMENT 5



END OF ATTACHMENT 6





RPS JPM-012 SET-UP INSTRUCTIONS

PREPARATION:

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Ahead of time, prepare a full RPS Logic Matrix Procedure with sections 7.1 thru 7.4 all signed off. Ensure copy of Appendix A is included and have extra copies of section 7.5 AB matrix ready for replacement maintenance of the book.

- 1. INSTALL IC-1 (100% Power, MOL Steady State)
- 2. Turn ON RPS Testing Power Supply
- 3. ENSURE all RPS Test switches are in the OFF position
- 4. EXECUTE JPM SCENARIO
- 5. TRIGGER JPM-012 Lesson Step
- 6. VERIFY TCB-01 breaker is red box failed as is.

REGION II INITIAL LICENSE EXAMINATION JOB PERFORMANCE MEASURE ST. LUCIE NUCLEAR PLANT

PERFORM RPS LOGIC MATRIX TEST UNIT 2

CANDIDATE

EXAMINER

REGION II INITIAL LICENSE EXAMINATION JOB PERFORMANCE MEASURE ST LUCIE NUCLEAR PLANT

Task: Monitor the RPS

Alternate Path: Yes X No _____

Facility JPM #: 0821103 / modified

Task Standard: Perform an RPS Logic Matrix test Unit 2

Preferred Evaluation Location:

Simulator X Control Room In-Plant

Preferred Evaluation Method:

Perform X Simulate _____

References: 2-OSP-62.02 RPS LOGIC MATRIX TEST, Revision 1

Validation Time 15 minutes Time Critical No

Candidate:	Name	Time Start Time Finish	
Performance Rating: Sat	Unsat		
Examiner:	Signa	ture:	
Toolo/Equipmont/ Procedu	ros Noodod:		

2-OSP-62.02 RPS LOGIC MATRIX TEST

Read to Candidate

Directions to candidate for In-Plant or Control Room JPMs:

I will explain the initial conditions and state the task to be performed. All in-plant or control room JPM steps, including any communications, shall be simulated for this JPM. Under no circumstances, unless directed by the examiner, are you to operate any plant equipment. I will provide initiating cues and reports on other actions when directed by you. Ensure you indicate to me when you finish your assigned task by returning the handout sheet I provided you.

Directions to candidate for Simulator JPMs:

I will explain the initial conditions and state the task to be performed. All simulator JPM steps, including any communications, shall be performed for this JPM. You are you to operate any plant equipment that is necessary for the completion of this JPM. The simulator will provide the cues as you perform this JPM. Ensure you indicate to me when you finish your assigned task by returning the handout sheet I provided you.

Initial Conditions:	The Unit is operating at full power and the periodic surveillance of
	the RPS is being performed.

- Sections 7.1, 7.2, 7.3 and 7. 4 of the test have been already been satisfactorily completed.
- Limits and Precautions section has been reviewed and all requirements for the test have been set ready. Shift Briefing Appendix A is available for review if desired.
- System Alignment for Testing (7.1) has been completed and the RPS Test Power Supply is energized.

Initiating Cues:

The ANPS has directed you to complete the Two-Out-Of-Four Logic Matrix Tests IAW 2-OSP-62.02 RPS LOGIC MATRIX TEST. For the purpose of this JPM, the 'Two Man Rule' will **NOT** be performed during this evolution.

Start Time

Standard: Operator may wish to review the Limits-Precautions and Test Alignment and Shift Breifing Appendix-A prior to beginning the test. (This is an acceptable candidate option) Sat _ Unsat Cue: (RPS panel A) Section 4.0 Precautions/Limits and Section 7.1 System Alignment for Testing of the RPS test procedure are complete. Unsat Comments: Step 2: Depress and hold the AB Matrix Relay Hold pushbutton and verify that the four Hold lights are lit. (step 7.4.3A) Critical Sat _ Standard: Operator depresses and holds the Matrix Relay Hold pushbutton, observes the four hold lights to be illuminated Unsat Cue: (RPS panel A) Matrix Relay Hold pushbutton depressed and held, four hold lights illuminated* Unsat Step 3: Place the AB Channel Trip Select switch in position 1 and verify ALL four white AB Matrix Relay lights are NOT_LIT (step 7.4.3C) Critical Sat _	
Cue: (RPS panel A) Section 4.0 Precautions/Limits and Section 7.1 System Alignment for Testing of the RPS test procedure are complete. Comments:	
Comments: Step 2: Depress and hold the AB Matrix Relay Hold pushbutton and verify that the four Hold lights are lit. (step 7.4.3A) Critical Sat	
Step 2: Depress and hold the AB Matrix Relay Hold pushbutton and verify that the four Hold lights are lit. (step 7.4.3A) Critical Sat _ Standard: Operator depresses and holds the Matrix Relay Hold pushbutton, observes the four hold lights to be illuminated Unsat <u>Cue:</u> (RPS panel A) Matrix Relay Hold pushbutton depressed and held, four hold lights illuminated* Unsat <u>Comments:</u> * If JPM is performed on the simulator, cues will not be verbalized by the examiner, but will be used to verify the JPM is being performed correctly. Critical Step 3: Place the AB Channel Trip Select switch in position 1 and verify ALL four white AB Matrix Relay lights are NOT_LIT (step 7.4.3C) Critical Sat _ Standard: Operator places the Channel Trip select switch to position 1, verifies Sat _	
Standard: Operator depresses and holds the Matrix Relay Hold pushbutton, observes the four hold lights to be illuminated Unsat Cue: (RPS panel A) Matrix Relay Hold pushbutton depressed and held, four hold lights illuminated* Comments: * If JPM is performed on the simulator, cues will not be verbalized by the examiner, but will be used to verify the JPM is being performed correctly. Critica Step 3: Place the AB Channel Trip Select switch in position 1 and verify ALL four white AB Matrix Relay lights are NOT,LIT (step 7.4.3C) Critica Standard: Operator places the Channel Trip select switch to position 1, verifies Sat _	Step
Cue: (RPS panel A) Matrix Relay Hold pushbutton depressed and held, four hold lights illuminated* Comments: * If JPM is performed on the simulator, cues will not be verbalized by the examiner, but will be used to verify the JPM is being performed correctly. Step 3: Place the AB Channel Trip Select switch in position 1 and verify ALL four white AB Matrix Relay lights are NOT_LIT (step 7.4.3C) Critica Sat _ Standard: Operator places the Channel Trip select switch to position 1, verifies Sat _	
<u>Comments:</u> * If JPM is performed on the simulator, cues will not be verbalized by the examiner, but will be used to verify the JPM is being performed correctly. <u>Step 3:</u> Place the AB Channel Trip Select switch in position 1 and verify ALL four white AB Matrix Relay lights are NOT_LIT (step 7.4.3C) Critica Standard: Operator places the Channel Trip select switch to position 1, verifies Sat _	
 * If JPM is performed on the simulator, cues will not be verbalized by the examiner, but will be used to verify the JPM is being performed correctly. <u>Step 3:</u> Place the AB Channel Trip Select switch in position 1 and verify ALL four white AB Matrix Relay lights are NOT_LIT (step 7.4.3C) <u>Standard:</u> Operator places the Channel Trip select switch to position 1, verifies 	
Step 3:Place the AB Channel Trip Select switch in position 1 and verify ALL four white AB Matrix Relay lights are NOT_LIT (step 7.4.3C)Critica Sat _Standard:Operator places the Channel Trip select switch to position 1, verifiesSat _	
<u>Standard:</u> Operator places the Channel Trip select switch to position 1, verifies	l Step
the four AB Matrix Relay lights are OFF Unsa	t
<u>Cue:</u> (RPS panel A) Channel Trip select switch to position 1, all four white AB Matrix Relay lights not illuminated*	
Comments:	

<u>Step 4:</u>	Place the AB Matrix Relay Trip Select switch to position 1 and verify the following lights change status: (step 7.4.3D) AB1 : Hold, NOT LIT Drop out, LIT, RPS TRIP STATUS PANEL :K1 Relay NOT LIT, TCB-1 & TCB-5 Position, OPEN, Left Side Phase Current: LIT	Sat Unsat
<u>Standard</u>	Operator places the AB Matrix Relay Trip select switch to position 1 and observes the following: AB1: Hold, NOT LIT Drop out, LIT RPS TRIP STATUS PANEL: K1 Relay, NOT LIT TCB-1, CLOSED TCB-5, OPEN Left Side Phase Current: LIT	
<u>Cue:</u>	(RPS panel A) AB1 : Hold, NOT LIT Drop out, LIT RPS TRIP STATUS PANEL : K1 Relay, NOT LIT TCB-1, CLOSED TCB-5, OPEN Left Side Phase Current: LIT	
<u>Commen</u>	<u>ts:</u>	
* If JPM is examiner	s performed on the simulator, cues will not be verbalized by the , but will be used to verify the JPM is being performed correctly.	
Step 5:	Back out of the RPS logic Matrix test by performing the following:	Critical Step
	Rotate the channel trip select switch to the OFF position (Appendix-A, Shift Brief; Step 1.E.2.a Safe Condition 3-steps.)	Sat
Standard	Rotate the channel trip select switch to the OFF position (Appendix-A, Shift Brief; Step 1.E.2.a Safe Condition 3-steps.) Operator rotates the channel trip select switch to the OFF position	Sat Unsat
Standard	Rotate the channel trip select switch to the OFF position (Appendix-A, Shift Brief; Step 1.E.2.a Safe Condition 3-steps.) Operator rotates the channel trip select switch to the OFF position (RPS panel A) Channel trip select switch in OFF*	Sat Unsat

Step 6: Standard: Cue: Comments	Slowly release the Matrix Hold pushbutton (Appendix-A, Shift Brief; Step 1.E.2.a Safe Condition 3-steps.) Operator releases the Matrix Hold pushbutton (RPS panel A) Matrix Hold pushbutton released*	Critical Step Sat Unsat
<u>Step 7:</u> <u>Standard:</u>	Rotate the Matrix Relay Trip select switch to the OFF position (Appendix-A, Shift Brief; Step 1.E.2.a Safe Condition 3-steps.) Operator rotates the Matrix Relay Trip select switch to the OFF position	Critical Step Sat Unsat
Cue: Comment	(RPS panel A) Matrix Relay Trip select switch in OFF* <u>s:</u> s performed on the simulator, cues will not be verbalized by the but will be used to verify the JPM is being performed correctly.	

Stop Time _____

CANDIDATE CUE SHEET

(TO BE RETURNED TO THE EXAMINER UPON COMPLETION OF TASK)

Initial Conditions: The Unit is operating at full power and the periodic surveillance of the RPS is being performed.

- Sections 7.1, 7.2, 7.3 and 7. 4 of the test have been already been satisfactorily completed.
- Limits and Precautions section has been reviewed and all requirements for the test have been set ready. Shift Briefing Appendix A is available for review if desired.
- System Alignment for Testing (7.1) has been completed and the RPS Test Power Supply is energized.

Initiating Cues: The ANPS has directed you to complete the Two-Out-Of-Four Logic Matrix Tests IAW 2-OSP-62.02 RPS LOGIC MATRIX TEST. For the purpose of this JPM, the 'Two Man Rule' will **NOT** be performed during this evolution.



ST. LUCIE UNIT 2

OPERATIONS SURVEILLANCE PROCEDURE

2-OSP-62.02

Current Revision No. 1

11/05/99

Effective Date

SAFETY RELATED

Title:

RPS LOGIC MATRIX TEST

Responsible Department: OPERATIONS

REVISION SUMMARY:

REVISION 1 - THIS PROCEUDRE HAS BEEN COMPLETELY REWRITTEN. Modified and incorporated TC #99-141 and first time use comments for improvement, checked the TCB armature in the UP position during two out of four logic matrix tests while the Matrix relay trip select switch is in a numbered position, added steps to RTGB Manual Trip Pushbutton Operability Test, and added light color to tables for the HOLD and DROP OUT lights. Also added color to the Trip Unit lights for human factors. (Bill Scott, 10/28/99)

REVISION 0 – Previously issued as OP 2-1400059. This procedure provides instructions for the periodic checks of the Reactor Protection System (RPS) circuitry to satisfy Technical Specification Surveillance Requirements 4.3.1.1.1, Table 4.3-1 items 1, 11 and 12. (Bill Scott, 10/05/99)

Appucance Paces only (105 pps)

Revision	FRG Review Date	Approved By	Approval Date	DATE S	2_OPS
	10/03/33	Plant General Manager		DOCT	PROCEDURE
Revision	FRG Review Date	Approved By	Approval Date	DOCN	2-OSP-62.02
1	10/28/99	R. G. West	10/28/99	SYS	
		Plant General Manager		СОМ	COMPLETED
		N/A	•	ITM	1
		Designated Approver	, <u>,,,,</u>		

2-OSP <u>S</u> 1.0 P 2.0 F 3.0 F 3.0 F 3.0 F 3.0 A 7.0 II	P-62.02 <u>SECTION</u> PURPOS REFERE PREREG PRECAU RECORE ACCEPT	ST. LUCIE UNIT 2 TABLE OF CONTENTS	<u>PAGE</u> 3 4 6 6 7		
<u>S</u> 1.0 F 2.0 F 3.0 F 5.0 F 5.0 F 3.0 A 7.0 II	SECTION PURPOS REFERE PREREC PRECAU RECORE	TABLE OF CONTENTS	<u>PAGE</u> 3 4 6 6 7		
1.0 F 2.0 F 3.0 F 4.0 F 5.0 F 3.0 A 7.0 II	PURPOS REFERE PREREG PRECAU RECORE	SE NCES UISITES TIONS / LIMITATIONS S REQUIRED	3 		
2.0 F 3.0 F 4.0 P 5.0 F 3.0 A 7.0 II	REFERE PREREC PRECAU RECORE	NCES UISITES TIONS / LIMITATIONS S REQUIRED	4 6 6 		
3.0 F 4.0 P 5.0 F 3.0 A 7.0 II	PREREG PRECAU RECORE ACCEPT	UISITES TIONS / LIMITATIONS S REQUIRED	6 6 7		
4.0 F 5.0 F 3.0 A 7.0 II	PRECAU RECORE ACCEPT	TIONS / LIMITATIONS	6 7		
5.0 F 3.0 A 7.0 II	RECORE	S REQUIRED	7		
5.0 A 7.0 II	ACCEPT				
7.0 II		ACCEPTANCE CRITERIA7			
	INSTRUCTIONS8				
7 7 7 7 7 7 7 7 7 7 7 7 7	7.1 Sy 7.2 Tri 7.3 Ve 7.4 Ve 7.5 Tw 7.6 Tw 7.6 Tw 7.7 Tw 7.8 Tw 7.9 Tw 7.10 Tw 7.10 Tw 7.11 RT 7.12 Sy	stem Alignment For Testing p Matrix Fuse Test rification Of Matrix Relay Hold Coils orification Of Bistable Trip Unit Test Coils vo-Out-Of-Four Logic AB Matrix Test vo-Out-Of-Four Logic BC Matrix Test vo-Out-Of-Four Logic CD Matrix Test vo-Out-Of-Four Logic CD Matrix Test vo-Out-Of-Four Logic CD Matrix Test vo-Out-Of-Four Logic AD Matrix Test			
A	APPENDICES				
APPENDIX A		SHIFT BRIEFING FOR RPS LOGIC MATRIX TEST	90		
APPENDIX B		K-RELAY TRIP PATH TEST	94		
APPENDIX C		REACTOR TRIP PUSHBUTTON CONTACTS TEST	100		

REVISI	ON NO.:	PROCEDURE TITLE:	PAGE:		
		RPS LOGIC MATRIX TEST	6 of 105		
2-OSP-62.02		ST. LUCIE UNIT 2			
3.0	PREREG	UISITES	INITIA		
3.1	The Steam Generator levels shall be greater than the Low RPS S/G Level trip set point.				
3.2	If performing Trip Relay contact testing, <u>Then</u> I&C Maintenance is available with test equipment for performing K-Relay testing.				
3.3	If applica	ble, System Load Dispatcher has been notified.	ANPS		
4.0	PRECAUTIONS / LIMITATIONS				
4.1	When TCBs are opened, the breaker armature shall be verified in the closed air gap (down) position prior to reclosing the TCBs. These may be manually assisted if necessary.				
4.2	TCB-9 shall be closed before beginning this test to ensure synchronizing capabilities exist.				
4.3	Failure to allow at least a five-second-time delay between opening and closing TCBs may result in breaker damage. This time delay allows the breaker to attain equilibrium conditions prior to operating in the opposite direction and reduces heating effects on the breaker internals.				
4.4	During low mode operation (Modes 3, 4 and 5), this surveillance is a prerequisite for other testing procedures. Due to low RCS pressure and flow, TCBs will NOT close unless the following keylock bypass switches are bypassed:				
	• Ze	ero Power Mode.			
	• Lo	w SG Pressure.			
4.5	Trip Relay contact testing is only required to be performed on one logic matrix on an 18 month frequency or for PMT on trip relay replacement.				
4.6	It is the expectation of St. Lucie Plant Management that the Control Room staff will utilize the Two-Man rule while performing the testing sections of this procedure. In this process, one licensed operator reads the procedural step and a second licensed operator performs the action. The reader then verifies the correct performance and signs for the step.				
REVISI	ON NO.:	PROCEDURE TITLE:	PAGE:		
--------	---------------------------	---	---------------------------------		
PROCE		RPS LOGIC MATRIX TEST	7 of 105		
2-0	SP-62.02	ST. LUCIE UNIT 2			
5.0	RECORD	DS REQUIRED			
5.1	RCO Chr	onological Log entries.			
5.2	Complete accordan	ed sections of this procedure shall be processed as QA ce with QI-17-PSL-1, Quality Assurance Records.	records in		
5.3	Complete accordan	ed appendices of this procedure shall be processed as ce with QI-17-PSL-1, Quality Assurance Records.	QA records in		
6.0	ACCEPT	ANCE CRITERIA			
6.1	Verification Select sw	on Of Matrix Relay Hold Coils is satisfactory if for each vitch position, all Matrix Relay Hold lights responded as	Matrix Relay Trip indicated.		
6.2	Verification Select sw	on Of Bistable Trip Unit Test Coils is satisfactory if for e vitch position, all Trip Unit lights responded as indicated	ach Channel Trip		
6.3	The Two- indicated	Out-Of-Four Logic Matrix Test is satisfactory all actions	responded as		
6.4	The Trip each RPS	Matrix Fuse Test is satisfactory if all actions responded S Trip Matrix.	as indicated for		
6.5	The RTG responde	B Manual Trip Pushbutton Operability Test is satisfactored as indicated for each Reactor Trip Channel TCB push	ry if all actions hbutton.		

	1		RPS	LOGIC MA	TRIX TEST	Г		-6 105
PROCE	EDURE N	0.:					8	01 105
2-C	SP-62	2.02		ST. LUCIE	UNIT 2			
7.0	INS	TRUC	TIONS					INITIA
74	Curch	a A	lianment For Test	ina				
1.1	Syst	em A	ligititent for rest	ing			<u>_</u>	
			This section d	<u>NO1</u> loes NOT re	E quire the ty	vo-man rule)	
	1.	EN Ap	ISURE a shift brie pendix A, Shift Bri	fing has bee efing For RI	en conducte PS Logic M	ed in accord atrix Test.	lance with	
	2.	<u>If</u> T see Ch se	CBs are NOT CL ctions of OP 2-121 annels Functional ven days.	OSED, <u>Ther</u> 10051, Wide Test, have	ENSURE Range Nu been comp	that ALL a clear Instru leted withir	pplicable mentation a the last	
		Da	te last performed:	//	, 			
	3.	<u>If</u> T co	CBs are required nditions exist:	to be closed	d <u>and</u> EITH	ER of the f	ollowing	
		٠	RCS pressure	e is less thar	n the RPS T	ſMLP trip s	etpoint,	
		•	Less than fou	r RCPs are	running,			
		<u>Th</u> ke	en PLACE ALL of y-switches to the E	f the followir 3YPASS po	ng Zero Pov sition:	wer Mode T	rip Bypass	
	Г	<u> </u>			RPS P	ANELS		
		sw	ITCH POSITION	MA	MB	MC	MD	INITIAL
				Key 115	Key 116	Key 117	Key 118	
		E	BYPASS (V)					
	4.	<u>If</u> is Pr	TCBs are required less than 600 psia essure Trip Bypas	to be close , <u>Then</u> PLA s key-switch	d <u>and</u> Stea CE ALL of nes to the E	m Generato the followin 3YPASS po	or pressure g Low SG sition:	
	Γ				RPS P	ANELS		
		SW	ITCH POSITION	MA	MB	MC	MD	INITIAL
				Key 119	Key 120	Key 121	Key 122	
		· • •	BYPASS (🖌)					

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DEVICIO	ON NO		COUDE TITLE.					PAGE	
REVISIO		Phot				TEOT		IT AGE.	
	1		Kh	'S LUGIC	MATRIX	IESI		9	of 105
PROCE	DURE	NO.:							
2-0	SP-6	52.02		ST. LUC		2			
7.1	Sy	stem Alignr	nent For Te	sting (con	tinued)				INITIA
	5.	VERIF	Y ALL TCB	s (TCB-1 t	hrough T	CB-9) ar	e CLOSE	D.	
		• [I <u>f</u> ALL TCB: 2-NOP-66.0	s are NOT 1, CEDM	CLOSEI MG Set (D, <u>Then</u> I Dperatior	REFER T 1.	0	
	6.	ENSUF are in t	RE ALL of the OFF pos	he followir sition:	ng Matrix	Relay T	rip Select	switches	
	Γ	SWITCH	1	MATRIX R	ELAY TRI	SELEC	T SWITC⊦	IES	
		POSITIO	N AB	BC	BD	AC	CD	AD	
	ŀ		<u> </u>						
	ſ	SWITCH		CHANN	EL TRIP S	SELECT S	WITCHE	<u> </u>	
		SWITCH POSITION	N AB	CHANN BC	EL TRIP S	SELECT S		S AD	
		SWITCH POSITION OFF (N AB	CHANN BC	EL TRIP S BD	SELECT S		AD	- INITIAI
	8.	SWITCH POSITION OFF (N AB	CHANN BC DC Power owing pane	EL TRIP S BD Supply r els:	ELECT S	GWITCHES	AD AD hts each)	- INITIAL
	8.	SWITCH POSITION OFF (N AB	CHANN BC DC Power owing pane	EL TRIP S BD Supply r els:	ELECT S	GWITCHES	S AD hts each)	
	8.	SWITCH POSITION OFF (V ENSUF are LIT LIC PS-1 P	N AB AB AB AB AB AB AB AB AB AB AB AB AB A	CHANN BC DC Power owing pane	EL TRIP S BD Supply r els:	ELECT S	GWITCHES CD (three lig ELS MC	AD AD hts each)	
	8.	SWITCH POSITION OFF (ENSUF are LIT LIC PS-1, P	AB AB AB AB AB AB AB AB AB AB AB AB AB A	CHANN BC DC Power owing pane MA	EL TRIP S BD Supply r els: F	ELECT S AC ed lights RPS PAN B	SWITCHES CD (three lig ELS MC	AD hts each)	
	8. 9.	SWITCH POSITION OFF (ENSUF are LIT LIC PS-1, P LIT ENSUF LIT on	AB AB AB AB AB AB AB AB AB AB AB AB AB A	CHANN BC DC Power owing pane MA Trip Units g panels:	EL TRIP S BD Supply r els: F M red lights	AC AC ed lights RPS PAN B (three li	GWITCHES CD (three lig ELS MC	AD hts each) MD	
	8. 9.	SWITCH POSITION OFF (ENSUF are LIT LIC PS-1, P LIT ENSUF LIT on	AB AB AB AB AB AB AB AB AB AB AB AB AB A	CHANN BC DC Power owing pane MA Trip Units g panels:	EL TRIP S BD Supply r els: F M red lights	AC AC ed lights RPS PAN B (three li	SWITCHES CD (three lig ELS MC ghts each ELS	AD hts each) MD	
	8. 9.	SWITCH POSITION OFF (ENSUF are LIT LIC PS-1, P LIT ENSUF LIT on TRIP	N AB AB AB AB AB AB AB AB AB AB	CHANN BC DC Power owing pane MA Trip Units g panels: MA	EL TRIP S BD Supply r els: F M red lights F M M	AC AC ed lights RPS PAN B (three li RPS PAN B	SWITCHES CD (three lig ELS MC ghts each ELS MC	S AD hts each) MD) are NO ⁻	- INITIAL - INITIAL - INITIAL

REVISION NO).:	PROCEDU	JRE TITLE:					PAGE:	
1			RP	S LOGIC	MATRIX	TEST		1) of 105
PROCEDURE	NO.:								
2-0SP-6	52.02			ST. LUC	CIE UNIT	2			
7.1 Sy	stem A	lignmer	nt For Tes	sting (con	tinued)				<u>INITIAL</u>
10.	. VE LIT	RIFY A F:	LL four v	vhite Matr	ix Relay I	ights for	each RPS	S Matrix	are
[MA	TRIX		RPS	MATRIX F	RELAY LIC	GHTS		
	LIC	ЭНТ	AB	BC	BD	AC	CD	AD	
	LIT	(🗸)							
11.	• . EN	<u>lf</u> A the IERGIZ	.NY of the bulbs ha E the Tes	e white Ma ve been c st Power S	atrix Relay checked, <u>-</u> Supply, as	y Lights a <u>Then</u> NOT s follows:	re NOT L ⊓FY ICM.	IT <u>and</u>	
	Α.	DE	PRESS tl	ne Test P	ower pus	nbutton.			<u> </u>
	В.	VE	RIFY the	following	light INDI	CATION:			

TEST POWER SUPPLY LIGHTS	CONDITION	INITIAL
TEST POWER	LIT	
Left GND DET	LIT	
Right GND DET	LIT	

END OF SECTION 7.1

REVISI	ON NO.:		PROCEDURE TITL	.E:					PAGE:	·
	1			RPS LC	DGIC MA	TR	IX TEST	-		
PROCE	DURE NO	.:					_		34	l of 105
2-0	SP-62.0	02		ST	. LUCIE	UN	IT 2			
7.5	Two-0	 Out-(Of-Four Logic	: AB Ma	trix Test	(co	ntinued)		I	INITIAL
	-	,	. N	,		•	,			
	3.	(CO	ntinued)							
		D.	PLACE the Position 1	ne AB M I <u>and</u> VI	latrix Rel ERIFY the	lay e fc	Trip Sel Ilowing	ect switch t lights chan	o ge status:	
			<u></u>				AB MA		S	
			LIGHTS	5	AB	1	AB2	AB3	AB4	
			HOLD (re	ed)	NOT	LIT				
			DROP OUT (green)	LIT	•				
			LIC	GHTS			RPS]	TRIP STATU	JS PANEL	
			K-1	RELAY				NOT LIT		
		<u> </u>	TCB-1 & TC	B-5 PO	SITION			OPEN		<u> </u>
			LEFT SIDE PI	HASE CI	URRENT	[
		C	ONDITION			LO	CAL AT	TCBs	·····	INITIAL
			TCB-1		OPEN	& A	rmature	in UP positio	on	
			TCB-5		OPEN	<u>& A</u>	rmature	in UP positio	on	
		E.	<u>If</u> Trip Pat by ICM, <u>T</u> Test.	h Relay <u>hen</u> PE	v K-1 con RFORM	taci Apj	s testing pendix B	g is to be co 8, K-Relay ⁻	onducted Frip Path	
		F.	PLACE th MID-Posit VERIFY ti	ie AB M tion Betw he follow	atrix Rel ween Pos wing:	ay sitic	Trip Sele on 1 and	ect switch t Position 2	o the <u>and</u>	
						A	B MATRI	X LIGH T S		
					AB1		AB2	AB3	AB4	
			HOLD (red)	2	LIT		LIT	LIT	LIT	
		D	ROP OUT (gre	en) I	NOT LIT	N	OT LIT	NOT LIT	NOT LIT	
		-	LIC	GHTS			RPS T	RIP STATU	S PANEL	INITIAL
			K-1	RELAY				LIT	· · · · · · · · · · · · · · · · · · ·	
			TCB-9	POSITIC)N			CLOSED		
		C				LO	CAL AT	TCBs		INITIAL
			TCB-1		Arma	ture	e in DOW	/N position		
			TCB-5		Arma	iture	in DOW	/N position		

REVIOR			PBOCEDUBE TITLE				PAGE:	
		ļ	RPS I		BIX TEST			
20005							35	of 105
PROUE	DUREINC							
2-0	SP-62.	.02	3					<u> </u>
7.5	Two-	Out-	Of-Four Logic AB M	atrix Test (continued)			<u>INITIAL</u>
	3.	(C(ontinued)					
		G.	CLOSE BOTH ⁻ Breaker Reset s	TCB-1 <u>and</u> switch to RI	TCB-5 by tu ESET <u>and</u> V	irning the T ERIFY the	rip Circuit following:	t
		[LIGHTS		RPS TF	RIP STATUS	PANEL	INITIAL
		-	TCB-1 POSIT	 10N		CLOSED		
l		-	TCB-5 POSIT			CLOSED		
			LEFT SIDE PHASE	CURRENT		NOT LIT		
			CONDITIO	<u>N</u>	L(<u>,DS</u>	
			TCB-1 POSIT	<u>'ION</u>				<u> </u>
		L	1CB-2 5020					
		Γ			AB MATRI			
			LIGHTS	AB1	AB2	AB3	AB4	
			HOLD (red)		NOT LIT			
			DROP OUT (green)		LIT			
		r				PSTATUS		
		⊢				F SIAIUU	PANEI	
						NOTLIT	PANEL	INITIA
				SITION			PANEL	INITIA
		-	TCB-2 & TCB-6 PO			NOT LIT OPEN LIT	PANEL	
			TCB-2 & TCB-6 PO LEFT SIDE PHASE C	SITION URRENT		NOT LIT OPEN LIT	PANEL	
			TCB-2 & TCB-6 PO LEFT SIDE PHASE C	SITION CURRENT	LOCAL	NOT LIT OPEN LIT		
			TCB-2 & TCB-6 PO LEFT SIDE PHASE C CONDITION TCB-2	OPEN	LOCAL A	NOT LIT OPEN LIT AT TCBs in the UP pe	osition	INITIA INITIA
			CONDITION TCB-2 CONDITION TCB-2 TCB-6	OPEN	LOCAL A V & Armature V & Armature	NOT LIT OPEN LIT AT TCBs in the UP pe in the UP pe	osition	INITIAI

HE VIOR	ON NO.:		PROCEDURE TITLE:		······································		PAGE:	
	1		RPS L		RIX TEST		36	of 105
PROCE	DURE NO	.:	İ					01 100
2-0	SP-62.	02	S	T. LUCIE U	JNIT 2			
7.5	Two-(Out-	Of-Four Logic AB N	latrix Test (continued)			INITIAL
	3.	(cc	ontinued)					
		J.	PLACE the AB MID-Position B- VERIFY the foll	Matrix Rel etween Pos lowing:	ay Trip Sele sition 2 and	ect switch to Position 3	o the <u>and</u>	
					AB MATR	X LIGHTS		
			LIGHTS	AB1	AB2	AB3	AB4	
			HOLD (red)	LIT	LIT	LIT	LIT	
		- [DROP OUT (green)	NOT LIT	NOT LIT	NOT LIT	NOT LIT	
				D			=1	INITIAI
					<u>-3 mir 31</u>			
		-				SED		
		L	TCB-9 POSITION		020			
		Г	CONDITION		LOCAL	AT TCBs		INITIAL
		-	TCB-2	Arn	nature in the	DOWN pos	ition	
			TCB-6	Arn	nature in the	DOWN pos	ition	
		к.	CLOSE BOTH Circuit Breaker following:	TCB-2 <u>anc</u> Reset swit	TCB-6 by ch to RESE	turning the	Trip RIFY the	
							5 PANEL	
			TCB-2 POSI1					
		L.,	LEFT SIDE PHASE	CURRENT				
		Γ	CONDITIC	N	L	OCAL AT T	CBs	INITIA
			TCB-2 POSIT			CLOSED		

HEVISIC	ON NO.:		PROCEDURE TITLE:			<u> </u>		PAGE:	
	1		RPS I		ЛАТF	RIX TEST		37	of 105
PROCE	DURE NO	D.:							
2-08	SP-62	02	S	T. LUCI	EUN	JIT 2			
7.5	Two-	Out-	Of-Four Logic AB N	latrix Te	st (co	ontinued)			<u>INITIAL</u>
	3.	(cc	ontinued)						
		L.	PLACE the AB Position 3 <u>and</u>	Matrix F VERIFY	Relay the f	Trip Seloologies	ect switch to lights chang	o ge status:	
							X LIGHTS		
			LIGHTS	AB1		AB2	AB3	AB4	INITIAL
			HOLD (red)				NOT LIT		
			BOP OUT (green)				LIT		
			LIGHTS			RPS T	RIP STATUS	SPANEL	INITIAL
			K-3 RELA	(NOT LIT		
			TCB-3 & TCB-7 P	OSITION			OPEN		
			RIGHT SIDE PHASE	CURRE	NT		LIT		
					L				
			CONDITION			LOC	AL AT TCBs		INITIAL
			TCB-3 POSITION	1	OPE	N & Arma	ture in the U	P position	
			TCB-7 POSITION	N	OPE	N & Arma	ture in the U	P position	
		М.	<u>If</u> Trip Path Rel by ICM, <u>Then</u> F Test.	ay K-3 c PERFOR	ontao IM Ap	ots testing opendix E	g is to be co 3, K-Relay 1	onducted Trip Path	
		N.	PLACE the AB MID-Position B VERIFY the fol	Matrix F etween l lowing:	Relay Positi	Trip Sel ion 3 and	ect switch to Position 4	o the <u>and</u>	
				Ŭ					
		1					IX LIGHTS	1.0 - 20/200	
		2	LIGHTS	AB1	/	AB MATRI AB2	IX LIGHTS AB3	AB4	INITIAL
			LIGHTS HOLD (red)	AB1 LIT	/	AB MATRI AB2 LIT	IX LIGHTS AB3 LIT	AB4 LIT	INITIAL
			LIGHTS HOLD (red))ROP OUT (green)	AB1 LIT NOT LI		AB MATRI AB2 LIT NOT LIT	AB3 LIT NOT LIT	AB4 LIT NOT LIT	INITIAL
			LIGHTS HOLD (red) DROP OUT (green)	AB1 LIT NOT LI		AB MATRI AB2 LIT NOT LIT	IX LIGHTS AB3 LIT NOT LIT	AB4 LIT NOT LIT	
			LIGHTS HOLD (red) DROP OUT (green) LIGHTS	AB1 LIT NOT LI	/ 	AB MATRI AB2 LIT NOT LIT RPS T	IX LIGHTS AB3 LIT NOT LIT RIP STATU	AB4 LIT NOT LIT S PANEL	INITIAL
			LIGHTS HOLD (red) DROP OUT (green) LIGHTS K-3 RELA TCB-9 POSIT	AB1 LIT NOT LI Y	IT I	AB MATRI AB2 LIT NOT LIT RPS T	IX LIGHTS AB3 LIT NOT LIT RIP STATU LIT CLOSED	AB4 LIT NOT LIT S PANEL	INITIAL INITIAL
			LIGHTS HOLD (red) DROP OUT (green) LIGHTS K-3 RELA TCB-9 POSIT	AB1 LIT NOT LI Y TION		AB MATRI AB2 LIT NOT LIT RPS T	IX LIGHTS AB3 LIT NOT LIT RIP STATU LIT CLOSED	AB4 LIT NOT LIT S PANEL	
			LIGHTS HOLD (red) DROP OUT (green) LIGHTS K-3 RELA TCB-9 POSIT	AB1 LIT NOT LI Y TION		AB MATRI AB2 LIT NOT LIT RPS T	IX LIGHTS AB3 LIT NOT LIT RIP STATU LIT CLOSED OCAL AT TO	AB4 LIT NOT LIT S PANEL CBs	
			LIGHTS HOLD (red) DROP OUT (green) LIGHTS K-3 RELA TCB-9 POSIT CONDITIO TCB-3 POSIT	AB1 LIT NOT LI Y TION N ION		AB MATRI AB2 LIT NOT LIT RPS T	IX LIGHTS AB3 LIT NOT LIT RIP STATU LIT CLOSED OCAL AT TO o in the DOW	AB4 LIT NOT LIT S PANEL CBs /N position	INITIAL INITIAL

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	1		RPS I		ATRI	X TEST			(4 O F
PROCE		D.:						38	of 105
2-0	SP-62.	.02	S	T. LUCIE	E UNI	T 2			
7.5	Two-	Out-	Of-Four Logic AB M	latrix Tes	st (cor	ntinued)			INITIA
	-	,							
	3.	(00	ontinued)						
		0.	CLOSE BOTH Circuit Breaker following:	TCB-3 <u>ar</u> Reset sw	<u>nd</u> TC vitch t	CB-7 by to to RESE	turning the T <u>and</u> VEF	Trip NFY the	
			LIGHTS			RPS T	RIP STATU	S PANEL	INITIAL
			TCB-3 POSIT		-		CLOSED		
			TCB-7 POSIT	ION			CLOSED		
			RIGHT SIDE PHASE		JT		NOT LIT		
		L							• ···-
			CONDITIO	N		L	OCAL AT T	CBs	INITIA
			TCB-3 POSIT	TION			CLOSED		
		 P.	TCB-7 POSI PLACE the AB Position 4 <u>and</u>	Matrix R VERIFY t	elay ⁻ the fo	Trip Sele	ect switch to ights chang	o ge status:	L
		P.	TCB-7 POSI PLACE the AB Position 4 <u>and</u>	Matrix R VERIFY t	elay ⁻ the fo	Trip Sele Ilowing I B MATRI	ect switch t ights chang	o ge status:	
		P.	TCB-7 POSIT PLACE the AB Position 4 <u>and</u> LIGHTS	Matrix R VERIFY t	ielay ⁻ the fo	Trip Sele Ilowing I B MATRI AB2	ect switch trights chang X LIGHTS AB3	o ge status: AB4	INITIAI
		P.	TCB-7 POSI1 PLACE the AB Position 4 <u>and</u> LIGHTS HOLD (red)	Matrix R VERIFY t AB1	lelay ⁻ the fo Al	Trip Sele Ilowing I B MATRI AB2 	ELOSED ect switch trights chang X LIGHTS AB3 	o ge status: AB4 NOT LIT	INITIAI
		P.	TCB-7 POSI1 PLACE the AB Position 4 <u>and</u> LIGHTS HOLD (red) DROP OUT (green)	Matrix R VERIFY t AB1 	ielay ⁻ the fo Al	Trip Sele Ilowing I B MATRI AB2 	ELOSED ect switch trights chang X LIGHTS AB3 	o ge status: AB4 NOT LIT LIT	INITIAI
		P.	TCB-7 POSIT PLACE the AB Position 4 <u>and</u> LIGHTS HOLD (red) DROP OUT (green)	Matrix R VERIFY t AB1 	ielay ⁻ the fo Al	Trip Sele Ilowing I B MATRI AB2 RPS TF	CLOSED ect switch trights chang X LIGHTS AB3 RIP STATUS	o ge status: AB4 NOT LIT LIT	
		P.	TCB-7 POSIT PLACE the AB Position 4 <u>and</u> LIGHTS HOLD (red) DROP OUT (green) LIGHTS K-4 RELAY	Matrix R VERIFY t AB1 	Al	Trip Sele Ilowing I B MATRI AB2 RPS TF	CLOSED ect switch tr ights chang X LIGHTS AB3 RIP STATUS NOT LIT	o ge status: AB4 NOT LIT LIT S PANEL	
		P.	TCB-7 POSIT PLACE the AB Position 4 <u>and</u> LIGHTS HOLD (red) DROP OUT (green) LIGHTS K-4 RELAY TCB-4 & TCB-8 PO	Matrix R VERIFY t AB1 	AI	Trip Sele Ilowing I B MATRI AB2 RPS TF	CLOSED ect switch trights chang X LIGHTS AB3 RIP STATUS NOT LIT OPEN	o ge status: AB4 NOT LIT LIT S PANEL	
		P.	TCB-7 POSIT PLACE the AB Position 4 <u>and</u> LIGHTS HOLD (red) DROP OUT (green) LIGHTS K-4 RELAY TCB-4 & TCB-8 PO RIGHT SIDE PHASE	Matrix R VERIFY t AB1 OSITION CURREN	Al	Trip Sele Ilowing I B MATRI AB2 RPS TF	CLOSED ect switch trights change X LIGHTS AB3 RIP STATUS NOT LIT OPEN LIT	O ge status: AB4 NOT LIT LIT S PANEL	
		P.	TCB-7 POSIT PLACE the AB Position 4 <u>and</u> LIGHTS HOLD (red) DROP OUT (green) LIGHTS K-4 RELAY TCB-4 & TCB-8 PO RIGHT SIDE PHASE CONDITION	Matrix R VERIFY t AB1 OSITION CURREN	Al	Trip Selo Ilowing I B MATRI AB2 RPS TF	CLOSED ect switch tr ights chang X LIGHTS AB3 RIP STATUS NOT LIT OPEN LIT	O ge status: AB4 NOT LIT LIT S PANEL	
		P.	TCB-7 POSIT PLACE the AB Position 4 <u>and</u> LIGHTS HOLD (red) DROP OUT (green) LIGHTS K-4 RELAY TCB-4 & TCB-8 PO RIGHT SIDE PHASE CONDITION TCB-4 POSITION	Matrix R VERIFY t AB1 OSITION CURREN	Al	Trip Sele Ilowing I B MATRI AB2 RPS TF RPS TF	CLOSED ect switch trights change X LIGHTS AB3 RIP STATUS NOT LIT OPEN LIT AL AT TCBs ture in the U	AB4 NOT LIT LIT S PANEL	
		P.	TCB-7 POSIT PLACE the AB Position 4 <u>and</u> LIGHTS HOLD (red) DROP OUT (green) LIGHTS K-4 RELAY TCB-4 & TCB-8 PO RIGHT SIDE PHASE CONDITION TCB-4 POSITION TCB-8 POSITION	Matrix R VERIFY t AB1 OSITION CURREN	Al	Trip Sele Ilowing I B MATRI AB2 RPS TF RPS TF LOC N & Arma	CLOSED ect switch trights change X LIGHTS AB3 RIP STATUS NOT LIT OPEN LIT AL AT TCBs ture in the U ture in the U	AB4 NOT LIT LIT S PANEL	

REVISIO	:.ON NC	P	ROCEDURE TITLE:				PAGE:	
	1		RPS I		RIX TEST		39	of 105
PROCE	DURE NO	D.:						
2-0	SP-62.	.02	S	ST. LUCIE L	INIT 2			
7.5	Two-	Out-O	f-Four Logic AB M	latrix Test (continued)			INITIAL
	3.	(con	tinued)					
		R.	PLACE the AB Position <u>and</u> VI	Matrix Rela	ay Trip Sele ollowing:	ect switch to	o the OFF	
		[
			LIGHTS		AB2	AB3	AB4	INITIAL
			HOLD (red)			LIT	LIT	
		DF	ROP OUT (green)	NOT LIT	NOT LIT	NOT LIT	NOT LIT	
				/				
			1CB-9 POSIT		<u> </u>	OLOOLD		
			CONDITIO	N	L	OCAL AT TO	Bs	INITIAL
			TCB-4 POSIT	ION	Armature	in the DOW	N position	
			TCB-8 POSIT	ION	Armature	in the DOW	N position	
		~		TCB-4 and	TCB-8 by	turning the	Trip NEV the	
		5.	Circuit Breaker following:	r Reset swite	ch to RESE	ET <u>and</u> VEF		
		s.	Circuit Breaker following:	Reset swit	ch to RESE	ET and VEF	S PANEL	INITIAL
		5.	Circuit Breaker following: LIGHTS TCB-4 POSIT	r Reset swit	RPS T	T and VEF	S PANEL	INITIAL
		5.	Circuit Breaker following: LIGHTS TCB-4 POSIT TCB-8 POSIT	Reset swite	RPS T	T and VEF RIP STATUS CLOSED CLOSED	S PANEL	
		S.	Circuit Breaker following: LIGHTS TCB-4 POSIT TCB-8 POSIT	ION ION CURRENT	RPS T	T <u>and</u> VEF RIP STATUS CLOSED CLOSED NOT LIT	S PANEL	INITIAL
		S.	Circuit Breaker following: LIGHTS TCB-4 POSIT TCB-8 POSIT IGHT SIDE PHASE	Reset swite	RPS TI	T <u>and</u> VEF RIP STATUS CLOSED CLOSED NOT LIT	S PANEL	INITIAL
		S.	Circuit Breaker following: LIGHTS TCB-4 POSIT TCB-8 POSIT IGHT SIDE PHASE CONDITIO TCB-4 POSIT	TION TION CURRENT	RPS TI	T and VEF	S PANEL	
		S.	Circuit Breaker following: LIGHTS TCB-4 POSIT TCB-8 POSIT IGHT SIDE PHASE CONDITIO TCB-4 POSIT TCB-8 POSIT	Reset swite ION CURRENT N ION ION	RPS TI	RIP STATUS CLOSED CLOSED NOT LIT OCAL AT TO CLOSED CLOSED	S PANEL	
		S.	Circuit Breaker following: LIGHTS TCB-4 POSIT TCB-8 POSIT IGHT SIDE PHASE CONDITIO TCB-4 POSIT TCB-8 POSIT TCB-8 POSIT PLACE the AB Position and V lights are LIT.	Reset swite ION ION CURRENT N ION ION S Channel T ERIFY ALL	rip Select :	T and VEF RIP STATUS CLOSED CLOSED NOT LIT OCAL AT TO CLOSED CLOSED switch to th AB Matrix	B PANEL DBs e OFF Relay	

	RPS LOGIC MATRIX TEST	40 of 105
2-OSP-62.02	ST. LUCIE UNIT 2	
7.5 Two-Out-	-Of-Four Logic AB Matrix Test (continued)	
4. VE	ERIFY the following acceptance criteria:	
•	This surveillance is satisfactory ALL actions responsion responsion of the second se	onded as
•	If ANY action did NOT respond as indicated in Mo REFER TO Tech Spec Table 3.3-1 <u>and</u> PERFOR within 1 hour.	ode 1 or 2, <u>Then</u> M required action
•	If ANY action did NOT respond as indicated in Mo <u>Then</u> REFER TO Tech Spec Table 3.3-1 <u>and</u> PEF action.	ode 3, 4 or 5, RFORM required
Results of Criteria. Ba	this surveillance have been reviewed and compared to ased on this review, the surveillance is \Box SAT \Box U	the Acceptance NSAT .
Reviewed E	By: Date:/ NPS/ANPS	'/
Reviewed E Remarks:	By: Date:/ NPS/ANPS	'/
Reviewed E Remarks:	By: Date:/ NPS/ANPS	'/
Reviewed E Remarks:	By: Date:/ NPS/ANPS	'/
Reviewed E	By: Date:/ NPS/ANPS	'/
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Reviewed E	By: Date:/ NPS/ANPS	
Reviewed E	By: Date: NPS/ANPS	
Reviewed E	By: Date: / NPS/ANPS	
Reviewed E	By: Date: / NPS/ANPS	
Reviewed E	3y: Date:/ NPS/ANPS	

REVISI	ON NO.:	PROCEDUR		FAGE.									
	1	4	RPS LOGIC MATRIX TEST										
PROCE 2-0	EDURE NO.: 0 SP-62.02		ST. LUCIE UNIT 2										
7.5	Two-Ou	it-Of-Four L	Of-Four Logic AB Matrix Test										
	CAUTION If testing must be terminated for any reason, the following steps should be taken in order to avoid a trip condition: 1. Rotate the Channel Trip Select switch to the OFF position. 2. SLOWLY release the Matrix Relay Hold pushbutton. 3. Rotate the Matrix Relay Trip Select switch to the OFF position. 4. Re-enter at the beginning of this section when testing is to resume.												
	Docum section	entation is is complet	<u>NOTE</u> required at the end of this section when any c ed.	or all of this									
	1. E	ENSURE Section 4.0, Precautions / Limitations, has been reviewed.											
	2. l	ENSURE Section 7.1, System Alignment For Testing, is complete.											
	3 .	PERFORM the AB Matrix test on RPS Panel MA, as follows:											
	,	A. DEP pust	PRESS and HOLD the AB Matrix Relay HOLD										
		B. VER LIT.	RIFY ALL four red AB Matrix Relay HOLD ligh	ts are									
		•	If ANY of the Matrix Relay HOLD lights are <u>and</u> the bulbs have been checked, <u>Then</u> N ICM.	NOT LIT OTIFY									
		C. PLA <u>and</u> NOT	CE the AB Channel Trip Select switch to Pos VERIFY ALL four white AB Matrix Relay light I LIT.	sition 1 Is are 									

1 PROCEDURE NO.: 2-OSP-62.02			RPS LOGIC MATRIX TEST	of 105						
			ST. LUCIE UNIT 2	90 01 105						
		1	APPENDIX A SHIFT BRIEFING FOR RPS LOGIC MATRIX TEST (Page 1 of 4)							
_				<u>INITI</u>						
1.	REV cond	IEW litions	the following items that are applicable to the current plant s:							
	Α.	Co	mmunications:							
		1.	It is the expectation of St. Lucie Plant Management that the Control Room staff will utilize the Two-Man rule while performing the testing sections of this procedure.							
			 In this process, one licensed operator reads the procedural step and a second licensed operator performs the action. 							
			• The reader then verifies the correct performance and signs for the step.							
		2.	Communication shall be established with an operator at the TCBs when local verification of TCB trip position is required.							
		3.	This is a load threatening surveillance procedure. The local operator at the TCBs should NOT try to follow along with the procedure in hand. The operator performs the checks communicated from the Control Room. This method of performance allows the local operator to perform the required check without slowing down the performance of the procedure.							
		4.	If performing Trip Relay contact testing, <u>Then</u> the following shall be set up in advance:							
			 I&C Maintenance shall be available with test equipment for performing K-Relay testing. 							
			Covers for measuring voltages for K-Relay testing							

PROCEDURE NO.:			91 PPS LOGIC MATRIX TEST							
2-0	SP-62	.02	ST. LUCIE UNIT 2							
			<u>Shif</u>	APPENDIX A T BRIEFING FOR RPS LOGIC MATRIX TEST (Page 2 of 4)	INIT					
1.	(con	tinued)								
	в.	Plan	t Condi	tions:						
		1.	If in I actio	Modes 1 or 2, failure of the test results in a one-h n statement per Tech Spec 3.3.1 Table 3.3-1 Ac	10ur tion 2					
		2.	. If applicable, System Load Dispatcher is to be notified.							
		3.	The Steam Generator levels shall be greater than the Low RPS S/G Level trip set point.							
		4.	TCB sync	-9 shall be closed before beginning this test to er hronizing capabilities exist.	nsure					
		5.	Durir surve Due unles bypa	ng low mode operation (Modes 3, 4 and 5), this eillance is a prerequisite for other testing procedu to low RCS pressure and flow, TCBs will NOT cl ss the following keylock bypass switches are ussed:	ures. ose					
			•	Zero Power Mode.						
			•	Low SG Pressure.	.					
	C.	Trip Relay contact testing is only required to be performed on on logic matrix on an 18 month frequency or for PMT on trip relay replacement.								
	D.	Equ	Equipment Special requirements:							
		1.	When TCBs are opened, the breaker armature shall be verified in the closed air gap (down) position prior to reclosing the TCBs. These may be manually assisted if necessary.							

REVISION NO .:			PROCEDURI	PAGE:	AGE:					
1 PROCEDURE NO.:				RPS LOGIC MATRIX TEST 92						
2-C)SP-62	.02								
	·		SHIFT	BRIE	APPENDIX A FING FOR RPS LOGIC MATRIX TEST (Page 3 of 4)	Γ	INITIAL			
1.	(con	tinuec	J)							
	E.	Ma	trix Relay	Hold	pushbutton:					
		1.	This depre	oushbu ssed c	Itton becomes difficult to maintain in a condition for prolonged periods.					
		2.	How event	How do we place the system in a safe condition in the event that the operator needs to release the pushbutton?						
			a.	PERI	FORM the following three steps:					
				1.	Rotate the Channel Trip Select switch OFF position.	n to the				
				2.	SLOWLY release the Matrix Relay Hepperbolic pushbutton.	old				
				3.	Rotate the Matrix Relay Trip Select so the OFF position.	witch to				
		3.	If TC the th perm	Bs are ree ste issible	tripped in the procedure and after perfore aps to place the system in a safe condi- to reset the TCBs?	orming tion, is it				
			YES. Pane condi	After I has b tions p	a careful evaluation of operability, the f een returned to the original status and permit, then RESET the TCBs.	२PS plant				

•

REVIS	ION NO.:	PF	ROCEDURE TITLE:	PAGE:		
1 PROCEDURE NO.: 2-OSP-62.02			RPS LOGIC MATRIX TEST	93 of 105		
			ST. LUCIE UNIT 2			
1.	(conti	nued)	APPENDIX A SHIFT BRIEFING FOR RPS LOGIC MATRIX TEST (Page 4 of 4)	<u>INITIA</u>		
	F.	Acce	eptance Criteria:			
		1.	 What is the Acceptance Criteria for the sections of the procedure to be performed? Discuss the requirements of Section 6.0, Acceptance Criteria, for the sections to be performed. 	the 		
		2.	What are the actions to be performed in the event of unsatisfactory results?	of		
			 Discuss Tech Spec action requirements for unsatisfactory results. 			
			END OF APPENDIX A			

SET-UP INSTRUCTIONS ECCS JPM-006

PREPARATION:

(

Ahead of time, prepare a full Safety Injection Tank Fill Procedure 2-0410021. Ensure sections 5.1 thru 5.4 are already signed off.

EXECUTE JPM:

- 1. INSTALL IC-1 (100% Power, MOL Steady State)
- 2. EXECUTE JPM SCENARIO
- 3. TRIGGER JPM-006 Lesson Step
- 4. RUN Simulator for two minutes
- 5. VERIFY Annunciators R-1, R-21, and R-31 are in.

IMPORTANT NOTE:

There is a simulator DR open in the response of the Header Isolation valve. The pressure throttling response of the value is currently UnSat and will need to be resolved prior to administration of this JPM.

REGION II INITIAL LICENSE EXAMINATION JOB PERFORMANCE MEASURE ST. LUCIE NUCLEAR PLANT

FILL A SAFETY INJECTION TANK UNIT 2

CANDIDATE

EXAMINER

REGION II INITIAL LICENSE EXAMINATION JOB PERFORMANCE MEASURE ST LUCIE NUCLEAR PLANT

Task: Fill a Safety Injection Tank

Alternate Path: Yes ____ No _X

Facility JPM #: New

Task Standard: Successfully fill 2A1 Safety Injection Tank

Preferred Evaluation Location:

Simulator X Control Room In-Plant

Preferred Evaluation Method:

Perform <u>X</u> Simulate _____

References: OP 2-0410021, "Safety Injection Tank Normal Operation"

Validation Time1	<u>5 minutes</u> T	ime Crit	ical <u>N</u>	0
Candidate:	Name			Time Start Time Finish
Performance Rating:	Sat	Unsat		Question Grade
Examiner:	Name		Signatu	re:

Tools/Equipment/ Procedures Needed:

OP 2-0410021, "Safety Injection Tank Normal Operation"

Read to Candidate

Directions to candidate for In-Plant or Control Room JPMs:

I will explain the initial conditions and state the task to be performed. All in-plant or control room JPM steps, including any communications, shall be simulated for this JPM. Under no circumstances, unless directed by the examiner, are you to operate any plant equipment. I will provide initiating cues and reports on other actions when directed by you. Ensure you indicate to me when you finish your assigned task by returning the handout sheet I provided you.

Directions to candidate for Simulator JPMs:

I will explain the initial conditions and state the task to be performed. All simulator JPM steps, including any communications, shall be performed for this JPM. You are you to operate any plant equipment that is necessary for the completion of this JPM. The simulator will provide the cues as you perform this JPM. Ensure you indicate to me when you finish your assigned task by returning the handout sheet I provided you.

Initial Conditions: Unit 2 is at 100% power. Annunciator R-1, R-21 and R-31are in alarm. The 2A1 Safety Injection Tank level has decreased below normal operating band.

Initiating Cues: The ANPS has directed you to fill the 2A1 SIT to normal operating level IAW OP 2-0410021 using the 2A HPSI pump.

Start Time _____

<u>Step 1:</u> <u>Standard:</u> <u>Cue:</u> <u>Comment</u> :	Prior to filling SITs, ensure makeup water is between 1720 and 2100 ppm boron (step 8.3.1) Operator verifies RWT boron concentration between 1720 and 2100 ppm by contacting Chemistry or looking at Chemistry report Chemistry reports RWT boron at 1900 ppm*	Sat Unsat
Step 2: Standard: Cue: Comment	Ensure the loop SI headers are less than 1100 psig by verifying the absence of SI header high pressure annunciators (step 8.3.2) Operator observes absence of SI header high pressure annunciators (RTGB 206) No SI header high pressure annunciators present*	Sat Unsat
Step 3: Standard: <u>Cue:</u> Comment	If dilution of the SI header is indicated, then recirc the header per section 8.6.2 (step 8.3.3) Operator observes no backleakage from RCS loop check valve indicated (RTGB 206) No loop check valve leakage indicated* <u>(s:</u>	Sat Unsat
Step 4: Standard Cue: Commen	Start the 2A HPSI pump (step 8.3.4) Operator announces and starts the 2A HPSI pump by placing the control switch to START (RTGB 206) 2A HPSI indicates red light illuminated, amps stable*	Critical Step Sat Unsat

* If JPM is performed on the simulator, cues will not be verbalized by the examiner, but will be used to verify the JPM is being performed correctly.

Step 5:	Open V3621 (SIT fill and drain valve) (step 8.3.5)	Critical Step
Standard:	Operator places the control switch for V3621 to the OPEN position	Sat
<u>Cue:</u> Comments	(RTGB 206) V3621 indicates red light illuminated* <u>s:</u>	Unsat
Step 6:	Open HCV-3628 (SI loop check valve leakage valve) (step 8.3.6)	Critical Step
<u>Standard:</u> <u>Cue:</u> <u>Comment</u> :	Operator rotates controller knob to obtain full output on controller and observes red light indication (RTGB 206) HCV-3628 indicates red light illuminated* <u>s.</u>	Sat Unsat
<u>Step 7:</u>	CAUTION: Do not exceed 700 psig on SIT loop pressure indiction Throttle open HCV-3627 (HPSI header isolation valve) (step 8.3.7)	Critical Step Sat
Standard:	Operator throttles open HCV-3627 while observing 2A1 SIT header loop pressure and ensures not to exceed 700 psig	Unsat
<u>Cue:</u> <u>Comment</u>	(RTGB 206) HCV-3627 indicates dual indication, 2A1 SIT loop header pressure <700 psig* <u>s:</u>	

* If JPM is performed on the simulator, cues will not be verbalized by the examiner, but will be used to verify the JPM is being performed correctly.

Step 8: Standard: Cue: Comments	Monitor and maintain SIT pressure < 565 psig (step 8.3.8) Operator monitors SIT pressure < 565 psig. When (if) pressure exceeds 545 psig, he crossties the nitrogen fill lines between SITs to reduce pressure by opening V3622, V3612, V3632 and V3642 (RTGB 206) Pressure < 545 psig, (V3622, V3612, V3632 and V3642 indicate red lights Illuminated, green lights illuminated after pressure decreases < 545 psig)*	Critical Step (if valves are manipulated) Sat Unsat
(Candidate	e may elect to cross-tie SIT vents to equalize pressure during fill)	
Step 9:	When SIT is filled to desired level, then close HCV-3627 (step 8.3.9)	Critical Step
<u>Standard:</u>	Operator takes control switch for HCV-3627 to close, observes green light indication	Sat Unsat
<u>Cue:</u> Comment	(RTGB 206) HCV-3627 indicates green light illuminated* <u>s:</u>	
<u>Step 10:</u>	Close V3621 (SIT fill and drain valve) (step 8.3.10)	Critical Step
Standard:	Operator places control switch for V3621 to CLOSED	Sat
<u>Cue:</u>	(RTGB 206) V3621 indicates green light illuminated*	Unsat
<u>Comment</u>	<u>s:</u>	
<u>Step 11:</u>	Close HCV-3628 (SI loop check valve leakage valve) (step 8.3.11)	Critical Step
<u>Standard:</u>	Operator rotates controller knob to obtain zero output on controller, and observes green light indicated on HCV-3628	Sat Unsat
<u>Cue:</u> Comment	(RTGB 206) HCV-3628 indicates green light illuminated* is:	

* If JPM is performed on the simulator, cues will not be verbalized by the examiner, but will be used to verify the JPM is being performed correctly.

<u>Step 12:</u>	Stop 2A HPSI pump and return the control switch to AUTO	Critical Step
<u>Standard:</u> <u>Cue:</u> <u>Comment</u> :	(step 8.3.12) Operator places the control switch for the 2A HPSI pump to OFF and then to the AUTO position (RTGB 206) 2A HPSI pump indicates green light illuminated, switch in mid- position* <u>5:</u>	Sat Unsat
<u>Step 13:</u> <u>Standard:</u> <u>Cue:</u> <u>Comment</u>	Record SIT post fill data on Data Sheet 1 (step 8.3.13) Operator records post fill data on Data Sheet 1 Data Sheet 1 completed <u>s:</u>	Sat Unsat
<u>Step 14:</u> <u>Standard:</u> <u>Cue:</u> <u>Comment</u>	Notify Tech Staff to perform Data Sheet 25* Operator contacts Tech Staff to perform Data Sheet 25 Tech Staff acknowledges* <u>S:</u>	Sat Unsat
	End of Task	

* If JPM is performed on the simulator, cues will not be verbalized by the examiner, but will be used to verify the JPM is being performed correctly.

Stop Time _____

CANDIDATE CUE SHEET

(TO BE RETURNED TO THE EXAMINER UPON COMPLETION OF TASK)

Initial Conditions: Unit 2 is at 100% power. Annunciator R-1, R-21 and R-31are in alarm. The 2A1 Safety Injection Tank level has decreased below normal operating band.

Initiating Cues: The ANPS has directed you to fill the 2A1 SIT to normal operating level IAW OP 2-0410021 using the 2A HPSI pump.

		PRO	CEDUF	te nu	.Е:								
0			ANNUNCIATOR RESPONSE PROCEDURE										
URE N	10:	-									WINDOW:		
P-01	-R1					S	T. LU	CIEU	JNIT 2				
				<u> </u>		<u> </u>	<u> </u>			······································			
	IUNC		DR P	ANE	LR								
2	3	4	5	6	7	8	9	10					
12	13	14	15	16	17	18	19	20		2A1 SIT			
22	23	24	25	26	27	28	29	30		PRESS	.,		
32	33	34	35	36	37	38	39	40		HIGH/LOV	V		
42	43	44	45	46	47	48	49	50			· D_1		
52	53	54	55	56	57	58	59	60			<u></u>		
				متان	M-	·.			SETPOINT:				
E: 21			RTG	B 206					High 570 psi	g rising			
									Low 540 psig	g dropping			
		ΙΔΤΙΟ	N٠										
-3321	, Si Ta	ank 2A	1 Pre	ssure									
	-								·				
	0 DURE N P-01 2 12 22 32 42 52 E: 21 E: 21 M COI -3321	0 DURE NO: P-01-R1 ANNUNC 2 3 12 13 22 23 32 33 42 43 52 53 E: 21 M CONFIRM -3321, SI Ta	0 DURE NO: P-01-R1 ANNUNCIATO 2 3 4 12 13 14 22 23 24 32 33 34 42 43 44 52 53 54 E: 21 M CONFIRMATIO -3321, SI Tank 24	0 DURE NO: P-01-R1 2 3 4 5 12 13 14 15 22 23 24 25 32 33 34 35 42 43 44 45 52 53 54 55 E: LOC 21 RTG M CONFIRMATION: -3321, SI Tank 2A1 Pre	0 ANNI DURE NO: ANNUNCIATOR PANE 2 3 4 5 6 12 13 14 15 16 22 23 24 25 26 32 33 34 35 36 42 43 44 45 46 52 53 54 55 56 E: LOCATION RTGB 206 RTGB 206 M CONFIRMATION: -3321, SI Tank 2A1 Pressure	0 ANNUNCI DURE NO: IP-01-R1 ANNUNCIATOR PANEL R 2 3 4 5 6 7 12 13 14 15 16 17 22 23 24 25 26 27 32 33 34 35 36 37 42 43 44 45 46 47 52 53 54 55 56 57 E: LOCATION: RTGB 206 RTGB 206 M CONFIRMATION: -3321, SI Tank 2A1 Pressure ACTIONS:	0 ANNUNCIATO DURE NO: ST IP-01-R1 ST 2 3 4 5 6 7 8 12 13 14 15 16 17 18 22 23 24 25 26 27 28 32 33 34 35 36 37 38 42 43 44 45 46 47 48 52 53 54 55 56 57 58 E: LOCATION: RTGB 206 RTGB 206 M CONFIRMATION: -3321, SI Tank 2A1 Pressure ACTIONS:	0 ANNUNCIATOR RE DURE NO: ST. LU P-01-R1 ST. LU ANNUNCIATOR PANEL R ST. LU 2 3 4 5 6 7 8 9 12 13 14 15 16 17 18 19 22 23 24 25 26 27 28 29 32 33 34 35 36 37 38 39 42 43 44 45 46 47 48 49 52 53 54 55 56 57 58 59 E: LOCATION: RTGB 206 RTGB 206 ACTIONS: ACTIONS:	0 ANNUNCIATOR RESPOne DURE NO: ST. LUCIE U P-01-R1 ST. LUCIE U ANNUNCIATOR PANEL R 2 3 4 5 6 7 8 9 10 12 13 14 15 16 17 18 19 20 22 23 24 25 26 27 28 29 30 32 33 34 35 36 37 38 39 40 42 43 44 45 46 47 48 49 50 52 53 54 55 56 57 58 59 60 E: LOCATION: RTGB 206 RTGB 206 M CONFIRMATION: RTGB 206 RTOP ACTIONS	0 ANNUNCIATOR RESPONSE PROCEDO SURE NO: ST. LUCIE UNIT 2 P-01-R1 ST. LUCIE UNIT 2 ANNUNCIATOR PANEL R ST. LUCIE UNIT 2 2 3 4 5 6 7 8 9 10 12 13 14 15 16 17 18 19 20 22 23 24 25 26 27 28 29 30 32 33 34 35 36 37 38 39 40 42 43 44 45 46 47 48 49 50 52 53 54 55 56 57 58 59 60 SETPOINT: E: LOCATION: RTGB 206 SETPOINT: High 570 psignature Set 90 psignature MCONFIRMATION: RTGB 206 SETPOINS: Set 90 psignature Set 90 psignature	0 ANNUNCIATOR RESPONSE PROCEDURE DURE NO: ST. LUCIE UNIT 2 AP-01-R1 ST. LUCIE UNIT 2 ANNUNCIATOR PANEL R 2 3 4 5 6 7 8 9 10 12 13 14 15 16 17 18 19 20 22 23 24 25 26 27 28 29 30 32 33 34 35 36 37 38 39 40 42 43 44 45 46 47 48 49 50 52 53 54 55 56 57 58 59 60 E: LOCATION: SETPOINT: High 570 psig rising Low 540 psig dropping MCONFIRMATION: -3321, SI Tank 2A1 Pressure High 570 psig rising Low 540 psig dropping		

- SIT LEVEL HIGH/LOW.
 ENSURE SIT nitrogen supply valves and vent valves are aligned in accordance with OP 2-0410021, Safety Injection Tank Normal Operation.
- ESTABLISH proper SIT pressure in accordance with OP 2-0410021, Safety Injection Tank Normal Operation.

CAUSES: System leak, valve misalignment or temperature change.

REFERENCES: 1. CWD 2998-B-327 sheet 281

- 2. P&ID 2998-G-078 sheet 132
- 3. TEDB

PROCEDURE TITLE:

ANNUNCIATOR RESPONSE PROCEDURE

PROCEDURE NO:

REVISION:

2-ARP-01-R21

0

ST. LUCIE UNIT 2

R-21

PANEL

🕞 R

WINDOW:

ANNUNCIATOR PANEL R

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60

PRESS LOW-LOW

2A1 SIT

DEVICE: PIS-3322 LOCATION: RCB/49/N-50/W-10

SETPOINT: 515 psig dropping

ALARM CONFIRMATION:

- 1. PIA-3321, SI Tank 2A1 Pressure
- 2. R-1, 2A1 SIT PRESS HIGH/LOW in alarm

OPERATOR ACTIONS:

- 1. If SIT level is low or is dropping unexpectedly, Then REFER TO R-31, 2A1 SIT LEVEL HIGH/LOW.
- 2. ENSURE V3735 and V3736, SIT 2A1 Vent, are LOCKED CLOSED.
- 3. ENSURE SIT valves are aligned in accordance with OP 2-0410021, Safety Injection Tank Normal Operation.
- 4. ESTABLISH proper SIT pressure in accordance with OP 2-0410021, Safety Injection Tank Normal Operation.
- 5. If SIT pressure CAN NOT be maintained, Then ATTEMPT to identify leaks by visual inspection.

CAUSES: Decreasing SIT Level. SIT valve misalignment or system leak.

1. CWD 2998-B-327 sheet 1522 **REFERENCES:**

2. P&ID 2998-G-078 sheet 132

3. TEDB

REVISION:				PRC	PROCEDURE TITLE:								
0					ANNUNCIATOR RESPONSE PROCEDURE							K	
PROCEDURE NO:				-									WINDOW:
2-ABP-01-B31				ST. LUCIE UNIT 2								31	
				<u></u>							<u></u>		8
			IUNC	IATO	DR P	ANE	LR						
1	Ī	2	3	4	5	6	7	8	9	10	-		
1	1	12	13	14	15	16	17	18	19	20		2A1 SIT	
2	1	22	23	24	25	26	27	28	29	30			,
3	1	32	33	34	35	36	37	38	39	40		HIGH/LOW	
4	1	42	43	44	45	46	47	48	49	50			P-31
5	1	52	53	54	55	56	57	58	59	60			11-01
DEVICE: LOCATION: LIA-3321 RTGB-206					SETPOINT: High 87% rising Low 82.5% dropping								
ALA 1. L	ARN Lia-	1 COI 3321,	NFIRM SI Ta	IATIO nk 2A ONS:	N: 1 Leve	əl							

- 2. If SIT Level is high or rising, Then PERFORM a primary leak rate in accordance with OP 2-0010125A, Data Sheet 1, Reactor Coolant System Water Inventory Balance.
 - A. If primary leak rate indicates the SIT level increase is from RCS, Then GO TO ONOP 2-0120031, Excessive Reactor Coolant System Leakage.
- 3. If SIT Level is low or dropping, Then PERFORM the following:
 - A. If V3624, SIT 2A1 Isolation, is OPEN, Then ENSURE RCS Pressure is greater than SIT pressure.
 - B. DISPATCH an Operator to check for external system leaks.
 - C. MONITOR LIS-07-6, Reactor Cavity Sump Level, for a higher rate of change. D. MONITOR LR-07-2D and LIS-07-02A thru D, Refueling Water Tank Level, for unexpected level rise.
 - E. MONITOR other SIT levels for unexpected rise.
- 4. ESTABLISH proper SIT level in accordance with OP 2-0410021, Safety Injection Tank Normal Operation.
- 5. If an inadvertent SIT discharge to the RCS occurred, Then DETERMINE required reportability in accordance with AP 0010721, NRC Required Non-Routine Notifications and Reports.

CAUSES: High level could result from valve misalignment or valve leakage. Low level could result from valve misalignment or valve leakage, system leakage, or discharge into the RCS.

REFERENCES:	1.	CWD 2998-B-327	shee	Ħ	28	3.	1
						-	-

2. P&ID 2998-G-078 sheet 132

3. TEDB

		ST. LUCIE UN	IIT 2	Procedure No. 2-0410021
FP	ОР	ERATING PRO	CEDURE	Current Rev. No 36A
		SAFETY RELATE	ED	Effective Date: 12/02/99
Title:	SAFE NO	TY INJECTION	ON TAN RATION	κ
Responsibl	le Department: OP	ERATIONS		
Revision S	Summary			
Revision 3	36A - Corrected not	e box in Data Sheet 1.	(Bob Czachor,	11/10/99)
Revision ?	36 - Deleted Mode	4 requirement for SIT or	erability. (Gene	e Boyd, 05/04/99)
This revisio (Charlie Si Minor corre	on changes a proce mpkins, 02/18/99) ection to Step 8.3.1	AND dure number from OP 2 AND 4 to correct reference to	2-0250020 to 2-1	NOP-02.24. J. S. Napier, 03/10/99
		(Appl	CABLE PAGE	is included)
Revision	FRG Review Date	Approved By	Approval Date	S_2_OPS
Revision 0	FRG Review Date 05/21/82	Approved By C. M. Wethy Plant General Manager	Approval Date 05/22/82	S_2_OPS DATE DOCT_PROCEDURE DOCN_2-0410021
Revision 0 Revision	FRG Review Date 05/21/82 FRG Review Date	Approved By C. M. Wethy Plant General Manager Approved By	Approval Date 05/22/82 Approval Date	S_2_OPS DATE DOCT_PROCEDURE DOCN_2-0410021 SYS COMP_COMPLETED
Revision 0 Revision 36A	FRG Review Date 05/21/82 FRG Review Date 05/04/99	Approved By C. M. Wethy Plant General Manager Approved By R. G. West Plant General Manager	Approval Date 05/22/82 Approval Date 05/04/99	S_2_OPS DATE DOCT_PROCEDURE DOCN_2-0410021 SYS_ COMP_COMPLETED ITM36A

1.0 <u>TITLE</u>:

SAFETY INJECTION TANK NORMAL OPERATION

2.0 REVIEW AND APPROVAL:

See cover page.

3.0 <u>PURPOSE</u>:

This procedure provides instructions for normal valve alignment, initial filling and nitrogen or borated water makeup to the Safety Injection Tanks (SIT).

4.0 PRECAUTIONS AND LIMITS:

- 4.1 During plant cooldown, RCS pressure must be maintained greater than SIT pressure at all times to prevent SIT discharge to the RCS.
- 4.2 Notify personnel in the containment prior to venting a SIT, due to the loud noise emitted.
- \P_2 4.3 All SITs shall be operable in modes 1, 2 and 3 (with pressurizer press. greater than or equal to 1750 psia), operability includes: isolation valve open and power removed, level 81% 88.5% on narrow range level instruments, boron concentration 1720 2100 ppm and N₂ pressure 500-650 psig. /R36
- \P_2 4.4 When in Mode 3 with pressurizer pressure less than 1750 psia, either of the following shall be operable: /R36
 - 1. Three SITs operable, with isolation values open and power removed, level 75-88.5%, boron concentration 1720-2100 ppm and N_2 pressure 235-650 psig.
 - All four SITs operable, with isolation valves open and power removed, level 49-88.5% boron concentration 1720-2100 ppm and N₂ pressure 235-650 psig.
- \P_2 4.5 The SIT isolation values must be open in Modes 1-3. /R36
 - 4.6 SITs shall NOT be filled when the RCS is on solid pressure control.

INITIAL

ST. LUCIE UNIT 2 OPERATING PROCEDURE NO. 2-0410021, REVISION 36A SAFETY INJECTION TANK NORMAL OPERATION

4.0 PRECAUTIONS AND LIMITS: (continued)

 §1 4.7 V3551 and V3523, 2B HPSI Hot Leg Injection Header Isolations, are affected by V3523 inoperability. PSL-ENG-SEMS-98-119, Rev. 1, has V3551 deenergized in Locked Closed position and V3523 in Open, with breaker cubicle Thermal Overload Heaters removed.

5.0 RELATED SYSTEM STATUS:

- 5.1 The SITs shall be aligned in accordance with 2-NOP-03.31, Safety Injection Tanks Initial Alignment.
- 5.2 The Nitrogen System is aligned for normal operation.
- 5.3 The HPSI and LPSI Systems are aligned for operation according to plant conditions.
- 5.4 Instrument Air System is available to the air operated valves.

8.0 INSTRUCTIONS: (continued)

¶ı

INITIAL

8.3 Filling of SITs with RCS Pressure greater than 1500 psig.

<u>NOTE</u> The practice of cross tying SIT Nitrogen Supply Lines has been evaluated by Engineering and concluded that this practice is within the bounds of analyzed conditions.

- 1. Prior to filling SITs, ensure SIT makeup water is between 1720 and 2100 ppm boron.
- Ensure loop SI headers are less than 1100 psig by verifying the absence of SI header high pressure annunciators. <u>If</u> the 2B2 SI Hdr pressure indicator (PIA-3349) is in alarm, <u>Then</u> Fill the 2B2 SIT per step 8.4.15.
- 3. <u>If dilution of the SI header is indicated (i.e., RCS loop check</u> valve backleakage or maintenance on the header), <u>Then</u> recirc the header per section 8.6.2.
- 4. START 2A or 2B HPSI Pump.
- 5. OPEN V3621, V3611, V3631 or V3641 (SIT Fill and Drain Valve) for the SIT to be filled.
- 6. OPEN HCV-3618, HCV-3628, HCV-3638 or HCV-3648 (SI Loop Check Valve leakage valve) for appropriate SIT.

CAUTION

Do not exceed 700 psig on SIT loop pressure indication to prevent lifting relief valve on RWT return line.

 If the 2A HPSI Pump is to be used, <u>Then</u> THROTTLE OPEN HCV-3617, HCV-3627, HCV-3637 or HCV-3647 (HPSI Header Isol) to appropriate SI header. <u>If</u> the 2B HPSI Pump is to be used, <u>Then</u> THROTTLE OPEN HCV-3616, HCV-3626, HCV-3636, HCV-3646 (B HPSI Header Isol) to appropriate SI header. _____

8.0 INSTRUCTIONS: (continued)

8.3 (continued)

INITIAL

<u>CAUTION</u>

Notify personnel in containment prior to venting a SIT due to the loud noise emitted.

- 8. Monitor and maintain SIT pressure less than or equal to 565 psig utilizing the following methods.
 - A. The primary method of SIT pressure control to conserve N_2 during fill operations is to crosstie the nitrogen fills between the selected SITs.

2A1 SIT: V3622 2A2 SIT: V3612 2B1 SIT: V3632 2B2 SIT: V3642

B. The alternate method of SIT pressure control is to operate the SIT vent to containment.

2A1 SIT: V3735 or V3736 2A2 SIT: V3733 or V3734 2B1 SIT: V3737 or V3738 2B2 SIT: V3739 or V3740

<u>NOTE</u>

Safety Injection Tank level should be filled to greater than 84% as required by OP-2-0010125A, Data Sheet 25.

- 9. <u>When the SIT is filled to the desired level, Then CLOSE the</u> HPSI header isolation valve opened in Step 7.
- 10. CLOSE the SI fill and drain valve opened in Step 5.
- 11. CLOSE the SI loop check valve leakage valve opened in Step 6.
- 12. STOP the running HPSI pump and return the control switch to AUTO.

13. Record SIT post fill data per Data Sheet 1.

8.0 INSTRUCTIONS: (continued)

- 8.3 (continued)
 - Notify Technical Staff to Perform Verification of ECCS Check Valve Integrity per OP 2-0010125A, Data Sheet 25, on those applicable header check valves used during the performance of Section 8.3.
 - 15. Filling of 2B2 SIT with leakage on V3247 (PIA-3349 in alarm is annunciated by R57)

CAUTION

During the implementation of step 8.4.15 the following precautions shall be used:

- 1. Conduct a tailboard meeting prior to the evolution emphasizing the use of correct RTGB indications.
- 2. The NPS/ANPS or NWE shall monitor the evolution.
 - A. START the 2B HPSI Pump.
 - B. OPEN V3641, 2B2 Fill/Drain.
 - C. OPEN HCV-3638, SI Loop 2B1 Check Valve Leakage.

<u>CAUTION</u>

Do not exceed 700 psig on 2B1 loop pressure indication (PIA-3339) to prevent lifting relief valve on RWT return line.

D. THROTTLE OPEN HCV-3636, Header B to Loop 2B1 Valve, DO NOT exceed 700 psig as indicated on PI-3339, SI Loop 2B1 pressure.

CAUTION

Notify personnel in containment prior to venting a SIT due to the loud noise emitted.

E. Monitor and maintain 2B2 SIT pressure (PIA-3341) less than or equal to 565 psig utilizing the following methods.

INITIAL

8.0 INSTRUCTIONS: (continued)

- 8.3 (continued)
 - 15. (continued)
 - E. (continued)
 - 1. The primary method of SIT pressure control to conserve Nitrogen during fill operations is to crosstie the nitrogen fills between selected SITs.

