ITEM # 5
COVER SHEET

-- FINAL SUBMITTAL INFORMATION --
ALL IN ONE ADAMS DOCUMENT

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

FEBRUARY 7 - 11, 2000

FINAL SUBMITTAL

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

FEBRUARY 7 - 11, 2000

NUREG-1021 - ES-501

ES-301-1 - ADMIN TOPICS OUTLINE

ES-301-2 - CONTROL ROOM SYSTEMS AND FACILITY WALK-THROUGH TEST OUTLINE

Facility: St. Lucie
Examination Level (circle one): RO / SRO
Date of Examination: 2/7/00
Operating Test Number: 1

Administrative 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 Critical Condition Calculation Unit 1
	Overtime Guidelines K2.1.1 - 3.7/3.8	Question 1/ Evaluate Overtime Guidelines Question 2/ Minimum level 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 facility radiation control requirements K2.3.1 - 2.6 / 3.0	Question 1 / Determine Posting 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 (RO Only)	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 Protective Action Recommendations

Facility: St. Lucie
Exam Level (circle one): RO / SRO(I) / SRO(U)

Date of Examination: 2/7-9-00
Operating Test No.: 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) (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, (A)lternate path, (C)ontrol room, (S)imulator, (L)ow-Power, (R)CA

FINAL SUBMITTAL

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

FEBRUARY 7 - 11, 2000

FINAL AS ADMINISTERED

RO WRITTEN EXAMINATION

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

Applicant Information

Name:	Region: II
Date: 2/10/00	Facility/Unit: St. Lucie
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

PART B - WRITTEN EXAMINATION GUIDELINES

1. ***[Read Verbatim]*** After you complete the examination, sign the statement on the cover sheet indicating that the work is your own and you have not received or given assistance in completing the examination.

2. To pass the examination, you must achieve a grade of 80.00 percent or greater; grades will not be rounded up to achieve a passing score. Every question is worth one point.

3. For an initial examination, the time limit for completing the examination is five hours. For a requalification examination, the time limit for completing both sections of the examination is three hours. If both sections are administered in the simulator during a single three-hour period, you may return to a section of the examination that was already completed or retain both sections of the examination until the allotted time has expired.

4. You may bring pens, pencils, and calculators into the examination room. Use black ink to ensure legible copies; dark pencil should be used only if necessary to facilitate machine grading.

5. Print your name in the blank provided on the examination cover sheet and the answer sheet. You may be asked to provide the examiner with some form of positive identification.

6. Mark your answers on the answer sheet provided and do not leave any question blank. Use only the paper provided and do not write on the back side of the pages. If you are using ink and decide to change your original answer, draw a single line through the error, enter the desired answer, and initial the change.

7. If you have any questions concerning the intent or the initial conditions of a question, do *not* hesitate asking them before answering the question. Ask questions of the NRC examiner or the designated facility instructor *only*. When answering a question, do *not* make assumptions regarding conditions that are not specified in the question unless they occur as a consequence of other conditions that are stated in the question. For example, you should not assume that any alarm has activated unless the question so states or the alarm is expected to activate as a result of the conditions that are stated in the question.

8. Restroom trips are permitted, but only one applicant at a time will be allowed to leave. Avoid all contact with anyone outside the examination room to eliminate even the appearance or possibility of cheating.

9. When you complete the examination, assemble a package including the examination questions, examination aids, answer sheets, and scrap paper and give it to the NRC examiner or proctor. Remember to sign the statement on the examination cover sheet indicating that the work is your own and that you have neither given nor received assistance in completing the examination. The scrap paper will be disposed of immediately after the examination.

10. After you have turned in your examination, leave the examination area as defined by the proctor or NRC examiner. If you are found in this area while the examination is still in progress, your license may be denied or revoked.

11. Do you have any questions?

Question 1
A Waste Gas Decay Tank is to be released.

Which of the following provide an interlock to allow releasing the tank?

A. Plant Vent Radiation monitor.

B. Waste Gas Release flow meter.

C. RAB Supply fans HVS-4A and HVS-4B.

D. RAB Exhaust fans HVE-10A and HVE-10B.

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 increase results in high pressure reactor 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 decrease results in TMLP 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

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 and no CEA motion, 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 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

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

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

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

A. Reactor tripped and the 2A Diesel not started.

B. Reactor tripped and the 2A Diesel started with the 2A3 4.16 KV bus energized.

C. Reactor not tripped and the 2A Diesel not started.

D. Reactor not tripped and the 2A Diesel started but the 2A3 4.16 KV bus is not energized.

Question 9

Unit 1 Control Room has been evacuated due to a fire and all immediate actions have been completed. 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? (Assuming Pressurizer heaters are available)

	Range	Method
A.	1800-2300 psia, trending to 2225-2275 psia	Auxiliary spray.
B.	1800-2300 psia, trending to 2225-2275 psia	Main spray.
C.	1850-2250 psia, trending to 2175-2225 psia	PORV's.
D.	1850-2250 psia, trending to 2175-2225 psia	Varying Presserizer level

Question 10

The following annunciators are received on Unit 2:

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

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 11

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 Delta T Power.

D. upward to null Nuclear Power-Delta T Power.

Question 12

Which of the below statements describes the reason for closing the Unit 2 MSR Block valves 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 13

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

Assuming no Operator actions, 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 14

A loss of the 1A DC bus occurs and the Unit immediately trips

Which of the following was the first signal that tripped the reactor?

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 15

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 16

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 increases to 120ºF.

B. Containment pressure increases to 5.5 psig.

C. Containment radiation increases to 1 R/Hr.

D. Containment particulate activity increases to 10,000 counts per minute.

Question 17

The following conditions exist:

- Unit 2 tripped from 100% power due to a large break LOCA
- SIAS "A" has failed to actuate
- Containment pressure is 6 psig

With NO operator actions, which one of the following describes the status of the Containment Spray Pumps (CS) and Hydrazine Pumps at this time?

	2A CS pump	2A Hydrazine Pump	2B CS Pump	2B Hydrazine Pump
A.	Off	Off	Off	Off
B.	Off	Off	On	On
C.	On	Off	On	Off
D.	On	On	On	On

Question 18

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 Instrument air problem is above the capacity of the Unit 1 /Unit 2 Instrument air cross tie.
- 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 19

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 20

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:

A. will sequence closed as load is reduced.

B. are individually selected and closed as load is reduced.

C. will close together as load is reduced.

D. will close with valves 3, 2 and 1 closing together prior to #4 closing as load is reduced.

Question 21

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 bleedoff flow	.8 GPM	.68 GPM	.9 GPM	.65 GPM
Middle cavity pressure	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 22

Given the following conditions:

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

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

A. To provide Natural circulation so RCS Boron stratification is minimized.

B. To remove decay heat load due to insufficient ECCS flow.

C. To condense the steam generated from the RCS two phase mixture which provides the primary means of decay heat removal.

D. To provide a means of RCS pressure control in the event main or auxiliary spray is not available.

Question 23

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 24

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 as a primary source of information and use 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 use safety related instruments to confirm these indications.

Question 25

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 26

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 and with approval of the ANPS.

Question 27

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 28

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 29

Given the following conditions:

- Unit 2 is at 100% power when a 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 30

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 31

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 letdown isolates on high Letdown heat exchanger outlet temperature.

Question 32

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 properly?

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 33

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

- RCS boron concentration: 500 PPM.
- VCT level: 41%,
- 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. 602 gallons water, 40 gallons boric acid

B. 599 gallons water, 43 gallons boric acid

C. 588 gallons water, 54 gallons boric acid

D. 555 gallons water, 87 gallons boric acid

Question 34

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 throttle valves could be subject to thermal locking.

D. AFW suction pressure instrumentation could be damaged by high pressure.

Question 35

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 insert 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. Gripper coil damage will occur if not removed from the hold bus within 45 minutes

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. The 2A and 2B Diesel Generator start and tie to their respective busses.

Assuming no Operator actions, which of the following describes how the AFW system responds to this event?

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

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

- SBCS in Auto maintaining Tave 532 ° F.
- Steam pressure regulator PCV 12-29 (to the SJAE) fails closed.
- Condenser backpressure goes to 15 inches HG before the regulator can be bypassed and backpressure 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 backpressure has reached 5 inches HG.

Question 40

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 41

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 42

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 43

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 44

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, then stabilizes after placing a new CVCS Ion Exchanger in service.

D. RCS temperature decreases 4° F, then stabilizes due to a leaking steam bypass control valve .

Question 45

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 46

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	Pressurizer Pressure	S/G Pressure
A.	Increasing	increasing,	increasing
B.	Increasing	decreasing	decreasing
C.	decreasing	increasing	increasing
D.	decreasing	decreasing	decreasing

Question 47

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. Close the inlet to 2B Gas Decay tank V6589.

B. Stop the Waste Gas compressors.

C. Close Waste Gas release valve V6565.

D. Check the waste gas valve line-up to the 2B Gas Decay Tank.

Question 48

A Start-up is being performed on Unit 1 with the following indications:

	Ch A	Ch B	Ch C	Ch D
Power (%)	1.8	2.0	2.1	1.9
Startup Rate (DPM)	1.2	1.3	1.5	1.4

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 49

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 50

Unit 2 is at 100% power when Instrument air to 2A Component Cooling Water (CCW) Heat Exchanger temperature control valve, TCV-14-4A is 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 51

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

A. Significant Iodine increase that remains above prior levels during steady state operations.

B. An increase of 100/E bar.

C. Significant Iodine increase, concurrent with a Gross activity increase during a load change.

D. An increase in high energy gamma from N-16.

Question 52

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 the condition, that in itself would require a controlled plant shutdown?

A. Any LED lit on the PORV/Safety Valve acoustic leakage monitor.

B. Leakage into the Pressurizer Quench Tank is calculated to be 12 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 53

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 Liquid release flow control valve FCV-6627X.

D. Contact Chemistry to determine the validity of the alarm.

Question 54

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 flow path to regain the Reactivity Control Safety Function IAW 2-EOP-15, 'Functional Recovery'?

A. LPSI supplied by the RWT.

B. SIT discharge to the RCS.

C. Charging through the HPSI header

D. Charging through the Auxiliary Spray Line

Question 55

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 56

The following conditions exist on Unit 1 while at 100% power:

- A SGTR has occurred on 1A S/G
- 1A S/G has been isolated.
- The unit is cooling down on the 1B S/G.
- 1A S/G pressure: 850 psia.
- 1B S/G pressure: 575 psia.
- AFW automatically isolated to the 1B SG.

Which of the following is the correct method to re-establish feedwater flow to the 1B S/G?

A. Initiate AFAS 2 from RTGB 102.

B. Open the AFW valves to 2B S/G on RTGB 102.

C. Override the Main Feedwater Isolation valves and use Main Feedwater.

D. Actuate AFAS 2 from the AFAS panel.

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 would require the securing of the two remaining Reactor Coolant Pumps after entering 2-EOP-03 'Loss of Coolant Accident'?

A. RCS Pressure is 1200 psia

B. RCS Subcooled Margin is 12º F.

C. Hot Leg Temperature of 498º F.

D. Pressurizer level is 18%.

Question 58

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 59

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 line-up to once through cooling.

D. prevent dry out of S/G's to preclude feeding a dry S/G when feedwater is recovered.

Question 60

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 61

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 62

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 63

When performing a reactor startup on Unit 2, which of the following occurs at ≥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 64

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

D. LA-10, CCW SURGE TANK COMPARTMENT A LEVEL LOW

Question 65

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 66

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

A. Physical hands on check, slightly moving the valve closed then open, then back to the closed direction ¼ to ½ 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 67

I/C has requested a clearance to de-energize a component by removing 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 68

A surveillance is being performed on the 1A Diesel Generator. As the Diesel Generator is being unloaded, the KW chart recorder stops responding to the decreasing load.

Which of the following indications is used to determine when to open the Diesel Generator output breaker?

A Ammeter on 1A3 4.16 KV bus.

B. Ammeter on the local Diesel panel.

C. KW meter on local Diesel panel.

D. KW meter on remote shutdown panel.

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 condenser vacuum due to loss of condensate flow through the air ejector condenser.

C. Degrading 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 70

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 71

Which of the following systems, if removed form service would impact fire fighting strategies if a fire were to occur in Unit 2 Containment?

A. Primary water system.

B. Service water system.

C. Deminerilized water system.

D. Firewater system.

Question 72

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 would first require the execution of a manual reactor and turbine trip?

A. Two of four narrow range steam generator level indications are ≤ 40% and decreasing.

B. Two of four wide range steam generator level indications are ≥ 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 73

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 74

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 75

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 76

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 77

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 78

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 79

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. Reset B1 and B4 480V backup heaters on RTGB 203.

Question 80

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 81

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 82

Given the following conditions:

- Unit 1 is at 100% power
- Pressurizer pressure is 2250 psia

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

A. Maintain PIC-1100X current setpoint, turn on all Pressurizer heaters.

B. Maintain PIC-1100X current setpoint, turn on Backup heaters B-1 through B-4.

C. Reduce PIC-1100X setpoint, turn on Backup heaters B-1 through B-4.

D. Reduce PIC-1100X setpoint, turn on all Pressurizer heaters.

Question 83

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. 2 hours

B. 4 hours

C. 8 hours

D. 12 hours

Question 84

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 85

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 86

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	Delta T
A.	Decrease	Increase
B.	Decrease	Decrease
C.	Increase	Decrease
D.	Increase	Increase

Question 87

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 88

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 89

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 the method to determine the location of the RCS leak?

	Change in leak rate	Location
A.	RCS leakage flow recorder FR-07-3	comparing the CIAS radiation monitor readings.
B.	RCS leakage flow recorder FR-07-3	sampling different 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 90

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 non-essential 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 91

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 92

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 one of the following core cooling methods will be implemented?

A. Cooling through the Fuel Pool Heat Exchanger.

B. Cooling through the Letdown Heat Exchanger.

C. Feed and bleed to the RWT

D. Containment Spray system through the SDC heat exchangers.

Question 93

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 94

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
B.	High	Letdown flow will increase
C.	Low	Letdown flow will decrease
D.	Low	Letdown flow will increase

Question 95

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

- The Unit has been shutdown 4 days
- SDC cooling temperature from RCS: 130° F
- SDC cooling temperature to RCS: 116° 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)

A. 11 minutes to boil, 60 GPM makeup rate

B. 11 minutes to boil, 75 GPM makeup rate

C. 14 minutes to boil, 60 GPM makeup rate

D. 14 minutes to boil, 75 GPM makeup rate

Question 96

A large break LOCA has occurred on Unit 1. Which of the following describes the primary method for Hot Leg Injection?