2A1 SIT: V3622 2A2 SIT: V3612 2B1 SIT: V3632 2B2 SIT: V3642

2. The alternate method of SIT pressure control is to operate the SIT vent to containment.

2B2 SIT: V3739 or V3740

- F. When the desired level in the 2B2 SIT is reached, CLOSE HCV-3636, HPSI Hdr Isolation.
- G. CLOSE V3641, 2B2 SIT fill and drain.
- H. CLOSE HCV-3638, 2B1 loop check valve leakage valve.
- I. STOP the 2B HPSI Pump and return the control switch to AUTO.
- J. Record 2B2 SIT post fill data per Data Sheet 1.
- K. Notify Tech Staff to perform Verification of ECCS Check Valve Integrity per OP 2-0010125A, Data Sheet 25, for the 2B1 SI Hdr valve (V3260).

INITIAL

		DATA SHEET 1 <u>SAFETY INJECTION TANK POST FILL DATA SHEET</u> (Page 1 of 2)	INITIAL						
Rec	ord th	ne following:							
1.	Safety Injection Tank filled.								
2.	The	The date/time the SIT was filled.							
3.	The con	The date/time the SIT was last sampled for boron concentration prior to this fill.							
4.	<u>lf</u> th the	If the makeup water source was the RWT, Then determine the following:							
	A.	The date/time of the last RWT boron concentration							
	В.	Boron concentration result of last RWT sample.							
	C.	Review the RCO chronological log for any RWT fill evolutions since the last RWT boron sample.	RCO						
	If ir be 1) 2) 3) If ii	NOTE n Modes 1, 2, 3 or 4, <u>Then</u> the SIT boron concentration shall be verified between 1720 and 2100 ppm as follows: <u>If</u> the SIT makeup water source was the RWT <u>and</u> the RWT has been verified to be between 1720 and 2100 ppm by sample analysis since last filling evolution of the RWT, <u>Then</u> the boron concentration in the shall be verified by sample analysis within 31 days (with a maximum allowable extension not to exceed 25% of the surveillance interval) of last boron sample of the SIT. <u>If</u> the makeup water source was the RWT <u>and</u> RWT boron concentration has NOT been verified to be between 1720 and 2100 ppm by sample analysis since the last filling evolution of the RWT, <u>Then</u> the boron concentration of the SIT shall be verified by sample analysis within 6 hours of filling the SIT. <u>If</u> the makeup water source was NOT the RWT, <u>Then</u> the boron concentration of the SIT shall be verified by sample analysis within 6 hours of filling the SIT. <u>If</u> the makeup water source was NOT the RWT, <u>Then</u> the boron concentration of the SIT shall be verified by sample analysis within 6 hours of filling the SIT. <u>If</u> the makeup water source was NOT the RWT, <u>Then</u> the boron concentration of the SIT shall be verified by sample analysis within 6 hours of filling the SIT. <u>If</u> the SIT shall be verified by sample analysis within 6 hours of filling the SIT.	d to n the SIT f the tion e						

between 1720 and 2100 ppm prior to entering Mode 4.
ST. LUCIE UNIT 2 OPERATING PROCEDURE NO. 2-0410021, REVISION 36A SAFETY INJECTION TANK NORMAL OPERATION

		DATA SHEET 1 SAFETY INJECTION TANK POST FILL DATA SHEET (Page 2 of 2)	INITIAL
*5.	The boro	date/time or mode the SIT is required to be sampled for	<u> </u>
*6.	<u>lf</u> the <u>Ther</u>	e SIT is required to be sampled within 6 hours of filling, record the following:	
	A.	The time the Chemistry Technician was notified to sample.	
	В.	The date/time the SIT was sampled.	
	C.	Boron concentration in ppm determined by sample analysis.	
	D.	Post fill results satisfy conditions and requirements of Technical Specifications 3.5.1 and 4.5.1.	RCO
7.	<u>If</u> the 275 on E OP 2	e SIT is required to be sampled prior to exceeding psia in Mode 4, <u>Then</u> ensure the sample requirement is recorded Data Sheet 30, Unscheduled Surveillance Tracking, of 2-0010125A, "Surveillance Data Sheets."	RCO
8.	<u>lf</u> the furth	e SIT is required to be sampled within 31 days of its last sample, <u>The</u> ler action is required per this Data Sheet.	<u>n</u> no

Reviewed by _____

NPS/ANPS/NWE

* Satisfactory performance of the above asterisked steps assures conformance with applicable Technical Specifications.

REGION II INITIAL LICENSE EXAMINATION JOB PERFORMANCE MEASURE ST. LUCIE NUCLEAR PLANT

RESPOND TO AN "A" SHUTDOWN COOLING LOOP SUCTION VALVE CLOSURE (V3480) WHILE ON SDC

CANDIDATE _____

EXAMINER _____

REGION II INITIAL LICENSE EXAMINATION JOB PERFORMANCE MEASURE ST LUCIE NUCLEAR PLANT

Task: Perform lineups on the RHRS

Alternate Path: Yes ____ No _X___

Facility JPM #: 0821086

Task Standard: Reestablish Shutdown Cooling

Preferred Evaluation Location:

Simulator X Control Room In-Plant

Preferred Evaluation Method:

Perform <u>X</u> Simulate ____

References: ONOP 2-0440030, "Shutdown Cooling Off-Normal," Rev 35

Validation Time 2	0 minutes	Time Criti	cal <u>N</u>	lo
Candidate:	Name			Time Start Time Finish
Performance Rating:	Sat	Unsat _		Question Grade
Examiner:		S	Signature Name);

Tools/Equipment/ Procedures Needed:

ONOP 2-0440030, "Shutdown Cooling Off-Normal", Appendix E

Read to Candidate

Directions to candidate for In-Plant or Control Room JPMs:

I will explain the initial conditions and state the task to be performed. All in-plant or control room JPM steps, including any communications, shall be simulated for this JPM. Under no circumstances, unless directed by the examiner, are you to operate any plant equipment. I will provide initiating cues and reports on other actions when directed by you. Ensure you indicate to me when you finish your assigned task by returning the handout sheet I provided you.

Directions to candidate for Simulator JPMs:

I will explain the initial conditions and state the task to be performed. All simulator JPM steps, including any communications, shall be performed for this JPM. You are you to operate any plant equipment that is necessary for the completion of this JPM. The simulator will provide the cues as you perform this JPM. Ensure you indicate to me when you finish your assigned task by returning the handout sheet I provided you.

Initial Conditions: The 2A Shutdown Cooling System was in service when V-3480, the 2A loop suction isolation closed due to a spurious signal. The 2A LPSI pump has been stopped and the problem has been corrected. The B train SDC System is out of service, the RCS hot legs are full and RCS level and temperature are unchanged. RCS level is 33 feet, RCS temperature is 121 degrees and stable.

Initiating Cues: The ANPS has directed that 2A Shutdown Cooling flow be restored IAW ONOP 2-0440030, Appendix E

Start Time _____

.

Step 1: Standard: Cue: Comments	Ensure V3480, V3481 and V3664 hot leg suction valves are open (step 2A2) Operator verifies V3480, V3481 and V3664 hot leg suction valves are open (RTGB 206) V3481 and V3664 indicate red lights illuminated, V3480 indicates green light illuminated*	Sat Unsat
<u>Step 2:</u>	Open V3480 (step 2A2, indicates <u>ensure</u>)	Critical Step
<u>Standard:</u> <u>Cue:</u>	Operator places the keyswitch for V3480 to the Open position (RTGB 206) V3480 indicates red light illuminated*	Sat Unsat
<u>Comment</u>	<u>s:</u>	
<u>Step 3:</u>	Ensure open HCV-14-3A (step 2A3)	
Standard:	Operator verifies HCV-14-3A open	Sat
<u>Cue:</u>	(RTGB 206) HCV-14-3A indicates red light illuminated*	Unsat
Comment	<u>s:</u>	
Step 4:	Open HCV-3615 and HCV-3625 (step 2A4)	Critical Step
Standard:	Operator takes control switches for HCV-3615 and HCV-3625 to Open position	Sat
<u>Cue:</u>	HCV-3615 and HCV-3625 indicate red lights illuminated*	
Comment	<u>ts:</u>	

Step 5:	Close HCV-3657 (step 2A5)	Critical Step
Standard:	Operator places HCV-3657 control switch to Closed	Sat
<u>Cue:</u>	(RTGB 206) HCV-3657 indicates green light illuminated*	Unsat
Comment	<u>S:</u>	
Step 6:	Ensure closed V3444 (step 2A6)	
Standard:	Operator checks closed V3444	Sat
<u>Cue:</u>	(RTGB 206) V3444 indicates green light illuminated*	Unsat
Comment	<u>s:</u>	
<u>Step 7:</u>	Ensure closed V3536 (step 2A7)	
Standard:	Operator checks closed V3536	Sat
<u>Cue:</u>	(RTGB 206) V3536 green light illuminated*	Unsat
<u>Comment</u>	<u>S:</u>	
<u>Step 8:</u>	Place FCV-3306 keyswitch in the Modulate position (step 2A8)	Critical Step
Standard:	Operator places FCV-3306 keyswitch in the Modulate position or verifies switch in Modulate if already performed	Sat Unsat
<u>Cue:</u>	(RTGB 206) FCV-3306 keyswitch in the Modulate position*	
<u>Comment</u>	<u>'s:</u>	

Step 9:	Close FCV-3306 (step 2A9)	Critical Step
Standard:	Operator places FCV-3306 control switch to Closed position	Sat
<u>Cue:</u>	(RTGB 206) FCV-3306 indicates green light illuminated*	Unsat
<u>Comment</u>	<u>s:</u>	
<u>Step 10:</u>	Ensure RCS pressure < 275 psia (step 2A10)	
Standard:	Operator observes indications to ensure RCS pressure < 275 psia	Sat
<u>Cue:</u>	(RTGB 206) RCS pressure indicates 270 psia*	Unsat
Comment	<u>s:</u>	
<u>Step 11:</u>	Start the 2A LPSI pump (step 2A12)	Critical Step
Standard:	Operator places the control switch for 2A LPSI pump to Start	Sat
<u>Cue:</u>	(RTGB 206) 2A LPSI pump indicates red light illuminated, stable amps after starting surge*	Unsat
Commen	<u>ts:</u>	
<u>Step 12:</u>	Adjust FCV-3306 to obtain 100 to 200 gpm as indicated on FI-3322 and FI-3312 (step 2A13)	Critical Step
Standard	Operator positions FCV-3306 to obtain 100 to 200 gpm as indicated on FI-3322 and FI-3312 (indications must be multiplied by X10)	Unsat
<u>Cue:</u>	(RTGB 206) FCV-3306 positioned, flow 150 gpm*	
Commen	<u>ts:</u>	

Step 13: Standard: <u>Cue:</u> <u>Comment</u> :	When temperature stabilizes, increase flow until desired flowrate is obtained as indicated on FR-3306 (step 2A14) Operator positions control switch for FCV-3306 to open until flowrate on FR-3306 is 3000 gpm (RTGB 206) FCV-3306 has dual indication, 3000 gpm indicated on FR-3306* s:	Critical Step Sat Unsat
<u>Step 14:</u> <u>Standard:</u> <u>Cue:</u> <u>Comment</u>	Ensure open V3517, SDC HX to 2A HX valve (step 2A15) Operator observes V3517 to be in the open position (RTGB 206) V3517 indicates red light illuminated* s:	Sat Unsat
<u>Step 15:</u>	Throttle open HCV-3657, HCV-3615 and HCV-3625 to establish the following: FCV-3306 full closed, 2A SDC loop flow \geq 1000 gpm, FI-3322 and FI-3312 are within 300 gom of each other (Steps 2A16 a, b and c) operator throttles open HCV-3657, HCV-3615 and HCV-3625 and verifies FCV 3306 is closed, 2A SDC loop flow \geq 1000 gpm and loop 2A1 and 2A2 flow indications are within 300 gpm of each other	Critical Step Sat Unsat
<u>Cue:</u> <u>Commen</u>	(RTGB 206) HCV-3657, HCV-3615 and HCV-3625 indicate red and green lights illuminated, flow is > 1000 gpm and loop flows agree within 300 gpm* <u>ts:</u>	

Step 16: Standard: <u>Cue:</u> <u>Comment</u>	Establish the desired cooldown rate and ensure 2A SDC inlet and outlet warmup rates are <20°F/minute (steps 2A16 d and e) Operator observes cooldown is established and ensures 2A SDC inlet and outlet warmup rates are <20°F/minute on TR-3351 and TR-3303W (RTGB 206) Cooldown rate established, 2A SDC inlet and outlet heatup rates <20°F/minute*	Sat Unsat
<u>Step 17:</u> Standard:	Operate the SDC system in the TOTAL flow range of 3000 to 7000 gpm and NOT to exceed 3500 gpm per train Operator observes flow rate is between 3000 and 3500 gpm	Critical Step Sat Unsat
<u>Cue:</u>	(RTGB 206) Flow rate is 3300 GPM*	
Comment	<u>is:</u>	
	END OF TASK	

Stop Time _____

* If JPM is performed on the simulator, cues will not be verbalized by the examiner, but will be used to verify the JPM is being performed correctly.

CANDIDATE CUE SHEET

(TO BE RETURNED TO THE EXAMINER UPON COMPLETION OF TASK)

INITIAL CONDITIONS:

Unit 2 A train Shutdown Cooling System was in service when V-3480, the A loop suction isolation closed due to a spurious signal. The 2A LPSI pump has been stopped and the problem has been corrected. The B train SDC System is out of service, the RCS hot legs are full and RCS level and temperature are unchanged. RCS level is 33 feet, RCS temperature is 121 degrees and stable.

INITIATING CUE:

The ANPS has directed that A train Shutdown Cooling flow be restored IAW ONOP 2-0440030, Appendix E



REVISION NO	.:	PROCEDURE TITLE:	PAGE:
35		SHUTDOWN COOLING OFF-NORMAL	
PROCEDURE NO .:			33 of 48
2-0440030		ST. LUCIE UNIT 2	
2-0440	000	APPENDIX E	
		RESTORATION OF SDC	
		(Page 8 of 14)	
1. (conti	nued)		
, /		N N	
В. (continu	led)	
1	3. (co	ntinued)	
	f	(continued)	
	1.	(continued)	
		6. (continued)	
		If ALL the following RCS conditions exist; and if	desired:
		-	than or
		• The Reactor has been subcritical for greater equal to 125 hours,	
		 The highest RCS temperature is less than or 117°F, 	r equal to
		 CCW Inlet temperature to the SDC Heat Exc less than or equal to 87°F. 	hangers is
		<u>Then</u> OPERATE the SDC System in the TOTAL of 2000 to 2500 gpm, and NOT to exceed a max 2200 gpm per train.	flow range a. flow of
	14. <u>If</u> k Op	both trains are to be blaced in operation, <u>Then</u> ensure loss V3545, Hot Leg Suction Crosstie.	Locked
2. If RC	S:	•	
•	Level h desired	has NOT dropped below the hot leg centerline (29' 6") of SDC Train in operation.	with the
		AND	
•	Has No desired	OT heated up excessively (to greater than 200 degrees d SDC Train has been in operation.	s) since the

REVISION NO .:		NO.	PROCEDURE TITLE:	PAGE:
35		35	SHUTDOWN COOLING OFF-NORMAL	
PRC		RE NO.		34 of 48
	2-01/	1003	ST LUCIE UNIT 2	
'	2-04-	+000		
			RESTORATION OF SDC	
			(Page 9 of 14)	
2.	(co	ntinu	ed)	
	The	<u>en</u> re	store the desired SDC Train to service as follows:	
	Α.	То	restore the 2A SDC Train:	
		1.	If the 2A LPSI pump has NOT been secured, <u>Then</u> secure 2A LPSI pump to preclude damage to the pump.	the
		2.	Ensure V3480, V3481 and V3664, 2A Hot Leg Suction Val OPEN.	ves, are
		3.	Ensure OPEN HCV-14-3A, CCW to the 2A SDC HX.	
		4.	OPEN HCV-3615 and HCV-3625, 2A LPSI Header Isolatio	n Valves.
		5.	CLOSE HCV-3657, 2A SDC HX Flow Control Valve.	
		6.	Ensure CLOSED V3444, 2A LPSI Suction Valve.	
		7.	Ensure CLOSED V3536, 2A SDC Warmup Valve.	
		8.	Place FCV-3306, Bypass Keyswitch, in the MODULATE po	osition.
		9.	CLOSE FCV-3306, 2A Shutdown Cooling Bypass Valve.	
		10.	Ensure that RCS pressure is less than 275 psia.	
and the second se		11.	If cavitation was observed prior to securing the 2A LPSI pullocally vent the 2A LPSI pump.	ımp, <u>Then</u>
		12.	Start the 2A LPSI pump.	
		13.	Immediately after starting the 2A LPSI pump, ADJUST the FCV-3306, 2A Shutdown Cooling Bypass Valve, to obtain 100 and 200 gpm TOTAL flow as indicated on the followin	position of between g:
			FI-3322, LPSI Loop 2A1 Flow	
			FI-3312, LPSI Loop 2A2 Flow	

		Protection and a second s	
REVISION	N NO.:	PROCEDURE TITLE:	PAGE:
35		SHUTDOWN COOLING OFF-NORMAL	0E of 40
ROCED	URE NO.:		35 01 46
2-0440030		ST. LUCIE UNIT 2	
<u>_</u>		APPENDIX E	
		RESTORATION OF SDC	
		(Page 10 of 14)	
2. (c	ontinued)		
A.	. (contin	ued)	
	14. Wł ob	nen temperature stabilizes, increase flow slowly until des tained as indicated on FR-3306.	sired flow is
	15. En	sure OPEN V3517, SDC to 2A HX Valve.	
	16. Th fol	rottle OPEN HCV-3657, HCV-3615 and HCV-3625 to es lowing:	stablish the
	a.	FCV-3306, SDC Loop 2A Bypass, is FULL CLOSED.	
	b.	2A SDC Loop flow is greater than or equal to 1000 gp	m.
	C.	FI-3322, LPSI Loop 2A1 Flow, and FI-3312, LPSI Loo Flow, are within 300 gpm of each other.	p 2A2
	d.	ONE of the following:	
		The desired cooldown rate.	
		OR	
		The desired RCS temperature.	
	• 2A S pen	<u>NOTE</u> SDC Heat Exchanger INLET temperature is indicated by on TR-3351.	the red V.
	e.	2A SDC Heat Exchanger inlet and outlet warm up rate 20 degrees/minute.	e less than

BEVISION NO.:	PROCEDURE TITLE:	PAGE:
35	SHUTDOWN COOLING OFF-NORMAL	
PROCEDURE NO.:		36 of 48
2-0440030	ST LUCIE UNIT 2	
2-0440030		<u>_</u>
	RESTORATION OF SDC	
	(Page 11 of 14)	
0 (continuo)	47	
2. (continued	1)	
A. (conti	nued)	
16 (continued)	
10. (continuedy	
f	ONE of the following:	
	If the RCS level is greater than 30 feet, <u>Then</u> OPER SDC System in the TOTAL flow range of 3000 to 70 NOT to exceed a max. flow of 3500 gpm per train.	ATE the 100 gpm, and
	OR	
	If the RCS level is between 29 feet 8 inches and 30 OPERATE the SDC System in the TOTAL flow rang 4400 gpm, and NOT to exceed a max. flow of 2200 train.	feet, <u>Then</u> le of 3000 to gpm per
	OR	
	If ALL the following RCS conditions exist; and if des	sired:
	 The Reactor has been subcritical for greater the 125 hours, 	an or equal to
	• The highest RCS temperature is less than or ec	ual to 117°F,
	 CCW Inlet temperature to the SDC Heat Exchant than or equal to 87°F. 	ngers is less
	<u>Then</u> OPERATE the SDC System in the TOTAL flow 2000 to 2500 gpm, and NOT to exceed a max. flow per train.	v range of of 2200 gpm
17. <u> </u>	f both Trains are to be placed in operation, ensure Lock /3545, Hot Leg Suction Crosstie.	ked Open

EXECUTE JPM:

1. INSTALL IC-54 (Special JPM Set Up IC Set, Standard Facility Set-Up)

2. EXECUTE FACILITY 077A JPM SCENARIO

3. START SCENARIO 077A

4. RUN Simulator for one minute

5. FREEZE Simulator

6. UNFREEZE Simulator when candidate is ready to start JPM

IMPORTANT NOTE:

No procedure for this JPM

REGION II INITIAL LICENSE EXAMINATION JOB PERFORMANCE MEASURE ST. LUCIE NUCLEAR PLANT

MANUALLY ACTUATE AFAS - UNIT 2

CANDIDATE

EXAMINER

REGION II INITIAL LICENSE EXAMINATION JOB PERFORMANCE MEASURE ST LUCIE NUCLEAR PLANT

Task. Teeu Steam	Generators with the Ar W System	
Alternate Path: Ye	es <u>X</u> No	
Facility JPM #:	0821077A	
Task Standard:	Manually actuate AFAS and fee	d the 2A steam generator
Preferred Evaluat	tion Location:	
Simulator <u>X</u>	_ Control Room In-Pl	ant
Preferred Evalua	tion Method:	
Perform <u>X</u>	Simulate	
<u>References:</u> None	e	
<u>Validation Time</u>	10 minutesTime Critic	cal <u>No</u>
Candidate:	Name	Time Start Time Finish
Performance Rat	t ing: Sat Unsat _	Question Grade

Tools/Equipment/ Procedures Needed:

None

Read to Candidate

Directions to candidate for In-Plant or Control Room JPMs:

I will explain the initial conditions and state the task to be performed. All in-plant or control room JPM steps, including any communications, shall be simulated for this JPM. Under no circumstances, unless directed by the examiner, are you to operate any plant equipment. I will provide initiating cues and reports on other actions when directed by you. Ensure you indicate to me when you finish your assigned task by returning the handout sheet I provided you.

Directions to candidate for Simulator JPMs:

I will explain the initial conditions and state the task to be performed. All simulator JPM steps, including any communications, shall be performed for this JPM. You are you to operate any plant equipment that is necessary for the completion of this JPM. The simulator will provide the cues as you perform this JPM. Ensure you indicate to me when you finish your assigned task by returning the handout sheet I provided you.

Initial Conditions: A Steam Generator Tube Rupture occurred in S/G 2B. The 2B S/G has been isolated and the RCS is being cooled down and depressurized. AFW to S/G 2A has just secured automatically due to a differential pressure lock-out.

Initiating Cues:

The ANPS has directed you to manually initiate AFAS-1 and restore S/G 2A Level to the normal range (60-70% NR).

Start Time _____

Step 1:	Manually initiate AFAS-1	Critical Step
Standard:	Operator places all four AFAS initiation switches to the MANUAL position	Sat Unsat
<u>Cue:</u> Comments	(RTGB 203) All four AFAS initiation switches to MANUAL* <u>5:</u>	
Step 2:	Observe valves MV-09-9, 1-SE-09-2, MV-09-11 & 1-SE-09-4 stroke to full open	Critical Step
Standard:	Operator observes MV-09-9, 1-SE-09-2, MV-09-11 & 1-SE-09-4 stroke to full open and flow indicated on FI-09-2A and FI-09-2C	Unsat
<u>Cue:</u>	(RTGB 203) MV-09-9 indicates red light illuminated, SE-09-4 indicates red light illuminated, MV-09-11 indicates green light illuminated, SE- 09-2 indicates green light illuminated, no flow indicated on FI-09- 2A and FI-09-2C*	
<u>Comment</u>	<u>S:</u>	
Step 3:	Manually initiate flow to S/G 2A from the 2A OR 2C AFW Pump	Critical Step Sat
Standard:	Operator obtains key and opens SE-09-2 to establish flowpath from 2A AFW to 2A SG OR manually opens MV-09-11 from RTGB to establish flowpath from 2C AFW to 2A SG	Unsat
<u>Cue:</u>	(RTGB 203) MV-09-11 indicates red light illuminated OR SE-09-2 indicates red light illuminated*	
Comment	<u>ts:</u>	
<u>Step 4:</u>	Restore S/G 2A Level to 60-70% NR using 2A OR 2C AFW Pump.	Critical Step
<u>Standard</u>	Operator throttles AFW flow and observes level increase in the 2A steam generator	Sat
<u>Cue:</u>	(RTGB 203) 2A steam generator level increasing*	
Commen	<u>IIS.</u>	

<u>Step 5:</u>	Notify ANPS that 2A steam generator level is 60%-70% Narrow Range indication	Sat
Standard:	Operator notifies ANPS that 2A steam generator level is 60%-70% Narrow Range indication	Unsat
<u>Cue:</u>	ANPS acknowledges (In the interest of time, this JPM can be terminated at any time after flow is established)*	
Comment	<u>S.</u>	
	END OF TASK	

Stop Time _____

CANDIDATE CUE SHEET

(TO BE RETURNED TO THE EXAMINER UPON COMPLETION OF TASK)

INITIAL CONDITIONS:

A Steam Generator Tube Rupture occurred in S/G 2B. The 2B S/G has been isolated and the RCS is being cooled down and depressurized. AFW to S/G 2A has just secured automatically due to a differential pressure lock-out.

INITIATING CUE:

The ANPS has directed you to manually initiate AFAS-1 and restore S/G 2A Level to the normal range (60-70% NR).

(NO PROCEDURE REF)

CRDS JPM-001 SET-UP INSTRUCTIONS

PREPARATION:

Ahead of time, prepare a full CEA OFF-NORMAL Procedure 2-0410021.

EXECUTE JPM:

- 1. INSTALL IC-1 (100% Power, MOL Steady State)
- 2. RUN Simulator
- 3. EXECUTE JPM SCENARIO
- 4. TRIGGER JPM-001 Lesson Step
- 5. Program DEH to 805 MW at 5 MW/Min
- 6. Reset (4) RPS Hi-Rate Trip Units
- 7. Freeze Simulator When DEH GO light is Extinguished

REGION II INITIAL LICENSE EXAMINATION JOB PERFORMANCE MEASURE ST. LUCIE NUCLEAR PLANT

RECOVER A SLIPPED CEA UNIT 2

CANDIDATE

EXAMINER

REGION II INITIAL LICENSE EXAMINATION JOB PERFORMANCE MEASURE ST LUCIE NUCLEAR PLANT

Task: Operate the control rods manually while the reactor is at power

Alternate Path: Yes X No ____

Facility JPM #: New

<u>Task Standard:</u> Recover a slipped CEA IAW OP 2-0110030, Appendix A, trip the reactor and turbine.

Preferred Evaluation Location:

Simulator X Control Room In-Plant

Preferred Evaluation Method:

Perform X Simulate ____

References: ONOP 2-0110030, "CEA Off-Normal and Realignment

Validation Time 15 minutes	Time CriticalNo
Candidate:Nan	Time Start Time Finish
Performance Rating: Sat	Unsat Question Grade
Examiner:	Signature: Name

Tools/Equipment/ Procedures Needed:

ONOP 2-0110030, "CEA Off-Normal and Realignment, Appendix A,

Read to Candidate

Directions to candidate for In-Plant or Control Room JPMs:

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Directions to candidate for Simulator JPMs:

I will explain the initial conditions and state the task to be performed. All simulator JPM steps, including any communications, shall be performed for this JPM. You are you to operate any plant equipment that is necessary for the completion of this JPM. The simulator will provide the cues as you perform this JPM. Ensure you indicate to me when you finish your assigned task by returning the handout sheet I provided you.

Initial Conditions: Unit 2 is at 98% power, 5000 EFPH. The CEA periodic was in progress when CEA #57 slipped to 18" below the rest of group 5. All IOAs have been performed and Reactor Engineering and Plant Management has been notified.

Initiating Cues:

The ANPS has directed you to investigate CEA # 57 for operability per Appendix A of ONOP 2-0110030, "CEA Off-Normal and Realignment.

Start Time

Step 1:	CAUTION: Reactor power shall NOT be increased above the stable power level established following CEA misalignment (caution step, Appendix A)	Sat
Standard:	Operator remains cognizant of power level at all times	Unsat
<u>Cue:</u>	Power level constant*	
<u>Comments</u>		
<u>Step 2:</u>	Place the mode select switch in Manual Individual mode (step 1A)	Critical Step
Standard:	Operator places mode select switch in Manual Individual	Sat
<u>Cue:</u>	(RTGB 204) Mode select switch in Manual Individual*	Unsat
<u>Comments</u>	<u>s:</u>	
Step 3:	Select the affected CEA on the individual CEA selection switches (step 1B)	Critical Step
Standard:	Operator selects CEA 57 on the individual CEA selection switches	Unsat
<u>Cue:</u>	(RTGB 204) CEA 57 selected*	
<u>Comment</u>	<u>s:</u>	
Step 4:	Select the group of the affected CEA on the group select switch (step	Critical Step
Standard	Operator selects group 5 on the group select switch	Sat
<u>Stanualu.</u>	(DTCR 204)	Unsat
	Group 5 selected*	
Comment	<u>ts:</u>	
		<u> </u>

Step 5:	Depress and hold the CEA motion inhibit bypass pushbutton (step 1D1)	Critical Step
Standard:	Operator depresses and holds the CEA motion inhibit bypass pushbutton	Unsat
<u>Cue:</u>	(RTGB 204) Motion inhibit bypass pushbutton depressed*	
<u>Comments</u>	<u></u>	
<u>Step 6:</u>	Depress and release the bypass enable pushbutton (step 1D2)	Critical Step
Standard:	Operator depresses and released the bypass enable pushbutton	Sat
<u>Cue:</u>	(RTGB 204) CMI bypass enabled*	Unsat
Comment	<u>S:</u>	
<u>Step 7:</u>	Insert and withdraw the affected CEA and check for smooth operation and normal indications (step 1F)	Critical Step
	Contract and with draws CEA 57 and absences smooth	Sat
Standard:	operation and normal indications	Unsat
<u>Cue:</u>	(RTGB 204) CEAs #9 and #10 drop to the bottom of the core*	
Comment	<u>s:</u>	

Step 8:	Trip the reactor and turbine	Critical Step
Standard:	Operator, upon indications of 2 additional dropped CEAs, depresses the Reactor trip pushbuttons on RTGB 204	Sat Unsat
<u>Cue:</u>	(RTGB 204) All rods inserted*	
Comment	END OF TASK	

Stop Time _____

r

CANDIDATE CUE SHEET

(TO BE RETURNED TO THE EXAMINER UPON COMPLETION OF TASK)

INITIAL CONDITIONS:

Unit 2 is at 98% power, 5000 EFPH. The CEA periodic was in progress when CEA #57 slipped to 18" below the rest of group 5. All IOAs have been performed and Reactor Engineering and Plant Management has been notified.

INITIATING CUE:

The ANPS has directed you to investigate CEA # 57 for operability per Appendix A of ONOP 2-0110030, "CEA Off-Normal and Realignment.

BEVISION NO :	ISION NO.: PROCEDURE TITLE:				
45	CEA OFF-NORM				
	- AND REAL	5 of 30			
THOOLDONE NO.					
2-0110030					
7.0 OPERAT	<u>JR ACTIONS</u> :				
7.1 Imme	diate Operator Actions:				
IN	STRUCTIONS		ſ		
1. Place	EDMCS panel in OFF.				
2. <u>If</u> cor is inc pane react out 2 Trip	Itinuous CEA withdrawal licated, while CEDMCS I is OFF, <u>Then</u> trip the or and turbine and carry -EOP-01, "Standard Post Actions."				
3. <u>If</u> a m powe (T-av adjus react	nismatch between reactor er and turbine power rg and T-ref) exists, <u>Then</u> st turbine power to equal for power.				
4. <u>If</u> 3 c misa CEA than drop the r carry Post	or more CEAs are ligned from any other in their group by greater 15 inches and/or ped, <u>Then</u> manually trip eactor and turbine and out 2-EOP-01, "Standard Trip Actions."				

		1.00 mil 240			
EVISION NO.:			PAGE:		
PROCEDURE NO.:		AND REALIGNMENT	8 of 30		
2-0110030		ST. LUCIE-UNIT 2			
		CEA INVESTIGATION FOR OPERABILITY (Page 1 of 3)			
·	Rea esta	<u>CAUTION</u> actor Power shall NOT be increased above the stable p ablished following the CEA(s) misalignment.	ower level		
·	Crit	icality shall be anticipated any time CEAs are being wit	hdrawn.		
1. F A	For tl	ne affected CEA(s), perform the following to determine Place the mode select switch in the manual individual n	operability: node.		
в	3. 5	Select the affected CEA on the individual CEA selection	n switches.		
-		Select the group of the affected CEA on the group sele	ct switch.		
D. If CEA motion inhibit is present. Then:					
	-	 Depress and hold the CEA motion inhibit bypass pression 	ushbutton.		
	2	2. Depress then release the bypass enable pushbutto	n.		
E	Ξ. <u>Ι</u> (<u>f</u> the CEA was dropped, <u>Then</u> first withdraw the affecter core mimic CEA bottom light and lower electrical limit li deenergize.	ed CEA until ghts both		
<u>Do N</u> from	NOT the	$\frac{CAUTION}{exceed \pm 10 \text{ inches of the original position without per ANPS.}}$	mission		
F	=.	Insert and withdraw the affected CEA and check for smooperation and normal indications.	nooth		
(G.	If CEA is determined to be operable proceed to the appendix for CEA realignment.	plicable		

l

EVISION NO).:	PROCED	URE TITLE:	PAGE:	
45 PROCEDURE NO.:			CEA OFF-NORMAL OPERATION	0.06.00	
		1	AND REALIGNMENT	90130	
2-0110030			ST. LUCIE UNIT 2		
			APPENDIX A		
		<u>CE/</u>	A INVESTIGATION FOR OPERABILITY		
			(Fage 2 01 3)		
			NOTE		
Tri	pped	CEA dis	connect and/or loss of CEA subgroup logic fur	nction will	
ca	use d	ropped C	CEAs.		
	16 11-		deep NOT energies (move). Then sheck the s	tatus of the	
2.		e CEA(s)M coil p	power supply panels in the cable spreading roc	om:	
	•	O. monto.			
	А.	Sympton	ins.		
		1. CE/	A disconnect in OFF; red light off, green light o	n.	
		2 CE/	A disable lights are red for the affected CEA.		
		2. 02,			
		3. Tim	er failure lights are red for the affected CEA.		
B. Trouble Shooting:					
	1 If CEA disconnect is off Then:				
		т. <u>п</u> О			
		а.	Turn ON disconnect switch.		
		b.	Reset ACTM card toggle switch. (located insid	de cabinet,	
			top switch, UG ENGD light should remain on)).	
		2. If C	EA disconnect is not off, <u>Then</u> :		
			Deast ACTM cord toggle switch		
		a.	Reset ACTIM card toggle switch.		
	C.	Check t	the air conditioning system for proper operation	۱.	
	D Check the cooling fans for proper operation.				
	-	0	the ISO Dept. for excitance and patify them	of the	
	E.	problem	n and any abnormalities found.		
		1. Cho mig	eck the CEDMCS and CEA drive system for al ght indicate the CEA problem.	arms that	

9 9		the second state			
VISION NO .:	PROCEDURE TITLE:		PAGE:		
45	CEA OFF	-NORMAL OPERATION	10 - 1 00		
OCEDURE NO .:	- ANI	DREALIGNMENT	10 01 30		
2 0110020	ST. LUCIE UNIT 2				
2-0110000	<u>_</u>	PPENDIX A			
	CEA INVESTIGA	TION FOR OPERABILITY			
	(P	Page 3 of 3)			
2. (co	ntinued)				
F	(continued)				
L.					
		CALITION			
	T exceed + 10 inches (of original position without pe	rmission from		
the AN	<u>P</u> S.				
	2. Withdraw and ins	ert the CEA(s) in manual ind	ividual or manual		
	group at the direc	ction of I&C to support trouble	eshooting.		
с.	Have 1.8 C parform th	a following as necessary			
г.	Have I & C perform a	le following as necessary.			
	1. Check associated	power supplies and fuses.			
	2. Obtain coil currer	nt traces and voltage measure	ements to		
	determine the loc	ation of trouble.			
T	more CEAe eimultane	NUTE ously transferring to the lowe	r gripper could		
indicat	CEDMCS noise caus	ed by system arounds.	r grippor ocula		
			/R4		
	3 If two or more CI	=As simultaneously transfer to	o the lower		
	gripper. Then be	form the following:	/R4		
	3	U U			
	a. Direct I&C to	troubleshoot for possible sys	stem grounds. /R4		
	h Minimizo mo	vement of CEAs	/Rz		
	D. MILITAZE MO		/11-		
G.	Proceed to the applic	able Appendix for CEA realig	nment or to		
	Appendix B if CEA is	determined to be inoperable			



"Lesson-Plan"



Lesson File: /cae/if/ifdata/lesson/nrc2/xl04.xld Lesson Description: Y2000 NRC OPERATING TEST, JPM SET-UP FILE Lesson IC used: Created on: 11/28/99 12:22:50




Step #:1Step Description :JPM 012 -- Set Up for Logic Matrix JPMDelay Time :0:00:00Mode :RegularInitialState :Pending

	INSTRUCTION				TYPE	DEMANDED VALUE	RAMP TIME	DELAY TIME
1	TFL2CBA - L2 2 93301	TCB1 - FAIL	AS	IS	MALF	TRUE		



Step #:2Step Description :JPM 006 -- 2A1 SIT Fill JPM Set-UpDelay Time :0:00:00Mode :RegularInitialState :Pending

INSTRUCTION		TYPE	DEMANDED VALUE	RAMP TIME	DELAY TIME
1 TAMFMA1 - MF_TANKA1 MASS	LB	REM	81500.000	0:00:20	





Step #:3Step Description :JPM 001 -- Set-Up Step for SLIPPED CEA JPMDelay Time :0:00:00Mode :RegularInitialState :Pending

	INSTRUCTION		TYPE	DEMANDED	VALUE	RAMP TIME	DELAY TIME
1	TVLIR01D - LI_CEAF DROPPED CEA HEI	IGHT	MALF	118.000			
2	TFLIR57D - LI_CEA57 DROP CEA #57 7	TO SELECTE	MALF	TRUE			
3	TFLIR57D - LI_CEA57 DROP CEA #57 D	TO SELECTE	MALF	FALSE			0:00:04



"Lesson-Plan"



Step #:4Step Description :JPM 001 (1) -- DROPS TWO MORE CEAs (manual Trigger)Delay Time :0:00:00Mode :RegularInitialState :Pending

INSTRUCTION	TYPE	DEMANDED VALUE	RAMP TIME	DELAY TIME
1 TVLIR01D - LI_CEAF DROPPED CEA HEIGHT	MALF	0.0		
2 TFLIR09D - LI_CEA9 DROP CEA #9 TO SELECTED	MALF	TRUE		
3 TFLIR10D - LI_CEA10 DROP CEA #10 TO SELECTE	MALF	TRUE		

REGION II INITIAL LICENSE EXAMINATION JOB PERFORMANCE MEASURE ST. LUCIE NUCLEAR PLANT

OPERATE THE HYDROGEN RECOMBINER UNIT 1

· •

CANDIDATE

EXAMINER

REGION II INITIAL LICENSE EXAMINATION JOB PERFORMANCE MEASURE ST LUCIE NUCLEAR PLANT

Task: Start up the Hydrogen Recombiners

Alternate Path: Yes ____ No __X

Facility JPM #: Not in bank, Unit 2 used previously for 1997NRC exam

Task Standard: Place the 1A Hydrogen Recombiner in service

Preferred Evaluation Location:

Simulator X Control Room In-Plant

Preferred Evaluation Method:

Perform X Simulate _____

References: 1-EOP-99, Appendix M

Validation Time	10 minutes	Time Cri	itical <u>No</u>	<u>) </u>	
Candidate:	Name		<u></u>	Time Start Time Finish	
Performance Rating:	Sat	Unsat			
Examiner:	Name		Signature:	<u></u>	

Tools/Equipment/ Procedures Needed:

1-EOP-99, Appendix M

Read to Candidate

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Directions to candidate for Simulator JPMs:

I will explain the initial conditions and state the task to be performed. All simulator JPM steps, including any communications, shall be performed for this JPM. You are you to operate any plant equipment that is necessary for the completion of this JPM. The simulator will provide the cues as you perform this JPM. Ensure you indicate to me when you finish your assigned task by returning the handout sheet I provided you.

Initial Conditions: A large break LOCA has occurred inside Unit 1 containment building. Chemistry has reported that hydrogen concentration is 1.2%.

Initiating Cues: The ANPS has directed you to place 1A Hydrogen Recombiner in service IAW 1-EOP-99, Appendix M. The SNPO has reported that breakers 1-41251 and 1-42103 are closed.

Start Time _____

.

Step 1: Verify the power available white light on the H2 recombiner control panel is illuminated (step 2) Sat			
Step 2: Place the power adjust potentiometer at 000 (step 3) Critical Step Standard: Operator simulates rotating the power adjust potentiometer until the value is 000. Sat	Step 1: Standard: Cue: Comments	Verify the power available white light on the H2 recombiner control panel is illuminated (step 2) Operator observes the power available white light is illuminated (1A H2 recombiner panel behind RTGB 103) White light illuminated. S:	Sat Unsat
Standard: Operator simulates rotating the power adjust potentiometer until the value is 000. Sat Cue: (1A H2 recombiner panel behind RTGB 103) Power adjust potentiometer rotated. Unsat Comments: Step 3: Place the power out switch on the control panel to the ON position, The red light on the switch will illuminate (step 4) Critical Step 3 Standard: Operator simulates placing the power on switch to the ON position and observes the red light on the switch illuminates. Unsat Cue: (1A H2 recombiner panel behind RTGB 103) Red light illuminated. Comments: Sat Step 4: Gradually turn the power adjust potentiometer to 70 KW as indicated on the power out wattmeter (step 5) Sat Standard: Operator simulates SLOWLY turning the power adjust potentiometer to 70 KW, ensuring not to exceed 75 KW. Cue: (1A H2 recombiner panel behind RTGB 103) Power adjust potentiometer at 70 KW. Sat	<u>Step 2:</u>	Place the power adjust potentiometer at 000 (step 3)	Critical Step
Cue: (1A H2 recombiner panel behind RTGB 103) Power adjust potentiometer rotated. Comments: Step 3: Place the power out switch on the control panel to the ON position, The red light on the switch will illuminate (step 4) Critical Step Sat Standard: Operator simulates placing the power on switch to the ON position and observes the red light on the switch illuminates. Unsat Cue: (1A H2 recombiner panel behind RTGB 103) Red light illuminated. Critical Step Step 4: Gradually turn the power adjust potentiometer to 70 KW as indicated on the power out wattmeter (step 5) Critical Step Standard: Operator simulates SLOWLY turning the power adjust potentiometer to 70 KW, ensuring not to exceed 75 KW. Cue: (1A H2 recombiner panel behind RTGB 103) Power adjust potentiometer at 70 KW. Cue: (1A H2 recombiner panel behind RTGB 103) Power adjust potentiometer at 70 KW. Unsat	<u>Standard:</u>	Operator simulates rotating the power adjust potentiometer until the value is 000.	Sat Unsat
Step 3: Place the power out switch on the control panel to the ON position, The red light on the switch will illuminate (step 4) Critical Step Standard: Operator simulates placing the power on switch to the ON position and observes the red light on the switch illuminates. Unsat Cue: (1A H2 recombiner panel behind RTGB 103) Red light illuminated. Unsat Comments: Step 4: Gradually turn the power adjust potentiometer to 70 KW as indicated on the power out wattmeter (step 5) Sat Standard: Operator simulates SLOWLY turning the power adjust potentiometer to 70 KW, ensuring not to exceed 75 KW. Sat	<u>Cue:</u> <u>Comment</u> :	(1A H2 recombiner panel behind RTGB 103) Power adjust potentiometer rotated. <u>s:</u>	
Standard: Operator simulates placing the power on switch to the ON position and observes the red light on the switch illuminates. Unsat <u>Cue:</u> (1A H2 recombiner panel behind RTGB 103) Red light illuminated. Unsat <u>Comments:</u> Step 4: Gradually turn the power adjust potentiometer to 70 KW as indicated on the power out wattmeter (step 5) Critical Step Standard: Operator simulates SLOWLY turning the power adjust potentiometer to 70 KW, ensuring not to exceed 75 KW. Sat <u>Cue:</u> (1A H2 recombiner panel behind RTGB 103) Power adjust potentiometer at 70 KW. Comments:	<u>Step 3:</u>	Place the power out switch on the control panel to the ON position, The red light on the switch will illuminate (step 4)	Critical Step
Cue: (1A H2 recombiner panel behind RTGB 103) Red light illuminated. Comments: Comments: Step 4: Gradually turn the power adjust potentiometer to 70 KW as indicated on the power out wattmeter (step 5) Critical Step Standard: Operator simulates SLOWLY turning the power adjust potentiometer to 70 KW, ensuring not to exceed 75 KW. Sat Cue: (1A H2 recombiner panel behind RTGB 103) Power adjust potentiometer at 70 KW. Unsat	Standard:	Operator simulates placing the power on switch to the ON position and observes the red light on the switch illuminates.	Unsat
Step 4: Gradually turn the power adjust potentiometer to 70 KW as indicated on the power out wattmeter (step 5) Critical Step Standard: Operator simulates SLOWLY turning the power adjust potentiometer to 70 KW, ensuring not to exceed 75 KW. Sat Cue: (1A H2 recombiner panel behind RTGB 103) Power adjust potentiometer at 70 KW. Unsat Comments: Comments: Comments:	<u>Cue:</u> Comment	(1A H2 recombiner panel behind RTGB 103) Red light illuminated. <u>s:</u>	
Step 4: Gradually turn the power adjust potentiometer to 70 KW as indicated on the power out wattmeter (step 5) Critical Step Standard: Operator simulates SLOWLY turning the power adjust potentiometer to 70 KW, ensuring not to exceed 75 KW. Sat Cue: (1A H2 recombiner panel behind RTGB 103) Power adjust potentiometer at 70 KW. Unsat Comments: Comments: Comments:			
Standard: Operator simulates SLOWLY turning the power adjust potentiometer to 70 KW, ensuring not to exceed 75 KW. Unsat Cue: (1A H2 recombiner panel behind RTGB 103) Power adjust potentiometer at 70 KW. Unsat Comments: Comments: Comments:	<u>Step 4:</u>	Gradually turn the power adjust potentiometer to 70 KW as indicated on the power out wattmeter (step 5)	Critical Step Sat
<u>Cue:</u> (1A H2 recombiner panel behind RTGB 103) Power adjust potentiometer at 70 KW . <u>Comments:</u>	Standard:	Operator simulates SLOWLY turning the power adjust potentiometer to 70 KW, ensuring not to exceed 75 KW.	Unsat
	Cue:	(1A H2 recombiner panel behind RTGB 103) Power adjust potentiometer at 70 KW.	
		<u></u>	

		and the second second second second second second second second second second second second second second second
<u>Step 5:</u>	Periodically check the temperature of the three thermocouples using	Critical Step
	the temperature channel selector switch. When temperature reaches 1250°F, then adjust the power adjust potentiometer to maintain	Sat
	temperature between 1250°F and 1400°F	Unsat
<u>Standard:</u>	Operator simulates selecting each temperature control channel by placing the selector switch in each position and observes temperature indication.	
<u>Cue:</u>	(1A H2 recombiner panel behind RTGB 103) Temperatures indicate 1270°F on all three channels. (Note: this JPM can be terminated after candidate has checked temperature indication)	
<u>Comment</u>	<u>s:</u>	
	END OF TASK	

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Stop Time _____

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CANDIDATE CUE SHEET

(TO BE RETURNED TO THE EXAMINER UPON COMPLETION OF TASK)

INITIAL CONDITIONS:

A large break LOCA has occurred inside Unit 1 containment building. Chemistry has reported that hydrogen concentration is 1.2%.

INITIATING CUE:

The ANPS has directed you to place 1A Hydrogen Recombiner in service IAW 1-EOP-99, Appendix M. The SNPO has reported that breakers 1-41251 and 1-42103 are closed.

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		1. 18. 19. 19. 19. 19. 19. 19. 19. 19. 19. 19	1			
REVISIC	N NO.: 28		PAGE:			
			51 of 155			
1-E	EOP-99	ST. LUCIE UNIT 1				
<u> </u>		APPENDIX M				
		OPERATION OF HYDROGEN RECOMBINERS				
		CRITERIA FOR OPERATION	<i>x</i>			
1. <u> </u> F	<u>f</u> containm blace the h	ent hydrogen concentration is greater than or equal to 0. ydrogen recombiners in service per page 2 of this apper	5%, <u>Then</u> ndix.			
2. (ł	Operation on Nydrogen c	of the hydrogen recombiners may be terminated when co oncentration is less than 0.5%.	ontainment			
3. <u> </u> v t	 If the containment hydrogen concentration is greater than 3.5%, <u>Then</u> consult with the TSC in considering the use of the Hydrogen Purge System to reduce the concentration. Factors to consider include the following: 					
ļ	A. Contair	nment atmosphere radiation level.				
E	B. Containment hydrogen concentration.					
(C. Rate of	increase in containment hydrogen concentration.				
4. <u>I</u>	I <u>f</u> it is decio service per	led to operate the Hydrogen Purge System, <u>Then</u> place Appendix N, "Hydrogen Purge System Operation."	it in			
5.	Operation	of the Hydrogen Purge System may be terminated if:				
	A. Contaiı	nment hydrogen concentration is less than 0.5%.				
		OR				
	B. Contain recomb	nment hydrogen concentration is less than 3.5% and hyd piners are operating.	Irogen			
		(Continued on Next Page)				

REVI	SION NO.:		PAGE:			
	28	APPENDIXES/FIGURES/TABLES	52 of 155			
PRO	CEDURE NO .:					
	1-EOP-99					
		APPENDIX M OPERATION OF HYDROGEN RECOMBINERS (Page 2 of 2)				
	Р	LACING HYDROGEN RECOMBINERS IN SERVICE				
1.	Ensure the	following breakers are CLOSED:				
	Breaker 1-4 Breaker 1-4	41251 "Hydrogen Recombiner 1A" 42103 "Hydrogen Recombiner 1B"				
2.	Verify powe	er available white light on H_2 Recombiner Control Panel	is			
3.	Place the p	oower adjust potentiometer at zero (000).				
4.	Place the p light on the	power out switch on the control panel to the ON position. a switch will illuminate.	The red			
5.	 <u>CAUTION</u> There is a lag in the power out wattmeter reading, so the potentiometer knob must be rotated slowly. Do NOT exceed 75 KW. 5. Gradually turn the power adjust potentiometer to 70 KW as indicated on the 					
		<u>CAUTION</u> Do NOT exceed recombiner temperature of 1400°F.				
6.	Periodicall temperatur <u>Then</u> adjus 1250°F an	y check the temperature of the three thermocouples usin re channel selector switch. <u>When</u> the temperature reach st the power adjust potentiometer to maintain temperatur d 1400°F.	ng the les 1250°F, re between			
		END OF APPENDIX M				

REGION II INITIAL LICENSE EXAMINATION JOB PERFORMANCE MEASURE ST. LUCIE NUCLEAR PLANT

INITIATE HOT AND COLD LEG INJECTION UNIT 1

CANDIDATE

EXAMINER

REGION II INITIAL LICENSE EXAMINATION JOB PERFORMANCE MEASURE ST LUCIE NUCLEAR PLANT

Task: Adjust HPSI flow

Alternate Path: Yes _____ No __X

Facility JPM #: New

<u>Task Standard:</u> Initiate hot and cold leg injection using the secondary alternate method

Preferred Evaluation Location:

Simulator _____ Control Room __X__ In-Plant _____

Preferred Evaluation Method:

Perform _____ Simulate __X___

References: 1-EOP-99, Appendix O

Validation Time 20 minutes Time Critical No

Candidate:	Name		Time Start Time Finish
Performance Rating:	Sat	Unsat	
Examiner:	Name		Signature:

Tools/Equipment/ Procedures Needed:

Read to Candidate

Directions to candidate for In-Plant or Control Room JPMs:

I will explain the initial conditions and state the task to be performed. All in-plant or control room JPM steps, including any communications, shall be simulated for this JPM. Under no circumstances, unless directed by the examiner, are you to operate any plant equipment. I will provide initiating cues and reports on other actions when directed by you. Ensure you indicate to me when you finish your assigned task by returning the handout sheet I provided you.

Directions to candidate for Simulator JPMs:

I will explain the initial conditions and state the task to be performed. All simulator JPM steps, including any communications, shall be performed for this JPM. You are you to operate any plant equipment that is necessary for the completion of this JPM. The simulator will provide the cues as you perform this JPM. Ensure you indicate to me when you finish your assigned task by returning the handout sheet I provided you.

Initial Conditions: A large break LOCA/LOOP occurred on Unit 1 approximately eight hours ago. The 1B Emergency Diesel Generator tripped on overspeed and cannot be restarted.

Initiating Cues: The ANPS has directed you to align hot and cold leg injection using the 1A Containment Spray Pump through the 1A LPSI injection flow path IAW 1-EOP-99, Appendix O.

Start Time _____

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Step 1: Standard: Cue: Comment	Ensure all of the following: 1A Containment Spray pump is running, RCS pressure is < 250 psia, RCS to containment differential pressure is less than 150 psid, and all available HPSI pumps running and all associated header valves open. (step 4A) Operator observes 1.) 1A Containment Spray pump is running 2.)RCS pressure indications and verifies pressure < 250 psia, 3.) containment pressure and calculates containment to RCS differential and 4.) all available HPSI pumps running and all associated header valves open. (RTGB 106) 1.) Red light on, green light off for 1A CS pump. 2.) RCS pressure 160 psia. 3.) Containment Pressure 5 psig. 4.) Red light on green light off for 1A HPSI pump, normal flow indicated.	Sat Unsat
<u>Step 2:</u>	Ensure V3456 1A SDC HX outlet open (step 4B1)	Sat
Standard:	Operator observes V3456 and verifies open indication.	
<u>Cue:</u>	(CRAC Panel) Red light on, green light off for V3456.	
Comment	<u>s:</u>	
<u>Step 3:</u>	Ensure both LPSI pumps are stopped (step 4B2)	
Standard:	Operator observes 1A and 1B LPSI pumps light indication to verify both are stopped	Sat
<u>Cue:</u>	(RTGB 106) Green lights on, red lights off for 1A and 1B LPSI pumps.	Unsat
Comment	<u>s:</u>	

Step 4:	Place FCV-3306 keyswitch in the AUTO position (step 4B3)	Critical Step
<u>Standard:</u> <u>Cue:</u>	Operator simulates placing the keyswitch for FCV-3306 in the AUTO position. (RTGB 106) FCV-3306 in AUTO.	Sat Unsat
<u>Comment</u>	<u>s:</u>	
<u>Step 5:</u> <u>Standard:</u> <u>Cue:</u> <u>Comment</u>	With keyswitch in AUTO, take manual control of FIC-3306 and close FCV-3306 (step 4B4) Operator simulates reducing the output of FIC-3306 to 0%. (RTGB 106) Green light on, red light off for FCV-3306. S:	Critical Step Sat Unsat
<u>Step 6:</u> Standard: <u>Cue:</u> <u>Comment</u>	Close V3206, 1A LPSI discharge isolation (step 4C) Operator simulates placing keyswitch for V3206 to the CLOSED position. (CRAC panel) Green light on, red light off for V3206. <u>S:</u>	Critical Step Sat Unsat
<u>Step 7:</u> <u>Standard:</u> <u>Cue:</u> <u>Comment</u>	Close V3444, 1A LPSI pump suction isolation (step 4C) Operator simulates placing the keyswitch for V3444 to the CLOSED position. (CRAC panel) Green light on, red light off for V3444. <u>S:</u>	Critical Step Sat Unsat

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	Open MV-03-1A, Shutdown Cooling warmup valve. (step 4C)	Critical Step
<u>Standard:</u>	Operator simulates placing the keyswitch for MV-03-1A to the OPEN position.	Sat Unsat
<u>Cue:</u>	(CRAC panel) Red light on, green light off for MV-03-1A.	
Comment	<u>s:</u>	
Step 9:	Open HCV-3480, SDC loop 1A suction valve (step 4C)	Critical Step
Standard:	Operator simulates placing the keyswitch for HCV-3680 in the OPEN position.	Sat Unsat
<u>Cue:</u>	(RTGB 106) Red light on, green light off for HCV-3480.	
<u>Commen</u>	<u>ts:</u>	
Step 10:	Open HCV-3481, SDC loop 1A suction valve (step 4C)	Critical Step
Standard	: Operator simulates placing the keyswitch for HCV-3681 in the OPEN	Sat
	position.	Unsat
<u>Cue:</u>	Position. (RTGB 106) Red light on, green light off for HCV-3481.	Unsat
<u>Cue:</u> Commen	(RTGB 106) Red light on, green light off for HCV-3481. ts:	Unsat
Cue: Commen Step 11:	position. (RTGB 106) Red light on, green light off for HCV-3481. <u>ts:</u> Close ALL LPSI header isolation valves (HCV-3615, HCV-3625, HCV-3635, HCV-3645) (step 4E)	Unsat Critical Step Sat
<u>Cue:</u> <u>Commen</u> <u>Step 11:</u> <u>Standarc</u>	position. (RTGB 106) Red light on, green light off for HCV-3481. ts: Close ALL LPSI header isolation valves (HCV-3615, HCV-3625, HCV-3635, HCV-3645) (step 4E) L: Operator simulates placing the control switches for HCV-3615, HCV-3615, HCV-3625, HCV-3635, HCV-3645 in the CLOSED position.	Unsat Critical Step Sat Unsat
<u>Cue:</u> <u>Commen</u> <u>Step 11:</u> <u>Standarc</u> <u>Cue:</u>	 position. (RTGB 106) Red light on, green light off for HCV-3481. ts: Close ALL LPSI header isolation valves (HCV-3615, HCV-3625, HCV-3635, HCV-3645) (step 4E) Dperator simulates placing the control switches for HCV-3615, HCV-3625, HCV-3635, HCV-3645 in the CLOSED position. (RTGB 106) Green lights on, red lights off for all LPSI header isolation valves. 	Unsat Critical Ster Sat Unsat

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<u>Step 12:</u>	Place HCV-3657, SDC Temp Control, keyswitch to manual (step 4F)	Critical Step
Standard:	Operator simulates placing the keyswitch for HCV-3657 to the MANUAL position.	Sat
<u>Cue:</u>	(RTGB 106) HCV-3657 in manual.	
Comment	<u>S:</u>	
<u>Step 13:</u>	Slowly open HCV-3657 using HIC-3657, SDC Temp Control, to maintain a minimum of 250 GPM on FIC-3306 (step 4G)	Critical Step Sat
Standard:	Operator simulates adjusting HIC-3657 to obtain >250 GPM as indicated on FIC-3306.	Unsat
<u>Cue:</u>	(RTGB 106) Green and red lights on for HCV-3657, 300 GPM indicated on FIC-3306.	
Comment	<u>S:</u>	
<u>Step 14:</u>	Adust the A train HPSI header valves to maintain a total hot and cold leg injection of 250 to 1500 gpm (step 4H)	Critical Step
Standard:	Operator simulates opening HCV-3617, HCV-3627, HCV-3637 and HCV-3647 and adjusting each valve until flow is balanced between 250 and 1500 gpm	Unsat
<u>Cue:</u>	(RTGB 106) Cold leg injection flow is 300 gpm.	
Comment	<u>'S'</u>	
	End of Task	

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Stop Time _____

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CANDIDATE CUE SHEET

(TO BE RETURNED TO THE EXAMINER UPON COMPLETION OF TASK)

INITIAL CONDITIONS:

A large break LOCA/LOOP occurred on Unit 1 approximately eight hours ago. The 1B Emergency Diesel Generator tripped on overspeed and cannot be restarted..

INITIATING CUE:

The ANPS has directed you to align hot and cold leg injection using the 1A Containment Spray Pump through the 1A LPSI injection flow path IAW 1-EOP-99, Appendix O.

REVISION NO.:	PROCEDURE TITLE:	FAGE.
۷۵	AFFENDIAES/FIGURES/FABLES	54 of 15
1-EOP-99		
	HOT AND COLD LEG INJECTION	
	(Page 1 of 16)	ινητίδι
		<u></u>
	NOTE	
This app	pendix contains 5 sections:	
 Sect Sect Sect Sect Sect Sect 	tion 1: Aligning 1A LPSI Pump for Hot Leg Injection tion 2: Aligning 1B LPSI Pump for Hot Leg Injection tion 3: Aligning HPSI Pump for Hot/Cold Leg Injection tion 4: Aligning 1A CS Pump for Hot/Cold Leg Injection tion 5: Aligning 1B CS Pump for Hot/Cold Leg Injection	
Select th availabili	ne method to be used by RCS conditions present and equip ity. The sections are listed in design preferred order, from	pment the
"primary "Second 1. Aligning 1	A LPSI Pump for Hot Leg Injection	si) and
"primary "Second 1. Aligning 1 Radiolog normal of fuel dan	Method", using LPSI, to the "First Alternate" method (HPS A LPSI Pump for Hot Leg Injection <u>CAUTION</u> gical conditions in the RAB could be significantly higher that dose rates during LOCA conditions, depending on the externage.	an nt of
"primary "Second 1. Aligning 1. Radiolog normal of fuel dan A. VERIF	Method", using LPSI, to the "First Alternate" method (HPS A LPSI Pump for Hot Leg Injection <u>CAUTION</u> gical conditions in the RAB could be significantly higher that dose rates during LOCA conditions, depending on the exter mage.	an nt of
"primary "Second 1. Aligning 1. Radiolog normal of fuel dan A. VERIF • RC	Method", using LPSI, to the "First Alternate" method (HPS A LPSI Pump for Hot Leg Injection <u>CAUTION</u> gical conditions in the RAB could be significantly higher that dose rates during LOCA conditions, depending on the exter mage. FY ALL the following conditions exist: CS Pressure is less than 250 psia	an int of
"primary "Second 1. Aligning 1 Radiolog normal of fuel dan A. VERIF • RC • RC les	 Method", using LPSI, to the "First Alternate" method (HPS I Alternate" method (CS). A LPSI Pump for Hot Leg Injection <u>CAUTION</u> gical conditions in the RAB could be significantly higher that dose rates during LOCA conditions, depending on the externage. FY ALL the following conditions exist: CS Pressure is less than 250 psia CS Pressure: Containment Pressure differential is as than 150 psid 	an nt of
"primary "Second 1. Aligning 1/ Radiolog normal of fuel dan A. VERIF • RC les • BC	A LPSI Pump for Hot Leg Injection <u>CAUTION</u> gical conditions in the RAB could be significantly higher that dose rates during LOCA conditions, depending on the exter mage. FY ALL the following conditions exist: CS Pressure is less than 250 psia CS Pressure: Containment Pressure differential is as than 150 psid DTH LPSI Pumps are OFF.	an Int of
"primary "Second 1. Aligning 1/ Radiolog normal of fuel dan A. VERIF • RC • RC les • BC • AL HP cor (64	A LPSI Pump for Hot Leg Injection <u>CAUTION</u> gical conditions in the RAB could be significantly higher that dose rates during LOCA conditions, depending on the externage. FY ALL the following conditions exist: CS Pressure is less than 250 psia CS Pressure: Containment Pressure differential is so than 150 psid OTH LPSI Pumps are OFF. L available HPSI Pumps are RUNNING and ALL associate PSI Header Injection valves are fully OPEN unless this nfiguration conflicts with HPSI run-out considerations 40 gpm maximum per pump).	an nt of
"primary "Second 1. Aligning 1 Radiolog normal of fuel dan A. VERIF • RC • RC les • BC • AL HP cor (64	 Method", using LPSI, to the "First Alternate" method (HPS Alternate" method (CS). A LPSI Pump for Hot Leg Injection <u>CAUTION</u> gical conditions in the RAB could be significantly higher that dose rates during LOCA conditions, depending on the externage. FY ALL the following conditions exist: CS Pressure is less than 250 psia CS Pressure: Containment Pressure differential is as than 150 psid DTH LPSI Pumps are OFF. L available HPSI Pumps are RUNNING and ALL associate PSI Header Injection valves are fully OPEN unless this nfiguration conflicts with HPSI run-out considerations 40 gpm maximum per pump). 	an Int of

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VISION NO	PROCEDURE TITLE:	<u>. 81.68</u>	PAGE:
28	APPENDIXES/FIG	55 of 151	
DCEDURE NO .:		55 01 15;	
1-EOP-99	ST. LUCIE		
	APPENDI	(0	
	HOT AND COLD LEC	G INJECTION	
	(Faye 2 Of	10)	<u>INITIAL</u>
1. (continue	ed)		
B. ALIG	N the LPSI System by perfo	rming the following	in order:
COMPONENT	ID COMPONENT NAME	POSITION	PERF INITIAL
1B LPSI Pum TGB Hand Sw	p LPSI Pump 1B	STOP	
V3207	LPSI Pump Disch Isol Va (CRAC)	CLOSE	
V3432	LPSI Pump Suct Isol Va (CRAC)	CLOSE	
MV-03-1B	B SDC Warm-up Va (CRAC)	OPEN	
HCV-3625	LPSI Header to Loop 1A1 Valve	CLOSED	
HCV-3615	LPSI Header to Loop 1A2 Valve	CLOSED	
HCV-3635	LPSI Header to Loop 1B1 Valve	CLOSED	
HCV-3645	LPSI Header to Loop 1B2 Valve	CLOSED	
V3651	SDC Loop 1B	OPEN	
V3652	SDC Loop 1B	OPEN	
 C. CLOSE D. PLACE E. PLACE 5% OP 	MV-03-2, FCV-3306 Bypass FCV-3306, SDC Return Flow FIC-3306, SDC Return Flow EN output.	s Va (CRAC) w, keyswitch in AU v, in MAN and SET	TO to
	(Continued on N	Vext Page)	

		PAGE
28	APPENDIXES/FIGURES/TABLES	
	_	56 of 155
PROCEDORE NO		
1-EOP-99	ST. LUCIE UNIT T	
	(Page 3 of 16)	
	(Page 5 of To)	INITIAL
1. (contir	nued)	
	CAUTION	
Limit LF	PSI Pump operation in simultaneous Hot and Cold Leg	Injection
alignme	ent to 3500 gpm.	
F. SI	ART LPSI Pump 1A.	
G AF	JUST FIC-3306 to control LPSI flow between	
25	0 to 3500 gpm.	
		/R
-		
	(Continued on Next Dags)	
	(Continued on Next Page)	

REVISION NO.:			PAGE:
28	APPENDIAES/FIGURES///		57 of 155
PROCEDURE NO .:			
1-EOP-99	ST. LUCIE UNIT 1		
	APPENDIX O HOT AND COLD LEG INJEC (Page 4 of 16)	<u>FION</u>	<u>INITIAL</u>
2. Aligning	1B LPSI Pump for Hot Leg Injection		
Radiologio normal do fuel dama	<u>CAUTION</u> al conditions in the RAB could be sig se rates during LOCA conditions, dep ge.	nificantly high bending on the	er than extent of
A. VER	FY ALL the following conditions exist	:	
• R	CS Pressure is less than 250 psia		
• R le	CS Pressure: Containment Pressure ss than 150 psid	differential is	
• B	OTH LPSI Pumps are OFF.		
• A a u c	LL available HPSI Pumps are RUNNI ssociated HPSI Header Injection valve nless this configuration conflicts with l onsiderations (640 gpm maximum per	NG and ALL es are fully OF HPSI run-out · pump).	PEN
B. ALIG	N the LPSI System by performing the	e following in (order:
COMPONENT	ID COMPONENT NAME	POSITION	PERF INITIAL
1A LPSI Pum RTGB Hand Switch	D LPSI Pump 1A	STOP	
V3206	LPSI Pump Disch Isol Va (CRAC)	CLOSÉ	
V3444	LPSI Pump Suct Isol Va (CRAC)	CLOSE	
MV-03-1A	A SDC Warm-up Va (CRAC)	OPEN	
HCV-3625	LPSI Header to Loop 1A1 Valve	CLOSED	
HCV-3615	LPSI Header to Loop 1A2 Valve	CLOSED	
L			/R:
	(continued on Next Pag	e)	

REVISION NO:: PROCEDURE TITLE: APPENDIXES/FIGURES/TABLES PAGE:: 28 APPENDIXES/FIGURES/TABLES 58 c 1-EOP-99 ST. LUCIE UNIT 1 Image: String of the str	of 155
23 AFFENDIXES/FIGURES/FI	AL
PROCEDURE NO.: ST. LUCIE UNIT 1 1-EOP-99 ST. LUCIE UNIT 1 APPENDIX O HOT AND COLD LEG INJECTION (Page 5 of 16) INITI/ 2. B. (continued) INITI/ COMPONENT ID COMPONENT NAME POSITION PERF INITIAL HCV-3635 LPSI Header to Loop CLOSED INITIAL HCV-3645 LPSI Header to Loop CLOSED Valve V3480 SDC Loop 1A OPEN V3481 SDC Loop 1A OPEN V3481 SDC Loop 1A OPEN	<u>AL</u>
1-EOP-99 ST. LUCIE UNIT 1 APPENDIX O HOT AND COLD LEG INJECTION (Page 5 of 16) (Page 5 of 16) INITI/ 2. B. (continued) COMPONENT ID COMPONENT NAME POSITION PERF INITIAL HCV-3635 LPSI Header to Loop CLOSED INITIAL HCV-3645 LPSI Header to Loop CLOSED INITIAL V3480 SDC Loop 1A OPEN OPEN V3481 SDC Loop 1A OPEN OPEN D. PLACE FCV-3306, SDC Return Flow, keyswitch in AUTO. D.	<u>AL</u>
APPENDIX O HOT AND COLD LEG INJECTION (Page 5 of 16) INITI/ INITI/ 2. B. (continued) COMPONENT ID COMPONENT NAME POSITION PERF INITIAL HCV-3635 LPSI Header to Loop 1B1 Valve CLOSED INITIAL HCV-3645 LPSI Header to Loop 1B2 Valve CLOSED Initial V3480 SDC Loop 1A OPEN OPEN V3481 SDC Loop 1A OPEN Initial C. CLOSE MV-03-2, FCV-3306 Bypass Va (CRAC). Initial Initial D. PLACE FCV-3306, SDC Return Flow, keyswitch in AUTO. Initial	
HOT AND COLD LEG INJECTION (Page 5 of 16) INITI/ 2. B. (continued) INITI/ COMPONENT ID COMPONENT NAME POSITION PERF INITIAL HCV-3635 LPSI Header to Loop CLOSED Initial HCV-3645 LPSI Header to Loop CLOSED Initial V3480 SDC Loop 1A OPEN OPEN V3481 SDC Loop 1A OPEN Initial D. PLACE FCV-3306, SDC Return Flow, keyswitch in AUTO. Initial	AL
(Page 5 of 16) INITI/ 2. B. (continued) COMPONENT ID COMPONENT NAME POSITION PERF INITIAL HCV-3635 LPSI Header to Loop CLOSED 1B1 Valve CLOSED Initial HCV-3645 LPSI Header to Loop CLOSED V3480 SDC Loop 1A OPEN V3481 SDC Loop 1A OPEN C. CLOSE MV-03-2, FCV-3306 Bypass Va (CRAC).	
COMPONENT ID COMPONENT NAME POSITION PERF HCV-3635 LPSI Header to Loop CLOSED HCV-3645 LPSI Header to Loop CLOSED HCV-3645 LPSI Header to Loop CLOSED V3480 SDC Loop 1A OPEN V3481 SDC Loop 1A OPEN C. CLOSE MV-03-2, FCV-3306 Bypass Va (CRAC).	
COMPONENT ID COMPONENT NAME POSITION PERF HCV-3635 LPSI Header to Loop CLOSED HCV-3645 LPSI Header to Loop CLOSED HCV-3645 LPSI Header to Loop CLOSED V3480 SDC Loop 1A OPEN V3481 SDC Loop 1A OPEN C. CLOSE MV-03-2, FCV-3306 Bypass Va (CRAC).	
COMPONENT IDCOMPONENT NAMEPOSITIONPERF INITIALHCV-3635LPSI Header to Loop 1B1 ValveCLOSED	
HCV-3635LPSI Header to Loop 1B1 ValveCLOSEDHCV-3645LPSI Header to Loop 1B2 ValveCLOSEDV3480SDC Loop 1AOPENV3481SDC Loop 1AOPENC. CLOSE MV-03-2, FCV-3306 Bypass Va (CRAC)	
HCV-3635 LPSI Header to Loop 1B1 Valve CLOSED HCV-3645 LPSI Header to Loop 1B2 Valve CLOSED V3480 SDC Loop 1A OPEN V3481 SDC Loop 1A OPEN C. CLOSE MV-03-2, FCV-3306 Bypass Va (CRAC).	
1B1 Valve HCV-3645 LPSI Header to Loop 1B2 Valve V3480 SDC Loop 1A V3481 SDC Loop 1A OPEN C. CLOSE MV-03-2, FCV-3306 Bypass Va (CRAC). D. PLACE FCV-3306, SDC Return Flow, keyswitch in AUTO.	
HCV-3645 LPSI Header to Loop CLOSED 1B2 Valve 1B2 Valve V3480 SDC Loop 1A OPEN V3481 SDC Loop 1A OPEN C. CLOSE MV-03-2, FCV-3306 Bypass Va (CRAC).	
IB2 Valve V3480 SDC Loop 1A OPEN V3481 SDC Loop 1A OPEN C. CLOSE MV-03-2, FCV-3306 Bypass Va (CRAC).	
V3480 SDC Loop TA OPEN V3481 SDC Loop 1A OPEN C. CLOSE MV-03-2, FCV-3306 Bypass Va (CRAC). D. PLACE FCV-3306, SDC Return Flow, keyswitch in AUTO.	
V3481 SDC Loop IA OPEN C. CLOSE MV-03-2, FCV-3306 Bypass Va (CRAC). D. PLACE FCV-3306, SDC Return Flow, keyswitch in AUTO.	
 C. CLOSE MV-03-2, FCV-3306 Bypass Va (CRAC). D. PLACE FCV-3306, SDC Return Flow, keyswitch in AUTO. 	
<u>CAUTION</u> Limit LPSI Pump operation in simultaneous Hot and Cold Leg Injection alignment to 3500 gpm.	
F. START 1B LPSI Pump	
G. ADJUST FIC-3306 to control LPSI flow between 250 to 3500 gpm.	
	/R
(Continued on Next Page)	

					PAGE:
28		APPENDIXES/FI	GURES/TABLES		59 of 15
1-EOP-99 ST. LUCIE UNIT 1		F UNIT 1			
	9		X O		
		HOT AND COLD LE	G INJECTION		
		(Page 6 o	f 16)		<u>INITIAL</u>
3. Aliç	ining HP	SI Pump for Hot and Co	old Leg Injection		
Α.	ENSURE Header li configura (640 gpn	BOTH HPSI Pumps an njection valves are fully ntion conflicts with HPSI n maximum per pump).	e RUNNING AND OPEN unless this run-out considerat	ALL HPSI ions	
В.	STOP A	L Charging Pumps.			
C.	PERFOF	M ALL of the following	local operations:		
COMPON	ENT ID	COMPONENT NAME	POSITION	PE INI	ERF TIAL
V2336		1C Charging Pump Disch Isol	LOCKED CLOSED		
V2337		1B Charging Pump Disch Isol	LOCKED CLOSED		
V2339		1A Charging Pump Disch Isol	LOCKED CLOSED		
V2340		Charging Pump Disch Hdr to Aux HPSI Hdr Isol (1A Charging	LOCK OPEN		

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		SURES/TABLES		TAGE.	
20	EDURE NO.:				
1-EOP-99					
		G INJECTION			
	(Page 7 of	16)			
3 (continu	ied)				
0. (0011111					
D. PEF	FORM ALL of the following	RTGB operations:			
[NO	 TE			
	No.	LBLOCA and initi	ation of H	ot and	
SE-02-03	is a non-eu vaive, Dunnu a			II	
SE-02-03 Cold Leg	injection, this valve MAY NO	T operate. The re	quired flow	w path	
SE-02-03 Cold Leg for Hot at	injection, this valve. During a nd Cold Leg injection is still a	T operate. The re vailable and adeq	quired flow uate throu	w path Igh	
SE-02-03 Cold Leg for Hot at SE-02-04	injection, this valve MAY NO nd Cold Leg injection is still a)T operate. The re available and adeq	quired flow uate throu	w path Igh	
SE-02-03 Cold Leg for Hot a SE-02-04	injection, this valve. During a injection, this valve MAY NO nd Cold Leg injection is still a)T operate. The re available and adeq	quired flow uate throu	w path Igh	
SE-02-03 Cold Leg for Hot a SE-02-04	injection, this valve MAY NO nd Cold Leg injection is still a	T operate. The re vailable and adeq POSITION	quired flov uate throu	w path igh ERF	
SE-02-03 Cold Leg for Hot at SE-02-04	injection, this valve MAY NO nd Cold Leg injection is still a	T operate. The re vailable and adeq POSITION	quired flov uate throu PI	ERF	
SE-02-03 Cold Leg for Hot a SE-02-04 COMPONENT	Injection, this valve MAY NO Ind Cold Leg injection is still a Image: I	T operate. The re available and adeq POSITION CLOSED	quired flov uate throu PI	RF	
SE-02-03 Cold Leg for Hot al SE-02-04 COMPONENT SE-02-1 SE-02-2	Injection, this valve MAY NO Ind Cold Leg injection is still a Image: Component NAME 1B1 Loop Charging Isol 1A2 Loop Charging Isol	T operate. The re available and adeq POSITION CLOSED CLOSED	quired flov uate throu PI	W path igh ERF TIAL	
SE-02-03 Cold Leg for Hot an SE-02-04 COMPONENT SE-02-1 SE-02-2 PCV-1100	Injection, this valve MAY NO Ind Cold Leg injection is still a Image: Component NAME 1B1 Loop Charging Isol 1A2 Loop Charging Isol Isol IPZ IPZ IPZ	T operate. The re vailable and adeq POSITION CLOSED CLOSED	quired flov uate throu PI	RF TIAL	
SE-02-03 Cold Leg for Hot an SE-02-04 COMPONENT SE-02-1 SE-02-2 PCV-11001 PCV-11001	Image: Sister Non-EQ value. During a injection, this value MAY NO nd Cold Leg injection is still a i. Image: Ima	T operate. The re vailable and adeq POSITION CLOSED CLOSED CLOSED CLOSED	quired flov uate throu PI	W path igh IRF TIAL	
SE-02-03 Cold Leg for Hot at SE-02-04 COMPONENT SE-02-1 SE-02-2 PCV-11001 PCV-11001 SE-02-03	Injection, this valve MAY NO Ind Cold Leg injection is still a Image: Component NAME 1B1 Loop Charging Isol 1A2 Loop Charging Isol IPzr] Spray Valve 1B2 IPzr] Spray Valve 1B1 Pressurizer Auxiliary Spray Valve	T operate. The re vailable and adeq POSITION CLOSED CLOSED CLOSED CLOSED OPEN	quired flov uate throu PI	RF TIAL	

(Continued On Next Page)

EVISION NO.: PRC	OCEDURE TITLE: APPENDIXES/FIGU	PAGE:			
ROCEDURE NO.:	61 of 155				
1-EOP-99	ST. LUCIE UNIT 1				
	APPENDIX	0			
	HOT AND COLD LEG	INJECTION			
		(0)			
3. (continued))				
		_			
The 1B HPS	I will need to be running for	≞ r Core Heat Remo	oval post RAS		
	I WIII HEED TO BE FORMING TO				
while the 1A	HPSI is aligned for Hot Leg	g Injection.			
while the 1A	HPSI is aligned for Hot Leg	g Injection.			
E. PERFO	HPSI is aligned for Hot Leg	g Injection. TGB operations:			
E. PERFO	HPSI is aligned for Hot Leg	TGB operations:			
E. PERFO	HPSI is aligned for Hot Leg RM ALL of the following R COMPONENT NAME	g Injection. TGB operations: POSITION	PERF INITIAL		
E. PERFO COMPONENT ID HCV-3627	HPSI is aligned for Hot Leg RM ALL of the following R COMPONENT NAME Aux HPSI Hdr to Loop 1A1 Valve	g Injection. TGB operations: POSITION CLOSED	PERF INITIAL		
while the 1A E. PERFO COMPONENT ID HCV-3627 HCV-3617	HPSI is aligned for Hot Leg DRM ALL of the following R Description COMPONENT NAME Aux HPSI Hdr to Loop 1A1 Valve Aux HPSI Hdr to Loop 1A2 Valve	g Injection. TGB operations: POSITION CLOSED CLOSED	PERF INITIAL		
while the 1A E. PERFO COMPONENT ID HCV-3627 HCV-3617 HCV-3637	HPSI is aligned for Hot Leg DRM ALL of the following R D COMPONENT NAME Aux HPSI Hdr to Loop 1A1 Valve Aux HPSI Hdr to Loop 1A2 Valve Aux HPSI Hdr to Loop 1A2 Valve Aux HPSI Hdr to Loop 1A1 Valve	g Injection. TGB operations: POSITION CLOSED CLOSED CLOSED	PERF INITIAL		

(continued on Next Page)

REVISION NO .:		PROCEDURE TITLE:	PAGE:	
28		APPENDIXES/FIGURES/TABLES	62 of 1	55
PROCEDURE NO.: 1-EOP-99			02 01 1	ŰŰ
		ST. LUCIE UNIT 1		
		(Page 9 of 16)		
			<u>INITIAL</u>	
4. Ali	igning	g 1A CS Pump for Hot and Cold Leg Injection		
А.	VER	RIFY ALL of the following conditions exist:		
	• 1	A Containment Spray Pump is RUNNING.		
	• F	RCS Pressure is less than 250 psia.		
	• F	RCS Pressure:Containment Pressure differential pressure s less than 150 psid.		
	• E A C	ENSURE ALL available HPSI Pumps are RUNNING AND ALL associated HPSI Header Injection valves are fully OPEN unless this configuration conflicts with HPSI run-out considerations (640 gpm maximum per pump).	t 	
В.	. PER	RFORM ALL of the following:		
	1. E	ENSURE V3456, A SDC Hx Outlet Isol Va, is OPEN (CRA	AC).	
	2 . E	ENSURE BOTH LPSI Pumps are STOPPED.		
	3. F	PLACE FCV-3306, SDC Return Flow, keyswitch to AUTO.	<u> </u>	
	4. (CLOSE FCV-3306 using FIC-3306, SDC Return Flow.		
				/
		(Continued On Next Page)		

REVISION NO .:		PAGE:					
28	APPENDIXES/FIGURES/TABLES 63 of 155						
PROCEDURE NO.:							
1-EOP-99	1-EOP-99 ST. LUCIE UNIT 1						
	APPENDI HOT AND COLD LE (Page 10 o	X O I <mark>G INJECTION</mark> If 16)					
4. (continu C. <u>If</u> 1/ The	ued) A LPSI injection flow path is t n ALIGN the A LPSI Train by	o be used, / performing ALL					
of th	ne following:						
COMPONEN	ID COMPONENT NAME	POSITION	PERF INITIAL				
V3206	LPSI Pump Disch Isol Va (CRAC)	CLOSE					
V3444	LPSI Pump Suct Isol Va (CRAC)	CLOSE					
MV-03-1A	A SDC Warm-up Va (CRAC)	OPEN					
HCV-3480	SDC Loop 1A	OPEN					
HCV-3481	SDC Loop 1A	OPEN					
D. <u>If</u> 1 <u>The</u>	B LPSI injection flow path is t an ALIGN ALL of the followin	to be used, g valves as indicate	ed:				
COMPONEN	T ID COMPONENT NAME	POSITION	PERF				

COMPONENT ID	COMPONENT NAME	POSITION	
V3207	LPSI Pump Disch Isol Va (CRAC)	CLOSE	
V3432	LPSI Pump Suct Isol Va (CRAC)	CLOSE	
MV-03-1B	B SDC Warm-up Va (CRAC)	OPEN	
HCV-3651	SDC Loop 1B	OPEN	
HCV-3652	SDC Loop 1B	OPEN	

(Continued On Next Page)

REVISION NO .:	PROCEDURE TITLE:		PAGE:
28	APPENDIXES/FIC	JURES/TABLES	64 of 155
PROCEDURE NO .:			04 01 100
1-EOP-99	ST. LUCIE	E UNIT 1	
	APPENDI	xo	
	HOT AND COLD LE	G INJECTION	
	(Page 11 o	f 16)	
4. (continu	ied)		INITIAL
	OF ALL of the following IDS	N Handar Icolation	Valves:
C . CLU	SE ALL OF the following LFS		valves.
COMPONENT	ID COMPONENT NAME	POSITION	PERF
			INITIAL
HCV-3615	LPSI Header to Loop	CLOSED	
	1A2 Valve		
HCV-3625	LPSI Header to Loop	CLOSED	
1101/0005			
HCV-3635	1B1 Valve	CLOSED	
HCV-3645	LPSI Header to Loop	CLOSED	
	1B2 Valve		
	<u>NO</u>		

1A Containment Spray Pump is still supplying cooled water to 1A HPSI Pump and is now aligned to the LPSI Header, except for opening HCV-3657.