A. LPSI pump via Hot Leg suction line.

B. HPSI pump via auxiliary spray line.

C. HPSI pump via dedicated Hot Leg injection line.

D. Containment Spray pump via Hot Leg suction line.

Question 97

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 98

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 99

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)

Question 100

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

FINAL SUBMITTAL

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

FEBRUARY 7 - 11, 2000

FINAL AS ADMINISTERED

SRO WRITTEN EXAMINATION

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

Applicant Information

Name:	Region: II
Date: 2/10/00	Facility/Unit: St. Lucie
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	Points
Applicant's Score		Points
Applicant's Grade		Percent

PART B - WRITTEN EXAMINATION GUIDELINES

1. ***[Read Verbatim]*** After you complete the examination, sign the statement on the cover sheet indicating that the work is your own and you have not received or given assistance in completing the examination.

2. To pass the examination, you must achieve a grade of 80.00 percent or greater; grades will not be rounded up to achieve a passing score. Every question is worth one point.

3. For an initial examination, the time limit for completing the examination is five hours. For a requalification examination, the time limit for completing both sections of the examination is three hours. If both sections are administered in the simulator during a single three-hour period, you may return to a section of the examination that was already completed or retain both sections of the examination until the allotted time has expired.

4. You may bring pens, pencils, and calculators into the examination room. Use black ink to ensure legible copies; dark pencil should be used only if necessary to facilitate machine grading.

5. Print your name in the blank provided on the examination cover sheet and the answer sheet. You may be asked to provide the examiner with some form of positive identification.

6. Mark your answers on the answer sheet provided and do not leave any question blank. Use only the paper provided and do not write on the back side of the pages. If you are using ink and decide to change your original answer, draw a single line through the error, enter the desired answer, and initial the change.

7. If you have any questions concerning the intent or the initial conditions of a question, do *not* hesitate asking them before answering the question. Ask questions of the NRC examiner or the designated facility instructor *only*. When answering a question, do *not* make assumptions regarding conditions that are not specified in the question unless they occur as a consequence of other conditions that are stated in the question. For example, you should not assume that any alarm has activated unless the question so states or the alarm is expected to activate as a result of the conditions that are stated in the question.

8. Restroom trips are permitted, but only one applicant at a time will be allowed to leave. Avoid all contact with anyone outside the examination room to eliminate even the appearance or possibility of cheating.

9. When you complete the examination, assemble a package including the examination questions, examination aids, answer sheets, and scrap paper and give it to the NRC examiner or proctor. Remember to sign the statement on the examination cover sheet indicating that the work is your own and that you have neither given nor received assistance in completing the examination. The scrap paper will be disposed of immediately after the examination.

10. After you have turned in your examination, leave the examination area as defined by the proctor or NRC examiner. If you are found in this area while the examination is still in progress, your license may be denied or revoked.

11. Do you have any questions?

Question 1
A Waste Gas Decay Tank is to be released.

Which of the following provide an interlock to allow releasing the tank?

A. Plant Vent Radiation monitor.

B. Waste Gas Release flow meter.

C. RAB Supply fans HVS-4A and HVS-4B.

D. RAB Exhaust fans HVE-10A and HVE-10B.

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 RCS temperature rises to 207 ºF.

Which one of the following statements describes the current 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 the current mode.

D. not required if, within 1 hour, RCS temperature is lowered to 190 ºF.

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 and no CEA motion, 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 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 completed. 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? (Assuming Pressurizer heaters are available)

	Range	Method
A.	1800-2300 psia, trending to 2225-2275 psia	Auxiliary spray.
B.	1800-2300 psia, trending to 2225-2275 psia	Main spray.
C.	1850-2250 psia, trending to 2175-2225 psia	PORV's.
D.	1850-2250 psia, trending to 2175-2225 psia	Varying Presserizer level

Question 9

The following annunciators are received on Unit 2:

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

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 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 valves 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.

Assuming no Operator actions, 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 increases to 120ºF.

B. Containment pressure increases to 5.5 psig.

C. Containment radiation increases to 1 R/Hr.

D. Containment particulate activity increases to 10,000 counts per minute.

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
Status	Off	Running	Running	Running
RCP controlled bleedoff flow	.8 GPM	.68 GPM	.9 GPM	.65 GPM
Middle cavity pressure	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 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 actuation.
- All systems are operating as expected

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

A. To provide Natural circulation so RCS Boron stratification is minimized.

B. To remove decay heat load due to insufficient ECCS flow.

C. To condense the steam generated from the RCS two phase mixture which provides the primary means of decay heat removal.

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 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 as a primary source of information and use 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 use 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 and with approval of the ANPS.

Question 22

Given the following conditions:

- Unit 2 is in day 5 of a refueling outage.
- Five nuts have been removed from the Reactor Vessel head
- 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, no action required.

D. Unit is in Mode 6, suspend Reactor Vessel Head disassembly.

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 being 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 High/High re-flash 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 will be disabled for 10 days for the purpose of silencing it.

C. The Containment Chiller Units are hooked up to the CCW system for Containment cooling while in Mode 5.

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.

C. EOP-05, 'Excess Steam Demand' Manually actuate MSIS and SIAS. Maintain RCS subcooling 20-200° F.

D. EOP-15, 'Functional Recovery', Emergency borate and attempt to isolate the affected S/G. Stabilize RCS temperature and pressure.

Question 26

Unit 1 is at 100% steady state power. The following are the results of Chemistry sampling over the past few days:

1-18-00 / 0700	0.9 Uci/gram	DE 131
1-20-00 / 0700	1.2 Uci/gram	DE 131
1-22-00 / 0700	0.8Uci/gram	DE 131
1-24-00 / 0700	75Uci/gram	DE 131

Which of the following is the required operator response?

(REFERENCES PROVIDED)

A. Place the Unit in Hot Standby with Tave <500 °F by 1300 1-24-00.

B. Place the Unit in Hot Standby with Tave <500 °F by 1700 1-24-00.

C. Continue 100% power operation for up to 100 hours.

D. Reduce power to <76% and continue power operation.

Question 27

On Unit 1, which of the following conditions has a Technical Specification action statement of less than one hour?

A. 5% power and RCS T_{ave} = 510º F.

B. 100% power and RCS T_c = 550º F.

C. Mode 1 and 1A Battery bank is declared out of service.

D. Mode 2 and 1A SIT outlet valve is found closed.

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: 0
- Pressurizer pressure: 850 psia
- CET temperature highest per quadrant: 560 °F
- 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 addressed next?

(REFERENCES PROVIDED)

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 letdown isolates on high Letdown heat exchanger outlet temperature.

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 properly?

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 insert 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. Gripper coil damage will occur if not removed from the hold bus within 45 minutes

Question 35

Which of the following plant situations allow 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. The 2A and 2B Diesel Generator start and tie to their respective busses.

Assuming no Operator actions, which of the following describes how the AFW system responds to this event?

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 dual 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 Paths 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

Unit 1 RCP bleedoff Containment Isolation valve V2505 has failed closed and cannot be reopened.

Which of the below conditions describes the current RCP bleedoff flow path and the first required Operator actions after V2505 has closed?

	Bleedoff flowpath	Operator actions
A.	Isolated	Open V2507 RCP bleedoff to Quench Tank
B.	Isolated	Stop all RCP's
C.	To reactor drain tank	Stop all RCPs
D.	Quench Tank	None

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, then stabilizes after placing a new CVCS Ion Exchanger in service.

D. RCS temperature decreases 4° F, then stabilizes 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, backpressure is steady at 5.1 inches Hg. If backpressure 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.

St. Lucie USNRC SRO Initial License Exam

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	Pressurizer Pressure	S/G Pressure
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. Close the inlet to 2B Gas Decay tank V6589.

B. Stop the Waste Gas compressors.

C. Close Waste Gas release valve V6565.

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. PCV 18-6, Unit 2 supply from Unit 1 has not reached the pressure at which it should close.

C. PCV 18-6, Unit 2 supply from Unit 1, has failed open due to low Instrument air pressure.

D. PCV 18-5, Unit 1 supply from Unit 2 has failed to close.

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

Unit 2 is at 100% power when Instrument air to 2A Component Cooling Water (CCW) Heat Exchanger temperature control valve, TCV-14-4A is 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. Significant Iodine increase that remains above prior levels during steady state operations.

B. An increase of 100/E bar.

C. Significant 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 flow path to regain the Reactivity Control Safety Function IAW 2-EOP-15, 'Functional Recovery'?

A. LPSI supplied by the RWT.

B. SIT discharge to the RCS.

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 would require the securing of the two remaining Reactor Coolant Pumps after entering 2-EOP-03 'Loss of Coolant Accident'?

A. RCS Pressure is 1200 psia

B. RCS Subcooled Margin is 12º F.

C. Hot Leg Temperature of 498º F.

D. Pressurizer level is 18%.

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 line-up 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 ≥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

D. 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 line-up on the AFW system. Which of the below methods describes how to verify the 1A AFW discharge valve to be in the correct position?

A. Physical hands on check, slightly moving the valve closed then open, then back to the closed direction ¼ to ½ 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

A surveillance is being performed on the 1A Diesel Generator. As the Diesel Generator is being unloaded, the KW chart recorder stops responding to the decreasing load.

Which of the following indications is used to determine when to open the Diesel Generator output breaker?

A Ammeter on 1A3 4.16 KV bus.

B. Ammeter on the local Diesel panel.

C. KW meter on local Diesel panel.

D. KW meter on remote shutdown panel.

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 quench 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 only enter containment:

A. if a fire occurs inside containment.

B. during day shift hours.

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 condenser vacuum due to loss of condensate flow through the air ejector condenser.

C. Degrading 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 70

Which of the following systems, if removed form service would impact fire fighting strategies if a fire were to occur in Unit 2 Containment?

A. Primary water system.

B. Service water system.

C. Deminerilized water system.

D. Firewater system.

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

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 75

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 76

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 77

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. Reset B1 and B4 480V backup heaters on RTGB 203.

Question 78

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 79

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 80

Given the following conditions:

- Unit 1 is at 100% power
- Pressurizer pressure is 2250 psia

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

A. Maintain PIC-1100X current setpoint, turn on all Pressurizer heaters.

B. Maintain PIC-1100X current setpoint, turn on Backup heaters B-1 through B-4.

C. Reduce PIC-1100X setpoint, turn on Backup heaters B-1 through B-4.

D. Reduce PIC-1100X setpoint, turn on all Pressurizer heaters.

Question 81

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. 2 hours

B. 4 hours

C. 8 hours

D. 12 hours

Question 82

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 83

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 84

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 85

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 86

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 the method to determine the location of the RCS leak?

	Change in leak rate	Location
A.	RCS leakage flow recorder FR-07-3	comparing the CIAS radiation monitor readings.
B.	RCS leakage flow recorder FR-07-3	sampling different 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 87

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 non-essential 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 88

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 89

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 one of the following core cooling methods will be implemented?

A. Cooling through the Fuel Pool Heat Exchanger.

B. Cooling through the Letdown Heat Exchanger.

C. Feed and bleed to the RWT

D. Containment Spray system through the SDC heat exchangers.

Question 90

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 91

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
B.	High	Letdown flow will increase
C.	Low	Letdown flow will decrease
D.	Low	Letdown flow will increase

Question 92

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

- The Unit has been shutdown 4 days
- SDC cooling temperature from RCS: 130° F
- SDC cooling temperature to RCS: 116° 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)

A. 11 minutes to boil, 60 GPM makeup rate

B. 11 minutes to boil, 75 GPM makeup rate

C. 14 minutes to boil, 60 GPM makeup rate

D. 14 minutes to boil, 75 GPM makeup rate

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)

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 2 was at 100% power, all systems in normal configuration when the following events occurred:

- Numerous secondary annunciators in alarm
- Generator megawatts decreasing
- Steam Generator levels decreasing
- DEH operator auto light 'OFF'

Which of the following describes the failure that has caused the current plant condition?

Loss of:

A. Instrument air.

B. the 120 VAC Vital bus.

C. the 120 VDC bus.

D. 2B Heater Drain pump.

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?

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 one of the following is the correct response of the 1BB Battery charger's voltage and amps?

	Voltage	Amps
A.	decrease	decrease
B.	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.

FINAL SUBMITTAL

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

FEBRUARY 7 - 11, 2000

FINAL RO/SRO WRITTEN EXAM

ANSWER KEY

Question 1

A Waste Gas Decay Tank is to be released.

Which of the following provide an interlock to allow releasing the tank?

A. Plant Vent Radiation monitor.

B. Waste Gas Release flow meter.

C. RAB Supply fans HVS-4A and HVS-4B.

D. RAB Exhaust fans HVE-10A and HVE-10B.

A. Plant Vent Radiation monitor (Required to be monitored during the release, but not interlocked)

B. Waste Gas Release flow meter (Incorrect, if the flow meter is OOS, the rate of pressure reduction is specified on the release permit but not interlocked)

C. RAB Supply fans HVS-4A and HVS-4B (Exhaust fans interlocked not supply fans)

D. RAB Exhaust fans HVE-10A and HVE-10B (Correct, waste gas release valve is interlocked with RAB exhaust fan)

Question level: 1
Question source: New
Exam: Both
K/A: 071.K3.04
Importance: 2.7 / 2.9
References: OP 1-0530021 Controlled Gaseous Batch release to Atmosphere

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 increase results in high pressure reactor 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 decrease results in TMLP trip.

A. proportional and backup heaters full on spray valves open, pressure increase results in high pressure reactor trip. (incorrect, heaters on, spray valves closed)

B. proportional and backup heaters off, spray valves closed, pressure decrease results in TMLP trip. (incorrect, heaters on)

C. proportional and backup heaters full on, spray valves closed, pressure increase results in high pressure reactor trip. (correct)

D. proportional and backup heaters full on, spray valves open, pressure decrease results in TMPL trip. (incorrect, pressure will decrease, sprays closed)

Question Level: 1
Question Source: New
Exam: RO
K/A: 000027.G2.1.28
Importance: 3.2
References: 0711206 Pressurizer Pressure and Level RCO Text,
1-0120035 Pressurizer Pressure and Level Off Normal Operating Procedure.

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.