F. PLACE HCV-3657, SDC Temp Control, keyswitch to MAN.

G. SLOWLY OPEN HCV-3657 using HIC-3657, SDC Temp Control, to maintain a minimum of 250 gpm on FIC-3306.

/R28

(Continued On Next Page)

VISION NO.: PR				
	APPENDIXES/FIGURES/TABLES		65 of 1	155
I-EOF-33		X O	l	
	HOT AND COLD LE	G INJECTION		
	(Page 12 o	f 16)		
4. (continued)			
	NO	<u>ТЕ</u>		
Total SI	flow should be equally div	vided between hot	and cold legs.	
H If the 1	A I PSI injection flow path	was used		
<u>Then</u> A	DJUST the A HPSI Head	er Isolation Valves	to maintain total	
hot and	d cold leg injection betwee	n 250 and 1500 gp	om:	
COMPONENT ID	COMPONENT NAME	POSITION	PERF]
HC\/_3627	Aux HPSI Hdr to Loop	THROTTLED		_
100-3027	1A1 Valve			
HCV-3617	Aux HPSI Hdr to Loop 1A2 Valve	THROTTLED		
HCV-3637	Aux HPSI Hdr to Loop 1B1 Valve	THROTTLED		
HCV-3647	Aux HPSI Hdr to Loop 1B2 Valve	THROTTLED		
I. <u>If</u> the 1	B LPSI injection flow path	was used,		
<u>Then</u> A	DJUST the B HPSI Head	er Isolation Valves n 250 and 1500 gr	to maintain total	
				7
COMPONENT IE		POSITION		
HCV-3626	HPSI Hdr B to Loop 1A1 Valve	THROTTLED		
		THROTTLED		
HCV-3616	HPSI Hdr B to Loop 1A2 Valve			
HCV-3616 HCV-3636	HPSI Hdr B to Loop 1A2 Valve HPSI Hdr B to Loop 1B1 Valve	THROTTLED		
HCV-3616 HCV-3636 HCV-3646	HPSI Hdr B to Loop 1A2 Valve HPSI Hdr B to Loop 1B1 Valve HPSI Hdr B to Loop 1B2 Valve	THROTTLED		
HCV-3616 HCV-3636 HCV-3646	HPSI Hdr B to Loop 1A2 Valve HPSI Hdr B to Loop 1B1 Valve HPSI Hdr B to Loop 1B2 Valve	THROTTLED		/R28
HCV-3616 HCV-3636 HCV-3646	HPSI Hdr B to Loop 1A2 Valve HPSI Hdr B to Loop 1B1 Valve HPSI Hdr B to Loop 1B2 Valve	THROTTLED		/R28

REVISION NO.: 28	PROCEDURE TITLE: APPENDIXES/FIGURES/TABLES	PAGE:
		66 of 155
1-EOP-99	ST. LUCIE UNIT 1	
	APPENDIX O HOT AND COLD LEG INJECTION	
	(Page 13 of 16)	
		INITIAL
5. Alignir	g 1B CS Pump for Hot and Cold Leg Injection	
A. VE	RIFY ALL of the following conditions exist:	
•	1B Containment Spray Pump is RUNNING.	
•	RCS Pressure is less than 250 psia.	
•	RCS Pressure:Containment Pressure differential pressure is less than 150 psid.	
•	ENSURE ALL available HPSI Pumps are RUNNING AND ALL associated HPSI Header Injection valves are fully OPEN unless this configuration conflicts with HPSI run-ou considerations (640 gpm maximum per pump).	t
B. PE	RFORM ALL of the following:	
1.	ENSURE V3457, B SDC Hx Outlet Isol Va, is OPEN (CR/	AC <u>).</u>
2.	ENSURE BOTH LPSI Pumps are STOPPED.	
3.	PLACE FCV-3306, SDC Return Flow, keyswitch to AUTO	•
4.	CLOSE FCV-3306 using FIC-3306, SDC Return Flow.	
		/F
	(Continued On Next Page)	
1		

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REVISION NO.: F		URES/TARIES	
28		67 of 155	
PROCEDURE NO .:			
1-EOP-99	ST. LUCIE		
	APPENDI	<u>x o</u>	
	HOT AND COLD LE	G INJECTION	
	(Page 14 of	f 16)	
5. (continue	ed)		
	1 DOI introdian flow noth in th	o bo used	
$\begin{array}{c c} C. \underline{II} 1A \\ Then \end{array}$	PERFORM ALL of the follow	wina:	
		in igi	
COMPONENT	ID COMPONENT NAME	POSITION	PERF
			INITIAL
V3206	LPSI Pump Disch Isol	CLOSE	
	Va (CRAC)		
V3444	LPSI Pump Suct Isol	CLOSE	
	Va (CRAC)		
MV-03-1A	A SDC Warm-up Va	OPEN	
	(CRAC)		
HCV-3480	SDC Loop 1A		
HCV-3481	SDC Loop 1A	UPEN	
	LDCL injection flow path is f	o be used	
D. II 1B	PERFORM ALL of the folio	owina:	
COMPONENT	ID COMPONENT NAME	POSITION	PERF
		_	INITIAL
V3207	LPSI Pump Disch Isol	CLOSE	
	Va (CRAC)		
V3432	LPSI Pump Suct Isol	CLOSE	
	Va (CRAC)		
MV-03-1B	B SDC Warm-up Va	OPEN	
	(CRAC)		
HCV-3651	SDC Loop 1B	OPEN	

(Continued On Next Page)

SDC Loop 1B

HCV-3652

OPEN

28 PROCEDURE NO.: 1-EOP-99 5. (continued E. CLOSE COMPONENT IE	ST. LUCII APPENDI HOT AND COLD LE (Page 15 o	E UNIT 1 X O G INJECTION of 16)	68 of 1	
5. (continued E. CLOSE	ST. LUCI APPENDI HOT AND COLD LE (Page 15 o	E UNIT 1 X O G INJECTION f 16)	INITIAI	
5. (continued E. CLOSE	APPENDI HOT AND COLD LE (Page 15 o	X O G INJECTION of 16)	INITIAI	
5. (continued E. CLOSE COMPONENT IE	HOT AND COLD LE (Page 15 o	f 16)	ΙΝΙΤΙΑΙ	
5. (continuec E. CLOSE COMPONENT IE	(Page 15 o	f 16)	INITIAL	
5. (continuec E. CLOSE COMPONENT IE)		INITIAL	
5. (continuec E. CLOSE COMPONENT IE	i)			:
E. CLOSE	ALL of the following ! D			
COMPONENT I	E ALL OF THE TOHOWING LPS	SI Header Isolation	Valves:	
11	COMPONENT NAME	POSITION	PERF INITIAL	
HCV-3615	LPSI Header to Loop 1A2 Valve	CLOSED		
HCV-3625	LPSI Header to Loop 1A1 Valve	CLOSED		
HCV-3635	LPSI Header to Loop 1B1 Valve	CLOSED		
HCV-3645	LPSI Header to Loop 1B2 Valve	CLOSED		
1B Containr Pump and i HCV-3657. F . PLACI G . SLOW Contro	<u>NC</u> ment Spray Pump is still s s now aligned to the LPSI E HCV-3657, SDC Temp (/LY OPEN HCV-3657 usin ol, to maintain a minimum	DTE upplying cooled wa Header, except fo Control, keyswitch og HIC-3657, SDC of 250 gpm on FIC	ater to 1B HPSI r opening to MAN Temp c-3306	
				I
	(Continued On	Next Page)		

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REVISION NO.: F		PAGE:	
28	APPENDIXES/FIC	69 of 155	
PROCEDURE NO.:			
1-EOP-99			
	(Page 16 o	f 16)	
		,	
5. (continue	ed)		
	NO	TE	
Total S	SI flow should be equally div	/ided between hot a	and cold legs.
		<u> </u>]
H. <u>If</u> the	1A LPSI injection flow path	was used,	
<u>Then</u>	ADJUST the A HPSI Heade	er Isolation Valves t	o maintain totai m:
nora	to cold leg injection betwee		
COMPONENT	D COMPONENT NAME	POSITION	PERF
110) (0007			INITIAL
HCV-3027	1A1 Valve	INKOTTEED	
HCV-3617	Aux HPSI Hdr to Loop	THROTTLED	
	1A2 Valve		
HCV-3637	Aux HPSI Hdr to Loop	THROTTLED	
HCV-3647	Aux HPSI Hdr to Loop	THROTTLED	
	1B2 Valve		
I if the	1B PSI injection flow nath	was used	
Then	ADJUST the B HPSI Head	er Isolation Valves t	o maintain total
hot ar	nd cold leg injection betwee	n 250 and 1500 gpi	m:
COMPONENT		POSITION	PERF
			INITIAL
HCV-3626	HPSI Hdr B to Loop 1A1 Valve	THROTTLED	
HCV-3616	HPSI Hdr B to Loop 1A2 Valve	THROTTLED	
HCV-3636	HPSI Hdr B to Loop 1B1 Valve	THROTTLED	
HCV-3646	HPSI Hdr B to Loop 1B2 Valve	THROTTLED	
			/R2
	END OF APPE	ENDIX O	
REGION II INITIAL LICENSE EXAMINATION JOB PERFORMANCE MEASURE ST. LUCIE NUCLEAR PLANT

OPEN CCW SUPPLY VALVES TO THE RCP's WITH DEGRADED INSTRUMENT AIR SYSTEM PRESSURE – UNIT 1

CANDIDATE

EXAMINER

JOB PERFORMANCE MEASURE

<u>Task:</u>

Open CCW Supply Valves to the RCP's with Degraded Instrument Air System Pressure – Unit 1

Alternate Path:

Facility JPM #:

0821074

K/A Rating(s):

B.01.03.038	B.01.03.040	B.01.04.025	B.01.05.026
B.01.05.101	B.01.06.044	B.01.06.197	(3.22 Average)

J.

Task Standard:

This JPM is complete when one (1) nitrogen connection has been successfully completed, the selected HCV is verified open, and the N2 hose has been verified as documented.

Evaluation Location:

Evaluation Method:

Perform _____ Simulate __X___

Simulator	 In-Plant _	X

References:

ONOP 1-0120034, Appendix A

Validation Time: 10 min. T	Time Critical: <u>NO</u>	
Candidate:NAME	Time Start: Time Finish:	
Performance Rating: SAT UNS	SAT Performance Time	
Examiner:NAME	///////_	DATE
	COMMENTS	

Tools/Equipment/Procedures Needed:

None

READ TO OPERATOR

DIRECTIONS TO TRAINEE:

I will explain the initial conditions, and state the task to be performed. All in-plant steps, including any required communications, **shall be simulated** for this JPM. Under no circumstances are you to operate any plant equipment. I will provide initiating cues and reports on other actions when directed by you. Ensure you indicate to me when you understand your assigned task. To indicate that you have completed your assigned task return the handout sheet I provided you. Any safety infraction during this task performance evaluation will be corrected immediately prior to continuing the JPM.

INITIAL CONDITIONS:

Unit 1 is at 100% power and is combating a degradation of instrument air system pressure.

Initial operator actions have placed the Unit in a relatively stable condition.

Annunciators J-9, J-12, J-27, and J-30, "RCP Low Cooling Water Flow" have alarmed.

The ANPS has directed that the nitrogen connections to the CCW valve HCV 14-1 be hooked-up to restore CCW flow to the RCP's.

INITIATING CUES:

Make up the nitrogen connections required to reopen the RCP CCW supply valve HCV-14-1 IAW ONOP 1-0120034, Appendix A. START TIME: _____

STEP 1:	Enter the RCA, review RWP, obtain Merlin Gerlin monitor, consult survey map, inform H.P. of intentions and request further radiological protection requirements.	SAT					
STANDARD:	Remain in compliance with H.P. precautions and recommendations.	3A1					
INSTRUCTOR	INSTRUCTOR NOTE: This is NOT to be a rapid entry into the RAB.						
EXAM	EXAMINER'S CUE: ALL HP PRECAUTIONS AND RECOMMENDATIONS HAVE BEEN MET.						
COMMENTS:							
STEP 2:	Close instrument air supply valve T-V18134 to HCV-14-1.						
STANDARD:	CLOSE IA valve to HCV-14-1.						
EXAM	INER'S CUE: T-V18134 HAS BEEN TURNED FULLY CLOCKWISE.	SAT					
COMMENTS:		UNSAT					
STEP 3:	Attach the nitrogen flex hose (female end, supplied to HCV-14-1) to the male quick disconnect fitting in the air supply line to HCV-14-1	CRITICAL STEP					
STANDARD:	ATTACH the nitrogen supply flex hose to the fitting in the air supply line for HCV-14-1"CCW Supply HDRN to PENETR. 23 Isol.",	SAT					
EXAM	EXAMINER'S CUE: HOSE ATTACHED FROM NITROGEN TO HCV-14-1 AIR LINE.						
COMMENTS:							

<u>STEP 4:</u> <u>STANDARD:</u>	Verify HCV-14-1 has opened. <u>VERIFY</u> HCV OPENS	SAT		
EXAM	EXAMINER'S CUE: HCV HAS OPENED			
COMMENTS:		UNSAT		
<u>STEP 5:</u>	Ensure hoses are documented in accordance with AP 0010124, "Temporary System Alteration Control".	SAT		
STANDARD:	VERIFY documentation of TSAs installed in AP 0010124.			
EXAM	EXAMINER'S CUE: TSAs DOCUMENTED.			
COMMENTS:				

STOP TIME:

1

•

CANDIDATE CUE SHEET (TO BE RETURNED TO EXAMINER UPON COMPLETION OF TASK)

INITIAL CONDITIONS:

Unit 1 is at 100% power and is combating a degradation of instrument air system pressure.

Initial operator actions have placed the Unit in a relatively stable condition.

Annunciators J-9, J-12, J-27, and J-30, "RCP Low Cooling Water Flow" have alarmed.

The ANPS has directed that the nitrogen connection to the CCW valve HCV-14-1 be hooked-up to restore CCW flow to the RCPs.

INITIATING CUES:

Make up the nitrogen connections required to reopen the RCP CCW supply valve HCV-14-1 IAW ONOP 1-0120034, Appendix A.

	••••••	I PROCEDURE III	LE:			PAGE:			
	43A								
ROCE	DURE NO.:	-				21 of 23			
.	0400004		ST LH		·				
]-(0120034				<u> </u>				
LOCAL RESTORATION OF CCW TO RCPS									
		<u></u>	(Page 1	of 3)					
2	All te with	mporary hose	N connections Temporary Sy	I <u>OTE</u> must be doci /stem Alterati	umented in acco on Control.	rdance			
			· •····· · · · · · · · · · · · · · · ·						
	After conta testin resto	movement of inment isolat ig in accorda red to normal	f the position of ion valves is r nce with OP 1 I configuration	of the vent ba equired to be -0010125A w	Il valves, operate verified by ASN when the valves a	AE stroke are			
	lf loss of (CCW is due t	o an air suppl	y failure, <u>The</u>	n perform the fo	llowing			
	local actio	ns:							
	A. CLOS	SE the instrun	nent air supply	valve to the	affected HCV(s).			
	HCV NU	MBER	HCV-14-1	HCV-14-7	HCV-14-2	HCV-14-6			
IA	SUPPLY VI	V NUMBER	T-V18134	T-V18137	T-V18135	T-V18136			
		CH the nitro	gen flex hose	(female end,	supplied at each	HCV) to			
	B. ATTA the m	ale quick dis	connect fitting	in the air sup	oply line to each	HCV.			
	B. ATTA the m C. VERI	ale quick dis	connect fitting has opened.	in the air sup	oply line to each	HCV.			
	B. ATTA the m C. VERI	ale quick dis	connect fitting has opened.	in the air su	oply line to each	HCV.			
	B. ATTA the m C. VERI	ale quick dis	connect fitting has opened.	in the air su	oply line to each	HCV.			
	B. ATTA the m C. VERI	FY the HCV	connect fitting has opened.	in the air su	oply line to each	HCV.			
	B. ATTA the m C. VERI	FY the HCV	connect fitting has opened.	in the air su	oply line to each	HCV.			
	B. ATTA the m C. VERI	The HCV	connect fitting has opened.	in the air su	oply line to each	HCV.			
	B. ATTA the m C. VERI	FY the HCV	connect fitting has opened.	in the air su	oply line to each	HCV.			
	B. ATTA the m C. VERI	FY the HCV	connect fitting has opened.	in the air su	oply line to each	HCV.			
	B. ATTA the m C. VERI	FY the HCV	connect fitting has opened.	in the air su	oply line to each	HCV.			
	B. ATTA the m C. VERI	FY the HCV	connect fitting has opened.	in the air su	oply line to each	HCV.			
	B. ATTA the m C. VERI	FY the HCV	connect fitting has opened.	in the air su	oply line to each	HCV.			
	B. ATTA the m C. VERI	FY the HCV	connect fitting has opened.	in the air su	oply line to each	HCV.			
	B. ATTA the m C. VERI	FY the HCV	connect fitting has opened.	in the air su	oply line to each	HCV.			
	B. ATTA the m C. VERI	FY the HCV	connect fitting	in the air su	oply line to each	HCV.			
	B. ATTA the m C. VERI	FY the HCV	connect fitting has opened.	in the air su	oply line to each	HCV.			

REGION II INITIAL LICENSE EXAMINATION JOB PERFORMANCE MEASURE ST. LUCIE NUCLEAR PLANT

MAKEUP TO THE SPENT FUEL POOL UNIT 1

CANDIDATE _____

EXAMINER

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REGION II INITIAL LICENSE EXAMINATION JOB PERFORMANCE MEASURE ST LUCIE NUCLEAR PLANT

Task: Fill the Spent Fuel Pool

Alternate Path: Yes _____ No __X___

Facility JPM #: New

Task Standard: Successfully align the RWT to fill the Unit 1 SFP

Preferred Evaluation Location:

Simulator _____ Control Room _____ In-Plant __X___

Preferred Evaluation Method:

.

Perform _____ Simulate __X___

References: ONOP 1-02350030, "Fuel Pool Cooling System"

Validation Time	20 minutes	Time Cr	itical <u>No</u>		
Candidate:	Name			Time Start Time Finish	
Performance Rating:	Sat	Unsat			
Examiner:	Name		Signature:	<u></u>	

Tools/Equipment/ Procedures Needed:

ONOP 1-02350030, "Fuel Pool Cooling System"

Read to Candidate

Directions to candidate for In-Plant or Control Room JPMs:

I will explain the initial conditions and state the task to be performed. All in-plant or control room JPM steps, including any communications, shall be simulated for this JPM. Under no circumstances, unless directed by the examiner, are you to operate any plant equipment. I will provide initiating cues and reports on other actions when directed by you. Ensure you indicate to me when you finish your assigned task by returning the handout sheet I provided you.

Directions to candidate for Simulator JPMs:

I will explain the initial conditions and state the task to be performed. All simulator JPM steps, including any communications, shall be performed for this JPM. You are you to operate any plant equipment that is necessary for the completion of this JPM. The simulator will provide the cues as you perform this JPM. Ensure you indicate to me when you finish your assigned task by returning the handout sheet I provided you.

Initial Conditions:

FUEL POOL LEVEL HIGH/LOW annunciator in the control room is locked in alarm. The SNPO has determined that the level is low and makeup to the Spent Fuel Pool is needed.

Initiating Cues:

The ANPS has directed you to align makeup from the RWT to the Spent Fuel Pool IAW ONOP 1-02350030, "Fuel Pool Cooling System". Chemistry reports that Fuel Pool boron concentration is 1750 ppm.

Start Time _____

2

<u>Step 1:</u>	Stop the Fuel Pool Purification Pump. (step 2A)	Critical Step
Standard:	Operator simulates stopping the fuel pool purification pump by turning the local control switch to OFF	Sat
<u>Cue:</u> (SFI Pun	P purification pump room on 19.5"elevation) np not rotating	<u> </u>
Comments:		
Step 2:	LOCK OPEN V07104, RWT to Fuel Pool Loop isolation. (step 2B1)	Critical Step
<u>Standard:</u>	Operator simulates removing lock, opening V07104 and re- installing lock	Unsat
<u>Cue:</u>	(At RWT) Valve rotated until stop is reached and lock installed	
Comments:		
<u>Step 3:</u>	LOCK CLOSE V07101, Fuel Pool IX outlet to RWT isolation. (step 2B2)	Critical Step
Standard:	Operator simulates removing lock, closing V07101 and re- installing lock	Unsat
<u>Cue:</u>	(At RWT) Valve rotated until stop is reached and lock installed	
Comments		
<u>Step 4:</u>	CLOSE V4220, Fuel Pool outlet to Purification pump isolation. (step 2B3)	Critical Step
Standard:	Operator simulates closing V4220	Jineat
<u>Cue:</u>	(SFP purification pump room in corner below floor level) Valve rotated until stop is reached	

Step 4: Standard: Cue: Comments:	CLOSE V4220, Fuel Pool outlet to Purification pump isolation. (step 2B3) Operator simulates closing V4220 (SFP purification pump room in corner below floor level) Valve rotated until stop is reached	Critical Step Sat Unsat
<u>Step 5:</u> <u>Standard:</u> <u>Cue:</u> <u>Comments</u>	CLOSE V4201, Fuel Pool Makeup isolation. (step 2B4) Operator simulates closing V4201 (SFP purification pump room in corner below floor level) Valve rotated until stop is reached	Critical Step Sat Unsat
Step 6: Standard: Cue: Comments	OPEN V4252, Fuel Pool inlet from Fuel Pool Purification IX isolation. (step 2B5) Operator simulates opening V4252 (SFP purification pump room in corner below floor level) Valve rotated until stop is reached	Critical Step Sat Unsat

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<u>Step 7:</u>	Start the SFP purification pump. (step 2C)	Critical Step
<u>Standard:</u> <u>Cue:</u>	 <u>andard:</u> Operator simulates starting the SFP purification pump by placing the local control switch to START <u>ue:</u> (SFP purification room) 	
Comments		
<u>Step 8:</u>	When Fuel Pool level rises above the low-level setpoint, Then verify annunciator N-20 , Fuel Pool Sump Pump Moisture/Lvl High/Low Clears. (step 2D)	Sat
Standard:	Operator simulates contacting control room to verify the status of the annunciator	Unsat
<u>Cue:</u>	Control Room reports N-20 not in alarm	
Comments	<u>.</u>	
	End of Task	

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Stop Time _____

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CANDIDATE CUE SHEET

(TO BE RETURNED TO THE EXAMINER UPON COMPLETION OF TASK)

Initial Conditions:

FUEL POOL LEVEL HIGH/LOW annunciator in the control room is locked in alarm. The SNPO has determined that the level is low and makeup to the Spent Fuel Pool is needed.

Initiating Cues:

The ANPS has directed you to align makeup from the RWT to the Spent Fuel Pool IAW ONOP 1-02350030, "Fuel Pool Cooling System". Chemistry reports that Fuel Pool boron concentration is 1750 ppm.



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REVIS	ION NO.:	:	PR	OCEDURE TITLE:	PAGE:
	14			FUEL POOL COOLING SYSTEM	2 of 15
PROCI	ROCEDURE NO.:			OFF-NORMAL OPERATING PROCEDURE	2 01 15
1-	03500)30		ST. LUCIE UNIT 1	
1.0	<u>TITL</u>	<u>E</u> :			
	FUE	L POC	DL (COOLING SYSTEM	
2.0	<u>PUR</u>	POSE			
	This capa Pool	proce city is	dur los	e provides instructions to be followed when Fuel Poo st or restricted or when abnormal water level exists in	I cooling the Fuel
3.0	<u>REF</u>	EREN	ICE	<u>:S</u> :	
	3.1	St. L	ucie	e Unit 1 FUSAR, Section 9.1.3.	
	3.2	Ebas	co	P&ID 8770-G-078, Sheet 140, Fuel Pool Cooling	
	3.3	1-03 Oper	500 atic	20, "Fuel Pool Cooling and Purification System-Norm on."	al
	3.4	1-NC)P-′	14.01, "Component Cooling Water System Initial Align	iment." /R14
	3.5	1-03	100	20, "Component Cooling Water System - Normal Ope	eration."
	3.6	1-00	301	31, "Plant Annunciator Summary."	
	3.7	AP 1	-00	10123, "Administrative Control of Valves, Locks and	Switches."
	3.8	PSL· Full	-EN Cor	IG-SENS-97-050, Safety Evaluation - Routine Perform e Fuel Offloads.	nance of
	3.9	One	or	more of the following symbols may be used in this pro	ocedure.
		1.	§	Indicates a Regulatory commitment made by technic specifications, condition of license, audit, LER, bullet should NOT be revised without Facility Review Grou	al in, etc. and p approval.
		2.	¶	Indicates a management directive, vendor recomment plant practice or other non-regulatory commitment the NOT be revised without consultation with the plant s	ndation, at should taff.
		3.	Ψ	Indicates a step that requires a sign off on a data sh	neet.
4.0	REC	CORD	S F	REQUIRED:	
	4.1	Nor	nal	log entries.	
1					

			the state of the s		
REVIS	ION NO	.:	PROCEDURE TITLE:	PAGE:	
14			FUEL POOL COOLING SYSTEM		
PROCEDURE NO.: 1-0350030		NO.:	OFF-NORMAL OPERATING PROCEDURE ST. LUCIE UNIT 1	3 of	15
5.0	FNT	RY C	ONDITIONS:	L	
	5.1	Sym Syst	ptoms indicate an abnormal condition in the Fuel Pool Co em. One or more of the following may be present:	oling	
		1.	Annunciator N-36, Fuel Pool Temp High, alarm.		/R14A
		2.	Annunciator N-20, Sump Pump Moisture/Lvl High/Low, ala	arms.	/R14A
		3	Annunciator N-28, Fuel Pool Pump Disch Hdr Press Low,	alarm.	/R14A
		4.	Annunciator N-44, Fuel Pool Pumps Motor Ovrld, alarm.		/R14A
		5	Annunciator R-5, SIAS Channel A/B Actuation.		
6.0	<u>EXI</u>		IDITIONS:		
	Fuel anni	Pool unciat	Cooling has been returned to normal operation and no ur ors exits.	nexplaine	d

					and the second s			
REVIS	ION NO	D.:	PROCEDURE TITLE:		· · · · · · · · · · · · · ·	PAGE:		
	14		FUEL POOL	FUEL POOL COOLING SYSTEM				
PROC	EDURE	NO.:	OFF-NORMAL OP	ERA	TING PROCEDURE	4 01 10		
1-	-0350	030	ST. LU	JCIE	UNIT 1			
7.0	OPI	ERATO	R ACTIONS:					
	-7 A		diate Operator Actions:					
	7.1	Imme	ediate Operator Actions.					
	1.	None						
	7.2	Subs	equent Operator Actions:					
		INS	STRUCTIONS		CONTINGENCY ACTIONS	Y		
	1.	VERIF annun	Y Control Room ciators are valid.	1.	<u>If</u> the Control Room annu are NOT valid, <u>Then</u> PER following:	nciators FORM the		
					A. <u>If</u> a refueling outage is progress, <u>Then</u> initiate NPWO.	NOT in an		
					B. <u>If</u> a refueling outage progress, <u>Then</u> GO T OP 1-1600023, Refue Sequencing Guidelin INITIATE an NPWO.	is in CO ling les, <u>And</u>		
	2.	<u>lf</u> a fu	Il core offload outage is	2.	SUSPEND core offload a	ctivities.		
		in pro both OPEF	gress, <u>Then</u> vERFT Fuel Pool Pumps are ∖ATING.		A. VERIFY at least one I Pump is OPERATING	Fuel Pool		
					B. <u>If</u> NO Fuel Pool Pump operating, <u>Then</u> PERF following:	os are FORM the		
					1. RESET either of t following breakers	he :		
					 1-41501, Fuel Pump 1A 	Pool		
					 1-42301, Fuel Pump 1B 	Pool		

			r				
REVISI	ON NO	D.:		~~~		PAGE:	
ROCI	14 Edure	E NO.:				5 of 15	
1-	0350	030	ST. LU		UNIT 1		
7.0	OP	ERATO	RACTIONS: (continued))			
	7.2	(contin	nued)				
		INS	STRUCTIONS		CONTINGENC ACTIONS	Y	
	2.			2.	(continued)		
					B. (continued)		
					START at least on Pool Pump.	e Fuel	
					C. CONTACT EM for troubleshooting and re	epairs.	
					D. CONTINUE troublesh repair efforts until bot Pool Pumps are OPE	ooting and h Fuel RATING.	
					E. GO TO STEP 7.2.4		
	3.	VERIF	TY at least one Fuel Pool	3.	START the standby Fuel Pool Pump		
		Pump	IS OPERATING.		A. <u>If</u> NO Fuel Pool Pump operating, <u>Then</u> PERF following:	os are FORM the	
					1. RESET either of t following breakers	he :	
					 1-41501, Fuel Pump 1A 	Pool	
					 1-42301, Fuel Pump 1B 	Pool	
					2. START at least or Pool Pump.	ne Fuel	

			PAGE:
14	FUEL POOL C	OOLING SYSTEM	0.545
PROCEDURE NO .:	OFF-NORMAL OPE	RATING PROCEDURE	60115
1-0350030	ST. LUC	CIE UNIT 1	
7.0 <u>OPERAT</u>	<u>DR ACTIONS</u> : (continued)		
7.2 (conti	nued)		
IN	STRUCTIONS		1
3.	:	3. (continued)	
		B. CONTACT EM for troubleshooting and re	pairs.
		C. GO TO STEP 7.2.4.	
[N		
The Fue	<u>در</u> I Pool Coolina System is de	esigned to limit fuel pool tempe	erature to
150°F w	ith 3 1/3 cores stored in the	e pool. During normal operation	ons, the
fuel poo	temperature is maintained	less than 120°F with one cool	ing pump
in opera	shorter unloading times for	the annual refuelings, it may	be
necessa	ry to operate both spent fue	el cooling pumps for a short pe	eriod of
time afte	er a refueling offload to main	ntain pool water temperature	
less that	n 125°F .		
IF CCW	has been lost due to SIAS.	conditions required to reset th	e
safegua	rds signal should be met be	efore restoring CCW.	
4. <u>If</u> Fue	el Pool cooling is	4. It Fuel Pool temperatu	re Is 1en:
degra Fuel	Pool temperature to be	greater than 120 r ; <u></u>	
less	than 125°F. (TIA-4420, side of Fuel Pool 62'	A. Manually isolate For Ion Exchangers.	uel Pool
elev.).	B Ensure proper CC	W
		alignment to the Fi	uel Pool
		Hx. Refer to 1-NC)P-14.01,
		Component Coolin System Initial Aligr	g water oment /R14
		Cystem militar Aigr	

REVIS		PROCEDURE TITLE:		PAGE:
	14	FUEL POOL CO	OOLING SYSTEM	
PROCI	EDURE NO.:			7 of 15
1_	0350030	OFF-NORMAL OPE	RATING PROCEDURE	
7.0	OPERATO	R ACTIONS: (continued)		
	7.0 (
	7.2 (contir	lued)		
	INS	STRUCTIONS	CONTINGENC	Ϋ́
			ACTIONS	
]
	The first	<u>N</u> nool nining is arranged to n	<u>UIE</u> revent inadvertent uncoverir	ng of the
		poor piping is arranged to p ask in the cooling loop coul	d only reduce the water leve	by 6 feet.
	which wo	uld still leave adequate leve	el to provide shielding. Wor	st case
	loss of co	oling capability would resu	It in the pool water reaching	the bulk
	boiling po	oint in approximately 5 hour	s with a full core offload in t	he pool.
	L			······································
	5. <u>If</u> Fue	Pool High/Lo level is		
	indica	ted (Annunciator N-20),		
	Inen lovel d	locally check Fuel Pool		
		initized.		
		CAI	UTION	
	During re	fueling operations with the	reactor cavity full and the fu	el transfer
	tube gate	a valve open, changes with	the containment/fuel handlin	ng building
	ventilatio	n systems can change the	tuel pool level.	
	A. If	a high level exists.		
	<u> </u>	hen:		
	1.	Determine the source		
		of in-leakage either		
		from an open or leaking value on the		
		nurification nump		
		suction or		
		demineralized makeup		
		water supply.		
	~	laclata the source of		
	2.	in-leakage and restore		
		level to normal per		
		Appendix A.		

			.			
EVISION	N NO.	.:		PROCEDURE TITLE:		PAGE:
14				FUEL POOL COOLING SYSTEM		8 of 15
PROCED	URE	NO.:		OFF-NORMAL OPER ST. LUCI	ATING PROCEDURE E UNIT 1	
7.0 C	DPE	RAI		R ACTIONS: (continued)		
7	7.2	(con	tin	ued)		
		11	٧S	TRUCTIONS		Y
5	5.	(con	tin	ued)		
		B.	lf I Th	ow level is indicated, <u>en</u> :		
			1.	Determine if leakage is from the cooling pump or purification loop.		
			2.	Verify no open vent(s) or drain(s) on the demineralizer and filters.		
			3.	Isolate the source of leakage and restore level to normal per Appendix B.		
				CALL	TION	
	Ma <u>O1</u>	ake-i NLY	up as	capability from the Intake C a last resort.	ooling Water System is ava	ilable
	6.	<u>If</u> Finhas rees the A.	uel be stal fol fa fa tir re	Pool cooling capability een lost and cannot be blished, <u>Then</u> perform lowing: etermine the cause of ilure and estimate the ne necessary to make pairs.		

				DACE
REVISION	NO.:	PROCEDURE TITLE:		PAGE:
	14		JUULING STSTEM	9 of 15
ROCEDU	RE NO.	OFF-NORMAL OPE		
1-03	50030) ST. LU		
7.0 <u>O</u>	PERA	TOR ACTIONS: (continued)		
7.	2 (co	ntinued)		
		INSTRUCTIONS	CONTINGENC	(
			ACTIONS	
6.	(co	ontinued)		
	Б	Varify the availability of		
	D.	makeup from the RWT.		
		···		
	C.	Verify Fuel Pool ventilation		
		is in service.		
	D.	Ensure Fuel Pool Ion		
		Exchangers are isolated.		
	-	Notify the Operations		
	E.	Supervisor. Chemistry		
		Supervisor and Health		
		Physics Supervisor.		
	F	Provide makeup from the		
	•••	RWT as required to		
		maintain level.		

			PAGE:
EVISION NO.: 14	FUEL POOL C	OOLING SYSTEM	
ROCEDURE NO.:			10 of 15
1-0350030	OFF-NORMAL OPE	CIE UNIT 1	
7.0 OPERAT	OR ACTIONS: (continued)		,, <u>.</u>
7.0 (
7.2 (cont	inuea)		
IN	ISTRUCTIONS	CONTINGENO	Y
		ACTIONS	
6. (cont	inued)		
	<u>CA</u>	UTION	any use of
Plant M	anagement or Technical Su ke Cooling Water System fo	or makeup to the Fuel Pool.	any use of
G. I	Provide makeup from the		
į	ntake Cooling Water		
	System using the flex		
	nose connections only as		
·	a last resort. These		
· ·	connections are located		
	on the East Side of the		
	Fuel Handling Blog. and		
I			
	CCW platform.		

				PACE
EVIS		D.:		FAGE.
ROC	14 EDURE	E NO.:		11 of 15
1	-0350	030	ST. LUCIE UNIT 1	
			APPENDIX A RESTORATION OF FUEL POOL LEVEL CAUSED BY A HIGH LEVEL CONDITION (Page 1 of 2)	
	A if 1	dedica he Fue	<u>NOTE</u> ted fuel pool level watch must be maintained during level el Pool level annunciation in the control room is out of ser	changes vice.
1.	Ens Loc	sure co ks and	ompliance with AP 1-0010123, "Administrative Control of I Switches," when repositioning locked valves.	/alves,
2.	Re	store th	ne Fuel Pool level as follows:	
	A.	Stop	the Fuel Pool purification pump.	
	В.	To de	ecrease the Fuel Pool level:	
		1. L	ock closed V07104, RWT to Fuel Pool Purif. Loop Isol.	
		2. L	ock open V07101, Fuel Pool IX Outlet to RWT Isol.	
		3. C	Open V4220, Fuel Pool Outlet to Purification Pump Isol.	
		4. C	Close V4252, Fuel Pool Inlet from Fuel Pool Purif. IX Isol.	
	C.	Start	the Fuel Pool purification pump.	
	D.	Verify decre	/ the Fuel Pool Level annunciator in control room clears a eases below the high level setpoint.	s level
	E.	<u>Wher</u> Pool)	normal level is established (Approx. 2' below the top of , <u>Then</u> :	the Fuel
		1. 5	Stop the Fuel Pool purification pump.	
		2. <u>I</u>	f RWT purification is required, <u>Then</u> :	
		e	a. Close V4220, Fuel Pool Outlet to Purification Pump Is	ol.

	NO -		PAGE:
1	4	FUEL POOL COOLING SYSTEM	
ROCEDU	RE NO.		12 of 15
		OFF-NORMAL OPERATING PROCEDURE	
1-03	50030		
		APPENDIX A RESTORATION OF FUEL POOL LEVEL	
		CAUSED BY A HIGH LEVEL CONDITION	
		(Page 2 of 2)	
2. (c	ontinı	ed)	
E.	(co	ntinued)	
	2.	(continued)	
		b. Lock open V07104, RWT to Fuel Pool Purif. Loop	isol.
		c. Start the Fuel Pool Purification Pump.	
	3.	If RWT Purification is NOT required, Then:	
		 Align Fuel Pool Purification System to normal line 1-0350020, "Fuel Pool Cooling and Purification Sy Operation." 	-up per /stem - Normal
	4.	Check for possible intrusion of borated water into vent	lilation

END OF APPENDIX A

REVIS	SION NO.:	PROCEDURE TITLE:	PAGE:			
	14	FUEL POOL COOLING SYSTEM				
PROC	-0350030	OFF-NORMAL OPERATING PROCEDURE ST. LUCIE UNIT 1	13 of 15			
		APPENDIX B RESTORATION OF FUEL POOL LEVEL CAUSED BY A LOW LEVEL CONDITION (Page 1 of 3)				
	A dedicat if the Fue	<u>NOTE</u> ed fuel pool level watch must be maintained during leve Pool level annunciation in the control room is out of se	l changes rvice.			
1.	Ensure con Locks and	mpliance with AP 1-0010123, "Administrative Control of Switches," when repositioning locked valves.	Valves,			
2.	If Fuel Pool level is to be increased using the Fuel Pool Purification System, <u>Then</u> PERFORM the following:					
	A. Stop t	he Fuel Pool purification pump.				
	B. PERF	ORM the following valve alignment:				
	1. Lo	ock open V07104, RWT to Fuel Pool Purif. Loop Isol.				
	2. Lo	ock closed V07101, Fuel Pool IX Outlet to RWT Isol.				
	3. Close V4220, Fuel Pool Outlet to Purification Pump Isol.					
	4. C	lose V4201, Fuel Pool M/U Isol.				
	5. O	pen V4252, Fuel Pool Inlet from Fuel Pool Purif. IX Isol.				
	To preve Pool leve the local	<u>CAUTION</u> ent boric acid intrusion into the Fuel Pool Ventilation Systel shall NOT be allowed to exceed elevation 61'1" by ob- level indicator.	tem, Fuel serving			
	Increased Spent Fu prompt n	<u>NOTE</u> d awareness is required while pumping the transfer cana lel Pool. If a Fuel Pool high level exists, RCOs shall ens otification of the SNPO.	al to the sure			
	C. Start f	the Fuel Pool purification pump.				

		<u>.</u>	-		PAGE:
REVIS	14			FUEL POOL COOLING SYSTEM	14 of 15
PROC	EDURE	E NO.:		OFF-NORMAL OPERATING PROCEDURE ST. LUCIE UNIT 1	
I	-0350	000		APPENDIX B RESTORATION OF FUEL POOL LEVEL CAUSED BY A LOW LEVEL CONDITION (Page 2 of 3)	
2.	(co	ntinu	ed)		
	D.	<u>Whe</u> VEF CLE	<u>en</u> RIF` EAF	Fuel Pool level rises above the low level alarm setpoint, Y annunciator N-20, Fuel Pool Sump Pump Moisture/Lvl RS.	<u>Then</u> High/Low
	E.	<u>Wh</u> Poc	<u>en</u> i il), j	normal level is established (Approx. 2' below the top of t <u>Then</u> :	the Fuel
		1.	Sto	op the Fuel Pool purification pump.	
		2.	<u> f</u>	RWT purification is required, <u>Then</u> :	
			a.	Close V4252, Fuel Pool Inlet from Fuel Pool Purif. IX	Isol.
			b.	Lock open V07101, Fuel Pool IX Outlet to RWT Isol.	
			c.	Start the Fuel Pool Purification Pump.	
		3.	<u> f</u>	RWT Purification is NOT required, <u>Then</u> :	
			a.	Align Fuel Pool Purification System to normal line-up 1-0350020, "Fuel Pool Cooling and Purification System Operation."	per m - Normal
3.	<u>lf</u> ti be the	he Fi trans follo	uel sfer wir	Pool bulkhead is installed and the NPS determines that red to the Fuel Pool using submersible pumps, <u>Then</u> PE ng:	water is to ERFORM
	A.	EN dise	SU cha	RE submersible pump(s) are placed in the transfer cana rge hose(s) routed to the Spent Fuel Pool.	ll with

REVISION NO.	.:	PROCEDURE TITLE:	PAGE:
14		FUEL POOL COOLING SYSTEM	
ROCEDURE	NO.:	OFF-NORMAL OPERATING PROCEDURE	15 01 15
1-03500	030	ST. LUCIE UNIT 1	<u> </u>
		APPENDIX B RESTORATION OF FUEL POOL LEVEL CAUSED BY A LOW LEVEL CONDITION (Page 3 of 3)	
. (cont	tinued))	
To Por the	preve ol leve local	<u>CAUTION</u> nt boric acid intrusion into the Fuel Pool Ventilation Syst I shall NOT be allowed to exceed elevation 61'1" by ob- level indicator.	tem, Fuel serving
Inci Spe pro	reased ent Fui empt no	<u>NOTE</u> d awareness is required while pumping the transfer cana el Pool. If a Fuel Pool high level exists, RCOs shall ens otification of the SNPO.	al to the sure
В.	STAR	T submersible pump(s).	
C.	MONI	TOR Fuel Pool local level indicator.	
D	<u>When</u> VERIF CLEAI	Fuel Pool level rises above the low level alarm setpoint Y annunciator N-20, Fuel Pool Sump Pump Moisture/Ly RS.	, <u>Then</u> /I High/Low
Ε.	<u>When</u>	either of the following occur:	
	• No th	ormal Fuel Pool level is reached (approximately elevatione local level indicator)	on 60' 0" on
	_	OR	
	• Si	ubmersible pump(s) lose suction,	
	Then	STOP submersible pump(s).	
F.	REMC siphor	OVE discharge hose from submersible pump(s) to preve ning.	nt

REGION II INITIAL LICENSE EXAMINATION JOB PERFORMANCE MEASURE ST. LUCIE NUCLEAR PLANT

LOCALLY START THE 1B EMERGENCY DIESEL GENERATOR DURING A STATION BLACKOUT

CANDIDATE _____

EXAMINER

REGION II INITIAL LICENSE EXAMINATION JOB PERFORMANCE MEASURE ST LUCIE NUCLEAR PLANT

Task: Start an EDG

<u>Alternate Path:</u> Yes <u>X</u> No _____

Facility JPM #: 0821072 / modified

Task Standard: Locally start the 1B Emergency Diesel Generator

Preferred Evaluation Location:

Simulator _____ Control Room _____ In-Plant __X___

Preferred Evaluation Method:

Perform _____ Simulate _ X ___

References: 1-EOP-99, Appendix C

Validation Time 15 minutes Time Critical No

Candidate:	Name			Time Start Time Finish
Performance Rating:	Sat	Unsat		
Examiner:	Name		Signature:	

Tools/Equipment/ Procedures Needed:

1-EOP-99, Appendix C

Read to Candidate

Directions to candidate for In-Plant or Control Room JPMs:

I will explain the initial conditions and state the task to be performed. All in-plant or control room JPM steps, including any communications, shall be simulated for this JPM. Under no circumstances, unless directed by the examiner, are you to operate any plant equipment. I will provide initiating cues and reports on other actions when directed by you. Ensure you indicate to me when you finish your assigned task by returning the handout sheet I provided you.

Directions to candidate for Simulator JPMs:

I will explain the initial conditions and state the task to be performed. All simulator JPM steps, including any communications, shall be performed for this JPM. You are you to operate any plant equipment that is necessary for the completion of this JPM. The simulator will provide the cues as you perform this JPM. Ensure you indicate to me when you finish your assigned task by returning the handout sheet I provided you.

Initial Conditions: A Station Blackout has occurred on Unit 1. 1-EOP-10 is being carried out and the unit is in a stable Mode 3 condition. The NORMAL/ISOLATE switch at the 1B EDG output breaker has been placed in the ISOLATE position.

Initiating Cues: The ANPS has instructed you to proceed to the 1B EDG room to locally reset and start the 1B EDG IAW 1-EOP-99, APPENDIX C.

Start Time _____

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<u>Step 1:</u>	Investigate the statue of the local alarm panel at the diesel control station. If no alarms present, verify the overspeed level has not tripped (step 1B)	Sat
<u>Standard:</u>	Operator observes the panel for no alarms, and trip latches on the 12 and 16 cylinder diesel engines are down such that the latch is horizontal and the limit switch is set.	Unsat
<u>Cue:</u>	(1B EDG room) No alarms present, both trip latches horizontal, limit switches depressed	
Comments	<u></u>	
<u>Step 2:</u>	Ensure that the lockout relay is reset (step 1C)	Critical Step
Standard:	Operator observes position of lockout relay Operator simulates positioning the lockout relay to the RESET position	Sat Unsat
Cue:	(1B EDG control panel) 1.) Lockout indicates green flag	
	2.) Lockout indicates red flag, engine does not start	
Comments	<u>S:</u>	
<u>Step 3:</u>	If the diesel does not start, then place the engine start switch to START (step 1D)	Critical Step
Standard:	Operator simulates placing the engine start switch to START	Unsat
<u>Cue:</u>	(1B EDG control panel) Engine start switch in START, engine does not start	
Comment	<u>S:</u>	
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<u>Step 4:</u>	If diesel still does not start, then position the following NORMAL/ISOLATE switches in the ISOLATE position: Voltage	Critical Step
	Control, Frequency Control, Start Circuit (step 1E1 a,b,c)	Sat
<u>Standard:</u>	Operator simulates placing Voltage Control, Frequency Control, Start Circuit in the isolate position	Unsat
<u>Cue:</u>	(1B EDG control panel) a.) Voltage Control, b.) Frequency Control, c.) Start Circuit switches in the isolate position	
<u>Comments</u>	<u>:</u>	
<u>Step 5:</u>	Place engine control switch to START (step 1E2)	Critical Step
Standard:	Operator simulates placing the engine control switch to the START position	Sat
Cue:	(1B EDG control panel) Engine control switch to start, 1B EDG starts	Unsat
Comments	<u></u>	
<u>Step 6:</u>	When diesel generator reaches 900 RPM, adjust voltage control and governor control switches to obtain 4160 volts and 60 hertz (step 1E3)	Sat
Standard:	Operator observes voltage and frequency indications and simulates adjustment to 4160 volts and 60 hertz	
<u>Cue:</u>	(1B EDG control panel) Diesel generator is at 4160 volts and 60 hertz	
Comments	<u>5:</u>	
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<u>Step 7:</u>	Place the following NORMAL/ISOLATE switches back to the NORMAL position: Voltage Control, Frequency Control, Start Circuit	Critical Step
	(step 1E4)	Sat
<u>Standard:</u>	Operator simulates placing the Voltage Control, Frequency Control, Start Circuit back to the NORMAL position	Unsat
<u>Cue:</u>	(1B EDG control panel) a.) Voltage Control, b.) Frequency Control, c.) Start Circuit NORMAL/ISOLATE switches in the NORMAL position	
Comments	<u>:</u>	
<u>Step 7:</u>	Check that the diesel generator is operating normally (step 2)	
Standard:	Operator checks EDG parameters and verifies normal operation	Sat
Cue:	1B EDG running normally	Unsat
Comments	<u></u>	
<u>Step 8:</u>	Notify RCO that diesel generator is ready to accept load and check the diesel generator to be operating normally (step 3)	Sat
Standard:	Operator simulates notifying the control room and observes proper operation of 1B EDG	Unsat
<u>Cue:</u>	Control room acknowledges, 1B EDG operating properly	
Comments	<u>S:</u>	
	End of Task	

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Stop Time _____

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CANDIDATE CUE SHEET

(TO BE RETURNED TO THE EXAMINER UPON COMPLETION OF TASK)

INITIAL CONDITIONS:

A Station Blackout has occurred on Unit 1. 1-EOP-10 is being carried out and the unit is in a stable Mode 3 condition. The NORMAL/ISOLATE switch at the 1B EDG output breaker has been placed in the ISOLATE position.

INITIATING CUE:

The ANPS has instructed you to proceed to the 1B EDG room to locally reset and start the 1B EDG IAW 1-EOP-99, APPENDIX C.
REVISION NO.: 27A		PROCEDURE TITLE: APPENDIXES/FIGURES/TABLES	PAGE:
PRO	CEDURE NO.:		5 of 13 4
•	1-EOP-99	ST. LUCIE UNIT 1	
		APPENDIX C DIESEL GENERATOR LOCAL START (Page 1 of 2)	
1.	<u>If</u> manual s the followin	tart of emergency diesel generator is unsuccessful, <u>Then</u> g steps:	perform
	A. Place ti 1-2021	ne Diesel Generator Output breaker, 1A (1B) D/G 4.16 K 1 (1-20401, NORMAL/ISOLATE switch in ISOLATE.	/ Breaker
	B. Investig there a NOT tri	ate status of local alarm panel at diesel local control stati re no alarms present, <u>Then</u> verify that the overspeed trip pped.	on. <u>If</u> lever has
	lf auto-sta generato	<u>CAUTION</u> art signal is present and the lockout relay is reset, the die r will automatically start.	esel •
	C. Ensure D. <u>If</u> the di START	that the lockout relay is reset. iesel does NOT start, <u>Then</u> place the engine start switch .	to
	E. <u>If</u> diese	I still does NOT start, <u>Then</u> perform the following steps:	
	1. Plac	e the following NORMAL/ISOLATE switches to ISOLATE	position:
	a. \	/oltage Control	
	b. F	Frequency Control	
	c. \$	Start Circuit	
	2. Plac	e engine control to START.	
	3. Whe elec	en diesel generator reaches 900 rpm, adjust voltage contr tric governor control switches to obtain 4160 volts and 60	ol and hertz.

(Continued on Next Page)

REVISION NO.: PROCEDURE TITLE:	PA	GE 3
27A APPENDIXES/FIG	URES/TABLES	6 of 13 4
PROCEDURE NO.: 1-EOP-99 ST. LUCIE	UNIT 1	
APPENDIX DIESEL GENERATOR L (Page 2 of	C _OCAL START 2)	
1. (continued)	_,	
E. (continued)		
4. Place the following NORMAL/ISOL position:	ATE switches back to the NC	ORMAL
a. Voltage Control		
b. Frequency Control		
c. Start Circuit		
2. Check that the diesel generator is operation	ng normally.	•
3. Notify the Control Room that the diesel ge accordance with Appendix E.	enerator is ready to be restore	ed in

INITIAL SUBMITTAL

ST. LUCIE EXAM 2000-301 50-335/2000-301 & 50-389/2000-301

FEBRUARY 7 - 11, 2000

INITIAL SUBMITTAL

OPERATING TEST SIMULATOR SCENARIOS





Set-Up / Validated By:

J. Charles Couture

Table of Contents		Operating Exam Outlines
	2	Scenario 1
	3	Scenario 2
	4	Scenario 3
	5	Notes

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ES-301

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Form ES-301-1

Facility Exami	y: St. Lucie ination Level (circle o	one): RO / SRO	Date of Examination: 2/7/00 Operating Test Number: 1
	AdministrativeDescribe method of evaluation:Topic/Subject1. ONE Administrative JPM, ORDescription2. TWO Administrative Questions		
A.1	Plant Parameter Verification K2.17 - 3.7 / 4.4	JPM / Perform Estimate	ed Critical Condition Calculation Unit
	Overtime	Question 1/ Ev	valuate Overtime Guidelines
	Guidelines K2.1.1 - 3.7/3.8	Question 2/ Minimu	um level of approval for deviation
A.2	Surveillance	JPM / Verify Borid	c Acid Makeup Tank Operability
	Procedures K2.2.12 - 3.0/3.4		
A.3	Knowledge of 10 CFR 20 and	Question 1 / Determine	Posting Requirements from a Surve
	facility radiation control requirements K2.3.1 - 2.6 / 3.0	Question 2 / When an a	rea is posted for Airborne Radioactivi
A.4	Knowledge of the emergency	JPM / Complete the	e State of Florida Notification Form
	plan K2.4.29 - 2.6/4.0 (RO Only)		
A.4	Knowledge of the Emergency	JPM / Determine P	rotective Action Recommendations
	Plan. K2.4.44-2.1/4.0 (SRO Only)		

ES-301	Control Room S	vstems and	Facility ¹	Walk-Through	Test Outline	Forr

Form ES-301-2

Facility: St. Lucie Exam Level (circle one): RO / SRO(I) / SRO(U) Date of Examination: 2/7/00 Operating Test No.: 1

System / JPM Title	Type Code*	Safety Function
 a. RPS 012 / Perform a Logic Matrix Test Unit 2 (15 minutes) 	M, S, A	07
 b. ECCS 006 / Fill a Safety Injection Tank Unit 2 (15 minutes) 	N, S	03
c. RHRS 005 / Respond to an "A" SDC Loop Suction Valve Closure while on SDC (20 minutes) (SRO-U)	D, S, L	04P
 d. AFW 061 / Manually Actuate AFAS Unit 2 (10 minutes) 	D, S, A	04S
e. CRDS 001 / Recover a Slipped CEA Unit 2 (15 minutes) (SRO-U)	N, S, A	01
f. HRPS 028 / Operate the Hydrogen Recombiner Unit 1 (10 minutes)	N, C	05
g. ECCS 006 / Initiate Hot and Cold Leg Injection Unit 1 (20 minutes) (SRO-U)	N, C	02
B.2 Facility Walk-Through		
a. HRPS 028 / Hydrogen Purge System Operation Unit 1 (20 Minutes) (SRO-U)	D, R	05
 b. SFPCS 033 / Makeup to the Spent Fuel Pool Unit 1 (20 minutes) 	N, R	08
c. EDG 064 / Locally Start the 1B EDG During a Station Blackout (15 minutes) (SRO-U)	M , A	06

Facility: St. Lucie

Op-Test No.: 1

Objectives: To evaluate the students ability to implement the ONOPs for various instrument and component failures; perform a normal plant power reduction; and to execute the EOPs for a Small Break LOCA combined with a Loss of Offsite Power and subsequent total loss of High Pressure Safety Injection. (Functional Recovery)

Initial Conditions: Unit 2 is at 100% power MOC

Turnover: The plant is operating at 100% power, MOC. The 2B Heater Drain Pump has developed a discharge flange leak and management has made the decision to reduce power to 90% in order to facilitate repairs. 2A Emergency Diesel Generator is out of service for relay replacement, expected back in four hours. 2A Auxiliary Feedwater Pump is out of service for bearing replacement, not expected back this shift. Chemistry reports a .5 GPD tube leak in the 2A Steam Generator. Severe thunderstorms have been forcasted for St. Lucie and Martin counties. Instructions to the shift is to reduce power to 90% and remove the 2B Heater Drain Pump from service.

Preexisting Malfunctions: 2B HPSI pump becomes air bound 10 minutes after SIAS

Event No.	Malf. No.	Event Type*	Event Description
1	0	R-RO N-BOP N-BOP	Power decrease from 100% to 90% Start Second Charging Pump Place Pressurizer on Recirc
2	1	C-BOP C-BOP	DEH power supply failure, turbine control swaps to manual, 2B heater drain pump trips two minutes later
3	2	I-RO	PT-1100X setpoint (selected pressurizer pressure controller) drifts high
4	3	I-BOP	LT-9011(2A steam generator level transmitter) develops noise signal causing the valve to cut-off feedwater flow.
5	4	C-RO	Reference leg for LT-1110X ruptures (common leg failure) Starts RCS leak
6	5	M-RO M-BOP	Small break LOCA, Loss of Offsite Power on reactor trip
7	6	C	2B HPSI pump becomes air bound when started after SIAS, loss of all High Pressure Safety Injection until vented.
	 		

* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor

ppendix D		endix D Operator Actions		
Op-Test No.: 1 Sce		Test No.: 1 Scenario No.: 1 Event No.: 1 P		
Event De	escription:	Power decrease from 100% to 90%		
Time	Position	Applicant's Actions	or Behavior	
	BOP	Refers to appropriate procedure for d reactor power: NOP-2-0030125, "Turk Zero Load"	ecrease of turbine and bine Shutdown - Full Load to	
		Operates DEH to decrease turbine lo	ad	
		Monitors secondary parameters durin	g power change	
RO		Places pressurizer on recirc IAW NOI Operating Guidelines during Steady S	P-2-0030123, "Reactor State and Load Changes"	
		Starts second Charging Pump IAW 2-NOP-02.02, "Charging and Letdown."		
		Operates CVCS and BCC to decreas IAW 2-NOP-02.24, "Boron Concentra	e RCS temperature	
		Operates control rods to maintain AS	l at 100% value	
		Remains cognizant of RCS paramete	ers during power increase	
	SRO	Performs shift brief prior to power de	crease	
		Directs RO to place pressurizer on re charging pump	circ and start additional	
		Directs RO to maintain ASI at 100%	value	
		Directs RO to decrease RCS temperative	ature by CVCS addition	
		Directs BOP to decrease turbine pow	ver by DEH	
		Notifies System of impending power	decrease	
. # .3				

St. Lucie 00-301 Date of Exam 2/7-9-00

Appendix I	ppendix D		Actions	Form ES-D-2
Op-Test No.: 1		Scenario No.: 1 E	cenario No.: 1 Event No.: 2	
Event De	escription:	DEH power supply failure (Examiner must cue tri	e, turbine control swap gger sometime betw	s to manual een 98-96%)
Time	Position	Ар	plicant's Actions or Bel	navior
	BOP	Recognizes DEH in n	nanual control, loss of	control power.
		Reduce turbine powe	r using DEH in manua edure	I using ONP2-22.03
	<u></u>	Recognizes 2B heate	r high amps and low fl	ow alarms
		Manually trips 2B hea	ter drain pump on hig	h amps if not already
		Communicates with F decreased	RO as to when turbine	power must be
				tubing power pot
	RO	Recognizes RCS tem automatically decreased	sing, mismatch develo	ping.
		Recognizes DEH in r	nanual control	
		Recognizes 2B heate	er drain pump is tripped	d
		Communicates with I	30P as to when turbin constant with RCS Ta	e power must be va
		Borates RCS to redu temperature control i	ce temperature, Insert f required.	s CEAs for rapid
				ante DELL Off Normal
	SRO	Recognizes DEH in r Procedure . ONP 2-2	2.03	nents DEH OII-Normai
		Contact I&C for assis	stance with Turbine DE	EH condition
		Directs BOP to contin	nue with power reducti	on in manual DEH
ļ,		Recognizes 2B heat	er high amps and low f	low alarms
		Directs BOP to manu	ually trip 2B heater dra	in pump
		Directs RO and BOP heater drain pump tr	to perform a rapid do to 90% power.	wnpower due to the 2B

Op-Test No.: 1		Scenario No.: 1	Event No.: 3	Page 4 of 12	
Event De	escription:	PT-1100X setpoint (selected pressurizer pressure controller) drifts high, (Examiner must cue trigger)			
Time	Position		Applicant's Actions	or Behavior	
	RO	Recognizes PT-1 pressure increas	1100X setpoint drifting ing	g high or actual pressurizer	
		Swaps to operat (May place Spray	ble alternate channel (y Controller HIC-1100	(PIC-1100Y)) in manual to stop event)	
		Recognizes and statement T.S. 3	reports Entry into DN .2.5 P ¾ 2-14 (<2225	IB Tech Spec LCO Action	
		Places HIC-1100) in manual		
		Restores pressurizer pressure to normal value (2250 psia)			
		(if time allows) R HIC-1100 to Auto	lesets, Restores Pres omatic Control.	surizer Heaters and returns	
		Secures dilution (optional)			
	BOP	Recognizes PT- pressure increas	1100X setpoint driftin	g high or actual pressurizer	
		Refers to ONOP	2-0120035, "Pressu	rizer Pressure and Level"	
		Secures turbine	increase (optional)		
		Assists RO in m	onitoring RCS param	eters	
<u> </u>					
	<u> </u>				
	<u>L</u>				

Appendix	D
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Form ES-D-2

Op-Test No.: 1		Scenario No.: 1	Event No.: 3	Page 5 of 12		
Event Description:		PT-1100X setpoint (s high.	elected pressurizer pres	ssure controller) drifts		
Time	Position		Applicant's Actions or B	ehavior		
	SRO	Recognizes PT-11 pressure increasir	00X setpoint drifting hig	gh or actual pressurizer		
		Directs RO to swa	p pressure channels to	PIC-1100Y		
		Directs RO to take placing HIC-1100	Directs RO to take manual control of pressurizer pressure by placing HIC-1100 in manual and increasing spray flow			
		Directs RO and Bo already done)	Directs RO and BOP to stop power decrease (optional, if not already done)			
		Refers to ONOP 2-0120035, "Pressurizer Pressure and Le				
		Recognizes and Reviews Entry into DNB Tech Spec LCO A statement T.S. 3.2.5 P ³ / ₄ 2-14(<2225 psi)				
		Directs RO to rest psia)	tore pressurizer pressur	e to normal value (2250		
		Notifies I&C or RM	AS to report pressure ch	nannel failures		
	<u> </u>	Notifies Plant Mar	nagement			
		e de la production de la companya de		an an an an an an an an an an an an an a		
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St. Lucie 00-301 Date of Exam 2/7-9-00

Appendix D

Operator Actions

Form ES-D-2

Op-Test	No.: 1	Scenario No.: 1	Event No.: 4	Page 6 of 12		
Event De	escription: L	T-9011(2A steam Examiner must c	-9011(2A steam generator level controller) fails high Examiner must cue trigger)			
Time	Position		Applicant's Actions or Be	havior		
	BOP	Recognize LT-9 Decreasing.	011 is failing High, or 2A st	team generator level is		
		Transfer FIC-90 manually	11 to manual and control 2	A steam generator level		
		Stops turbine inc	crease (optional if not alrea	idy done)		
		Restores 2A ste	am generator level to norm	nal value (60-70% NR)		
	RO	Recognize LT-9 generator level	011 has failed high or decr	easing 2A steam		
		Refers to ONOF	2-0700030, Main Feedwa	ter		
		Stops dilution (o	ptional if not already done))		
		Monitors plant p	arameters during transient			
	SRO	Recognize LT-9 generator level	011 has failed high or decr	easing 2A steam		
		Directs BOP to	take manual control of 2A s	steam generator level		
		Refers to ONOF	2-0700030, Main Feedwa	ter		
		Directs RO and already done)	BOP to stop power decrea	se (optional, if not		
		Directs BOP to (60-70% NR)	restore 2A steam generato	r level to normal value		
		Notifies I&C or I	RMS of level channel failur	e		
	dina	Notifies Plant M	anagement			

Appendix D

Operator Actions

Form ES-D-2

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Op-Test	No.: 1	Scenario No.: 1	Event No.: 5	Page 7 of 12
Event D	escription: F	Reference leg for L (Examiner must c	T-1110X ruptures (comm ue trigger)	non leg failure)
Time	Position		Applicant's Actions or I	Behavior
	RO	Recognizes com 1110 X fails high increases.	mon leg failure by the fo , PT-1100X fails low, rea	llowing indications: LT- actor cavity leakage
		Notifies SRO of Pressurizer pres	increasing reactor cavity sure.	leakage, and decreasing
		Starts a third cha manual control c (pressure affected	arging pump as RCS lea of letdown. ed more than level, 3 rd pu	kage increases. May take
		Isolates letdown	as RCS leakage increas	ses
		Operates CVCS temperature as o	and control rods to decr directed by SRO	ease reactor power and
	BOP	Recognizes com 1110 X fails high increases.	mon leg failure by the fo n, PT-1100X fails low, rea	blowing indications: LT- actor cavity leakage
		Refers to ONOP	2-0120035, "Pressurize	r Pressure and Level"
		Refers to 2-ONF	2-22.01, "Rapid Downpov	ver"
		Operates DEH in	n Manual to reduce turbi	ne power
		Manually trips re longer be mainte	actor and turbine when a land	pressurizer level can no
		Refers to "RCS	Leakage ONP" for guida	nce if time allows.
	a sa ka ka ka ka ka ka			
		S-		

Form ES-D-2 **Operator Actions** Appendix D Page 8 of 12 Event No.: 5 Scenario No.: 1 Op-Test No.: 1 Event Description: Reference leg for LT-1110X ruptures (common leg failure) Applicant's Actions or Behavior Position Time Recognizes common leg failure by the following indications: LT-SRO 1110 X fails high, PT-1100X fails low, reactor cavity leakage increases. Directs RO to start a third charging pump as leakage increases. (pressure affected more than level, 3rd pump start may not occur) Directs RO to isolate letdown as leakage increases Refers to ONOP 2-0120035, "Pressurizer Pressure and Level" Directs RO and BOP to perform a plant shutdown IAW 2-ONP-22.01, "Rapid Downpower" Recognizes need to place PT-1102A RPS, and ESFAS SIAS channels in Bypass per Tech Specs, (T.S. 3.3.1 and 3.3.2 RPS and ESFAS) and Tech Spec Instrument Off-Normal. 2-ONP-99.01 (Bypass may NOT occur because of attention needed for multiple controllers in Manual). May assess this T.S. knowledge during post exercise questioning. . .

Appendix D

Operator Actions

Form ES-D-2

Op-Test	No.: 1	Scenario No.: 1	Event No.: 6	Page 9 of 12
Event D	escription: S	mall break LOCA,	Loss of Offsite Power on rea	actor trip
Time	Position		Applicant's Actions or Beha	avior
	RO	Manually trips the maintained	e reactor when pressurizer p	ressure can no longer
		Perform systema	atic board walkdown	
		Perform Standar	d Post Trip actions (2-EOP-1	1)
		Report all safety	function status to SRO	
		Verifies B train S	SI actuation	
		Performs a plant SRO	cooldown and depressurizat	tion when directed by
	Critical Task	Recover HPSI fl	ow to the core for inventory o	control.
	BOP	Manually trips th no longer be ma	e reactor and turbine when p intained	pressurizer level can
		Perform system	atic board walkdown	
		Perform Standa	rd Post Trip actions (2-EOP-	1)
		Report all safety	function status to SRO	
		Performs safety unavailable)	function status checks for 2-	EOP-3 (If STA is
		Verifies SI flow	per 2-EOP-99, Figure 2	
		Notifies NPO to	restore instrument air per 2-	EOP-99, Appendix H
		Open ADVs Mai of SBCS. (redu	nually to provide heat remove ce pressure below SG SRV I	al flowpath due to loss ift pressure)

Appendix	D	Ope	rator Actions	Form ES-D-
Op-Test No.: 1		Scenario No.: 1	Event No.: 6	Page 10 of 12
Event De	escription:	Small break LOCA,	Loss of Offsite Power or	n reactor trip
Time	Position		Applicant's Actions or E	Behavior
	SRO	Directs RO and E pressurizer level	BOP to manually trip read can no longer be mainta	ctor and turbine when
		Directs RO and E	BOP in the performance	of 2-EOP-1
	,	Performs shift br Coolant Accident HPSI is available	ief and directs entry into t," (EOP-15 acceptable if e)	2-EOP-03, "Loss of recognized early that No
		Directs BOP or S EOP-3	STA to perform safety fur	nction status checks for 2-
		Directs RO to pe	rform a plant cooldown a	and depressurization
		Contacts Chemis	stry to perform steam ger	nerator samples
		Directs BOP to c	ontact NPO and restore	instrument air
		Directs verification	on of 2-EOP-99, Figure 2	(SI flow)
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Appendix	D	Ope	rator Actions	Form ES-D-2
Op-Test	No.: 1	Scenario No.: 1	Event No.: 7	Page 11 of 12
Event D	escription: 2 H (E nust communic	B HPSI pump beco igh Pressure Safe Examiner must cu cate to crew 'pum	omes air bound when st ty Injection te trigger) When called p is very quiet and no	arted on SIAS, loss of all d to investigate HPSI pp. discharge pressure'
Time	Position		Applicant's Actions or	Behavior
	RO	Recognizes 2B I	IPSI pump amps fluctu	ating and no flow
		Stops 2B HPSI p	oump	
		Notifies SRO that	at there is currently no S	SI flow
		Monitors plant pa depressurization	arameters and continue	es cooldown and
	Critical Task	Recover HPSI fl	ow to the core for inven	tory control.
	BOP	Recognizes no H	HPSI flow	
		Contacts SNPO	to investigate	
		Performs safety (If STA is unava	function status checks ilable)	for 2-EOP-3 or EOP-15
		Reports to SRO (RCS inventory	that multiple safety fun control and RCS pressu	ctions are not being met ure control)
		Assists RO with SRO	maintenance of safety	functions as directed by
		Notifies SNPO t	o vent 2B HPSI pump	
	Critical Task	Starts 2B HPSI per 2-EOP-99 F	pump after vent to esta igure 2	blish SI flow for one train
			······································	
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Appendix	D	Operator Actions	Form ES-D-2
Op-Test	No.: 1	Scenario No.: 1 Event No.: 7	Page 12 of 12
Event D	escription: 2 H	3 HPSI pump becomes air bound 10 minu igh Pressure Safety Injection	utes after SIAS, loss of all
Time	Position	Applicant's Actions or	Behavior
	SRO	Recognizes 2B HPSI pump amps fluctu	ating and no flow
		Directs RO to stop 2B HPSI pump	
		Contacts Mechanical Maintenance to in HPSI pump	nvestigate (air bound) 2B
		Directs entry into 2-EOP-15, "Functiona not restored within 15 minutes of loss	l Recovery" if HPSI flow is
	Critical Task	Directs outside operator to vent 2B HPS pump is air bound	SI pump when notified the
		This scenario can be terminated whe vented and running and SI flow per 2	en 2B HPSI pump is P-EOP-99, Figure 2 is met.

Shift Turnover

- The plant is operating at 100% power MOC.
- 2B Heater Drain Pump has developed a discharge flange leak and management has made the decision to reduce power to 90% to facilitate repairs.
- 2A Emergency Diesel Generator is out of service for relay replacement, expected back in 4 hours
- 2A Auxiliary Feedwater pump is out of service for bearing replacement, not expected back this shift.
- Chemistry reports a .5 gpd tube leak in the 2A Steam Generator.
- Severe thunderstorms have been forcasted for St. Lucie and Martin counties.
- Instructions to the shift is to reduce power to 90% and remove the 2B Heater Drain Pump from service.

REVISION NO.		PROCEDURE TITLE:	PAGE:
8C PROCEDURE	NO.:	REACTOR OPERATING GUIDELINES DURING STEADY STATE AND SCHEDULED LOAD CHANGES	3 of 14
NOP-2-00	30123	ST. LUCIE UNIT 2	in the second second
3.0 <u>RE</u> F	ERENC	<u>CES</u> : (continued)	
3.9	2-NOF	P-02.24, "Boron Concentration Control."	/R8
3.10	JPN E PSL 1	Evaluation, Power Ramp Rates Following Refueling Outa I/2, JPN-PSL-SEFJ-94-024.	ages for
§₃ 3.11	FPL L	etter L-96-93, Reply to Notice of Violation EA 96-040.	
4.0 <u>PRE</u>	REQU	ISITES:	
4.1	Plant Apper perfor Press	is at Power Operation (Mode 1), except for performance ndix A, "Pressurizer Recirculation Guidelines," which ma rmed in any Mode if there is a bubble established in the surizer.	e of y be
5.0 <u>PRE</u>	CAUTI	IONS/LIMITATIONS:	
5.1	At or to cor subjec transi	above 50% power, boration/dilution should be the prima mpensate for changes in power level and transient xeno cts the majority of the fuel rods to uniform and smooth p ients.	ry means n. This power
5.2	During switch	g steady state base load operations, the CEA Mode Sel h should be maintained in OFF.	ector
5.3	Contii insert prima	nuous (in excess of 10 inches) regulating group withdra tions are undesirable. CEA motion should be in small in arily in response to deviations of ASI from ESI.	wals or crements,
5.4	ASI c	control bands about the ESI: (ASI values are in RPS un	its)
	1. S	Steady State Band:	
	E	ESI plus or minus 0.5 during steady state base load ope	ration
	2. T	Fransient Band:	
	A	A. ESI plus or minus 0.2 during load transients.	
	E	 ASI control to plus or minus 0.1 is recommended where practical. 	nenever
	3. F	Refer to 0-NOP-100.02, "Axial Shape Index Control," for	specific /R80

REVIS	ION NO.	:	PROCEDURE TITLE:	PAGE:				
	8C		REACTOR OPERATING GUIDELINES DURING					
PROCI	STEADY STATE AND SCHEDULED LOAD CHANGES							
FROO	LUUNE	NO						
NOP	-2-00	<u>30123</u>	ST. LUCIE UNIT 2					
5.0	PRE	CAUT	<u>IONS/LIMITATIONS</u> : (continued)					
	5.5 Pressurizer boron concentration should be maintained within 25 ppm of RCS boron concentration.							
₿1	5.6	RCS Tech	T-cold shall be maintained less than or equal to 549°F, r nical Specification 3.2.5.	efer to				
	5.7	With than	the reactor critical, the RCS T-avg should be maintained 525°F.	greater				
		1. <u> </u> r	<u>f</u> T-avg decreases below 525°F, <u>Then</u> at least once per 3 ninutes, verify RCS T-avg greater than or equal to 515°F	30				
§1		2. <u> </u> t	<u>f</u> T-avg decreases below 515°F, <u>Then</u> restore T-avg to gr han or equal to 515°F within 15 minutes or be in Hot Sta within the next 15 minutes. Refer to Technical Specificati 3.1.1.5.	reater ndby on				
6.0	REC	ORD	S REQUIRED:					
	6.1	Norn	nal log entries.					
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REVIS		.:		
PROC	EDURE	NO.:	STEADY STATE AND SCHEDULED LOAD CHANGES 7 of 1	4
		2012	3 ST LUCIE UNIT 2	£ ^{ar}
<u>10</u> 7.0	INS	TRUC	TIONS: (continued)	
	7.1	(cor	itinued)	
		3.	If available, <u>Then</u> ensure two Charging Pumps are operating. If necessary, start an additional Charging Pump in accordance with 2-NOP-02.02, "Charging and Letdown."	/R8
		4.	Place the Pressurizer on recirculation in accordance with Appendix A, "Pressurizer Recirculation Guidelines."	
		5.	Continue to load the Main Generator in accordance with 2-GOP-201, Reactor Plant Startup, Mode 2 to Mode 1.	
	7.2	Pov	ver Level Reductions:	
		1.	At or above 50% power:	
			A. All planned reactivity additions should be made by boration or dilution in accordance with 2-NOP-02.24, "Boron Concentration Control."	/F
			B. Use CEAs for ASI control, consider the reactivity effect of CEAs when adjusting boron concentration.	
			C. Refer to 0-NOP-100.02, "Axial Shape Index Control," for specific instructions regarding ASI control during planned or unplanned load reductions.	/R8
		2.	If available, <u>Then</u> ensure two Charging Pumps are operating. If necessary, start an additional Charging Pump in accordance with 2-NOP-02.02, "Charging and Letdown."	/Rŧ
		3.	Place the Pressurizer on recirculation in accordance with Appendix A, "Pressurizer Recirculation Guidelines."	
		4.	Unload the Main Generator in accordance with OP 2-0030125, "Turbine Shutdown - Full to Zero Load."	
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REVISIO	N NO.:	PROCEDURE TITLE:	PAGE:
PROCES	8C	REACTOR OPERATING GUIDELINES DURING STEADY STATE AND SCHEDULED LOAD CHANGES	11 of 14
PROCED	JURE NO		
NOP-2	2-0030123	ST. LUCIE UNIT 2	ing in the second second second second second second second second second second second second second second s
		PRESSURIZER RECIRCULATION GUIDELINES	
		(Page 1012)	
Į		NOTE	
	The purp	ose of placing the Pressurizer on recirculation is to keep	the
	Pressuriz	zer and RCS boron concentration within 25 ppm when cha	anging
	RCS bor	on concentration.	
Į	<u>L</u>		······
		NOTE	
	From me	easured data, the estimated time in minutes to correct a g	reater
	than or e	equal to 25 ppm boron mismatch by operating 6 Backup E	Bank
	heaters r	nay be determined as follows:	
		(Der nom DCC nom) 25 not	
	Time (in r	minutes) to correct mismatch = [(Pzr ppm - RCS ppm) - 23 pp	
	T		
1.	I o place t	ne Pressunzer on recirculation.	
	A. Plac	e all available Backup Bank heater control switches to Ol	Ν.
	B. <u>Slow</u> selec pres	<u>vly</u> reduce the AUTO setpoint on PIC-1100X or PIC-1100 cted "Pressurizer Pressure" controller, to <u>maintain</u> normal sure.	Y, the operating
	C. Obs "Pre	erve HIC-1100, "Pressurizer Spray" output and PCV-1100 ssurizer Spray Valve" position indication to verify Main Sp	DE/1100F, pray flow.

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 PROCEDURE INTE: REACTOR OPERATING GUIDELINES DURING STEADY STATE AND SCHEDULED LOAD CHANGES NOP-2-0030123 ST. LUCIE UNIT 2 APPENDIX A PRESSURIZER RECIRCULATION GUIDELINES (Page 2 of 2) NOTE Normally, the required number of Backup Bank heaters in service is dependent upon: 1. The magnitude of thermal losses from the system, including leakage to the Quench Tank. 2. The number of heater elements out of service. The normal configuration is to have enough Backup Bank heaters in service to keep the Proportional Bank heaters at approximately 50% output. 2. To take the Pressurizer off recirculation: A. Remove the additional Backup Bank heaters from service one at a time by returning the control switch to AUTO. B. ADJUST the AUTO setpoint on PIC-1100X or PIC-1100Y, the selected "Pressurizer Pressure" controller, to <u>maintain</u> normal operating pressure. C. Observe HIC-1100, "Pressurizer Spray" output and PCV-1100E/1100F, "Pressurizer Spray Valve" position indication to ensure: 1. Main Spray flow has stopped. AND 2. Proportional Bank heaters are at approximately 50% output. AnD Proportional Bank heaters are at approximately 50% output. AND C. Observe MIC-110al Bank heaters are at approximately 50% output. AND Proportional Bank heaters are at approximately 50% output. AND And AND AND AND AND And And AND AD AD AD				
8C HEACTOR OPERATING GOIDELINES DURING 12 of 1 PROCEDURE NO: STEADY STATE AND SCHEDULED LOAD CHANGES 12 of 1 NOP-2-0030123 ST. LUCIE UNIT 2 AppENDIX A PRESSURIZER RECIRCULATION GUIDELINES (Page 2 of 2) NOTE 12 of 1 Normally, the required number of Backup Bank heaters in service is dependent upon: 11. The magnitude of thermal losses from the system, including leakage to the Quench Tank. 12. The number of heater elements out of service. 2. The number of heater elements out of service. The normal configuration is to have enough Backup Bank heaters in service to keep the Proportional Bank heaters at approximately 50% output. 2. 2. To take the Pressurizer off recirculation: A. Remove the additional Backup Bank heaters from service one at a time by returning the control switch to AUTO. B. ADJUST the AUTO setpoint on PIC-1100X or PIC-1100Y, the selected "Pressurizer Pressure" controller, to maintain normal operating pressure. C. Observe HIC-1100, "Pressurizer Spray" output and PCV-1100E/1100F, "Pressurizer Spray Valve" position indication to ensure: 1. Main Spray flow has stopped. AND 2. Proportional Bank heaters are at approximately 50% output.	REVISION NO.	:		FAGE.
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NOP-2-0030123 ST. LUCIE UNIT 2 APPENDIX A PRESSURIZER RECIRCULATION GUIDELINES (Page 2 of 2) NOTE Normally, the required number of Backup Bank heaters in service is dependent upon: 1. The magnitude of thermal losses from the system, including leakage to the Quench Tank. 2. The number of heater elements out of service. The normal configuration is to have enough Backup Bank heaters in service to keep the Proportional Bank heaters at approximately 50% output. 2. To take the Pressurizer off recirculation: A. Remove the additional Backup Bank heaters from service one at a time by returning the control switch to AUTO. B. ADJUST the AUTO setpoint on PIC-1100X or PIC-1100Y, the selected "Pressurizer Pressure" controller, to maintain normal operating pressure. C. Observe HIC-1100, "Pressurizer Spray" output and PCV-1100E/1100F, "Pressurizer Spray Valve" position indication to ensure: 1. Main Spray flow has stopped. AND 2. Proportional Bank heaters are at approximately 50% output.	PROCEDURE	NO.:	STEADT STATE AND SCHEDOLED LOAD ON ANGLO	
APPENDIX A PRESSURIZER RECIRCULATION GUIDELINES (Page 2 of 2) (Page 2 of 2) Normally, the required number of Backup Bank heaters in service is dependent upon: 1. The magnitude of thermal losses from the system, including leakage to the Quench Tank. 2. The number of heater elements out of service. The normal configuration is to have enough Backup Bank heaters in service to keep the Proportional Bank heaters at approximately 50% output. 2. To take the Pressurizer off recirculation: A. Remove the additional Backup Bank heaters from service one at a time by returning the control switch to AUTO. B. ADJUST the AUTO setpoint on PIC-1100X or PIC-1100Y, the selected "Pressurizer Pressure" controller, to maintain normal operating pressure. C. Observe HIC-1100, "Pressurizer Spray" output and PCV-1100E/1100F, "Pressurizer Spray Valve" position indication to ensure: 1. Main Spray flow has stopped. AND 2. Proportional Bank heaters are at approximately 50% output.	NOP-2-00	30123	ST. LUCIE UNIT 2	
PRESSURIZER RECIRCULATION GUIDELINES (Page 2 of 2) NOTTE Normally, the required number of Backup Bank heaters in service is dependent upon: 1. The magnitude of thermal losses from the system, including leakage to the Quench Tank. 2. The number of heater elements out of service. The normal configuration is to have enough Backup Bank heaters in service to keep the Proportional Bank heaters at approximately 50% output. 2. To take the Pressurizer off recirculation: A. Remove the additional Backup Bank heaters from service one at a time by returning the control switch to AUTO. B. ADJUST the AUTO setpoint on PIC-1100X or PIC-1100Y, the selected "Pressurizer Pressure" controller, to maintain normal operating pressure. C. Observe HIC-1100, "Pressurizer Spray" output and PCV-1100E/1100F, "Pressurizer Spray Valve" position indication to ensure: 1. Main Spray flow has stopped. AND 2. Proportional Bank heaters are at approximately 50% output.				
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 A. Remove the additional Backup Bank heaters from service one at a time by returning the control switch to AUTO. B. ADJUST the AUTO setpoint on PIC-1100X or PIC-1100Y, the selected "Pressurizer Pressure" controller, to maintain normal operating pressure. C. Observe HIC-1100, "Pressurizer Spray" output and PCV-1100E/1100F, "Pressurizer Spray Valve" position indication to ensure: Main Spray flow has stopped. AND Proportional Bank heaters are at approximately 50% output. 	2. To t	ake th	e Pressurizer off recirculation:	
 B. ADJUST the AUTO setpoint on PIC-1100X or PIC-1100Y, the selected "Pressurizer Pressure" controller, to <u>maintain</u> normal operating pressure. C. Observe HIC-1100, "Pressurizer Spray" output and PCV-1100E/1100F, "Pressurizer Spray Valve" position indication to ensure: Main Spray flow has stopped. AND Proportional Bank heaters are at approximately 50% output. 	А.	Rem by re	ove the additional Backup Bank heaters from service on eturning the control switch to AUTO.	e at a time
 C. Observe HIC-1100, "Pressurizer Spray" output and PCV-1100E/1100F, "Pressurizer Spray Valve" position indication to ensure: 1. Main Spray flow has stopped. AND 2. Proportional Bank heaters are at approximately 50% output. 	B.	ADJI "Pres pres	UST the AUTO setpoint on PIC-1100X or PIC-1100Y, the ssurizer Pressure [®] controller, to <u>maintain</u> normal operatin sure.	e selected g
 Main Spray flow has stopped. AND Proportional Bank heaters are at approximately 50% output. 	C.	Obse "Pre	erve HIC-1100, "Pressurizer Spray" output and PCV-110 ssurizer Spray Valve" position indication to ensure:	0E/1100F,
AND 2. Proportional Bank heaters are at approximately 50% output.		1.	Main Spray flow has stopped.	
2. Proportional Bank heaters are at approximately 50% output.			AND	
		2.	Proportional Bank heaters are at approximately 50% out	put.
			END OF APPENDIX A	

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EVISIC	N NO.:		PROCEDURE TITLE:	PAGE:
	0B		CHARGING AND LETDOWN	18 of 65
PROCE)2	ST. LUCIE UNIT 2	
 6.5	Normal	Plant	Operation	
	Selectir start on 1. [r f	ng the low p During unnin ollow A. B. C.	NOTE following positions will allow the backup Charging Purp pressurizer level (2.5% less than setpoint.) g normal steady state operation, only one Charging Pung. The Charging Pump control switches should be alig s: The running Charging Pump control switch is in STAF The backup Charging Pump control switch is in AUTO The other Charging Pump control switch is in AUTO. The Chrg Pump Sel Running-B/U PP switch selected	mp to mp should be ned as RT. D.
	The fo SIAS. 2.	llowin Durin	Position. <u>NOTE</u> Ig switch positions will allow the third Charging Pump to ag abnormal circumstances, two charging pumps may back clean up, scheduled load changes, etc.). The Cha	o start on be operating arging Pump
		contr	Both running charging pump control switches in STA	.RT.
		В. С.	The Chrg Pump Sel Running-B/U PP switch selecter with Table 1, Charging Pump Combinations vs. Sele Position.	d in accordance ector Switch
	,			

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DEVION			PROCEDURE TITLE:	PAGE:
			CHARGING AND LETDOWN	10 of 65
PROCEDURE NO.:		.:	÷•••••••	190100
2-	NOP-0	2.02	ST. LUCIE UNIT 2	
6.5	Norm	al Plant	Operation (continued)	
	Steps Pump Char	s 6.5.3. <i>F</i> o to star ging Pu	<u>NOTE</u> A and 6.5.3.B below satisfy the logic to allow the 2C Ch t on SIAS and Steps 6.5.3.D and 6.5.3.E align the back mp to start on low pressurizer level.	arging up
	3.	Opera out of	tion of the 2C Charging Pump (with the 2A or 2B Char service) should be as follows:	ging Pump
		А.	ALIGN the 480 LC 2AB to the side with the inoperable Pump in accordance with 2-NOP-52.02, Transfer of 24 Components.	Charging AB Buses and
		В.	PLACE the inoperable Charging Pump Control switch	to STOP.
		C.	PLACE the running Charging Pump control switch in S	START.
		D.	PLACE the backup Charging Pump control switch in A	UTO.
		Ε.	PLACE the Chrg Pump Sel Running-B/U PP switch in with Table 1, Charging Pump Combinations vs. Select Position.	accordance tor Switch
	4.	<u>lf</u> Cha	arging Pump (s) are to be started, <u>Then</u> PERFORM the	following:
		A .	ENSURE that each Charging pump that is desired to ready to operate by local inspection by the SNPO.	be started is
		В.	If the associated Charging Pump Recirc Valve is oper ENSURE that it is OPEN prior to starting the Charging	able, <u>Then</u> g Pump.
		C.	START the Charging pump.	
		D.	ADJUST the bias on HIC-1110, Level, using the upper knob, to control the letdown flow to maintain the actua Level to program RRS Pressurizer Level for current p conditions.	er knurled al Pressurize lant
		E.	If FIA-2212, Charging to Regen Hx, is in service, <u>The</u> proper Charging Header Flow by observing FIA-2212 stabilize for the number of Charging Pumps that are i	n VERIFY raise and running.

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DEVIO			PROCEDI		PAGE:
REVISI				CHARGING AND LETDOWN	20 of 65
		IO.:			20 01 00
2.	NOP-	02.02		ST. LUCIE UNIT 2	
6.5	Norr	mai Plant	Operat	tion (continued)	
	4.	(contir	nued)		
		F.	If FIA-2 VERIF and ex Chargi	2212, Charging to Regen Hx, is NOT in service, Y proper Charging Header Flow by observing L pected changes in Pressurizer level for the num ing pumps that are running.	<u>Then</u> etdown flow nber of
		G.	ENSU	RE the running Charging Pump Recirc Valve is	CLOSED.
		Н.	<u>When</u> value,	the Charging Header flow has stabilized at the Then PERFORM the following:	expected
			1.	STOP one of the charging pumps.	
			2.	ADJUST the bias on HIC-1110, Level, using th knurled knob, to control the letdown flow to ma actual Pressurizer Level to program RRS Press for current plant conditions.	e upper intain the surizer Level
			3.	VERIFY the secured charging pump recirc value	e OPENS.
	Placing a se flow which letdown line room to exc reduced tra l.		4.	VERIFY the charging flow is at the expected va	alue.
			econd o may cau e in the seed 10 nsport t	<u>NOTE</u> Ir third charging pump in service will increase let use the general area dose rates in the vicinity of 19.5' Pipe Penetration room or 19.5' Letdown C 00 mr/hr (Locked High Radiation Area limit) due time of short lived radioactive isotopes.	down the ubicle to
			<u>lf</u> con Then	tinued operation of two or more charging pump PERFORM the following:	s is desired,
			1.	ADJUST the bias on HIC-1110, Level, using the knurled knob, to control the letdown flow to material Pressurizer level to program RRS Prest current plant conditions.	ne upper aintain the surizer level for
			2.	NOTIFY Health Physics of the current chargin alignment.	ıg pump
	J.		PLA with Posi	CE the Chrg Pump Sel Running-B/U PP switch i Table 1, Charging Pump Combinations vs. Sele tion.	n accordance ctor Switch

REVIS	ION NO	D.:	PROCEDURE TITLE:		PAGE:	
<u> </u>		2	BORON CONCENTRATION CONT	ROL	21	l of 33
PHOC ク		- NO.: 2-02 24	ST. LUCIE UNIT 2			
6.6	Alig	ning for MA	NUAL Boration			INITIAL
	1.	ENSURE S at least on	Section 3.0, Prerequisites is completed ce per shift.			<u></u>
	2.	ENSURE S has been r	Section 4.0, Precautions / Limitations, eviewed at least once per shift.			
	3.	DETERMI added.	NE the desired volume of boric acid to be			
	4.	PLACE the MANUAL.	e Makeup Mode Selector switch in	<u> </u>		
	5.	PLACE FF MANUAL ZERO.	RC-2210X, Reactor Water Flow, in and REDUCE the controller output to			
	6.	ENSURE switch is in	FCV-2210X, Reactor Makeup. control n CLOSED.			
	7.	PLACE FI and REDU	RC-2210Y, Boric Acid Flow, in MANUAL JCE the controller output to ZERO.			
	8.	ENSURE	FCV-2210Y, Boric Acid, control switch is D.			
	9.	ENSURE 2A or 2B i	one of the Primary Makeup Water Pumps is running.			
	10.	. START ei	ither BA Pump 2A or 2B.			
	11.	. PLACE F	CV-2210Y control switch in AUTO.		<u></u>	
	12.	. <u>If</u> borating Makeup V	g to the VCT, <u>Then</u> OPEN V2512, Reactor Water Stop VIv.			
	13	. <u>If</u> borating OPEN V2	g to the Charging Pump suction, <u>Then</u> 2525, Boron Load Control Valve.			
	14	. ADJUST	FRC-2210Y to the desired flowrate.		<u></u>	
	15	. MAINTAI 30 psig b as neede	N VCT pressure less than or equal to y opening and closing V2513, VCT Vent, d.			

BEVIS		PROCEDURE TITLE:	PAGE:
	2	BORON CONCENTRATION CONTROL	22 of 23
PROC	EDURE NO.:		22 01 33
	P-NOP-02.24	ST. LUCIE UNIT 2	
6.6	Aligning for MA	ANUAL Boration (continued)	INITIAL
	16. <u>If</u> necessa <u>Then</u> DIVI Managem Divert Val	ry to maintain the desired VCT level, ERT the letdown flow to the Waste ent System by placing V2500, VCT ve, in the WMS position.	
	17. <u>When t</u>he PERFORI	desired VCT level is reached, <u>Then</u> M the following:	
	A. PLAC	E V2500 to the AUTO position.	
	B. ENSU	IRE V2500 indicates CLOSED.	
	18. <u>When the</u> added, <u>Th</u>	desired amount of boric acid has been nen CLOSE FCV-2210Y, Boric Acid.	
	19. <u>If</u> addition expected are NOT through 6	al Borations are desired, <u>or</u> if the changes to Tave, or Boron concentration achieved, <u>Then</u> REPEAT Steps 6.6.1. .6.18.	
		CAUTION	
	¶₁ Stopping any posi	either BAM pump with the Makeup Mode Selector sw tion other than MANUAL could cause the pump breake	itch in er to trip.
	20. STOP the the control	e running Boric Acid Pump and PLACE	
	If Plant con is not requir piping follow	<u>NOTE</u> ditions require multiple or constant borations, the follov ed to be performed until conditions allow flushing of th ving boration.	ving step e CVCS
	21. <u>If</u> flushing PERFOF	g the CVCS piping after a boration, <u>Then</u> RM the following:	
	A. PLA swite	CE FCV-2210X, Reactor Makeup, control	

	SION NO.:	PROCEDURE TITLE:		FAGE.	
	2	BORON CONCENTRATION CONT	ROL	23	of 33
ROC		ST LUCIE UNIT 2			
	2-INOP-02.24				
6.6	Aligning for MANUAL Boration (continued)			<u> </u>	NITIAL
	21. (continued)				
	B. PLAC contro	E FRC-2210X, Makeup Water Flow, ller in MANUAL.			
	C. ADJU flush t Prima	ST FRC-2210X to the desired flowrate to he piping with at least 30 gallons of ry Water.			
	D. <u>When</u> addeo switch	the desired amount of PMW has been I, <u>Then</u> PLACE FCV-2210X control n in CLOSE.			
	E. ENSU REDU	IRE FRC-2210X is in MANUAL <u>and</u> ICE the controller output to ZERO.			
	22. <u>When</u> the V2512, Re Switch is	boration is complete, <u>Then</u> ENSURE eactor Makeup Water Stop VIv, Control in AUTO or CLOSED.			
	23. <u>When</u> the V2525, B	boration is complete, <u>Then</u> ENSURE pron Load Control Valve, is CLOSED.			
	24. ENSURE MANUAL ZERO.	FRC-2210Y, Boric Acid Flow, is in and REDUCE the controller output to			
	25. §1 RECO Log, 1 as inc	ORD on Data Sheet 1, Boration/Dilution the number of gallons of Boric Acid added dicated on FQI-2210Y, Flow Totalizer.			
	26. §1 REC Log, wate Flow	ORD on Data Sheet 1, Boration/Dilution the number of gallons of Primary Makeup r added as indicated on FQI-2210X, Water Totalizer.			
	27. MONITO	R for any abnormal change in Tave.			
	28. MONITO boron co	R for any undesired change in the RCS ncentration by boronometer indication.			

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REVISION NO .:	PROCEDURE TITLE:	PAGE:
2	BORON CONCENTRATION CONTROL	24 of 33
2-NOP-02.24	ST. LUCIE UNIT 2	
6.6 Aligning for MA	ANUAL Boration (continued)	INITIAL
29. <u>If</u> it is desi Control sy Operation for AUTO	red to restore the Boron Concentration rstem to the AUTOMATIC Mode of , <u>Then</u> REFER to Section 6.1, Aligning MATIC Mode of Operation.	
30. Section 6.	6 is complete, ANPS review.	
	END OF SECTION 6.6	

			and the second second second second second second second second second second second second second second second				
REVIS	ION NO.	:	PROCEDURE TITLE:	PAGE:			
14			TURBINE SHUTDOWN -	4 of 47			
PROC	EDURE I	4 01 47					
NOF	-2-00	30125	ST. LUCIE UNIT 2				
3.0 <u>REFERENCES</u> : (continued)							
¶1	1, 3.2 Westinghouse Steam Turbine Technical Manual						
\P_2	3.3	Cond	lition Report 96-670				
¶₃	3.4	PSL- Hydro	ENG-SEMS-97-017, Manual Operation of the TCV for the ogen Coolers (TCV-13-15).	e			
§1	3.5	St. L	ucie Unit 2 Technical Specifications				
	3.6	2-0N	IP-22.01, Rapid Down Power.				
	3.7	CR 9	98-0658				
4.0	PRE	REQL	JISITES:				
	4.1	For pre-planned evolutions a load reduction request should be submitted by Work Control Department personnel and routed to the Division Load Dispatcher as early as possible to allow sufficient time fo replacement power to be arranged. Responsible Department Heads should also be given prior notification to make appropriate arrangements in support of the load reduction.					
	4.2	For e notifi him,	emergency load reductions the Division Load Dispatcher ied as quickly as possible and the following information r if available:	should be elayed to			
		1.	The rate at which the load reduction is expected to occur	r.			
		2.	The power level at which the load reduction is expected stopped or that the Unit will be removed from service.	to be			
		3.	The reason for the load reduction.				
	4.3	<u>lf</u> the re fe	e NPS/ANPS determines that a rapid down power is requ r to 2-ONP-22.01, Rapid Down Power.	uired, <u>Then</u>			
5.0	<u>PR</u>	ECAU	TIONS/LIMITATIONS:				
¶₁	5.1	Max thar <u>The</u>	timum permissible backpressure for on-line operation at I a 30% power is 3.5 inches of Hg. absolute. <u>If</u> this limit is <u>n</u> immediately TRIP the unit.	oads less exceeded,			

DELCO				PAGE:
REVIS	ION NO.: 1 /		TUBBINE SHUTDOWN -	
PROCI		NO ·	FULL LOAD TO ZERO LOAD	5 of 47
NOP	<u>2-00</u>	30125	ST. LUCIE UNIT 2	
5.0	PRE	CAUL	IONS/EIMITATIONS. (continued)	
¶1	5.2	Maxir great excee	num permissible backpressure for on-line operation a er than 30% power is 5.5 inches of Hg. absolute. <u>If</u> eded, <u>Then</u> immediately TRIP the unit.	at loads this limit is
¶ı	5.3	Maxir 2.5 ir TRIP	mum permissible pressure differential between the conches of Hg. absolute. <u>If</u> this limit is exceeded, <u>Then</u> the unit.	ondensers is immediately
	5.4	For s follov	teady state operation at loads greater than 30% pow ving operational guidelines are recommended:	ver, the
		1. \ k s t	With four waterboxes in operation: Maintain condens backpressure less than the low vacuum alarm setpoin should NOT exceed 4.5 inches of Hg. absolute by the he two condensers. Unit load may be adjusted to ac	ser nt, but it e average of ccomplish this.
		2. \ 	With less than four waterboxes in operation: Backpro NOT exceed 4.5 inches of Hg. absolute by the highe Unit load may be adjusted to accomplish this.	essure should st indication.
¶ı	5.5	Turb	ine bearing related temperatures should be adhered	to as follows:
		Maxi	mum bearing metal temperature	225°F
		Maxi	imum discharge temperature	180°F
		Norr	nal operating temperature	110°F to 120°F
		Mini	mum for turbine roll or turning gear operation	70°F
		Mini	mum for any motor operated pump operation	50°F
¶₁	5.6	To a char and	avoid unnecessary stress due to expansion of parts on mber and misalignment of the low pressure turbine in rotor, exhaust hood temperatures should be adhered	of the exhaust nner cylinder d to as follows:
		High	n exhaust hood temperature Turbine trip	250°F
		High	n exhaust hood temperature alarm	175°F
		Exh	aust hood sprays automatic actuation	160°F
		Max pres	timum exhaust hood differential between the low	50°F

DEVIC			PROCEDURE TITLE:		PAGE:
REVIS				WN -	
	14		FULL LOAD TO ZER	O LOAD	6 of 47
PROC	EDURE N	10.:			
NOF	2-003	30125	ST. LUCIE UNIT	2	i
5.0	PRE	CAUT	IONS/LIMITATIONS: (continued)		
¶1	5.7	A Mo place chang provid excee	nisture Separator Reheater (MSR) n ed in service while the unit is in ope ge of steam temperature to a low p ded a maximum rate of change of eded.	nay be removed from ration. A 50°F instant ressure turbine is allo 100°F per hour is NO T	service or aneous wed
¶₁	5.8	Oper occur are a	ation at low frequency is to be avoi rrence of blade resonance. Lifetime as follows:	ded due the probable e total accumulative ti	me limits
		59.5	to 60.5 HZ	Continuous	s operation
		58.5	to 59.5 HZ		60 minutes
		56.0	to 58.5 HZ		10 minutes
¶1	5.9	The distu majo cont limits	high initial response exciter is design arbances too rapid for operator inter or equipment damage. <u>If</u> any voltag rolled, <u>Then</u> ensure the following pa s:	ned to respond to systemation prior to the or pe excursion was limite arameters are within a	stem iset of ed and llowable
		Gen	erator amperes	Less than 26 kiloamps	or equal to per phase
		Gen	erator terminal voltage	21 K	V to 23 KV
		Exci	iter field current	Less than or equal to	o 310 amps
		2A3	and 2B3 4.16 KV bus voltage	3.95 KV	to 4.35 KV
	5.10	Maii equ Sys 500 rem	n generator reactive load should be al to 50 MVARs in the lag (out). Th tem Technical Services to account /230 KV auto transformer. This lim loving the unit from service.	maintained greater the nis limit is imposed by for a 3-phase fault at it is not applicable wh	an or Power Midway's ile
6.0) <u>RE</u>	CORE	DS REQUIRED:		
	6.1	This plar	s procedure, with each step disposi nt files in accordance with QI-17-PS	tioned, shall be mainta SL-1, Quality Assuranc	ained in the e Records.
	6.2	Nor	rmal log entries.		

				PAGE:
REVISI	ION NO.	:		
	14			7 of 47
PROCE	EDURE	NO.:		
NOP	-2-00	30125	ST. LUCIE UNIT 2	
7.0 INS		RUC	TIONS:	<u>INITIAL</u>
	_			
	7.1	Prepa NOP State	are the unit for the load reduction in accordance with -2-0030123, Reactor Operating Guidelines During Steady and Scheduled Load Changes.	
	7.2	Prepa perfo	are the CEA Control Panel for the load reduction by rming the following:	
		1. F	PLACE the Mode Select switch in MS.	<u></u>
			AND	
		2. \	Verify the Manual Sequential Reg light is LIT.	
	7.3	<u>If</u> Gro opera elect in tha beer	oup 5 CEAs are fully withdrawn, <u>Then</u> verify CEA ability by INSERTING Group 5 just until the upper crical limit (UEL) lights clear for all the CEAs at group or until all the CEAs in that group have in inserted approximately one inch.	
	7.4	<u>If</u> CE redu	EA motion is unavailable at any time during the load ction, Then perform the following:	
		1.	STOP the load reduction and refer to ONOP 2-0110030, CEA Off-Normal Operation and Realignment.	
			OR	
		2.	If the load reduction can NOT be stopped, <u>Then</u> contact Reactor Engineering for recommendation on ASI control.	
BEVIS	ION NO :	PROCEDURE TITLE:	PAGE:	
-------	------------------------------------	---	---------------------	
PROCI	14 EDURE NO.:	TURBINE SHUTDOWN - FULL LOAD TO ZERO LOAD	8 of 47	
NOP	-2-003012	5 ST. LUCIE UNIT 2		
7.0	INSTRUC	TIONS: (continued)		
	7.5 <u>If</u> the Syst on ti	e DEH is NOT in Turbine Manual, <u>Then</u> program the DEH em for the load reduction by performing the following ne Turbine DEH Cont Panel:		
	1.	DEPRESS the Ref pushbutton.		
	In the ev number pushbut	<u>NOTE</u> vent an error is made in depressing a numerical pushbutto in the Demand display can be removed by depressing the ton.	on, the e Cancel	
	2.	Enter the desired load by DEPRESSING the numerical pushbuttons on the keyboard. Verify the desired number appears in the Demand display.		
	3.	DEPRESS the Enter pushbutton.		
	4.	Verify the Hold pushbutton illuminates.		
	5.	DEPRESS the Load Rate MW/Min pushbutton.		
	6.	Enter the desired load rate by DEPRESSING the numerical pushbuttons on the keyboard. Verify the desired number appears in the Demand display.		
	7.	DEPRESS the Enter pushbutton. Verify the desired load rate appears in both the Reference and Demand displays.		
	8.	DEPRESS the Ref pushbutton.		

REVISION NC	、 I		PAGE.
).: 		
14			9 of 47
ROCEDURE	E NO.:	FULL LOAD TO ZENO LOAD	
NOP-2-00	030125	ST. LUCIE UNIT 2	
7.0 INS	TRUCT	IONS: (continued)	INITIAL
7.6	<u>lf</u> a ra 2-ON	ipid load reduction is necessary, <u>Then</u> GO TO P-22.01, Rapid Down Power.	
7.7	<u>lf</u> a ra follow	upid load reduction is NOT required, <u>Then</u> perforing:	orm the
	1. E a (legin borating the RCS to reduce RCS tempera .ccordance with 2-NOP-02.24, Boron Concentra Control.	ation
			
<u>lf</u> Ac tra	the pov ction or ansient.	/er reduction is being performed in Turbine Mar the turbine valves should be avoided to preclu	nual, <u>Then</u> Fast ide an uncontrolled
		Moon a docrease in BCS temperature is noted.	Then
	2. <u>1</u>	begin the load reduction by performing the follow	wing:
		DEPRES the Converbutton on the Turbir	
		Cont Panel.	ne DEH
		Cont Panel. OR	ne DEH
		 A. DEPRESS the Go pushbutton on the raisin Cont Panel. OR 3. <u>If in Turbine Manual, Then DEPRESS and RELEASE the GV Lower pushbutton on the DEH Cont Panel as necessary to control th reduction rate.</u> 	ne DEH e Turbine ne load
	3.	 A. DEPRESS the Go pushbutton on the Fulsh Cont Panel. OR <u>If</u> in Turbine Manual, <u>Then</u> DEPRESS and RELEASE the GV Lower pushbutton on the DEH Cont Panel as necessary to control th reduction rate. Control ASI with CEAs in accordance with 0-NC Axial Shape Index Control, or as recommended Reactor Engineering. 	e Turbine ne load OP-100.02, d by
7.8	3. 8 As ti posi turbi	 A. DEPRESS the Go pushbutton on the relistic Cont Panel. OR <u>If</u> in Turbine Manual, <u>Then</u> DEPRESS and RELEASE the GV Lower pushbutton on the DEH Cont Panel as necessary to control th reduction rate. Control ASI with CEAs in accordance with 0-NC Axial Shape Index Control, or as recommended Reactor Engineering. ne load reduction progresses verify the turbine vertices on the Turbine DEH Cont Panel Action Panel indicate the transmission on the Turbine DEH Cont Panel indicate the table of the turbine vertices are closing. 	e Turbine he load OP-100.02, d by valve that the

BEV/IS			PROCEDURE TITLE:	PAGE:
	1 <i>1</i>		TURBINE SHUTDOWN -	
PROC		10.	FULL LOAD TO ZERO LOAD	10 of 47
NOF	P-2-00	30125	ST. LUCIE UNIT 2	
7.0	INST	RUCT	<u>FIONS</u> : (continued)	INITIAL
¶₃	7.10	ADJU maint Hydro	JST TCV-13-15, H2 Cooler Outlet, as necessary to tain Hydrogen Cold Gas Temperature between the ogen Dew Point of 45°F (7.2°C) and 114°F (46.1°C).	
	7.11	Maint reduc Turbi	tain T-avg and T-ref as close as possible during the load ction by adjusting the reactivity addition rate and/or the ne load rate.	
	7.12	Moni level:	tor heater drain pump amperage and 4A and 4B heater s as the load reduction proceeds.	
	7.13	<u>If</u> hea low le cons	ater drain pump amperage is abnormal or 4A or 4B heate evel alarms annunciate and remain in alarm, <u>Then</u> ider stopping heater drain pumps.	er
	Ind foll 1. 2. 3.	icatior ows: Abno redu Abno Pum	ns that a TCW Pump is operating at less than desired no ormally high discharge and/or suction pressure as compa ndant pump. ormally low amps as compared to its redundant pump. op casing hot to the touch.	red to its
	7.14	Mon redu is op Pum	itor Turbine Cooling Water Pump parameters as the load ction proceeds. <u>If</u> there is indication that a TCW Pump perating at less than desired flow, <u>Then</u> STOP one TCW up as follows:	
		1.	OPEN SB13139, "TCW Pumps Disch Cross-Tie Isol."	NPO
		2.	STOP the 2A TCW Pump.	<u></u>
			OR	
		3.	STOP the 2B TCW Pump.	
		•		

				PAGE:
REVISION NO .:		PROCEDURE TITLE:		
14				11 of 47
PROCEDURE NO).: 	FULL LOAD TO		
NOP-2-0030)125	ST. LUCIE	UNIT 2	
7.0 INSTR	UC.	TIONS: (continued)		INITIAL
		·	(at the support of the supplication of the support	
7.15 C	Cont	inue with the remaining steps	of this procedure until the	
C	lesir	ed power level or plant condi-	ION IS reached of this	
p	oroce	edure is complete.		
	_		<u>ION</u> ould be maintained greater 1	than
Main	Fe DO	ed Pump suction pressure she	or both Main Feed Pumps of	on low
400	PSI Ion			
Sucu		Jessue.		
740		n total foodwater flow is betw	veen 20.000 and 15.000 GP	ΡM,
/.16	vvne	dicated on FL-09-14 "24 Fee	edwater Pump Flow," and	
ć	as II El_0	a-1B "2B Feedwater Pump F	low," Then perform the	
	follo	wina:	·	
	1.	PLACE the control switch for	the Main Feed Pump to be	
		stopped in RECIRC.		
	_	Main E	ed Pump Recirculation Val	ve
	2.	verity the associated wall Fe	s follows:	
		is automatically positioned as	, , , , , , , , , , , , , , , , , , , ,	
		COMPONENT	POSITION	
		FCV-09-1A2, "Pump 2A	ODEN	
		Disch Recirc Valve"	UPEN	
		FCV-09-1B2. "Pump 2B		
		Disch Recirc Valve"	OPEN	
			a statela	
	3.	Verify that Main Feed Pump	suction pressure is stable	
		at greater than or equal to 4	00 PSIG as indicated off	ı
		PI-12-19, "Feedwater Pumps	s meader Pressure Suction.	
		Marile that Place Concretor	s are being maintained	
	4.	verify that Steam Generating	band of 55% to 75% narrow	,
		range level.		
1				

REVISION NO .:	PROCEDURE TITLE:	PAGE:
14	TURBINE SHUTDOWN -	10 of 47
PROCEDURE NO .:	- FULL LOAD TO ZERO LOAD	12 01 47
NICD-2-003012	5 ST. LUCIE UNIT 2	
7.0 INSTRUC	CTIONS: (continued)	INITIAL
7.16 (cor	ntinued)	
5.	If Main Feed Pump suction pressure can NOT be	
	maintained greater than or equal to 400 PSIG or	
	Steam Generator levels can NOT be maintained within	
	the normal operating band of 55% to 75% narrow range	
	Each Pump to be stopped in AUTO RECIRC.	
	CAUTION	
When t	otal feedwater flow is less than 10,000 GPM, only one Ma	ain Feed
Pump	should be operating.	
7.17 <u>Wh</u>	<u>en</u> power is approximately 45%, <u>Then</u> perform the followir	ıg:
4	STOP the Main Feed Pump that has its control switch	
1.	in RECIRC.	
2.	Verify the associated Main Feed Pump components are	
	automatically positioned as follows:	
	COMPONENTPOSITION	
	MV-09-1, "Pump 2A	
	Disch Valve"CLOSED	
	FOX 00 142 "Pump 24	
	FUV-09-1A2, Fump 2A Disch Becirc Valve"CLOSED	
	OR	
	MV-09-2, "Pump 2B Direct Value"CLOSED	
	DISCN VAIVE CLOSED	
	FCV-09-1B2, "Pump 2B	
	Disch Recirc Valve"CLOSED	
	-	

REVISION NO .:	PROCEDURE TITLE:		PAGE:
4		IE CONTROL SYSTEM	
			7 of 20
	et.		
2-0NP-22.03	51.		l
6.0 OPERATOR	ACTIONS		
6.1 Transfer – A	utomatic To Manual		
INS	TRUCTIONS	CONTINGENCY	ACTIONS
 Ψ RECO Data Cond 	DRD initial conditions or Sheet 1, Initial and Fina itions.	ר ו	
 The GV component change i Changin 	Raise and GV Lower pu ent. The longer the push n load will be made. g Turbine load will chan	NOTE ushbuttons operate on an exponent obutton is depressed, the faster t uge Reactor power.	ential he
2 If load ch	pandes are necessary		J
<u>Then</u> PE	RFORM the following:		
A. CHA follo	NGE load using the wing pushbuttons:		
•	GV Raise		
•	GV Lower		
B. PEF acco follo	FORM load changes in ordance with ONE of the wing:)	
•	NOP-2-0030124, Turbir Startup Zero Load to Fu Load.	ne Ill	
•	NOP-2-0030125, Turbir Shutdown Full Load to 2 Load.	ne Zero	
3. <u>When</u> re automa Append Operation	eady to return to tic operation, <u>Then</u> GC lix A, Return To Auton on.) TO natic	
	END OF	SECTION 6.1	

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REVISIO	ON NO	.:	PROCEDURE TITLE:		PAGE:
	-	1	DEH TURBINE CO	ONTROL SYSTEM	8 of 20
PROCEDURE NO.:		NO.:			
2-	ONP	-22.03	ST. LUCI		
6.2	Los	s Of DEH	Computer		
		INS	RUCTIONS	CONTINGENCY	ACTIONS
	ו. י	Y RECON Data S	RD initial conditions on heet 1, Initial Conditions.		
	•	The GV F compone change ir Changin	NOT Raise and GV Lower pushbunt. In the longer the pushbutton I load will be made.	E uttons operate on an expon on is depressed, the faster Reactor power.	ential the
	2.	<u>lf</u> load ch <u>Then</u> PEI	anges are necessary, RFORM the following:		
		A. CHA	NGE load using the ving pushbuttons:		
		• (W Raise		
		• (≩V Lower		
		B. PER acco follow	FORM load changes in rdance with ONE of the ving:		
		• N 5 L	NOP-2-0030124, Turbine Startup Zero Load to Full Load.		
		• N 5 1	NOP-2-0030125, Turbine Shutdown Full Load to Zero Load.		
	3.	NOTIFY	I&C.		
	4.	CHECK	the following indication:		
		 CONT Opera 	OFF light NOT LIT on tor Console A.		
		 CONT Opera 	RESET light LIT on tor Console B.		

				PAGE
EVISION NO	O.:	PROCEDURE TITLE:		
	1	DEH TURBINE CON	INUL STOLEW	9 of 20
	- NO.: P-22 03	ST. LUCIE I	JNIT 2	
2 011				
6.2 Lo	ss Of DEH	Computer (continued)		
	INS	FRUCTIONS	CONTINGENCY	ACTIONS
5.	DEPRES pushbutte	S the CONT RESET on on Operator Console B.		
6.	VERIFY 1 NOT LIT.	the CONT RESET light		
7.	<u>When</u> re automat Appendi Operatic	ady to return to ic operation, <u>Then</u> GO TO x A, Return To Automatic on.		
	Operatio			
1				

END OF SECTION 6.2

						PAGE:
REVISION NO.:					OL EVETEM	1,
PROCEDURE NO.:						10 of 20
2-ONP-22.03		03	· · · ·		IT 2	
2-ONP-22.03						
6.3 l	loss Of	Powe	er Supply To DEH Co	ontrol Cabine	t	
		INS	TRUCTIONS		CONTINGENCY	ACTIONS
1	I. <u>If</u> E cor	ITHEF dition	R of the following s exist:			
	• 4	nnun Supply	ciator D-19, DEH DC / Trouble, is ALARME	; ED		
	• E i	EMER s LIT,	G POWER SUPPLY	light		
	<u>Th</u>	<u>en</u> PE	RFORM the followin	ıg:		
	Α.	NOT	IFY I&C.			
	В.	WAI	T for direction from I8	έC.		
:	2. <u>If</u> ti PE	าe CO RFOF	NT OFF light is LIT, RM the following:	<u>Then</u>		
	Α.	NOT	IFY I&C.			
	В.	WAI	T for direction from 18	&C.		
:	3. <u>If</u> ti MC PE	ne TR)NITC :RFOF	ANS RELAY 24V)R light is LIT, <u>Then</u> RM the following:			
l	A.	CHE	CK the following ind	ication:		
		• (CONT OFF light NO ⁻ Operator Console A.	T LIT on		
		•	CONT RESET light L Operator Console B.	_IT on		
	B.	<u>lf</u> the NOT follo	e CONT RESET light Γ LIT, <u>Then</u> PERFOP wing:	t is }M the		
		1.	NOTIFY I&C.			
		2.	WAIT for direction fro	om		

EVISION NO.:			ONTROL SYSTEM	
ROCEDURE N	0.:	DEH TONDINE OC		11 of 20
2-ONP-	22.03	ST. LUCIE UNIT 2		
63 1 088	Of Powe	er Supply To DEH Control C	abinet (continued)	
	INC		CONTINGENCY	ACTIONS
3.	(continue	ed)	001111021001	
(C. DEPI push Cons	RESS the CONT RESET button on Operator sole B.		
1	D. VER	FY the following:		
	• (CONT RESET light NOT LIT	-	
	ר ● ז	RANS RELAY 24V MONITOR light is NOT LIT.		
4. ¥	Y RECO Data S Condit	RD initial conditions on Sheet 1, Initial and Final ions.		
•	The GV compone change i	<u>NO</u> Raise and GV Lower pushb ent. The longer the pushbut n load will be made.	TE outtons operate on an expon ton is depressed, the faster	ential the
•	Changin	g Turbine load will change I	Reactor power.	
5.	<u>lf</u> load cl <u>Then</u> PE	nanges are necessary, ERFORM the following:		
	A. CHA follo	ANGE load using the wing pushbuttons:		
	•	GV Raise		
	•	GV Lower		

			PAGE:
HEVISION NO.:		NUTROL SVSTEM	
1			12 of 20
	OT 11/		
2-ONP-22.03	51. LUC		
6.3 Loss Of Powe	er Supply To DEH Control	Cabinet	
			AOTIONS
INST	RUCTIONS	CONTINGENCY	ACTION5
5. (continue	id)		
B. PERF	-ORM load changes in		
accor	dance with ONE of the		
follow	/ing:		
• •	IOP-2-0030124 Turbine		
S	Startup Zero Load to Full		
L	.oad.		
ĸ	IOD 0 0000105 Turbing		
• 1	Shutdown Full Load to Zero)	
L	.oad.		
6. NOTIFY	I&C.		
automat Appendi Operatio	ic operation, <u>Inen</u> GO R x A, Return To Automation.	, ,	
	END OF S	ECTION 6.3	

2-0700	NO.:			
2-07000	200	ST LU	CIE UNIT 2	
.0 OPE	RATC	DR ACTIONS: (continued		
7.2	(conti	nued)		
	IN	STRUCTIONS	CONTINGENC ACTIONS	Y
3.	Loss	of Heater Drain Pump(s)		
	A	Attempt one restart of tripped pump or start standby heater drain pump if available.		
	Β.	Perform plant downpower as required to maintain 3 of 4 SG Narrow Range Level Channels on both SGs greater than or equal to 40% and main feedwater pump suction pressure greater than 400 psig.		
<u>lf</u> <u>Tr</u>	main <u>nen</u> m	<u>C/</u> feed regulating valve(s) is p ain feedwater block valve(s	AUTION pinned open and a Reactor tr s) must be closed.	ip occurs,
<u>lf</u> ree au De	manua quirec itomat epartn	al or local control of MFRV I for extended periods of tir tic 15% bypass valve contr nent should be contacted if	<u>NOTE</u> or operation of 100% bypase ne, it may be advantageous ol in conjunction with this. I& this option is used.	s valve is to utilize .C
4.	<u>If</u> S con folle	/G levels are NOT being trolled, <u>Then</u> perform the owing:		

REVIS	ION NO	.:	PROCEDURE TITLE:		PAGE:
	21		MAIN FEE	0.56.00	
PROC	EDURE	NO.:			9 Of 20
2	.0700	030	ST, LUCIE	E UNIT 2	
7.0	OPE	RATO	OR ACTIONS: (continued)		
	7.2	(conti	nued)		
		IN	STRUCTIONS	CONTINGENCY ACTIONS	
	4.	(con	tinued)	4. (continued)	
		C.	Verify main feedwater isolation valves are open		
			HCV-09-1A (HCV-09-2A) HCV-09-1B (HCV-09-2B)		
		D.	Verify main feedwater Reg. block valves are open.	D. <u>If</u> main feedwater R valves are NOT ope	eg. block en, <u>Then</u> :
			MV-09-5 (MV-09-6)	Reg. block valv	e
				2. Open 100% by valve.	pass
		E.	Verify condensate system Recirc. valve FCV-12-1 is	E. <u>If</u> FCV-12-1 is NOT <u>Then</u> :	closed,
			ciosea.	1. Close upstream V12304.	n isolation



ST. LUCIE UNIT 2 OFF-NORMAL OPERATING PROCEDURE

Procedure No. **2-0120035**

Current Rev. No. 22

SAFETY RELATED

Effective Date: 11/30/99

Title:

PRESSURIZER PRESSURE AND LEVEL

Responsible Department:

OPERATIONS

Revision Summary

Revision 22 - Deleted reference to Tech Spec 3.1.2.9 and Table 3.1.1. (Gene Boyd, 11/18/99)

Revision 21 - Added caution statement. (Carlos Diaz, 09/07/99)

AND

Alerted the user to technical specifications that are applicable to Pressurizer pressure and level instrument malfunctions. (Charles Pike, 09/03/99)

Revision 20A - Deleted 2-0210030 and superseded with 2-ONP-02.03. (C. Simpkins, 06/02/99)

Revision 20 - Added direction to notify Health Physics when two or more charging pumps are in service. This will prompt HP to survey areas that contain letdown equipment to obtain accurate dose rates for the plant condition. (Alvin Robertson, 01/14/99)

Revision	FRG Review Date	Approved By	Approval Date	S_2_OPS
0	03/01/83	J. H. Barrow (for) Plant General Manager	03/01/83	DOCT_PROCEDURE DOCN_2-0120035
Revision	FRG Review Date	Approved By	Approval Date	SYS COMP_COMPLETED
22	11/17/99	R. G. West Plant General Manager	11/18/99	ITM22
		N/A Designated Approver	· · · · · · · · · · · · · · · · · · ·	L

	PROCEDURE TITLE	PAGE:
	PRESSUBIZEB PRESSUBE AND LEVEL	
		2 of 14
ROCEDURE NO .:		
2-0120035	ST. LUCIE UNIT 2	
.0 <u>TITLE</u> :		
PRESS	URIZER PRESSURE AND LEVEL	
2.0 <u>PURPO</u>	<u>SE</u> :	
2.1 Th a ina	is procedure provides instructions for operator action in th malfunction of the Pressurizer Pressure or Level Control S advertent operation of pressurizer spray valves.	e event of ystems, or
3.0 <u>REFER</u>	ENCES:	
	NOTE	
One or n	nore of the following symbols may be used in this procedu	re:
		otions
§ Indica Cond revise Mana	ates a Regulatory commitment made by Technical Specific ition of License, Audit, LER, Bulletin, etc., and shall NOT t ed without Facility Review Group review and Plant Genera ager approval.	
¶ Indica pract revis	ates a management directive, vendor recommendation, pla ice or other non-regulatory commitment that should NOT b ed without consultation with the plant staff.	nt e
Ψ Indic	ates a step that requires a sign-off on a data sheet.	
3.1 2	-ONP-02.03, "Charging and Letdown."	
3.2 2 F	-0120036, "Pressurizer Relief/Safety Valve Off-Normal Ope Procedure."	erating
3.3 2 (2-0120031, "Excessive Reactor Coolant System Leakage C Operating Procedure."	off-Normal
3.4 C F	0010134, "Component Cycles and Transients Administrative Procedure."	9
3.5 \$	St. Lucie Unit 2 FUSAR, Section 7.7, "Control Systems," Section 15.0.2.6.2., Section 15.0.2.1.1.	
1		

REVIS	ION NO .:		PROCEDURE TITLE:	PAGE:
22			PRESSURIZER PRESSURE AND LEVEL	0 -1 4 4
PROCEDURE NO.:				3 OT 14
2-0120035 ST. LUCIE UNIT 2				
4.0	REC	ORDS	REQUIRED:	
	4.1	Norm	al log entries.	
	4.2	Appli	cable chart recorders.	
	4.3	If pre actua Trans	ssure transient was caused by inadvertent auxiliary spray Ition, document transient per AP 0010134, "Component C sients."	y valve Cycles and
5.0	<u>ENT</u>	RY C	ONDITIONS:	
	5.1	Cont level	rol Room instrumentation indicates pressurizer pressure a is NOT responding as expected for present conditions.	and/or
6.0	<u>EXI</u>		IDITIONS:	
	6.1	Pres retur	surizer pressure and/or level anomaly has been stabilized ning to expected parameters for present operating condit	d or is ions.
			OR	
	6.2	An a	ppropriate, approved procedure is available for implemer	ntation.

			DACE
REVISION NO .:	PROCEDURE TITLE:		FAGE.
22	PRESSURIZER PRES	SURE AND LEVEL	4 of 14
ROCEDURE NO .:	-		
2-0120035	ST. LUCIE	UNIT 2	
7.0 <u>OPERATO</u>	OR ACTIONS:		
IN	STRUCTIONS	CONTINGENCY ACTIONS	Y
7.1 Imme	diate Operator Actions:		
1. None			
7.2 Subs	equent Operator Actions:		
 Tecl Instr appl malt If SI Heat If SI Heat 	nnical Specifications 3.3.3.5, R rumentation, and 3.3.3.6, Accid licable for Pressurizer Level an functions. AS has actuated, SIAS must b ters can be energized. ORMAL PRESSURIZER SSURE CONDITION	emote Shutdown System lent Monitoring Instrumenta of Pressure Instrumentatio be RESET before Pressuria	ation, are n zer
Append associa	<u>NO</u> ix "A" contains a listing of pres ted with automatic actions.	TE surizer pressures which ar	re
A. 1	Verify pressurizer spray, proportional and back-up heaters are operating properly in automatic. Refer to Appendix "A" for expected automatic responses.	 A. <u>If</u> system is NOT properly in autom perform the follow necessary: 1. <u>If</u> selected prechannel has f shift to the op pressure channel has 	operating atic, <u>Then</u> <i>v</i> ing as essure ailed, <u>Then</u> perable nnel.

			PAGE
REVISION NO	PROCEDURE TITLE:		
22	PRESSURIZER P		5 of 14
PROCEDURE NO.:			
2-0120035	ST. LU	ICIE UNIT 2	
7.0 <u>OPERATO</u>	R ACTIONS: (continued))	
7.2 (contin	ued)		
INS	STRUCTIONS	CONTINGENO ACTIONS	Υ
		1. (continued)	
		A. (continued)	
		2. <u>If</u> selected pr channel has (greater than <u>Then</u> after se operable cha heater contro on RTGB 20	essure failed high 2340 psia), electing the nnel, reset ol switches 3.
		3. <u>If</u> both pressuare failed or pressure com NOT operate <u>Then</u> operate controller in the energize or on the aters as n	ure channels automatic trol does properly, spray manual and deenergize ecessary.
		 <u>If</u> pressure c decrease du open main s <u>Then</u> consid tripping the securing the affected loop 	ontinues to e to a failed pray valve, er manually reactor and RCP in the D.
		DOV 1100E	

					· · · · · · · · · · · · · · · · · · ·	PAGE:	
70 REVISION NO.:		PRESSURIZER PRE	SSUR	RE .	AND LEVEL		
PROCEDURE NO.:					6 of 14	6 of 14	
2-01200	35	ST. LUCIE UNIT 2					
7.0 OPE	RATO	R ACTIONS: (continued)					
		aught					
1.2 (COLUI	lueu)					
	INS	STRUCTIONS				Ϋ́	
1. (contir	nued)	1.	(co	ontinued)		/R2
E	3. Ve SI Va	erify SE-02-03, and E-02-04, "Auxiliary Spray alve(s)" CLOSED.		B.	<u>If</u> auxiliary spray OPEN, <u>Then</u> :	valve(s) is	
					 Attempt to clo key switch. 	ose using	
				1	2. <u>If</u> auxiliary sp will NOT clos stop all charg isolate letdow 2-ONP-02.03 and Letdown	ray valves e, <u>Then</u> ging and vn. Refer to , "Charging ."	
					3. Review AP 0 "Component Transients," applicability stabilized.	010134, Cycles and for when plant is	

					PAGE:
REVISION NO .:					
22		PRESSURIZER PRESSURE AND LEVEL		7 of 14	
PROCEDUR	RE NO.:				
2-012	20035	ST. LUC	IE UNIT 2	2	L
7.0 <u>O</u>	PERAT	OR ACTIONS: (continued)			
	0 /000+	inuad)			
1.1	z (cont				-
	IN	ISTRUCTIONS		CONTINGENCY	7
				ACTIONS	
د	1	tinued)	1 (cc	ntinued)	
1.	(con	unueu)	(00		
F	<u> </u>	N	OTE		
		Normally one POR	V is isolat	ed at power.	
	C.	Verify power operated	C.	If PORV is OPEN a	and an 2300
		relief valves are closed.		nsia Then close P	ORV block
				valve(s) V-1476 an	id/or
				V-1477. Refer to 2	2-0120036,
				"Pressurizer Relief	/Safety
				Valve Off-Normal (operating
				Procedure.	
	П	Ensure that PORV's			
	U.	V-1474 and V-1475 hand			
		switches are in the proper			
		position for existing plant			
		conditions; see below:			
	F		<u></u>	vitch in LTOP:	
		SWILCH IN NURWAL RANGE.	4	() if tSet point 470	nsia)
		1. (Lift Setpoint 2370 psia)	1. Pr	RCS temperature	less than
		than 255°F during heat	n or	255°F during heat	up or less
		greater than 240°F duri	nga	than 240°F during	
		cooldown.		cooldown.	
					لا
	_	No if a proposition opposition	F	Slow the rate of c	hange of
	E.	NOT caused by a large	L.	T-avg or stabilize	until
		rate of change of T-avg.		pressure anomaly	' is
				controlled.	

EVISION NO .:	PROCEDURE TITLE:		PAGE:
22	PRESSURIZER PRE	SSURE AND LEVEL	0 of 14
ROCEDURE NO .:	-		80114
2-0120035	ST. LUCI	E UNIT 2	
.0 OPERAT	OR ACTIONS: (continued)		
72 (cont	inued)		
IN	ISTRUCTIONS	CONTINGENC ACTIONS	Ŷ
1. (cont	inued)		
1. (0011			
⊢. <u> </u> 	Power has occurred with diesel generators supplying power <u>and</u> pressurizer level is greater han 27%, <u>Then</u> perform he following to regain pressurizer heaters:		
	 Manually close the breakers for pressurizer heater buses on 4160V buses 2A3 and 2B3. 		
:	 Manually reset the backup heater breakers B1 and B4 only (200 kw each). 		
2. AB N LEV	IORMAL PRESSURIZER EL CONDITION	2.	
Append with au	No lix "B" contains a listing of pre tomatic actions.	<u>OTE</u> essurizer levels which are a	ssociated
A.	Verify selected RRS channel is operating	A. <u>If</u> the selected R has failed, <u>Then</u>	RS channel shift to the

			PAGE
REVISION NO .:			TAGE:
22			9 of 14
PROCEDURE NO .:			
2-0120035	ST. LUC	IE UNIT 2	
7.0 <u>OPERAT</u>	OR ACTIONS: (continued)		
7.2 (cont	tinued)		
AI	ISTRUCTIONS	CONTINGENCY ACTIONS	•
2. (con	tinued)	2. (continued)	
В.	Ensure backup charging pump starts and letdown flow is decreasing, or the backup charging pump stops and letdown flow is increasing, whichever is applicable. (Appendix "B" contains expected automatic responses.)	B. <u>If</u> automatic actions NOT occurred, <u>The</u> manually control ch and letdown flow as	s have narging s required.
C.	Verify level anomaly is NOT caused by a large rate of change in T-avg.	C. Slow the rate of ch T-avg or stabilize u anomaly is controll	ange of Intil level ed.
D.	Verify "Letdown Isol. Valves", V-2515, V-2516, and V-2522 are open.	D. <u>If</u> letdown has isola secure charging ar 2-ONP-02.03, "Cha Letdown."	ated, <u>Then</u> nd refer to arging and
E.	Verify selected pressurizer level control valve (LCV-2110P/LCV-2110Q) is operating properly.	E. <u>If</u> selected level co is NOT operating p <u>Then</u> take manual level control valve to 2-ONP-02.03, "(and Letdown."	ntrol valve properly, control of and refer Charging
F.	Verify selected letdown pressure control valve (PCV-2201P/PCV-2201Q) is operating properly.	F. <u>If</u> selected pressur valve is NOT oper properly, <u>Then</u> tak control of pressure valve and refer to 2-ONP-02.03, "Ch Letdown."	e control ating e manual e control arging and

22 OCEDURE NO.: 2-0120035 0 <u>OPERA</u> 7.2 (con 1 2. (con With le transfo	PRESSURIZER PR ST. LU(TOR ACTIONS: (continued) attinued) NSTRUCTIONS	ESSURE AND LEVEL CIE UNIT 2 CONTINGENCY ACTIONS 2 (continued)	10 of 14
2-0120035 0 <u>OPERA</u> 7.2 (con 1 2. (con With le transfo	ST. LU(TOR ACTIONS: (continued) atinued) NSTRUCTIONS	CIE UNIT 2 CONTINGENCY ACTIONS	10 of 14
2-0120035 0 <u>OPERA</u> 7.2 (con 1 2. (con With le transfo	ST. LU(TOR ACTIONS: (continued) atinued) NSTRUCTIONS	CIE UNIT 2 CONTINGENCY ACTIONS	, ,
2-0120033 0 <u>OPERA</u> 7.2 (con 1) 2. (con With le transfo	TOR ACTIONS: (continued) Intinued) NSTRUCTIONS	CONTINGENCY ACTIONS	,
7.2 (con] 2. (con With le transfo	ntinued) NSTRUCTIONS Intinued)	CONTINGENCY ACTIONS	7
7.2 (con I 2. (con With le transfo	ntinued) NSTRUCTIONS ntinued)	CONTINGENCY ACTIONS	7
2. (cor With le transfo	NSTRUCTIONS	CONTINGENCY ACTIONS	7
2. (cor With le transfo	ntinued)	2 (continued)	
With le transfo		2. (00/////000/)	
pressu side 48 keyswi supplie	rizer heater transformer feed 30V power supplies deenerging tch selected to the level positions to be reset.	er breaker (2-20403) trips and ze. The backup interlock bypa tion, allows the 480V heater p	the "A" ass ower
G.	Verify pressurizer level indicating controllers (selected and non- selected) are operating properly and power is available to pressurizer heaters.	 G. It pressurizer heats deenergized or lev indicating controlle <u>Then</u> perform the f 1. If either level of channel has fa shift to the oper channel and resheaters as followa. Place the beinterlock by keyswitch (to the LEVI (This regain the proport backup heat controlled to selected channel and resheaters as followa. 	ars are el r(s) failed, ollowing: ontrol iled, <u>Then</u> rable eset ows: ackup pass RTGB-203) EL position. ns power to ional and ater banks by the nannel.) surizer

EVISION NO.:	PROCEDURE TITLE:	SSURE AND LEVEL	PAGE:
ZZ ROCEDURE NO.:			11 of 14
2-0120035	ST. LUC	E UNIT 2	
7.0 <u>OPERAT</u>	OR ACTIONS: (continued)		
7.2 (conti	nued)		
IN	STRUCTIONS	CONTINGENC ACTIONS	Y
2. (conti	nued)	2. (continued)	
		G. (continued)	
		 <u>If</u> actual press had decrease 27% and has restored, <u>The</u> pressurizer he a. Resetting 4 feeder bre 2-20204 a 2-20403, a resetting p heater cor switches. 	surizer level d below been n reset eaters by: 4160KV akers nd and <u>Then</u> pressurizer
H. N I I	 /erify that pressurizer PORV's/Safeties are NOT eaking or actuated as ndicated by: 1. PORV/Safety Valve acoustic flow monitors. 2. Downstream tailpipe temperatures. 3. Quench tank level, temperature, and pressure. 	H. <u>If</u> leakage is indic close PORV bloc V-1476 and/or V- required, and refe 2-0120036, "Pres Relief/Safety Valv Off-Normal Opera Procedure."	ated, <u>Then</u> k valve(s) 1477 as er to ssurizer /e ating

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			the state of the s	PAGE:
REVISION NO .:			ESSURE AND I EVEL	
				12 of 14
PROC	EDURE NO.:			
2-	0120035	ST. LUC	CIE UNIT 2	
7.0	OPERAT(<u>DR ACTIONS</u> : (continued)		
	7.2 (conti	hued)		
	7.2 (COR	nueuj		
	IN	STRUCTIONS	CONTINGENC	Y
			ACTIONS	
	2. (conti	nued)		
	1. N	lanually start a third		
	C	harging pump, if		
	C	onditions require.		
	1 6	Ensure letdown valve		
	J. L	miter bypass switch is in		
	t	he NORMAL position.		
	K I	f prossurizar laval		
	к. <u>і</u>	lecrease cannot be		
	i	mmediately explained,		
	-	Then refer to 2-0120031,		
	1	Excessive Reactor		
		Off-Normal Operating		
	I	Procedures."		
		<u>1</u>		letdown
	Placing	a second or third charging	area dose rates in the vicinity	of the
	letdown	line in the 19.5' Pipe Penel	ration room or 19.5' Letdown	Cubicle
	room to	exceed 1000 mr/hr (Locked	High Radiation Area limit) d	ue to
	reduced	I transport time of short live	d radioactive isotopes.	
	L			
	L	If letdown is in service and		
		or more charging pumps is		
		required, Then notify		
		Health Physics of the		
		current charging pump		
		alignment.		

REVISION NO .:	PROCEDURE TITLE:	PAGE:						
22	PRESSURIZER PRESSURE AND LEVEL							
PROCEDURE NO .:		13 of 14						
2-0120035	2-0120035 ST. LUCIE UNIT 2							
	APPENDIX A							
	C RESPONSES TO PRESSURIZER PRESSURE DEVIA	TIONS						
	(Page For T)							
PRESSURIZER	PRESSURE SETPOINTS							
(2500 PSIA) pre	essurizer safety valves open.							
(2437 PSIA) AT	WAS diverse scram system initiates Rx trip.							
(2370 PSIA) hig	h pressure Rx trip and PORV's open.							
(2340 PSIA) hig	gh press. alarm, backup signal to deenergize all pzr. heat	ers.						
(2325 PSIA) sp	ray valves fully open.							
(2275 PSIA) pro	oportional heaters at minimum output, spray valves fully o	closed.						
(2250 PSIA)-NORMAL PRESSURIZER PRESSURE OPERATING SETPOINT								
(2225 PSIA) proportional heaters at maximum output.								
(2220 PSIA) backup heaters deenergize (increasing pressure).								
(2200 PSIA) backup heaters energize.								
(2100 PSIA) low pressure alarm.								
(1900 PSIA) TM	(1900 PSIA) TM/LP Rx trip minimum pressure.							
(1736 PSIA) SIAS initiation.								

REVISION NO .:	PROCEDURE TITLE:	PAGE:			
22	PRESSURIZER PRESSURE AND LEVEL				
PROCEDURE NO .:	4	14 of 14			
2-0120035	ST. LUCIE UNIT 2				
	(Page 1 of 1)	<u>5115</u>			
PRESSURIZEF	LEVEL SETPOINTS				
(67% indicated	level) high level alarm.				
(+9% inc.) letdo	own flow increases to maximum (128 GPM).				
(+4% inc.) all b stop signal.	ackup heaters energize. Backup charging pump receives	a backup			
0% DEVIATIO	N FROM RRS SETPOINT FOR PRESSURIZER LEVEL				
(-1% dec.) letd	own flow decreases to minimum (29 GPM).				
(-1% inc.) back	up charging pump stops.				
(-3% dec.) bac	kup charging pump starts.				
(-5% dec.) low level alarm. Backup charging pump receives a backup start signal.					
(27% indicated level) all pressurizer heaters deenergize and respective pressurizer heater transformer feeder breaker opens.					

END OF APPENDIX B



ST. LUCIE UNIT 2

OFF-NORMAL OPERATING PROCEDURE

SAFETY RELATED

Procedure No.

2-ONP-99.01

Current Revision No.

8

Effective Date 05/12/99

Title:

LOSS OF TECH SPEC INSTRUMENTATION

Responsible Department: **OPERATIONS**

REVISION SUMMARY:

REVISION 8 – THIS PROCEDURE HAS BEEN COMPLETELY REWRITTEN. Consolidated the information from Wide Range Nuclear Instrument Malfunction (ONOP 2-1210030) and Linear Range Instrument Malfunction (ONOP 2-1220030). Placed in upgraded format. (Steve Willett, 05/06/99)

Revision	FRG Review Date	Approved By J. Scarola	Approval Date 03/10/97	S_ DATE	2_OPS
		Plant General Manager		DOCT	PROCEDURE
Revision	FRG Review Date	Approved By B. G. West	Approval Date 05/06/99	DOCN SYS	2-ONP-99.01
8	03/00/33	Plant General Manager		СОМ	COMPLETED
				ITM	8

REVIS	ION NO.:	PROCEDURE TITLE:	PAGE:
	8	LOSS OF TECH SPEC INSTRUMENTATION	2 of 28
PROC	EDURE NO.:		
2	-ONP-99.01	ST. LUCIE UNIT 2	
		TABLE OF CONTENTS	
	<u>SECTION</u>		PAGE
1.0	PURPOSE		3
2.0	ENTRY CONE	ITIONS	3
3.0	EXIT CONDIT	IONS	6
4.0	OPERATOR A	CTIONS	7
	4.1 Diagnosti		/ 8
	4.2 Nuclear I	nstrumentation Malfunction	
	4.3 ESFAS C 4.4 RPS Spe	cific Instrumentation Malfunction	
5.0	REFERENCE	S	26
6.0	RECORDS RE	EQUIRED	27
	APPENDIX		
APF		ACING TRIP UNITS IN TRIP	28

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8 LOSS OF TECH SPEC INSTRUMENTATION 3 of 26 2-ONP-99.01 ST. LUCIE UNIT 2 3 of 26 1.0 PURPOSE ST. LUCIE UNIT 2 10 1.1 To provide direction, in conjunction with the referenced Technical Specifications for RPS, ESFAS and AFAS safety channel bypass or trip in the event of an instrument failure. 10 PURPOSE 2.0 ENTRY CONDITIONS 2.0 ENTRY CONDITIONS 2.1 Wide Range Nuclear Instrumentation: 1. Alarms • Annunciator L-33, Start-up Rate High Channel Pre Trip • • Annunciator L-25, Start-up Rate High Channel Trip • • Annunciator L-40, NI Channel Inoperative 2. Significant disagreement between channels located on the local drawer meters or on RTGB 204. No easy way to determine voltage indication without I&C Department. "New Style" NI drawers have no direct read meters like the control and start-up NIs. 3. NI drawer Log Trouble light ON.	REVISIO	ON NO .:		PROCEDURE TITLE:			
2-ONP-99.01 ST. LUCIE UNIT 2 O PURPOSE To provide direction, in conjunction with the referenced Technical Specifications for RPS, ESFAS and AFAS safety channel bypass or trip in the event of an instrument failure. ENTRY CONDITIONS Wide Range Nuclear Instrumentation: Alarms Annunciator L-33, Start-up Rate High Channel Pre Trip Annunciator L-25, Start-up Rate High Channel Trip Annunciator L-40, NI Channel Inoperative Significant disagreement between channels located on the local drawer meters or on RTGB 204. No easy way to determine voltage indication without I&C Department. "New Style" NI drawers have no direct read meters like the control and start-up NIs. NI drawer Log Trouble light ON.	8			LOSS OF TECH SPEC INSTRUMENTATION	3 of 28		
 PURPOSE 1 To provide direction, in conjunction with the referenced Technical Specifications for RPS, ESFAS and AFAS safety channel bypass or trip in the event of an instrument failure. ENTRY CONDITIONS Wide Range Nuclear Instrumentation: Alarms Annunciator L-33, Start-up Rate High Channel Pre Trip Annunciator L-25, Start-up Rate High Channel Trip Annunciator L-40, NI Channel Inoperative Significant disagreement between channels located on the local drawer meters or on RTGB 204. No easy way to determine voltage indication without I&C Department. "New Style" NI drawers have no direct read meters like the control and start-up NIs. NI drawer Log Trouble light ON. 	-2-	ONP-9	99.01	ST. LUCIE UNIT 2			
 To provide direction, in conjunction with the referenced Technical Specifications for RPS, ESFAS and AFAS safety channel bypass or trip in the event of an instrument failure. ENTRY CONDITIONS Wide Range Nuclear Instrumentation: Alarms 	.0	PURPOSE					
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 Annunciator L-40, NI Channel Inoperative Significant disagreement between channels located on the local drawer meters or on RTGB 204. No easy way to determine voltage indication without I&C Department. "New Style" NI drawers have no direct read meters like the control and start-up NIs. NI drawer Log Trouble light ON. 			٠	Annunciator L-25, Start-up Rate High Channel Trip			
 Significant disagreement between channels located on the local drawer meters or on RTGB 204. No easy way to determine voltage indication without I&C Department. "New Style" NI drawers have no direct read meters like the control and start-up NIs. NI drawer Log Trouble light ON. 			•	Annunciator L-40, NI Channel Inoperative			
 No easy way to determine voltage indication without I&C Department. "New Style" NI drawers have no direct read meters like the control and start-up NIs. 3. NI drawer Log Trouble light ON. 		2.	Signifi meters	cant disagreement between channels located on the lo s or on RTGB 204.	cal drawer		
3. NI drawer Log Trouble light ON.	No easy way to dete "New Style" NI draw start-up NIs.			sy way to determine voltage indication without I&C Dep Style" NI drawers have no direct read meters like the c up NIs.	partment. ontrol and		
		3.	NI dra	wer Log Trouble light ON.			
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REVISI	ON NO.:		PROCEDURE TITLE:	PAGE:			
8			LOSS OF TECH SPEC INSTRUMENTATION	4 of 28			
PROCEDURE NO.:).:					
2-0NP-99.01			ST. LOCIE ONIT 2				
2.2	2 Linear nange Nuclear monumentation.						
	1.	Alarm	6				
		•	Annunciator K-14, RRS Selected Inoperative				
		•	Annunciator L-9, Reactor Power High Channel Trip				
		•	Annunciator L-17, Reactor Power High Channel Pre Trip				
		•	Annunciator L-22, Local Power Density Channel Trip				
		•	Annunciator L-30, Local Power Density Channel Pre T	rip			
		٠	Annunciator L-34, Nuclear / ΔT Power Channel Deviat	ion			
		•	Annunciator L-36, TM / LP Channel Trip				
	•		Annunciator L-40, NI Channel Inoperative				
		•	Annunciator L-43, Reactor Power Ratio Deviation				
		•	Annunciator L-44, TM/LP Channel Pre Trip				
	2.	Signif meter	nificant disagreement between channels indicated on the local dravers or on RTGB-204.				
	3.	LR NI has h	NI Drawer loss of power to the drawer. No easy way to tell if detectors high voltage (or low voltage) without I&C.				
	4.	LR NI	drawer LINEAR trouble light lit.				
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REVISI	:.ON NC			PAGE:	
8			LOSS OF TECH SPEC INSTRUMENTATION	5 of 28	
2- 2-	ONP-9	 9.01	ST. LUCIE UNIT 2		
 2.3	ESFA	AS channels			
	1.	Autom	atic Test Insertion (ATI) fault		
	2.	Failed indication occurring on ANY of the following vital instrumentation channels:			
		•	Reactor Coolant Flow		
		•	Pressurizer Level		
		•	Pressurizer Pressure		
		•	RCS T _{cold} Instrument		
		•	RCS T _{hot} Instrument		
		•	Containment Pressure		
		•	Containment Radiation		
		•	Component Cooling Water to RCP Seals		
		•	Turbine EH Fluid Pressure		
		•	Steam Generator Level		
		٠	Steam Generator Pressure		
		•	Feedwater Header Pressure		
		•	4160 / 480V AC Vital Bus Undervoltage		
		•	4160 / 480V AC Vital Bus Degraded Voltage		
	3.	Any fa summ	ailed or failing indication causing an alarm whose annun nary actions direct the user to this procedure.	nciator	

REVISION NO .:	PROCEDURE TITLE:	PAGE:
8	LOSS OF TECH SPEC INSTRUMENTATION	6 of 28
PROCEDURE NO .:		
2-ONP-99.01	ST. LUCIE UNIT 2	

3.0 EXIT CONDITIONS

- **3.1** ALL of the following conditions occur:
 - Applicable Tech Spec LCO action requirements complied with.
 - Affected / malfunctioning channel properly bypassed or tripped as applicable to instructions.
 - No unexplained alarms or abnormal conditions exist outside of initiating malfunction.

REVISION NO .:	PROCEDURE TITLE:	PAGE:
8	LOSS OF TECH SPEC INSTRUMENTATION	7 of 28
PROCEDURE NO .:		
2-ONP-99.01	ST. LUCIE UNIT 2	
4.0 OPERATOR A	ACTIONS	
4.1 Diagnostic		

INSTRUCTIONS

 If a process measurement channel malfunction / failure occurs, <u>Then</u> COMPARE all redundant meter indication channels to determine the validity of the alarm/indication.

CONTINGENCY ACTIONS

- **1.1** If redundant instrumentation shows actuation logic is COMPLETE and actuation has NOT occurred, <u>Then</u> PERFORM the following:
 - **A.** MANUALLY TRIP the Reactor.
 - **B.** MANUALLY TRIP the Turbine.
 - C. GO TO 2-EOP-01, Standard Post Trip Actions.

END OF SECTION 4.1

NO.: -99.01 lear Ins IN reactor dicate g eater th <u>If</u> a wic failed, <u>Then</u> F A. PL rat by B. NC so <u>If</u> a Lir	LOSS OF TEC LOSS OF TEC S trumentation Malfunct STRUCTIONS power is between 10 ⁻⁴ reater than 1.3 DPM s an 2.49 DPM a reacto le range NI channel have PERFORM the following ACE the failed channel e trip unit bistable in the pass or tripped condition DTIFY I&C Department on as practical.	H SPEC INST T. LUCIE UNI ion <u>NOTE</u> % and 15% pr startup rate, a or trip will occu as ng: el high he ion.	RUMENTATION TONTINGE ower and 2 or CWP is initiate r.	ENCY AC	8 of 28
vo.: -99.01 lear Ins IN reactor dicate g eater th <u>If</u> a wice failed, <u>Then</u> F A. PL rat by B. NC so <u>If</u> a Lir	trumentation Malfunct STRUCTIONS power is between 10 ⁻⁴ reater than 1.3 DPM s an 2.49 DPM a reacto le range NI channel ha PERFORM the followin ACE the failed channe e trip unit bistable in th pass or tripped condition DTIFY I&C Department on as practical.	T. LUCIE UNI ion <u>NOTE</u> % and 15% pr startup rate, a or trip will occu as ng: el high he ion.	OWERTAIN CONTINGE ower and 2 or CWP is initiate r.	ENCY AC	8 of 28
-99.01 lear Ins IN reactor dicate g eater th <u>If</u> a wic failed, <u>Then</u> F A. PL rat by B. NC so <u>If</u> a Lir	trumentation Malfunct STRUCTIONS power is between 10 ⁻⁴ reater than 1.3 DPM s an 2.49 DPM a reacto le range NI channel ha PERFORM the followin ACE the failed channe e trip unit bistable in th pass or tripped conditi DTIFY I&C Department on as practical.	MOTE MOTE % and 15% pr startup rate, a for trip will occu as ng: el high he ion.	OWER and 2 or CWP is initiate r.	more char	TIONS
lear Ins lear Ins IN reactor dicate g eater th <u>If a wic</u> failed, <u>Then F</u> A. PL rat by B. NC so <u>If a Lir</u>	trumentation Malfunct STRUCTIONS power is between 10 ⁻⁴ reater than 1.3 DPM s an 2.49 DPM a reacto le range NI channel ha PERFORM the followin ACE the failed channe e trip unit bistable in th pass or tripped conditi DTIFY I&C Departmen on as practical.	ion <u>NOTE</u> % and 15% protection as a set of the set	CONTINGE ower and 2 or CWP is initiate r.	more char	nnels n
reactor dicate g eater th <u>If</u> a wice failed, <u>Then</u> F A. PL rat by B. NC so <u>If</u> a Lir	power is between 10 ⁻⁴ reater than 1.3 DPM s an 2.49 DPM a reacto le range NI channel ha PERFORM the followin ACE the failed channe e trip unit bistable in th pass or tripped condition DTIFY I&C Department on as practical.	NOTE % and 15% pr startup rate, a or trip will occu as ng: el high he ion.	CONTINGE ower and 2 or CWP is initiate r.	more char	nnels en
reactor dicate g eater th <u>If</u> a wice failed, <u>Then</u> F A. PL rat by B. NC so <u>If</u> a Lir	STRUCTIONS power is between 10 ⁻⁴ reater than 1.3 DPM s an 2.49 DPM a reacto le range NI channel ha PERFORM the followin ACE the failed channe e trip unit bistable in th pass or tripped conditi DTIFY I&C Departmen on as practical.	NOTE % and 15% pr startup rate, a or trip will occu as ng: el high ne ion. t as	CONTINGE ower and 2 or CWP is initiate r.	more char	nnels n
reactor dicate g eater th <u>If</u> a wic failed, <u>Then</u> F A. PL rat by B. NC so <u>If</u> a Lir	power is between 10 ⁻⁴ reater than 1.3 DPM s an 2.49 DPM a reacto le range NI channel ha PERFORM the followin ACE the failed channe e trip unit bistable in th pass or tripped conditi DTIFY I&C Departmen on as practical.	NOTE % and 15% pr startup rate, a or trip will occu as ng: el high he ion. t as	ower and 2 or CWP is initiate r.	more char	nnels en
<u>If</u> a wic failed, <u>Then</u> F A. PL rat by B. NC so <u>If</u> a Lir	le range NI channel ha PERFORM the followin ACE the failed channe e trip unit bistable in th pass or tripped conditi DTIFY I&C Departmen on as practical.	as ng: el high he ion. it as			
 A. PL rat by B. NC so If a Lir 	ACE the failed channe e trip unit bistable in th pass or tripped conditi DTIFY I&C Departmen on as practical.	el high he ion. it as			
B. NO so	OTIFY I&C Departmen on as practical.	t as			
<u>If</u> a Lir					
a Cont has be <u>Then</u> I	ear Range NI malfund rol Channel (RRS 9 o een determined, PERFORM the followir	ction of r 10) ng:			
A. El se	NSURE operable RRS lected.	is			
B. Pl to in of Ca	ACE the failed chann ggle switch (channel 9 the OUT position (At 1 RPS cabinet D, Powe alculator).	el 9 or 10) the rear er Ratio			
C. VI R D	ERIFY annunciator L-4 eactor Pwr. Ratio Calc eviation, clears.	43, culator			
D.N	OTIFY the I&C Depart oon as practical.	tment as			
	 A. Er se B. Pl tog in of Ca C. VI Re Di D. Ne so 	 A. ENSURE operable find selected. B. PLACE the failed channel of toggle switch (channel of the OUT position (At the of RPS cabinet D, Power Calculator). C. VERIFY annunciator L-AReactor Pwr. Ratio Calculator Deviation, clears. D. NOTIFY the I&C Depart soon as practical. 	 A. ENSURE operable Rhs is selected. B. PLACE the failed channel toggle switch (channel 9 or 10) in the OUT position (At the rear of RPS cabinet D, Power Ratio Calculator). C. VERIFY annunciator L-43, Reactor Pwr. Ratio Calculator Deviation, clears. D. NOTIFY the I&C Department as soon as practical. 	 A. ENSURE operable RRS is selected. B. PLACE the failed channel toggle switch (channel 9 or 10) in the OUT position (At the rear of RPS cabinet D, Power Ratio Calculator). C. VERIFY annunciator L-43, Reactor Pwr. Ratio Calculator Deviation, clears. D. NOTIFY the I&C Department as soon as practical. 	 A. ENSURE operable RRS is selected. B. PLACE the failed channel toggle switch (channel 9 or 10) in the OUT position (At the rear of RPS cabinet D, Power Ratio Calculator). C. VERIFY annunciator L-43, Reactor Pwr. Ratio Calculator Deviation, clears. D. NOTIFY the I&C Department as soon as practical.