A. Initiate Auxiliary Spray (incorrect, subcooling meets the 20-200°F criteria)

B. Throttle open the Atmospheric Dump Valves (correct, T-hot rising is an indication of Natural Circulation not developing)

C. Throttle open the Auxiliary Feed Water control valves (incorrect, 150 GPM indicated flow is the minimum flow required to meet decay heat removal, natural circulation won't improve)

D. Turn available pressurizer heaters (incorrect, subcooling meets the 20-200°F criteria)

Question level: 2
Question source: New
Exam: Both
K/A: CE/A13.AK3.2
Importance factor: 2.9 / 3.4
Reference: EOP-09 Loss of Offsite Power step 14 Contingency actions

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

A. Variable High Power (correct, resetting of this trip is a manual action. Without resetting, the trip is 7% above existing power level)

B. High Start Up Rate (incorrect, High Start Up rate bypassed >15% Power)

C. Thermal Margin/Low Pressure (incorrect, pressurizer pressure controllers will maintain pressure at 2250 PSIA)

D. High Pressurizer Pressure (incorrect, pressurizer pressure controllers will maintain pressure at 2250 PSIA)

Question Level: 2
Question Source: Palisades NRC exam
Exam: Both
K/A: 000001.AK1.20
Importance: 3.1 / 3.3
Reference: 0711404 Reactor Protective System Lesson Text

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 RCS temperature rises to 207 ºF.

Which one of the following statements describes the current 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 the current mode.

D. not required if, within 1 hour, RCS temperature is lowered to 190 ºF.

A. not met. At least one airlock door must be maintained closed (correct)

B. not met. Both airlock doors must be maintained closed (incorrect, only one airlock required to be closed)

C. not required in the current mode (incorrect, containment integrity required for current plant conditions)

D. not required if, within 1 hour,RCS temperature is lowered to 190 ºF (incorrect, containment integrity must be restored within 1 hour)

Question level: 2
Question source: New
Exam: SRO
K/A: 000069.AK2.03
Importance: 2.8 / 2.9
Reference: Loss of Containment Integrity/Air Locks ONP 1-1300030

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

A. 2A LPSI Pump (incorrect, Unit 2 does not have CCW cooled LPSI pumps, Unit 1 does)

B. 2B HPSI Pump (incorrect, pump is idle. If pump was running with seal heat exchanger leak and pumping high activity fluid, could be plausible)

C. 2A Fuel pool Heat Exchanger (Fuel pool cooling pump pressures not high enough to cause leak into heat exchanger)

D. **2B SDC Cooling Heat Exchanger (correct, SDC in service with SDC heat exchanger leak would cause high activity)**

Question level: 2
Question Source: New
Exam: Both
K/A: 000026.A2.01
Importance: 2.9 / 3.5
References: Component Cooling Water Excessive Activity 1-ONP-14.02

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 and no CEA motion, which of the following identifies the approximate final Tave?

(REFERENCES PROVIDED)

A. 565° F

B. 560° F

C. 553° F

D. 546° F

A 565°F (Incorrect, this is the 80% Tave value)

B. 560°F (Correct)

C. 553°F (Incorrect, this is EOL value)

D. 546°F (Calculated Tc, not Tave)

Question level: 3
Question source: New
Exam: Both
K/A: 000024.AA1.16
Importance: 3.3 / 3.2
References: Plant curves Fig. C.4, C1, A.1, nomagraph , 2-NOP-22.01 Rapid Downpower.

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.

A. Raise the pressurizer level control setpoint (incorrect, raising level setpoint will add inventory to RCS and possibly cause a overpressure condition. Actual level of 36% meets the safety function)

B. Raise the pressurizer pressure control setpoint (incorrect, increasing pressure setpoint could possibly cause a overpressure condition. 100°F subcooling meets the safety function)

C. Increase Auxiliary Feedwater flow. (incorrect, procedure states if T-avg <525° F ensure feedwater flow not excessive.)

D. Close the Main Steam Isolation Valve (correct, this will terminate the cooldown)

Question level: 2
Question source: Modified
Exam: Both
K/A: CE/A11.AK1.2
Importance: 3.0 / 3.3
References: EOP-01 Standard Post Trip Actions

Question 9

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

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

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

A. Reactor tripped and the 2A Diesel not started.

B. Reactor tripped and the 2A Diesel started with the 2A3 4.16 KV bus energized.

C. Reactor not tripped and the 2A Diesel not started.

D. Reactor not tripped and the 2A Diesel started but the 2A3 4.16 KV bus is not energized.

A. Reactor tripped and the 2A Diesel not started. (incorrect, the Unit will not trip on loss of the 2A3 vital 4.16 KV bus. The Diesel will start on UV)

B. Reactor tripped and the 2A Diesel started and the 2A3 4.16 KV bus is energized. (incorrect, the reactor will not trip, the 2A Diesel will not energize the bus)

C. Reactor not tripped and the 2A Diesel not started. (incorrect, the 2A Diesel will start.)

D. Reactor not tripped and the 2A Diesel start but not energize the 2A3 4.16 KV bus. (correct, the vital 4.16 KV bus has a Δ current lockout, but this does not cause a Unit trip. The Diesel will start but not load on the bus)

Question level: 2
Question source: New
Exam: RO
K/A: 000057.AA2.19
Importance: 4.0
References: 2-0910054 Loss of Safety Related AC Bus, 0711502 Main Power distribution lesson text.

Question 10

Unit 1 Control Room has been evacuated due to a fire and all immediate actions have been completed. 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? (Assuming Pressurizer heaters are available)

	Range	Method
A.	1800-2300 psia, trending to 2225-2275 psia	Auxiliary spray.
B.	1800-2300 psia, trending to 2225-2275 psia	Main spray.
C.	1850-2250 psia, trending to 2175-2225 psia	PORV's.
D.	1850-2250 psia, trending to 2175-2225 psia	Varying Presserizer level

---

A. 1800-2300 psia, trending to2225-2275 psia Auxiliary spray. (correct)

B. 1800-2300 psia, trending to 2225-2275 psia Main spray. (incorrect, RCP's are stopped (main spray unavailable) as part of the immediate Operator actions)

C. 1850-2250 psia, trending to 2175-2225 psia PORV's. (incorrect, trending of pressure band incorrect.)

D. 1850-2250 psia, trending to 2175-2225 psia Varying Pressurizer level (incorrect, Varying Pressurizer level will change Pressure, but trending of pressure band incorrect)

Question level: 1
Question Source: New
Exam: Both
K/A: 000068.AA1.28
Importance: 3.8 / 4.0
References: 1-ONP-100.02 Control Room Inaccessibility

Question 11

The following annunciators are received on Unit 2:

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

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

A. Startup channel (incorrect, startup channels have no input to TMPL, High power trip, etc)

B. Linear Range Safety (correct)

C. Excore Neutron Monitoring
(incorrect, no input to NI channel trips, annunciator only)

D. Wide Range Monitoring (incorrect, input to startup rate pretrip and trip bistable trips)

Question Level: 2
Question Source: New
Exam: Both
K/A: 015.A3.02
Importance: 3.7 / 3.9
References: 2-ONP-99.01 Loss of Tech Spec Instrumentation

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 Delta T Power.

D. upward to null Nuclear Power-Delta T Power.

A. upward to match DDPS power.
(incorrect, not matched to DDPS)

B. downward to match manual Calorimetric.
(incorrect, adjusted upward to null Delta T Power)

C. downward to null Delta T Power.
(incorrect, adjusted upward)

D. upward to null Nuclear Power-Delta T Power.
(correct)

Question Level: 2
Question Source: New
Exam: Both
K/A: 015.K5.19
Importance: 2.9
References: 0711100 Plant Specific Reactor Theory Lesson Text. 2-OSP-69.01 Nuclear and Delta T Power Calibration

Question 13

Which of the below statements describes the reason for closing the Unit 2 MSR Block valves 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

A. overcooling the RCS (correct, the shell side reliefs of the 5 heaters would lift to atmosphere causing a overcooling event)

B. losing condenser vacuum. (incorrect, the shell side drains to the condenser when a ΔP of <50 PSID exists)

C. damaging the LP turbine seals. (incorrect, although main steam is the seal supply, the main steam is from the HP turbine or directly from the main steam header.)

D. overpressurizing the MSR shell side (incorrect, the reheat steam enters the tube side of the MSR's)

Question level:1
Question source: New
Exam: Both
K/A:039.K3.05
Importance: 3.6 / 3.7
References: 2-EOP-01 Standard Post Trip Actions, 0711304 Main Steam system description.

Question 14

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

Assuming no Operator actions, 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.

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.
(incorrect, ΔT limit is 32 degrees, if exceeded a trip is NOT required)

B. The 1A and 1B Condenser will lose equal amount of Circulating water flow, but due to reduced power, the Unit can remain operating. (correct)

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.
(incorrect, one CWP will trip in each condenser)

D. The 1A Condenser will be without Circulating water flow, but due to reduced power the Unit can remain operating.
(incorrect, one CWP will trip in each condenser)

Question Level: 2
Question Source: New
Exam: Both
K/A: 075.K2.03
Importance: 2.6 / 2.7
References: 0711502 Main Power Distribution System Text,
ONP 1-0620030 Circulating Water System.

Question 15

A loss of the 1A DC bus occurs and the Unit immediately trips

Which of the following was the first signal that tripped the reactor?

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.

A. Low Flow due to loss of two Reactor Coolant Pumps. (incorrect, Start-up transformers will not swap due to loss of bus and plant trip and low flow will exist, but immediate trip is result of 8 TCB's opening)

B. SIAS signal, which opens the MG set output Breakers. (incorrect, Unit 2 SIAS signal opens the MG set output breakers, not Unit 1)

C. Turbine trip due to loss of 20 ET and 20 AST. (incorrect, 20 ET and 20 AST are not powered from the 1A DC bus)

D. Two of four RPS channel trips opens 8 TCB's (correct, DC bus de-energizes two Instrument busses, resulting in 2 of 4 channel trip)

Question level: 2
Question source: New
Exam: RO
K/A: 063.K4.04
Importance: 2.6
References: 0711503 125 V DC System Text, 1-0030136 Loss of a Safety Related D.C. Bus, 0711404 Reactor Protective System

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.

A. All heaters are energized (incorrect, heaters de-energized at <28%, requires Operator action to re-energized >28%)

B. All heaters are de-energized. (correct, at 28% all heaters de-energize and must be manually reset)

C. Only the backup heaters are energized. (incorrect, proportional and backup heaters operate at same level setpoint)

D. Only the proportional heaters are energized. (incorrect, proportional and backup heaters operate at same level setpoint)

Question Level: 2
Question source: New
Exam: Both
K/A: 011.K6.03
Importance: 2.9 / 3.3
References: 0711206 Pressurizer Pressure and level System Text,
1-0120035 Pressurizer Pressure and level

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 increases to 120ºF.

B. Containment pressure increases to 5.5 psig.

C. Containment radiation increases to 1 R/Hr.

D. Containment particulate activity increases to 10,000 counts per minute.

A. Containment temperature of 120ºF.(incorrect, high temperature limits related to reactor cavity support fans, containment coolers)

B. Containment pressure increases to 5.5 PSIG (correct, 5 PSIG containment pressure on Unit 1 gives CIAS, which stops HVE 8A and 8B)

C. Containment radiation increases to 1 R/Hr.(incorrect, 10R/hr give CIAS)

D. Containment particulate activity increases to 10,000 counts per minute (incorrect, particulate activity high has no automatic action other than alarms)

Question level: 1
Question source: New
Exam: Both
K/A: 029.K1.03
Importance: 3.6 / 3.8
References: EOP-99 Appendixes/Figures/Tables, 0711401 ESFAS Lesson Text

Question 18

The following conditions exist:

- Unit 2 tripped from 100% power due to a large break LOCA
- SIAS "A" has failed to actuate
- Containment pressure is 6 psig

With NO operator actions, which one of the following describes the status of the Containment Spray Pumps (CS) and Hydrazine Pumps at this time?

	2A CS pump	2A Hydrazine Pump	2B CS Pump	2B Hydrazine Pump
A.	Off	Off	Off	Off
B.	Off	Off	On	On
C.	On	Off	On	Off
D.	On	On	On	On

	2A CS pump	2A Hydrazine Pump	2B CS Pump	2B Hydrazine Pump
A.	Off	Off	Off	Off
(incorrect, 'B' side will actuate. CSAS requires SIAS actuation also)				
B.	**Off**	**Off**	**On**	**On**
(correct)				
C.	On	Off	On	Off
(incorrect, 2A CS pump will not start)				
D.	On	On	On	On
(incorrect, 'A' side will not actuate)				

Question level: 2
Question Source: New
Exam: RO
KA 026K2.01
Importance 3.4
References: 0711401 Lesson Text 'ESFS Actuation System'

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 Instrument air problem is above the capacity of the Unit 1 /Unit 2 Instrument air cross tie.
- 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.

A. Stop fuel movement until a redundant source of instrument air can be established. (incorrect, although the refueling machine requires Instrument air , stopping refueling is not a requirement.)

B. Blowdown the Instrument air header drains to remove oil, water, and crud build-up. (correct, the service air system has no dryer, or filters)

C. Install Diesel air compressor to augment the installed station air compressor. (incorrect, 98 PSIG air pressure, although a little low is adequate)

D. Manually cross tie Instrument air to Unit 1 and isolate the Station air to Instrument air cross tie. (incorrect, auto closure for the cross tie valves is 95 PSIG)

Question level: 2
Question Source: New
Exam: RO
K/A: 079.A2.01
Importance: 2.9
References: 2-1010030 Loss of Instrument Air

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.

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. (incorrect, reasons same as B and C.)

B. Ensure the permissive switch in auto, ensure the master controller (PIC 8010) in auto, place HIC 8801-8804 in manual and closed. Dial the setpoint down on PCV 8010 to the desired cooldown rate. (incorrect, permissive switch must be in manual to cooldown to SDC conditions)

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. (incorrect, cannot dial down the setpoint for PCV 8801)

D. Place the permissive switch in manual, place the controller for PCV 8801 in manual and open PCV 8801 to the desired cooldown rate. (correct)

Question level: 2
Question source: New
Exam: Both
K/A: 041.K6.03
Importance: 2.7 / 2.9
Reference: 0711406 Steam Bypass Control System Lesson Text

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:

A. will sequence closed as load is reduced.

B. are individually selected and closed as load is reduced.

C. will close together as load is reduced.

D. will close with valves 3, 2 and 1 closing together prior to #4 closing as load is reduced.

A. will sequence closed as load is reduced.(incorrect, valves swap to single valve operation in turbine manual)

B. are individually selected and closed as load is reduced.
(incorrect, Operator can select valve to view the position but not to control its position)

C. will close together as load is reduced (correct, valves operate in single and move as one valve)

D. will close with valves 3, 2 and 1 closing together prior to #4 closing as load is reduced.(incorrect, valves operate as single but #4 closes prior to 3, 2, 1)

Question level: 1
Question source: New
Exam: RO
K/A: 045.A2.17
Importance: 2.7
Reference: 0711409 DEH Control System Lesson Text

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 bleedoff flow	.8 GPM	.68 GPM	.9 GPM	.65 GPM
Middle cavity pressure	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

A. Secure all running RCP's (incorrect, <1300 psia stop 1 RCP/Loop)

B. Stabilize RCS temperature and depressurize the RCS (incorrect, RCS is ,<200° F subcooled)

C. Reduce RCS temperature to establish 20° F subcooled (incorrect, RCS is >20° F subcooled.)

D. Stabilize RCS pressure and temperature at current value (correct, RCS pressure control safety function being met)

Question Level: 2
Question Source: San Onofre 1999 NRC exam
Exam: SRO
K/A: 000040.AK1.01
Importance: 4.1 / 4.4
References: 1-EOP-05 Excess Steam Demand

Question 24

Given the following conditions:

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

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

A. To provide Natural circulation so RCS Boron stratification is minimized.

B. To remove decay heat load due to insufficient ECCS flow.

C. To condense the steam generated from the RCS two phase mixture which provides the primary means of decay heat removal.

D. To provide a means of RCS pressure control in the event main or auxiliary spray is not available.

A. To provide Natural circulation so RCS Boron stratification is minimized. (incorrect, hot and cold leg injection line-up performs this function)

B. To remove decay heat due insufficient ECCS flow. (correct)

C. To condense the steam generated from the RCS two phase mixture which provides the primary means of decay heat removal.(incorrect, although reflux boiling may occur, it is not the primary means of heat removal)

D, To provide a means of RCS pressure control in the event main or auxiliary spray is not available. (incorrect, although the S/G could perform this function it is not addressed in the LOCA procedure and not the basis for availability of the S/G's)

Question Level: 1
Question Source: San Onofre 1999 NRC exam
Exam: Both
K/A: 000074.EK1.03
Importance: 4.5 / 4.9
References: 0711824 Loss of Coolant Accident (LOCA) Event and Procedures.

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.

A. Aligning blowdown to the main condenser. (incorrect, procedure gives direction to isolate the condenser from blowdown)

B. Aligning blowdown to the Monitor Storage tanks. (correct)

C. Opening the Main Steam drains and drain to the condenser sump. (incorrect, not addressed in procedure)

D. Installing drain hoses on the blowdown line and drain to RAB sumps. (incorrect, not addressed in procedure, but plausible)

Question level: 1
Question Source: New
Exam: Both
K/A: 000038.EA1.39
Importance: 3.6 / 3.7
References: 1-EOP-04 Steam Generator Tube Rupture, 0711825 Steam Generator Tube Rupture Lesson Text.

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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 as a primary source of information and use 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 use safety related instruments to confirm these indications.

A. Use only the qualified White Bezel instruments. (incorrect, all reg. Guide 1.97 instruments are not white bezeled. Conformatory indications should be used)

B. Use all instruments that suit the scale/range/response of the accident event that is occuring. (incorrect, these type of instruments are defined as use for 'normal operation')

C. Use all safety related instruments as primary source of information and use the White Bezel instruments only if a hostile environment is known to exist for greater than 15 minutes. (incorrect, time limit is not addressed)

D. Use the White Bezel instruments as a primary source of information and safety related instruments to confirm these indications (correct)

Question Level: 1
Question Source: New
Exam: Both
K/A: 2.4.3
Importance: 3.5 / 3.8
Reference: 0711834 Accident Instrumentation Lesson text, All EOP's contain Caution statement

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.

A. Out of spec log readings and Night order book (correct)

B. Equipment out of service log and Operator status log (incorrect, partial SRO required review)

C. Equipment out of service log and Night order book (incorrect, partial SRO required review)

D. Out of spec log readings and Operator status log. (incorrect, Operator log not required)

Question Level: 1
Question Source: New
Exam: RO
K/A: 2.1.3
Importance: 3.0
References: ADM. 0010120 Conduct Of Operations

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 and with approval of the ANPS.

A. after the surveillance has been complete. (incorrect, procedure states 'shall not take place' with the following exceptions...)

B. if the surveillance run will last >1 hour past turnover and with prior approval of the ANPS. (incorrect, prior approval of ANPS correct)

C. if the surveillance is in a steady state condition with approval of the ANPS. (correct)

D, if overtime guidelines will be exceeded for the individual responsible for the surveillance and with approval of the ANPS (incorrect, overtime guidelines plausible)

Question Level: 1
Question Source: New
Exam: Both
K/A: 2.1.3
Importance: 3.0 / 3.4
References: ADM. 0010120 Conduct of Operations

Question 29

Given the following conditions:

- Unit 2 is in day 5 of a refueling outage.
- Five nuts have been removed from the Reactor Vessel head
- 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, no action required.

D. Unit is in Mode 6, suspend Reactor Vessel Head disassembly.

A. Unit is in Mode 5, no action required (incorrect, unit is in Mode 6)

B. Unit is in Mode 5, suspend Reactor Vessel head disassembly (incorrect,unit in Mode 6 reactor disassembly is not a core alteration)

C. Unit is in Mode 6, no action required. (correct)

D. Unit is in Mode 6, suspend Reactor Vessel Head disassembly. (incorrect, monitor not required)

Question Level: 2
Question Source: New
Exam: SRO
K/A: 2.1.22
Importance: 3.3
Reference: ADM. 0010120 Conduct of Operations, Technical Specifications 3.9.2

Question 30

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 being 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 High/High re-flash 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

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A. inoperable, confirmed leakage of any rate disallows use of N-46 for Reactivity Cavity sump flow monitoring. (incorrect, as long as N-46 is not in alarm, N-46 can be used as part of leakage detection)

B. inoperable, with the flow detection alarm N-46 in an alarm state, credit cannot be taken for this flow monitoring device. (correct)

C. operable, as long as the leak rate remains below High/High re-flash alarm of N-46, N-46 can be used to satisfy the flow monitoring requirement. (incorrect, N-46 has no High-High alarm, only Cavity sump level)

D. operable, as long as annunciator N-29 'Rx Cavity sump level High' is operable (incorrect, cavity sump level not part of Cavity flow monitoring system)

Question Level: 2
Question Source: New
Exam: SRO
K/A: 2.1.12
Importance: 4.0
References: ADM. 0010120 Conduct of Operations, Technical Specifications 3.4.6.1

Question 31

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 will be disabled for 10 days for the purpose of silencing it.

C. The Containment Chiller Units are hooked up to the CCW system for Containment cooling while in Mode 5.

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.

A. Reactor Engineering has installed a reactivity computer in preparation for Low Power Physics testing.
(incorrect, covered by the procedure)

B. **A nuisance alarm on RTGB 203 will be disabled for 10 days for the purpose of silencing it. (correct)**

C. The Containment Chiller Units are hooked up to the CCW system for Containment cooling while in Mode 5.(incorrect, covered by the 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.
(incorrect, covered by the procedure)

Question level: 2
Question Source: Bank, similar to PSL 1997 NRC Exam

Exam: SRO
KA G2.2.17
Importance 3.5
References: AP-0010124, A Temporary System Alteration, ADM-09-03 Administrative Control of Defeated Annunciators, ADM 0010120 Conduct of Operations

Question 32

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.

C. EOP-05, 'Excess Steam Demand' Manually actuate MSIS and SIAS. Maintain RCS subcooling 20-200° F.

D. EOP-15, 'Functional Recovery', Emergency borate and attempt to isolate the affected S/G. Stabilize RCS temperature and pressure.

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° (correct)

B. ONP-01.02 'Plant Condition 2', 'S/G Heat Removal LTOP in effect' Manually actuate MSIS and SIAS. Stabilize RCS temperature and pressure. (incorrect, wrong procedure implemented)

C. EOP-05 'Excess Steam Demand'. Manually actuate MSIS and SIAS. . Maintain RCS subcooling 20-200° F (incorrect, wrong procedure implemented)

D. EOP-15 'Functional Recovery', Emergency borate, attempt to isolate the affected S/G. Stabilize RCS temperature and pressure.(incorrect, wrong procedure implemented)

Question Level: 2
Question Source: New
Exam: SRO
K/A: 000040/EO5. G2.4.9
Importance: 3.9
References: NOP-1-0030127 Reactor Plant Cooldown-Hot Standby to Cold Shutdown
1-ONP.01 Plant Condition 1, 'S/G Heat Removal LTOP not in effect'

Question 33

Unit 1 is at 100% steady state power. The following are the results of Chemistry sampling over the past few days:

1-18-00 / 0700	0.9 Uci/gram	DE 131
1-20-00 / 0700	1.2 Uci/gram	DE 131
1-22-00 / 0700	0.8Uci/gram	DE 131
1-24-00 / 0700	75Uci/gram	DE 131

Which of the following is the required operator response?

(REFERENCES PROVIDED)

A. Place the Unit in Hot Standby with Tave <500 °F by 1300 1-24-00.

B. Place the Unit in Hot Standby with Tave <500 °F by 1700 1-24-00.

C. Continue 100% power operation for up to 100 hours.

D. Reduce power to <76% and continue power operation.

A. Place the Unit in Hot Standby with Tave <500 °F by 1300 1-24-00.(correct)

B. Place the Unit in Hot Standby with Tave <500 °F by 1700 1-24-00 (incorrect, hot standby required in 6 hours)

C. Continue 100% power operation for up to100 hours. (incorrect, the Tech Spec. 'or' statement makes this incorrect)

D. Reduce power to <76% and continue power operation.(incorrect, once limit is exceeded, unit must be in hot standy within 6 hours)

Question level: 2
Question Source: Modified from cancelled 6/99 exam
Exam: SRO
KA 076AA2.02
Importance 3.4
References: St. Lucie Unit 1 Technical Specifications 3.4.8 Figure 3.4-1

Question 34

On Unit 1, which of the following conditions has a Technical Specification action statement of less than one hour?

A. 5% power and RCS T_{ave} = 510º F.

B. 100% power and RCS T_c = 550º F.

C. Mode 1 and 1A Battery bank is declared out of service.

D. Mode 2 and 1A SIT outlet valve is found closed.

A. 5% power and RCS T_{ave} = 510º F (correct, required to be restored in 15 minutes)

B. 100% power and RCS T_c = 550º F (incorrect, 2 hour time limit)

C. Mode 1 and 1A Battery bank is declared out of service. (incorrect, 2 hour time limit)

D. Mode 2 and 1A SIT outlet valve is found closed (incorrect, 24 hour time limit)

Question Level: 1
Question Source: New
Exam: SRO
K/A: 2.1.11
Importance: 3.8
References: Technical Specifications DC Bus 3.8.2.3, Reactivity 3.1.1.5, SIT 3.5.1, TC 3.2.5

Question 35

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: 0
- Pressurizer pressure: 850 psia
- CET temperature highest per quadrant: 560 °F
- 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 addressed next?

(REFERENCES PROVIDED)

A. Maintenance of Vital Auxiliaries

B. RCS and Core Heat Removal

C. RCS pressure control

D. Containment Isolation.

A. Maintenance of Vital Auxiliaries (incorrect, both busses energized)

B. RCS and Core Heat Removal (correct >22° F superheated)

C. RCS pressure control (incorrect, ECCS flow meeting requirements)

D. Containment Isolation. (incorrect, pressure <10 psig)

Question Level: 2
Question Source: New
Exam: SRO
K/A: E09.G2.4.22
Importance: 4.0
References: EOP-15 'Functional Recovery'

Question 36

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.

A. Manually actuate AFAS 1.
(incorrect, although manual actuation of AFAS will close the MFIV's, not allowed under these conditions)

B. Stop the 2A Main Feedwater pump.
(incorrect, would not terminate Main Feedwater flow)

C. Close the Main Feedwater block valve on the 2A S/G
(Correct)

D. Remove the pin and close the 2A Main Feedwater Regulating valve.
(incorrect, not addressed in procedure, would take to long and S/G would be overfed)

Question level: 2
Question Source: New
Exam: RO
K/A: 035.G2.4.11
Importance: 3.3
Reference: ONP 2-070030 Main Feedwater

Question 37

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.

A. Both S/G levels decrease to 25% wide range
(incorrect, S/G level requirement is 15% wide range)

B. The ANPS has directed two RCP's be restarted
(incorrect, all charging pumps required to be running, not LPSI pumps)

C. Pressuirzer level decreases to 32%.
(incorrect, <30% level)

D. RCS pressure decreases to 180 psia.
(correct, pressure <200 psia)

Question Level: 2
Question Source: Modified
Exam: Both
K/A: 006.A4.07
Importance: 4.4 / 4.4
Reference: 1-EOP-03 Loss of Coolant Accident

Question 38

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.

A. Isolate the 1A S/G and use the 1B S/G for heat removal (correct the 1A S/G is considered the most faulted)

B. Isolate the 1B S/G, and use the 1A S/G for heat removal. (incorrect, ESD on the S/G cannot be used for controlled heat removal)

C. Isolate both S/G's, ECCS flow will be used for heat removal. (incorrect, one S/G is required to be available 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. (incorrect, incorrect procedure compliance)

Question Level: 1
Question Source: New
Exam: SRO
K/A: 035.A2.01
Importance: 4.6
References: EOP-15 Functional Recovery

Question 39

Given the following conditions:

- Unit 2 is at 100% power when a 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

A. Four containment coolers in fast speed (incorrect, three coolers start in slow speed)

B. Four containment coolers in slow speed (incorrect, three coolers start in slow speed)

C. Three containment coolers in fast speed (incorrect, three coolers in slow speed)

D. Three containment coolers in slow speed (correct, loss of the 2A5 Load center results in one containment cooler de-energized)

Question Level: 2
Question Source: New
Exam: RO
K/A: 022.K2.01
Importance: 3.0
Reference: 0711207 Emergency core cooling and containment heat removal systems, 0711502 Main Power Distribution.

Question 40

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.

A. Restart RCP's (incorrect, pressurizer level to low)

B. Throttle HPSI pumps (incorrect, pressurizer level to low)

C. Terminate Containment Spray (correct. Containment pressure < 5 psig)

D. Isolate the Safety Injection Tanks (incorrect, RCS pressure to high)

Question Level: 2
Question Source: New
Exam: Both
K/A: 013. K4.05
Importance: 4.0 / 4.2
References: 1-EOP-03 Loss of coolant accident

Question 41

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 letdown isolates on high Letdown heat exchanger outlet temperature.