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REV	ISION	NO.:

PROCEDURE TITLE:

PAGE:

8 PROCEDURE NO.: LOSS OF TECH SPEC INSTRUMENTATION

2-ONP-99.01

ST. LUCIE UNIT 2

4.2 Nuclear Instrumentation Malfunction (continued)

INSTRUCTIONS

CONTINGENCY ACTIONS

NOTE

The linear range power drawer provides trip signals to the Variable High Power, Local Power Density (LPD), and Thermal Margin / Low Pressure (TM / LP) bistables <u>and</u> automatic bypasses for the High Startup Rate (HI RATE) and Loss of Load (LOSS LOAD) trip functions. Additionally, a CEA Withdrawal Prohibit (CWP) is initiated by two out of four pretrips on these trip bistables.

- 3. If a malfunction of a Linear Range Safety Channel (RPS A, B, C, or D) has occurred, Then PERFORM the following:
 - A. PLACE the failed channel Variable High Power, TM / LP, and LPD Trip unit bistables in Bypass or Trip.
 - <u>If</u> power level is greater than or equal to 15%,
 <u>Then</u> PLACE the affected channel LOSS LOAD trip bistable in Bypass or Trip.
 - **C.** If power level is at or between 10⁻⁴% and 15%, <u>Then</u> PLACE the HI RATE bistable in the Bypass or Trip.
 - **D.** DECLARE the failed channel out of service.
 - E. NOTIFY the I&C Department as soon as practical.
 - F. <u>If power level is greater than or</u> equal to 75%, <u>Then</u> NOTIFY Reactor Engineering to determine Azimuthal Tilt once 12 hours using the Incore Detectors
| REVISION NO | D.: | PROCEDURE TITLE: | | PAGE: |
|-------------|------------------------------|--|-------------------|----------|
| | 8 LOSS OF TECH SPEC INSTRI | | C INSTRUMENTATION | 10 of 28 |
| PROCEDURE | E NO.: | | | 10 01 20 |
| 2-ONF | 2-ONP-99.01 ST. LUCIE UNIT 2 | | | |
| 4.2 Nucl | lear Instru | mentation Malfunction (con | tinued) | |
| | INS. | TRUCTIONS | CONTINGENCY | ACTIONS |
| 3. | (continue | ed) | | |
| | G. REFE
Spec
Secti | ER to Technical
ifications, Table 3.3-1 and
on 3.2.4 to ensure | | |

compliance with all applicable

actions.

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END OF SECTION 4.2

00.00						PAGE:	
REVIS					PEC INSTRUMENTATION		
		<u>р</u>				11 of 28	
2		-99	01	ST. LUCIE UNIT 2			
4.3 ESEAS Char		Chann			<u></u>		
7.3	EQ!"		Jiani				
			INST	RUCTIONS	CONTINGENCY	ACTIONS	
	1.	<u>If</u> th req <u>The</u> and	ne faile uired i <u>en</u> DO <u>1</u> PER	ed instrumentation is NO in the current plant mode NOT CHANGE mode FORM the following:	Τ,		
		Α.	BYP/ chan	ASS <u>or</u> TRIP the affected nel(s).	1		
		В.	REFI Spec affec	ER to the applicable Tecl for requirements on the ted channel(s).	h		
		C.	DO N spec requi chan	NOT ENTER the mode ified in Tech Specs until irements for the affected nel(s) have been met.	all		
		D.	INITI instru <u>and</u> Main (RMS	ATE NPWOs for the faul ument channel(s) NOTIFY the Rotating tenance Shift Supervisor SS).	lty r		

VISION NO.:	PROCEDURE TITLE:		PAGE:
8	LOSS OF TECH SPEC	INSTRUMENTATION	12 of 28
OCEDURE NO.:			
2-UNP-99.01	nnol Malfunction (continued)		
ESFAS UNA			
IN	STRUCTIONS	CONTINGENCY	ACTIONS
If a chanr necessar • Key L • Devia • Equip	nel is placed in TRIP or BYPAS y: og entry (if a Bypass key is ren tion in AP 2-0010123 Data She ment OOS for affected protecti	S, the following log entries noved from a cabinet) eets on channel	may be
2. VERIF	Y normal operation of the		
2. VERIF following Operation Related L the failed Tech Spe	Y normal operation of the ng instrumentation: <u>CAUT</u> n may continue for up to 48 hou Inder-voltage Relay failed, or co relay in TRIP and the minimur oc 3.3.2 Table 3.3-3 is verified	ION urs with one 4160 / 480V A operation may continue if E n channels operable requir within one hour.	C Safety M places ement of
2. VERIF following Operation Related L the failed Tech Spe	Y normal operation of the ng instrumentation: <u>CAUT</u> n may continue for up to 48 hou Inder-voltage Relay failed, or o relay in TRIP and the minimur ec 3.3.2, Table 3.3-3, is verified	ION urs with one 4160 / 480V A operation may continue if E n channels operable requir I within one hour.	C Safety M places ement of
 2. VERIF following Operation Related Level the failed Tech Spectrum 4160 / 48 Tech Spectrum 	Y normal operation of the ng instrumentation: <u>CAUT</u> n may continue for up to 48 hou Juder-voltage Relay failed, or of relay in TRIP and the minimur ec 3.3.2, Table 3.3-3, is verified <u>NOT</u> OV AC Safety Related Bus Under a 3.3.2, Table 3.3-3.	TION urs with one 4160 / 480V A operation may continue if E n channels operable requir I within one hour. TE der-voltage relays are cove	C Safety M places ement of ered by
2. VERIF following Operation Related U the failed Tech Spectrum 4160 / 48 Tech Spectrum A. 41 Bu No	Y normal operation of the ng instrumentation: <u>CAUT</u> n may continue for up to 48 hou Inder-voltage Relay failed, or of relay in TRIP and the minimur ac 3.3.2, Table 3.3-3, is verified <u>NOT</u> OV AC Safety Related Bus Under- ac 3.3.2, Table 3.3-3. 60 / 480V AC Safety Related under-voltage relays are DRMAL:	ION urs with one 4160 / 480V A operation may continue if E n channels operable requir I within one hour. IE der-voltage relays are cove A.1 CONTACT the RMS PERFORM ONE of	C Safety M places ement of ered by SS to have EN the following:
2. VERIF following Operation Related U the failed Tech Spect A. 41 Bu NO	Y normal operation of the ng instrumentation: <u>CAUT</u> n may continue for up to 48 hou Inder-voltage Relay failed, or of relay in TRIP and the minimur of 3.3.2, Table 3.3-3, is verified NOT OV AC Safety Related Bus Under 00 / 480V AC Safety Related Is Under-voltage relays are DRMAL: 4160V Bus 2A3	TION Jurs with one 4160 / 480V A operation may continue if E in channels operable requir l within one hour. TE der-voltage relays are cove A.1 CONTACT the RMS PERFORM ONE of 1. BEGIN repairs of Under-voltage relays are cover	C Safety M places ement of ered by SS to have EN the following: on the failed relay, to be
2. VERIF following Operation Related U the failed Tech Spectrum A. 41 BU NO •	Y normal operation of the ng instrumentation: <u>CAUT</u> n may continue for up to 48 hou Inder-voltage Relay failed, or of relay in TRIP and the minimur of 3.3.2, Table 3.3-3, is verified <u>NOT</u> OV AC Safety Related Bus Under 2007 AC Safety Related Bus Under 2007 AC Safety Related Bus Under 2007 AC Safety Related Bus Under 2007 AC Safety Related 15 Under-voltage relays are DRMAL: 4160V Bus 2A3 4160V Bus 2B3	ION Jurs with one 4160 / 480V A operation may continue if E in channels operable requir within one hour. IE der-voltage relays are cove A.1 CONTACT the RMS PERFORM ONE of 1. BEGIN repairs of Under-voltage relays are completed with	C Safety M places ement of ered by SS to have EN the following: on the failed relay, to be in 48 hours.
 2. VERIF following Operation Related U the failed Tech Spectrum 4160 / 48 Tech Spectrum A. 41 Bu NO . 	Y normal operation of the ng instrumentation: <u>CAUT</u> n may continue for up to 48 hou Inder-voltage Relay failed, or of relay in TRIP and the minimur of 3.3.2, Table 3.3-3, is verified <u>NOT</u> OV AC Safety Related Bus Under 0V AC Safety Related Bus Under 60 / 480V AC Safety Related is Under-voltage relays are DRMAL: 4160V Bus 2A3 4160V Bus 2A3 480V Bus 2A2	ION Jurs with one 4160 / 480V A operation may continue if E in channels operable requir l within one hour. IE der-voltage relays are cove A.1 CONTACT the RMS PERFORM ONE of 1. BEGIN repairs of Under-voltage relay in 2. PLACE the affe voltage relay in	C Safety M places ement of ered by SS to have EN the following: on the failed relay, to be in 48 hours. cted Under- TRIP

2-0NP-99 01			ST ST		2	
2-01		99.0 99.0	hannel Malfunction (contin	ued)		
7.0 L	יה וכ		INSTRUCTIONS		CONTINGENCY	ACTIONS
2	. (con	tinued)			
	The son byp ens	e E ne i bass sure	C SFAS keyswitch and bistabl instances, directly line up. It is key, key switch, and actua is that the correct trip unit is	CAUTION e trip unit to w is necessary ation trip unit b bypassed.	which it applies do N to verify the labels being placed in Byp	NOT, in of the ass to
	•	RV ES	VT level indications are cove FAS cabinet door key and I	<u>NOTE</u> ered by Tech key 114, is red	Spec 3.3.2, Table 3 quired for bypassing	3.33. g ESFAS.
		В.	Refueling Water tank Leve instrumentation indication LIS-07-2A / B / C / D.	B.1 Pl 1. 2.	ERFORM ONE of the BYPASS the affect channel using key PLACE the affected units in TRIP in ac Appendix A, Placi Trip.	he following: ted RAS 131. ed ESFAS trip cordance withing Trip Units
		<u></u>	RCS flow indicators are cov	<u>NOTE</u> vered by Tech	n Spec 3.3.1, Table	3.3-1.
	<u> </u>	C.	RCS flow instrumentation indication PDI-1101A/B/C/	C.1 P D. 1. 2	 PERFORM ONE of the afference of the channel using key PLACE the affect units in TRIP in a Appendix A, Place Trip. 	the following: cted RAS y 103. ted ESFAS tri ccordance wi ing Trip Units

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REVISION NO .:	PROCEDURE TITLE:		PAGE:
	LOSS OF TECH SPEC INSTRUMENTATION		ON 14 of 28
2-ONP-99.01	ST. LUC	CIE UNIT 2	
4.3 ESFAS Chann	el Malfunction (continued)	
INST	RUCTIONS	CONTING	ENCY ACTIONS
2. (continued)		2. (continued)	
 Tech Spearmeasurem (that is, triin BYPAS inoperable PZR press for RPS at ESFAS cat ATWS is 1 	NOT c action requirements for a nent circuit include the pla- p units that also receive a S or TRIP, as applicable, channel inoperable. sure indicators are covere nd Tech Spec 3.3.2, Table abinet door key, key 114, i NOT an RPS or ESFAS tri	E an inoperable channe cing of all associated n input from the affec within one hour of de d by Tech Spec 3.3.1 a 3.3-3 for ESFAS. s required for bypass p unit, placing ATWS	el process functional units ted instrument), claring the , Table 3.3-1 ing ESFAS.
NOT requ	ired.		
D. Press instru PI-110 Setpo	urizer pressure mentation indication D2A/B/C/D <u>or</u> TM / LP int PIA-1102A/B/C/D.	 D.1 PERFORM O 1. BYPASS thaffected by pressure in Hi Pzr F (key 10) TM/Lo I (key 10) Pzr Pre Pzr Pre Pzr Pre 2. PLACE the ESFAS trip accordance Placing Trip 	NE of the following: The following channels the failed Pressurizer strument: Press RPS trip unit 6) Press RPS trip unit 7) The site of the following: Press RPS trip unit 7) The site of the following: Press RPS trip unit 6) Press RPS trip unit 7) The site of the following: Press RPS trip unit 7) The site of the following: 1000

			PAGE:			
REVISION NO .:						
88			15 of 28			
PROCEDURE NO.:	ети	LICIE LINIT 2				
2-ONP-99.01	51. LU					
4.3 ESFAS Cha	nnel Malfunction (continued	d)				
INS	STRUCTIONS	CONTINGENCY				
2. (continue	əd)	2. (continued)				
• •						
CCW flow Table 3.3-1	NO to RCP seals indicators are 1.	TE covered by Tech Spec 3.3.1	,			
E. CC	W flow to RUP seals	E.1 PERFORM ONE OF	ne ionowing.			
FIS	3-14-15A/B/C/D.	 BYPASS the affect using key 111 	ted RPS trip un			
		OR				
		2. PLACE the affecte in TRIP in accord Appendix A, Plac Trip.	ed RPS trip unit ance with ing Trip Units in			
		NOTE				
Conta	inment radiation monitors a	re covered by Tech Spec 3.3	5.2, Table 3.3-3.			
ESFA	S cabinet door key, key 114	4, is required for bypassing E	SFAS.			
F. Co	ontainment radiation	F.1 PERFORM ONE of	the following:			
ins	strumentation indication:	 BYPASS the CIS by the failed radia 	channel affecte ation monitor			
		using key 130.				
•	RIS-26-4-2B	0	R			
•	RIS-26-5-2C	2. PLACE the affect	ted ESFAS trip			
•	RIS-26-6-2D	unit in TRIP in ac Appendix A, Plac Trip.	cordance with cing Trip Units ir			

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BEVISIO	N NC):	PROCEDURE TITLE:				PAGE:
		8	LOSS OF TECH SF	PEC INS	STRUM	ENTATION	16 of 28
2-C		P-99.01	ST. LU		NIT 2		
4.3	ESI	-AS Chanr	nel Malfunction (continue	ed)			
		INST	FRUCTIONS		co	NTINGENCY	ACTIONS
	2.	(continue	d)	2.	(conti	nued)	
	•	Containm Table 3.3	Notes the second	DTE re covel ec 3.3.2	red by ⁻ , Table	Fech Spec 3.3.1 3.3-3 for ESFA	, S.
	•	ESFAS c	abinet door key, key 114	, is requ	uired fo	r bypassing ESI	FAS.
	•	Containm isolation	nent Pressure SIAS and modules.	MSIS sl	hare the	e same bistable	and
		G. Cont instru PIS-	ainment Pressure umentation indication 07-2A/B/C/D.	G.	1 PERI 1. BY aff Pro • • • • • • • • • • • • •	FORM ONE of the follow ected by the faileessure instrume Hi Cntmt Press (key 109) Cont Press SIA Cntmt Press COR Cntmt Press COR OR ACE the affecter SFAS trip units cordance with Alacing Trip Units	he following: ving channels ed Containment nt: a RPS trip unit AS (key 127) CIS (key 129) CSAS (key 128) ed RPS and in TRIP in Appendix A, s in Trip.

REVISION N	0.:	PROCEDURE TITLE:			PAGE:
	8	LOSS OF TECH SPEC		STRUMENTATION	17 of 28
ROCEDUR	E NO.:				17 01 20
2-0N	P-99.01	ST. LUC	IE UI	NIT 2	
4.3 ES	FAS Chan	nel Malfunction (continued)			
	INST	FRUCTIONS		CONTINGENCY	ACTIONS
2.	(continue	d)	2.	(continued)	
•	Feedwate Tech Spe	NOTI er Header Pressure instrum ec 3.3.2, Table 3.3-3 for ESI	E entat -AS.	ion indicators are cove	red by
•	ESFAS C	abinet door key, key 114, is	requ	lired for bypassing ESF	-A5.
	H. ¶1 • Pl • Pl	Feedwater Header Pressure instrumentation indication: I-09-9A/B/C/D I-09-10A/B/C/D	H.1	 I PERFORM ONE of the 1. BYPASS the follow channels affected by failed Feedwater Heressure instrumer AFAS-1 and AFAFAS cabinet of key 202 chan A – key 2 chan B – key 2 chan C – key 2 chan C – key 2 chan D – key 2 OR 	e following: ving by the eader nt: FAS-2 door 03 04 05 06

•

REVISION NO .:	PROCEDURE TITLE:	PAGE:
8	LOSS OF TECH SPEC INSTRUMENTATION	18 of 28
PROCEDURE NO .:		10 01 20

2-ONP-99.01

ST. LUCIE UNIT 2

4.3 ESFAS Channel Malfunction (continued)

INSTRUCTIONS

CONTINGENCY ACTIONS

2. (continued)

H.1 (continued)

CAUTION

¶1 An AFAS channel in the TRIPPED condition is administratively limited to 72 hours in accordance with AP 0010120, Conduct of Operations.

NOTE

Tech Spec action requirements for an inoperable channel process measurement circuit include the placing of all associated functional units (that is, trip units that also receive an input form the affected instrument), in BYPASS or TRIP, as applicable, within one hour of declaring the inoperable channel inoperable.

> 2. PLACE the affected RPS and ESFAS trip units in TRIP in accordance with Appendix A, Placing Trip Units in Trip.

LOSS OF TECH SP ST. LL Malfunction (continue UCTIONS e indicators are cover ch Spec 3.3.2, Table 3 net door key, key 114 Generator Pressure entation indication: D13A/B/C/D D23A/B/C/D	DEC INSTRUMENTATION JCIE UNIT 2 ed) CONTINGENCY ACTIONS 2. (continued) DTE ed by Tech Spec 3.3.1, Table 3.3-1 for 3.3-3 for ESFAS. is required for bypassing ESFAS. I.1 PERFORM ONE of the following: 1. BYPASS the following channels affected by the failed S/G pressure instrument: • Lo Press S/G trip unit (key 105)
ST. LL Malfunction (continue UCTIONS e indicators are covered ch Spec 3.3.2, Table 3 net door key, key 114 Generator Pressure entation indication: D13A/B/C/D D23A/B/C/D	JCIE UNIT 2 ed) CONTINGENCY ACTIONS 2. (continued) DTE ed by Tech Spec 3.3.1, Table 3.3-1 for 3.3-3 for ESFAS. is required for bypassing ESFAS. I.1 PERFORM ONE of the following: 1. BYPASS the following channels affected by the failed S/G pressure instrument: • Lo Press S/G trip unit (key 105)
ST. LL Malfunction (continue UCTIONS e indicators are covered ch Spec 3.3.2, Table 3 net door key, key 114 Generator Pressure entation indication: D13A/B/C/D D23A/B/C/D	JCIE UNIT 2 ed) CONTINGENCY ACTIONS 2. (continued) DIE ed by Tech Spec 3.3.1, Table 3.3-1 for 3.3-3 for ESFAS. . is required for bypassing ESFAS. I.1 PERFORM ONE of the following: 1. BYPASS the following channels affected by the failed S/G pressure instrument: • Lo Press S/G trip unit (key 105)
Malfunction (continue UCTIONS e indicators are coverent ch Spec 3.3.2, Table 3 net door key, key 114 Generator Pressure entation indication: D13A/B/C/D D23A/B/C/D	ed) CONTINGENCY ACTIONS 2. (continued) DTE ed by Tech Spec 3.3.1, Table 3.3-1 for 3.3-3 for ESFAS. , is required for bypassing ESFAS. I.1 PERFORM ONE of the following: 1. BYPASS the following channels affected by the failed S/G pressure instrument: • Lo Press S/G trip unit (key 105)
UCTIONS NC e indicators are cover ch Spec 3.3.2, Table 3 net door key, key 114 Generator Pressure entation indication: D13A/B/C/D D23A/B/C/D	 Continued) Continued) Continued) Contended by Tech Spec 3.3.1, Table 3.3-1 for 3.3-3 for ESFAS. A is required for bypassing ESFAS. I.1 PERFORM ONE of the following: 1. BYPASS the following channels affected by the failed S/G pressure instrument: Lo Press S/G trip unit (key 105)
<u>NC</u> e indicators are cover ch Spec 3.3.2, Table 3 <u>net door key, key 114</u> Generator Pressure entation indication: D13A/B/C/D D23A/B/C/D	 2. (continued) DTE ed by Tech Spec 3.3.1, Table 3.3-1 for 3.3-3 for ESFAS. . is required for bypassing ESFAS. I.1 PERFORM ONE of the following: 1. BYPASS the following channels affected by the failed S/G pressure instrument: Lo Press S/G trip unit (key 105)
<u>NC</u> e indicators are cover ch Spec 3.3.2, Table 3 <u>net door key, key 114</u> Generator Pressure entation indication: D13A/B/C/D D23A/B/C/D	 DTE ed by Tech Spec 3.3.1, Table 3.3-1 for 3.3-3 for ESFAS. is required for bypassing ESFAS. I.1 PERFORM ONE of the following: 1. BYPASS the following channels affected by the failed S/G pressure instrument: Lo Press S/G trip unit (key 105)
<u>NC</u> e indicators are cover ch Spec 3.3.2, Table 3 <u>net door key, key 114</u> Generator Pressure entation indication: D13A/B/C/D D23A/B/C/D	 DTE ed by Tech Spec 3.3.1, Table 3.3-1 for 3.3-3 for ESFAS. is required for bypassing ESFAS. I.1 PERFORM ONE of the following: 1. BYPASS the following channels affected by the failed S/G pressure instrument: Lo Press S/G trip unit (key 105)
net door key, key 114 Generator Pressure entation indication: 013A/B/C/D 023A/B/C/D	 , is required for bypassing ESFAS. I.1 PERFORM ONE of the following: 1. BYPASS the following channels affected by the failed S/G pressure instrument: Lo Press S/G trip unit (key 105)
Generator Pressure entation indication: 013A/B/C/D 023A/B/C/D	 I.1 PERFORM ONE of the following: 1. BYPASS the following channels affected by the failed S/G pressure instrument: Lo Press S/G trip unit (key 105)
Generator Pressure entation indication: 013A/B/C/D 023A/B/C/D	 I.1 PERFORM ONE of the following: 1. BYPASS the following channels affected by the failed S/G pressure instrument: Lo Press S/G trip unit (key 105)
entation indication: 013A/B/C/D 023A/B/C/D	 BYPASS the following channels affected by the failed S/G pressure instrument: Lo Press S/G trip unit (key 105)
	 TM/Lo Press RPS trip unit (key 107) AFAS-1 and AFAS-2 AFAS cabinet door key 202 chan A – key 203 chan B – key 204 chan C – key 205 chan D – key 206 If SG-2A, <u>Then</u> 2A S/G Press
	MSIS (key 134)
	 <u>If</u> SG-2B, <u>Then</u> 2B S/G Pre MSIS (key 136)
	OR

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ISION NO.:	PROCEDURE TITLE:			PAGE:
8	LOSS OF TECH SPEC INSTRUMENTATION		20 of 28	
	ST LU			
ESEAS Channel Malfunction (continued)				· · · · · · · · · · · · · · · · · · ·
S ESFAS Chann		·)		
INST	RUCTIONS	CO	NTINGENCY	ACTIONS
		2. (contin	ued)	
		I.1 (co	ontinued)	
• ¶ ₁ It is pre	NO eferable to leave the AFA	IE S trip units in I	BYPASS if it is	
 Tech Sp measure units (th instrume declarin 	ec action requirements for ement circuit include the p at is, trip units that also re ent), in BYPASS or TRIP, g the inoperable channel	r an inoperabl lacing of all as ceive an inpu as applicable, inoperable.	e channel proc ssociated functi t form the affect within one hou	ess onal :ed r of
		2.	PLACE the aff AFAS and ESI in TRIP in acc Appendix A, P Units in Trip.	ected RPS, FAS trip units ordance with lacing Trip

8 LOSS OF TECH SPEC INSTRUMENTATION 21 of PROCEDURE NO.: 2-ONP-99.01 ST. LUCIE UNIT 2 4.2 ESEAS Channel Malfunction (continued)	28	
21 of PROCEDURE NO.: 2-ONP-99.01 ST. LUCIE UNIT 2	28	
2-ONP-99.01 ST. LUCIE UNIT 2		
4.2 ESEAS Channel Malfunction (continued)		
	١S	
2. (continued) 2. (continued)		
 <u>NOTE</u> S/G level indicators are covered by Tech Spec 3.3.1, Table 3.3-1 for RPS and Tech Spec 3.3.2, Table 3.3-3 for ESFAS. 		
 ESFAS cabinet door key, key 114, is required for bypassing ESFAS. 		
J. Steam Generator Level J.1 PERFORM ONE of the following instrumentation indication:	g:	
 LIC-9013A/B/C/D 1. BYPASS the following channel affected by the failed instrument 	iels ient:	
LIC-9023A/B/C/D Lo LvI SG RPS trip unit (key 104)		
• If SG-2A, Then AFAS-1		
 <u>If</u> SG-2B, <u>Then</u> AFAS-2 / cabinet door key 202 chan A – key 203 chan B – key 204 chan C – key 205 chan D – key 206 	AFA	
OR		
	1	
CAUTION ¶1 An AFAS channel in the TRIPPED condition is administratively limited to 72 hours in accordance with AP 0010120, Conduct of Operations.		
NOTE		
It is preferable to leave the AFAS trip units in BYPASS if it is necessary to place the RPS and ESFAS trip units in TRIP.		
2. PLACE the affected RPS an AFAS trip units in TRIP in accordance with Appendix Placing Trip Units in Trip.	nd A,	
END OF SECTION 4.3		

REVISION NO.:		PROCEDURE TITLE:			PAGE:
0					
					22 of 28
2-0NP-99	01	s		٢2	
2-0NF-99.					l
4.4 RPS Spe	ecific l	nstrumentation Malf	unction		
	INST	RUCTIONS		CONTINGENCY	ACTIONS
1. <u>If</u> th requ <u>The</u> and	e faile uired i <u>en</u> DO PERI	d instrumentation is n the current plant n NOT CHANGE mod FORM the following:	NOT node, de		
A.	BYPA chanr	ASS <u>or</u> TRIP the affe nel(s).	ected		
В.	REFE Spec affect	R to the applicable for requirements on ed channel(s).	Tech the		
C.	Do N speci all red affect met.	OT enter the mode fied in Tech Specs (quirements for the ted channel(s) have	until been		
D.	INITI faulty <u>and</u> N	ATE NPWOs for the instrument channel NOTIFY the RMSS.) (S)		

REVISION NO.:	PROCEDURE TITLE:		PAGE:				
8	LOSS OF TECH SPI	EC INSTRUMENTATION	23 of 28				
PROCEDURE NO.:			23 01 20				
2-ONP-99.01	ST. LU	CIE UNIT 2					
4.4 RPS Specific Ir	nstrumentation Malfunctio	n (continued)					
INST	RUCTIONS	CONTINGENCY	ACTIONS				
If a channel in necessary:	If a channel is placed in TRIP or BYPASS, the following log entries may be necessary:						
Key log (i	f bypass key is removed f	rom cabinet)					
Deviation	in AP 2-0010123 Data SI	heets					
Equipmer	nt OOS for affected protect	ction channel					
2. VERIFY I following	normal operation of the instrumentation:						
	NO	TE					
RCS T _c	old indicators are covered	by Tech Spec 3.3.1, Table 3.3	3-1				
A. RCS	T _{cold} instrumentation ation TI-2201A/B/C/D.	A.1 PERFORM ONE of the	ne following:				
		 BYPASS the follow affected by the fail instrument: 	<i>r</i> ing channels ed T _{cold}				
		Hi Pwr RPS tri	p unit (key 101)				
		 TM/Lo Press F (key 107) 	IPS trip unit				
		 Loc Pwr Den F (key 110) 	≀PS trip unit				
		OR					
		2. PLACE the affecte units in TRIP in ac Appendix A, Placi Trip.	ed RPS trip cordance with ng Trip Units in				

VISION NO .:	PROCEDURE TITLE:		PAGE:
8	LOSS OF TECH SPE	EC INSTRUMENTATION	04 of 29
OCEDUBE NO.:			24 01 20
2-0NP-99.01	ST. LU	CIE UNIT 2	
2-011 -99.01		n (continued)	
I.4 RPS Specific Ir	nstrumentation Manuncuo	(continued)	
INST	RUCTIONS	CONTINGENCY	ACTIONS
2. (continued)	2. (continued)	
RCS T	NO ot indicators are covered b	<u>TE</u> by Tech Spec 3.3.1, Table 3.3	3-1.
B. RCS	T _{hot} instrumentation	B.1 PERFORM ONE of the	e following:
Indica		 BYPASS the follow affected by the faile instrument: 	ving channels ed T _{hot}
		Hi Pwr RPS trip	o unit (key 101
		 TM/Lo Press F (key 107) 	PS trip unit
		 Loc Pwr Den F (key 110) 	PS trip unit
		OR	
		2. PLACE the affected units in TRIP in ad Appendix A, Placi Trip.	ed RPS trip ccordance with ng Trip Units i
	NC)TF	
Turbine EH Table 3.3-1	fluid pressure indicators a	are covered by Tech Spec 3.3	.1,
C. Turk	bine EH fluid pressure.	C.1 PERFORM ONE of t	he following:
		1. BYPASS the affect RPS channel usin	cted Loss Loac Ig key 108.
		OR	
		 PLACE the affect in TRIP in accord Appendix A, Plac Trip. 	ed RPS trip un ance with ing Trip Units

			· · · · · · · · · · · · · · · · · · ·		
REVISION NO	D.:	PROCEDURE TITLE:		PAGE:	
	8	LOSS OF TECH SF	PEC INSTRUMENTATION	25 of 28	
PROCEDURE NO.:				23 01 20	
2-0N	2-ONP-99.01 ST. LUCIE UNIT 2				
4.4 RPS	Specific I	nstrumentation Malfunctio	on (continued)		
	INS	TRUCTIONS	CONTINGENC	Y ACTIONS	
3.	INITIATE instrumer NOTIFY	NPWOs for failed nt channel(s) <u>and</u> the RMSS.			
4.	ENSURE been con equipmer	proper log entries have npleted (i.e., deviation, nt OOS, etc.).			
5.	NOTIFY channel f	Operations Supervisor of ailure.			
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END OF SECTION 4.4

REVISION NO .:			PROCEDURE TITLE:	PAGE:					
	8		LOSS OF TECH SPEC INSTRUMENTATION	26 of 28					
PROCE	ROCEDURE NO .:								
2-	2-ONP-99.01		ST. LUCIE UNIT 2						
5.0	REFERE	NCE	ES						
	NOTE								
	One or m	ore	of the following symbols may be used in this procedure):					
	§ India Con and Gen	cate ditic sha eral	s a Regulatory commitment made by Technical Specifi on of License, Audit, LER, Bulletin, Operating Experience II NOT be revised without Facility Review Group review Manager approval.	cations, ce, etc. v and Plant					
	¶ Indie prac with	cate ctice out	s a management directive, vendor recommendation, pl or other non-regulatory commitment that should NOT consultation with the plant staff.	ant be revised					
5.1	Technica	ll Sp	ecifications						
	• Se	ectic	on 3.3.1						
	Section 3.3.2		on 3.3.2						
5.2	Updated	Fin	al Safety Analysis Report (UFSAR)						
	• S	ectio	on 7.2, Reactor Protective System						
	• S	ectio	on 7.3, Engineered Safety Features Systems						
5.3	Manage	mer	t Directives and Regulatory Commitments						
	• ¶·	ı (CR 97-1772, AFAS Channel Tripped Condition						

DEVISI		PBOCEDUBE TITLE:	PAGE:
8		LOSS OF TECH SPEC INSTRUMENTATION	07 - (00
PROCE	DURE NO.:		27 of 28
2-ONP-99.01		ST. LUCIE UNIT 2	
5.4	Procedures		
	• AP 2-0	0010123, Administrative Control of Valves, Locks and S	witches
	• AP 00	10120, Conduct of Operations	
	• 2-EOF	P-01, Standard Post Trip Actions	
	• 2-IMP Condi	-09.09, Auxiliary Feedwater Actuation System Place Ch tion	annel in Trip
5.5	Miscellaneou	us Documents	
	• 2998-	G-078, Sh. 109 & 110, Reactor Coolant System	
	• 2998-	G-079, Sh. 1, Main Steam	
	• 2998-	G-088, Sh. 1 & 2, Containment Spray and Refueling W	ater Systems
6.0	RECORDS F	REQUIRED	
6.1	RCO Chrono	blogical Log entries.	

EVIOR		PROCEDURE TITLE:	1, ,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,		
	8	LOSS OF TECH SPEC INSTRUMENTATION	00 of 09		
BOCE			28 01 28		
2-ONP-99.01		ST. LUCIE UNIT 2			
		APPENDIX A <u>PLACING TRIP UNITS IN TRIP</u> (Page 1 of 1)			
	The trip units	NOTE s should only be pulled out of the panel far enough t connected but NOT far enough to be removed from	o ensure he panel.		
	lf placing an	RPS trip unit in TRIP, Then PERFORM the followin	g:		
	A. LOOS	SEN the upper and lower bistable trip unit hold down	screws.		
	B. Slowly	y PULL the trip unit out until it begins to slide freely.			
•	<u>If</u> placing an	ESFAS isolation module in TRIP, <u>Then</u> PERFORM	the following:		
	A. LOOS	SEN the upper and lower isolation module hold down	ר screws.		
	B. Slowly PULL the module out until it begins to slide freely.				
	AFAS isolat	NOTE ion modules are placed in TRIP by I&C Department	in		
3.	AFAS isolat accordance Channel in <u>If</u> required to I&C Departr	<u>NOTE</u> ion modules are placed in TRIP by I&C Department with 2-IMP-09.09, Auxiliary Feedwater Actuation Sy <u>Trip Condition.</u> o place an AFAS isolation module in TRIP, <u>Then</u> CO ment.	in stem Place NTACT		
3.	B. Slowi AFAS isolat accordance Channel in <u>If</u> required to I&C Departr	<u>NOTE</u> ion modules are placed in TRIP by I&C Department with 2-IMP-09.09, Auxiliary Feedwater Actuation Sy <u>Trip Condition.</u> o place an AFAS isolation module in TRIP, <u>Then</u> CC ment.	in vstem Place ONTACT		
3.	B. Slowi AFAS isolat accordance Channel in <u>If</u> required to I&C Departr	<u>NOTE</u> ion modules are placed in TRIP by I&C Department with 2-IMP-09.09, Auxiliary Feedwater Actuation Sy <u>Trip Condition.</u> o place an AFAS isolation module in TRIP, <u>Then</u> CO ment.	in /stem Place ONTACT		
3.	B. Slowi AFAS isolat accordance Channel in <u>If</u> required to I&C Departr	<u>NOTE</u> ion modules are placed in TRIP by I&C Department with 2-IMP-09.09, Auxiliary Feedwater Actuation Sy <u>Trip Condition.</u> o place an AFAS isolation module in TRIP, <u>Then</u> CO ment.	in /stem Place ONTACT		
3.	B. Slowi	<u>NOTE</u> ion modules are placed in TRIP by I&C Department with 2-IMP-09.09, Auxiliary Feedwater Actuation Sy <u>Trip Condition.</u> o place an AFAS isolation module in TRIP, <u>Then</u> CC ment.	in /stem Place ONTACT		
3.	B. Slowi AFAS isolat accordance Channel in <u>If</u> required to I&C Departr	NOTE ion modules are placed in TRIP by I&C Department with 2-IMP-09.09, Auxiliary Feedwater Actuation Sy Trip Condition. o place an AFAS isolation module in TRIP, Then CO ment.	in /stem Place		
3.	B. Slowi	NOTE ion modules are placed in TRIP by I&C Department with 2-IMP-09.09, Auxiliary Feedwater Actuation Sy Trip Condition. o place an AFAS isolation module in TRIP, <u>Then</u> CO ment.	in estem Place		

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REVISION NO	O.:	PROCEDURE TITLE:		
	E NO.:		8 of 2	20
<u>2-070(</u> 7.0 <u>OP</u>	0030 ERAT	ST. LUC OR ACTIONS: (continued)	IE UNIT 2	
7.2	(con	tinued)		
	11	NSTRUCTIONS	CONTINGENCY ACTIONS	
4.	(co	ntinued)	4. (continued)	
	A.	Verify main feedwater Reg. valves (MFRV) are responding properly for current condition.	A. <u>If MFRVs are NOT</u> controlling S/G levels, <u>Then</u> perform the following as needed to control S/G level:	
			1. Place MFRV(s) controller in MANUAL.	
			 Operate 100% bypass valve(s) as required. 	
			 Adjust MFRV controller setpoint as necessary. 	/R
			4. Locally operate MFRV(s) using Appendix A.	
			5. Contact I&C Department for possible 15% bypass valve auto control.	
	B.	Verify main feedwater pump Recirc. valve(s) are	B. <u>If</u> Recirc. valve is open, <u>Then</u> :	
		FCV-09-1A2 (FCV-09-1B2)	 Perform downpower as required to control S/G levels. 	
		•	 Locally close downstream Isol. V09163 or (V09173) 	1
			2. Locally close downstream Isol. V09163 or (V09173)	1 •



ST. LUCIE UNIT 2 OFF-NORMAL OPERATING PROCEDURE

Procedure No. **2-0120031**

Current Rev. No. 20

SAFETY RELATED

Effective Date: 11/30/99

Title:

EXCESSIVE REACTOR COOLANT SYSTEM LEAKAGE

Responsible Department: **OPERATIONS**

Revision Summary

Revision 20 - Deleted the caution that is no longer applicable due to the deletion of Tech Spec 3.1.2.9. (Gene Boyd, 11/18/99)

Revision 19 - Added caution statements before Steps 7.2.2.L and 7.2.3.L. (Carlos Diaz, 09/07/99)

Revision 18 - This revision adds guidance to consider SDC reliefs as a source of RCS leakage Modes 3-6. (Roger Weller, 02/26/99)

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Revision	FRG Review Date	Approved By	Approval Date	S_2_OPS DATE
0	02/25/83	J. H. Barrow (for) Plant General Manager	04/18/83	DOCT PROCEDURE DOCN 2-0120031
Revision	FRG Review Date	Approved By	Approval Date	SYS COMP_COMPLETED
20	11/17/99	R. G. West Plant General Manager	11/18/99	ITM20
		N/A Designated Approver		

		PAGE:
20	EXCESSIVE BEACTOR COOLANT	
PROCEDURE NO.:	SYSTEM LEAKAGE	4 of 30
0.0100021		
5.0 ENTRY C	ONDITIONS: (continued)	
5.3 Cont the c or pr	rol Room instrumentation indicates leakage of reactor cod ontainment or other systems. Instruments listed below m ovide indication when excessive leakage is present:	plant to nay alarm
RCS leal Reactor particulat Reactor	<u>NOTE</u> ks occurring in Modes 2 through 4 may be detected by th cavity sump inlet flow indication before the Containment a se and gaseous monitor detects the leak, especially when is operating with no failed fuel.	e air the
1. (Containment air particulate and gas monitor.	
2.	Reactor cavity sump level and flow indication.	
3.	CCW radiation monitor.	
4.	Containment area radiation monitors.	
5.	High level, pressure or temperature in the quench tank.	
6.	High temperature in reactor coolant relief or safety valve line.	discharge
7.	Low level in volume control tank.	
8.	High component cooling water surge tank level.	
9.	High SI (Safety Injection) loop header pressure.	
10.	Indication of flow on safety or PORV acoustic monitors.	
11.	Indication of Refueling Cavity seal ring or Steam Genera dam leakage.	tor nozzle

REVISION NO .:		:	PROCEDURE TITLE:	PAGE:		
20			EXCESSIVE REACTOR COOLANT	5 of 30		
PROCE	DURE	NO.:	STSTEMELARAGE			
2-	01200	031	ST. LUCIE UNIT 2			
6.0	EXIT	CON	DITIONS:			
	6.1	Any o Low I NOT	of the Safety Function Status Checks Acceptance Criteria Mode Off-Normal Procedure for the current plant conditio met.	from the n are		
			OR			
6.2 Leak		Leak	age has been identified and corrected.			
OR						
	6.3 Leak		age is in excess of charging pump capacity.			
			AND			
	6.4	An a	pproved procedure is available for implementation.			
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REVISION NO	D.:	PROCEDURE TITLE:		PAGE:
20 PROCEDURE	NO.:	EXCESSIVE READ	EAKAGE	6 of 30
2-0120	031	ST. LUCI	E UNIT 2	
7.0 <u>OP</u> I	ERATC	OR ACTIONS:		
7.1	Imme	ediate Operator Actions:		
	1. 1	None		
7.2	Subs	equent Operator Actions:		
	IN	STRUCTIONS	CONTINGENO ACTIONS	Ϋ́
1.	<u>If</u> in M SIAS go to	lodes 1 thru 3 and is NOT blocked, <u>Then</u> step 2.		
	<u>If</u> in M and S go to	Nodes 3 thru Mode 6 SIAS is blocked, <u>Then</u> step 3.		
2.	ACTION 1 THE BLOC	ONS WHEN IN MODES RU MODE 3 (SIAS NOT CKED)		
	A. <u>If</u> ir tt a n s	RCS leakage is ndicated, <u>Then</u> analyze ne information available and determine as accurately as possible the magnitude and eriousness of the leak.		
	B. <u>If</u> le p le n	t at any time RCS eakage exceeds the eapacity of the charging oumps and pressurizer evel cannot be naintained, <u>Then</u> :		
	1	In Modes 1 and 2, trip the reactor and turbine and perform 2-EOP-01, "Standard Post Trip Actions."		

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REVIS	ION NO	D.:		PROCEDURE TITLE:				PAGE:
	20)		EXCESSIVE RE		;00 >E	LANI	7 of 30
PROCEDURE NO.:				SYSTEM		a⊏		
2-	0120	0031		ST. LU	CIE UNIT	2	<u></u>	
7.0	OP	ERA	то	R ACTIONS: (continued)				
	70	(00)	atin	uod)				
	1.2	(00)	11111	ueu)				_
		I	NS	STRUCTIONS		CC	ONTINGENCY ACTIONS	1
	2.	(co	ntin	ued)	2.	(co	ntinued)	
		В.	(cc	ntinued)				
			2.	If in Mode 3 (SIAS is NOT Blocked), <u>Then</u> enter 2-EOP-03, "Loss of Coolant Accident."				
		C.	<u>If</u> th le co si	the containment CIS diation monitors exceed e present alarm point vel, <u>Then</u> ensure ontainment isolation gnal is actuated.		C.	Manually actua	ite CIAS.
		D.	<u>If</u> sa in O P "F V in	pressurizer PORV or afety valve leakage is dicated, <u>Then</u> ensure ff-Normal Operating rocedure 2-0120036, Pressurizer Relief/Safety alve" has been nplemented.				
					NOTE	<u></u>		
	F	RCV-	14- CC	1 CCW Surge Tank Vent, N activity.	will align	to th	e Chemical Drai	in Tank on
		E.	lf a r C 2 C A	a CCW high activity larm is received, <u>Then</u> efer to Off-Normal Operating Procedure -0310031, "Component Cooling Water Excessive Activity."				

REVISION NO .:						
20			EXCESSIVE F	0.51.00		
PROCEDURE NO.:		D.:	SYSTE	EM LEAP	KAGE	8 of 30
0.0100001			ST II		NIT 2	
2-01 70 C	PFF		R ACTIONS: (continued	i)	<u></u>	
/.0 <u>c</u>				,		
7	'.2 (o	contir	nued)			
		IN	STRUCTIONS			GENCY DNS
2	2. (0	contii	nued)	2. (co	ntinued)	
	F	: E le c	nsure charging and tdown is automatically ontrolling pressurizer evel.	F.	Manually conti letdown as rec pressurizer lev	rol charging and juired to maintain rel.
Ψ	(э. <u>If</u> <u>Т</u> п	plant conditions permit, hen determine the rimary leak rate, per			
			Data Sheet 1 of DP 2-0010125A, Reactor Coolant System Water Inventory Balance.			
	Pre con ves	ssure tainii	Data Sheet 1 of DP 2-0010125A, Reactor Coolant System Water Inventory Balance. Boundary Leakage - is ng components of the Re piping, pumps and value	NOTE defined eactor Co es, which	as leakage from polant System, s n are:	any pressure such as pressure
	Pre con ves a.	ssure tainii sels, Par	Data Sheet 1 of DP 2-0010125A, Reactor Coolant System Water Inventory Balance. Boundary Leakage - is ng components of the Re piping, pumps and valve t of the RCS, or	NOTE defined eactor Co es, which	as leakage from polant System, s n are:	any pressure such as pressure
	Pre con ves a. b.	ssure itainii sels, Par Cor follo	Data Sheet 1 of DP 2-0010125A, Reactor Coolant System Water Inventory Balance. Boundary Leakage - is ng components of the Re piping, pumps and valve t of the RCS, or Inected to the RCS, up to pwing:	NOTE defined actor Co es, which	as leakage from polant System, s n are: cluding any and	any pressure such as pressure all of the
	Pre con ves a. b.	ssure tainin sels, Par follo 1.	Pata Sheet 1 of DP 2-0010125A, Reactor Coolant System Water Inventory Balance. Boundary Leakage - is og components of the Re piping, pumps and valve t of the RCS, or Inected to the RCS, up to owing: The outermost containm penetrates primary reac	NOTE defined eactor Co es, which o and inc nent isola tor conta	as leakage from polant System, s n are: cluding any and ation valve in sy ainment,	any pressure such as pressure all of the stem piping which
	Pre con ves a. b.	ssure tainin sels, Par Cor follo 1.	Data Sheet 1 of DP 2-0010125A, Reactor Coolant System Water Inventory Balance. Be Boundary Leakage - is ng components of the Re piping, pumps and valve t of the RCS, or Innected to the RCS, up to owing: The outermost containm penetrates primary reac The second of two valve operation in system pipi	NOTE defined eactor Co es, which o and ind nent isola tor conta es norma	as leakage from polant System, s n are: cluding any and ation valve in sy ainment, ally closed durin n does not pene	any pressure such as pressure all of the stem piping which g normal reactor strate containment,

DEVISI		PROCEDURE TITLE:		PAGE:
	20	EXCESSIVE RE	ACTOR COOLANT	
DD007		SYSTEM	1 LEAKAGE	9 of 30
	EDURE NO			
2-	0120031	ST. LUC		<u> </u>
7.0	<u>OPERATC</u>	OR ACTIONS: (continued)		
	72 (contin	nued)		
	7.2 (0011	1404)		-
	IN	STRUCTIONS	CONTINGENC	Y
			ACTIONS	
		n		
	2. (conti	nued)		
8	1 If	an increase in		
31	<u>"</u> u	nidentified leakage has		
	0	ccurred that is less than		
	Т	echnical Specification		
	 /	Mit (TGPW), <u>Their</u> relea		
	i i i			
	J. A	fter determining the		
	n	hagnitude of the leak,		
	C	continue to evaluate all		
	i i	dentify leakage source.		
			NOTE	
	When u	sing the Reactor Cavity Su	mp Level instrument (LIS-07-0)6) on
	RTGB-2	05, 1" is approximately equ	Jal to 46 gallons.	
	K. <u>I</u>	f leak appears to be		
		nside containment as		
	(cavity sump level, Then		
		close LCV-07-11A or		
	į	LCV-07-11B to isolate		
	:	sump from pumping to the		
1				

				PAGE:
		SYSTEM L	10 of 30	
PROCEDURE N	10.:	_		
2-01200	31	ST. LUCIE	UNIT 2	
7.0 <u>OPE</u>	RATO	R ACTIONS: (continued)		
7.2 (contin	luea)		
	INS	STRUCTIONS	CONTINGEN ACTIONS	CY
2. (contir	nued)		/R20
L	<u>If</u> ou co	leak appears to be utside containment, <u>Then</u> onsider the following:		
	1.	Local sample valve isolation, refer to Appendix B.		
	2.	Isolating letdown		
	3.	Isolating RCS sample lines: V5200 thru V5205		
	4.	Inspect charging pumps for increased seal leakage.		
	M. <u>If</u> le so C L w	charging pump seal eakage is the suspected ource of leakage, <u>Then</u> erform Appendix C, charging Pump Local Seal eakage Determination, while continuing.		
	N. M ra ir c b s	Ionitor secondary adiation levels for ncreasing trends on the ondenser air ejector, lowdown and main teamline monitors.	N. <u>If</u> secondary ra are increasing. ONOP 2-08300 Generator Tube	diation levels <u>Then</u> refer to 030, "Steam e Leak."

REVISION NO.: PROCEDURE TITLE: PAGE: 20 EXCESSIVE REACTOR COOLANT SYSTEM LEAKAGE 11 2-0120031 ST. LUCIE UNIT 2 11 7.0 OPERATOR ACTIONS: (continued) 7.2 (continued) 7.2 (continued) CONTINGENCY ACTIONS 2. (continued) 2. (continued) 0. Refer to Technical 2. (continued)	of 30
2-0120031 ST. LUCIE UNIT 2 7.0 OPERATOR ACTIONS: (continued) 7.2 (continued) INSTRUCTIONS CONTINGENCY ACTIONS 2. (continued) 0. Refer to Technical Output	
7.0 OPERATOR ACTIONS: (continued) 7.2 (continued) INSTRUCTIONS CONTINGENCY ACTIONS 2. (continued) 2. (continued) 0. Refer to Technical 0. Refer to Technical	
 7.2 (continued) INSTRUCTIONS CONTINGENCY ACTIONS 2. (continued) 0. Refer to Technical 0. Refer to Technical 0. Refer to Technical 	
INSTRUCTIONS CONTINGENCY ACTIONS 2. (continued) 2. (continued) 0. Refer to Technical	
 2. (continued) 2. (continued) O. Refer to Technical Our selficitions to oppure 	
O. Refer to Technical	
compliance with all applicable actions.	
P. Evaluate the need to perform a plant shutdown and/or cooldown.	
Q. <u>If</u> a plant shutdown is desired, <u>Then</u> perform a plant shutdown per Operating Procedure 2-0030125, "Turbine Shutdown - Full Load to Zero Load."	
R. If a plant cooldown is desired, <u>Then</u> perform a plant cooldown per Operating Procedure 2-0030127, "Reactor Plant Cooldown - Hot Standby to Cold Shutdown."	

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18A DURE NO.: EOP-03 DPERATOF	LOSS OF COOI ST. LUC <u>ACTIONS</u> : (continued)	LANT		6 of 79
DURE NO.: EOP-03 DPERATOF	ST. LUC <u>ACTIONS</u> : (continued)		IIT 2	0079
EOP-03 DPERATOF	ST. LUC <u>ACTIONS</u> : (continued)	IE UN	IIT 2	
OPERATOF	ACTIONS: (continued)			<u></u>
INST				
	RUCTIONS		CONTINGENCY ACTIONS	,
5. <u>If</u> press than 17 pressure <u>Then</u> ve	urizer pressure is less 36 psia or containment e greater than 3.5 psig, erify SIAS has actuated.	5.	If SIAS does NOT occ automatically, <u>Then</u> m initiate SIAS.	cur nanually
6. Ensure injectior the RCS A. Safe Figu Flow	maximum safety and charging flow to by: ty injection flow per re 2, "Safety Injection vs. RCS Pressure."	6.	If safety injection flow per Figure 2, "Safety Flow vs. RCS Pressurverify SIAS per Table Injection Actuation Sig	is NOT Injection re", <u>Then</u> 1, "Safety gnal."
B. All a oper	AND vailable charging pumps rating.			
7. <u>If</u> press less tha SIAS, <u>1</u> the folk	urizer pressure lowers to in 1300 psia following <u>Then</u> PERFORM ALL of owing:	7.	If pressurizer pressuring less than 1300 psia, operation may continu- provided CCW flow h been lost for greater t	e is NOT <u>Then</u> RCP Je as NOT than 10
A. STC B. <u>If</u> th than 4 Re	P 1 RCP in each loop. e RCS subcooling is less 20°F, <u>Then</u> STOP ALL CPs.		minutes.	
(Continued	d on Next Page)			
6	 than 173 pressure <u>Then</u> version the <u>RCS</u> Ensure injection the <u>RCS</u> A. Safe Figu Flow B. All a oper If press less that SIAS, <u>T</u> the follo A. STC B. <u>If</u> the than 4 RO 	 than 1736 psia or containment pressure greater than 3.5 psig, <u>Then</u> verify SIAS has actuated. Ensure maximum safety injection and charging flow to the RCS by: A. Safety injection flow per Figure 2, "Safety Injection Flow vs. RCS Pressure." AND B. All available charging pumps operating. If pressurizer pressure lowers to less than 1300 psia following SIAS, <u>Then</u> PERFORM ALL of the following: A. STOP 1 RCP in each loop. B. If the RCS subcooling is less than 20°F, <u>Then</u> STOP ALL 4 RCPs. 	 than 1736 psia or containment pressure greater than 3.5 psig, Then verify SIAS has actuated. Ensure maximum safety (a. Ensure maximum safety (b. Ensure 2, "Safety Injection Flow vs. RCS Pressure." (AND) B. All available charging pumps operating. A. If pressurizer pressure lowers to pressure lowers to (a. Ensure 1300 psia following SIAS, Then PERFORM ALL of the following: A. STOP 1 RCP in each loop. B. If the RCS subcooling is less than 20°F, Then STOP ALL 4 RCPs. 	 than 1736 psia or containment pressure greater than 3.5 psig, Then verify SIAS has actuated. Ensure maximum safety injection and charging flow to the RCS by: A. Safety injection flow per Figure 2, "Safety Injection Flow vs. RCS Pressure." AND B. All available charging pumps operating. 7. If pressurizer pressure lowers to less than 1300 psia following SIAS, Then PERFORM ALL of the following: A. STOP 1 RCP in each loop. B. If the RCS subcooling is less than 20°F, Then STOP ALL 4 RCPs. 7. If the RCS subcooling is less than 20°F, Then STOP ALL 4 RCPs. 6. If safety injection flow per Figure 2, "Safety Injection flow vs. RCS Pressure verify SIAS per Table Injection Actuation Signation actuation Signation actuation Signation actuation Signation actuation signation actuation actu

EVISION NO .:	PROCEDUF	RE TITLE:		I AGE.
18A		LOSS OF COOLANT	ACCIDENT	60 4 70
BOCEDURE NO.:				69 01 /9
	NIT 2			
2-EOP-03			Υ Δ	<u> </u>
	SAI	ETY FUNCTION STAT (Page 4 of	12)	
		3. RCS INVENTOR		
SAFET	Y		CHECK	l
FUNCT		UNITERIA		
A. LOCA is N	<u>OT</u> Isolat	ed	1	
		A 11		
Charging F	umps	All available operating <u>or</u> HPSI throttling criteria met.	AND	
		Injection flow per		
Satety Inje Pumps	CIION	Figure 2, "Safety Injection Flow vs. RCS Pressure" <u>or</u> HPSI throttling criteria met.	OR	
		RAS with at least one HPSI pump oper	rating.	
			AND	
Reactor V Level (pag QSPDS).	essel ge 212,	Core covered (Sensors 7 and 8 covered).	OR	
Represen CET temp	tative perature	NOT superheated		
		Ų	,	
		(Continued o	n Next Page)	



Step #:		T		
Step Description	:	Modification	to	IC
Delay Time :		0:00:00		
Mode :		Regular		
InitialState :		Triggered		

INSTRUCTION	TYPE	DEMANDED VALUE	RAMP	DELAY TIME
1 TAF4D01P - F4_2_20212 BREAKER POS	ITION P REM	3	1 1 1 1	
2 TAQ5AIS1 - Q5_2A_EG SS-ISOL-1 ELEC	T GOVER REM	0		
3 TAQ5AIS2 - Q5_2A_VR SS-ISOL-2 VOLT	REGULA REM	0		
4 TAQ5AIS3 - Q5_2A_EG SS-ISOL-3 HYD	GOVERN REM	0		
5 TAQ5072P - Q5_2_20211 2A3-11 BKR POSI	TION REM	3		
6 TFQ5AA52 - Q5_LOA 2A OVERSPEED TRI	P MALF	TRUE		
7 TAMH3411 - MH_V3411 PORT AREA (NORM.)	REM	0.0		





Step #: Step Description :	2 SWAP DEAD	DEH	CPU	Dies,	Manual,	Plus	2в	HDP	Trip	+2	mins
Delay Time : Mode : InitialState :	0:00:00 Regular Pending										

INSTRUCTION	TYPE	DEMANDED VALUE	RAMP TIME	DELAY TIME
1 TCU2DEAD - UH_DEH F2000 COMPUTER DEAD	REM	TRUE		
2 TVDDPBFB - FA HTR DRP_2B BEARING FRICTION	MALF	1.000		0:02:00





Step #:	3
Step Description :	PTX HIGH PT-1110X Drifts High
Delay Time :	0:00:00
Mode :	Regular
InitialState :	Pending

INSTRUCTION		TYPE	DEMANDED VALUE	RAMP TIME	DELAY TIME
1 TVH1M45G - H1_P1100X	DRIFT INCREMENT	MALF	0.200		





INSTRUCTION			TYPE	DEMANDED VALUE	RAMP TIME	DELAY TIME
1 TVF1S16N - SB_L9011	LE-9011	LEVEL SENSOR N	MALF	0.200	0:04:00	
2 TVF1S16N - SB_L9011	LE-9011	LEVEL SENSOR N	MALF	0.400	0:01:00	0:04:03
3 TVF1S16N - SB_L9011	LE-9011	LEVEL SENSOR N	MALF	0.200	0:01:00	0:07:00
4 TVF1S16N - SB_L9011	LE-9011	LEVEL SENSOR N	MALF	0.100		0:08:00





6

Step #:5Step Description :LEG GONE -- 6 Pzr Instruments Fail in response to Leg Tap FailureDelay Time :0:00:00Mode :RegularInitialState :Pending

DELAY RAMP DEMANDED VALUE TYPE INSTRUCTION TIME TIME FAIL HIGH MALFUNCTION MALF TRUE 1 TFH1M15B - H1_L1105 2 TFH1M16B - H1_LT1110X FAIL HIGH MALFUNCTION TRUE MALF MALF TRUE 3 TFH1M45C - H1_P1100X FAIL LOW MALFUNCTION TRUE 4 TFH1M47C - H1_P1102A FAIL LOW MALFUNCTION MALF TRUE FAIL LOW MALFUNCTION MALF 5 TFH1M51C - H1_P1103 TRUE FAIL LOW MALFUNCTION MALF 6 TFH1M56C - H1_P1108 0:05:00 0.100 7 TAHPTOPC - HP_LVPRZRHD PRESS. TOP LEAK REM


"Lesson-Plan"

Step #: Step Description : Delay Time : Mode : InitialState :	6 BIG LOCA 0:00:00 Regular Pending	Penetration	Fails,	200	GPM	LOCA
TILT 0 T 0 T 0 T 0 T 0 T 0 T 0 T 0 T 0 T 0	•					

INSTRUCTION	TYPE	DEMANDED VALUE	RAMP TIME	DELAY TIME
1 TAHPTOPC - HP_LVPRZRHD PRESS. TOP LEAK	REM	0.750		





Step #:7Step Description :LOOP - Automatic LOOP on Plant TripStep Condition :A1_A1_A1SI5_2Delay Time :0:00:00Mode :RegularInitialState :Triggered

	INSTRUCTION					TYPE	DEMANDED VALUE	RAMP TIME	DELAY TIME
1	TFP8D1ET - P8_52_1E	FAIL 7	RIP			MALF	TRUE		
2	TFP8D1MT - P8_52_1M	FAIL 7	TRIP			MALF	TRUE		
3	TFP8L09F - P8_IDA	FAULT (ON MIDWAY	LINE	#1	MALF	TRUE		
4	TFP8L10F - P8_IDA	FAULT (ON MIDWAY	LINE	#2	MALF	TRUE		
5	TFP8L11F - P8_IDA	FAULT (ON MIDWAY	LINE	#3	MALF	TRUE		
6	TAKFPU1 - KF_IDA PR	ESSURE (OF IAS OF	UNIT	1	REM	60.000	0:11:00	





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Step #: 8	" 2B-HPST after few minutes of Operation
Step Description : HPSI DIE (Auto) "Air-Binds	ZD-mibi dicci icu ministra i
Step Condition : a206_a1_ds132_1	
Delay Time : 0:01:00	
Mode · Regular	
Triggered	

	ΨYPE	DEMANDED VALUE	RAMP	DELAY
INSTRUCTION			TIME	TIME

1 TFMVMS2 - MH_HPSIPUMP2B HPSI MTR 2B SHEARED MALF TRUE







Step #:9Step Description :HPSI BACK -- Restore NPSH to the 2B HPSI PumpDelay Time :0:00:00Mode :RegularInitialState :Pending

INSTRUCTION	TYPE	DEMANDED VALUE	RAMP TIME	DELAY TIME
1 TFMVMS2 - MH_HPSIPUMP2B HPSI MTR 2B SHEARED	MALF	FALSE		
2 TAMH3411 - MH V3411 PORT AREA (NORM.)	REM	1.000	0:00:20	





Step #: Step Description : Delay Time : Mode :	10 AB AIR 0:00:00 Regular	NPO	Aligns	Emergency	Cooling	to	A&B	Inst	Air	Comp
InitialState :	Pending									

	INSTRUCTION	TYPE	DEMANDED VALUE	RAMP TIME	DELAY TIME
1	TAKFV109 - KF_V18109 2A AFTERCOOLER OUTLET	REM	1.000		
2	TAKFV118 - KF_V18118 2B AFTERCOOLER OUTLET	REM	1.000		
3	TCK5PB10 - KF_LOA PB-1/START OF COOLING FAN	REM	TRUE		
4	TCK5PB30 - KF_LOA PB-3/START OF RECIRC PUMP	REM	TRUE		
5	TAK5CS1 - KF_LOA CS-593-1 COMPR 2A CONT SW R	REM	1.		0:00:30
6	TAK5CS2 - KF_LOA CS-594-1 COMPR 2B CONT SW R	REM	2		0:00:15
7	TAKEV660 - KE V 18660 PORT AREA	REM	0.0		



"Lesson-Plan"



Step #:11Step Description :ESSENT -- SNPO Resets Non-Essential Loads BreakersDelay Time :0:00:00Mode :RegularInitialState :Pending

	INSTRUCTION			TYPE	DEMANDED VALUE	RAMP TIME	DELAY TIME
1	tce3e30p - E3_LOA	MCC 2A5 NIE	CONTACTOR PB	REM	TRUE		
2	TCE3E31P - E3_LOA	MCC 2A6 NIE	CONTACTOR PB	REM	TRUE		0:00:45
3	TCE3E32P - E3_LOA	MCC 2A8 NIE	CONTACTOR PB	REM	TRUE		0:04:00
4	TCE3E33P - E3_LOA	MCC 2BC NIE	CONTACTOR PB	REM	TRUE		0:01:30
5	5 TCE3E34P - E3_LOA	MCC 2B6 NIE	CONTACTOR PB	REM	TRUE		0:02:00
e	5 TCE3E35P - E3_LOA	MCC 2B8 NIE	CONTACTOR PB	REM	TRUE		0:04:10

Facility: St. Lucie

Scenario No.: 2

Objectives: To evaluate the students ability to implement the ONOPs for various instrument and component failures; perform a normal plant power reduction; and to execute the EOPs for an Excess Steam Demand combined with loss of two of three Auxiliary Feedwater Pumps and total loss of Instrument Air.

Initial Conditions: Unit 2 is at 100% power MOC

Turnover: The plant is operating at 100% power, MOC. The 2B Main Feedwater Pump has developed a crack in an oil line and is leaking approximately .3 GPM. Maintenance is standing by and adding oil as needed. Management is in the process of evaluating the problem and will make a decision within the next hour whether or not to reduce power and repair the leak. 2B Auxiliary Feedwater Pump is out of service for bearing replacement, not expected back this shift. The Steam Jet Air Ejector Radiation Monitor is out of service, not expected back this shift. Chemistry reports a .5 GPD tube leak in the 2A Steam Generator. Severe thunderstorms have been forcasted for St. Lucie and Martin counties. Instructions to the shift are to maintain 100% power.

Preexisting Malfunctions:

2C Auxiliary Feedwater pump trips 10 minutes after AFAS actuation. HCV-09-1A and HCV-09-1B fail to close on AFAS/MSIS

Event No.	Malf. No.	Event Type*	Event Description
1	1	C-BOP	PCV-8801 (Steam bypass control valve) drifts open
2	0	R-RO N-BOP N-RO	Power reduction to 45% Place Pressurizer on Recirc Start Second Charging Pump
3	3	C-RO	LCV-2110P (pressurizer level control valve) fails open, V2515 does not close automatically on high temperature*, (*High Temp may not reach setpoint, may be transparent, not counted)
4	0	N-BOP	Restoration of charging and letdown
4	0	L-BO	HIC-1100 (pressurizer spray controller) input fails high
6	4	I-BOP	PT-10-8 (condenser vacuum pressure transmitter) sensing line
7	5	M-RO M-BOP	Reactor trip on loss of vacuum, V-8201 and V-8202 (2A S/G main steam safety valves) stick fully open on the reactor trip
8	6	C	Loss of instrument air on reactor trip, Loss of CCW to RCPs, all 4 must be secured in 10 minutes
9	7	с	2C Auxiliary Feedwater pump trips 10 minutes after AFAS
		(l)not	rument (C)omponent (M)ajor

(N)ormal, (H)eactivity, (I)nstrument,

Appendix D		Operator Actions	Form ES-I					
Op-Test N	lo.:1	Scenario No.: 2 Event No.: 1 Page 2 of 10						
Event Des	scription: (Ex	PCV-8801 (Steam bypass control valve) drifts open aminer must cue trigger)						
Time	Position	Applicant's Actions or Behavior						
	BOP	Recognizes reactor power increasing						
		Recognizes RCS temperature decreasing						
		Notifies SRO that a transient may be taking place						
		Notifies NPO to investigate for a steam leak						
		Operates DEH to reduce turbine power to reduce rea	actor power					
		Directs NPO to manually isolate PCV-8801						
	BO	Recognizes reactor power increasing						
		Recognizes RCS temperature decreasing						
		Assists BOP in investigation of event						
		Monitors plant parameters while transient in progres	S					
<u> </u>	SRO	Recognizes reactor power increasing (may exceed	Г.S					
		Recognizes RCS temperature decreasing						
		Directs BOP to reduce reactor power by operation o	f DEH					
		Directs the isolation of PCV-8801						
		Notifies I&C or RMS of the event						
		Notifies Management of the event						

Appendix D		C	Form ES-					
Op-Test No.: 1		Scenario No.: 2 Power decrease fro	Page 3 of 10					
Time	Position		Applicant's Actions or B	ehavior				
BOP		Refers to appro	priate procedure for decrease	of turbine and reactor Full Load to Zero Load"				
		Operates DEH	to decrease turbine load					
		Monitors secon	dary parameters during power	change				
RO		Places pressur Guidelines duri	Places pressurizer on recirc IAW NOP-2-0030123, "Reactor Operating Guidelines during Steady State and Load Changes"					
		Starts second	Starts second Charging Pump					
		Operates CVC	Operates CVCS to decrease RCS temperature					
		Operates contr	Operates control rods to maintain ASI to curve					
······································		Remains cogn	izant of RCS parameters durin	g power increase				
	SRO	Performs shift	brief prior to power decrease					
		Directs RO to pump	place pressurizer on recirc and	d start additional charging				
		Directs RO to	maintain ASI to curve					
		Directs RO to	decrease RCS temperature by	CVCS addition				
		Directs BOP to	o decrease turbine power by D	EH				
		Notifies System	n of impending power decreas	Se				

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Appendix D Op-Test No.: 1 Event Description:		Operator Actions	Form ES-D
		CV-2110P (pressurizer level control valve) fails open. V2515 Hi-Temp nterlock is disabled to ensure Letdown will not automatically isolate if hi-temp setpoint is reached. (should be transparent) (Examiner must cue trigger)	
Time	Position	Behavior	
	RO	Recognizes letdown flow increasing (if annu annunciator summary)	nciator comes in, use of the
		Identifies LCV-2110 open	
		Recognizes High Letdown Flow. Pressurizer	level lowering
		Manually Isolates Letdown and secures cha Secures boration (if not already done)	rging
		Monitors plant parameters after transient oc	curs
	BOP	Recognizes loss of Letdown and Charging	
		Refers to ONOP 2-0210030, "Charging and	Letdown"
		Secures turbine decrease (if not already do	ne)
		Assists RO in monitoring plant parameters a	after transient occurs

Op-Test No.:1 Event Description:		Scenario No.: 2 LCV-2110P (pressuinterlock is disabled setpoint is reached. trigger)	Event No.: 3 Irizer level control valve) fails op I to ensure Letdown will not auto (should be transparent)	Page 6 of 10 pen. V2515 Hi-Temp pmatically isolate if hi-temp (Examiner must cue			
Time	Position		Applicant's Actions or Bel	havior			
	SRO	Recognizes loss	s of Letdown and Charging				
		Refers to ONOF	Refers to ONOP 2-0210030, "Charging and Letdown"				
l		Directs RO and	Directs RO and BOP to secure power decrease (if not already done)				
		Notifies I&C Su	pervisor				
	<u> </u>	Notifies plant m	Notifies plant management				

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ppendix D)	Operator Actions	Form ES-D
Op-Test N	No.:1 Sce	cenario No.: 2 Event No.: 4 Page 7 d	
Event De	scription: F	estoration of charging and letdow	n
Time	Position	Applicant	s Actions or Behavior
	BOP	Restores charging and letdown Letdown"	IAW ONOP 2-0210030, "Charging and
	RO	Monitors plant parameters while taking place	e restoration of charging and letdown is
	SRO	Works with BOP as procedure restoration of charging and letd	reader or in a position of oversight while lown is taking place

ppendix D)	Operator Actions	Form ES-D
Op-Test No.:1 Event Description:		cenario No.: 2 Event No.: 5 Pa	age 4 of 10
		HIC-1100 (pressurizer spray controller) input fails high Examiner must cue trigger)	
Time	Position	Applicant's Actions or Behavior	<u> </u>
	RO	Recognizes RCS pressure decreasing (if alarm comes in fire annunciator summary)	st, use of
		Recognizes pressurizer spray valves are open	
		Recognizes HIC-1100 output has failed high	
		Places HIC-1100 in manual	
		Controls RCS pressure by manual control of heaters and sp	orays
		Restores RCS pressure to normal value (2250 psia)	
		Stops boration (optional)	
	BOP	Refers to ONOP 2-0120035, "Pressurizer Pressure and Lev Monitors plant parameters during transient	vel"
		Stops turbine decrease (optional)	
	SBO	Recognizes HIC-1100 has failed high	
		Refers to ONOP 2-0120035, "Pressurizer Pressure and Le	vel"
		Directs RO to control pressurizer pressure by manual control and sprays	rol of heaters
		Consults Tech Spec 3.2.5 (RCS pressure limit / DNB)	
		Directs RO to restore RCS pressure to normal value (2250	psia)
		Directs RO and BOP to secure power decrease (optional)	
	_	Notifies I&C or RMS	
		Notifies Plant Management	

	Ap	pendix D
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Operator Actions

lo.:1 So	enario No.: 2 Event No.: 6	
cription: P	-10-8 (condenser vacuum pressure t (Examiner must cue trigger)	ransmitter) sensing line failure,
Position	Applicant's Ac	ctions or Behavior
BOP	Recognizes condenser vacuum is d use of the annunciator summary)	lecreasing (if annunciator comes in,
	Operates DEH to perform rapid dov	wnpower as directed by SRO
	Notifies SRO of actual condenser b rapid downpower.	ackpressure values during execution
	Ensures condenser backpressure c above 30% power.	does not exceed 5.5" HG with unit
	Trips reactor and turbine when con	denser backpressure reaches 5.5" H
RO	Recognizes condenser vacuum is o	decreasing
	Operates CVCS to perform rapid d	ownpwer as directed by SRO
	Monitors plant parameters with tran	nsient in progress
	Trips reactor when condenser back	kpressure reaches 5.5" HG
SPO	Becognizes condenser vacuum is	decreasing
350	Deferente ONOR 2-0610031 "Loss	s of Condenser Vacuum"
	Directs RO and BOP to perform a	rapid downpower IAW 2-ONP-22.01,
	Bemains cognizant of condenser to	backpressure values during transient
	Ensures condenser backpressure	does not exceed 5.5" HG with unit
	Directs RO and BOP to trip the rea	actor and turbine when condenser
	Io.:1 Sc acription: PT Indenser vacuum Position BOP RO SRO	0.:1 Scenario No.: 2 Event No.: 6 cription: PT-10-8 (condenser vacuum pressure to indenser vacuum (Examiner must cue trigger) Position Applicant's Action BOP Recognizes condenser vacuum is couse of the annunciator summary) Operates DEH to perform rapid dow Notifies SRO of actual condenser to rapid downpower. Ensures condenser backpressure of above 30% power. Trips reactor and turbine when condenser vacuum is complete to perform rapid downpower. RO Recognizes condenser vacuum is condenser backpressure of above 30% power. Trips reactor and turbine when condenser vacuum is complete to perform rapid downpower. Operates CVCS to perform rapid downpower. RO Recognizes condenser vacuum is complete to perform rapid downpower. Operates CVCS to perform rapid downpower. RO Recognizes condenser vacuum is complete to perform rapid downpower. Operates CVCS to perform rapid downpower. RO Recognizes condenser vacuum is complete to perform rapid downpower. Directs RO and BOP to perform an Rapid Downpower. SRO Recognizes condenser vacuum is complete to perform a Rapid Downpower. Ensures condenser backpressure above 30% power. Directs RO and BOP to perform a Rapid Downpower. Ensures condenser backpressure above 30% power.

ppendix D)	Operator Actions	Form ES-D	
Op-Test № Event De	No.:1 Scena scription: R sa fa of R	rio No.: 2 Event No.: 7 eactor trip on loss of vacuum, V-8201 and V-820 fety valves) stick fully open on the reactor trip, N il to close on AFAS/MSIS. Complete Loss of Ins Turbine Header. Loss of Instrument Air causes CPs	Page 9 of 10 02 (2A S/G main steam Main Feed isolation valves strument Air due to rupture loss of CCW to running	
Time	Position	Applicant's Actions or Be	ehavior	
	RO	Perform systematic board walkdown		
		Perform Standard Post Trip actions (2-EOP-1)	
		Recognizes Loss of Instrument Air and Loss of RCP CCW		
		Throttle AFW flow after actuation, recognize 2	C pump Trips	
		Contact NPO to investigate 2C AFW pump tri Emergency Borate per ONP 2-ONP-2.02 if dir Stop 1 BCP prior to 500 °F Tc	p rected	
Critical Task		Stop all BCPs 10 minutes after Loss of all CC	W	
	Critical Task	Stabilize RCS temperature after 2A Steam Ge	enerator blows dry	
	BOP	Perform systematic board walkdown		
		Perform Standard Post Trip actions (2-EOP-1)	
		Report all safety function status to SRO		
		Perform Safety function Status checks for 2-E Demand or 2-EOP-15, "Functional Recovery"	EOP-5, "Excess Steam (if STA is unavailable)	
		Recognize HCV-09-1A and HCV-09-1B fail to	close on AFAS/MSIS	
		Manually closes HCV-09-1A and HCV-09-1B		
		Recognize 2C AFW trips		
		Refers to 2-NOP-09.02, "Auxiliary Feedwater	39	
		Recognize no AFW flow to either steam gene	erator	
	Critical Task	Contact NPO to crosstie the A and B auxiliary reestablish flow with 2C AFW pump	y feedwater headers OR	
		Isolates 2A Steam Generator IAW 2-EOP-99	, Appendix R	

St. Lucie 00-301 Date of Exam 2/7-9-00

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	Ope	erator Actions	Form ES-I
No.:1 So	enario No.: 2 Reactor trip on loss of safety valves) stick fu fail to close on AFAS/ of Turbine Header. Lo RCPs	ario No.: 2 Event No.: 7 Page 10 of 10 actor trip on loss of vacuum, V-8201 and V-8202 (2A S/G main steam ety valves) stick fully open on the reactor trip, Main Feed isolation valves to close on AFAS/MSIS. Complete Loss of Instrument Air due to rupture Furbine Header. Loss of Instrument Air causes loss of CCW to running Ps	
Position		Applicant's Actions or B	Behavior
SRO	Directs RO and B	OP to perform systematic b	oard walkdown
	Directs the perform Directs 1 RCP stored Direct Emergency	mance of 2-EOP-1 pped prior to 500 °F Tc. Boration per ONP 2-ONP-2	2.02
	Directs all RCPs s	stopped 10 minutes after Lo	oss of all CCW
	Directs entry into	2-EOP-5, Excess Steam De	emand"
	Directs RO to thro Directs BOP to pe is unavailable)	ottle AFAS after actuation erform safety function status	s checks for 2-EOP-5 (if ST)
	Directs RO to stal Generator blows	bilize RCS temperature and dry	I pressure after 2A Steam
	Recognizes loss	of instrument air	
	Notifies HP to per capability (loss of	form secondary surveys du I/A)	le to loss of sampling
	Recognizes loss	of 2C AFW pump	
	Directs BOP to ca	arry out actions of 2-NOP-0	9.02, "Auxiliary Feedwater"
Critical Task	Directs BOP to co reestablish flow u	rosstie the A and B auxiliary Ising 2C AFW pump	/ feedwater headers OR
	Directs entry into (optional; feed m	2-EOP-15, "Functional Rec ust be restored within 15 mi	covery" upon loss of feedwa inutes)
	Directs BOP to is	olate 2A Steam Generator	IAW 2-EOP-99, Appendix F
<u> </u>			
	lo.:1 Sc scription: Position SRO	Io.:1 Scenario No.: 2 Io.:1 Scenario No.: 2 Scription: Reactor trip on loss of safety valves) stick fur fail to close on AFAS/ of Turbine Header. Lo RCPs Position Directs RO and Br Directs the perform Directs 1 RCP sto Directs all RCPs sto Directs all RCPs sto Directs BOP to perform Directs RO to throphic Directs RO to stal Generator blows of Recognizes loss of Notifies HP to perform capability (loss of Recognizes loss Directs BOP to car Critical Task Directs BOP to car Critical Task Directs BOP to car Directs BOP to	Operator Actions Io.:1 Scenario No.: 2 Event No.: 7 scription: Reactor trip on loss of vacuum, V-8201 and V-82 safety valves) stick fully open on the reactor trip, fail to close on AFAS/MSIS. Complete Loss of In of Turbine Header. Loss of Instrument Air causes RCPs Position Applicant's Actions or E SRO Directs RO and BOP to perform systematic b Directs the performance of 2-EOP-1 Directs 1 RCP stopped prior to 500 °F Tc. Directs all RCPs stopped 10 minutes after Los Directs all RCPs stopped 10 minutes after Los Directs BOP to perform safety function status is unavailable) Directs RO to throttle AFAS after actuation Directs BOP to perform safety function status is unavailable) Directs RO to stabilize RCS temperature and Generator blows dry Recognizes loss of instrument air Notifies HP to perform secondary surveys du capability (loss of I/A) Recognizes loss of 2C AFW pump Directs BOP to carry out actions of 2-NOP-0 Critical Task Directs BOP to crosstie the A and B auxiliary reestablish flow using 2C AFW pump Directs BOP to isolate 2A Steam Generator Directs BOP to isolate 2A Steam Generator

Shift Turnover

- The plant is operating at 100% power MOC.
- 2B Main Feedwater Pump has developed a crack in an oil line and is leaking approximately .3 gpm.
- Maintenance is adding oil as needed.
- Management is evaluating the problem and will make a decision within the next hour whether or not to reduce power and repair the leak.
- 2B Auxiliary Feedwater Pump is out of service for bearing replacement, not expected back this shift.
- The SJAE monitor is out of service, not expected back this shift.
- Chemistry reports a .5 gpd tube leak in the 2A Steam Generator.
- Severe thunderstorms have been forcasted for St. Lucie and Martin counties.
- Instructions to the shift is to maintain 100% power.

NOTE: SEE SCENARIO #1 FOR ADDITIONAL PROCEDURES

	2.03	ST. I					
				11.2			
	ATOF	R ACTIONS					
	INS	TRUCTIONS		CON	TING	ENCY	ACTIONS
1.	<u>lf</u> let <u>The</u> pum	down flow is lost, <u>n</u> STOP the charging ps.					
	Α.	RETURN the charging pump control switches AUTO.	g s to				
2.	<u>lf</u> ch <u>The</u> i	arging flow is lost, ISOLATE letdown.		2.1	ISOL follov	ATE Let	down by the
					А.	CLOS Valve-	E V2515, Stop IC
					В.	CLOSI Contai Valve-	E V-2516, nment Isol IC.
					C. [^]	CLOS Contai Valve-	E V2522, nment Isol OC.
With to RC	Charg P cor	ing and Letdown isolate htrolled bleedoff flow.	NOTE d pressuri	zer leve	el will lo	ower slov	vly due
3.	<u>If</u> ch beer <u>Thei</u> and to m devi	arging and letdown flow n lost, n MAINTAIN Reactor po RCS temperature consta inimize pressurizer level ations.	has wer ant				
4.	VER actic App expe	IFY all applicable automons have occurred. Endix A contains a listing acted automatic actions.	atic 9 of				
	1. 2. With to RC 3. 4.	 If let Therpum A. If ch Ther If ch Ther With Chargetor RCP cor If ch beer Therand to m devia VER actic Appore expension 	 If letdown flow is lost, <u>Then</u> STOP the charging pumps. A. RETURN the charging pump control switches AUTO. If charging flow is lost, <u>Then</u> ISOLATE letdown. With Charging and Letdown isolate to RCP controlled bleedoff flow. If charging and letdown flow been lost, <u>Then</u> MAINTAIN Reactor por and RCS temperature consta to minimize pressurizer level deviations. VERIFY all applicable autom actions have occurred. Appendix A contains a listing expected automatic actions. 	 If letdown flow is lost, <u>Then STOP the charging</u> pumps. A. RETURN the charging pump control switches to AUTO. If charging flow is lost, <u>Then ISOLATE letdown.</u> If charging and Letdown isolated pressuri to RCP controlled bleedoff flow. If charging and letdown flow has been lost, <u>Then MAINTAIN Reactor power</u> and RCS temperature constant to minimize pressurizer level deviations. VERIFY all applicable automatic actions have occurred. Appendix A contains a listing of expected automatic actions. 	 If letdown flow is lost, <u>Then STOP the charging</u> pumps. A. RETURN the charging pump control switches to AUTO. If charging flow is lost, <u>Then ISOLATE letdown</u>. 2.1 1 /ol>	 If letdown flow is lost, <u>Then</u> STOP the charging pumps. A. RETURN the charging pump control switches to AUTO. If charging flow is lost, <u>Then</u> ISOLATE letdown. A. B. C. With Charging and Letdown isolated pressurizer level will lot to RCP controlled bleedoff flow. Intermediate the second pressurizer level will lot to RCP controlled bleedoff flow. If charging and letdown flow has been lost, <u>Then</u> MAINTAIN Reactor power and RCS temperature constant to minimize pressurizer level deviations. VERIFY all applicable automatic actions have occurred. Appendix A contains a listing of expected automatic actions.	 If letdown flow is lost, <u>Then STOP the charging</u> pumps. A. RETURN the charging pump control switches to AUTO. If charging flow is lost, <u>Then ISOLATE letdown</u>. ISOLATE Let following: A. CLOSI Valve- B. CLOSI Contai Valve- C. CLOSI Contai Valve- With Charging and Letdown isolated pressurizer level will lower slow to RCP controlled bleedoff flow. If charging and letdown flow has been lost, <u>Then MAINTAIN Reactor power</u> and RCS temperature constant to minimize pressurizer level deviations. VERIFY all applicable automatic actions have occurred. Appendix A contains a listing of expected automatic actions.

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REVISIO	N NO.:	· · · · ·	PROCEDURE TITLE:		PAGE:			
0			CHARGING AN	D LETDOWN	7 - 1 00			
PROCEDURE NO.:			1		7 of 26			
2-0	ONP-	02.03	ST. LUCIE	ST. LUCIE UNIT 2				
6.0	OPE	RATOF	ACTIONS (continued)					
		INS	TRUCTIONS	CONTINGENCY	ACTIONS			
	5.	§₁ N b	AINTAIN Pressurizer level between 27% and 68%.	5.1 §1 If Pressurize NOT be main between 279 <u>Then</u> BE in a STANDBY w trip breakers 6 hours and SHUTDOWN following 6 h	r level can ntained % and 68%, at least HOT vith the reactor OPEN within in HOT I within the ours.			
	6.	<u>lf</u> ch beer <u>The</u> r	arging and letdown flow has n lost, n DETERMINE the cause.					
	7.	<u>If</u> a c occu <u>Thei</u> refei Spe	charging system leak has urred, <u>n</u> ISOLATE the leak and r to applicable Technical cifications for guidance.					
	8.	<u>If</u> the becc <u>The</u> Alte thro	e normal charging flow path omes unavailable, <u>n</u> REFER TO Appendix B, rnate Charging Flow Path ugh A HPSI Header.					
	9.	<u>lf</u> let <u>The</u> leve char	down is unavailable, n MAINTAIN pressurizer I by temporarily cycling rging pumps.					

	N NO.:		PROCEDURE TITLE:			F	PAGE:
0			CHARGING AND	LETDOW	N		8 of 26
ROCED		:					
2-0	JNP-02	2.03	31. LUCIE				
.0	OPEF	RATOR	ACTIONS (continued)				
		INST	RUCTIONS	CONT	ING	ENCY A	CTIONS
	If one have bindi bindi a sou	e or mo occurre ng) or r ng). If tl urce of v	<u>NOTE</u> re charging pumps have lost p ed. This can result from pumpi upture of a charging pump suc his occurred, the charging pum water to the suction.	umping abi ng the VCT tion accum nps must be	lity, ga dry (l ulator vente	as binding nydrogen (nitrogen ed after re	g may I estoring
	10.	<u>If</u> the bound <u>Then</u> Ventii Pump	charging pumps are gas d, REFER TO Appendix C, ng a Gas Bound Charging).				
	11.	<u>lf</u> cha been <u>Then</u> and le	rging and letdown has lost and can be restored, RE-ESTABLISH charging etdown flow as follows:	11.			
		Α.	ENSURE adequate VCT level is indicated.		A.1	RESTC to a not accorda 2-ONP Boron Concer Control	DRE the VCT rmal level in ance with -02.01, htration
		В.	ENSURE the Level Control Valve selector switch and the Pressure Control Valve selector switch are selected to the level and pressure control valves presently in service.				
		C.	PLACE HIC-1110, Level,				

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REVISIC	ON NO.:		PROCEDURE TITLE:		PAGE:
PROCE			CHARGING A	ND LETDOWN	9 of 26
2-ONP-02.03			ST. LUC	IE UNIT 2	
6.0	OPE	RATOR	ACTIONS (continued)		
		INST	RUCTIONS	CONTINGENCY	ACTIONS
	11.	(contir	nued)		
		D.	ENSURE the Level Control Valves are CLOSED.		
		E.	ENSURE PIC-2201, Pressure controller is in AUTO and set to maintain 150 psig.		
		F.	PLACE the Position Limiter Bypass key switch in the BYPASS position.		
		G.	START one charging pump		
		н.	VERIFY charging flow is indicated.		
		i.	VERIFY the regenerative heat exchanger high temperature alarm, SIAS or CIS alarms are NOT present.		
		J.	OPEN V2515, Stop Valve-IC.		
		К.	OPEN V2516, Containment Isol Valve- IC.		
		L.	OPEN V2522, Containment Isol Valve- OC.		

	0	CHARGING A	ND LETDOW	N 10	10 of 26	
PROCE	EDURE NO.: -ONP-02.03	ST. LUCIE UNIT 2				
6.0	OPERATOR	ACTIONS (continued)				
	INST	RUCTIONS	CONT		ONS	
	11. (contir	nued)	11.			
	···· (••••••					
	If V2515 rec cycle V2515 clear the hig	NO closed due to high letdown t 5 while opening the Level co gh temperature alarm.	E emperature, it ontrol valve un	may be necessary t til flow is adequate t	0 0	
	М.	SLOWLY OPEN the Level Control Valve <u>and</u> ESTABLISH approximately 5 gpm letdown flow.				
	Prolonged	CAU use of charging without letd	rion own could res	ult in the pressurizer		
	Prolonged going solid Charging T than 60°F	<u>CAU</u> use of charging without letd . Pressurizer level must be <u>NO</u> Temp Outlet Regen HX shou per minute.	r <u>ION</u> own could res closely monito TE uld NOT be allo	ult in the pressurizer red. owed to increase mo	ore	
	Prolonged going solid Charging T than 60°F N.	<u>CAUT</u> use of charging without letd . Pressurizer level must be <u>NO</u> Temp Outlet Regen HX shou per minute. <u>WHEN</u> Letdown temperature stabilizes or TIC-2221,Temp Regen Hx Tube Out, <u>Then</u> RAISE letdown flow at a rate NOT to exceed 5 to 10 gpm ove at least a 4 minute period.	r <mark>ION</mark> own could res closely monito TE uld NOT be all N.1	ult in the pressurizer red. owed to increase mo <u>If letdown cannot k</u> restored, <u>Then</u> INITIATE ch as required for res pressurizer level, s injection, or boratio	ore arging storing seal on.	

				15.00F
REVISION I	NO.:	PROCEDURE TITLE:		PAGE:
		CHARGING AND LET DOWN 11 o		
2-ONP-02.03		ST. LUCIE	E UNIT 2	
6.0 (PERATOR	ACTIONS (continued)		
	INS	TRUCTIONS	CONTINGENCY	ACTIONS
1	I 1. (conti	nued)		
	Ρ.	<u>When</u> PZR level is at its setpoint, <u>Then PERFORM</u> the following:		
		1. BALANCE HIC-1110, LEVEL, controller AUTO to MANUAL output signals, using the BIAS control knob while previewing the AUTO signal.		
		2. PLACE HIC-1110, LEVEL, controller to AUTO.		
		 MONITOR pressurizer level for abnormal trends. 		
	Q.	PLACE the Position Limiter Bypass key switch to the NORM position.		
	V2345, LT	CAUT DN CNTL VLV STATION SA	<mark>ION</mark> ∖FETY RELIEF, will open a	t 600 psig.
	R.	SLOWLY RAISE PIC-2201, Pressure, setpoint to 430 psig.		
	S.	ENSURE letdown pressure is being maintained at 430 psig.		

REVISIO	DN NO.:		PROCEDURE TITLE:				Ade.
0			CHARGING AND LETDOWN			12 of 26	
PROCEDURE NO.:		02	ST LUCIE UNIT 2				
2-	ONP-02	.03				<u> </u>	
6.0	OPER	ATOR	ACTIONS (continued)				
		INST	RUCTIONS	(CON	TINGENCY /	ACTIONS
	12.	<u>lf</u> Lete malfu <u>Then</u>	down Level control is Inctioning, PERFORM the following:	12.			
		Α.	VERIFY the output of HIC-1110, LEVEL, is	A.1	PLAC perfo	CE HIC-1110 in rming the follow	MANUAL by wing:
			responding as expected		1	BALANCE H	IC-1110
			to current plant conditions.			MANUAL to controller out previewing a MANUAL con match the ma controller out	AUTO put signals by nd using the ntrol knob to anual and auto tput signals.
					2.	PLACE HIC- MANUAL.	1110 to
					3.	ADJUST leto value consis current plant	down flow to a tent with the conditions.
					4.	PERFORM a walkdown ol leaks or liftir	a system oserving for ig relief valves
		в.	VERIFY the selected level control valve is responding as expected to HIC-1110 output.	B.1	PLA valve with Letd	CE the Alterna e in service in a 2-NOP-02.02, own.	te Level contro accordance Charging and

REVISION NO .:		PROCEDURE TITLE:			PAGE:	
0		CHARGING AND LETDOWN			13 of 26	
DURE NO.:					13 01 20	
ONP-02	.03	ST. LUC		Γ2		
OPER	ATOR	ACTIONS (continued)				
	INST	RUCTIONS		CON		ACTIONS
13.	<u>lf</u> letd malfu <u>Then</u>	own pressure control is nctioning, PERFORM the following:	13.			
	Α.	VERIFY the output of PIC-2201, pressure, is	A.1	PLA perfo	CE PIC-2201 in prming the follow	MANUAL by wing:
		for current plant conditions.		1.	PLACE PIC-2 MANUAL.	2201 to
				2. ADJUST leto to a value co current plant		own pressure nsistent with conditions.
				3.	PERFORM a walkdown ob leaks or lifting	a system serving for g relief valves.
В.	VER contr expe	IFY the selected pressure rol valve is responding as acted to PIC-2201 output.	B.1	PLA Pres in a Cha	CE the Alternat ssure control va ccordance with trging and Letdo	e letdown Ive in service 2-NOP-02.02, own.
	0 DURE NO.: OPER 13.	0 EDURE NO.: ONP-02.03 OPERATOR 13. If letd malfu Then A. B. VER cont expe	0 CHARGING / DURE NO.: ST. LUC ONP-02.03 ST. LUC OPERATOR ACTIONS (continued) INSTRUCTIONS 13. If letdown pressure control is malfunctioning, Then PERFORM the following: A. VERIFY the output of PIC-2201, pressure, is responding as expected for current plant conditions. B. VERIFY the selected pressure control valve is responding as expected to PIC-2201 output.	0 CHARGING AND LET DURE NO:: ST. LUCIE UNIT OPERATOR ACTIONS (continued) INSTRUCTIONS 13. If letdown pressure control is malfunctioning, Then PERFORM the following: 13. A. VERIFY the output of PIC-2201, pressure, is responding as expected for current plant conditions. A.1 B. VERIFY the selected pressure control valve is responding as expected to PIC-2201 output. B.1	0 CHARGING AND LETDOV DDURE NO:: ST. LUCIE UNIT 2 OPERATOR ACTIONS (continued) INSTRUCTIONS CON 13. If letdown pressure control is malfunctioning, Then PERFORM the following: 13. 13. A. VERIFY the output of PIC-2201, pressure, is responding as expected for current plant conditions. A.1 PLA perference 8. VERIFY the selected pressure control valve is responding as expected to PIC-2201 output. B.1 PLA Presin a Character output.	0 CHARGING AND LETDOWN DURE NO:: ST. LUCIE UNIT 2 OPERATOR ACTIONS (continued) INSTRUCTIONS 13. If letdown pressure control is malfunctioning, Then PERFORM the following: 13. A. VERIFY the output of PIC-2201, pressure, is responding as expected for current plant conditions. A.1 PLACE PIC-2201in performing the follow. B. VERIFY the selected pressure control valve is responding as expected to PIC-2201 output. B.1 PLACE the Alternat Pressure control valve is responding as expected to PIC-2201 output.

END OF SECTION 6.0

				PAGE:
NO.:	+		NSER VACUUM	
PROCEDURE NO.:		LOSS OF CONDEN		4 of 11
		OFF-NORMAL OPERA	TING PROCEDURE	
PFRA		ACTIONS:		
<u> </u>	<u> </u>			
. 1 I m	med	liate Operator Actions:		
I	NS'	TRUCTIONS	CONTINGENO ACTIONS	CY
. Ve	rify p	roper SJAE operation.		
. <u>If</u> v deo eje foll	acuu reas ctor(owin	um continues to se, <u>Then</u> place hogging (s) in service per the g:		
Α.	To eje	place 2A hogging ctor in service:		
	1.	Open V08181, Root Valve for Main Steam to Hogging Ejectors.		
	2.	Throttle open V16200, Isol. Valve for Aux. Steam Supply to Hogging Ejector 2A and maintain 200 psig on PI-12-48A.		
	3.	Open V12575, Isol. Valve for Hogging Ejector 2A Inlet from Condensers.		
	4.	Open V12995, 2A/2B Cndsr Crosstie to SJAE/Hogging Ejectors Isol.		
	NO.: 16 RE NO.: <u>10031</u> <u>PERA</u> 1 Im I Ver . <u>If</u> v dec ejeu follo A.	NO.: 16 RE NO.: 10031 PERATOF 1 Immed INS Verify p If vacuu decreas ejector(followin A. To eje 1. 2. 3. 4.	 NO:: IPROCEDURE INTE: LOSS OF CONDENT IOO31 OFF-NORMAL OPERATIONAL OPERATOR ACTIONS: Immediate Operator Actions: INSTRUCTIONS Verify proper SJAE operation. If vacuum continues to decrease, Then place hogging ejector(s) in service per the following: A. To place 2A hogging ejector in service: Open V08181, Root Valve for Main Steam to Hogging Ejectors. Throttle open V16200, Isol. Valve for Aux. Steam Supply to Hogging Ejector 2A and maintain 200 psig on PI-12-48A. Open V12575, Isol. Valve for Hogging Ejector 2A Inlet from Condensers. Open V12995, 2A/2B Cndsr Crosstie to SJAE/Hogging Ejectors Isol. 	NO.: PROCEDURE INTE: 16 LOSS OF CONDENSER VACUUM OFF-NORMAL OPERATING PROCEDURE ST. LUCIE UNIT 2 PERATOR ACTIONS: Immediate Operator Actions: INSTRUCTIONS CONTINGENO 1 Immediate Operator Actions: INSTRUCTIONS CONTINGENO • Verify proper SJAE operation. () • If vacuum continues to decrease, Then place hogging ejector(s) in service per the following: A. To place 2A hogging ejectors. 1. Open V08181, Root Valve for Main Steam to Hogging Ejectors. 2. Throttle open V16200, Isol. Valve for Aux. Steam Supply to Hogging Ejector 2A and maintain 200 psig on PI-12-48A. 3. 3. Open V12575, Isol. Valve for Hogging Ejector 2A and maintain 200 psig on PI-12-48A. 3. Open V12955, 2A/2B Cndsr Crosstile to SJAE/Hogging Ejectors Isol. SJAE/Hogging Ejectors Isol. SJAE/Hogging Ejectors Isol.

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EVISION NO .:	PROCEDURE TITLE:		PAGE:
16	LOSS OF CONDE	NSER VACUUM	5 of 11
ROCEDURE NO.:	OFF-NORMAL OPER	ATING PROCEDURE	5011
2-0610031			
0.0 <u>OPERATO</u>	<u>IR AUTIONS</u> .		
7.1 (contin	nued)		
INS	STRUCTIONS	CONTINGENO ACTIONS	CY
2. (contir	nued)		
A. (c	ontinued)		
5.	When hogging ejector is in service, <u>Then</u> remove SJAE(s) from service per OP 2-0610029, "Condenser Air Removal System Operations."		
B. T ej	o place 2B hogging jector in service:		
1	. Open V08181, Root Valve for Main Steam to Hogging Ejectors.		
2	. Throttle open V16203, Isol. Valve for Aux. Steam Supply to Hogging Ejector 2B and maintain 200 psig on PI-12-48B.		
3	 Open V12576, Isol. Valve for Hogging Ejector 2B Inlet from Condensers. 		
4	 Open V12995, 2A/2B Cndsr Crosstie to SJAE/Hogging Ejectors Isol 		

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REVISI	ON NO.:	PROCEDURE TITLE:	ENSER VACUUM	
				6 of 11
ROCE	LUURE NO.:	OFF-NORMAL OPEF		
2-	0610031	ST. LUC	E UNIT 2	<u> </u>
7.0	<u>OPERATO</u>	<u>DR ACTIONS</u> : (continued)		
	7.1 (conti	nued)		
	2. (conti	nued)		
	B. (0	continued)		
	IN	STRUCTIONS		(
	5	. When hogging ejector is in service, <u>Then</u> remove SJAE(s) from service per OP 2-0610029, "Condenser Air Removal System Operations."		
	7.2 Subs	equent Operator Actions:		
	1. <u>If</u> vac main turbir contr per C Shute Load "Rea	cuum cannot be tained, <u>Then</u> begin a ne/reactor shutdown in a olled manner (≈5%/min.) DP 2-0030125, "Turbine down, Full Load to Zero " and OP 2-0030128, ctor Shutdown."		
	The follo shall NC	<u>N</u> owing are maximum backpre OT be exceeded.	OTE ssure operating requirement	s and
1 1	2. <u>If</u> un less <u>Ther</u> less 3.5 i	it is operating on line at than 30% of rated load, a verify backpressure is than or equal to nches Hg. absolute.	 If backpressure exceed 3.5 inches Hg. absolution than 30% load, while <u>Then</u> immediately trip and carry out 2-EOP- "Standard Post Trip A 	eds ite, at less on line, the unit 01, Actions."



			PAGE:
16	I OSS OF CONDE	NSER VACUUM	
PROCEDURE NO.:	OFF-NORMAL OPERATING PROCEDURE		8 of 11
2-0610031	OB ACTIONS: (continued)		<u> </u>
1.0 OFERAI	<u>orraditorio</u> . (continued)		
7.2 (conti	nued)		
6. (conti	inued)		
IN	STRUCTIONS	CONTINGENC ACTIONS	Y
B. V s 1	/ERIFY each local turbine seal pressure is between I.5 and 5.0 psig.	B.1 <u>If</u> any local turbin pressure is low, PERFORM the f each seal with lo pressure:	ne seal <u>Then</u> ollowing for ow
		 THROTTLE Bypass to n to 5.0 psig. 	PCV naintain 1.5
		 CONTACT troubleshoo 	I&C to t.
		B.2 <u>If</u> any local turbi pressure is high PERFORM the each seal with h pressure:	ne seal , <u>Then</u> following for high
		 CHECK PC operation. 	V for proper
		 <u>If</u> alarming open, <u>Ther</u> PCV inlet. 	PCV is <u>1</u> CLOSE
		 THROTTLE Bypass to to 5.0 psig 	E PCV maintain 1.5
		CONTACT troubleshoe	I&C to ot.



				21	/ša=daga	PAGE:
EVISION NO.	:	I OSS OF CONDE	INSE	Rν	ACUUM	
PROCEDURE NO.:		OFF-NORMAL OPERATING PROCEDURE			10 of 11	
2-06100	031	ST. LUCI	E UN	IT 2		
7.0 <u>OPE</u>	RATC	OR ACTIONS: (continued)				
7.2	(contir	nued)				
	IN	STRUCTIONS			CONTINGENCY ACTIONS	
6.	(cont	tinued)	6.	(co	ntinued)	
	E.	Verify adequate CST inventory and the absence of Iow level annunciator (annunciator G-39).		E.	If CST level is low, isolate make up spra hotwell and begin re CST.	<u>Then</u> ays to efill of
	F.	Verify monitor storage tank levels to be greater than or equal to 10 feet.		F.	If monitor storage ta is less than 10 feet, ensure vacuum drag isolated from that ta	ank level <u>Then</u> g is ank.
	G.	Verify intake screens are free of debris.		G.	Start screen wash p and monitor D/P ind for decreasing trend	oumps dicators d.
	H.	Check condenser areas and connecting systems for leaking or misaligned valves. (Condensate or sweating on piping is indicative of such leakage).				
	Ι.	Verify proper drainage from after-condenser. (At gland steam recovery tank floor drain, V11800)		I.	If drainage is NOT from after-condens contact Mechanica Maintenance to ch SARCO drainer an plug to drain as ne	visible er, <u>Then</u> l eck d remove ecessary.



REVISI	ON NO	D.:	PROCEDURE TITLE:		PAGE:
17		,	LOSS OF INSTRUMEN	TAIR	6 of 20
PROCEDURE NO.: 2-1010030 OFF-NORMAL OF				ROCEDURE	0 01 20
<u>-2-</u> 7.0		EBATC	B ACTIONS: (continued)	•	
1.0			<u>ACTIONS</u> . (continued)		
	7.1	Imme	diate Operator Actions: (continued)		
	3.	(contir	nued)		
		IN	STRUCTIONS	CONTINGENCY ACTIONS	/
		B. O A A	PEN SH18718, Service ir Cross-tie to Instrument ir Isol.		
		C. <u>If</u> h S B Ir r b	the Instrument Air eader is fed from the ervice Air header for reater than 1 hour, <u>Then</u> LOW DOWN the astrument Air header low oint drains hourly to emove oil, water and crud uild-up.		
	4.	<u>If</u> the press 60 ps <u>Then</u>	Instrument Air header ure indicates less than ig <u>and</u> is still lowering, PERFORM the following:		
		А. Т Т	RIP the Reactor and urbine.		
		B. C S A	iO TO 2-EOP-01, standard Post Trip actions.		


			PAGE
VISION NO .:	PROCEDURE TITLE:		
17	LOSS OF IN		8 of 20
OCEDURE NO.:	OFF-NORMAL OPE ST. LU	RATING PROCEDURE	
0 OPERA	TOR ACTIONS: (continued)		
<u> </u>			
7.2 (coi	ntinued)		
1	NETRUCTIONS	CONTINGEN	ICY
•		ACTIONS	6
The a may b opera capab compo	bility to maintain Steam Gene te affected as instrument air p ted valves and instrumentatio ility. Appendix B contains a ponents and their mode of failu	erator levels at full power co pressure degrades below 7 in may lose full range opera partial listing of air operater ure upon loss of air supply.	5 PSIG. Air ating d
75 ne ac OF Sh Lo Pc	psig, <u>Then</u> evaluate the ed to shut down the unit in cordance with 2-0030125, "Turbine utdown Full Load to Zero ad" or 2-EOP-01, "Standard st Trip Actions."		
5. <u>If</u> by to us Sy pr	eedwater regulating 15% pass valves are being used maintain S/G level, <u>Then</u> e of the Auxiliary Feedwater rstem will be required if air essure continues to degrade.		
6. <u>If</u> to "S O	SDC is in service, <u>Then</u> refer ONOP 2-0440030, hutdown Cooling ff-Normal."		

NO: PAGEEDURE ITTLE: LOSS OF INSTRUMENT AIR 9 of 20 2-1010030 OFF-NORMAL OPERATING PROCEDURE 9 of 20 7.0 OPERATOR ACTIONS: (continued) 7.2 (continued) 7.2 (continued) INSTRUCTIONS CONTINGENCY ACTIONS 7.1 If a loss of CCW to the RCP's occurs due to degraded instrument air pressure, Then: A. 1. If CCW cannot be restored to RCP's within 10 minutes, Then: 1. 1. Trip the reactor. 2. 2. Carry out 2-EOP-01, "Standard Post Trip Actions." Standard Post Trip Actions." 8. If instrument air is lost to a feedwater regulating valve, Then take local control of valve as follows: A. A. Line up the hole in the jacking device with the hole in the valve stem. B. 9. Insert the coupling pin. C. C. Use handjack to control valve position as directed by control room personnel.				1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1	
17 LOSS OF INSTRUMENT AIR 9 of 20 PROCEEDURE NO:: OFF-NORMAL OPERATING PROCEDURE ST. LUCIE UNIT 2 7.0 OPERATOR ACTIONS: (continued) 7.2 (continued) INSTRUCTIONS CONTINGENCY ACTIONS 7. If a loss of CCW to the RCP's occurs due to degraded instrument air pressure, Then: A. If CCW cannot be restored to RCP's within 10 minutes, Then: Trip the reactor. Trip the RCP's. Carry out 2-EOP-01, "Standard Post Trip Actions." If instrument air is lost to a feedwater regulating valve, Then take local control of valve as follows: A. Line up the hole in the jacking device with the hole in the valve stem. Insert the coupling pin. Use handjack to control valve position as directed by control room personnel. 	REVISION N	NO.:	PROCEDURE TITLE:		PAGE:
PROCEDURE NO: OFF-NORMAL OPERATING PROCEDURE ST. LUCIE UNIT 2 9 of 20 7.0 OPERATOR ACTIONS: (continued) 7.2 (continued) 7.2 (continued) INSTRUCTIONS CONTINGENCY ACTIONS 7.1 If a loss of CCW to the RCP's occurs due to degraded instrument air pressure, Then: A. If CCW cannot be restored to RCP's within 10 minutes, Then: 1. Trip the reactor. 2. 2. Trip the RCP's. 3. Carry out 2-EOP-01, "Standard Post Trip Actions." 8. If instrument air is lost to a feedwater regulating valve, Then take local control of valve as follows: A. Line up the hole in the jacking device with the hole in the valve stem. B. Insert the coupling pin. C. Use handjack to control valve position as directed by control room personnel.	17		LOSS OF INS	0.06.00	
7.0 OPERATOR ACTIONS: (continued) 7.2 (continued) INSTRUCTIONS CONTINGENCY ACTIONS 7.0 If a loss of CCW to the RCP's occurs due to degraded instrument air pressure, Then: 7.0 If CCW cannot be restored to RCP's within 10 minutes, Then: 1. Trip the reactor. 2. Trip the RCP's. 3. Carry out 2-EOP-01, "Standard Post Trip Actions." 8. If instrument air is lost to a feedwater regulating valve, Then take local control of valve as follows: A. Line up the hole in the jacking device with the hole in the valve stern. B. Insert the coupling pin. C. Use handjack to control valve position as directed by control room personnel.	PROCEDUR	RE NO.:	OFF-NORMAL OPER		9 of 20
 7.2 (continued) 7.2 (continued) 7.2 (continued) 7.3 (continued) 7.4 (continued) 7.5 (continued) 7.6 (control to the RCP's occurs due to degraded instrument air pressure, <u>Then:</u> 7.6 (f CCW cannot be restored to RCP's within 10 minutes, <u>Then:</u> 8.7 (f CCW cannot be restored to RCP's. 9.7 (control to RCP's.) 9.8 (f instrument air is lost to a feedwater regulating valve, <u>Then</u> take local control of valve as follows: 9.4. Line up the hole in the jacking device with the hole in the valve stem. 9.5. Insert the coupling pin. 1.5. Use handjack to control valve position as directed by control room personnel. 	<u>2-101</u>			<u> </u>	
 Y.2 (continued) Y.S.TRUCTIONS S. MARCHARD ACCENT AND ACCENTS OCCURS due to degraded instrument air pressure, Then: A. If CCW cannot be restored to RCP's within 10 minutes, Then: Trip the reactor. Trip the RCP's. Carry out 2-EOP-01, "Standard Post Trip Actions." If instrument air is lost to a feedwater regulating valve, Then take local control of valve as follows: Line up the hole in the jacking device with the hole in the valve stem. Insert the coupling pin. Use handjack to control valve position as directed by control room personnel. 	7.0 <u>OF</u>		<u>IN ACTIONS</u> . (continued)		
 INSTRUCTIONS Structions If a loss of CCW to the RCP's occurs due to degraded instrument air pressure, Then: A. If CCW cannot be restored to RCP's within 10 minutes, Then: Trip the reactor. Trip the RCP's. Carry out 2-EOP-01, "Standard Post Trip Actions." If instrument air is lost to a feedwater regulating valve, Then take local control of valve as follows: A. Line up the hole in the jacking device with the hole in the valve stem. Insert the coupling pin. Use handjack to control valve position as directed by control room personnel. 	7.2	2 (conti	nued)		
 7. If a loss of CCW to the RCP's occurs due to degraded instrument air pressure, <u>Then</u>: A. If CCW cannot be restored to RCP's within 10 minutes, <u>Then</u>: Trip the reactor. Trip the reactor. Trip the RCP's. Carry out 2-EOP-01, "Standard Post Trip Actions." 8. If instrument air is lost to a feedwater regulating valve, <u>Then</u> take local control of valve as follows: Line up the hole in the jacking device with the hole in the valve stem. B. Insert the coupling pin. C. Use handjack to control valve position as directed by control room personnel. 		IN	STRUCTIONS	CONTINGENCY ACTIONS	(
 Actions." 8. If instrument air is lost to a feedwater regulating valve, <u>Then</u> take local control of valve as follows: A. Line up the hole in the jacking device with the hole in the valve stem. B. Insert the coupling pin. C. Use handjack to control valve position as directed by control room personnel. 	7.	<u>If</u> a lo occurs instru A. <u>If</u> re 1 ^r 1 2 3	ss of CCW to the RCP's s due to degraded ment air pressure, <u>Then</u> : CCW cannot be estored to RCP's within 0 minutes, <u>Then</u> : . Trip the reactor. . Trip the RCP's. . Carry out 2-EOP-01, "Standard Post Trip		
	8.	<u>If</u> inst feedw <u>Then</u> valve A. L ja B. Ir C. L	rument air is lost to a vater regulating valve, take local control of as follows: ine up the hole in the acking device with the ole in the valve stem. Insert the coupling pin. Use handjack to control valve position as directed by control room personnel.		

				PAGE:
REVISION NO.: 17		I OSS OF INST	RUMENT AIR	
			10 of 20	
FRUCEDURE		OFF-NORMAL OPER		
2-1010				
7.0 <u>OPE</u>	RAIC	<u>DR ACTIONS</u> . (continued)		
7.2	(contir	nued)		
	IN	STRUCTIONS	CONTINGENC ACTIONS	Y
9.	<u>If</u> letd	own isolates, <u>Then</u> :		
	A. S n ir p e	ecure charging unless eeded for RCP seal njection, or restoring ressurizer level, or for mergency boration.		
	B. F fe v v u	Place the control switches or letdown isolation valves V2515, V2516, /2522 to close to prevent uncontrolled restoration of etdown.		
10.	<u>If</u> SB contr atmo	CS was being used, <u>Then</u> ol RCS heat removal by spheric dump valves.		
11.	Refe listing may instru	r to Appendix B for a g of critical valves that fail with a loss of ument air.		

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ST. LUCIE UNIT 2

OFF-NORMAL OPERATING PROCEDURE

SAFETY RELATED

Procedure No.

2-ONP-02.02

Current Revision No.

2

Effective Date 11/11/99

Title:

EMERGENCY BORATION

Responsible Department: **OPERATIONS**

REVISION SUMMARY:

REVISION 2 – Added guidance for emergency boration from RWT contingency. (M. Gilmore, 11/02/99)

REVISION 1 – Changed entry conditions to reflect emergency boration while in Modes 3 and 4 without a reactor trip. (Gene Boyd, 10/05/99)

REVISION 0 – *Previously issued as 2-0250030.* This procedure provides more detailed direction and an easier to read format. Section 2.0 Included Tech Spec sections and headings and Included UFSAR section numbers and headings. Section 6.0 added the correct equipment nomenclature to all pumps and valves that are operated in this procedure. The purpose of this procedure is to provide instructions to inject concentrated boric acid solution into the Reactor Coolant System via the charging pumps. (Charlie Simpkins, 03/02/99)

Revision 0	FRG Review Date 03/02/99	Approved By R. G. West	Approval Date 03/02/99	DATE	5_2_OPS
<u></u>		Plant General Manager		DOCT	PROCEDURE
Revision	FRG Review Date	Approved By	Approval Date	DOCN	2-ONP-02.02
2	11/02/99	R. G. West	11/02/99	SYS	
<u></u>		Plant General Manager		СОМ	COMPLETED
		N/A		ITM	2
		Designated Approver			

REVISION NO .:	PROCEDURE TITLE:	PAGE:
2	EMERGENCY BORATION	2 of 9
PROCEDURE NO.:	ST. LUCIE UNIT 2	
SECTION	TABLE OF CONTENTS	PAGE
1.0 PURPOSE		3 3
2.0 REFERENCES	QUIRED	4
4.0 ENTRY COND	DITIONS	4
5.0 EXIT CONDIT	IONS	4
6.0 OPERATOR A	CTIONS	5

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REVIS	ON NO.:	PROCEDURE TITLE:	PAGE:					
	2	EMERGENCY BORATION	3 of					
PROCI								
2		ST. LOUIE UNIT 2	_					
1.0	FURFUSE							
1.1	The purpose of acid solution in	of this procedure is to provide instructions to inject connect the Reactor Coolant System (RCS) via the charg	ing pumps.					
2.0	REFERENCE	S						
	One or more	NOTE of the following symbols may be used in this proced	lure:					
	§ Indicates Conditio shall NC General	s a Regulatory commitment made by Technical Spec n of License, Audit, LER, Bulletin, Operating Experie T be revised without Facility Review Group review a Manager approval.	vifications, ence, etc. and nd Plant					
	Indicates a management directive, vendor recommendation, plant practice or other non-regulatory commitment that should NOT be revised without consultation with the plant staff.							
	Ψ Indicates a step that requires a sign off on an attachment.							
2.1	Technical Specifications							
	Section 3.	1.2.1 Boration Flow Paths Modes 5 and 6.						
	Section 3.	1.2.2 Boration Flow Paths Modes 1 thru 4.						
2.2	Updated Final Safety Analysis Report (UFSAR)							
	 Section 7.4 Systems Required for Safe Shutdown. 							
	Section 7.4.1.2 CVCS Boron Addition.							
	Section 9.3.4 Chemical and Volume Control System							
2.3	Management Directives and Regulatory Commitments							
	 ¶1 CR 98-1016, 1A Boric Acid Makeup Pump Trip (PM 98-08-069) 							
	• ¶ ₂ CR 99-0952							
2.4	Procedures							
I	C.E. Emergency Procedure F-EP-11							

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2		у О	EMERGENCY BORATION	4 of 9
PROCE	EDURE	NO.:		4013
2.	-ONF	P-02.02	ST. LUCIE UNIT 2	
3.0	REC	CORDS RE	EQUIRED	
3.1	Nor	mal Log Er	ntries.	
4.0	EN⁻		DITIONS	
ANY	of th	ne Followir	ng Conditions exist:	
4.1	¶2	Unanticip trip or in I	ated or uncontrolled RCS cooldown in Modes 1 & 2 foll Modes 3 & 4 as indicated by:	owing a reacto
	1.	Uncontrol	led decrease in RCS temperature.	
	2.	Uncontrol	led decrease in pressurizer pressure or level.	
	3.	Uncontrol	led decrease in secondary steam pressure.	
4.2	Un	explained o	or uncontrolled reactivity increase as indicated by:	
	1.	Abnormal	increase in RCS temperature or Reactor power.	
	2.	Abnormal	I increase in Reactor power or count rate when shut dow	wn.
4.3	Lo	ss of shutd	own margin due to excessive CEA insertion as indicate	d by:
	1.	Power de	ependent insertion alarm (DDPS).	
	2.	Power de	ependent insertion alarm (ADS).	
4.4	Мо	ore than on	e CEA NOT fully inserted following a Reactor Trip as in	dicated by:
	1.	The CEA fully inse	Lower Electrical Limit lights (green) indicate more than rted.	one CEA NO
	2.	The CEA	Bottom lights (amber) indicate more than one CEA NC	T fully inserted
	3.	ADS Dis	play indicates more than one CEA NOT fully inserted.	
5.0	E>		ITIONS	
5.1	R	CS cooldov	wn and/or reactivity excursion has been terminated.	
			AND	
5.2	2 SI	nutdown m	argin has been restored to greater than 5000 PCM.	

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REVISION NO .:	PROCEDURE TITLE:			PAGE:
2	EMERGENC	Y BORATION		5 of 9
PROCEDURE NO.: 2-ONIP-02 02	ST LUC	E UNIT 2		
	CTIONS			<u></u>
	PLICTIONS	CONTIN	GENCY	
11131	RUCTIONS	CONTIN		
1. ¶ ₁ PLACE Selecte	E the Makeup Mode or switch in MANUAL.			
2. ENSURE Control V	V2525, Boron Load alve, is CLOSED.			
3. START 2.	A or 2B BA Pump.			
4. CLOSE V Valve	2650, Tank 2A Recirc.			
5. CLOSE V Valve.	2651, Tank 2B Recirc			
6. OPEN V2	514, Emergency Borate.	6.		
		A. [l <u>f</u> V2514 fai PERFORM	ls to open, the following:
			1. OPEN Gravity	√2508, BA Feed B.
		:	2. OPEN Gravity	V2509, BA Feed A.
		:	3. CLOSE Outlet	V2501 VCT /alve.
			4. <u>If</u> VCT than 5% PLACE V2501 positior	evel is greate 6, <u>Then</u> and_hold in the CLOSE 1.
		4	5. OPEN V2501,	Bkr 2-42118, at MCC-2B6

REVISIO	ON NO.:	PROCEDURE TITLE:			PAGE:
	2	EMERGEN	CY BORATION		6 of 9
PROCE	DURE NO.:				
2-	ONP-02.02	ST. LU	CIE UNIT 2		
6.0 (OPERATOR /	ACTIONS			
	INS	TRUCTIONS	CONTI	NGEN	CY ACTIONS
			6 (con	tinued)	
	The BWT t	o Charging Pump Suction I	.UTION ine shall not be u	sed dur	ing a seismic
	event.				
			В.	lf the Bo	oric Acid Makeur
				Tanks a	re unavailable o
				failed to	avity Feed valve o open, Th <u>en</u>
				perform	the following:
				1 . OP	EN V2504 VCT
				Byp fror	oass / Chrg Pp S n RWT.
				2. CL(Out	OSE V2501 VCT tlet Valve.
				3. <u>If</u> th gre per	ne VCT level is ater than 5%, <u>Tr</u> form the followin
				a.	PLACE and hol V2504 VCT Bypass / Chrg I Suct from RWT the OPEN posit
				b.	PLACE and hol V2501 VCT Ou Valve in the CLOSED positi
				C.	OPEN Bkr 2-42036, V-2504, at MCC-2B5.
				d.	OPEN Bkr 2-42118, V-2501, at MCC-2B6.

BEVIS	ION NO.:	PROCEDURE TITLE:						PAGE:
	2	EMERGEN	CY BORA	TIC	ON			7 of 9
PROC	EDURE NO.:			0				
2	-ONP-02.02	SI. LUG		2				
6.0	OPERATOR A	CTIONS	_	_				
	INS	TRUCTIONS	C	:0	ΝΤΙ	NG	ENCY	ACTIONS
			6	-	(cor	ntinu	ed)	
					В.	(co	ntinued)
						4.	STOP BAM p	the running pumps.
						5.	ENSU Gravity CLOS	RE V2508 B y Feed B ED.
						6.	ENSU Gravit CLOS	RE V2509 B y Feed A ED.
						7.	ENSU Emerç CLOS	RE V2514 gency Borate ED.
	7. <u>If</u> Unit 2 SIAS Bl Boration PERFO	is in Mode 3 thru 6 with ocked and Emergency i is NOT available, <u>Then</u> RM the following:	·					
	A. PEF Stat Off con	RFORM Safety Function rus Check of the Low Mode Normal for the current plan dition.	e It					
	B. IMP Off- Pro	LEMENT the Low Mode Normal Operating cedure if required.						

/R2

2 PROCEDURE NO.:			EMERGENCY BORATION				8 of 9
			OT				
2-01	NP-02.0	2	51.				
6.0 OF	PERAT	DR A	CTIONS				
		INST	RUCTIONS		CONTINC	GENCY ACT	IONS
8	. <u>If</u> the com follo norr	e Eme plete wing nal al	ergency Boration is , <u>Then</u> PERFORM the to restore the system t ignment:	io			
	Α.	CLOS Borat	SE V2514, Emergency e.	r			
	В.	¶₁ El So M	NSURE the Makeup M elector switch is in ANUAL	lode			
	C.	STO and I in AL	P the running BAM pu PLACE the control swi JTO.	mp tch			
	D.	OPE Valve	N V2650, Tank 2A Re e	circ.			
	E.	OPE Valv	N V2651, Tank 2B Re e	circ.			
	F.	<u>lf</u> Gr PER	avity Feed was used, FORM the following:	<u>Then</u>			
		1.	CLOSE Bkr 2-42118, V2501, at MCC-2B6.				
		2.	OPEN V2501, VCT Ou Valve.	utlet			
		3.	CLOSE V2508, BA Gr Feed B.	avity			
		4.	CLOSE V2509, BA Gr Feed A.	avity			
		5.	PLACE the Makeup N Selector switch in the desired position.	lode			
		J.	Selector switch in the desired position.				

REVIS		10.:		PROCEDURE TITLE:		PAGE:
2 PROCEDURE NO.:				EMERGENCY		
						3013
2	2-ON	IP-02	.02	ST. LUCIE	E UNIT 2	
6.0	OP	ERA	TOR A	ACTIONS		
			INS	TRUCTIONS	CONTINGENCY	ACTIONS
	8.	(co	ntinue	d)		
		G.	If the Suct perfo	e RWT to Charging Pump ion was used, <u>Then</u> orm the following: CLOSE Bkr 2-42118, /-2501, at MCC-2B6.		
			2. (\	CLOSE Bkr 2-42036, /-2504, at MCC-2B5.		
			3. (\	OPEN V2501 VCT Outlet /alve.		
			4. (CLOSE V2504 VCT Bypass Chrg Pp Suct from RWT.		

END OF SECTION 6.0

/R2

10,010	SION N	0.:	PROCEDURE TITLE:		PAGE:
	25	5	REACTOR CO	DOLANT PUMP	
ROC	EDUR	E NO.:			11 of 18
2	-0120034ST. LUC			PROCEDURE TITLE: REACTOR COOLANT PUMP 11 ST. LUCIE UNIT 2 202 ACTIONS: (continued) inued) STRUCTIONS CONTINGENCY ACTIONS P oil temperatures are at ove their alarm setpoint, : . . Continue to monitor the iffected pump. . . Ensure adequate CCW low to the affected RCP. . . HCV-14-11A1, HCV-14-11A2, HCV-14-11B1, and HCV-14-11B2, poler Isolations" close on high seal cooler outlet temperature and fail open on loss of instrument air or loss of power. 6. P low cooling water flow containment isolation raives are open: A. If non-essential header valves or CCW containment isolation raives are closed Then reset and attempt to open. 1. Non-essential header valves: . HCV-14-8A, HCV-14-9, HCV-14-10. .	
7.0	<u>OP</u>	ERAT	OR ACTIONS: (continued)		
	7.2	(con	tinued)		
		11	NSTRUCTIONS	CONTING ACTIO	ENCY NS
	5.	<u>If</u> RC or al <u>Ther</u>	CP oil temperatures are at pove their alarm setpoint, <u>n</u> :		
		А.	Continue to monitor the affected pump.		
		В.	Ensure adequate CCW		
۶ì	Va "S (2	alves Seal C 00°F)	flow to the affected RCP. <u>N</u> HCV-14-11A1, HCV-14-11A2 cooler Isolations" close on hig and fail open on loss of inst	<u>OTE</u> , HCV-14-11B1, and H h seal cooler outlet ten rument air or loss of po	CV-14-11B2, nperature wer.
§1	Va "S (2	alves Seal C 00°F) <u>If</u> R(flow to the affected RCP. <u>N</u> HCV-14-11A1, HCV-14-11A2 cooler Isolations" close on hig and fail open on loss of inst	OTE , HCV-14-11B1, and H h seal cooler outlet tem rument air or loss of po 6.	CV-14 -11 B2, nperature wer.
ŝ1	Va "S (2 6.	alves Seal C 00°F) <u>If</u> R(alarr A.	flow to the affected RCP. <u>N</u> HCV-14-11A1, HCV-14-11A2 cooler Isolations" close on hig and fail open on loss of instr CP low cooling water flow ms are present, <u>Then</u> : Ensure non-essential header valves and CCW containment isolation valves are open:	OTE , HCV-14-11B1, and H h seal cooler outlet ten rument air or loss of po 6. A. <u>If</u> non-essen valves or CC isolation valv <u>Then</u> reset a open.	CV-14-11B2, nperature wer. tial header CW containment ves are closed, and attempt to
§1	V: "S (2 6.	alves Seal C 00°F) <u>If</u> R(alarr A.	flow to the affected RCP. <u>N</u> HCV-14-11A1, HCV-14-11A2 cooler Isolations" close on hig and fail open on loss of instr CP low cooling water flow ms are present, <u>Then</u> : Ensure non-essential header valves and CCW containment isolation valves are open: 1. Non-essential header valves:	OTE , HCV-14-11B1, and H h seal cooler outlet ten rument air or loss of po 6. A. <u>If non-essen</u> valves or CC isolation valv <u>Then</u> reset a open.	CV-14-11B2, hperature ower. tial header CW containment ves are closed, and attempt to

DEVIOIO	NI NIC					PAGE:
REVISIO	0 NU	J.:	ľ	REACTOR CO	OLANT PUMP	
						12 of 18
FNUUED	, un t	. NO				
2-0	120	034		ST. LUC	IE UNIT 2	
7.0 <u>(</u>	0	<u>ERA</u>	IQF	<u>RACTIONS</u> : (continued)		
-	7.2	(cor	ntinu	ued)		
		1	NS	TRUCTIONS		СҮ
					Actione	
(6.	(cor	ntinu	ued)		
		A.	(co	ontinued)		
			2.	Containment isolation valves:		
				HCV-14-1, HCV-14-2, HCV-14-6, HCV-14-7.		
¶₁		В.	<u>If</u> (ca to 10	CCW flow is lost and n NOT be reestablished the RCPs within minutes, <u>Then</u> :		
			1.	<u>If</u> the reactor is critical, <u>Then</u> trip the reactor and turbine and refer to 2-EOP-01, "Standard Post Trip Actions."		
			2.	Stop all 4 RCPs.		
			3.	<u>If</u> an immediate reactor plant cooldown is <u>not</u> to be performed, <u>Then</u> depressurize the RCS to approximately 1850 psia to maintain RCP lower seal cavity temp less than 300°F.		/F

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REVIS	SION NO .:	PRO	CEDURE TITLE:		PAGE:
	25		REACTOR COO	DLANT PUMP	13 of 18
PROC	EDURE NO .:				13 01 10
2-	-0120034		ST. LUCIE	EUNIT 2	
7.0	<u>OPERA</u>	TOR A	CTIONS: (continued)		
	7.2 (cor	ntinued)		
	I	NSTR	UCTIONS	CONTINGENCY ACTIONS	,
	6. (cor	ntinued)		/R25
¶₃	C.	If CCV can No to the 30 mir ISOLA Bleedd	V flow is lost and OT be reestablished RCPs within nutes, <u>Then</u> ATE RCP Controlled off as follows:		/R25
		1. CI BI	LOSE V2505, RCP eedoff.		
		2. Cl Bl	LOSE V2524, RCP eedoff.		
		3. El Bl VI	NSURE V2507, RCP eedoff Relief Stop v is CLOSED.		
¶₄	D.	If CCV CBO i BEGIN cooldc with C within	V flow is lost and s isolated, <u>Then</u> N natural circ own in accordance ONP 2-0120039 4 hours.		/R25

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				an an an an an an an an an an an an an a
VISIO	N NC).:	PROCEDURE TITLE:	PAGE:
OCED	25 URE	NO.:	REACTOR CO	OOLANT PUMP 14 of 18
2-0	120	034	ST. LUC	DIE UNIT 2
0 0	OPE	RATO	OR ACTIONS: (continued)	
7	7.2	(conti	nued)	
		IN	STRUCTIONS	CONTINGENCY ACTIONS
e	6.	(conti	nued)	
		E. <u>If</u> is ir <u>T</u> C	low CCW flow to RCPs due to degraded astrument air pressure, <u>hen</u> refer to Off-Normal P 2-1010030, "Loss of astrument Air."	
	7.	Ensur coole RTGE HCV- HCV- HCV- HCV-	re the following RCP seal r CCW valves on 3 203 are open: 14-11A1, 14-11A2, 14-11B1, 14-11B2.	7. <u>If</u> valves are closed, <u>Then</u> attempt to reset and open.
	R(he lim	CP low atup, nited to	<u>Ner seal cavity temperature reseal cavity temperature restring the RCP.</u>	<u>OTE</u> may exceed alarm value during plant ower seal cavity temperature must be F in this case.
\$	8.	Verify tempo tempo below	v oil temperature, stator erature and seal cavity eratures are stable and v alarm values.	 8. <u>If</u> temperature is stable but above the alarm values, <u>Then</u>: A. Consider making containment entry to adjust CCW flow to the affected RCP to greater than 190 gpm.

	<u> </u>		A no trans	
REVISION N	0.:	PROCEDURE TITLE:		PAGE:
2			DWATER	7 of 24
PROCEDUR	E NO.:			7 01 24
2-ONP-	09.02	ST. LUCIE U	JNIT 2	
6.0 OP	ERATO	OR ACTIONS (continued)		
	IN	STRUCTIONS	CONTINGEN ACTIONS	CY
2.	(cont	inued)		
	C. 2 () ()	2-ONP-01.03, Plant Condition 3: Shutdown Cooling in Operation - No Reduced Inventory.		
	D. 2	2-ONP-01.04, Plant Condition 4: Shutdown Cooling in Operation - Reduced Inventory Operations.		
	E. :	2-ONP-01.05, Plant Condition 5: Shutdown Cooling in Operation - Reactor Head Removed.		
3.	<u>If</u> 2C trip h PER Rese Follo	AFW Pump overspeed has occurred, <u>Then</u> FORM Appendix A, etting 2C AFW Pump owing Overspeed Trip.		
4.	If 2C contr Roor local Appe of 20	C AFW pump can NOT be rolled from the Control m, <u>Then</u> CONSIDER operation using endix B, Local Operation C AFW Pump.		

		· · · · · · · · · · · · · · · · · · ·	10 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	
REVISION NO	D.:	PROCEDURE TITLE:		PAGE:
2			EDWATER	8 of 24
PROCEDURE	E NO.:			0 01 24
2-ONP-	09.02	ST. LUCIE	UNIT 2	
6.0 OP	ERAT	OR ACTIONS (continued)		
	IN	STRUCTIONS	CONTINGI ACTIOI	ENCY NS
5.	<u>If</u> ste any pum foilo	eam binding occurs on Auxiliary Feedwater p, <u>Then</u> PERFORM the wing:		
	Α.	STOP the affected pump.		
	В.	ESTABLISH feedwater flow to S/Gs by performing ONE of the following:		
		 INJECT feedwater flow to the affected S/G with 2C AFW Pump. 	 <u>If</u> 2C AFW P trip has occu PERFORM A Resetting 2C Following Ov 	ump overspeed Irred, <u>Then</u> Appendix A, S AFW Pump verspeed Trip.
		OR		
		2. INJECT feedwater flow to the affected S/G with the unaffected electric driven AFW Pump using Appendix C, Cross-Connecting AFW.		
	С.	REESTABLISH Auxiliary Feedwater flow with the affected steam bound pumps using Appendix D, Reestablishing AFW Flow Following Steam Binding.		
		END OF SEC	FION 6.0	

REVIS	ION NO.	:	PROCEDURE TITLE:	PAGE:
	2		AUXILIARY FEEDWATER	0 of 94
PROCI	EDURE	NO.:		9 01 24
2-C)NP-0	9.02	ST. LUCIE UNIT 2	
			APPENDIX A	_
	<u>F</u>	RESET	TING 2C AFW PUMP FOLLOWING OVERSPEED TRIF (Page 1 of 3)	2
				INITIAL
1.	<u>lf</u> 2C PER	; AFW FORM	pump tripped due to mechanical overspeed trip, <u>Then</u> I the following:	
	А.	Local	ly RESET MV-08-3, 2C AFW Pump Throttle/Trip, trip leve	ər.
	в.	CLOS	SE MV-08-12, SG 2B Stm To AFW Pp 2C.	
	C.	CLOS	SE MV-08-13, SG 2A Stm To AFW Pp 2C.	
	D.	VERI	FY pump has stopped rotating.	
	Е.	PERI 2C P	FORM the following to re-latch and open MV-08-3, ump, on RTGB-202:	
		1. F	PLACE MV-08-3, 2C Pump Key 78, key-switch to CLOSE	
		2 . F	RETURN MV-08-3, 2C Pump Key 78, key-switch to OPEI	N
	F.	PER of the	FORM ONE of the following to drain oil from the undersic e governor main speed piston:	le
		1. \	Vait 3 minutes after pump stops rotating.	
			OR	
		2. 1	PERFORM the following:	
		1	 PLACE manual control knob on turbine governor FULLY COUNTER-CLOCKWISE (idle speed). 	
		I	 RETURN manual control knob on turbine governor FULLY CLOCKWISE (normal speed). 	
	G.	OPE	N MV-08-12, SG 2B Stm To AFW Pp 2C.	
	u		N MY 00 10 CC 04 Stm To AEW/ Pp 2C	

REVIS					PAGE
	ION NO. 2	:			I AGE.
PROCI		NO ·			10 of 24
2-C	DNP-0	9.02		<u> </u>	
	F	RESE	TTING 2C AFW PUMP FOLLOWING OVE	RSPEED TR	<u>IP</u>
	-		(Page 2 of 3)		
1.	(cont	linued)		INITIAL
	١.	PERI	FORM Independent Verification of the follo	wing:	
			COMPONENT	POSITION	IV INITIAL
	MV	-08-12	, SG 2B Stm To AFW Pp 2C	OPEN	
	MV	-08-13	, SG 2A Stm To AFW Pp 2C		
	Mar	nual Co	ontrol Knob on AFW Pp 2C Turbine Governor	CLOCKWISE	
	ΜV	-08-3,	2C Pump Key 78	OPEN	
	В.	CLO	SE MV-08-13, SG 2A Stm To AFW Pp 2C		
	C.	VER	IFY pump has stopped rotating.	∕IV-08-3,	
	C. D.	VER PER 2C P	IFY pump has stopped rotating. FORM the following to re-latch and open M Pump, on RTGB-202:	∕IV-08-3,	_
	C. D.	VER PER 2C P	IFY pump has stopped rotating. FORM the following to re-latch and open M Pump, on RTGB-202: PLACE MV-08-3, 2C Pump Key 78, key-sv	/IV-08-3, vitch to CLOS	E.
	C. D.	VER 2C P 1. 1 2. 1	IFY pump has stopped rotating. FORM the following to re-latch and open M Pump, on RTGB-202: PLACE MV-08-3, 2C Pump Key 78, key-sv RETURN MV-08-3, 2C Pump Key 78, key-	//V-08-3, vitch to CLOS switch to OPI	ΞΝ
	C. D.	VER 2C P 1. 1 2. 1	IFY pump has stopped rotating. FORM the following to re-latch and open M Pump, on RTGB-202: PLACE MV-08-3, 2C Pump Key 78, key-sv RETURN MV-08-3, 2C Pump Key 78, key-	//V-08-3, vitch to CLOS switch to OPI	ΞΝ
	C. D.	VER 2C F 1. 1 2. 1	IFY pump has stopped rotating. FORM the following to re-latch and open M Pump, on RTGB-202: PLACE MV-08-3, 2C Pump Key 78, key-sv RETURN MV-08-3, 2C Pump Key 78, key-	//V-08-3, vitch to CLOS switch to OPI	ie. En
	C. D.	VER 2C F 1. 1 2. 1	IFY pump has stopped rotating. FORM the following to re-latch and open M Pump, on RTGB-202: PLACE MV-08-3, 2C Pump Key 78, key-sv RETURN MV-08-3, 2C Pump Key 78, key-	//V-08-3, vitch to CLOS	ΞΝ
	C. D.	VER 2C F 1. 1 2. 1	IFY pump has stopped rotating. FORM the following to re-latch and open M Pump, on RTGB-202: PLACE MV-08-3, 2C Pump Key 78, key-sv RETURN MV-08-3, 2C Pump Key 78, key-	//V-08-3, vitch to CLOS	iΕ. ΞΝ
	C. D.	VER 2C F 1. 1 2. 1	IFY pump has stopped rotating. FORM the following to re-latch and open M Pump, on RTGB-202: PLACE MV-08-3, 2C Pump Key 78, key-sv RETURN MV-08-3, 2C Pump Key 78, key-	//V-08-3, vitch to CLOS switch to OPI	Ξ. ΞΝ
	C. D.	VER 2C F 1. 1 2. 1	IFY pump has stopped rotating. FORM the following to re-latch and open Noump, on RTGB-202: PLACE MV-08-3, 2C Pump Key 78, key-sv RETURN MV-08-3, 2C Pump Key 78, key-	//V-08-3, vitch to CLOS	Ξ. ΞΝ
	C. D.	VER 2C F 1. 1 2. 1	IFY pump has stopped rotating. FORM the following to re-latch and open Noump, on RTGB-202: PLACE MV-08-3, 2C Pump Key 78, key-sv RETURN MV-08-3, 2C Pump Key 78, key-	//V-08-3, vitch to CLOS	;E. EN

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EVISION	I NO.:	PR	OCEDURE TITLE:		PAGE:
	2		AUXILIARY FEEDWATER		11 of 24
ROCEDL	JRE NO.	:			110124
	י מח-ם	2	ST. LUCIE UNIT 2		
2-011	00.	<u>, , , , , , , , , , , , , , , , , , , </u>	APPENDIX A		_
	RE	SETT	NG 2C AFW PUMP FOLLOWING OVEF (Page 3 of 3)	SPEED TRI	-
2. ((contin	ued)			INITIAL
E	E. P	ERFO f the g	RM ONE of the following to drain oil from overnor main speed piston:	the undersion	le
	1	. Wa	it 3 minutes after pump stops rotating.		
			OR		
	2	. PE	RFORM the following:		
			PLACE manual control knob on turbine FULLY COUNTER-CLOCKWISE (idle s	governor peed).	
		b.	RETURN manual control knob on turbir FULLY CLOCKWISE (normal speed).	e governor	
	F. (OPEN	MV-08-12, SG 2B Stm To AFW Pp 2C.		
	G. (OPEN	MV-08-13, SG 2A Stm To AFW Pp 2C.		
	н. I	PERFO	ORM Independent Verification of the follow	wing:	
			COMPONENT	POSITION	IV INITIAL
	MV-0)8-12, 3	SG 2B Stm To AFW Pp 2C	OPEN	
	MV-0	08-13,	SG 2A Stm To AFW Pp 2C		
	Man	ual Cor	ntrol Knob on AFW Pp 2C Turbine Governor	CLOCKWISE	
	NAV/	18-3 3	C Pump Key 78	OPEN	
	MV-(MV-(MV-(08-12, 3 08-13, 3 ual Cor 08-3, 2	SG 2B Stm To AFW Pp 2C SG 2A Stm To AFW Pp 2C htrol Knob on AFW Pp 2C Turbine Governor C Pump Key 78 Reviewed by:	OPEN OPEN FULLY CLOCKWISE OPEN	
			END OF APPENDIX A		

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EVISION NO.				
	.:	PROCEDURE TITLE:	PAGE:	
2		AUXILIARY FEEDWATER	16 of 2	1
ROCEDURE	NO.:		10 01 2-	Ŧ
	0 02	ST. LUCIE UNIT 2		!
2-010F-0	9.02	APPENDIX C		
		CROSS-CONNECTING AFW		
		(Page 1 of 3)	<u>INITIAL</u>	
I. <u>If</u> 2A	A AFW	Pump is to feed 2B S/G, <u>Then</u> PERFORM the following:		
Α.	STAF	RT Auxiliary Feedwater Pump 2A.		/R:
В.	<u>lf</u> 2A Disch	S/G is NOT to be fed, <u>Then</u> ENSURE MV-09-9, Pump 2 h To SG 2A Valve, is CLOSED.	A	
C.	OPE	N 1-SE-09-2, 2A Pump Disch To 2A S/G VIv Key 83.		/R
CL				
D.	Loca	ally OPEN MV-09-13, 2A To 2B AFW Hdr Cross-tie.		
Ε.	Loca	ally OPEN MV-09-14, 2B To 2A AFW Hdr Cross-tie.		
F.		an Direct To CC OR Value to		
	THF esta	OTTLE MV-09-10, Pump 2B Disch 10 SG 2B valve, to ublish desired flow rate.		
G.	THP esta <u>If</u> fe To \$	ROTTLE MV-09-10, Pump 2B Disch 10 SG 2B Valve, to ablish desired flow rate. eding 2A S/G, <u>Then</u> THROTTLE MV-09-9, Pump 2A Disc SG 2A Valve, to establish desired flow rate.	ch	
G. H.	THP esta <u>If</u> fe To S <u>Whe</u> the	ROTTLE MV-09-10, Pump 2B Disch To SG 2B valve, to ablish desired flow rate. eding 2A S/G, <u>Then</u> THROTTLE MV-09-9, Pump 2A Disc SG 2A Valve, to establish desired flow rate. <u>en</u> the system is to be returned to normal, <u>Then</u> PERFOF following:	ch RM	
G. H.	THF esta <u>If</u> fe To \$ <u>Whe</u> the 1 .	CLOSE MV-09-10, Pump 2B Disch To SG 2B Valve, to ablish desired flow rate. eding 2A S/G, <u>Then</u> THROTTLE MV-09-9, Pump 2A Disc SG 2A Valve, to establish desired flow rate. <u>en</u> the system is to be returned to normal, <u>Then</u> PERFOF following: CLOSE MV-09-10, Pump 2B Disch To SG 2B Valve.	ch RM	
G. H.	THF esta <u>If</u> fe To \$ <u>Whe</u> the 1 . 2 .	AOTTLE MV-09-10, Pump 2B Disch To SG 2B valve, to ablish desired flow rate. eding 2A S/G, <u>Then</u> THROTTLE MV-09-9, Pump 2A Disc SG 2A Valve, to establish desired flow rate. <u>en</u> the system is to be returned to normal, <u>Then</u> PERFOF following: CLOSE MV-09-10, Pump 2B Disch To SG 2B Valve. <u>If</u> 2A S/G is being fed, <u>Then</u> CLOSE MV-09-9, Pump 2A Disch To SG 2A Valve.	ch RM 	
G. H.	THF esta <u>If</u> fe To \$ <u>Whe</u> the 1 . 2 . 3 .	AOTTLE MV-09-10, Pump 2B Disch 16 SG 2B valve, to ablish desired flow rate. eding 2A S/G, <u>Then</u> THROTTLE MV-09-9, Pump 2A Disc SG 2A Valve, to establish desired flow rate. <u>en</u> the system is to be returned to normal, <u>Then</u> PERFOF following: CLOSE MV-09-10, Pump 2B Disch To SG 2B Valve. <u>If</u> 2A S/G is being fed, <u>Then</u> CLOSE MV-09-9, Pump 2A Disch To SG 2A Valve. STOP Auxiliary Feedwater Pump 2A.	ch RM 	/
G. H.	THP esta <u>If</u> fe To S <u>Whe</u> the 1 . 2 . 3 . 4 .	 ROTTLE MV-09-10, Pump 2B Disch To SG 2B Valve, to ablish desired flow rate. eding 2A S/G, <u>Then</u> THROTTLE MV-09-9, Pump 2A Disc SG 2A Valve, to establish desired flow rate. en the system is to be returned to normal, <u>Then</u> PERFOF following: CLOSE MV-09-10, Pump 2B Disch To SG 2B Valve. If 2A S/G is being fed, <u>Then</u> CLOSE MV-09-9, Pump 2A Disch To SG 2A Valve. STOP Auxiliary Feedwater Pump 2A. CLOSE 1-SE-09-2, 2A Pump Disch To 2A S/G Vlv Key 	ch RM 83	/

					
EVISIO	N NO.:	PROCEDURE TITLE:		PAGE:	
	2	AUXILIARY FEEDWATER		17 of 24	4
ROCEDURE NO.:					
2-01	NP-09.02	APPENDIX C			
		CROSS-CONNECTING AFW			
		(Page 2 01 3)		INITIAL	
_	(!	n.			
Ι.	(continued	1)			
	H. (cont	tinued)			
	6.	Locally CLOSE MV-09-14, 2B To 2A AFW	Hdr Cross-tie.		
	7	PERFORM Independent Verification of the	following:		
		COMPONENT	POSITION		
	M1/_09-9	Pump 2A Disch To SG 2A Valve	CLOSED		
	MV-09-10	Pump 2B Disch To SG 2B Valve	CLOSED		
	1-SE-09-	2. 2A Pump Disch To 2A S/G VIv Key 83	CLOSED		/F
	MV-09-1	3. 2A To 2B AFW Hdr Cross-tie	CLOSED		
	MV-09-1	4, 2B To 2A AFW Hdr Cross-tie	CLOSED		
			M the following		
2.	<u>If</u> 2B AF\	W Pump is to feed 2A S/G, Then PERFOR			,
	A. STA	ART Auxiliary Feedwater Pump 2B.			/
	B. <u>If</u> 2	B S/G is NOT to be fed, Then ENSURE M	V-09-10, Pump	2B	
	Dis	ch To SG 2B Valve, is CLOSED.			
	C. OP	EN 1-SE-09-3, 2B Pump Disch To 2B S/G	Vlv Key 84.		/
	[NOTE			
	Key-sw	itches for MV-09-13 and MV-09-14 are loc	ated in 2A/2B A	AFW	
	Pump F	Room. Two keys are required since the ke	eys are removal		
					IJ
	D. Loo	cally OPEN MV-09-13, 2A To 2B AFW Hd	r Cross-tie.		
	E. Lo	cally OPEN MV-09-14, 2B To 2A AFW Hd	r Cross-tie.		

EVISI	ON NO.	:	PROCEDURE TITLE:		PAGE:	
	2				18 of 24	Ļ
ROCE	EDURE I	NO.:				
<u>2-C</u>	DNP-0	9.02	ST. LUCIE UNIT 2			
			APPENDIX C CROSS-CONNECTING AFW			
			(Page 3 of 3)			
、	loon	tinuar	n		INITIAL	
	(001	unuec		A Valva ta		
	F.	THR estal	a valve, lo			
	G.	<u>lf</u> fee To S	Pump 2B Disc	ch		
	Н.	H. <u>When</u> the system is to be returned to normal, <u>Then</u> PERFOR the following:				
		1.	CLOSE MV-09-9, Pump 2A Disch To SG 2	A Valve.		
	2. <u> </u>		<u>If</u> 2A S/G is being fed, <u>Then</u> CLOSE MV-09 Disch To SG 2B Valve.	9-10, Pump 2B		
		3.	STOP Auxiliary Feedwater Pump 2B.			/R2
		4.	CLOSE 1-SE-09-3, 2B Pump Disch To 2B	S/G VIv Key 8	4	/R:
		5.	Locally CLOSE MV-09-13, 2A To 2B AFW	Hdr Cross-tie.		
		6.	Locally CLOSE MV-09-14, 2B To 2A AFW	Hdr Cross-tie.		
		7.	PERFORM Independent Verification of the	following:		
-			COMPONENT	POSITION	IV INITIAL	
	M	V-09-9	, Pump 2A Disch To SG 2A Valve	CLOSED		
	M	MV-09-10, Pump 2B Disch To SG 2B Valve		CLOSED		
	1-	 SE-09	-3, 2B Pump Disch To 2B S/G VIv Key 84	CLOSED		/R
	м	V-09-1	3, 2A To 2B AFW Hdr Cross-tie	CLOSED		
		MV-09-13, 2A To 2B AFW Har Cross-lie CLOSED				

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END OF APPENDIX C



Lesson File:	/cae/if/ifdata/lesson/nrc2/x107.x1d
Lesson Description:	Y2000, NRC OPERATING EXAM, Scenario #2
Lesson IC used:	
Created on:	12/03/99 11:46:58



INSTRUCTION	TYPE	DEMANDED VALUE	RAMP TIME	DELAY TIME
1 TAF4D02P - F4_2_20412 BREAKER POSITION P	REM	3		
2 TFC3D079 - C3_EAG403 Detector Loss of Count,	MALF	TRUE		
3 TFFVV1BO - FA_HCV_09_1B FWA ISOL VLV 1B FA	MALF	TRUE		
4 TFFVV1AO - FA_HCV_09_1A FWA ISOL VLV 1A F	MALF	TRUE		
5 TFFVV1BO - FA_HCV_09_1B FWA ISOL VLV 1B F.	A MALF	FALSE		
a206_a1_s63_1 6 TFFVV1AO - FA_HCV_09_1A FWA ISOL VLV 1A F a206_a1_s59_1	A MALF	FALSE		



Step #: Step Description : Delay Time : Mode :	2 8801 DRIFT SBCS Valve Drifts (0:00:00 Regular Pending	Open
TnitialState :	Pending	

INSTRUCTION	TYPE	DEMANDED VALUE	RAMP TIME	DELAY TIME
1 TVSVSD - SB_PCV_8801 VALVE LEAKAGE A	MALF	1.000	0:05:00	
2 A202 A1 DS64_1 - PCV-8801 OPEN (R, RTGB-202)	OVER	TRUE		0:00:15



"Lesso --- Plan"

Step #:3Step Description :8801 ISOLATE -- NPO/NWE Locally Isolate and Remove air from 8801Delay Time :0:00:00Mode :RegularInitialState :Pending

INSTRUCTION	TYPE	DEMANDED VALUE	RAMP TIME	DELAY TIME
1 A202_A1_DS64_1 - PCV-8801 OPEN (R, RTGB-202)	OVER	FALSE		0:03:00
2 TASVA359 - SB_V8359 BYPASS LINE #1 TO CNDSR	REM	0.0	0:03:00	



5

Step #: Step Description : Delay Time :	4 SPRAYS OPEN 0:00:00 Begular	Spray	Controller	Fails,	Opening	BOTH	Sprays
Mode : InitialState :	Regular Pending						

INSTRUCTION	TYPE	DEMANDED VALUE	RAMP TIME	DELAY TIME

1 A203_A1_A18_11 - HIC-1100 DISPLAYED PROCES OVER 77.160





Step #:5Step Description :LETDOWN FAILURES -- FLOW LCV-2110P fails OPEN, V2515 Fails AS-ISDelay Time :0:00:00Mode :RegularInitialState :Pending

INSTRUCTION	TYPE DEMANDED VALUE RAMP TIME	DELAY TIME
1 TFBVV15A - BL_V2515 FAIL AS IS	MALF TRUE	
2 TFBVV0PO - BL_LCV2110P FAIL OPENED	MALF TRUE	0:00:02
3 TFBVV15A - BL_V2515 FAIL AS IS a205_a1_s33_1	MALF FALSE	





Step #: Step Description : Delay Time : Mode : TritialState :	6 CONDENSER 1 0:00:00 Regular Pending	PT	Vacuum	PT-10-6	Sensing	Line	Breaks	Off
InitialState .								

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INSTRUCTION		TYPE	DEMANDED VALUE	RAMP TIME	DELAY TIME
1 TFF2M04H - FC_P_10_6	PT10-6 FAIL HIGH	MALF	TRUE		
2 TAFCMAF2 - FC_LV2	AIR INLEAK #2	REM	0.240	0:10:00	





Step #: Step Description : Delay Time : Mode : InitialState :	7 HOG ON 0:00:00 Regular Pending	Place	first	Hogging	Ejector	Inservice'
T 112 0						

	INSTRUCTION			TYPE	DEMANDED VALUE	RAMP TIME	DELAY TIME
1	TAFBV200 - FC_V16200	VLV	PORT AREA	REM	0.300		
2	TAFBV575 - FC_V12575	VLV	PORT AREA	REM	1.000	0:00:20	
3	TAFBV200 - FC_V16200	VLV	PORT AREA	REM	0.100		0:00:30



Delay Time : 0:00:00 Mode : Regular InitialState : Pending	Step #: Step Description : Delay Time : Mode : InitialState :	8 MORE HOGS 0:00:00 Regular Pending	Place	Second	Hogging	Ejector	Inservi
--	---	---	-------	--------	---------	---------	---------

	INSTRUCTION			TYPE	DEMANDED VALUE	RAMP TIME	DELAY TIME
1	TAFBV203 - FC_V16203	VLV	PORT AREA	REM	0.300		
2	TAFBV576 - FC_V12576	VLV	PORT AREA	REM	1.000	0:00:20	0:00:02
3	TAFBV203 - FC_V16203	VLV	PORT AREA	REM	0.100		0:00:30



Step #: Step Description : Step Condition :	9 OPEN SAFETIES A1_A1_A1SI5_2	 Opens	(2)	SG	Safeties	on	Trip	(Auto)
Delay Time : Mode : InitialState :	0:00:08 Regular Triggered							

INSTRUCTION	TYPE	DEMANDED VALUE	RAMP TIME	DELAY TIME
1 TFSVR010 - SB_V8201 FAIL OPEN	MALF	TRUE		
2 TFSVR020 - SB_V8202 FAIL OPEN	MALF	TRUE		



Step #: Step Description : Step Condition :	10 AIR OFF Loss of Inst Air Header Post-Trip (A A1_A1_A1SI5_2	Auto)
Delay Time :	0:00:00	
Mode :	Regular	
InitialState :	Triggered	

	INSTRUCTION	TYPE	DEMANDED VALUE	RAMP TIME	DELAY TIME
1	TAKFVI4 - KF LV4 LEAK VLV BEFORE AIR DRYER	REM	1.000	0:10:00	



"Lesso -- Plan"

Step Step Step Delay Mode	#: Description : Condition : Time : :	11 CHARLIE A1_A1_AJ 0:13:00 Regular	TRIP LSI5_2	2C	afw	Pump	Trips	10	Mins	After	Start
Initi	alState :	Triggere	ed								

INSTRUCTION	TYPE	DEMANDED VALUE	RAMP TIME	DELAY TIME
-------------	------	----------------	--------------	---------------

1 TFF4TRIP - FK_AFAS MECH FAIL OR MANU MALF TRUE




Step #: Step Description : Delay Time : Mode :	12 AFW XTIE NPO OPENS AFW Cross-Tie V 0:00:00 Regular	Jalves
Mode : TnitialState :	Pending	

INSTRUCTION		TYPE	DEMANDED VALUE	RAMP TIME	DELAY TIME
1 TFFYV080 - FK_MV_09_13	FAIL OPEN	MALF	TRUE		
2 TFFYV090 - FK_MV_09_14	FAIL OPEN	MALF	TRUE		





Step #: Step Description : Delay Time : Mode : InitialState :	13 CHARLIE 0:00:00 Regular Pending	RESET	 NPO	Resets	2C	AFW	ΡP	Trip	Mech
Interactor .									

INSTRUCTION				TYPE	DEMANDED VALUE	RAMP TIME	DELAY TIME
1 TFF4TRIP - FK_AFAS	MECH	FAIL	OR MANU	MALF	FALSE		
2 TCF4MOSR - FK LOA	MECH.	OVERS	PEED RES	REM	TRUE		0:00:15



15

Step #:	14 SWAR R/O
Step Description :	0:00:00
Mode :	Regular
InitialState :	Pending

-- SNPO swaps P/Q Valves

	INSTRUCTION		TYPE	DEMANDED VALUE	RAMP TIME	DELAY TIME
1	TABLV344 - BL_V2344	LCV-2110Q DOWNSTREAM I	REM	1.000		
2	TABLV343 - BL_V2343	LCV-2110Q UPSTREAM ISO	REM	1.000		
3	TABLV342 - BL_V2342	LCV-2110P DOWNSTREAM I	REM	0.0		
4	TABLV341 - BL_V2341	LCV-2110P UPSTREAM ISO	REM	0.0		

SZ Fixes



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Facility: St. Lucie

Scenario No.: Backup 3

Op-Test No.: 1

Objectives: To evaluate the students ability to implement the ONOPs and take manual control of systems due to various instrument and component failures; perform a normal plant power increase; and to execute the EOPs for a Loss of Offsite Power with loss of both Emergency Diesel Generators (Station Blackout)

Initial Conditions: Unit 2 is at 30% power BOC

Turnover: The plant is operating at 30% power, BOC. The unit is returning from Plant Trip four days ago after reaching 100% power. Plant up-power has just been secured at 300 MW to prepare for placing MSRs inservice. 2A Emergency Diesel Generator has just been taken out of service to replace a defective relay, expected back in four hours. Reactor Reg #2 is out of service, I&C is troubleshooting. Instructions to the shift is to increase power to 100%.

Preexisting Malfunctions:	2B EDG trips 15 minutes after LOO

Event No.	Malf. No.	Event Type*	Event Description
1	0	R-RO N-BOP	Power increase from 30% to 100% (start at 300 Mw) Initiate placing MSR's in service
2	1	I-RO	TE-1111Y (Rx Reg Thot input) fails high
3	2	C-BOP	LCV-9006 (2B 15% bypass valve) drifts open
4	3	I-BOP	FR-8011 (2A steam generator steam flow transmitter) drifts high, requires placing FIC-9011 in Manual to avoid plant trip.
5	4	C-RO	PCV-1100E (Pressurizer spray valve) fails open
6	5	M-RO M-BOP	Loss of offsite power, Manually Open ADVs, Start AFW flow to SGs
7	6	C	2B EDG trips 15 minutes after LOOP (Station Blackout)
, 		N	SBO Cross-tie 4.16 KV power with Unit 1
0			
	1		

* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor

Op-Test No.: 1 Scenario No.: Backup 3 Event No.: 1

Page 2 of 10

Event Description: Power increase from 30% to 100% power.