A. with the letdown level control valves closing to minimum letdown flow at –2% deviation from setpoint. (incorrect, -1% deviation results in minimum letdown flow, also Regen Temp. will isolate letdown first)

B. with the letdown backpressure control valves closing to minimum letdown flow. (incorrect, backpressure control valves control letdown pressure upstream of letdown heat exchanger)

C. until letdown isolates on high Regenerative heat exchanger outlet temperature. (correct, with no charging flow letdown isolates at 470 °F)

D. until letdown isolates on high Letdown heat exchanger outlet temperature (incorrect, high letdown heat exchanger outlet temperature opens CCW temperature flow control valve)

Question Level: 2
Question Source: New
Exam: Both
K/A: 004.K3.07
Importance: 3.8 / 4.1
References: 1-ARM-01-M5,7,30 Annunciator Response Procedure,
1-ONP-02.03 Charging and Letdown.

Question 42

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 properly?

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

A. 2A and 2B HPSI pumps (incorrect)

B. 2A LPSI and 2B LPSI pumps (incorrect)

C. 2A Mini Flow isolation valves 3495 and 3459 (correct, candidates taught and required to know that if recirc valves stay open after RAS a loss of cooling inventory and an unmonitored, uncontrolled release is occuring)

D. 2B Mini Flow isolation valves 3496 and 3660 (incorrect)

Question Level: 2
Question Source: New
Exam: Both
K/A: 013.A4.03
Importance: 4.5 / 4.7
References: 2-EOP-99 Table 4, 2-EOP-04 Loss of Coolant Accident

Question 43

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

- RCS boron concentration: 500 PPM.
- VCT level: 41%,
- 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. 602 gallons water, 40 gallons boric acid

B. 599 gallons water, 43 gallons boric acid

C. 588 gallons water, 54 gallons boric acid

D. 555 gallons water, 87 gallons boric acid

A. 602 gallons water, 40 gallons boric acid (incorrect, results in dilution of RCS)

B. 620 gallons water, 42 gallons boric acid (incorrect, results in dilution of RCS)

C. 588 gallons water, 54 gallons boric acid (correct)

D. 551 gallons water, 87 gallons boric acid (incorrect, would result in boration of RCS)

Question Level: 3
Question Source: New
Exam: RO
K/A: 004.A4.04
Importance: 3.2
References: 1-NOP-02.24 Boron Concentration Control

Question 44

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 throttle valves could be subject to thermal locking.

D. AFW suction pressure instrumentation could be damaged by high pressure.

A. AFW pump could be damaged due to casing material not designed for high temperatures.(incorrect, not addressed in procedure)

B. AFW piping could be damaged due to water hammer. (correct)

C. AFW throttle valves could become subject to thermal locking (incorrect, plausible, industry has had instances of this occuring on ECCS valves)

D. AFW suction pressure instrumentation could be damaged by high pressure. (incorrect, not addressed in procedure)

Question Level: 1
Question Source: New
Exam: RO
K/A: 061.K5.05
Importance: 2.7
Reference: 2-OSP-09.31A Monitoring 2A AFW Header for Water Hammer Conditions

Question 45

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 insert 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. Gripper coil damage will occur if not removed from the hold bus within 45 minutes

---

A. CEA 56 will not insert on a reactor trip. (incorrect, note in procedure)

B. **Any attempt to move the CEA 56 will cause CEA 56 to drop. (correct)**

C. Gripper coil damage has occurred due to the length of time to put CEA 56 on the hold bus. (incorrect, 10 minute time limit)

D. Gripper coil damage will occur if not removed from the hold bus within 45 minutes(incorrect, if properly transferred the CEA can remain on the hold bus)

Question level: 1
Question Source: New
Exam: Both
K/A: 000003.AK2.05
Importance: 2.5 / 2.8
References: 1-0110030 CEA Off-Normal Operation and Realignment.

Question 46

Which of the following plant situations allow 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.

A. Pressurizer level stable at 18% with letdown isolated and all charging pumps running (incorrect, level does not meet safety function)

B. A Main Steam Safety Valve (MSSV) stuck open and reseated at 575 psia while in EOP-01. (incorrect, conduct of Ops states S/G considered faulted until MSSV gagged)

C. MSIS has actuated for unknown reason with plant parameters normal. (incorrect, procedure states 'cause has been determined')

D. A trip from 50% power with 2A Main Feedwater pump OOS and loss of 2B1 6.9 KV bus. (correct)

Question Level: 2
Question Source: Modified from cancelled 1999 PSL NRC exam
Exam: SRO
K/A: 000007.EA1.3
Importance: 3.3 / 3.8
References: 2-EOP-02 Reactor Trip Recovery

Question 47

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. The 2A and 2B Diesel Generator start and tie to their respective busses.

Assuming no Operator actions, which of the following describes how the AFW system responds to this event?

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.

A. start immediately upon the Diesel breaker closing and the S/G's continue to be fed at 160 GPM. (incorrect, pumps don't start immediately)

B. start immediately upon the Diesel breaker closing and the S/G's will be fed at full flow. (incorrect, the AFW pumps start after short time delay(30 seconds))

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. (incorrect, AFW valves will go wide open,full flow)

D. start after a short time delay from the Diesel breaker closing and the S/G's will be fed at full flow. (correct)

Question Level: 2
Question Source: New
Exam: Both
K/A: 000056.AA1.10
Importance: 4.3 / 4.3
Reference: 0711412 'Auxiliary Feedwater System' Lesson Text

Question 48

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

---

A. Shutdown cooling flow will be lost due to hot leg suction valve closure. (incorrect, the SDC reliefs will lift prior to 500 psia closure of Hot Leg Suction valves)

B. Shutdown cooling flow will increase due to FCV 3306 (flow control valve) failing open (incorrect, FCV 3306 is MOV, AOV on Unit 1)

C. RCS inventory will be lost due to SDC relief valves opening (correct, SDC relief valves will lift at 350 psia, due to letdown valves closing with charging pumps running)

D. RCS temperature will decrease due to HCV 3657 failing open (incorrect, HCV 3657 is MOV, AOV on Unit 1)

Question Level: 2
Question Source: New
Exam: Both
K/A: 005.K1.04
Importance: 2.9 / 3.1
References: 2-1010030 Loss of Instrument air, 2-0440030 Shutdown Cooling Off-Normal, 0711207 'Emergency Core Cooling System' Lesson Text

Question 49

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.

A. 15% bypass valves automatically controlling S/G levels. (incorrect, turbine trip positions valves to 5% flow)

B. 15% bypass valves supplying constant 5% flow. (correct)

C. Main Feed Reg. valves automatically controlling S/G levels. (incorrect, turbine trip closes the Main Feed Req. valves)

D. Main Feed Reg. valves in manual at 5% flow. (incorrect, turbine trip closes Main Feed Reg. Valves)

Question Level: 1
Question Source: New
Exam: Both
K/A: 059.K4.18
Importance: 2.8 / 3.0
References: 0711408 Steam Generators and Feedwater Control System.

Question 50

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

- SBCS in Auto maintaining Tave 532 ° F.
- Steam pressure regulator PCV 12-29 (to the SJAE) fails closed.
- Condenser backpressure goes to 15 inches HG before the regulator can be bypassed and backpressure 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 backpressure has reached 5 inches HG.

A. SBCS can maintain RCS temperature in manual only after depressing the 'Emergency off/Vacuum interlock pushbutton'. (incorrect, auto is available even without interlock pushbutton depressed)

B. SBCS will maintain RCS temperature in automatic, with no Operator action. (correct, all stations maintained in auto, system will auto reset)

C. SBCS permissive switch must be placed in manual, and the 'Emergency off/Vacuum interlock pushbutton' depressed to regain control of SBCS. (incorrect, permissive switch need not be placed in manual)

D. SBCS cannot be used in any mode until backpressure has reached 5 inches HG. (incorrect, setpoint is 12 inches HG)

Question Level: 2
Question Source: New
Exam: RO
K/A: 000051.K3.01
Importance: 2.8
References: 0711406 'Steam Bypass Control System' Lesson Text

Question 51

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.

A. Steam Generator pressure decreases to 600 psia. (incorrect, both units)

B. Steam Generator levels decrease to 10% narrow range. (correct, MFIV's close on AFAS on U-2 not on U-1)

C. RCS pressure decreases to 1500 psia. (incorrect, Unit 1 only)

D. Containment pressure increases to 5.5 psig. (incorrect, Both Units)

Question Level: 1
Question Source: New
Exam: Both
K/A: 059.A3.06
Importance: 3.2 / 3.3
References: 0711301 , 'Condensate and Feedwater' Lesson Text

Question 52

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.

A. CEA 24 is at 55 inches. (incorrect, must have >1 CEA stuck out)

B. **Containment temperature is 123 ° F. (correct, >120 ° F ensure all available containment coolers running. Objective 5 from 0702822 Lesson Plan and Lesson Text 0711822 required knowledge from RCO training program)**

C. The 2A Diesel is carrying the 2A3 4.16 KV bus. (incorrect, meets safety function)

D. The 1A S/G 15% Main Feedwater bypass valve is fully closed. (incorrect, at least 1 S/G with feed available)

Question Level: 1
Question Source: Modified from Cancelled 1999 PSL NRC exam
Exam: Both
K/A: 022.A1.01
Importance: 3.6 / 3.7
References: 2-EOP-01 'Standard Post Trip Actions'

Question 53

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.

A. Reactor Vessel Level (correct)

B. Core Exit Temperature (incorrect, uses thermocouples)

C. Upper Head subcooling (incorrect, upper head subcooling uses UHJTC's)

D. Reactor Coolant System subcooling (incorrect, uses hot leg RTD's)

Question Level: 1
Question Source: New
Exam: Both
K/A: 017.K6.01
Importance: 2.7 / 3.0
Reference: OP 1-1150020 Qualified Safety Parameter Display System Operation, 0711407 Incore Instrumentation and Qualified Safety Parameter Display System.

Question 54

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.

A. only be controlled by the Auxiliary spray valves (incorrect, PCV 1100 E available)

B. only be controlled by Main spray valve PCV 1100 E (incorrect, auxiliary spray valves available)

C. only be controlled Main Spray valves PCV 1100E and 1100F (incorrect, spray valve 1100F ineffective with loss of 2B1 RCP)

D. be controlled by PCV 1100E and Auxiliary spray valves (correct)

Question Level: 2
Question Source: New
Exam: Both
K/A: 003.K2.01
Importance: 3.1 / 3.1
References: ADM. 2-0010720 Unit 2 Power Distribution Breaker List, 0711206 Pressure Pressure and Level Lesson Text

Question 55

Unit 1 is experiencing a dual 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 Paths 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

A. Heaters and Spray (incorrect, heaters are not available)

B. Safety Injection (incorrect, requires charging pumps available)

C. Steam Generator Heat Removal (correct)

D. PORVs (incorrect, used if Steam Generator Heat Removal is not available)

Question Level: 2
Question Source: New
Exam: SRO
K/A: A13. G2.4.6
Importance: 4.0
References: 1-EOP-15 Functional Recovery

Question 56

Unit 1 RCP bleedoff Containment Isolation valve V2505 has failed closed and cannot be reopened.

Which of the below conditions describes the current RCP bleedoff flow path and the first required Operator actions after V2505 has closed?

	Bleedoff flowpath	Operator actions
A.	Isolated	Open V2507 RCP bleedoff to Quench Tank
B.	Isolated	Stop all RCP's
C.	To reactor drain tank	Stop all RCPs
D.	Quench Tank	None

Bleedoff flowpath — Operator actions

A. **Isolated** — **Open V2507 RCP bleedoff to Quench Tk**
(correct, with new seals, V2507 is now normally closed and must be reopened within 30 minutes or the RCP's must be tripped)

B. Isolated — Stop all RCP's
(incorrect, RCP's not required to be stopped unless bleedoff flow cannot be established within 30 minutes)

C. To reactor drain tank — None
(incorrect, flowpath isolated, flowpath to QT must be re-eatablished)

D. Quench Tank — None
(incorrect, Operator action required to align to QT, prior to new RCP seals, no Operator actions required)

Question Level: 1
Question Source: New
Exam: SRO
K/A: 015/017.AA2.01
Importance: 3.5
References: ONP 1-0120034 Reactor Coolant Pump

Question 57

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, then stabilizes after placing a new CVCS Ion Exchanger in service.

D. RCS temperature decreases 4° F, then stabilizes due to a leaking steam bypass control valve .

A. Two CEA's are found to be mechanically bound and untrippable. (correct)

B. Two CEA's drop to the bottom of the core resulting in a violation of PDIL. (incorrect, manual trip required on Unit 1)

C. RCS temperature increases 2° F, then stabilizes after placing a new CVCS Ion Exchanger in service. (incorrect, procedure says unexplained or uncontrolled)

D. RCS temperature decreases 4° F, then stabilizes due to a leaking steam bypass control valve. (incorrect, cooldown must be post trip)

Question Level: 1
Question Source: Modified
Exam: BOTH
K/A: 000005.G2.4.11
Importance: 3.4 / 3.6
References: 1-ONP-02.02, 'CEA Off-Normal Operation and Realignment'

Question 58

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, backpressure is steady at 5.1 inches Hg. If backpressure 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%

A. When 3 of 4 RPS channels Nuclear power indicate <11% (incorrect, this is a downpower milestone to verify prior to tripping the turbine)

B. When DMW-871 'Net Megawatts' on RTGB 101 indicate zero net Megawatts (incorrect, this is the normal turbine shutdown milestone)

C. When ΔT indicates power 35% (incorrect, this is the value to stop heater drain pumps)

D. When NIS power indicates 30% (correct)

Question Level: 1
Question Source: New
Exam: SRO
K/A; 0000051.AA2.02
Importance: 4.1
References: NOP-1-0030125 Turbine Shutdown-Full Load to Zero Load, ONP-1-0610031 Loss of Condenser Vacuum

Question 59

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.

A. To prevent fuel uplift (incorrect, limit of no more than 3 RCP's operating at <500 ° F)

B. To reduce heat input into the RCS (correct)

C. To allow a greater cooldown rate (incorrect, cooldown RATE not affected)

D. To minimize leak flow into the affected S/G (incorrect, possible minor effect)

Question Level: 1
Question Source: New
Exam: Both
K/A: 0000037.AK3.08
Importance: 4.1 / 4.3
References: 1-0830030 'Steam Generator Tube Leak'

Question 60

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	Pressurizer Pressure	S/G Pressure
A.	Increasing	increasing,	increasing
B.	Increasing	decreasing	decreasing
C.	decreasing	increasing	increasing
D.	decreasing	decreasing	decreasing

A.	increasing (incorrect, power decreases)	increasing,	increasing
B.	increasing	decreasing	decreasing (incorrect, pressure will increase, S/G pressure will increase)
C.	**decreasing**	**increasing**	**increasing (correct)**
D.	decreasing	decreasing	decreasing (incorrect, pressure and S/G pressure will increase)

Question Level: 2
Question Source: New
Exam: Both
K/A: 0000029.EK1.01
Importance: 2.8 / 3.1
References: 1-0030030 Anticipated Transient Without Scram, 0711827 'Loss of Feedwater event and Procedure'

Question 61

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. Close the inlet to 2B Gas Decay tank V6589.

B. Stop the Waste Gas compressors.

C. Close Waste Gas release valve V6565.

D. Check the waste gas valve line-up to the 2B Gas Decay Tank.

A. Close the inlet to 2B Gas Decay tank V6589 (incorrect, will be performed but not the immediate action)

B. Stop the waste gas compressors (incorrect, stopping the compressors will stop the input to the inservice tank, but not terminate the release)

C. Close Waste Gas release valve V6565. (correct)

D. Check the waste gas valve line-up to the 2B Gas Decay Tank. (incorrect, will be performed but not the immediate action)

Question Level: 1
Question Source: New
Exam: BOTH
K/A: 000060.AA2.05
Importance: 3.7 / 4.2
References: Off-Normal Operating procedure 2-0530030 'Waste Gas System'

Question 62

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. PCV 18-6, Unit 2 supply from Unit 1 has not reached the pressure at which it should close.

C. PCV 18-6, Unit 2 supply from Unit 1, has failed open due to low Instrument air pressure.

D. PCV 18-5, Unit 1 supply from Unit 2 has failed to close.

A. PCV 18-5, Unit 1 supply from Unit 2 has not reached the pressure at which it should close
(incorrect, this valve closes at <85 psig on Unit 2)

B. PCV18-6, Unit 2 supply from Unit 1 has not reached the pressure at which it should close. (incorrect, this valve closes at <85 psig decreasing on Unit 1)

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(correct, the valve should have closed at 85 PSIG on the unaffected Unit)**

Question Level: 2
Question Source: New
Exam: SRO (on SRO test, but does not meet NRC SRO criteria)
K/A: 000065.AA2.01
Importance: 3.2
Reference: 0711413 'Instrument and Station air System' Lesson Text, ONP 2-1010030 Loss Of Instrument Air

Question 63

A Start-up is being performed on Unit 1 with the following indications:

	Ch A	Ch B	Ch C	Ch D
Power (%)	1.8	2.0	2.1	1.9
Startup Rate (DPM)	1.2	1.3	1.5	1.4

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

A. Auto Withdrawal Prohibit (incorrect, AWP generated from Reactor Regulating System)

B. CEA Withdrawal Prohibit (correct 1.3 DPM or greater on 2/4 RPS channels gives pre-trip and CEA withdrawl prohibit)

C. CEA Motion Inhibit (incorrect, generated from CEDS)

D. Low Power Automatic Withdrawal Prohibit (incorrect, generated from Reactor Regulating System)

Question Level: 2
Question Source: New
Exam: RO
K/A: 001.K1.05
Importance: 3.2
References: 0711404 Reactor Protective System

Question 64

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

A. A CEA MG Set (incorrect, no TCB's open)

B. 120V Instrument Bus (correct)

C. An RPS "K" relay (incorrect, 2 TCB's open)

D. 120V Vital AC bus (incorrect, no TCB's open)

Question Level: 2
Question Source: Bank
Exam: Both
K/A: 001/K6.03
Importance: 3.7 / 4.2
References: ONP 1-0970030 120 V Instrument AC System (Class 1E/QSPDS)

Question 65

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

A. **RCS Cold Leg temperature**
(Correct)

B. RCS subcooling
(incorrect, would require entry into EOP-15, not direct to SP-4)

C. Reactor Vessel level
(incorrect, would require entry into EOP-15, not direct to SP-4)

D. Steam Generator pressure
(incorrect, not addressed in EOP-6)

Question level: 1
Question Source: New
Exam: SRO
KA 000054G2.4.6
Importance 4.0
References: 1-EOP-06, Total Loss of Feedwater (0702828-2)

Question 66

Unit 2 is at 100% power when Instrument air to 2A Component Cooling Water (CCW) Heat Exchanger temperature control valve, TCV-14-4A is 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.

A. **decrease because TCV-14-4A fully opens.**
(Correct)

B. increase because TCV-14-4A fully closes.
(incorrect, fails open on loss of air)

C, remain the same because TCV-14-4A movement is restricted by a mechanical stop.(incorrect, limits valve closure, not opening)

D. remain the same because TCV-14-4A actuator is pneumatically locked.
(incorrect, Feedwater Regulator valve has this feature)

Question level: 1
Question Source: New
Exam: both
KA 000062AA1.06
Importance 2.9 / 2.9
References: 0711209, Component Cooling Water System, St. Lucie P&IDs

Question 67

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

A. Significant Iodine increase that remains above prior levels during steady state operations.

B. An increase of 100/E bar.

C. Significant Iodine increase, concurrent with a Gross activity increase during a load change.

D. An increase in high energy gamma from N-16.

A. Significant Iodine increase that remains significantly above prior levels during steady state operations. (correct)

B. An increase of 100/E bar. (incorrect, this is a calculated value from Chemistry)

C. Significant Iodine increase concurrent with a Gross activity increase during a load change.(incorrect, this is an indication of a crud burst)

D. An increase in high energy gamma from N-16. (incorrect, detector range is max 3 MEV gamma and location of detector minimizes affect of short lived N-16)

Question Level: 1
Question Source: Bank
Exam: Both
K/A: 0000076.AK2.01
Importance: 2.6 / 3.0
References: 1-ONP-01.06 Excessive RCS Activity

Question 68

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 the condition, that in itself would require a controlled plant shutdown?

A. Any LED lit on the PORV/Safety Valve acoustic leakage monitor.

B. Leakage into the Pressurizer Quench Tank is calculated to be 12 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.

A. Any LED lit on the PORV/Safety Valve acoustic leakage monitor (incorrect, requires monitoring leakage)

B. Leakage into the Pressurizer Quench Tank is calculated to be 12 GPM. (correct, leakage exceeds Tech. Spec. limits)

C. Pressurizer boron concentration cannot be maintained within 25 PPM of the RCS boron concentration. (incorrect, Pressurizer/RCS boron concentration delta will increase, but not criteria)

D. More than four backup heaters are required to be on to maintain Pressurizer pressure. (incorrect, additional heaters will require to be on, but not criteria)

Question Level: 2
Question Source: Bank
Exam: RO
K/A: 000008.GG2.4.4
Importance: 4.0
References: ONP 1-0120036, ‘Pressurizer Relief/Safety Valve’, PSL Unit 1 Technical Specifications.

Question 69

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 Liquid release flow control valve FCV-6627X.

D. Contact Chemistry to determine the validity of the alarm.

A. Stop the 1A Waste Monitor Pump (incorrect, subsequent action)

B. Close the final effluent valve V-21462 (incorrect, subsequent action)

C. Close Liquid release flow control valve FCV-6627X (correct)

D. Contact Chemistry to determine the validity of the alarm. (incorrect, subsequent action)

Question Level: 1
Question Source: Bank
Exam: RO
K/A: 0000059.AA2.05
Importance: 3.6
References: ONOP 1-0510030, 'Uncontrolled Release of Radioactive Liquids'

Question 70

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 flow path to regain the Reactivity Control Safety Function IAW 2-EOP-15, 'Functional Recovery'?

A. LPSI supplied by the RWT.

B. SIT discharge to the RCS.

C. Charging through the HPSI header

D. Charging through the Auxiliary Spray Line

A. LPSI supplied by the RWT.
(incorrect, HPSI is addressed (not LPSI) after attempting to use Charging from RWT)

B. SIT discharge to the RCS.
(incorrect, would add negative reactivity but requires depressurizing to <550 psia, also not addressed in procedure)

C. **Charging through the HPSI header**
(Correct)

D. Charging through the Auxiliary Spray Line
(incorrect, may be possible with the location of the rupture, not addressed)

Question level: 2
Question Source: New
Exam: both
KA 000022AK3.02
Importance 3.5 / 3.8
References: 2-EOP-15, Functional Recovery

Question 71

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.

A. **step that may be performed out of sequence.**
(Correct)

B. step that requires a sign off or data sheet.
(incorrect, another symbol used for this)

C. management directive or vendor recommendation.
(incorrect, another symbol used for this)

D. regulatory commitment made by Technical Specifications.
(incorrect, another symbol used for this)

Question level: 1
Question Source: New
Exam: both
KA G2.4.19
Importance 2.7 / 3.7
References: St. Lucie EOPs, AP 0010120 Conduct of Operations

Question 72

The following conditions exist on Unit 1 while at 100% power:

- A SGTR has occurred on 1A S/G
- 1A S/G has been isolated.
- The unit is cooling down on the 1B S/G.
- 1A S/G pressure: 850 psia.
- 1B S/G pressure: 575 psia.
- AFW automatically isolated to the 1B SG.

Which of the following is the correct method to re-establish feedwater flow to the 1B S/G?

A. Initiate AFAS 2 from RTGB 102.

B. Open the AFW valves to 2B S/G on RTGB 102.

C. Override the Main Feedwater Isolation valves and use Main Feedwater.

D. Actuate AFAS 2 from the AFAS panel.

A. Initiate AFAS 2 from RTGB 102 (incorrect, would be correct on Unit 2)

B. Open the AFW valves to 1B S/G on RTGB 102 (incorrect, valves will re-close after manually opened)

C. Override the Main Feedwater Isolation valves and use Main Feedwater. (incorrect, MFIV's close on AFAS on Unit 2 only. Can be overridden. Also not procedurally addressed)

D. Actuate AFAS 2 from the AFAS panel. (correct, would be correct on Unit 1)

Question Level: 2
Question Source: Bank
Exam: RO
K/A: 2.1.1
Importance: 3.7
References: 2-EOP-04 Steam Generator Tube Rupture, ADM 0010120 Conduct of Operations, 0711412 AFW/AFAS Lesson Text

Question 73

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 would require the securing of the two remaining Reactor Coolant Pumps after entering 2-EOP-03 'Loss of Coolant Accident'?

A. RCS Pressure is 1200 psia

B. RCS Subcooled Margin is 12º F.

C. Hot Leg Temperature of 498º F.

D. Pressurizer level is 18%.

A. RCS Pressure is 1200 psia
(incorrect, reason for securing first two)

B. **RCS Subcooled Margin is 12º F**
(Correct)

C. Hot Leg Temperature 498º F
(incorrect, reason for securing one)

D. Pressurizer level is 18%
(incorrect, used for determining RCP re-start criteria and status of RCS inventory control safety function)

Question level: 2
Question Source: New
Exam: both
KA 000011EA1.03
Importance 4.0 / 4.0
References: 2-EOP-03, Loss of Coolant Accident

Question 74

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

A. RCS vessel head (incorrect, Pressurizer level would not be going up)

B. Letdown line in Containment (incorrect, Pressurizer level would not be going up)

C. Pressurizer surge line sample line (incorrect, Pressurizer level would not be going up)

D. Pressurizer steam space sample line (correct)

Question Level: 2
Question Source: Bank
Exam: RO
K/A: 000009.EA2.02
Importance: 3.5
References: 0711824 'Loss of Coolant Event and Procedure' Lesson Text

Question 75

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 line-up to once through cooling.

D. prevent dry out of S/G's to preclude feeding a dry S/G when feedwater is recovered.

A. **depressurize the RCS and allow the admission of safety injection flow.(Correct)**

B. depressurize the RCS and prevent a PTS event after re-pressurization following dryout. (incorrect, no repressurization occurs if PORVs open)

C. maintain RCS temperature at current value in preparation for system line-up to once through cooling. (incorrect, plausible, incorrect)

D. prevent dry out of S/G's to preclude feeding a dry S/G when feedwater is recovered.(incorrect, plausible, incorrect)

Question level: 2
Question Source: New
Exam: both
KA EO9EA2.2
Importance 3.7 / 4.2
References: 0702828, Functional Recovery

Question 76

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

A. Reactivity control (incorrect, ADS will have power)

B. Containment Isolation (correct, Main Steam Monitors, SJAE, and blowdown monitors lose power)

C. Maintenance of Vital Auxiliaries (incorrect, AC and DC indications are available)

D. Containment Temperature, Pressure and Combustible gas (incorrect, instrumentation all powered up)

Question Level: 1
Question Source: Bank
Exam: Both
K/A: 0000061.AK1.01
Importance: 2.5 / 2.9
Reference: 2-EOP-09 Loss of Offsite Power, 0711835 'Loss of Offsite Power and Natural Circulation' Lesson Text

Question 77

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

A. The RCO performs a 150 gallon blend to the VCT (incorrect, would be correct if letdown is not in service)

B. The RCO drains the Quench tank from 60% to 57% (incorrect, adjusted for on Data Sheet)

C. Charging pump seal leakage increases to 0.5 GPM (incorrect, adjusted for on Data Sheet)

D. RCS cold leg temperature increases 2 degrees (correct)

Question Level: 2
Question Source: Bank
Exam: RO
K/A: A16.G2.1.12
Importance: 3.0
References: OP 1-0010125A Data Sheet 1, 'Reactor Coolant System Water Inventory Balance'

Question 78

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

A. Failed fuel (incorrect, letdown radiation alarm only)

B. Steam Generator tube leak (incorrect, isolates blowdown)

C. **RCP seal heat exchanger leak (correct, high activity in CCW system diverts surge tank to chemical drain tank)**

D. Regenerative heat exchanger leak (incorrect, would be correct if letdown heat exchanger)

Question Level:2
Question Source: Bank
Exam: Both
K/A: 068.K1.07
Importance: 2.7 / 2.9
Reference: ONOP 1-0310031 Component Cooling Water Excessive Activity,
ONOP 1-0310030 Component Cooling Water – Off Normal Operation

Question 79

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

A. Startup Rate Trip is enabled
(incorrect, SUR Trip enabled 10^{-4}% power)

B. Zero Power Mode Bypass is enabled
(incorrect, ZPMB disabled ,1% power)

C. Startup Channels automatically de-energize
(correct)

D. Wide Range Log Safety Channel shifts to Extended Range
(incorrect, Unit 1 at 1000 CPS)

Question level: 1
Question Source: Bank
Exam: both
KA 000032Ak2.01
Importance 2.7 / 3.1
References: 0711403, Nuclear Instrumentation, 2-ARP-01-L31 Annunciator Response Procedure

Question 80

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

D. LA-10, CCW SURGE TANK COMPARTMENT A LEVEL LOW

A. J-2, RCP 2A1 SEAL TROUBLE
(incorrect, seals would not degrade immediately)

B. J-11, RCP 2A1 COOLING WATER LOW FLOW
(incorrect, cooling water flow would be high due to RCS leakage

C. **J-33, RCP SEAL COOLER VALVE CLOSED / PWR FAILURE**
(Correct)

D. LA-10, CCW SURGE TANK COMPARTMENT A LEVEL LOW
(incorrect, surge tank would go high in this case)

Question level: 2
Question Source: New
Exam: both
KA 008K3.03
Importance 4.1 / 4.2
References: 0711202, Reactor Coolant Pumps

Question 81

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

A. 85 psig (incorrect, auto start of backup air compressor)

B. 74 psig (incorrect, suggested power reduction)

C. 65 psig (incorrect, various air operated valves start to close)

D. 59 psig (correct)

Question Level: 1
Question Source: Bank
Exam: RO
K/A: 078.A4.01
Importance: 3.1
References: ONP 1-1010030, 'Loss of Instrument Air',

Question 82

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

A. Physical hands on check, slightly moving the valve closed then open, then back to the closed direction ¼ to ½ 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.