Time	Position	Applicant's Actions or Behavior
	BOP	Refers to appropriate procedures for increase of turbine and reactor power: NOP-2-0030123, "Reactor Operating Guidelines during Steady State and Load Changes", "2-GOP-201"Reactor Plant Start-up Mode 2 to Mode 1"
		Operates DEH to increase turbine load
		Places MSRs in service per 2-GOP-201 -> 2-GOP-502
	RO	Operates CVCS to increase RCS temperature
		Operates Control Rods to maintain ASI within limits
		Remains cognizant of RCS parameters during power increase
	SRO	Performs shift brief prior to power increase
		Directs RO to increase RCS temperature by CVCS addition
		Directs BOP to increase turbine power by DEH
		Notifies System of impending power increase
		Directs BOP to place MSRs in service per 2-GOP-201-> 2-GOP- 502
		Remains cognizant of RO and BOP actions

Op-Test	No.: 1 Scer	nario No.: Backup 3 Event No.: 2 Page 3 of 10					
Event De	Event Description: TE-1111X (Rx Reg Thot input) fails low						
Time	Position	Applicant's Actions or Behavior					
	RO	Recognize that TE-1111X failed high					
		Takes manual control of letdown and reduces output of level control valve (LCV will go to minimum output on failure)					
		Manually controls pressurizer level					
		Stops dilution (optional)					
	BOP	Refers to ONOP 2-0120035, Pressuirzer Pressure and Level (minimal guidance due to both RRS out of service)					
		Stops turbine increase (optional)					
		Assists RO in monitoring RCS parameters					
· ·	SRO	Directs RO to take manual control of CVCS to maintain pressurizer level					
		Directs RO and BOP to stop power ascension (optional)					
		Refers to ONOP 2-0120035, Pressuirzer Pressure and Level (minimal guidance due to both RRS out of service)					
		Notifies I&C Supervisor to report TE-1111X failed high					
		Notifies Plant Management					

Op-Test Event De	Op-Test No.: 1 Scenario No.: Backup 3 Event No.: 3 Page 4 of 10 Event Description: LCV-9006 (2B 15% bypass valve) drifts open							
Time	Position	Applicant's Actions or Behavior						
	BOP	Recognizes 2B steam generator level increasing						
		Recognizes LCV-9006 drifting open (60%)						
		Takes manual control of FIC-9021(2B main feed reg valve)						
		Maintains 2B steam generator within normal band (60-70% NR)						
		Stops turbine increase (optional, if not already done)						
	RO	Recognizes 2B steam generator level increasing						
		Refers to ONOP 2-0700030, "Main Feedwater"						
		Monitors plant parameters during transient						
		Stops dilution (optional, if not already done)						
	SRO	Recognizes 2B steam generator level increasing						
		Directs BOP to take manual control of FIC-9021						
		Refers to ONOP 2-0700030, "Main Feedwater"						
		Directs BOP to maintain 2B steam generator level within normal band (60-70% NR)						
		Directs RO and BOP to						
		Notifies I&C or RMS of feedwater valve failures						
		Notifies Plant Management						
1								

Op-Test	No.: 1 Scer	nario No.: Backup 3 Event No.: 4 Page 5 of 10				
Event Description: FR-8011 (2A steam generator steam flow transmitter) drifts high						
Time	Position	Applicant's Actions or Behavior				
	BOP	Recognizes 2A steam generator level increasing				
		Recognizes FR-8011 drifting high				
		Takes manual control of FIC-9011 (2A main feed reg valve controller)				
		Restores 2A steam generator level to normal value (60-70% NR)				
	RO	Refers to ONOP 2-0700030, "Main Feedwater"				
		Monitors plant parameters during transient				
	SRO	Recognizes 2A steam generator level increasing				
		Directs BOP to take manual control of FIC-9011				
		Refers to ONOP 2-0700030, "Main Feedwater"				
		Notifies I&C or RMS of FR-8011 failure				
		Notifies Plant Management				
1						

Op-Test No.: 1 Scenario No.: Backup 3 Event No.: 5

Event Description: PCV-1100E (Pressurizer spray valve) fails open

Time	Position	Applicant's Actions or Behavior
	RO	Recognizes PCV-1100E fails open
	Critical Task	Place spray selector control switch on RTGB 203 to PCV-1100F to terminate RCS de-pressurization prior to automatic trip.
		Notify SRO that RCS pressure is less than Tech Spec minimum value
		Monitors and restores RCS pressure to normal value (2250 psia)
		Stops dilution (optional, if not already done)
	BOP	Refers to ONOP 2-0120035, "Pressurizer Pressure and Level"
		Monitors plant parameters during transient
		Stops turbine increase (optional, if not already done)
	SRO	Recognizes PCV-1100E fails open
		Directs RO to take manual control of HIC-1100 <u>or</u> place spray selector control switch on RTGB 203 to PCV-1100F to terminate RCS depressurization
		Consults Tech Spec 3.2.5 (RCS pressure limit / DNB)
		Directs RO to restore RCS pressure to normal value (2250 psia)
		Notifies I&C or RMS of PCV-1100E failure
		Notifies Plant Management

Page 6 of 10

Op-Test	Op-Test No.: 1 Scenario No.: Backup 3 Event No.: 6 Page 7 of 10					
Event De	Event Description: Loss of offsite power					
Time	Position	Applic	cant's Actions or Be	havior		
	RO	Recognize loss of offsit	e power			
		Perform systematic boa	rd walkdown			
		Perform Standard Post	Trip actions (2-EOF	P-1)		
		Report all safety function	on status to SRO			
		Manually Initiate Auxilia	ry Feedwater flow to	o SGs (150 gpm / SG)		
		Operate Atmospheric s temperature	team dumps to main	ntain stable RCS		
		Monitor plant paramete	rs			
				······		
	BOP	Recognize loss of offsit	e power			
		Perform systematic boa	ard walkdown			
		Perform Standard Post	Trip actions (2-EOI	P-1)		
		Report all safety function	on status to SRO			
		Perform safety functior unavailable)	n status checks for 2	2-EOP-9 (if STA is		
		Contact NPO for restor	ration of instrument	air		
		Assist RO as directed	by SRO in stabilizati	on of plant		
			<u>, , , , , , , , , , , , , , , , , , , </u>			
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Appendix [C	Operator Actions	Form ES-
Op-Test	No.: 1 Sce	nario No.: Backup 3 Event No.: 6	Page 8 of 10
		Applicant's Actions	or Behavior
lime	Position	Applicant's Actions	
	SRO	Recognize loss of offsite power	
		Direct RO and BOP to manually trip th	ne reactor and turbine
		Direct RO and BOP to perform system	natic board walkdown
		Direct the performance of 2-EOP-1	
		Direct entry into 2-EOP-9, "Loss of Of	fsite Power"
		Direct RO to stabilize RCS pressure a	ind temperature
		Direct BOP to perform safety function (if STA is unavailable)	status checks for 2-EOP-9
		Contact HP for secondary radiation su	urveys
		Direct BOP in restoration of instrumer	nt air
· · · · · · · · · · · · · · · · · · ·			
		s	

St. Lucie 00-301 Date of Exam 2/7-9-00

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Appendix D

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Operator Actions

Form ES-D-2

Op-Test Event De	No.: 1 Scen escription: 28	ario No.: Backup 3 Event No.: 7 / 8 Page 9 of 10 3 EDG trips 15 minutes after LOOP (Station Blackout)		
Time	Position	Applicant's Actions or Behavior		
	BOP	Recognize 2B EDG trips		
		Contact SNPO to investigate 2B EDG failure		
		Report to SRO that Maintenance of Vital Auxiliary safety function not being met		
Perform safety function status checks for 2-EOP-10 (if STA is unavailable)				
		Perform Table 7 of 2-EOP-99, "Vital Power Breaker Configuration/Station Blackout"		
	Critical Task	Crosstie Unit 2 to Unit 1 per Appendix V of 2-EOP-99, "SBO Crosstie From Unit 1 to Unit 2"		
	RO	Recognize 2B EDG trips		
		Realign Auxiliary Feedwater (2C pump feeding both steam generators)		
		Realign Atmospheric Steam Dumps (All dumps in Manual/Manual)		
		Monitor plant parameters and maintain RCS pressure and temperature stable		
		Isolate leakage and cooldown paths as directed by SRO		

Appendix D

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Operator Actions

Form ES-D-2

Op-Test	No.: 1 Scer	nario No.: Backup 3 Event No.: 7 / 8 Page 10 of 10
Event D	escription: 2	B EDG trips 15 minutes after LOOP (Station Blackout)
Time	Position	Applicant's Actions or Behavior
	SRO	Recognize 2B EDG trips
		Recognize Maintenance of Vital Auxiliaries safety function not met
		Direct entry into 2-EOP-10, "Station Blackout"
		Direct RO to maintain plant stable
		Direct efforts to recover an AC power source
		Direct BOP to perform Table 7 of 2-EOP-99
		Direct RO in the isolation of leakage and cooldown paths
	Critical Task	Direct BOP to crosstie 4.16 KV power to Unit 1 through the SBO breaker per Appendix V of 2-EOP-99
	·····	

Shift Turnover

- The plant is operating at 30% power, BOC.
- The unit is returning from a 30 day refueling outage and has been on a chemistry hold.
- Chemistry has given the approval to continue the power ascension to 100%.
- 2A Emergency Diesel Generator has just been taken out of service to replace a defective relay, expected back in four hours.
- Reactor Reg #2 is out of service, I&C is troubleshooting.
- Instructions to the shift is to increase power to 100%

REVIS	SION NO	.:	PROCEDURE TITLE:	PAGE:
4			REACTOR PLANT STARTUP -	
PROC	EDURE	NO.:	MODE 2 TO MODE 1	48 of 65
		001		
<u>-2</u> . 6 0	INS ⁻		TIONS (continued)	
0.0				<u></u>
	6.116	Whe that inlea Off N	n Turbine load is approximately 250 MW, <u>Then</u> VERIFY secondary chemistry values are less than the minor kage limits of ONOP 2-0610030, Secondary Chemistry - lormal.	CHEM
6.117 P h		Prior highe	to Reactor Power reaching 30% as indicated on the est reading instrument, PERFORM the following:	
		1. 3	STOP the power ascension.	
		2. (PERFORM 2-OSP-69.01, Nuclear / Delta T Power Calibration.	
ł	ser 6.118	Whe PER	n Turbine load is approximately 300 MW, <u>Then</u> FORM Appendix BB of 2-GOP-502, Placing MSRs In	
(6.119	<u>If</u> Tu TRA	rbine startup is being performed in Single Valve, <u>Then</u> NSFER to Sequential Valve as follows:	
		1. <u> </u> -	<u>f</u> keyboard location 4412 has been stable for 1 minute, Then PROCEED to step 3.	
		2. <u> </u>	<u>f</u> location 4412 is NOT stable, <u>Then</u> PERFORM the ollowing:	
		4	A. MONITOR keyboard location 4265 (Digital Speed).	
		I	 If this value is greater than or equal to 1802 or changing from 1801 to 1802, <u>Then</u> PROCEED as follows: 	
			 INSERT key into the Maintenance Test key switch. 	
			 INSERT key into the Maintenance Test key switch. 	

REVISION N	0.:	PROCED	DURE TITLE:	PAGE:
4			REACTOR PLANT STARTUP -	
PROCEDURI	E NO.:		MODE 2 TO MODE 1	49 of 65
2-GOF	P-201		ST. LUCIE UNIT 2	
6.0 INS	STRUCT	IONS	(continued)	INITIAL
6.119) (conti	nued)		
	2. (0	continu	ed)	
	B	B. (cor	ntinued)	
			NOTE	
	The fo	ollowing	g step will transfer the DEH System to Turbine Ma	anual.
		2.	PLACE the Maintenance Test key switch in TEST.	<u>_,</u>
		3.	VERIFY the value of key board location 3104 is 2.00.	
		4.	DEPRESS Change.	
		5.	ENTER 10.00.	
		6.	VERIFY key board location 3104 is now 10.00.	
		7.	TURN Maintenance Test key switch to OFF.	<u> </u>
		8.	VERIFY that the Oper Auto pushbutton is flashing.	
		<u></u>	NOTE	
	The fo	llowing	step will transfer the DEH System to automatic c	ontrol.
		9.	DEPRESS the Oper Auto.	
		10.	VERIFY keyboard location 4412 is stable for at least one minute.	
		11.	If stable, Then PROCEED with the transfer.	
		12.	If the value is NOT stable, <u>Then</u> DO NOT attempt to transfer to Sequential Valve <u>and</u> CONTACT the I&C Department.	

and the second se			PAGE:
REVISION NO.: 4	PRO	REACTOR PLANT STARTUP -	50 of 65
PROCEDURE NO .:		MODE 2 TO MODE T	
2-GOP-201		ST. LUCIE UNIT 2	INITIAL
6.0 INSTRU	CHOP	43 (continued)	
6.119 (co	ntinue	ed)	
3.	PLA by p	CE the Impulse Pressure Feedback loop in service erforming BOTH of the following:	
	A .	DEPRESS the Imp In/Imp Out.	
	В.	VERIFY the Imp in light is LIT.	
4.	DEP	PRESS the Single Valve/Seq Valve pushbutton.	
5.	VEF	RIFY the Seq Valve light is flashing.	
When comple	Seq V ete. T	The transfer should take approximately 10 minutes.	
0.	VER	hirf transier to ocqueritar value changed. Then	
7.	<u>If</u> th PEF	RFORM the following:	
	Α.	INSERT the key into the Maintenance Test key switch.	
ТІ	he folle	<u>NOTE</u> owing step will transfer the DEH System to Turbine N	lanual.
	в.	PLACE the Maintenance Test key switch to TEST.	
	C.	ENTER location 3104 into the key board.	
	D.	DEPRESS Change.	
1			
	E.	ENTER 2.00.	

REVISION NO.: 4		REACTOR PLANT STARTUP -	PAGE:
PROCEDURE NO .:		MODE 2 TO MODE 1	51 of 65
2-GOP	-201	ST. LUCIE UNIT 2	
6.0 INS	TRUC	CTIONS (continued)	INITIAL
6.119	(cor	tinued)	
	7.	(continued)	
		G. PLACE Maintenance Test key switch to OFF.	
		H. VERIFY the Oper Auto pushbutton is flashing.	
		NOTE	
	The 1	ollowing step will transfer the DEH System to automatic o	ontrol.
		I. DEPRESS Oper Auto.	
		J. REMOVE Maintenance Test Key.	
	8.	REMOVE the Impulse Pressure Feedback Loop from service as follows:	
		A. DEPRESS Imp In/Imp Out.	
		B. VERIFY Imp Out light is LIT.	
6.120	<u>Whe</u> on t follo	en Reactor Power is at approximately 45% as indicated he highest reading instrument, <u>Then</u> PERFORM the wing:	
	1.	STOP the power ascension.	
	2.	At the discretion of the NPS/ANPS, PLACE LEFM in service in accordance with 2-NOP-09.06.	
§1	3.	PERFORM a Nuclear / Delta T power calibration in accordance with 2-OSP-69.01, Nuclear and Delta T Power Calibration if NOT performed while placing LEFM in service.	
	4.	If the Condensate Polisher is in service, <u>Then</u> ENSURE enough Powdex vessels are in service to support the increase in condensate flow.	
		١	

		PAGE:
REVISION NO.:	BEACTOR PLANT STARTUP -	
	MODE 2 TO MODE 1	52 of 65
PROCEDORE NO		
2-GOP-201	ST. LUCIE UNIT 2	INITIAL
6.0 INSTRUC	CHONS (continued)	
6.120 (cor	ntinued)	
5.	START the second Condensate Pump in accordance with OP 2-0700020, Condensate and Feedwater System - Normal Operation.	
6.	ENSURE the second Main Feed Pump is ready to start in accordance with OP 2-0700020, Condensate and Feedwater System - Normal Operation.	
7.	WARMUP the Heater Drain Pumps in accordance with OP 2-0700020, Condensate and Feedwater System - Normal Operation.	
8.	VERIFY proper operation of heater Drain and Vent system.	
	A. VERIFY proper heater levels.	
	B. VERIFY proper operation of normal and alt drain valves.	
The se Conde 10,000	<u>CAUTION</u> econd Main Feed Pump should NOT be started until the se ensate Pump is running and total feedwater flow is approxir) GPM.	cond nately
9.	START the second Main Feed Pump in accordance with OP 2-0700020.	
10	. <u>When</u> total feedwater flow is between 15,000 GPM and 20,000 GPM, <u>Then</u> :	
10	 <u>When</u> total feedwater flow is between 15,000 GPM and 20,000 GPM, <u>Then</u>: A. PLACE the second Main Feed Pump control switch in AUTO RECIRC. 	
10	 When total feedwater flow is between 15,000 GPM and 20,000 GPM, <u>Then</u>: A. PLACE the second Main Feed Pump control switch in AUTO RECIRC. B. VERIFY the Recirc Valve CLOSES. 	
10	 When total feedwater flow is between 15,000 GPM and 20,000 GPM, <u>Then</u>: A. PLACE the second Main Feed Pump control switch in AUTO RECIRC. B. VERIFY the Recirc Valve CLOSES. 	

-	:	PROCEDURE TITLE:	PAGE:
4 OCEDURE I		REACTOR PLANT STARTUP - MODE 2 TO MODE 1	53 of 65
2-GOP-:	201	ST. LUCIE UNIT 2	
0 INST	RUC	TIONS (continued)	INITIAL
_			
The pre	∍ pov ssur	CAUTION ver ascension should be stopped if Main Feed Pump suctive e decreases to less than 400 psig.	on
6.121	VEF limi1	RIFY the Moderator Temperature Coefficient is within as specified in TS 3.1.1.4.b.	RE
6.122 ₆	<u>Wh</u> on t follo	<u>en</u> Reactor Power is at approximately 50% as indicated the highest reading instrument, <u>Then</u> PERFORM the owing:	
	1.	ENSURE both Turbine Cooling Water Pumps are in operation.	
	2.	If 2-OSP-69.01, Nuclear / Delta T Power Calibration, was performed at 45% Reactor Power with LEFM in service,	
		OR	
		Margin improvements have been captured in a reload PCM, <u>Then</u> VERIFY a specific stop at 50% power is NOT required to perform 2-OSP-69.01, Nuclear / Delta T Power Calibration, in accordance with ONE of the following:	
		The current reload PCM	
		Source: Date//	RE/STA
		 2-OSP-69.01, Nuclear / Delta T Power Calibration was performed at 45% Reactor Power with LEFM in 	

EXISION NO:: PROCEDURE TITLE: REACTOR PLANT STARTUP - 54 of 65 2-GOP-201 ST. LUCIE UNIT 2 St of 65 3.0 INSTRUCTIONS (continued) INITIAL INITIAL 6.122 (continued) INITIAL				
2-GOP-201 ST. LUCIE UNIT 2 5.0 INSTRUCTIONS (continued) INITIAL 6.122 (continued) 3. If 2-OSP-69.01 is NOT required to be performed, Then the following Substeps are NOT required.	REVISION NO.: 4 PROCEDURE N	10.:	PROCEDURE TITLE: REACTOR PLANT STARTUP - MODE 2 TO MODE 1	PAGE: 54 of 65
5.0 INSTRUCTIONS (continued) INITIAL 6.122 (continued) 3. If 2-OSP-69.01 is NOT required to be performed, Then the following Substeps are NOT required.	2-GOP-2	201	ST. LUCIE UNIT 2	
6.122 (continued) 3. If 2-OSP-69.01 is NOT required to be performed, Then the following Substeps are NOT required. A. STOP the power ascension. B. PERFORM 2-OSP-69.01, Nuclear / Delta T Power Calibration. 6.123 When Reactor power is approximately 60%, as indicated by the higher of Calorimetric or NI Power, Then PERFORM the following: 1. VERIFY proper heater levels. 2. VERIFY proper operation of normal and alt drain valves. 6.124 When Turbine load is approximately 60% MW, Then PLACE the Heater Drain Pumps in service in accordance with OP 2-070020, Condensate and Feedwater System - Normal Operation. 6.125 When Reactor power is approximately 80%, as indicated on the highest reading instrument, Then PERFORM the following: 1. STOP the power ascension. 5. 2. PERFORM a Nuclear/Delta T Power calibration in accordance with 2-OSP-69.01, Nuclear and Delta T Power Calibration. 5. 2. PERFORM a Nuclear/Delta T Power calibration in accordance with 2-OSP-69.01, Nuclear and Delta T Power Calibration. 3. VERIFY proper operation of Heater Drain and Vent system. A. VERIFY proper operation of normal and alt drain valves. B. VERIFY proper operation of normal and alt drain valves.	6.0 INST	RUC	TIONS (continued)	INITIAL
3. If 2-OSP-69.01 is NOT required to be performed, Then the following Substeps are NOT required.	6.122	(con	tinued)	
A. STOP the power ascension.		3.	If 2-OSP-69.01 is NOT required to be performed, <u>Then</u> the following Substeps are NOT required.	
B. PERFORM 2-OSP-69.01, Nuclear / Delta T Power Calibration. 6.123 When Reactor power is approximately 60%, as indicated by the higher of Calorimetric or NI Power, Then PERFORM the following: 1. VERIFY proper heater levels. 2. VERIFY proper operation of normal and alt drain valves. 6.124 When Turbine load is approximately 660 MW, Then PLACE the Heater Drain Pumps in service in accordance with OP 2-070020, Condensate and Feedwater System - Normal Operation. 6.125 When Reactor power is approximately 80%, as indicated on the highest reading instrument, Then PERFORM the following: 1. STOP the power ascension. 2. PERFORM a Nuclear/Delta T Power calibration in accordance with 2-OSP-69.01, Nuclear and Delta T Power Calibration. 3. VERIFY proper operation of Heater Drain and Vent system. A. VERIFY proper heater levels. B. VERIFY proper operation of normal and alt drain valves.			A. STOP the power ascension.	
 6.123 When Reactor power is approximately 60%, as indicated by the higher of Calorimetric or NI Power, Then PERFORM the following: VERIFY proper heater levels. VERIFY proper operation of normal and alt drain valves. 6.124 When Turbine load is approximately 660 MW, Then PLACE the Heater Drain Pumps in service in accordance with OP 2-0700020, Condensate and Feedwater System - Normal Operation. 6.125 When Reactor power is approximately 80%, as indicated on the highest reading instrument, Then PERFORM the following: STOP the power ascension. PERFORM a Nuclear/Delta T Power calibration in accordance with 2-OSP-69.01, Nuclear and Delta T Power Calibration. VERIFY proper operation of Heater Drain and Vent system. VERIFY proper operation of normal and alt drain valves. 			B. PERFORM 2-OSP-69.01, Nuclear / Delta T Power Calibration.	
 VERIFY proper heater levels. VERIFY proper operation of normal and alt drain valves. VERIFY proper operation of normal and alt drain valves. Mhen Turbine load is approximately 660 MW, Then PLACE the Heater Drain Pumps in service in accordance with OP 2-0700020, Condensate and Feedwater System - Normal Operation. When Reactor power is approximately 80%, as indicated on the highest reading instrument, Then PERFORM the following: STOP the power ascension. STOP the power ascension. PERFORM a Nuclear/Delta T Power calibration in accordance with 2-OSP-69.01, Nuclear and Delta T Power Calibration. VERIFY proper operation of Heater Drain and Vent system. VERIFY proper operation of normal and alt drain valves. VERIFY proper operation of normal and alt drain valves. 	6.123	<u>Whe</u> the follo	en Reactor power is approximately 60%, as indicated by higher of Calorimetric or NI Power, <u>Then</u> PERFORM the wing:	
 VERIFY proper operation of normal and alt drain valves. When Turbine load is approximately 660 MW, <u>Then PLACE</u> the Heater Drain Pumps in service in accordance with OP 2-0700020, Condensate and Feedwater System - Normal Operation. When Reactor power is approximately 80%, as indicated on the highest reading instrument, <u>Then PERFORM the</u> following: STOP the power ascension. PERFORM a Nuclear/Delta T Power calibration in accordance with 2-OSP-69.01, Nuclear and Delta T Power Calibration. VERIFY proper operation of Heater Drain and Vent system. VERIFY proper operation of normal and alt drain valves. MERIFY proper operation of normal and alt drain valves. 		1.	VERIFY proper heater levels.	<u> </u>
 6.124 When Turbine load is approximately 660 MW, Then PLACE the Heater Drain Pumps in service in accordance with OP 2-0700020, Condensate and Feedwater System - Normal Operation. 6.125 When Reactor power is approximately 80%, as indicated on the highest reading instrument, Then PERFORM the following: STOP the power ascension. PERFORM a Nuclear/Delta T Power calibration in accordance with 2-OSP-69.01, Nuclear and Delta T Power Calibration. VERIFY proper operation of Heater Drain and Vent system. VERIFY proper operation of normal and alt drain valves. 		2.	VERIFY proper operation of normal and alt drain valves.	
 6.125 When Reactor power is approximately 80%, as indicated on the highest reading instrument, Then PERFORM the following: STOP the power ascension. PERFORM a Nuclear/Delta T Power calibration in accordance with 2-OSP-69.01, Nuclear and Delta T Power Calibration. VERIFY proper operation of Heater Drain and Vent system. VERIFY proper heater levels. VERIFY proper operation of normal and alt drain valves. 	6.124	<u>Wh</u> the OP Ope	en Turbine load is approximately 660 MW, <u>Then</u> PLACE Heater Drain Pumps in service in accordance with 2-0700020, Condensate and Feedwater System - Normal eration.	
 STOP the power ascension. PERFORM a Nuclear/Delta T Power calibration in accordance with 2-OSP-69.01, Nuclear and Delta T Power Calibration. VERIFY proper operation of Heater Drain and Vent system. VERIFY proper heater levels. VERIFY proper operation of normal and alt drain valves. 	6.125	<u>Wh</u> the folle	<u>en</u> Reactor power is approximately 80%, as indicated on highest reading instrument, <u>Then</u> PERFORM the pwing:	
 §1 PERFORM a Nuclear/Delta T Power calibration in accordance with 2-OSP-69.01, Nuclear and Delta T Power Calibration. VERIFY proper operation of Heater Drain and Vent system. A. VERIFY proper heater levels. B. VERIFY proper operation of normal and alt drain valves. 		1.	STOP the power ascension.	
 3. VERIFY proper operation of Heater Drain and Vent system. A. VERIFY proper heater levels. B. VERIFY proper operation of normal and alt drain valves. 	§1	2.	PERFORM a Nuclear/Delta T Power calibration in accordance with 2-OSP-69.01, Nuclear and Delta T Power Calibration.	
 A. VERIFY proper heater levels. B. VERIFY proper operation of normal and alt drain valves. 		3.	VERIFY proper operation of Heater Drain and Vent system.	
 B. VERIFY proper operation of normal and alt drain valves. 			A. VERIFY proper heater levels.	
			B. VERIFY proper operation of normal and alt drain valves.	

REVISION NO	D.:	PROCEDURE TITLE:	PAGE:
4		REACTOR PLANT STARTUP -	
PROCEDURE	NO.:	MODE 2 TO MODE 1	55 of 65
2-GOP	-201	ST. LUCIE UNIT 2	
6.0 INS	TRUC	TIONS (continued)	<u>INITIAL</u>
0.400	Man	Turking load is approximately 705 MM/	
0.120	(85% Mega proce	Calorimetric Power) as indicated on WR-871, Gross awatts, Then PERFORM the following prior to eeding:	
	1. <u> 1</u>] te F	f all four Circulating Water Pumps are in operation, Then VERIFY the Main Condenser is less than or equal o 4.5 inches of Hg. absolute by the average of the two condensers as indicated on PI-10-7A, A Condenser Back Press (WR), and PI-10-6, B Condenser Back Pressure.	
	2. <u> </u> tu F	f only three Circulating Water Pumps are in operation, Then VERIFY the Main Condenser is less than or equal o 4.5 inches of Hg. absolute by the higher of the two condensers as indicated on PI-10-7A, A Condenser Back Press (WR), or PI-10-6, B Condenser Back Pressure.	
	3. E ii F	ENSURE at least one Heater Drain Pump is in operation n accordance with OP 2-0700020, Condensate and Feedwater System - Normal Operation.	
	4. E /	ENSURE the MSRs are in service in accordance with Appendix BB of 2-GOP-502, Placing MSRs in Service.	
	5. <u>l</u> í v	f desired, <u>Then</u> PLACE CTCS in service in accordance vith 2-OI-21-01.	
6.127	Wher ENS	<u>n</u> Turbine load is approximately 810 MW, <u>Then</u> JRE both Heater Drain Pumps are in operation.	
6.128	Wher the h follow	<u>n</u> Reactor power is approximately 98%, as indicated on ighest reading instrument, <u>Then</u> PERFORM the ving:	
	1. 8	STOP the power ascension.	
\$1	2. F a F	PERFORM a Nuclear/Delta T Power calibration in accordance with 2-OSP-69.01, Nuclear and Delta T Power Calibration.	

REVISION NO.	.:	PROCEDURE TITLE:	PAGE:
4		REACTOR PLANT STARTUP -	
PROCEDURE	NO.:	MODE 2 TO MODE 1	56 of 65
2-GOP-	201	ST. LUCIE UNIT 2	
6.0 INST	FRUCT	IONS (continued)	INITIAL
	<i>.</i>		
6.128	(conti	nued)	
	3. ∨ s	ERIFY proper operation of Heater Drain and Vent ystem.	
	A	VERIFY proper heater levels.	
	E	 VERIFY proper operation of normal and alt drain valves. 	
6.129	INCR	EASE power to 100% steady state.	<u></u>
6.130	If I&C Chan Powe 2-122 stable	performed the Linear Power Range Safety and Control nel Monthly Calibration, 2-1220052, while Reactor er was reduced to less than 90%, <u>Then</u> REPERFORM 20052 following Reactor Power return to 100% and e.	
6.131	GO T Durir furth	O NOP-2-0030123, Reactor Operating Guidelines ng Steady State and Scheduled Load Changes for er guidance.	

END OF SECTION 6.0

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REVISION	N NO.:	PROCEDURE TITLE:	PAGE:
	4	REACTOR PLANT STARTUP -	
PROCED	URE NO.:	MODE 2 TO MODE 1	57 of 65
2-G	OP-201	ST. LUCIE UNIT 2	
7.0	NFREQ	UENT OPERATION	INITIAL
-	·	notes DELLO store from Tarking Manual to Operator Auto	
1	r.i Tra	nster DEH System from Turbine Manual to Operator Auto	
	1	VEBIEV the Oper Auto is flashing	
	••		
	2.	ENSURE the Valve Position Limit is set to 131%.	
		CAUTION	
	lf the T	urbine is in Sequential Valve when the Oper Auto pushbutt	on is
	depres	sed the potential exists for the Turbine to automatically trai	nsfer to
	Single	Valve.	
	egre		
		``	
	3	DEPRESS Oper Auto	
	0.		
	4.	If the Turbine begins to transfer to Single Valve, Then	
		DEPRESS Imp In.	
	5.	MAINTAIN steady state conditions during the transfer to	
		Single Valve.	
	_		
	6.	If desired, Then RETURN the DEH System to Sequential	
		Valve, as follows:	
		A VERIEV keyboard location 4412 is stable for	
		1 minute	
		i minato.	<u> </u>
		B. If location 4412 is NOT stable, Then PERFORM the	
		following:	
		 If keyboard location 4265 is greater than or 	
		equal to 1802 or changing from 1801 to 1802,	
		<u>Then</u> INSERT key into the Maintenance Test	
		switch.	

REACTOR PLANT STARTUP - MODE 2 TO MODE 1 58 of 68
MODE 2 TO MODE 1 58 of 6
-201 51. LOCIE ONT 2
REQUENT OPERATION (continued)
Transfer DEH System from Turbine Manual to Operator Auto (continued)
6. (continued)
B. (continued)
<u>NOTE</u> The following step will transfer the DEH System to Turbine Manual.
 PLACE the Maint Test key switch to TEST.
3. VERIFY key board location 3104 is 2.00.
4. DEPRESS Change.
5. ENTER a value of 10.00.
6. VERIFY key board location 3104 is set to 10.00.
7. PLACE Maint Test key switch in OFF.
8. VERIFY Oper Auto pushbutton is flashing.
<u>NOTE</u> The following step will transfer the DEH System to automatic control.
9. DEPRESS Oper Auto.
10. VERIFY Turbine Program Display keyboard location 4412 is stable for 1 minute.
a. If stable, Then PROCEED with the transfer.
 b. <u>If</u> location 4412 is NOT stable, <u>Then</u> DO NOT continue. CONTACT the I&C Department.
NOT continue. CONTACT the I&C Department.

SION NO .:	PROCEDURE TITLE:	PAGE:
4 CEDURE NO.:	REACTOR PLANT STARTUP - MODE 2 TO MODE 1	59 of 65
-GOP-201	ST. LUCIE UNIT 2	
INFREQUE	ENT OPERATION (continued)	INITIAL
7.1 Trans (conti	sfer DEH System from Turbine Manual to Operator Auto inued)	
6. (continued)	
E	3. (continued)	
	 ENSURE the Impulse Pressure Feedback loop is in service as follows: 	
	a. VERIFY Imp In light is LIT.	
	b. VERIFY Imp Out light is NOT LIT.	
	 DEPRESS the Single Valve/Seq Valve pushbutton. 	
	13. VERIFY the Seq valve Light is flashing.	<u> </u>
When the is comple	NOTE Seq Valve light comes on solid, the transfer to Sequen ete. The transfer should take approximately 10 minutes.	itial Valve
L	14. VERIFY transfer to Sequential valve is COMPLETE.	
	15. <u>If</u> the value of key board location 3104 was changed, <u>Then</u> RETURN to a value of 2.00 as follows:	
	a. INSERT key into Maint Test key switch.	
	NOTE	lanual
The f	following step will transfer the DEH System to Turbine M	lanual.
The f	b. PLACE the Maint Test key switch to TEST.	

			PAGE:
P	AUCEDURE I	REACTOR PLANT STARTUP -	00 K 05
10.:		MODE 2 TO MODE 1	60 of 65
201		ST. LUCIE UNIT 2	
EQUEN	IT OPER	ATION (continued)	INITIAL
Transfe (continu	er DEH Sy ued)	stem from Turbine Manual to Operator Auto	
6. (co	ntinued)		
В.	(continu	ed)	
	15. (cor	ntinued)	
	C.	ENTER location 3104 into the key board.	
	d.	DEPRESS Change.	
	e.	ENTER a value of 2.00.	
	f.	VERIFY the value of key board location 3104 is now 2.00.	
	g.	PLACE Maint Test key switch to OFF.	
	h.	VERIFY Oper Auto light is flashing.	
The foll	owing ste	NOTE p will transfer the DEH System to automatic of	control.
	i.	DEPRESS Oper Auto.	
	j.	REMOVE the Maintenance Test Key.	
	16. RE fro	EMOVE the Impulse Pressure Feedback Loop m service as follows:	
	a.	DEPRESS Imp In/Imp Out.	
	b.	VERIFY Imp Out Light LIT.	
	PI 0.: !01 EQUEN Transfe (continu 6. (co B. The foll	PROCEDURE T O.: 201 EQUENT OPERA Transfer DEH Sy (continued) 6. (continued) 6. (continued) B. (continued) C. d. e. f. g. h. The following ster i. j. 16. RE fro a.	PROCEDURE TITLE: REACTOR PLANT STARTUP - MODE 2 TO MODE 1 ST. LUCIE UNIT 2 EQUENT OPERATION (continued) Transfer DEH System from Turbine Manual to Operator Auto (continued) 6. (continued) 15. (continued) c. ENTER location 3104 into the key board. d. DEPRESS Change. e. ENTER a value of 2.00. f. VERIFY the value of key board location 3104 is now 2.00. g. PLACE Maint Test key switch to OFF. h. VERIFY Oper Auto light is flashing. NOTE The following step will transfer the DEH System to automatic of i. DEPRESS Oper Auto. j. REMOVE the Maintenance Test Key. 16. REMOVE the Impulse Pressure Feedback Loop from service as follows: a. DEPRESS Imp In/Imp Out.

BEVISION NO ·		PAGE:
A	BEACTOR PLANT START I	D _
4		61 of 65
PROCEDURE NO.:		
2-GOP-201	ST. LUCIE UNIT 2	
7.0 INFREQU	JENT OPERATION (continued)	INITIAL
7.1 Trai (cor	nsfer DEH System from Turbine Manual to ntinued)	Operator Auto
6.	(continued)	
	B. (continued)	
	17. RESTORE the valve position limit value.	to the desired
Reviewed	d By:	Date//
	SRO	

					PAGE
VIS	ION NO.: F	ROCED			
	4		REACTOR PLANT STARTUP -		62 of 65
ROCI	EDURE NO.:				
2-	GOP-201		ST. LUCIE UNIT 2		
'.0	0 INFREQUENT OF		PERATION (continued)		INITIAL
	7.2 Reesta Inadve 1. EN 95	ablish ertent (NSUR 5%.	Reheat Steam Flow To The MSRs A Closure Of The TCVs: E Reactor power level is less than or	fter equal to	
	2. DI Va 3. VI	EPRE aive P ERIFY	SS the Reset pushbutton on the Reh anel. I locally the MSR TCVs are positione	d as follows:	
	COMPONE	ENT	DESCRIPTION	POSITION	INITIAL
	TCV-08-	.1	MS to 2A MSR	CLOSED	
	TCV-08-	-7	MS to 2A MSR	CLOSED	
	TCV-08-	-3	MS to 2B MSR	CLOSED	
	TCV-08-	-9	MS to 2B MSR	CLOSED	
	TCV-08	-4	MS to 2C MSR	CLOSED	
	TCV-08-	10	MS to 2C MSR	CLOSED	
	TCV-08	-2	MS to 2D MSR	CLOSED	
	TCV-08	-8	MS to 2D MSR	CLOSED	
	4. E a	ENSUF are pos	RE the manual isolation valves for the sitioned as follows:		ΙΝΙΤΙΔΙ
	COMPON	IENT	DESCRIPTION	OPEN	
	V0838	1			
	V0837	0	TCV-08-7 Isol		
	V0837	<u>'8</u>	TCV-08-8 Dwnstm Isol		
	V0838	32			
	V0838	33			
	V0837	2			
1	V0837	75	1CV-08-10 Isol		

TCV-08-10 Isol

V08384

نمب

OPEN

EVISI	ON NO.: F	ROCEDURE TITLE:			PAGE:
	4	REACT	OR PLANT STAR	TUP -	
PROCE	DURE NO.:	MC	DDE 2 TO MODE	1	63 of 6
2-(GOP-201	S	T. LUCIE UNIT 2		
7.0	INFREQUE	IT OPERATION (c	continued)		
	7.2 Reesta Inadve	olish Reheat Stear tent Closure Of Th	m Flow To The MS he TCVs: (continue	SRs After ed)	
	A large ste	am demand may o lock Valves that w	occur while opening	g the MSR Block ` uld be opened one	Valves. e at a
	A large ste The MSR E time, allowi 5. EN fol	am demand may o lock Valves that w ng time for the RC SURE the MSR B ows:	occur while opening vill be opened show S to stabilize. Block Valves are po	g the MSR Block	Valves. e at a
	A large ste The MSR E time, allow 5. EN fol	am demand may o lock Valves that wing time for the RC SURE the MSR B ows:	occur while opening vill be opened shou S to stabilize. Block Valves are po SCRIPTION	g the MSR Block of uld be opened on ositioned as POSITION	Valves. e at a
	A large ste The MSR E time, allow 5. EN fol COMPONE MV-08-4	am demand may o lock Valves that w ng time for the RC SURE the MSR B ows: NT DE 2A Block TCV	occur while opening vill be opened shou S to stabilize. Block Valves are po SCRIPTION	g the MSR Block of uld be opened on ositioned as POSITION OPEN	Valves. e at a
	A large ste The MSR E time, allow 5. EN fol COMPONE MV-08-4 MV-08-6	am demand may o block Valves that wing time for the RC SURE the MSR B ows: NT DE 2A Block TCV 2D Block TCV	occur while opening vill be opened shou S to stabilize. Block Valves are po SCRIPTION	g the MSR Block of uld be opened on ositioned as POSITION OPEN OPEN	Valves. e at a
	A large ste The MSR E time, allow 5. EN fol COMPONE MV-08-4 MV-08-6 MV-08-8	am demand may o lock Valves that w ng time for the RC SURE the MSR B ows: VT DE 2A Block TCV 2D Block TCV 2B Block TCV	occur while opening vill be opened shou S to stabilize.	g the MSR Block of ald be opened on ositioned as POSITION OPEN OPEN OPEN	Valves. e at a INITIAL

COMPONENT	DESCRIPTION	POSITION	INITIAL
MV-08-5	Warmup 2A MSR	OPEN	
MV-08-7	Warmup 2D MSR	OPEN	
MV-08-9	Warmup 2B MSR	OPEN	
MV-08-11	Warmup 2C MSR	OPEN	

		PAGE:
EVISION NO .:	PROCEDURE ITTLE:	1
4	REACTOR PLANT STARTUP -	GA of GE
	MODE 2 TO MODE 1	64 01 65
2-GOP-201		
7.0 INFREQU	JENT OPERATION (continued)	<u>11 NT 1 17 XE</u>
7.2 Ree Inad 7.	stablish Reheat Steam Flow To The MSRs After Ivertent Closure Of The TCVs: (continued) <u>After</u> a period of approximately 2 hours, <u>Then</u>	
	PERFORM the following:	
If the wr depress	<u>NOTE</u> rong pushbutton is depressed, the controller can be res ing the Reset pushbutton.	set by
	A. If automatic startup is desired, <u>Then</u> DEPRESS the Ramp pushbutton.	ne
	tests a 0 hour timod opening of 1027-08-7 8, 9 200 10) (smail
Ramp s TCVs). timed o and 40	 starts a 2 hour timed opening of TCV-08-7, 8, 9 and 10 This is followed by a 30 minute time delay and then a pening of TCV-08-1, 2, 3 and 4 (large TCVs). Total time minutes until TCV-08-1, 2, 3 and 4 indicate open. B. If manual startup is desired, <u>Then PERFORM the following</u>: 	a 10 minute me is 2 hours
Ramp s TCVs). timed o and 40	 starts a 2 hour timed opening of TCV-08-7, 8, 9 and TO This is followed by a 30 minute time delay and then a pening of TCV-08-1, 2, 3 and 4 (large TCVs). Total time minutes until TCV-08-1, 2, 3 and 4 indicate open. B. <u>If</u> manual startup is desired, <u>Then</u> PERFORM the following: 	a 10 minute me is 2 hours
Ramp s TCVs). timed o and 40 If the r Valve the ma the res	 starts a 2 hour timed opening of TCV-08-7, 8, 9 and TO This is followed by a 30 minute time delay and then a pening of TCV-08-1, 2, 3 and 4 (large TCVs). Total time minutes until TCV-08-1, 2, 3 and 4 indicate open. B. <u>If</u> manual startup is desired, <u>Then</u> PERFORM the following: manual valve positioner is NOT on zero before pushing Position pushbutton, the TCVs will OPEN to a position anual valve positioner setpoint and possibly damage the sultant thermal stresses. 	the Manual relative to e MSRs from
Ramp s TCVs). timed o and 40 If the r Valve the ma the res	 starts a 2 hour timed opening of TCV-08-7, 8, 9 and TO This is followed by a 30 minute time delay and then a opening of TCV-08-1, 2, 3 and 4 (large TCVs). Total time minutes until TCV-08-1, 2, 3 and 4 indicate open. B. If manual startup is desired, Then PERFORM the following: <u>CAUTION</u> manual valve positioner is NOT on zero before pushing Position pushbutton, the TCVs will OPEN to a position anual valve positioner setpoint and possibly damage the sultant thermal stresses. 1. ENSURE the manual valve positioner is on zero. 	the Manual relative to e MSRs from
Ramp s TCVs). timed o and 40 If the r Valve the ma the res	 starts a 2 hour timed opening of TCV-08-7, 8, 9 and 10 This is followed by a 30 minute time delay and then a pening of TCV-08-1, 2, 3 and 4 (large TCVs). Total time minutes until TCV-08-1, 2, 3 and 4 indicate open. B. If manual startup is desired, Then PERFORM the following: <u>CAUTION</u> manual valve positioner is NOT on zero before pushing Position pushbutton, the TCVs will OPEN to a position anual valve positioner setpoint and possibly damage the sultant thermal stresses. 1. ENSURE the manual valve positioner is on zero. 2. DEPRESS the Manual Valve Position pushbutton. 	the Manual relative to e MSRs from
Ramp s TCVs). timed o and 40 If the r Valve the ma the res	 starts a 2 hour timed opening of TCV-08-7, 8, 9 and 10 This is followed by a 30 minute time delay and then a pening of TCV-08-1, 2, 3 and 4 (large TCVs). Total time minutes until TCV-08-1, 2, 3 and 4 indicate open. B. If manual startup is desired, Then PERFORM the following: <u>CAUTION</u> manual valve positioner is NOT on zero before pushing Position pushbutton, the TCVs will OPEN to a position anual valve positioner setpoint and possibly damage the sultant thermal stresses. 1. ENSURE the manual valve positioner is on zero. 2. DEPRESS the Manual Valve Position pushbutton. 	tely 2 hours.

		PROCEDURE TITL	E			PAGE:	
	1	R	FACTOR PLANT ST	ARTUP -			
	4		MODE 2 TO MOD	DE 1		65 of	65
PROCE	EDURE NO.:						
2-0	GOP-201		ST. LUCIE UNIT	ſ2	- <u>-</u>	<u> </u>	
7.0	INFREQUE	NT OPERAT	ION (continued)				
	Inadvo 8. <u>A</u> fo	ertent Closure I <u>ter</u> the MSR Ilowing:	e Of The TCVs: (conti TCVs are OPEN, <u>Th</u>	inued) <u>en</u> PERFORI	VI the		
	А	. POSITION	the small TCV isolat	ion valves as	s follows:		
		. POSITION	the small TCV isolat	ion valves as	s follows: DSITION	INITIAL	
	A COMPON V0838	. POSITION	the small TCV isolat	ion valves as PC Cl	s follows: DSITION LOSED	INITIAL	
	A COMPON V0838 V0837	. POSITION ENT 1 TCV-08 3 TCV-08	the small TCV isolat DESCRIPTION 3-7 Isol 3-7 Isol	ion valves as PC Cl	s follows: DSITION LOSED LOSED	INITIAL	
	A COMPON V0838 V08370 V08370	POSITION ENT TCV-08 TCV-08 TCV-08 TCV-08	DESCRIPTION B-7 Isol B-7 Isol B-8 Dwnstm Isol	ion valves as PC Cl Cl Cl	s follows: DSITION LOSED LOSED LOSED	INITIAL	
	A COMPON V0838 V08370 V08375 V08385	POSITION ENT TCV-08 TCV-08 TCV-08 TCV-08 TCV-08 TCV-08	DESCRIPTION B-7 Isol B-7 Isol B-8 Dwnstm Isol B-8 Upstrm Isol	ion valves as PC Cl Cl Cl Cl	s follows: DSITION LOSED LOSED LOSED LOSED		
	A COMPON V0838 V08370 V08375 V08385 V08385	POSITION ENT TCV-08 TCV-08 TCV-08 TCV-08 TCV-08 TCV-08 TCV-08 TCV-08 TCV-08	DESCRIPTION 3-7 Isol 3-7 Isol 3-8 Dwnstm Isol 3-8 Upstrm Isol 3-9 Isol	ion valves as PC CI CI CI CI CI CI	s follows: DSITION LOSED LOSED LOSED LOSED	INITIAL	
	A COMPON V0838 V08370 V08370 V08382 V08382 V08382 V08382	POSITION ENT TCV-08 TCV-08 TCV-08 TCV-08 TCV-08 TCV-08 TCV-08 TCV-08 TCV-08 TCV-08 TCV-08	DESCRIPTION DESCRIPTION 3-7 Isol 3-7 Isol 3-8 Dwnstm Isol 3-8 Upstrm Isol 3-9 Isol 3-9 Isol	ion valves as PC Cl Cl Cl Cl Cl Cl Cl Cl Cl Cl Cl	s follows: DSITION LOSED LOSED LOSED LOSED LOSED	INITIAL	
	A COMPON V0838 V0837 V0837 V0838 V0838 V0838 V0837 V0837	POSITION ENT TCV-08 TCV-08 TCV-08	DESCRIPTION DESCRIPTION 3-7 Isol 3-7 Isol 3-8 Dwnstm Isol 3-8 Upstrm Isol 3-9 Isol 3-9 Isol 3-10 Isol	ion valves as PC Cl Cl Cl Cl Cl Cl Cl Cl Cl Cl Cl Cl Cl	s follows: DSITION LOSED LOSED LOSED LOSED LOSED LOSED	INITIAL	

B. ALIGN the MSR Warm Up Valves as follows:

COMPONENT	DESCRIPTION	POSITION	INITIAL
MV-08-5	Warmup 2A MSR	CLOSED	
MV-08-7	Warmup 2D MSR	CLOSED	
MV-08-9	Warmup 2B MSR	CLOSED	
MV-08-11	Warmup 2C MSR	CLOSED	

Reviewed by		Date	
	SRO		
	END OF SECTION 7.2	· · · · · · · · · · · · · · · · · · ·	turi tu
<u></u>			

10A	STATION BLACKOUT		4 of 28
PROCEDURE NO .:			
2-EOP-10	SI. LUC		
5.0 <u>OPERATO</u> INST	RACTIONS:	CONTINGE	NCY
		ACTION	S
1. Verify 2 Post Ti perform	2-EOP-01, "Standard rip Actions" has been ned.	1. Perform 2-EOP- Post Trip Action	01, "Standard s."
	CA	UTION	
All availa accident Instrume indication	able indications should be a will cause extensive loss o nt readings must be verifie ns are available.	used in diagnosing the e of control room instrumer d when one or more cor	vent since the ntation. nfirmatory
	<u> </u>	IOTE	
All step	s preceded with an asteris	k (*) are to be performed	continuously.
 ★ 2. To corstation A. Ver Stacrit B. Per Sta Ap 15 	firm the diagnosis of a blackout: ify the Safety Function tus Check acceptance eria are satisfied. form Safety Function tus Check per pendix A every minutes until exit	2. <u>If</u> Safety Function acceptance criters satisfied, <u>Then</u> event and exit to appropriate Ema Operating Proce 2-EOP-15, "Fun Recovery."	on Status Check eria are NOT rediagnose the o either ergency edure or actional
★ 3. Conta condu radiati	ct Health Physics to ct secondary area on surveys.		

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REVISION	NO.:	PROCEDURE TITLE:				PAGE:
10A		STATION	BLAC	KOU	т	5 of 28
PROCEDU	RE NO.:					0.01.20
2-EC)P-10	ST. LUC	CIE UN	IT 2		
5.0 <u>OF</u>	ERATO	R ACTIONS: (continued)				
	INST	RUCTIONS		С	ONTINGENCY ACTIONS	,
	f all feec generato 150 gpm	<u>CAU</u> water has been stopped, w rs is reinitiated, flow should for five minutes or until a l	UTION when fe be lim evel in	ed fle ited creas	ow to the steam to less than or equ se is observed.	ual to
* 4.	Ensure genera	at least one steam tor has the following:	4.	<u>If</u> 20 <u>The</u> nece	C AFW flow capac <u>n</u> perform the follo essary:	ity is lost, wing as
	A. Lev mai ban rang Pun	el being restored or ntained in the normal d (60% to 70% narrow ge) using the 2C AFW np. AND		Α.	If 2C AFW Pump on overspeed a be performed pe Off-Normal Oper Procedure 2-ON "Auxiliary Feedw	o is tripped restart can r ating P-09.02, rater."
	B. Pre the pref	ssure control by one of following (listed in ferred order): Atmospheric Dump Valves (ADVs) (manual control). Main Steam Safety Valves.		В.	Locally operate 2 Pump per Apper "Local Operation Auxiliary Feedwa	2C AFW ndix G, of the 2C ater Pump."
5.	OPEN deener and 48 "Vital F Config	all breakers on the gized 6.9 KV, 4.16 KV, OV buses per Table 7, Power Breaker uration/Station Blackout."				

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10A		A	STATION	N BLAC	KOU	6 of 28
PROCEDURE NO.:		RE NO.:	et III		ut o	
2 5 0		PERATO	B ACTIONS: (continued)			
0.0	<u> </u>	INST	RUCTIONS	'	С	CONTINGENCY ACTIONS
	6.	Locally Dischar operatin 10 TUF 2A ICW 2B ICW 2C ICW	THROTTLE ICW Pump rge Valves on previously ng pumps approximately NS OPEN: / Disch SB21163 / Disch SB21209 V Disch SB21206			
*	7.	If diese to start start fro	I generators have failed , <u>Then</u> attempt a manual om RTGB.	7.	<u>If</u> m <u>The</u> perf App Loc this	nanual start is unsuccessful, en dispatch an operator to form a local start per pendix C, "Diesel Generator eal Start" and continue with procedure.
* 8	8.	<u>If</u> 4.16k to ener operatii <u>Then</u> :	(V Bus 2A3 or 2B3 fails gize from its associated ng diesel generator,	8.	<u>If</u> th the brea (2B) Brea	ne breaker fails to close from RTGB, <u>Then</u> locally CLOSE aker 2-20211 (2-20401), "2A) Diesel Generator Output aker":
		A. Inse dee pos	ert sync plug for the nergized bus and turn to ition DG-2A (DG-2B).		A.	Place LOCAL/ISOLATE switch(es) in ISOLATE position.
		B. Mar 2-20	ually CLOSE breaker)211 (2-20401), "2A (2B)		В.	Locally CLOSE breaker.
		Dies Brea	aker."		Ċ.	Return LOCAL/ISOLATE switch(es) to NORMAL.
		C. Rer	nove sync plug.		D.	Verify breaker remains CLOSED.
			<u></u> .		PAGE:	
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REVISION NO.: 10A	STATION B	LAC	(OUT	r	7 of 28	
PROCEDURE NO .:			тο			
2-EOP-10			12			
5.0 <u>OPERATC</u>	<u>PRACTIONS</u> : (continued)					
INSTRUCTIONS			C	ONTINGENCY ACTIONS		
★ 9. If Unit availat power Restor	2 EDG or offsite power is ole, <u>Then</u> restore normal per Appendix E, "Power ration Station Blackout."	9.	<u>lf</u> Ur NOT A.	hit 2 EDG or offsite available, <u>Then</u> : <u>If</u> Unit 1 has at le energized 4.16 K Emergency Bus, crosstie AB 4.16 from Unit 1 to Un	e power is ast one V <u>Then</u> KV buses it 2 per	
				Appendix V, "SB From Unit 1 to U	O Crosstie nit 2."	
			В.	If SBO crosstie fi is NOT available consider crosstie Unit 1 per Appen "Alternate Metho Crosstying Unit 1 Startup Transfore Unit 2."	rom Unit 1 , <u>Then</u> from idix F, d of Diesel or mer to	
10. To mi coold follow	inimize RCS leakage and own, perform the ring:	10.	<u>If</u> N per nec	ISIVs do NOT clos form the following cessary:	se, <u>Then</u> as	
A. M	anually CLOSE the Main		Α.	Manually initiate	MSIS.	
St (N	eam Isolation Valves ISIVs).		В.	Locally CLOSE Appendix I, "MS	MSIVs per IV Local	
1.	HCV-08-1A - S/G 2A			Closure."		
	AND					
2.	HCV-08-1B - S/G 2B					
(Continu	ued on Next Page)					

		PAGE:
PROCEDURE TITLE: STATION B	LACKOUT	8 of 28
		
ST. LUCI	E UNIT 2	
<u>ACTIONS</u> : (continued)		
RUCTIONS		NCY S
ed)	10.	
ually CLOSE S/G down Valves and ple Valves.		
CV-23-3 and FCV-23- - S/G 2A		
AND		
CV-23-5 and FCV-23-6 S/G 2B		
AND		
FCV-23-7 and FCV-23-9, Blowdown Sample" (one switch).		
nually CLOSE RCS and ssurizer Sample Isolation ves.		
200 V5203 201 V5204 202 V5205		
nually CLOSE V2515, 516 and V2522, "Letdown lation Valves."		
nually CLOSE V2505 and 524, "RCP Bleed-Off lation Valves."		
	PROCEDURE TITLE: STATION B ST. LUCII ACTIONS: (continued) RUCTIONS ed) Jually CLOSE S/G down Valves and ple Valves. CV-23-3 and FCV-23- - S/G 2A AND CV-23-5 and FCV-23-6 S/G 2B AND CV-23-7 and FCV-23-9, Blowdown Sample" (one switch). nually CLOSE RCS and ssurizer Sample Isolation /es. 200 V5203 201 V5204 202 V5205 nually CLOSE V2515, 516 and V2522, "Letdown ation Valves."	STATION BLACKOUT STATION BLACKOUT 2 ACTIONS: (continued) RUCTIONS CONTINGEN ACTIONS ed) 10. July CLOSE S/G down Valves and ple Valves. CV-23-3 and FCV-23-6 - S/G 2A AND CV-23-5 and FCV-23-6 S/G 2B AND CV-23-7 and FCV-23-9, Blowdown Sample" (one switch). nually CLOSE RCS and ssurizer Sample Isolation /es.

REVISION N	10.: A	PROCEDURE TITLE: STATION	BLAC	KOUT	PAGE:
PROCEDUR	E NO.:				0 01 20
2-EO	P-10	ST. LUC	IE UN	IIT 2	
5.0 <u>OP</u>	ERATO	R ACTIONS: (continued)			
	INST	RUCTIONS		CONTINGENCY ACTIONS	
	It take	No. No. 15 minutes for national second second second second second second second second second second second second	<u>DTE</u> Iral ci	rculation flow to fully dev	/elop.
* 11.	Verify n at least followin	atural circulation flow in one loop by all of the g:	11.	If natural circulation flo observed, <u>Then</u> ensure control of S/G feeding steaming.	w is NOT e proper and
	A. Loop T-co pow	o Δ T (T-hot minus Id) is less than full er Δ T (50°F).			
	B. T-cc decr	old constant or reasing.			
	C. T-ho deci	ot constant or reasing.			
	D. No a (gre T-ho Core (CE	abnormal differences ater than 20°F) between ot and Representative e Exit Thermocouple T) temperature.			
	E. Rep tem leas	resentative CET perature indicates at t 20°F subcooling.			

10A	STATION B	LACKOUT	10 of 28
PROCEDURE NO.: 2-EOP-10	ST. LUCIE	E UNIT 2	
5.0 <u>OPERATO</u>	R ACTIONS: (continued)		
INST	RUCTIONS	CONTINGENCY ACTIONS	
 ★ 12. If power least of Bus an Air Cor availab instrum followin A. Ens Cer ene vita ava Ope 2-N 2AI Cor B. Dis and var cor App the Air 2A C. Wr "O Ins is cor 	r has been restored to at he 4.16 KV Emergency <u>d</u> 2C and 2D Instrument npressors are NOT le, <u>Then</u> restore ient air by performing the hg: ure 2AB 480V Load iter is aligned to an rgized bus, if only one I AC electrical train is ilable. (Refer to erating Procedure OP-52.02, "Alignment of Buses and mponents"). patch an operator to align I start emergency cooling ter to the instrument air npressors per bendix H, "Operation of 2A and 2B Instrument Compressors." (Requires B MCC to be energized.) <u>nen</u> Appendix H, beration of the 2A and 2B trument Air Compressors" completed, <u>Then</u> locally		/R10
(Ret to	n one instrument an npressor as follows: equires 2A6 or 2B6 MCC be energized.)		
1. (Continue	Place local handswitch in AUTO. ed on Next Page)		

REVISION N	IO.:			KOUT	PAGE:
PROCEDUR		STATION	DLAU		11 of 28
2-EO	P-10	ST. LUC	IE UN	IT 2	
5.0 <u>OP</u>	ERATO	R ACTIONS: (continued)			
	INST	RUCTIONS		CONTINGENCY ACTIONS	(
12.	(continu	ued)			
	C. (con	tinued)			
	2. F II C s	Reset 2A or 2B nstrument Air Compressor control switch (HVCB).			
	3. \ F	/erify instrument air pressure being restored.			
□ 13.	Maintai to 50°F	n RCS subcooling 20°F (Representative CET	13.	<u>If</u> subcooling is NOT 20°F and 50°F, <u>Then</u>	between :
	"RCS F using a steamir	Pressure Temperature") Nuxiliary feedwater and Ng with ADVs.		A. <u>If</u> subcooling less 20°F, <u>Then</u> reductemperature and Representative temperature is le 22°F superheate	is than lice RCS I verify CET ess than ed.
				B. <u>If</u> subcooling is than 50°F, <u>Ther</u> cooldown in pro	greater <u>1</u> stop any gress.
□ 14.	Ensure invento maintai conditio "Time I Require Availab "Conde Cooldo	available condensate ory is adequate to in Hot Standby ons. (Refer to Figure 3, Until Shutdown Cooling ed vs. Condensate oility" and Figure 4, ensate Required For own").	14.	<u>If</u> condensate invento adequate, <u>Then</u> requ alternate sources fro Technical Support Co	ory is NOT est m the enter.

10A	STATION	BLACKOUT		
ROCEDURE NO .:	-		12 of 28	
2-EOP-10	ST. LUC	HE UNIT 2		
5.0 <u>OPERATC</u>	R ACTIONS: (continued)			
INSTRUCTIONS		CONTINGEN ACTIONS	CY	
★ 15. <u>If</u> powe restore electric the foll	er has NOT been ed to at least one cal train, <u>Then</u> perform owing:	15. <u>If</u> power has been at least one electr <u>Then</u> go to Step 1	restored to ical train, 6.	
A. Cal bas and time cal the dep	culate shutdown margin ed on T-cold minus 50°F I boron concentration at e of trip. Repeat culation every 50°F as plant cools down and pressurizes.			
B. As dep auto and	the plant cools down and pressurizes, block the omatic actuation of SIAS MSIS.			
C. Cor moi ope	ntact NPO to locally nitor the 2C AFW Pump eration.			
D. Cor ope cor swi	ntact Security to block on exterior doors to atrol room and electrical tchgear rooms.			
E. Dee per Equ Dee Bat	energize DC equipment Table 9, "125V DC uipment Which May Be energized to Extend ttery Life."			
F. Do ren pro per Ste	NOT perform the naining steps of this cedure. Continue forming Instruction eps 1 through 15.			

REVISION NO.: 10A	PROCEDURE TITLE: STATIO	N BLACKOUT	13 of 28	
PROCEDURE NO .:				
2-EOP-10	ST. LU			
5.0 <u>OPERATO</u>	<u>R ACTIONS</u> : (continued)		
INS	INSTRUCTIONS CONTINGE ACTION			
16. Ensure power least o Operat 2-0960 Power Operat	e that vital 125V DC is being supplied by at ne battery charger per ing Procedure 020, "125V DC Class 1E System - Normal tion."			
17. Borate to mai pcm s valve neces	the RCS as necessary ntain greater than 5000 hutdown margin. (Manua operation may be sary.)			
If AC por restriction margin only op	Ower is being supplied from ons may preclude starting exists. Do NOT restart an erating EDG on Unit 1.	<u>CAUTION</u> m a Unit 1 Diesel, then EDG an ICW or CCW pump unti n ICW or CCW pump if pow	a loading I adequate er is from the	
□ 18. <u>If</u> AC <u>other</u> EDG A, Fr	power is from any source <u>than</u> the only operating on Unit 1, <u>Then:</u> isure at least one ICW			
pu re Di	mp is operating and store operating ICW Pump scharge Valve(s) to DRMAL position.	þ		
B. Er ve Pr "Ir St	nsure ICW System is ented per Operating rocedure 2-0640020, ntake Cooling Water ystem Operation."			
(Continu	ed on Next Page)			

10A	:	PROCEDURE TITLE: STATION E	BLACKOUT	PAGE:
PROCEDURE	NO.:			14 of 28
2-EOP-	-10	ST. LUCI	E UNIT 2	
5.0 <u>OPE</u>	RATO	R ACTIONS: (continued)	· · · · · · · · · · · · · · · · · · ·	L
	INST	RUCTIONS	CONTINGENCY ACTIONS	
18. (0	continu	ied)		
C	Ensi oper Proc "Cor Norr	ure CCW is restored to ration per Operating redure 2-0310020, mponent Cooling Water - mal."		
☐ 19. <u>If</u> o b lr fc	powe ffsite, be rest nstrum pllows:	r has been restored from <u>Then</u> instrument air may ored using the 2C or 2D ent Air Compressor as		
۵	A. Ens Wat rest corr	ure Turbine Cooling er (TCW) has been ored to instrument air pressors.		
E	3. Loca Inst con pos	ally, place 2C and 2D rument Air Compressor trol switches to OFF ition.		
C	C. Dep on I Inst	oress Reset push button both 2C and 2D rument Air Compressors.		
[D. Plac com RUI	ce desired instrument air pressor control switch to N position.		
E	E. Ver con	ify instrument air npressor starts and loads.		
F	F. Plaestar star con pos	ce control switch for ndby instrument air npressor to AUTO ition.		

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TEVISION NO.: 10A	PROCEDURE TITLE: STATIO	N BLACKOUT	PAGE:
PROCEDURE NO.:			15 of 28
2-EOP-10	ST. L	UCIE UNIT 2	
5.0 <u>OPERATO</u>	R ACTIONS: (continued)	
INST	RUCTIONS	CONTINGEN ACTIONS	ICY S
The non- instrumer letdown u	essential sections of MC nt air available to restore using 'P' valves, MCC 2A	<u>NOTE</u> C 2A6 and 2B6 must be en letdown using 'Q' valves. 2 must <u>also</u> be energized.	ergized, and To restore
★ 20. <u>If</u> plant restore Operat 2-0210 Letdow	conditions permit, <u>Then</u> letdown per Off-Normal ing Procedure 030, "Charging and n."		
 21. Ensure restore followin A. Ope (and requires 10% 	RCS inventory is being d or maintained per the ng criteria: erate charging pumps d letdown if available) as uired to maintain ssurizer level 6 to 70%.	21. <u>If</u> adequate RCS control is NOT es <u>Then</u> ensure all a charging pumps a	inventory stablished, available are operating.
	AND		
B. RC 20° pag	S subcooling at least F (Representative CET, e 213, QSPDS).		
	AND		
C. Rea indi (sei pag rep tem sup	actor vessel level cates core covered nsors 7 and 8 covered, le 212, QSPDS) <u>or</u> resentative CET operature NOT erheated.		/F

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TEVISION NO.: 10A	PROCEDURE TITLE: STATION	BLACKOUT	TE of 29
PROCEDURE NO.:	-		10 01 20
2-EOP-10	ST. LUC	IE UNIT 2	
5.0 <u>OPERATO</u>	<u>R ACTIONS</u> : (continued)		
INS	TRUCTIONS	CONTINGEI ACTIONS	NCY S
If Unit 2 capacity Table 11	<u>N(</u> is being supplied by a Unit of the EDG may limit operat , "Emergency Diesel Genera	<u>DTE</u> I EDG, then restriction o tion Pressurizer Heaters ator Loading (SBO)."	n the load . Refer to
 22. Restor pressu Figure Tempe A. CLO pre 416 who B. Ma Her onl C. Ma spr 	e and maintain rizer pressure within the re/temperature limits of 1, "RCS Pressure erature" curve: OSE the breakers for ssurizer heater buses on OV Buses 2A3 and 2B3 en available. nually reset the Backup ater Banks B1 and B4 y. nual operation of auxiliary rays.	 22. <u>If</u> RCS subcoolin maintained, <u>Ther</u> following as appredict of the subcoolin and the sub	g is NOT being perform the opriate: cooling is less <u>Then</u> : 20°F ng by reducing perature. pressurizer to establish pcooling. cooling is n 200°F or ate is greater /hr, <u>Then</u> following steps ate: y cooldown in s.
		(Continued on Nex	t Page)

REVISION NO.: 10A	PROCEDURE TITLE: STATIC	N BLAC	KOU	T	AGE:
PROCEDURE NO.:					17 of 28
2-EOP-10	ST. L	UCIE UN	IT 2		
5.0 OPERATO	R ACTIONS: (continued	d)			
INST	RUCTIONS		С	CONTINGENCY ACTIONS	
22.		22.	(cor	ntinued)	
			B.	(continued)	
				2. Depressurize the by using auxiliar to restore and m pressurizer press within the limits Figure 1, "RCS Pressure Tempe curve.	e plant y spray aintain sure of erature"
				OR	
				3. Depressurize the by using manua of letdown to res and maintain pre pressure within limits of Figure 7 Pressure Tempe curve.	e plant I control store essurizer the I, "RCS erature"
				4. <u>If</u> overpressuriza to charging flow depressurize RC stopping chargir pumps, one at a restore and mai pressurizer pres within the limits Figure 1, "RCS Pressure Tempo	ation due , <u>Then</u> CS by ng a time, to ntain sure of erature"

10,	0.:	PROCEDURE TITLE:		PAGE:
	A	STATIO	ON BLACKOUT	18 of 28
PROCEDURI	E NO.:	1		
2-EOI	P-10	ST. L	UCIE UNIT 2	
5.0 <u>OPE</u>	ERATO	<u>R ACTIONS</u> : (continue	d)	
	INS	RUCTIONS	CONTIN ACTI	IGENCY IONS
If ca Ro	Unit 2 apacity efer to <u>If</u> AC p	s being supplied by a U of the EDG may limit op Table 11, "Emergency D ower is from any source	NOTE nit 1 EDG, then restrict eration to only 1 contai piesel Generator Loadin	tion on the load inment cooling fan. ng (SBO)."
	other <u>t</u> EDG o contair service	<u>nan</u> the only operating n Unit 1, <u>Then</u> place two ment fan coolers in as follows:)	
	A. <u>If</u> 'A ava and Coo be	A' Electrical Train is ilable, <u>Then</u> start the 2A 2B Containment olers. (MCC 2A9 must energized.)		
		OR		
	B. <u>If</u> 'E ava anc Coo be	3' Electrical Train is ilable, <u>Then</u> start the 2C 2D Containment olers. (MCC 2B9 must energized.)	;	
★ 24.	If power Unit 1, power Appen Station	er is being supplied from <u>Then</u> restore normal configuration per dix E, "Power Restoration Blackout", when offsite	'n	

			2442 140 Link	PAGE:		
REVISION NO.:		STATIC	N BLACKOUT			
				19 of 28		
PROCEDURE N	0.:					
2-EOP-10 ST. LUCIE UNIT 2						
5.0 <u>OPER</u>	ATO	R ACTIONS: (continue	d)			
		DUCTIONS	CONTINGENCY	r		
I	INS I	RUCTIONS	ACTIONS			
			Actions			
★ 25. <u>W</u> co	<u>hen</u> t Inditic	he station blackout exit ons are satisfied, <u>Then</u> :				
	A Verify Safety Function					
A.	Stat	us Check acceptance				
	crite	eria of 2-EOP-09, "Loss				
	of Offsite Power (LOOP)"					
	can	be met, and exit to				
	2-5	OF-09.				
		OR				
В	. Exit	t to appropriate				
	pro	cedure as directed by th	e			
	Tec	chnical Support Center.				
			a the plant in a condition where	all safety		
	Thi	s procedure should leave	ned and the RCS is in a MODE	3 condition.		
	Fur	ther recovery actions maintain	ay be recommended by the Tec	hnical Support		
	Ce	nter.				
		E	ND OF TEXT			

			DAGE
REVISI	ON NO.: 22	APPENDIXES/FIGURES/TABLES	83 of 139
PROCE	EDURE NO.: EOP-99	ST. LUCIE UNIT 2	
		APPENDIX V SBO CROSSTIE FROM UNIT 1 TO UNIT 2 (Page 1 of 12)	ΙΝΙΤΙΔΙ
1.	Establish c plant radio	ommunications with Unit 1 via Gai-Tronics or (if available).	
2.	To bring A	C power from Unit 1 to Unit 2 via the SBO crosstie bus:	
	Selection the RCS Bus shou restored considera	<u>NOTE</u> I should be based on equipment availability necessary to , i.e., if the 2A Charging Pump is out of service, the 2B3 Id be considered, or the electrical train LEAST likely to I by either offsite power or EDG. Due to 10 CFR 50 Appen ations, the 'A' side is preferable.	o stabilize 4.16 KV pe endix R
	A. Select Circle	the 4.16 KV vital bus to be energized on Unit 2. selected bus: 2A3 2B3	
	B. Place positio	the following pump switches in the PULL TO LOCK n:	
	2A ICV	V Pump	
	2B ICV	V Pump	
	2C IC\	N Pump	
	2A CC	W Pump	
	2B CC	W Pump	
	2C CC	CW Pump	
	C. Perfor	m the following steps:	
	1. En: Sta	sure Table 7, "Vital Power Breaker Configuration/ ation Blackout" of 2-EOP-99 has been completed.	
	2. Ve bus	rify the EDG output breaker on the selected 4.16 KV s is OPEN 2-20211 (2-20401).	

EVISION NO.: 22	PROCEDURE TITLE: APPENDIXES/FIGURES/TABLES	PAGE:
ROCEDURE NO.:		84 of 139
2-EOP-99 ST. LUCIE UNIT 2		
	SBO CROSSTIE FROM UNIT 1 TO UNIT 2 (Page 2 of 12)	
(INITIAL
. (continued)		<u></u>
C. (contin	ued)	
The follo Technica	<u>CAUTION</u> wing step will render a Unit 1 EDG inoperable. Refer to al Specifications 3.8.1.1 and 3.8.1.2.	o Unit 1
3. <u>If</u> U (Au with to U	Init 1 will supply power from a 4.16 KV Transformer xiliary or Startup), <u>Then</u> disable the Unit 1 EDG associa In the Unit 1 4.16 KV Emergency Bus that will be crosstie Unit 2 as follows:	ted ed
a.	Disable the 1A Emergency Diesel Generator as follows:	
	 Place the 1A Diesel Generator Start Control Norm/Isolate switch in ISOLATE. 	
	2. OPEN the Control Power knife switch.	
	OR	
b.	Disable the 1B Emergency Diesel Generator as follows:	
	 Place the 1B Diesel Generator Start Control Norm/Isolate switch in ISOLATE. 	
	2. OPEN the Control Power knife switch.	. <u></u>

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REVISION N	10.:		PAGE:
2	2	APPENDIXES/FIGURES/TABLES	85 of 139
		ST LUCIE UNIT 2	
2-E0			
		SBO CROSSTIE FROM UNIT 1 TO UNIT 2 (Page 3 of 12)	
2. (co	ntinued)		INITIAL
lf s F L	SBO cr ubseque , "Alterr Jnit 2."	<u>NOTE</u> rosstie from Unit 1 is unavailable or is NOT successful in ent steps, <u>consider</u> crosstie from Unit 1 per 2-EOP-99, Ap nate Method of Crosstying Unit 1 Diesel or Startup Transf	opendix former to
D.	<u>When</u> Buses,	the Unit 1 Control Room is ready to crosstie AB 4.16 KV <u>Then</u> CLOSE in the Unit 2 SBO Breaker (2-20501).	
E.	Reque Breake	st the Unit 1 Control Room to CLOSE the Unit 1 SBO er (1-20501)	
F.	Place t bus for positio	the RTGB control switches on the selected 4.16 KV vital the HPSI, LPSI, CS and AFW pumps in the OFF n.	
<u> </u> u r	f 2C AF using a r restored	<u>NOTE</u> W Pump is NOT available, <u>Then</u> feedwater must be reste motor driven AFW pump as soon as a vital 4.16 KV bus	ored is
G.	Align t 4.16 K (2-205	he selected 2A3 or (2B3) 4.16 KV vital bus to the 2AB XV Bus by closing 2-20208 and 2-20505 or (2-20409) and 04). Verify proper bus voltage on the selected vital bus.	3

EVISION NO.:		FAGE.
22		86 of 139
ROCEDURE NO .:		
2-EOP-99	ST. LUCIE UNIT 2	
	APPENDIX V <u>SBO CROSSTIE FROM UNIT 1 TO UNIT 2</u> (Page 4 of 12)	
2. (continued)		INITIAL
Up to this from Unit only oper for use o prevent e 11, "Eme as neces	<u>NOTE</u> a point, this appendix has one 4.16 KV Emergency Bus 1 via both units' AB 4.16 KV Buses. It may be energiz ating EDG on plant site, thus limiting the load capability in Unit 2. Close coordination between the units is require xceeding the operating EDG maximum loading. Refer rgency Diesel Generator Loading (SBO)," load list of 2- sary.	energized zed by the y available red to to Table EOP-99
J. If the por Star 3. If the Unit	 Step 4. Step 4. Step 5. Then GO TO Step 5. EDG energizing the Unit 2 vital 4.16 KV bus is the ting EDG on plant site, <u>Then</u> restore loads as follows: 	(Auxiliary
Notify th loading breakers Maximu amps, a	<u>CAUTION</u> e Unit 1 Control Room to monitor the operating diesel. causes bus load instabilities, <u>Then</u> Unit 2 480V L.C. fee and 4.16 KV loads may be tripped to protect the diese m loading on the SBO (2AB 4.16 KV) bus is 550 contin s indicated on AM 942 on RTGB 101.	<u>If</u> the eder el. uous
A. Turn tl	ne RCP oil lift pump switches to the OFF position.	

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REVISION NO.: 22		PROCEDURE TITLE: APPENDIXES/FIGURES/TABLES	FAGE.
			87 of 139
2-EOP-9	/ 9	ST. LUCIE UNIT 2	
		APPENDIX V	
		SBO CROSSTIE FROM UNIT 1 TO UNIT 2	
		(Page 5 of 12)	
3. (contin	ued)		<u>INITIAL</u>
[
KW ii provi	ndica ided	<u>NOTE</u> ation is the preferred method of EDG loading. Ampere in the event that KW indication is NOT available.	values are
B. Ha tha	ive U an or	nit 1 verify the crosstied EDG is carrying less equal to 2500 KW (350 amps) load.	
C. En sel the	ergiz lecte e follo	te the 2A2 or (2B2) 480V L.C. powered by the d 4.16 KV vital bus by closing or ensuring CLOSED owing:	
2A	2 - 2	2-20213,"Station Service Transformer Feeder 2A2" and 2-40219, "480V 2A2 L.C. Feeder."	
		OR	
2B	32 - (a	2-20402, "Station Service Transformer Feeder 2B5" and 2-40503, "480V 2B2 L.C. Feeder.")	
D. En	nsure	all containment fan coolers are stopped.	
E. Sta inj	art th ectio	ne 2A or 2B Charging Pump and initiate seal n if available.	
Add capa	litiona acity.	<u>CAUTION</u> al charging pumps operation may exceed diesel/bus loa	ading
F. <u>If</u> 1	the 2	C Charging Pump is required for operation, Then:	
1.	CL(Cer fror	OSE Bkr. 2-40220, "Feed to 480V Vital Load nter 2AB" and CLOSE Bkr. 2-40702, "Supply n 480V Vital L.C. 2A2."	
		OR	

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REVISION NO .:	PROCEDURE TITLE:	PAGE:						
22	APPENDIXES/FIGURES/TABLES	88 of 139						
PROCEDURE NO .:								
2-EOP-99	ST. LUCIE UNIT 2							
	(Page 6 of 12)							
3. (continued)	3. (continued) <u>INITI</u>							
F. (continu	ued)	,						
1. (cor	1. (continued)							
(CL) and L.C.	(CLOSE Bkr. 2-40504, "Feed to 480V Vital L.C. 2AB" and CLOSE Bkr. 2-40706, "Supply from 480V Vital L.C. 2B2.")							
2. Sta	rt the 2C Charging Pump, if it did NOT auto start.							
G. Energiz 4.16 K	 G. Energize the 2A5 or (2B5) 480V L.C. powered by the selected 4.16 KV vital bus by ensuring CLOSED: 							
2A5 - 2	2A5 - 2-20210, "480V L.C. Station Service Transformer 2A5" and 2-40361, "Feeder from Station Service Transformer 2A5."							
	OR							
2B5 -	(2-20402, "480V L.C. Station Service Transformer 2B5" and 2-40653, "Feeder from Station Service Transformer 2B5.")							
H. Exit th	is Appendix.							