A. Physical hands on check, slightly moving the valve closed then open then back to the closed direction ¼ to ½ turn. (correct)

B. Physical hands on check, rotating the valve at least one turn fully closed, then open against the backseat. (incorrect, not required to rotate a full turn, should not open to backseat)

C. Visual observation of the valve stem position. (incorrect, correct if area inaccessible)

D. Visual observation of the valve position mechanical pointer. (incorrect, correct, if area inaccessible)

Question level: 1
Question Source: Bank
Exam: both
KA G2.1.29
Importance 3.4 / 3.3
References: Op 1250020 Valve, Breaker, Motor and Instrument Instructions

Question 83

I/C has requested a clearance to de-energize a component by removing 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.

A. By direction of the I/C work order. (incorrect, would be correct for relaying fuses by the Relay Department)

B. Equipment clearance order tags placed on the fuses. (incorrect, not permitted by procedure)

C. A non-tagged step in the Equipment clearance order. (incorrect, correct for grounding devices)

D. **Equipment clearance order tags placed on or close to the fuse holders. (correct)**

Question level: 1
Question Source: New
Exam: RO
KA G2.2.13
Importance 3.6 / 3.8
References: ADM-09.08, Operations In-Plant Equipment Clearance Orders

Question 84

A surveillance is being performed on the 1A Diesel Generator. As the Diesel Generator is being unloaded, the KW chart recorder stops responding to the decreasing load.

Which of the following indications is used to determine when to open the Diesel Generator output breaker?

A Ammeter on 1A3 4.16 KV bus.

B. Ammeter on the local Diesel panel.

C. KW meter on local Diesel panel.

D. KW meter on remote shutdown panel.

A. Ammeter on 1A3 4.16 KV bus (incorrect, although the ammeter could reflect Diesel load, not an indication of KW)

B. Ammeter on the local Diesel panel (incorrect, although available to be observed, megawatt meter used)

C. Megawatt meter on local Diesel panel (correct)

D. Megawatt meter on remote shutdown panel (incorrect, Unit 2 only has this indication)

Question Level: 1
Question Source: Bank
Exam: Both
K/A: 064.A1.08
Importance: 3.1 / 3.4
References: OP 1-2200050A 1A Emergency Diesel Generator Periodic Test and General Operating Instructions.

Question 85

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 quench tank

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A. Letdown isolation valve 2515 packing leakage of 1.5 gpm.
(incorrect, identified leakage <10 gpm)

B. 2A1 RCP bleedoff cavity leakage of 3 gpm to the VCT.
(incorrect, identified leakage <10 gpm)

C. Primary to secondary leakage in the 2A Steam Generator of .52 gpm.
(correct, >720 gallons/day)

D. RCS inventory balance data sheets indicate 2.5 gpm leakage into the quench tank. (incorrect, identified leakage <10 gpm)

Question level: 2
Question Source: New
Exam: SRO
KA CEA16G2.1.12
Importance 4.0
References: St. Lucie Unit 1 and Unit 2 Technical Specifications

Question 86

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

A. Increasing leak flow
(incorrect, leak flow not a factor if steaming to condenser)

B. **Loss of offsite power**
(Correct)

C. Increasing secondary radiation levels
(incorrect, would not alone require evacuation)

D. Loss of a 120 VAC Instrument bus
(incorrect, would not require evacuation)

Question level: 2
Question Source: New
Exam: SRO
KA G2.4.41
Importance 4.1
References: EPIP-1, Classifications of Emergencies

Question 87

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)

A. Quality Instruction (QI).
(incorrect, QI procedures not permitted to be TC’d)

B. Administrative Procedure (ADM).
(incorrect, ADM procedures not permitted to be TC’d)

C. Emergency Operating Procedure (EOP).
(incorrect, EOP’s not permitted to be TC’d)

D. **Off-Normal Operating Procedure (ONP).**
(correct)

Question level: 1
Question Source: New
Exam: SRO
K/A: G2.2.11
Importance 3.4
References: ADM-11.03, Temporary Changes to Procedures

Question 88

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 only enter containment:

A. if a fire occurs inside containment.

B. during day shift hours.

C. for a period of up to one hour.

D. if no other non-brigade members are available.

A. if a fire occurs inside containment (correct)

B. during day shift hours (incorrect, not addressed)

C. for a period of up to one hour (incorrect, not addressed)

D. if no other non-brigade members are available (incorrect, is correct for all other fire team members)

Question Level: 1
Question Source: Bank
Exam: SRO
K/A: G2.4.26
Importance: 3.3
References: Operations Policy 207 ‘Fire Brigade’

Question 89

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 condenser vacuum due to loss of condensate flow through the air ejector condenser.

C. Degrading condenser vacuum due to loss of exhaust hood sprays.

D. Water hammer in the MSR reheater drain piping due to loss of quench water.

A. the running condensate pump will trip on low flow.(incorrect, condensate pumps have no low flow trip,feedwater and heater drains pumps have low flow trips)

B. Degrading condenser vacuum due to loss of condensate flow through the air ejector condenser. (correct)

C. Degrading condenser vacuum due to loss of exhaust hood sprays. (incorrect, exhaust hood sprays still available)

D. water hammer in the MSR reheater drain piping due to loss of quench water. (incorrect, quench water supplied from feedwater, not condensate)

Question Level: 1
Question Source: Bank
Exam: Both
K/A: 055.K3.01
Importance: 2.5 / 2.7
References: 0711301 Condensate, Feedwater, Heater Vent and Drains Systems.

Question 90

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.

A. The 2B Main Feedwater pump trips on low suction pressure. (incorrect, suction pressure will be low, but the electrical interlock to trip the 2B MFP will be first)

B. The 2B Main Feedwater pump trips on low suction flow. (incorrect, suction flow will not be at the setpoint of <3000 GPM)

C. Alarms only, capacity of one condensate pump is 55% power. (incorrect, electrical interlock will trip the 2B MFP)

D. The 2B Main Feedwater pump trips as a direct result of 2B Condensate pump trip. (correct)

Question Level: 1
Question Source: Bank
Exam: RO
K/A: 056.K1.03
Importance: 2.6
References: 0711301 'Condensate, Feedwater, and Heater Vents and Drains' Lesson Text.

Question 91

Which of the following systems, if removed form service would impact fire fighting strategies if a fire were to occur in Unit 2 Containment?

A. Primary water system.

B. Service water system.

C. Deminerilized water system.

D. Firewater system.

A. **Primary water system. (correct for Unit 2 only)**

B. Service water system (incorrect, service water is not available in the containment)

C. Deminerilized water system (incorrect, deminerilized water available in containment, but not tied to fire hoses)

D. Fire water system (incorrect, Fire water system is not available in containment)

Question level: 1
Question Source: New
Exam: both
KA 086A3.02
Importance 2.9 / 3.3
References: Lesson Text 0511027 Primary Makeup and Demineralized Water Systems

Question 92

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 would first require the execution of a manual reactor and turbine trip?

A. Two of four narrow range steam generator level indications are ≤40% and decreasing.

B. Two of four wide range steam generator level indications are ≥ 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.

A. Two of four narrow range steam generator level indications are < 40% and decreasing. (correct)

B. Two of four wide range steam generator level indications are > 80% and increasing. (incorrect, high level setpoint not reached)

C. Three of four RPS Steam Generator Water Low pretrips are illuminated. (incorrect, would require a trip, not minimum conditions)

D. Three of four narrow range Steam Generator level indications have reached the high level override setpoint. (incorrect, would not require a trip)

Question Level: 1
Question Source: Bank
Exam: RO
K/A: 000054.AA2.01
Importance: 4.3
References: ONOP 1-0700030 'Main Feedwater'

Question 93

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

A. 0745
(100°F / hr)

B. 0800
(75°F / hr)

C. **0845**
(correct)

D. 0900
(40°F / hr)

Question level: 2
Question Source: New
Exam: RO (reference needed for exam)
K/A:002G2.1.12
Importance 2.9
References: Unit 1 Technical Specifications

Question 94

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

A. Lithium
(incorrect, produced by RCS at EOC, non-acidic)

B. **Boric acid**
(Correct)

C. Trisodium Phosphate dodecahydrate
(incorrect, used to raise PH in containment sump, non-acidic)

D. Sodium hydroxide/hydrazine
(incorrect, caustic, not acidic)

Question level: 1
Question Source: New
Exam: both
K/A: 028K5.03
Importance 2.9 / 3.6
References: Plant Specific Chemistry

Question 95

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

A. Incore Neutron Flux (incorrect, alternate means not referred to in EOP-03)

B. Excore Neutron Flux (incorrect, not referred to in EOP-03)

C. Core Exit Thermocouples (correct)

D. Reactor Vessel Level (incorrect, not positive indication)

Question Level: 1
Question Source: Bank
Exam: RO
K/A: 017.A2.02
Importance: 3.6
References: 0711832 'Core Melt Scenario' (0702832-8)

Question 96

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

A. Close the PORV valves.
(incorrect, would be correct for loss of A or B DC bus)

B. Secure one RCP in each loop.
(correct, due to loss of C AFW pp and B AFW pp OOS)

C. Manually control Pressurizer heaters and spray.
(incorrect, would be correct if PORV's were open then reclosed as a result of the loss of A or B DC bus)

E. Secure all RCPs within 10 minutes of the electrical fault
(incorrect, correct for loss of CCW)

Question level: 2
Question Source: New
Exam: both
KA 000058G2.4.18
Importance 2.7 / 3.6
References: 1-EOP-01, Standard Post Trip Actions, 0711412 AFAS Lesson Text

Question 97

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

A. Local Power Density (correct)

B. Variable High Power (incorrect, power related trip)

C. High Rate of Change (incorrect, power related trip)

D. Thermal Margin/Low Pressure (incorrect, power related trip)

Question Level: 1
Question Source: Bank
Exam: Both
K/A: 012.K5.02
Importance: 3.1 / 3.3
References: 0711404, 'Reactor Protection System'

Question 98

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

A. Training building (incorrect, normal work location)

B. Operations support center (incorrect, would be correct for NLO's)

C. Jaycee park (incorrect, would be correct for Site Area Emergency)

D. Unit 2 Control room (correct)

Question Level: 1
Question Source: Bank
Exam: BOTH
K/A: 2.4.29
Importance: 2.6 / 4.0
References: 0010120 'Conduct of Operations'

Question 99

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.

A. Operable as long as HVE-41B remains Operable (incorrect, both fans must be operable until room temperature can be determined)

B. Operable as long as the ICW room temperature remains less than design temperature. (incorrect, ICW pump must be declared inoperable until room temperature can be determined)

C. Inoperable until ICW room temperature can be proven to be maintained less than design temperature. (correct)

D. Inoperable until a temporary air moving system can be installed. (incorrect, no allowance for non-qualified temporary air removal system)

Question Level: 2
Question Source: Bank
Exam: SRO
K/A: 2.2.3
Importance: 3.1 / 3.3
References: ADM. 0010120 'Conduct of Operations'

Question 100

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.

A. **Containment Temperature and Pressure safety function is met. (correct, SRO lesson plan 0902704 'EOP Overview' and discussion with Assistant Ops Supervisor indicated knowledge of meeting safety functions is expected of SRO's)**

B. Containment Temperature and Pressure safety function is not met. Start one additional Containment Cooler to meet the Safety Function.
(Incorrect, additional cooler not needed)

C. Containment Temperature and Pressure safety function is not met. Increase spray header flow to 3200 gpm to meet the Safety Function.
(incorrect, flow rate of ≥2700 gpm meets 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.
(incorrect, one spray header with ≥ 2700 gpm and two coolers meets safety function)

Question level: 2
Question Source: Cancelled 1999 PSL NRC Exam
Exam: SRO
KA 000009G2.4.21
Importance 4.3
References: 1-EOP-03,Loss of Coolant Accident

Question 101

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. Reset B1 and B4 480V backup heaters on RTGB 203.

A. Reset all the 480V backup heaters on RTGB 203. (incorrect, Transformer breaker must be reset, all backup heaters cannot be reset)

B. Close A and B 4160 V Pressurizer heater transformer breakers and reset all the 480V backup heaters on RTGB 203. (incorrect, all backup heaters cannot be reset)

C. Close A and B 4160 V Pressurizer heater transformer breakers and reset B1 and B4 480V backup heaters on RTGB 203. (correct)

D. Reset B1 and B4 480V backup heaters on RTGB 203 (incorrect, must also close the Pressurizer heater transformer breaker)

Question Level: 2
Question Source: Bank
Exam: BOTH
K/A: 000027.AA2.10
Importance: 3.3 / 3.6
References: 0711206, 'Pressure Pressure and Level' Lesson Text, 2-EOP-09 Loss of Offsite Power

Question 102

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.