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	N NO.:		PAGE:
	22	APPENDIXES/FIGURES/TABLES	89 of 139
PROCED	URE NO.:		
2-E	EOP-99	ST. LUCIE UNIT 2	
		APPENDIX V SBO CROSSTIE FROM UNIT 1 TO UNIT 2 (Page 7 of 12)	<u>INITIAL</u>
	The follo L.C.s and sequence breaker. (SBO)", I	<u>NOTE</u> wing actions will energize the 2A2 and 2A5, or 2B2 and 2 3 subordinate MCCs. Loads will sequence on bus per LC 9 within 35 seconds following the closure of the 480V L.C Refer to Table 11, "Emergency Diesel Generator Loadin oad list of 2-EOP-99 as necessary.	2B5 480V DOP load C. feeder Ig
4. <u>lf</u> L	two Unit Jnit 2, <u>The</u>	1 EDGs are running and one EDG is being used to supp <u>in</u> restore loads as follows:	bly
£	breakers Maximur amps, a A. Turn th	and 4.16 KV loads may be tripped to protect the diesel. n loading on the SBO (2AB 4.16 KV) bus is 550 continues indicated on AM 942 on RTGB 101.	bus
	KW indic	<u>NOTE</u> ation is the preferred method of EDG loading. Ampere v in the event that KW indication is NOT available.	values are
l	<u>L</u>		
E	3. Have I than o	Jnit 1 verify the crosstied EDG is carrying less r equal to 2500 KW (350 amps) load.	
E	 Have than o Energi 4.16 K 	Jnit 1 verify the crosstied EDG is carrying less r equal to 2500 KW (350 amps) load. ze the 2A2 or (2B2) 480V L.C. powered by the selected V vital bus by closing or ensuring CLOSED:	
E	 Have I than o Energi 4.16 K 2A2 - 	Jnit 1 verify the crosstied EDG is carrying less r equal to 2500 KW (350 amps) load. ze the 2A2 or (2B2) 480V L.C. powered by the selected V vital bus by closing or ensuring CLOSED: 2-20213, "Station Service Transformer Feeder 2A2" and 2-40219, "480V 2A2 L.C. Feeder."	
E	3. Have than o than o C. Energi 4.16 K 2A2 -	Unit 1 verify the crosstied EDG is carrying less r equal to 2500 KW (350 amps) load. ze the 2A2 or (2B2) 480V L.C. powered by the selected V vital bus by closing or ensuring CLOSED: 2-20213, "Station Service Transformer Feeder 2A2" and 2-40219, "480V 2A2 L.C. Feeder." OR	

REVISION NO.:		PAGE:				
		90 of 139				
PROCEDURE NO.:						
2-EOP-99						
	SBO CROSSTIE FROM UNIT 1 TO UNIT 2 (Page 8 of 12)					
4. (continue	ed)	INITIAL				
D. Ener selee	gize the 2A5 or (2B5) 480V L.C. powered by the tted 4.16 KV vital bus by closing or ensuring CLOSED:					
2A5	- 2-20210, "480V L.C. Station Service Transformer 2A5" and 2-40361, "Feeder from Station Service Transformer 2A5."					
	OR					
2B5	 (2-20402, "480V L.C. Station Service Transformer 2B5" and 2-40653, "Feeder from Station Service Transformer 2B5.") 					
E. Ens	are all containment fan coolers are stopped.					
F. Star injec	the 2A or 2B Charging Pump and initiate seal tion if available.					
G. <u>If</u> th	e 2C Charging Pump is required for operation, Then:					
1. (2 L	LOSE Bkr. 2-40220, "Feed to 480V Vital Load Center AB" and CLOSE Bkr. 2-40702, "Supply from 480V Vital .C. 2A2."					
	OR					
(2	CLOSE Bkr. 2-40504, "Feed to 480V Vital L.C. 2AB" nd CLOSE Bkr. 2-40706, "Supply from 480V Vital L.C. B2.")					
2. 8	start the 2C Charging Pump, if it did NOT auto start.					
H. Star	t an available ICW pump.					
I. Star	t an available CCW pump.					

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EVISION NO .:	PROCEDURE TITLE:	PAGE:
22	APPENDIXES/FIGURES/TABLES	01 of 139
OCEDURE NO .:		9101139
2-EOP-99	ST. LUCIE UNIT 2	
	APPENDIX V	·
	SBO CROSSTIE FROM UNIT 1 TO UNIT 2	
	(Page 9 of 12)	
(continued)		INITIAL
, (continued)		<u></u>
	CAUTION	
Additio	nal equipment operation may exceed diesel/bus loadi	ng capacity.
J. Start H	PSI, LPSI, CS, and AFW pumps as necessary.	<u> </u>
K Evit th	is Annendix	

22 APPENDIXES/FIGORES/TABLES 92 of 139 OCEDURE NO.: 2-EOP-99 ST. LUCIE UNIT 2 92 of 139 APPENDIX V SBO CROSSTIE FROM UNIT 1 TO UNIT 2 (Page 10 of 12) NOTE The following actions will energize the 2A2 and 2A5, or 2B2 and 2B5 480V L.C.s and subordinate MCCs. Loads will sequence on bus per LOOP load sequence within 35 seconds following the closure of the 480V L.C. feeder breaker. Refer to Table 11, "Emergency Diesel Generator Loading (SBO)," load list of 2-EOP-99 as necessary. If a Unit 1 4.16 KV Transformer (Auxiliary or Startup) is being used to supply power to Unit 2, Then restore loads as follows:	22 APPENDIXES/FIGURES/TABLES 92 of 139 ROCEDURE NO:: 2:EOP-99 ST. LUCIE UNIT 2 APPENDIX V APPENDIX V SECOP:99 ST. LUCIE UNIT 2 NOTE NOTE NOTE The following actions will energize the 2A2 and 2A5, or 2B2 and 2B5 480V L.C.s and subordinate MCCs. Loads will sequence on bus per LOOP load sequence within 35 seconds following the closure of the 480V L.C. feeder breaker. Refer to Table 11, "Emergency Diesel Generator Loading (SBO)," load list of 2-EOP-99 as necessary. St. LUCIE UNIT 2 Mathematical MCCs. Loads will sequence on bus per LOOP load gequere within 35 seconds following the closure of the 480V L.C. feeder breaker. Refer to Table 11, "Emergency Diesel Generator Loading (SBO)," load list of 2-EOP-99 as necessary. Maximum loading on the SBO (2AB 4.16 KV) Bus is 550 continuous amps, as indicated on AM 942 on RTGB 101. INITIAL A. Turn the RCP oil lift pump switches to the off position.	EVISION	NO.:		PAGE:
OCEDURE NO.: 2-EOP-99 ST. LUCIE UNIT 2 APPENDIX V SBO CROSSTIE FROM UNIT 1 TO UNIT 2 (Page 10 of 12) NOTE The following actions will energize the 2A2 and 2A5, or 2B2 and 2B5 480V L.C.s and subordinate MCCs. Loads will sequence on bus per LOOP load sequence within 35 seconds following the closure of the 480V L.C. feeder breaker. Refer to Table 11, "Emergency Diesel Generator Loading (SBO)," load list of 2-EOP-99 as necessary. If a Unit 1 4.16 KV Transformer (Auxiliary or Startup) is being used to supply power to Unit 2, Then restore loads as follows:	ACCEDURE NO:: 2-EOP-99 ST. LUCIE UNIT 2 APPENDIX V SBO CROSSTIE FROM UNIT 1 TO UNIT 2 (Page 10 of 12) NOTE The following actions will energize the 2A2 and 2A5, or 2B2 and 2B5 480V L.C.s and subordinate MCCs. Loads will sequence on bus per LOOP load sequence within 35 seconds following the closure of the 480V L.C. feeder breaker. Refer to Table 11, "Emergency Diesel Generator Loading (SBO)," load list of 2-EOP-99 as necessary. ff a Unit 1 4.16 KV Transformer (Auxiliary or Startup) is being used to supply power to Unit 2, Then restore loads as follows: Maximum loading on the SBO (2AB 4.16 KV) Bus is 550 continuous amps, as indicated on AM 942 on RTGB 101. NITIAL A. Turn the RCP oil lift pump switches to the off position. B. Energize the 2A2 or (2B2) 480V L.C. powered by the selected 4.16 KV vital bus by closing or ensuring CLOSED: 2A2 - 2-20213, "Station Service Transformer Feeder 2A2" and 2-40219, "480V 2A2 L.C. Feeder." OR 2B2 - (2-40402, "Station Service Transformer Feeder 2B5" and 2-40503, "480V 2B2 L.C. Feeder.")	2	2	APPENDIXES/FIGURES/TABLES	92 of 139
2-EOP-99 ST. LUCIE UNIT 2 APPENDIX V SBO CROSSTIE FROM UNIT 1 TO UNIT 2 (Page 10 of 12) The following actions will energize the 2A2 and 2A5, or 2B2 and 2B5 480V L.C.s and subordinate MCCs. Loads will sequence on bus per LOOP load sequence within 35 seconds following the closure of the 480V L.C. feeder breaker. Refer to Table 11, "Emergency Diesel Generator Loading (SBO)," load list of 2-EOP-99 as necessary. If a Unit 1 4.16 KV Transformer (Auxiliary or Startup) is being used to supply power to Unit 2, <u>Then</u> restore loads as follows:	2-EOP-99 ST. LUCIE UNIT 2 APPENDIX V SBO CROSSTIE FROM UNIT 1 TO UNIT 2 (Page 10 of 12) NOTE The following actions will energize the 2A2 and 2A5, or 2B2 and 2B5 480V L.C.s and subordinate MCCs. Loads will sequence on bus per LOOP load sequence within 35 seconds following the closure of the 480V L.C. feeder breaker. Refer to Table 11, "Emergency Diesel Generator Loading (SBO)," load list of 2-EOP-99 as necessary. 4. If a Unit 1 4.16 KV Transformer (Auxiliary or Startup) is being used to supply power to Unit 2, Then restore loads as follows: INITIAL A. Turn the RCP oil lift pump switches to the off position. B. Energize the 2A2 or (2B2) 480V L.C. powered by the selected 4.16 KV vital bus by closing or ensuring CLOSED: 2A2 - 2-20213, "Station Service Transformer Feeder 2A2" and 2-40219, "480V 2A2 L.C. Feeder." OR 2B2 - (2-40402, "Station Service Transformer Feeder 2B5" and 2-40503, "480V 2B2 L.C. Feeder.")	ROCEDUR	RE NO.:		
APPENDIX V <u>SBO CROSSTIE FROM UNIT 1 TO UNIT 2</u> (Page 10 of 12) <u>NOTE</u> The following actions will energize the 2A2 and 2A5, or 2B2 and 2B5 480V L.C.s and subordinate MCCs. Loads will sequence on bus per LOOP load sequence within 35 seconds following the closure of the 480V L.C. feeder breaker. Refer to Table 11, "Emergency Diesel Generator Loading (SBO)," load list of 2-EOP-99 as necessary. <u>If</u> a Unit 1 4.16 KV Transformer (Auxiliary or Startup) is being used to supply power to Unit 2, <u>Then</u> restore loads as follows:	APPENDIX V SBO CROSSTIE FROM UNIT 1 TO UNIT 2 (Page 10 of 12) NOTE The following actions will energize the 2A2 and 2A5, or 2B2 and 2B5 480V L.C.s and subordinate MCCs. Loads will sequence on bus per LOOP load sequence within 35 seconds following the closure of the 480V L.C. feeder breaker. Refer to Table 11, "Emergency Diesel Generator Loading (SBO)," load list of 2-EOP-99 as necessary. 5. If a Unit 1 4.16 KV Transformer (Auxiliary or Startup) is being used to supply power to Unit 2, Then restore loads as follows: INITIAL Maximum loading on the SBO (2AB 4.16 KV) Bus is 550 continuous amps, as indicated on AM 942 on RTGB 101. INITIAL A. Turn the RCP oil lift pump switches to the off position. B. Energize the 2A2 or (2B2) 480V L.C. powered by the selected 4.16 KV vital bus by closing or ensuring CLOSED: 2A2 - 2-20213, "Station Service Transformer Feeder 2A2" and 2-40219, "480V 2A2 L.C. Feeder." OR 2B2 - (2-40402, "Station Service Transformer Feeder 2B5" and 2-40503, "480V 2B2 L.C. Feeder.")	2-EC)P-99	ST. LUCIE UNIT 2	
<u>NOTE</u> The following actions will energize the 2A2 and 2A5, or 2B2 and 2B5 480V L.C.s and subordinate MCCs. Loads will sequence on bus per LOOP load sequence within 35 seconds following the closure of the 480V L.C. feeder breaker. Refer to Table 11, "Emergency Diesel Generator Loading (SBO)," load list of 2-EOP-99 as necessary. <u>If</u> a Unit 1 4.16 KV Transformer (Auxiliary or Startup) is being used to supply power to Unit 2, <u>Then</u> restore loads as follows:	NOTE The following actions will energize the 2A2 and 2A5, or 2B2 and 2B5 480V L.C.s and subordinate MCCs. Loads will sequence on bus per LOOP load sequence within 35 seconds following the closure of the 480V L.C. feeder breaker. Refer to Table 11, "Emergency Diesel Generator Loading (SBO)," load list of 2-EOP-99 as necessary. 5. If a Unit 1 4.16 KV Transformer (Auxiliary or Startup) is being used to supply power to Unit 2, Then restore loads as follows: CAUTION Maximum loading on the SBO (2AB 4.16 KV) Bus is 550 continuous amps, as indicated on AM 942 on RTGB 101. INITIAL A. Turn the RCP oil lift pump switches to the off position. B. Energize the 2A2 or (2B2) 480V L.C. powered by the selected 4.16 KV vital bus by closing or ensuring CLOSED: 2A2 - 2-20213, "Station Service Transformer Feeder 2A2" and 2-40219, "480V 2A2 L.C. Feeder." OR 2B2 - (2-40402, "Station Service Transformer Feeder 2B5" and 2-40503, "480V 2B2 L.C. Feeder.")			APPENDIX V SBO CROSSTIE FROM UNIT 1 TO UNIT 2 (Page 10 of 12)	
power to Unit 2, Then restore loads as follows:	CAUTION Maximum loading on the SBO (2AB 4.16 KV) Bus is 550 continuous amps, as indicated on AM 942 on RTGB 101. INITIAL A. Turn the RCP oil lift pump switches to the off position. B. Energize the 2A2 or (2B2) 480V L.C. powered by the selected 4.16 KV vital bus by closing or ensuring CLOSED: 2A2 - 2-20213, "Station Service Transformer Feeder 2A2" and 2-40219, "480V 2A2 L.C. Feeder." OR 2B2 - (2-40402, "Station Service Transformer Feeder 2B5" and 2-40503, "480V 2B2 L.C. Feeder."	T L S (; 5. <u>If</u> a	The follow C.s and equence oreaker. SBO)," k SBO)," k	<u>NOTE</u> wing actions will energize the 2A2 and 2A5, or 2B2 and 2 I subordinate MCCs. Loads will sequence on bus per LC within 35 seconds following the closure of the 480V L.C Refer to Table 11, "Emergency Diesel Generator Loading bad list of 2-EOP-99 as necessary.	B5 480V OP load feeder
Maximum loading on the SU() (2018 / 16 K)/) RUE IS bb() CONTIDUOUS	INITIAL A. Turn the RCP oil lift pump switches to the off position. B. Energize the 2A2 or (2B2) 480V L.C. powered by the selected 4.16 KV vital bus by closing or ensuring CLOSED: 2A2 - 2-20213, "Station Service Transformer Feeder 2A2" and 2-40219, "480V 2A2 L.C. Feeder." OR 2B2 - (2-40402, "Station Service Transformer Feeder 2B5" and 2-40503, "480V 2B2 L.C. Feeder."	r a	Maximun amps, as	n loading on the SBO (2AB 4.16 KV) Bus is 550 continuo is indicated on AM 942 on RTGB 101.	us
amps, as indicated on AM 942 on RTGB 101.	INITIAL A. Turn the RCP oil lift pump switches to the off position.				
amps, as indicated on AM 942 on RTGB 101.	 A. Turn the RCP oil lift pump switches to the off position. B. Energize the 2A2 or (2B2) 480V L.C. powered by the selected 4.16 KV vital bus by closing or ensuring CLOSED: 2A2 - 2-20213, "Station Service Transformer Feeder 2A2" and 2-40219, "480V 2A2 L.C. Feeder." OR 2B2 - (2-40402, "Station Service Transformer Feeder 2B5" and 2-40503, "480V 2B2 L.C. Feeder.") 				INITIAL
amps, as indicated on AM 942 on RTGB 101.	 A. Turn the RCP oil lift pump switches to the off position. B. Energize the 2A2 or (2B2) 480V L.C. powered by the selected 4.16 KV vital bus by closing or ensuring CLOSED: 2A2 - 2-20213, "Station Service Transformer Feeder 2A2" and 2-40219, "480V 2A2 L.C. Feeder." OR 2B2 - (2-40402, "Station Service Transformer Feeder 2B5" and 2-40503, "480V 2B2 L.C. Feeder.") 				
initial amps, as indicated on AM 942 on RTGB 101.	 B. Energize the 2A2 or (2B2) 480V L.C. powered by the selected 4.16 KV vital bus by closing or ensuring CLOSED: 2A2 - 2-20213, "Station Service Transformer Feeder 2A2" and 2-40219, "480V 2A2 L.C. Feeder." OR 2B2 - (2-40402, "Station Service Transformer Feeder 2B5" and 2-40503, "480V 2B2 L.C. Feeder.") 	Α.	Turn th	e RCP oil lift pump switches to the off position.	<u></u>
A. Turn the RCP oil lift pump switches to the off position.	 2A2 - 2-20213, "Station Service Transformer Feeder 2A2" and 2-40219, "480V 2A2 L.C. Feeder." OR 2B2 - (2-40402, "Station Service Transformer Feeder 2B5" and 2-40503, "480V 2B2 L.C. Feeder.") 	В.	Energiz 4.16 K	ze the 2A2 or (2B2) 480V L.C. powered by the selected V vital bus by closing or ensuring CLOSED:	
A. Turn the RCP oil lift pump switches to the off position. B. Energize the 2A2 or (2B2) 480V L.C. powered by the selected 4.16 KV vital bus by closing or ensuring CLOSED:	OR 2B2 - (2-40402, "Station Service Transformer Feeder 2B5" and 2-40503, "480V 2B2 L.C. Feeder.")		2A2 - 2	2-20213, "Station Service Transformer Feeder 2A2" and 2-40219, "480V 2A2 L.C. Feeder."	
A. Turn the RCP oil lift pump switches to the off position. B. Energize the 2A2 or (2B2) 480V L.C. powered by the selected 4.16 KV vital bus by closing or ensuring CLOSED: 2A2 - 2-20213, "Station Service Transformer Feeder 2A2" and 2-40219, "480V 2A2 L.C. Feeder."	2B2 - (2-40402, "Station Service Transformer Feeder 2B5" and 2-40503, "480V 2B2 L.C. Feeder.")			OR	
Maximum Idading on the SBO (2AB 4.16 KV) Bus is 500 continuous amps, as indicated on AM 942 on RTGB 101. INITIAL A. Turn the RCP oil lift pump switches to the off position.			2B2 - (2-40402, "Station Service Transformer Feeder 2B5" and 2-40503, "480V 2B2 L.C. Feeder.")	
Maximum Idading on the SBO (2AB 4.16 KV) bus is 550 continuous amps, as indicated on AM 942 on RTGB 101. INITIAL A. Turn the RCP oil lift pump switches to the off position.					
Maximum loading on the 3BO (2AB 4.16 KV) bus is 500 continuous amps, as indicated on AM 942 on RTGB 101. A. Turn the RCP oil lift pump switches to the off position B. Energize the 2A2 or (2B2) 480V L.C. powered by the selected 4.16 KV vital bus by closing or ensuring CLOSED: 2A2 - 2-20213, "Station Service Transformer Feeder 2A2" and 2-40219, "480V 2A2 L.C. Feeder." OR 2B2 - (2-40402, "Station Service Transformer Feeder 2B5" and 2-40503, "480V 2B2 L.C. Feeder.")					
Maximum idading on the SBC (2AB 4.16 KV) Bds is 350 continuous amps, as indicated on AM 942 on RTGB 101. INITIAL A. Turn the RCP oil lift pump switches to the off position. B. Energize the 2A2 or (2B2) 480V L.C. powered by the selected 4.16 KV vital bus by closing or ensuring CLOSED: 2A2 - 2-20213, "Station Service Transformer Feeder 2A2" and 2-40219, "480V 2A2 L.C. Feeder." OR 2B2 - (2-40402, "Station Service Transformer Feeder 2B5" and 2-40503, "480V 2B2 L.C. Feeder.")					
Maximum idading on the SBC (2AB 4.16 KV) bits is 550 continuedus amps, as indicated on AM 942 on RTGB 101. INITIAL A. Turn the RCP oil lift pump switches to the off position. B. Energize the 2A2 or (2B2) 480V L.C. powered by the selected 4.16 KV vital bus by closing or ensuring CLOSED: 2A2 - 2-20213, "Station Service Transformer Feeder 2A2" and 2-40219, "480V 2A2 L.C. Feeder." OR 2B2 - (2-40402, "Station Service Transformer Feeder 2B5" and 2-40503, "480V 2B2 L.C. Feeder.")					
INITIAL A. Turn the RCP oil lift pump switches to the off position. B. Energize the 2A2 or (2B2) 480V L.C. powered by the selected 4.16 KV vital bus by closing or ensuring CLOSED: 2A2 - 2-20213, "Station Service Transformer Feeder 2A2" and 2-40219, "480V 2A2 L.C. Feeder." OR 2B2 - (2-40402, "Station Service Transformer Feeder 2B5" and 2-40503, "480V 2B2 L.C. Feeder.")					





Lesson File:	/cae/if/ifdata/lesson/nrc2/x103.xld
Lesson Description:	Y2000, NRC OPERATING EXAM, Scenario #3
Lesson IC used:	
Created on:	11/26/99 18:02:42





Step #:1Step Description :Modification to ICDelay Time :0:00:00Mode :RegularInitialState :Triggered

	INSTRUCTION		TYPE	DEMANDED VALUE	RAMP TIME	DELAY TIME
1	TAQ5072P - Q5_2_20211 2	2A3-11 BKR POSITION	REM	3		
2	TAQ5AIS1 - Q5_2A_EG	SS-ISOL-1 ELECT GOVER	REM	0		
3	TAQ5AIS2 - Q5_2A_VR	SS-ISOL-2 VOLT REGULA	REM	0		
4	TAQ5AIS3 - Q5_2A_EG	SS-ISOL-3 HYD GOVERN	REM	0		
5	TFQ5AA52 - Q5_LOA 22	A OVERSPEED TRIP	MALF	TRUE		
6	TFLCPWR2 - LC_PP_221 P	OWER FAILURE (RRS2)	MALF	TRUE		





Step #:2Step Description :RRS FAIL -- Failure of TE-1111YDelay Time :0:00:00Mode :RegularInitialState :Pending

INSTRUCTION		TYPE	DEMANDED VALUE	RAMP TIME	DELAY TIME
1 TFH1S10D - H1 T1111X	FAIL HIGH MALFUNCTION	MALF	TRUE		



Step #:3Step Description :15% OPEN -- B-Side 15% Feed Reg Fails OpenDelay Time :0:00:00Mode :RegularInitialState :Pending

INSTRUCTION	TYPE	DEMANDED VALUE	RAMP TIME	DELAY TIME
1 A202_A1_A23_26 - LIC-9006 OUTPUT	OVER	0.600		



Step #:4Step Description :STM FLOW -- 2A SG Steam Flow Xmtr Fails HIGHDelay Time :0:00:00Mode :RegularInitialState :Pending

INSTRUCTION			TY	PE D	EMANDED	VALUE	RAMP TIME	DELAY TIME
1 TVF1M03D - S	B_F_081A FT-8	8011 DRIFT	INC MA	ALF 0	.030			



Step #:5Step Description :SPRAY VALVE -- Pzr Spray PCV-1100E Fails OPENDelay Time :0:00:00Mode :RegularInitialState :Pending

	INSTRUCTION	TYPE	DEMANDED VALUE	RAMP TIME	DELAY TIME
1	TFHV0701 - HV_PCV1100E FAIL OPENED	MALF	TRUE		
2	TFHV0701 - HV_PCV1100E FAIL OPENED a203_a1_s15_3	MALF	FALSE		





Step #:6Step Description :LOOP -- Initiates Manual Input for LOOPDelay Time :0:00:00Mode :RegularInitialState :Pending

	INSTRUCTION			TYPE	DEMANDED VALUE	RAMP	DELAY
1	TFP8D1ET - P8_52_1E	FAIL TRIP		MALF	TRUE	1 1111	1 1.12
2	TFP8D1MT - P8_52_1M	FAIL TRIP		MALF	TRUE		
3	TFP8L09F - P8_IDA	FAULT ON MIDWAY	LINE #1	MALF	TRUE		
4	TFP8L10F - P8_IDA	FAULT ON MIDWAY	LINE #2	MALF	TRUE		
5	TFP8L11F - P8_IDA	FAULT ON MIDWAY	LINE #3	MALF	TRUE		
6	TAKFPU1 - KF_IDA PR	ESSURE OF IAS OF	UNIT 1	REM	60.000	0:11:00	





Step #:7Step Description :SBO NOW -- (Auto) Trips Running EDG 15 mins Post-TripStep Condition :A1_A1_SI5_2Delay Time :0:15:00Mode :RegularInitialState :Triggered

INSTRUCTION		TYPE	DEMANDED VALUE	RAMP TIME	DELAY TIME
1 TFQ5BBTR - Q5_2_20401 2B3-1	BKR FAIL TRIP	MALF	TRUE		



9

Step #:8Step Description :1-WHISKEY -- Unit 1 App 'W', Prep to Feed Power to Unit 2Delay Time :0:00:00Mode :RegularInitialState :Pending

INSTRUCTION		TYPE	DEMANDED VALUE	RAMP TIME	DELAY TIME
1 TAE2DF9L - E2_1_20409	BREAKER LOCAL CONTRO	REM	3		
2 TAE2DG2L - E2_1_20504	BREAKER LOCAL CONTRO	REM	3		
3 TAE2DF8L - E2_1_20209	BREAKER LOCAL CONTRO	REM	3		
4 TAQ5U1AS - Q5_1_20211	D/G 1A BKR CONTROL S	REM	1		
5 TAE2DF7L - E2_1_20208	BREAKER LOCAL CONTRO	REM	1		
6 TAE2DG1L - E2_1_20505	BREAKER LOCAL CONTRO	REM	1		





Step #:9Step Description :CLOSE U1 -- Close Unit 1 SBO X-Tie 1-20501Delay Time :0:00:00Mode :RegularInitialState :Pending

I	INSTRUCTION		TYPE	DEMANDED VALUE	RAMP TIME	DELAY TIME
1 1	TAE2501L - E2_51_20501	XTIE BREAKER LOCAL T	REM	1		1 2112





Step #:10Step Description :LOOPER SWAP -- Swap RRS Input LoopsDelay Time :0:00:00Mode :RegularInitialState :Pending

	INSTRUCTION	TYPE	DEMANDED VALUE	RAMP TIME	DELAY TIME
1	TCLCS1L1 - LC_LOA RRS1 LOOP 1 SELECTED	REM	FALSE		
2	TCLCS2L1 - LC_LOA RRS1 LOOP 2 SELECTED	REM	TRUE		0:00:02

ISION NO .:	PROCED	URE TITLE:		PAGE:	
2		DATA SHEETS REQUIRED FOR	HEATUP		
ROCEDURE NO.:				140 of 143	
2-GOP-502		ST. LUCIE UNIT 2			
··· · · · · · ·		APPENDIX BB			
		PLACING MSRs IN SERVICE			
		(Page 1 of 4)		INTTAL	
1. DEPF	RESS th	he Reset pushbutton on the Rehe	ater Control		
Syste	m.				
		lly the MSP TOVe are positioned	as follows:		
2. VERI	FY loca	ily the Mon TOVS are positioned	as 10110ws.		
2. VERI	NENT	DESCRIPTION	POSITION	INITIAL	
2. VERI	NENT 8-1	DESCRIPTION MS to 2A MSR	POSITION CLOSED	INITIAL	
2. VERI	NENT 8-1 8-7	DESCRIPTION MS to 2A MSR MS to 2A MSR	POSITION CLOSED CLOSED	INITIAL	
2. VERI	PY loca NENT 8-1 8-7 8-3	DESCRIPTION MS to 2A MSR MS to 2A MSR MS to 2B MSR	POSITION CLOSED CLOSED CLOSED	INITIAL	
2. VERI	PY loca NENT 8-1 8-7 8-3 8-9	DESCRIPTION MS to 2A MSR MS to 2A MSR MS to 2B MSR MS to 2B MSR	POSITION CLOSED CLOSED CLOSED CLOSED		
2. VERI	PY loca NENT 8-1 8-7 8-3 8-9 8-4	DESCRIPTION MS to 2A MSR MS to 2A MSR MS to 2B MSR MS to 2B MSR MS to 2B MSR MS to 2C MSR	POSITION CLOSED CLOSED CLOSED CLOSED CLOSED		
2. VERI	NENT 8-1 8-7 8-3 8-9 8-4 3-10	DESCRIPTION MS to 2A MSR MS to 2A MSR MS to 2B MSR MS to 2B MSR MS to 2B MSR MS to 2C MSR MS to 2C MSR	POSITION CLOSED CLOSED CLOSED CLOSED CLOSED CLOSED		
2. VERI	NENT 8-1 8-7 8-3 8-9 8-4 3-10 8-2	DESCRIPTION MS to 2A MSR MS to 2A MSR MS to 2B MSR MS to 2B MSR MS to 2C MSR MS to 2C MSR MS to 2C MSR MS to 2D MSR	POSITION CLOSED CLOSED CLOSED CLOSED CLOSED CLOSED CLOSED	INITIAL	

<u>NOTE</u>

A large steam demand may occur while opening the MSR Block Valves. The MSR Block Valves should be opened one at a time, allowing time for the RCS to stabilize.

3. POSITION the MSR Block Valves as follows:

COMPONENT	DESCRIPTION	POSITION	INITIAL
MV-08-4	2A Block TCV	OPEN	
MV-08-6	2D Block TCV	OPEN	
MV-08-8	2B Block TCV	OPEN	
MV-08-10	2C Block TCV	OPEN	

2 DATA SHEETS REQUIRED FOR HEATUP 141 of 143 2-GOP-502 ST. LUCIE UNIT 2 141 of 143 APPENDIX BB PLACING MSRs IN SERVICE (Page 2 of 4) INITIAL Quench water to the MSRs will be supplied approximately 2 minutes after the MSR Block Valves are open due to an associated time delay. 4. When the MSR Block Valves are open, Then THROTTLE OPEN the following components to adjust MSR subcooling flow to app 5 to 7 gpm on applicable indicator: COMPONENT V09322 SE-09-1A 2A, MSR Subcooling to 7 gpm V09319 SE-09-1A 2A, MSR Subcooling to 7 gpm V09328 SE-09-12 CC MSR, Subcooling to 7 gpm V09328 SE-09-1D 2D MSR, Subcooling to 7 gpm V09325	EVISION NO .:	PROCED	DURE TITLE:		PAGE:
INDICEDURE NO:: 141 of 143 2-GOP-502 ST. LUCIE UNIT 2 APPENDIX BB PLACING MSRs IN SERVICE (Page 2 of 4) INITIAL Quench water to the MSRs will be supplied approximately 2 minutes after the MSR Block Valves are open due to an associated time delay. 4. When the MSR Block Valves are open, Then THROTTLE OPEN the following components to adjust MSR subcooling flow to app 5 to 7 gpm on applicable indicator: COMPONENT DESCRIPTION INDICATOR INITIAL V09322 SE-09-1A 2A, MSR Subcooling FI-09-4A = 5 V09319 SE-09-1B 2B MSR, Subcooling FI-09-4B = 5 to 7 gpm V09328 SE-09-1C 2C MSR, Subcooling FI-09-4C = 5 to 7 gpm V09325 SE-09-1D 2D MSR, Subcooling FI-09-4D = 5 to 7 gpm	2		DATA SHEETS REQUIRED FOR H	IEATUP	
2-GOP-502 ST. LUCIE UNIT 2 APPENDIX BB PLACING MSRs IN SERVICE (Page 2 of 4) INITIAL Quench water to the MSRs will be supplied approximately 2 minutes after the MSR Block Valves are open due to an associated time delay. 4. When the MSR Block Valves are open, Then THROTTLE OPEN the following components to adjust MSR subcooling flow to app 5 to 7 gpm on applicable indicator: COMPONENT DESCRIPTION INDICATOR INITIAL V09322 SE-09-1A 2A, MSR Subcooling Dwnstrm Isol FI-09-4A = 5 to 7 gpm 1 0 V09319 V09328 SE-09-1C 2C MSR, Subcooling Dwnstrm Isol FI-09-4C = 5 to 7 gpm 1 0 V09325 V09325 SE-09-1D 2D MSR, Subcooling Dwnstrm Isol FI-09-4D = 5 to 7 gpm 1 0 V09325	ROCEDURE NO .:	1			141 of 14
APPENDIX BB APPENDIX BB PLACING MSRs IN SERVICE (Page 2 of 4) INITIAL Quench water to the MSRs will be supplied approximately 2 minutes after the MSR Block Valves are open due to an associated time delay. 4. When the MSR Block Valves are open, Then THROTTLE OPEN the following components to adjust MSR subcooling flow to app 5 to 7 gpm on applicable indicator: COMPONENT DESCRIPTION INDICATOR INITIAL V09322 SE-09-1A 2A, MSR Subcooling Dwnstrm Isol FI-09-4A = 5 to 7 gpm V09319 SE-09-1B 2B MSR, Subcooling Dwnstrm Isol FI-09-4B = 5 to 7 gpm V09328 SE-09-1C 2C MSR, Subcooling Dwnstrm Isol FI-09-4C = 5 to 7 gpm V09325 SE-09-1D 2D MSR, Subcooling Dwnstrm Isol FI-09-4D = 5 to 7 gpm	2-GOP-502		ST. LUCIE UNIT 2		
PLACING MSRs IN SERVICE (Page 2 of 4) INITIAL NOTE Quench water to the MSRs will be supplied approximately 2 minutes after the MSR Block Valves are open due to an associated time delay. 4. When the MSR Block Valves are open, Then THROTTLE OPEN the following components to adjust MSR subcooling flow to app 5 to 7 gpm on applicable indicator: COMPONENT DESCRIPTION INDICATOR INITIAL V09322 SE-09-1A 2A, MSR Subcooling FI-09-4A = 5 100 V09319 SE-09-1B 2B MSR, Subcooling FI-09-4B = 5 100 V09328 SE-09-1C 2C MSR, Subcooling FI-09-4C = 5 100 V09325 SE-09-1D 2D MSR, Subcooling FI-09-4D = 5 100 V09325 SE-09-1D 2D MSR, Subcooling FI-09-4D = 5 100	2 001 002	I	APPENDIX BB		
INITIAL NOTE Quench water to the MSRs will be supplied approximately 2 minutes after the MSR Block Valves are open due to an associated time delay. 4. When the MSR Block Valves are open, Then THROTTLE OPEN the following components to adjust MSR subcooling flow to app 5 to 7 gpm on applicable indicator: V09322 SE-09-1A 2A, MSR Subcooling V09319 SE-09-1B 2B MSR, Subcooling FI-09-4A = 5 V09319 SE-09-1C 2C MSR, Subcooling FI-09-4C = 5 V09328 SE-09-1C 2C MSR, Subcooling FI-09-4C = 5 V09325 SE-09-1D 2D MSR, Subcooling FI-09-4D = 5 V09325 SE-09-1D 2D MSR, Subcooling FI-09-4D = 5 V09325 SE-09-1D 2D MSR, Subcooling FI-09-4D = 5			PLACING MSRs IN SERVICE		
NOTEQuench water to the MSRs will be supplied approximately 2 minutes after the MSR Block Valves are open due to an associated time delay.4. When the MSR Block Valves are open, Then THROTTLE OPEN the following components to adjust MSR subcooling flow to app 5 to 7 gpm on applicable indicator:COMPONENTDESCRIPTIONINDICATORINITIALV09322SE-09-1A 2A, MSR Subcooling Dwnstrm IsolFI-09-4A = 5 to 7 gpmV09319SE-09-1B 2B MSR, Subcooling Dwnstrm IsolFI-09-4E = 5 to 7 gpmV09328SE-09-1C 2C MSR, Subcooling Dwnstrm IsolFI-09-4C = 5 to 7 gpmV09325SE-09-1D 2D MSR, Subcooling Dwnstrm IsolFI-09-4D = 5 to 7 gpm			(Page 2 of 4)		INITIAL
Quench water to the MSRs will be supplied approximately 2 minutes after the MSR Block Valves are open due to an associated time delay. 4. When the MSR Block Valves are open, Then THROTTLE OPEN the following components to adjust MSR subcooling flow to app 5 to 7 gpm on applicable indicator: COMPONENT DESCRIPTION INDICATOR INITIAL V09322 SE-09-1A 2A, MSR Subcooling Dwnstrm Isol FI-09-4A = 5 to 7 gpm to 7 gpm V09319 SE-09-1B 2B MSR, Subcooling Dwnstrm Isol FI-09-4B = 5 to 7 gpm to 7 gpm V09328 SE-09-1C 2C MSR, Subcooling Dwnstrm Isol FI-09-4C = 5 to 7 gpm to 7 gpm V09325 SE-09-1D 2D MSR, Subcooling Dwnstrm Isol FI-09-4D = 5 to 7 gpm to 7 gpm		······	NOTE		
the MSR Block Valves are open due to an associated time delay. 4. When the MSR Block Valves are open, Then THROTTLE OPEN the following components to adjust MSR subcooling flow to app 5 to 7 gpm on applicable indicator: COMPONENT DESCRIPTION INDICATOR INITIAL V09322 SE-09-1A 2A, MSR Subcooling Dwnstrm Isol FI-09-4A = 5 to 7 gpm INOPARATION V09319 SE-09-1B 2B MSR, Subcooling Dwnstrm Isol FI-09-4B = 5 to 7 gpm Inoparation of the following components for a gpm V09328 SE-09-1C 2C MSR, Subcooling Dwnstrm Isol FI-09-4C = 5 to 7 gpm Inoparation of the following components for a gpm V09325 SE-09-1D 2D MSR, Subcooling Dwnstrm Isol FI-09-4D = 5 to 7 gpm Inoparation of the following components for a gpm	Quench v	vater to	the MSRs will be supplied approxi	mately 2 minut	es after
When the MSR Block Valves are open, Then THROTTLE OPEN the following components to adjust MSR subcooling flow to app 5 to 7 gpm on applicable indicator: COMPONENT DESCRIPTION INDICATOR INITIAL V09322 SE-09-1A 2A, MSR Subcooling Dwnstrm Isol FI-09-4A = 5 to 7 gpm Initial V09319 SE-09-1B 2B MSR, Subcooling Dwnstrm Isol FI-09-4B = 5 to 7 gpm Initial V09328 SE-09-1C 2C MSR, Subcooling Dwnstrm Isol FI-09-4C = 5 to 7 gpm Initial V09325 SE-09-1D 2D MSR, Subcooling Dwnstrm Isol FI-09-4D = 5 to 7 gpm Initial	the MSR	Block	Valves are open due to an associat	ed time delay.	
COMPONENTDESCRIPTIONINDICATORINITIALV09322SE-09-1A 2A, MSR Subcooling Dwnstrm IsolFI-09-4A = 5 to 7 gpmFI-09-4B = 5 to 7 gpmV09319SE-09-1B 2B MSR, Subcooling Dwnstrm IsolFI-09-4B = 5 to 7 gpmFI-09-4B = 5 to 7 gpmV09328SE-09-1C 2C MSR, Subcooling Dwnstrm IsolFI-09-4C = 5 to 7 gpmFI-09-4C = 5 to 7 gpmV09325SE-09-1D 2D MSR, Subcooling Dwnstrm IsolFI-09-4D = 5 to 7 gpmFI-09-4D = 5 to 7 gpm	4. <u>When</u> OPEN flow t	the M the fo o app t	SR Block Valves are open, <u>Then</u> Then Then Then Then The Section of the Section o	HROTTLE subcooling	
V09322SE-09-1A 2A, MSR Subcooling Dwnstrm IsolFI-09-4A = 5 to 7 gpmV09319SE-09-1B 2B MSR, Subcooling Dwnstrm IsolFI-09-4B = 5 to 7 gpmV09328SE-09-1C 2C MSR, Subcooling Dwnstrm IsolFI-09-4C = 5 to 7 gpmV09325SE-09-1D 2D MSR, Subcooling Dwnstrm IsolFI-09-4D = 5 to 7 gpm	COMPON	IENT	DESCRIPTION	INDICATOR	INITIAL
V09319SE-09-1B 2B MSR, Subcooling Dwnstrm IsolFI-09-4B = 5 to 7 gpmV09328SE-09-1C 2C MSR, Subcooling Dwnstrm IsolFI-09-4C = 5 to 7 gpmV09325SE-09-1D 2D MSR, Subcooling Dwnstrm IsolFI-09-4D = 5 to 7 gpm	V0932	2	SE-09-1A 2A, MSR Subcooling Dwnstrm Isol	FI-09-4A = 5 to 7 gpm	
V09328SE-09-1C 2C MSR, Subcooling Dwnstrm IsolFI-09-4C = 5 to 7 gpmV09325SE-09-1D 2D MSR, Subcooling Dwnstrm IsolFI-09-4D = 5 to 7 gpm	V0931	9	SE-09-1B 2B MSR, Subcooling Dwnstrm Isol	FI-09-4B = 5 to 7 gpm	
V09325SE-09-1D 2D MSR, Subcooling Dwnstrm IsolFI-09-4D = 5 to 7 gpm	V0932	:8	SE-09-1C 2C MSR, Subcooling Dwnstrm Isol	FI-09-4C = 5 to 7 gpm	
	V0932	25	SE-09-1D 2D MSR, Subcooling Dwnstrm Isol	Fl-09-4D = 5 to 7 gpm	
	• Whe autor	n the M matic o	<u>NOTE</u> ISR TCVs have started the warm u r manual control, the Turbine startu	p period by eit p should conti	her nue.
 When the MSR TCVs have started the warm up period by either automatic or manual control, the Turbine startup should continue. 	If the deprive the deprive term of the deprive term of the deprive term of the deprive term of the deprive term of the deprive term of the deprive term of the deprive term of the deprive term of the deprive term of the deprive term of the deprive term of the deprive term of the deprive term of the deprive term of term o	essing	pushbutton is depressed, the cont the Reset pushbutton.	roller can be re	eset by
 NOTE When the MSR TCVs have started the warm up period by either automatic or manual control, the Turbine startup should continue. If the wrong pushbutton is depressed, the controller can be reset by depressing the Reset pushbutton. 	• Ram TCV 10 m time	p starts s). Thi ninute t is 2 ho	s a 2 hour timed opening of TCV-08 s is followed by a 30 minute time d imed opening of TCV-08-1, 2, 3 and ours and 40 minutes until TCV-08-1	3-7, 8, 9 and 10 elay and then a d 4 (large TCV , 2, 3 and 4 inc	0 (small a s). Total licate

5. <u>If automatic startup is desired, Then</u> DEPRESS the Ramp pushbutton.

open.
REVISION NO.:	PROCEDURE TITLE:		PAGE:
2	DATA SHEETS REQUIRED I	OR HEATUP	
PROCEDURE NO.:			142 of 143
2-GOP-502	ST LUCIE UNIT	2	
	APPENDIX BB		1
	PLACING MSRs IN SER	VICE	
	(Page 3 of 4)		INTTAL
	CAUTION		
If the man	ual valve positioner is NOT on zero	before pushing the	Manual
Valve Pos	ition pushbutton, the TCVs will OPI	EN to a position relat	ive to
the manua	I valve positioner setpoint and pos- nt thermal stresses	sibly damage the MS	Rs from
the result			
6. <u>If</u> manu	ual startup is desired, <u>Then</u> PERFC	ORM the following:	
A. El	SURE the manual valve positione	r is on zero.	
	TODESS the Manual Value Desition	a nuchhutton	
B. Di	PRESS the Manual Valve Position	r pushbutton.	<u> </u>
C. SI	owly OPEN the TCVs by rotating the	ne manual valve	
pc tal	sitioner. Manual opening of the M	SR ICVs should	
7. <u>After</u> th followir	ne MSR TCVs are OPEN, <u>Then</u> PE ng:	RFORM the	
	OSITION the small TCV isolation v	aives as follows:	
COMPONE	INT DESCRIPTION	POSITION	INITIAL
V08381	TCV-08-7 Isol	CLOSED	
V08370	TCV-08-7 Isol	CLOSED	
V08378	TCV-08-8 Dwnstm Isol	CLOSED	
V08382	TCV-08-8 Upstrm Isol	CLOSED	
V08383	TCV-08-9 Isol	CLOSED	
V08372	TCV-08-9 Isol	CLOSED	
V08375	TCV-08-10 Isol	CLOSED	
1/08264	TCV-08-10 leol	CLOSED	
v 00304			I

DURE TITLE:		PAGE:
DATA SHEETS REQUIRED FOR HEA	ATUP	1/2 of 1/4
		143 01 14
ST. LUCIE UNIT 2		
APPENDIX BB		
PLACING MSRs IN SERVICE		
(Page 4 of 4)		
the MSR vents to the 5A and 5B Fee	dwater	
s as follows:		
DESCRIPTION	POSITION	INITIAL
2A MSB to Extr Stm Isol	OPEN	
2B MSR To Extr Stm Isol	OPEN	
2C MSR To Extr Stm Isol	OPEN	
2D MSB To Extr Stm Isol	OPEN	
the MSR vents to the Condenser as	follows:	
the MSR vents to the Condenser as	follows:	INITIAL
the MSR vents to the Condenser as DESCRIPTION	follows: POSITION CLOSED	INITIAL
the MSR vents to the Condenser as DESCRIPTION 2B Cndsr Vent From 2A MSR Isol 2B Cndsr Vent From 2B MSR Isol	follows: POSITION CLOSED CLOSED	INITIAL
DESCRIPTION2B Cndsr Vent From 2A MSR Isol2B Cndsr Vent From 2B MSR Isol2B Cndsr Vent From 2C MSR Isol	follows: POSITION CLOSED CLOSED CLOSED	
DESCRIPTION2B Cndsr Vent From 2A MSR Isol2B Cndsr Vent From 2B MSR Isol2B Cndsr Vent From 2C MSR Isol2A Cndsr From 2D MSR Tube BundleVent Isol	follows: POSITION CLOSED CLOSED CLOSED CLOSED	
the MSR vents to the Condenser as DESCRIPTION 2B Cndsr Vent From 2A MSR Isol 2B Cndsr Vent From 2B MSR Isol 2B Cndsr Vent From 2C MSR Isol 2A Cndsr From 2D MSR Tube Bundle Vent Isol	follows: POSITION CLOSED CLOSED CLOSED CLOSED	
DESCRIPTION2B Cndsr Vent From 2A MSR Isol2B Cndsr Vent From 2B MSR Isol2B Cndsr Vent From 2C MSR Isol2B Cndsr From 2D MSR Tube BundleVent Isol	follows: POSITION CLOSED CLOSED CLOSED CLOSED	
DESCRIPTION 2B Cndsr Vent From 2A MSR Isol 2B Cndsr Vent From 2B MSR Isol 2B Cndsr Vent From 2C MSR Isol 2B Cndsr From 2D MSR Tube Bundle Vent Isol N the MSR Warm Up Valves as follows DESCRIPTION	follows: POSITION CLOSED CLOSED CLOSED CLOSED S: POSITION	INITIAL
DESCRIPTION 2B Cndsr Vent From 2A MSR Isol 2B Cndsr Vent From 2B MSR Isol 2B Cndsr Vent From 2C MSR Isol 2B Cndsr From 2D MSR Tube Bundle Vent Isol N the MSR Warm Up Valves as follows DESCRIPTION Warmup 2A MSR	follows: POSITION CLOSED CLOSED CLOSED CLOSED S: POSITION CLOSED	INITIAL
DESCRIPTION 2B Cndsr Vent From 2A MSR Isol 2B Cndsr Vent From 2B MSR Isol 2B Cndsr Vent From 2C MSR Isol 2B Cndsr From 2D MSR Tube Bundle Vent Isol DESCRIPTION UP Valves as follows DESCRIPTION Warmup 2A MSR Warmup 2D MSR	follows: POSITION CLOSED CLOSED CLOSED CLOSED S: POSITION CLOSED CLOSED	INITIAL
DESCRIPTION 2B Cndsr Vent From 2A MSR Isol 2B Cndsr Vent From 2B MSR Isol 2B Cndsr Vent From 2C MSR Isol 2B Cndsr Vent From 2C MSR Isol 2A Cndsr From 2D MSR Tube Bundle Vent Isol DESCRIPTION Warmup 2A MSR Warmup 2D MSR Warmup 2B MSR	follows: POSITION CLOSED CLOSED CLOSED CLOSED S: POSITION CLOSED CLOSED CLOSED	INITIAL
DESCRIPTION 2B Cndsr Vent From 2A MSR Isol 2B Cndsr Vent From 2B MSR Isol 2B Cndsr Vent From 2C MSR Isol 2B Cndsr Vent From 2C MSR Isol 2A Cndsr From 2D MSR Tube Bundle Vent Isol Vent SR Up Valves as follows DESCRIPTION Warmup 2A MSR Warmup 2D MSR Warmup 2B MSR Warmup 2C MSR	follows: POSITION CLOSED CLOSED CLOSED CLOSED S: POSITION CLOSED CLOSED CLOSED CLOSED	INITIAL
DESCRIPTION 2B Cndsr Vent From 2A MSR Isol 2B Cndsr Vent From 2B MSR Isol 2B Cndsr Vent From 2C MSR Isol 2B Cndsr Vent From 2C MSR Isol 2A Cndsr From 2D MSR Tube Bundle Vent Isol N the MSR Warm Up Valves as follows DESCRIPTION Warmup 2A MSR Warmup 2D MSR Warmup 2B MSR Warmup 2C MSR	follows: POSITION CLOSED CLOSED CLOSED CLOSED S: POSITION CLOSED CLOSED CLOSED CLOSED	INITIAL
	ST. LUCIE UNIT 2 APPENDIX BB PLACING MSRs IN SERVICE (Page 4 of 4) the MSR vents to the 5A and 5B Fee S as follows: DESCRIPTION 2A MSR to Extr Stm Isol 2C MSR To Extr Stm Isol 2D MSR To Extr Stm Isol 2D MSR To Extr Stm Isol	ST. LUCIE UNIT 2 APPENDIX BB PLACING MSRs IN SERVICE (Page 4 of 4) the MSR vents to the 5A and 5B Feedwater s as follows: DESCRIPTION POSITION 2A MSR to Extr Stm Isol OPEN 2B MSR To Extr Stm Isol OPEN 2C MSR To Extr Stm Isol OPEN 2D MSR To Extr Stm Isol OPEN

END OF APPENDIX BB

NOTES SEE SCENARIO #1 AND #2 FOR ADDITIONAL PROCEDURES

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ST. LUCIE UNIT 2 EMERGENCY OPERATING PROCEDURE

Procedure No. **2-EOP-09**

Current Rev. No. 9

SAFETY RELATED

Effective Date: 10/04/99

Title:

LOSS OF OFFSITE POWER

Responsible Department:

OPERATIONS

Revision Summary

Revision 9 - Added ampere values for EDG loading when kW indication is not available. (Dennis Bonsall, 09/16/99)

Revision 8A - Changed OP 2-0120023 to 2-NOP-01.02. (Ron Pennenga, 07/13/99)

Revision	FRG Review Date	Approved By	Approval Date	S <u>2</u> OPS
0	09/19/89	G. J. Boissy Plant General Manager	09/19/89	DOCT_PROCEDURE DOCN_2-EOP-09
Revision	FRG Review Date	Approved By	Approval Date	SYS COMP_COMPLETED
9	09/16/99	R. G. West Plant General Manager	09/16/99	ITM <u>9</u>
		N/A Designated Approver		

REVISION NO .:	PROCEDURE TITLE:	PAGE:
9	LOSS OF OFFSITE FOWER	2 of 28
PROCEDURE NO.: 2-EOP-09	ST. LUCIE UNIT 2	
1.0 <u>TITLE</u> :		
LOSS OF (OFFSITE POWER	
2.0 <u>PURPOSE</u>	;	
1. This pro- the ever mitigate necess The go condition and mat	ocedure provides operator actions which must be accomp ent of a Loss of Offsite Power (LOOP) including actions re e the loss of forced circulation. The actions in this proced eary to ensure that the plant is placed in a stable, safe co pal of this procedure is to safely establish the plant in a M on while minimizing any radiological releases to the envir aintaining adequate core cooling.	olished in equired to dure are ndition. IODE 3 onment
3.0 <u>ENTRY CO</u>	ONDITIONS:	
1. The 2-	EOP-01, "Standard Post Trip Actions" have been perform	ned.
	OR	
All of t	he following conditions exist:	
A. Eve	ent initiated from MODE 3.	
B. SIA	AS has NOT been blocked.	
	AND	
2. A. Pla lea ma	ant conditions indicate that a Loss of Offsite Power has on ast one vital (AC) 4.16 KV bus is energized. Any of the fo ay be present:	ccurred. At bllowing
1.	Diesel generator(s) automatically start	
2.	Loss of normal control room lighting.	
3.	Both 6.9 KV buses are de-energized.	
	OR	
B. A 4.	station blackout event has occurred, and at least one vita 16 KV bus has been restored.	al (AC)

REVISION NO.:	PROCEDURE TITLE:	PAGE:
9	LOSS OF OFFSITE POWER	
ROCEDURE NO .:	-	3 01 20
2-EOP-09	ST. LUCIE UNIT 2	
.0 EXIT CON	IDITIONS:	
1. The di	agnosis of a Loss of Offsite Power is NOT confirmed.	
	OR	
2. Any of accept	the Loss of Offsite Power Safety Function Status Chec ance criteria are NOT met.	k
	OR	
3. The Lo satisfy	oss of Offsite Power procedure has accomplished its put ing ALL of the following:	rpose by
A. At l trar	east one vital 4.16 KV bus is energized from a Unit 2 st nsformer.	art up
B. All	safety function status check acceptance criteria are sati	sfied.
C. RC	S conditions are being controlled and maintained in MO	DE 3.
D. An	approved procedure is available for implementation.	

REVISIO	DN NO.:	PROCEDURE TITLE:			PAGE:
	9		JEESHE	FUWER	4 of 28
PROCE		ST 11	JCIE UN	IT 2	
500					<u> </u>
5.0 <u>C</u>	FENAIO	<u>H ACTIONS</u> .			
	INST	RUCTIONS		CONTINGENCY ACTIONS	
1	. Verify 2 Post Tr perform	2-EOP-01, "Standard ip Actions" has been ned.	1.	Perform 2-EOP-01, "S Post Trip Actions."	tandard
Ĩ			NOTE		
	 All s cont 	steps preceded with an as inuously.	sterisk (*)	are to be performed	
	• All a the part whe	available indications shoul loss of offsite power (LOC icular instrument reading. n one or more confirmato	d be use DP) may Instrum ry indica	ed in diagnosing the eve cause irregularities in a nent readings must be v tions are available.	ent since a verified
* 2	2. To con Loss of	firm the diagnosis of a f Offsite Power (LOOP):	2.	If Safety Function Stat acceptance criteria are satisfied, Then rediag	tus Check e NOT nose the
	A. Ver Stat crite	ify the Safety Function tus Check acceptance eria are satisfied.		event and exit to eithe appropriate Emergence Operating Procedure 2-EOP-15, "Functiona	er Sy Or I
	B. Per Sta A e con	form Safety Function tus Check per Appendix very 15 minutes until exit ditions are met.		Recovery."	
* 3	3. Contac conduc radiatic	et Health Physics to t secondary area on surveys.			

REVI	SION	NO.: 9	PROCEDURE TITLE: LOSS OF O	FFSITE	PO	VER	PAGE:
PRO	CEDL	IRE NO.:				5 of 28	
2	2-EOP-09 ST. LUCIE UNIT 2						
5.0	<u>OF</u>	ERATO	R ACTIONS: (continued)				
		INST	RUCTIONS		C	ONTINGENCY ACTIONS	
	T a	he LOC.	A, SGTR, ESDE, and TLC date a concurrent loss of	<u>IOTE</u>)F proce offsite p	edure	es are written to r.	
*	4.	<u>If</u> diagn SGTR, occurre <u>Then</u> er Emerge Procede	osis indicates a LOCA, ESD, or TLOF has d in addition to LOOP, xit to appropriate ency Operating ure.				
	5.	Verify E and 2B energiz 4.16 K\	Diesel Generators 2A have started and ed their associated vital / buses.	5.	<u>If</u> 2/ hav <u>The</u> nec	A and 2B Diesel G e NOT started and <u>n</u> perform the follo essary:	enerators l loaded, wing as
					Α.	If one diesel gene to start or load, <u>T</u> attempt a manual CLOSE output br energize the asso 4.16 KV bus.	erator fails <u>'hen</u> I start or eaker to ociated
					B.	If manual start is unsuccessful, <u>The</u> Appendix C, "Die Generator Local S continue on with procedure.	<u>en</u> refer to sel Start" and this
					C.	<u>If</u> no vital 4.16 KV are energized, <u>Th</u> this procedure an 2-EOP-10, "Static Blackout."	/ buses <u>nen</u> exit nd go to on
							····

REVISION NO.: 9		_{E:} _OSS OF OFFSI	ΤE	POWER	PAGE: 6 of 28
PROCEDURE NO 2-EOP-0).:)	ST. LUCIE	UNI	Т 2	
5.0 <u>OPER</u>	TOR ACTIONS:	(continued)			
II	ISTRUCTIONS	5		CONTINGENCY ACTIONS	,
6. Ens bus bat bat	sure at least one v is energized from tery charger or sta teries.	rital DC n either the ation	6.	If neither vital DC bu energized, <u>Then</u> GO 2-EOP-15, "Function Recovery."	is is TO al
☐ 7. <u>If</u> r 2B OF suj tie Po Co Po	on-vital 4.16 KV E 2 is NOT energize EN startup transfo ply breakers and breakers per Tabl wer Breaker nfiguration/Loss o wer."	Bus 2A2 or ed, <u>Then</u> ormer 4.16 KV le 6, "Vital f Offsite			
	IOT evened 70%	<u>CAUTI</u>	ON A	ctions to maintain pres	surizer
leve	take precedence	over maintaining	, se	al injection.	
8. Ini R(tiate seal injection CPs if available:	to the			
A.	Ensure charging available.	flow			
B.	OPEN V2185, "Ir Actuation Valve."	njection			

REVISION NO .:	PROCEDURE TITLE:	<u></u>	PAGE:			
9	LOSS C	OF OFFSITE POWER	7 of 28			
			<u> </u>			
DU UPERA	ION ACTIONS. (Continu	ied)				
INSTRUCTIONS CONTINGENCY ACTIONS						
If all fe	edwater has been stopp	bed, when feed flow to the steam				
genera 150 g	ators is reinitiated, flow si om for five minutes or un	hould be limited to less than or equitil a level increase is observed.	ual to			
* 9. Ensi	ure at least one steam					
gene	erator has the following:					
A. L	evel being restored or					
n b	and (60% to 70% narrow	I				
ra	ange) using AFW pumps					
	AND					
B. P	ressure control by one o	f				
tr p	referred order):					
1	. Atmospheric Dump					
	Valves (ADVs).					
2	. Main Steam Safety					
	Valves.					
* 10. Oper	rate charging pumps as	70r				
level	10% to 70%.					

9	LOSS OF OFFSI	TE POWER	8 of 28
PROCEDURE NO.: 2-EOP-09	ST. LUCIE	UNIT 2	
5.0 OPERATO	R ACTIONS: (continued)		
INS ¹	RUCTIONS	CONTINGE ACTION	NCY IS
 11. Restore 2A or 2 Comprifollowir A. Ensing Cerrence B. Dising and wate contended on the contended of the contende of the contended of t	e instrument air using the 2B Instrument Air essor by performing the ng: sure 2AB 480V Load her is aligned to an ergized bus. patch an operator to align start emergency cooling er to the instrument air npressors per bendix H, "Operation of 2A and 2B Instrument Compressors." <u>en</u> Appendix H, beration of the 2A and 2B trument Air Compressors" completed, <u>Then</u> locally rt one instrument air npressor as follows: Place local handswitch in AUTO. Reset 2A or 2B Instrument Air Compressor control switch (HVCB). Verify instrument air pressure being restored.		

REVISION NO.:		ESITE POWEB	PAGE:
PROCEDURE NO.:			9 of 28
2-EOP-09	ST. LUC	IE UNIT 2	
5.0 <u>OPERATO</u>	R ACTIONS: (continued)		
INST	FRUCTIONS		NCY S
12. <u>When</u> i restore flow to reestat	nstrument air has been d, <u>Then</u> ensure CCW the RCPs has been blished.		
★ 13. Ensure maintai Figure Tempe	RCS pressure is being ined within the limits of 1, "RCS Pressure rature" curve.	 13. <u>If</u> RCS subcoolin maintained, <u>Ther</u>following as apprendixed apprendixed apprendixed apprendixed apprendixed apprendixed apprendixed apprendixed apprendixed appropriate as appropriate appropriate as appropriate as appropriate appropriste appropriate appropriate appropriate approp	g is NOT being perform the ropriate: cooling is less 20°F ng by reducing perature. pressurizer o establish pooling is 200°F or the is greater hr, <u>Then</u> following steps ate: cooldown in
		(Continued on Next	Page)

PROCEDURE TITLE:	OFFSITE POWER	PAGE:
-		10 of 28
ST. L	UCIE UNIT 2	
R ACTIONS: (continued)	
TRUCTIONS	CONTINGENO ACTIONS	Y
	13. (continued)	
	B. (continued)	
	2. Depressuriz by using ma auxiliary spi and maintai pressure wi limits of Fig Pressure Te curve.	e the plant ain or ray to restore n pressurizer thin the ure 1, "RCS emperature"
	OR	
	3. Depressuriz by using ma of letdown t and maintal pressure wi limits of Fig Pressure Te curve.	te the plant anual control o restore n pressurizer thin the ure 1, "RCS emperature"
	4. <u>If</u> overpress to charging depressuriz stopping ch pumps, one restore and pressurizer within the li	flow, <u>Then</u> e RCS by arging e at a time, to maintain pressure mits of
	PROCEDURE TITLE: LOSS OF (ST. LU <u>RACTIONS</u> : (continued)	PROCEDURE TITLE: LOSS OF OFFSITE POWER ST. LUCIE UNIT 2 RACTIONS: (continued) IRUCTIONS 13. (continued) B. (continued) B. (continued) 2. Depressuriz by using ma auxiliary spr and maintai pressure Te curve. OR 3. Depressuriz by using ma of letdown t and maintai pressure wi limits of Fig Pressure Te curve. OR 3. Depressurize by using ma of letdown t and maintai pressure wi limits of Fig Pressure Te curve. OR 4. If overpress to charging depressurizes within the li

REVISION NO.: 9		PROCEDURE TITLE: LOSS OF OF	FSITE POWER	PAGE:
PRO	CEDURE NO.:			11 of 28
2	-EOP-09 ST. L		IE UNIT 2	
5.0	OPERATO	R ACTIONS: (continued)		
	INST	FRUCTIONS	CONTINGENCY ACTIONS	
	lt take	<u>No</u> es about 15 minutes for nati	<u>OTE</u> ural circulation flow to fully de	velop.
*	14. Verify at leas followin	natural circulation flow in t one loop by all of the ng:	 14. <u>If</u> natural circulation fle observed, <u>Then</u> ensur control of S/G feeding steaming, and RCS in and pressure. 	ow is NOT e proper and eventory
	A. Loc T-c pov	op Δ T (T-hot minus old) is less than full ver Δ T (50°F).		
	B. T-c dec	old constant or creasing.		
	C. T-h deo	ot constant or creasing.		
	D. No (gr T-ł Co (Cl	abnormal differences eater than 20°F) between not and Representative re Exit Thermocouple ET) temperature.		
	E. Re ter lea	presentative CET nperature indicates at st 20°F subcooling.		
×	15. Period in the tanks opera Trans uninte opera	dically check fuel oil levels diesel generator day to confirm proper tion of the Fuel Oil fer System and to ensure errupted diesel generator tion.		

REVISION NO.: 9	PROCEDURE TITLE: LOSS OF OF	FSITE POWER	PAGE: 12 of 28
PROCEDURE NO.: 2-EOP-09	ST. LUC	CIE UNIT 2	
5.0 <u>OPERATO</u>	R ACTIONS: (continued)		L
INST	RUCTIONS	CONTINGENCY ACTIONS	
16. Isolate follows:	S/G blowdown as		
A. CLC FC\ Ger	OSE FCV-23-3 and /-23-4, " 'A' Steam lerator Blowdown."		
B. CLC FC\ Ger	OSE FCV-23-5 and /-23-6, " 'B' Steam erator Blowdown."		
17. <u>If</u> Unit Station Unit 1 v Append With Ad Crossti	1 has experienced a Blackout, <u>Then</u> supply with AC power per dix W, "Supplying Unit 1 C Power Using SBO e."		
★ 18. When of to the second power for the secon	offsite power is available switchyard, <u>Then</u> restore to the Electrical ution System and station as follows:		
A. Con Disp to th	tact Division Load batcher to restore power ne switchyard.		
B. Res elec App Res Pow	tore power to plant strical buses per endix D, "Power toration Loss of Offsite ver."		

PROCEDURE NO.:			
	1		13 of 28
2-EOP-09	ST. LU	JCIE UNIT 2	
5.0 <u>OPERATO</u>	R ACTIONS: (continued)		
INST	RUCTIONS	CONTINGE ACTIONS	NCY S
Sufficien Diesel G (Maximu KW indic load, if K available	<u>C.</u> t power (KW) should be a enerator loading should b m continuous load, if KW ation is NOT available, 5 W indication is available, 550 amps.)	<u>AUTION</u> vailable prior to energizing e reevaluated as loads are indication is available, is 3 10 amps; maximum 2000 h is 3935 KW if KW indicatio	these loads. reenergized. 685 KW if nour rated on is NOT
19. <u>When</u> a on the the foll started Table & Genera running A. Mar brea hea Bus	adequate margin exists diesel generator, <u>Then</u> owing loads may be as required. Refer to 3, "Emergency Diesel ator Loading (LOOP)" for g (KW) loads. hually CLOSE the akers for pressurizer ter buses on 4.16 KV es 2A3 and 2B3.		
B. Mar Hea only	nually reset the Backup tter Breakers B1 and B4 /.		
C. Star coo thar tem	rt the spent fuel pool ling pump. Maintain less n 150°F spent fuel pool perature.		
D. Res brea MC	et non-essential loads aker on the following Cs:		

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REVI	SION NO.: PROCEDURE TITLE: 9 LOSS OF OFFSITE POWER		FSITE POWER	PAGE:
PRO	CEDURE NO .:			14 of 28
2	-EOP-09	ST. LUCIE UNIT 2		
5.0	OPERATO	R ACTIONS: (continued)		
	INST	RUCTIONS	CONTINGENCY ACTIONS	
	20. Energiz nuclear reactor	ze startup channel r instrumentation as r power decreases.	20. <u>If</u> startup nuclear instrumentation is NO available, <u>Then</u> use E Neutron Monitoring Sy	T Excore vstem.
	21. Locally MV-10 Breake	OPEN MV-10-1A and -1B, "Condenser Vacuum ers."		
	22. CLOSI HCV-0 Isolatic	E HCV-08-1A and 8-1B, "Main Steam on Valves."		
	23. Ensure pumps	e the following turbine oil are operating:		
	A. Em pur	ergency bearing oil np.		
	B. Air pur "Se Ru	side seal oil backup mp. (Annunciator D-40, eal Oil DC Backup Pump nning.")		
	The nor instrume letdown	l-essential sections of MCC ent air available to restore l using 'P' valves, MCC 2A2	NOTE 2A6 and 2B6 must be energi etdown using 'Q' valves. To r 2 must <u>also</u> be energized.	zed, and estore
×	24. <u>When</u> <u>Then</u> Off-No Proce "Char	plant conditions permit, restore letdown per ormal Operating dure 2-0210030, ging and Letdown."		

	LOSS OF OFFSITE POWER ST. LUCIE UNIT 2		15 of 28
2-EOP-09			
5.0 <u>OPERATO</u>	R ACTIONS: (continued)		
INST	RUCTIONS	CONTINGEN ACTIONS	NCY S
 25. When a Then e desirab with Te concurre Consid A. Ade hear circle B. Existem C. The press D. The inter 1. For the press E. RCF press F. Des if Corisola 	offsite power is restored, valuate the need and ility of restarting RCPs chnical Support Center rence (if operational). er the following: quacy of RCS and core t removal using natural ulation. ting RCS pressure and peratures. need for main surizer spray capability. duration of CCW ruption to pumps. RCPs were NOT operated greater than 10 minutes without CCW. CCW was NOT lost greater than 30 minutes. P seal breakdown sures and temperatures. irability to operate RCPs ontrolled Bleedoff was ated.		

REVISION NO.: 9	PROCEDURE TITLE: LOSS OF OF	FSITE POWER	16 of 28
PROCEDURE NO.: 2-FOP-09	ST. LUC	IE UNIT 2	10 01 20
5.0 <u>OPERATO</u>	R ACTIONS: (continued)		l
INS	TRUCTIONS	CONTINGENCY ACTIONS	
★ 26. <u>If</u> RCP determ RCP re	restart is desired, <u>Then</u> ine if all the following estart criteria are met:	26. <u>If</u> RCP restart criteria met, <u>Then</u> GO TO ste	a is NOT ep 28.
A. All req per Coo (Le is N	RCP starting uirements are satisfied 2-NOP-01.02, "Reactor plant Pump Operation." tdown System operation NOT required.)		
B. No exis	high temperature alarms st on the selected RCPs.		
C. Re ten lea	presentative CET nperature indicates at st 20°F subcooling.		
D. Un gre (wi ava	isolated S/G level is eater than or equal to 15% de range) with feedwater ailable for removing heat.		
E. Pre tha NC	essurizer level is greater In or equal to 45% and DT decreasing.		

	n no.: 9	PROCEDURE TITLE: LOSS OF OF	FSITE POWER	PAGE:
ROCED	POCEDURE NO.: 2-EOP-09 ST. LU		CIE UNIT 2	
.0 <u>O</u> F	PERATO	R ACTIONS: (continued)		
	INST	RUCTIONS	CONTINGENCY ACTIONS	
	Pressuriz level deci operation charging	<u>CAL</u> er level and pressure may ease may be large enough with a drained pressurizer pumps are operating and a	JTION decrease upon starting RCPs to drain the pressurizer. RC may continue provided all av Il other RCP restart criteria al	a. The P ailable re met.
27	7. <u>If</u> RCP restart o the follo	restart is desired and criteria are met, <u>Then</u> do wing:	27. <u>If</u> RCPs can NOT be <u>Then</u> GO TO step 28	restarted,
	A. Ensu pum	ire all available charging ps are operating.		
	B. Star	one RCP in each loop.		
	C. Verif to Fi Tem RCP	y adequate NPSH (refer g. 1, "RCS Pressure perature") and stable amperage.		
	D. Rest prog	ore pressurizer level to ram level.		
] 28	Evaluat based c systems condens "Time L Bequire	e the need for cooldown in plant status, auxiliary availability and sate inventory (Figure 3, intil Shutdown Cooling d vs. Condensate		

REVISION NO .:	PROCEDURE TITLE:		PAGE:
9	LOSS OF O	FFSITE POWER	19 of 29
PROCEDURE NO .:			10 01 20
2-EOP-09	ST. LU	CIE UNIT 2	
5.0 <u>OPERATO</u>	R ACTIONS: (continued)		
INST	RUCTIONS	CONTINGENCY ACTIONS	
 29. <u>If</u> condition 29. <u>If</u> condition SDC erricoldov SDC erricoldov SDC erricoldov A. Off-I Procentia Procentia Procentia Procentia Procentia Procentia Procentia SDC erricoldov /ul>	tions require a plant vn, <u>Then</u> cooldown to ntry conditions using one ollowing procedures: Normal Operating cedure 2-0120039, tural Circulation Idown." erating Procedure 030127, "Reactor Plant Idown - Hot Standby to d Shutdown."		
★ 30. <u>If</u> exit of maintai stabilize an app	onditions are met, <u>Then</u> n the plant in a ed condition and exit to licable procedure.		
This func Furt Sup	procedure should leave t tions are being maintained her recovery actions may port Center, if operational.	he plant in a condition where a d and the RCS is in a MODE 3 be recommended by the Techr	Il safety condition. nical
	END O	= TEXT	

PROCEDURE NO.: 2-EOP-09 ST. LUCIE UNIT 2 APPENDIX A SAFETY FUNCTION STATUS CHECK SHEET (Page 1 of 9) DATE	erion
APPENDIX A SAFETY FUNCTION STATUS CHECK SHEET (Page 1 of 9) DATE Notify NPS/ANPS immediately if any safety function acceptance crite is NOT met. 1. REACTIVITY CONTROL SAFETY ACCEPTANCE FUNCTION CRITERIA CHECK √ TIME A. Reactor Power Less than 5 X 10 ⁻⁴ % and stable or decreasing. AND	erion
DATE CAUTION Notify NPS/ANPS immediately if any safety function acceptance critics NOT met. 1. REACTIVITY CONTROL SAFETY FUNCTION ACCEPTANCE CRITERIA CHECK √ TIME A. Reactor Power Less than 5 X 10 ⁻⁴ % and stable or decreasing. AND	erion
CAUTION Notify NPS/ANPS immediately if any safety function acceptance crities NOT met. 1. REACTIVITY CONTROL SAFETY ACCEPTANCE CRITERIA CHECK √ FUNCTION CRITERIA CHECK √ TIME A. Reactor Power Less than 5 X 10 ⁻⁴ % and stable or decreasing. AND	erion
Notify NPS/ANPS immediately if any safety function acceptance critics NOT met. 1. REACTIVITY CONTROL SAFETY FUNCTION ACCEPTANCE CRITERIA CHECK √ A. Reactor Power Less than 5 X 10 ⁻⁴ % and stable or decreasing. TIME	erion
I. REACTIVITY CONTROL SAFETY FUNCTION ACCEPTANCE CRITERIA CHECK √ TIME Ime A. Reactor Power Less than 5 X 10 ⁻⁴ % and stable or decreasing. AND	
1. REACTIVITY CONTROL SAFETY FUNCTION ACCEPTANCE CRITERIA CHECK √ TIME	
SAFETY FUNCTION ACCEPTANCE CRITERIA CHECK √ TIME	
A. Reactor Power Less than 5 X 10 ⁻⁴ % and stable or decreasing.	
A. Reactor Power Less than 5 X 10 ⁻⁴ % And stable or decreasing.	
A. Reactor Power Less than 5 X 10 ⁻⁴ % And stable or decreasing.	
A. Reactor Power Less than 5 X 10 % Less than 5 X 10 % Less than 5 X 10 % AND	
AND	
CEA Position Maximum of 1 CEA NOT fully inserted.	
₩	
(Continued on Next Page)	

REV	ISION NO.: 9	PROCEDUI	RE TITLE: LOSS OF OFFSI	TE POWER	PAGE:
PRC	CEDURE NO .:				20 of 28
2	2-EOP-09		ST. LUCIE L	JNIT 2	
		<u>SA</u> I	APPEND FETY FUNCTION STA (Page 2 of 1. REACTIVITY	IX A TUS CHECK SHEET of 9) Y CONTROL	
	SAFET	Y	ACCEPTANCE		
В.	Reactor Pov	<u>on</u> wer	Less than 5 X 10 ⁻⁴ % and stable or decreasing.		
	Emergency Boration		Borating to greater than 5000 pcm shutdown margin.		
C.	Reactor Por	wer	Less than 5 X 10 ⁻⁴ % and stable or decreasing.		
	Startup Rate	e	Negative or zero.		
			END OF SAFETY	FUNCTION 1	

	0		LOSS OF OFFS		
000					21 of 28
PRO					
2	-EOP-09				
		<u>SA</u>	APPEN FETY FUNCTION ST (Page 3	DIX A TATUS CHECK SHEET 3 of 9)	
		2. M	AINTENANCE OF	VITAL AUXILIARIES	
	SAFET FUNCT	Y ION	ACCEPTANC CRITERIA	E CHECK	<u> </u>
Α.	Vital DC Bu	uses	At least one		
	(2A or 2B)		energizea.	AND	
	Vital 4.16 k Bus (2A3 c	(V or 2B3)	At least one energized.		
			END OF SAFET	TY FUNCTION 2	
			END OF SAFET	TY FUNCTION 2	
			END OF SAFET	Y FUNCTION 2	
			END OF SAFET	TY FUNCTION 2	
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			END OF SAFET	TY FUNCTION 2	

PRC			
4	2-EOP-09	51. LUUIE	
		SAFETY FUNCTION ST (Page 4	of 9)
		3. RCS INVENTO	
	SAFETY		
	FUNCTION		
Α.	Pressurizer Le	evel Being maintained	
		or restored	AND
		10 /0 10 /0 /0.	
	RCS Subcoole	ed Greater than or equa	
		Natural Circulation	
		use Representative	
		CET, page 213, <u>or</u> during Forced	AND
		Circulation use T-hol	
		page 211, QSPDS.)	
	Reactor Vesse	el Core covered	
	Level (page 21	12, (Sensors 7 and 8	
	QSPDS)	covered.)	
	Representative	e NOT superheated	
	CET temperatu	ure	
		END OF SAFET	FUNCTION 3

REVISION NO.:	FROCEDO			
9				23 of 28
PROCEDURE NO .:				
2-EOP-09		ST. LUCIE	UNIT 2	
	<u>SA</u>	APPENI FETY FUNCTION STA (Page 5	DIX A ATUS CHECK SHEE of 9)	<u>=T</u>
		4. RCS PRESSU		
SAFE	TY		CHE	ЕСК √
A. Pressuriz Heaters a Sprays	er and	Maintaining <u>or</u> restoring pressure within limits of Figure 1, "RCS		
		END OF SAFET	re" Y FUNCTION 4	
		END OF SAFET	re" Y FUNCTION 4	
		END OF SAFET	re" Y FUNCTION 4	
		END OF SAFET	Y FUNCTION 4	
		END OF SAFET	re" Y FUNCTION 4	
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		END OF SAFET	Y FUNCTION 4	
		END OF SAFET	Y FUNCTION 4	

PROCEDURE TITLE: LOSS OF OFFSIT	E POWER	PAGE: 24 of 28
ST. LUCIE U	NIT 2	
APPENDI SAFETY FUNCTION STAT (Page 6 o 5. CORE HEAT	X A F <u>US CHECK SHEET</u> f 9) REMOVAL	
	CHECK 1	
oled Greater than or equal to 20°F (During Natural Circulation use Representative CET, page 213, <u>or</u> during Forced Circulation use T-hot, page 211, QSPDS.)	AND	
Less than full power ∆T (50°F) (if all RCPs are off). Less than 10°F (if any RCPs are running).	OR	
END OF SAFETY	FUNCTION 5	
	PROCEDURE TITLE: LOSS OF OFFSIT ST. LUCIE U APPENDI SAFETY FUNCTION STAT (Page 6 o 5. CORE HEAT ACCEPTANCE ON CRITERIA Oled Greater than or equal to 20°F (During Natural Circulation use Representative CET, page 213, <u>or</u> during Forced Circulation use T-hot, page 211, QSPDS.) Less than full power AT (50°F) (if all RCPs are off). Less than 10°F (if any RCPs are running).	PROCEDURE TITLE: LOSS OF OFFSITE POWER ST. LUCIE UNIT 2 APPENDIX A SAFETY FUNCTION STATUS CHECK SHEET (Page 6 of 9) 5. CORE HEAT REMOVAL CRITERIA CHECK √ Oled Greater than or equal to 20°F (During Natural Circulation use Representative CET, page 213, <u>or</u> during Forced Circulation use T-hot, page 211, QSPDS.) Less than full power AT (50°F) (if all RCPs are off). OR Less than 10°F (if any RCPs are running). END OF SAFETY FUNCTION 5

REVISION NO .:	PROCEDU			PAGE:
9		L033 UF UFF311		25 of 28
PROCEDURE NO .:				
2-EOP-09		ST. LUCIE U	NIT 2]
	<u>SA</u>	APPENDI FETY FUNCTION STA (Page 7 d 6. RCS HEAT	IX A TUS CHECK SHEET of 9) REMOVAL	
CAEET	-v			····
FUNCT		CRITERIA	CHECK √	· · · · · · · · · · · · · · · · · · ·
A. Steam Generator Level		At least one S/G in the normal band (60% to 70% narrow range) with feedwater available, <u>or</u> being restored by total feedwater flow greater than or equal to 150 gpm.		
		END OF SAFETY	FUNCTION 6	

\. C F	Containment Pressure	Less than 2 psig.	
		•	AND
C F	Containment Radiation Monitors	No alarms or increasing trends.	AND
C E F	Condenser Air Ejector, Blowdown Ind Main Steamline Radiation Monitors	No alarms or increasing trends. Local surveys being performed indicate no secondary plant radiation.	OR

REVI	SION NO.: Q	PROCEDURE TITLE:		PAGE:
				27 of 28
PROC 2	-EOP-09	ST. LUCIE	UNIT 2	
	201 00			L
		APPENI SAFETY FUNCTION STA (Page 9	ATUS CHECK SHEET of 9)	
	8. C	ONTAINMENT TEMPER COMBUSTIBLE (ATURE, PRESSURE GAS CONTROL	AND
	SAFET FUNCTI	Y ACCEPTANCE ON CRITERIA	E CHECK V	
Α.	Containmer	nt Less than 2 psig.		
	Pressure		AND	
	Containmer Temperatur	nt Less than 120°F re <u>or</u> all available containment coolers operating.		
		END OF SAFET	Y FUNCTION 8	
		RO / SRO / STA		
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