A. Maintain RCS temperature constant, take the pressurizer solid if necessary. (incorrect, must cooldown due to lack of subcooling)

B. Maintain RCS temperature constant while reducing Pressurizer level to 27-35%. (incorrect, must cooldown, take pressurizer solid if necessary)

C. Cooldown the RCS, but do not let the Pressurizer go solid. (incorrect, lack of subcooling, take pressurizer solid if necessary)

D. Cooldown the RCS, take the pressurizer solid if necessary. (correct)

Question Level: 2
Question Source: Bank
Exam: SRO
K/A: 000008.AA2.14
Importance: 4.4
References: 1-EOP-03 Loss of Coolant Accident

Question 103

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

A. Plant Vent
(incorrect, will be constant or trend up due to the discharge of the Condenser Air Ejector Monitor)

B. Main steam Line
(correct)

C. Condenser Air Ejector
(incorrect, will be constant or will trend up)

D. Steam Generator Blowdown
(incorrect, will be constant or trend up)

Question level: 1
Question Source: New
Exam: both
KA 073A4.01
Importance 3.9 / 3.9
References: SGTR Lesson Plan 0702825, 1-EOP-04 Steam Generator Tube Rupture

Question 104

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

A. Upper Electrical Limit (incorrect, 136" will stop prior to this height)

B. Group Out of Sequence (entire Group must be out of sequence)

C. Group Deviation (correct)

D. Upper Group Stop (132.75" will stop prior to this height)

Question Level: 2
Question Source: Bank
Exam: RO
K/A: 014.K4.04
Importance: 3.1
References: 0711405 'Control Element Drive System', 1-ARP-01-K9 Annunciator Response Procedure

Question 105

Given the following conditions:

- Unit 1 is at 100% power
- Pressurizer pressure is 2250 psia

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

A. Maintain PIC-1100X current setpoint, turn on all Pressurizer heaters.

B. Maintain PIC-1100X current setpoint, turn on Backup heaters B-1 through B-4.

C. Reduce PIC-1100X setpoint, turn on Backup heaters B-1 through B-4.

D. Reduce PIC-1100X setpoint, turn on all Pressurizer heaters.

A. Maintain PIC-1100X current setpoint, turn on all Pressurizer heaters (incorrect, must reduce setpoint)

B. Maintain PIC-1100X current setpoint, turn on Backup heaters B-1 through B-4. (incorrect, must reduce setpoint and turn on all Pressurizer heaters)

C. Reduce PIC-1100X setpoint, turn on Backup heaters B-1 through B-4.(incorrect, setpoint is raised and all heaters turned on)

D. Reduce PIC-1100X setpoint, turn on all Pressurizer heaters (correct)

Question Level: 2
Question Source: Bank
Exam: Both
K/A: 010.A1.01
Importance: 2.8 / 2.9
References: NOP-1-0030123 'Reactor Operating Guidelines During Steady State and Scheduled Load Changes'

Question 106

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. 2 hours

B. 4 hours

C. 8 hours

D. 12 hours

A. 2 hours (correct)

B. 4 hours

C. 8 hours

D. 12 hours

Question Level: 1
Question Source: Bank
Exam: Both
K/A: 000055.EK3.01
Importance: 2.7 / 3.4
References: 0711503 '125 V DC Power'

Question 107

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.

A. The 2A, 2B and 2C Auxiliary Feedwater pumps are feeding at full flow (incorrect, AFAS reset of 29.5% closes AFW throttle valves on all AFW pumps)

B. The 2A and 2B Auxiliary Feedwater pumps are feeding at 150 gpm each. (incorrect, AFAS reset of 29.5% closes AFW throttle valves on all AFW pumps)

C. The 2A, 2B and 2C Auxiliary Feedwater pumps have stopped and their discharge valves closed. (incorrect, pumps do not stop, but throttle valves close)

D. The 2A, 2B and 2C Auxiliary Feedwater pumps are running with their discharge valves closed. (correct)

Question level: 2
Question Source: New
Exam: both
KA 061A1.01
Importance 3.9 / 4.2
References: 0711412, AFW and AFAS

Question 108

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.

A. The alarm setpoint is displayed.
(incorrect, pushing RED or AMBER pushbutton with function selector switch in the alarm set position performs this function)

B. Various A train CIS components actuate.
(Takes 2/4 to actuate)

C. **Containment Evacuation alarm actuates.**
(Correct)

D. No response, check source is disabled during testing.
(incorrect, check source is not disabled)

Question level: 2
Question Source: New
Exam: both
KA 072A4.03
Importance 3.1 /3.1
References: 0711410, Unit 1 Radiation Monitoring

Question 109

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	Delta T
A.	Decrease	Increase
B.	Decrease	Decrease
C.	Increase	Decrease
D.	Increase	Increase

A.	**Decrease**	**Increase (correct)**
B.	Decrease	Decrease (incorrect, Delta T increase)
C.	Increase	Decrease (incorrect, reverse logic)
D.	Increase	Increase (incorrect, DNBR decrease)

Question Level: 2
Question Source: Bank
Exam: RO
K/A: 003.K5.01
Importance: 3.3 / 3.9
References: 0711130 “PSL Plant Specific Heat Transfer’

Question 110

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.

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.
(Incorrect, plausible)

B. **was designed to supply a specified amount of makeup to Unit 1 in the event of damage to Unit 1 CST.**
(Correct)

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.
(incorrect, Unit 1 is analyzed for 8 hours)

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.
(incorrect, both are analyzed for a cooldown)

Question level: 1
Question Source: St. Lucie Exam bank modified
Exam: both
KA 056G2.1.12
Importance 2.9 / 4.0
References: 0711412, Auxiliary Feedwater and AFAS, St. Lucie Unit 2 Technical Specifications Bases

Question 111

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.

A. open and ICW flow is being supplied to the essential and non-essential headers.
(incorrect, correct if SIAS not present)

B. open and ICW flow is being supplied to the essential header only.
(incorrect, Valves are closed)

C. closed and ICW flow is being supplied to the essential and non-essential headers.
(incorrect, essential header supplied only)

D. **closed and ICW flow is being supplied to the essential header only.**
(Correct)

Question level: 2
Question Source: New
Exam: both
KA 076A3.02
Importance 3.7 / 3.7
References: 2-EOP-99 Appendixes/Figures/Tables

Question 112

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 the method to determine the location of the RCS leak?

	Change in leak rate	Location
A.	RCS leakage flow recorder FR-07-3	comparing the CIAS radiation monitor readings.
B.	RCS leakage flow recorder FR-07-3	sampling different 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

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A.	RCS leakage flow recorder FR-07-3	comparing the CIAS radiation monitor readings.
	(incorrect, FR-07-3 ranges out at 12 gpm. CIAS monitors not accurate indication of leak location)	
B.	RCS leakage flow recorder FR-07-3	sampling different atmospheric locations in the Containment
	(incorrect, FR-07-3 ranges out at 12 gpm)	
C.	**Cavity sump level, LI-07-6**	**sampling different atmospheric locations in the Containment.**
	(correct)	
D.	Cavity sump level LI-07-6	comparing the CIAS radiation monitor readings (incorrect, CIAS readings not accurate location of leak)

Question Level: 1
Question Source: New
Exam: Both
K/A: 002.A3.01
Importance: 3.7 / 3.9
References: 0711600 Containment and Sheild Building Lesson Text, 0711400 Radiation Monitoring Lesson Text

Question 113

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 non-essential 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.

A. Resetting SIAS
(correct)

B. Resetting CIAS
(incorrect, must reset SIAS)

C. Restoration of offsite power
(incorrect, restoration of offsite power not needed to reset non essentials)

E. Restoration of offsite power and opening the Diesel output breaker
(incorrect, restoration of offsite power and opening the output breaker without resetting SIAS will not reset the nonessentials.

Question Level: 1
Question Source: New
Exam: Both
K/A: 062.A2.04
Importance: 3.1 / 3.4
References: 0711502 Main Power Distribution Lesson Text, 2-ARP-01-A39 Annunciator Response Procedure.

Question 114

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.

A. Monitor Unit 2 fire alarms using Unit 1 fire computer. (correct)

B. Assign an Operator to monitor Unit 2 local fire panels (incorrect, plausible but not referenced in procedure)

C. Notify the roving fire watch to monitor Unit 2 fire alarms (incorrect, plausible but not referenced in procedure)

D. Station an Operator at the Unit 2 master local fire alarm panel. (incorrect, correct if transfer to other Unit does not work)

Question Level: 1
Question Source: Bank
Exam: Both
K/A: 000067.G2.4.27
Importance: 3.0 / 3.5
References: 0-ONP-79.01 'Fire Detection System'

Question 115

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 one of the following core cooling methods will be implemented?

A. Cooling through the Fuel Pool Heat Exchanger.

B. Cooling through the Letdown Heat Exchanger.

C. Feed and bleed to the RWT

D. Containment Spray system through the SDC heat exchangers.

A. **Cooling through the Fuel Pool Heat Exchanger**
(correct)

B. Cooling through the Letdown Heat Exchanger.
(incorrect, letdown isloated)

C. Feed and bleed to the RWT.
(incorrect, not addressed in any procedure)

D. Containment Spray system through the SDC heat exchangers
(incorrect, this is a Unit 1 flow path only. Different piping design precludes this lineup on Unit 2)

Question level: 1
Question Source: New
Exam: both
KA 033K1.02
Importance 2.5 / 2.7
References: 2-ONP-01.05, Plant Condition 5 - Shutdown Cooling in Service, Rx Head Removed

Question 116

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

A. **0.5 REM**
(Correct)

B. 2.0 REM
(incorrect, only correct if extension is granted)

C. 3.5 REM
(Incorrect, lifetime PAD)

D. 4.5 REM
(incorrect, NRC limit)

Question level: 2
Question Source: NRC modified
Exam: both
KA G2.3.4
Importance 2.5 / 3.1
References: HPP-30 Personnel Monitoring

Question 117

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
B.	High	Letdown flow will increase
C.	Low	Letdown flow will decrease
D.	Low	Letdown flow will increase

	Indicated Pressuirzer level	CVCS response
A.	High (incorrect, letdown flow will increase in response to selected high level condition)	Letdown flow will decrease
B.	**High** **(correct)**	**Letdown flow will increase**
C.	Low (incorrect, level will indicate high, letdown flow will increase)	Letdown flow will decrease
D.	Low (incorrect, level will indicate high)	Letdown flow will increase

Question level: 2
Question Source: New
Exam: both
KA 000028AK1.01
Importance 2.8 / 3.1
References: 0711170 Chapter 1, Process Detectors, ONP 2-0120035 Pressurizer Pressure and Level.

Question 118

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

- The Unit has been shutdown 4 days
- SDC cooling temperature from RCS: 130° F
- SDC cooling temperature to RCS: 116° 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)

A. 11 minutes to boil, 60 GPM makeup rate

B. 11 minutes to boil, 75 GPM makeup rate

C. 14 minutes to boil, 60 GPM makeup rate

D. 14 minutes to boil, 75 GPM makeup rate

A. 11 minutes to boil, 60 GPM makeup rate (correct)

B. 11 minutes to boil, 75 GPM makeup rate (incorrect, makeup rate wrong)

C. 14 minutes to boil, 60 GPM makeup rate (incorrect, time to boil based on temperature return to RCS)

D. 14 minutes to boil, 40 GPM makeup rate (incorrect, time to boil based on temperature return to RCS and makeup rate wrong)

Question Level: 3
Question Source: Bank
Exam: Both
K/A: 0000025.AK2.02
Importance: 3.2 / 3.2
References: 2-ONP-01.04 Plant Condition 4 Shutdown Cooling in Operation – Reduced Inventory Operation

Question 119

A large break LOCA has occurred on Unit 1. Which of the following describes the primary method for Hot Leg Injection?

A. LPSI pump via Hot Leg suction line.

B. HPSI pump via auxiliary spray line.

C. HPSI pump via dedicated Hot Leg injection line.

D. Containment Spray pump via Hot Leg suction line.

A. LPSI pump via. Hot Leg suction line
(correct)

B. HPSI pump via auxiliary spray line.
(incorrect, alternate method)

C. HPSI pump via dedicated Hot Leg injection line.
(incorrect, Unit 2 only has installed Hot Leg injection line)

D. Containment Spray pump via Hot Leg suction line.
(incorrect, second alternate method)

Question level: 1
Question Source: New
Exam: RO
KA G2.2.3
Importance 3.1 / 3.5
References: 0711207 Emergency Core Cooling and Containment Heat Removal Systems

Question 120

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.

A. Two CEA's have dropped to the bottom of the core.
(incorrect, 3 CEA's drop require a manual trip)

B. Main Feedwater Regulating valve malfunction results in 2A S/G level increase to 75%.
(incorrect, 85% level requires a manual trip)

C. **Reactor Support Cooling fans HVE-3A and HVE-3B have been out of service for. 60 minutes.**
(Correct)

D. Containment temperature is 110°F with two Containment Coolers out of service.
(incorrect, must have 120°F)

Question level: 1
Question Source: New
Exam: RO
KA: 103G2.1.7
Importance 3.7
References: 1-ONP-25.01 Loss of RCB Cooling Fans

Question 121

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

A. KW loading
(incorrect, not timed)

B. Output breaker closure
(incorrect, not timed)

C. Current and Voltage
(incorrect, current incorrect)

D. **Frequency and Voltage**
(Correct)

Question level: 1
Question Source: New
Exam: Both
KA G2.2.12
Importance 3.0 / 3.4
References: OP 1-2200050A, 1A Emergency Diesel Generator Periodic Test

Question 122

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)

A. **900 mrem/hr at 30 cm (correct)**

B. 1200 mrem/hr at 30 cm (incorrect, rad levels too high)

C. 900 mrem/hr at 100 cm (incorrect, distance too far)

D. 1200 mrem/hr at 100 cm (incorrect, rad levels too high, distance too far)

Question Level: 1
Question Source: Bank
Exam: BOTH
K/A: 2.3.1
Importance: 3.0
References: HPP-3 'High Radiation Areas'

Question 123

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

A. 1 REM

B. 2.5 REM

C. 3.5 REM

D. **5 REM (correct)**

Question Level: 1
Question Source: Bank
Exam: Both
K/A: 2.3.1
Importance: 2.6 / 3.0
References: HP-2 FP&L Health Pysics Manual

Question 124

Unit 2 was at 100% power, all systems in normal configuration when the following events occurred:

- Numerous secondary annunciators in alarm
- Generator megawatts decreasing
- Steam Generator levels decreasing
- DEH operator auto light 'OFF'

Which of the following describes the failure that has caused the current plant condition?

Loss of:

A. Instrument air.

B. the 120 VAC Vital bus.

C. the 120 VDC bus.

D. 2B Heater Drain pump.

A. Instrument air.
(incorrect, would cause all indications except DEH malfunction)

B. the 120 VAC Vital bus.
(correct)

B. the 120 VDC bus.
(incorrect, would cause secondary alarms, but not loss of megawatts)

C. 2B Heater Drain pump.
(incorrect, would cause all alarms/indications except DEH)

Question Level: 1
Question Source: Bank
Exam: SRO (on SRO test but does not meet NRC SRO criteria)
K/A: 000057. AA2.15
Importance: 4.1
References: 1-0970030 '120V Instrument AC System'

Question 125

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

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.

A. 10 psig with the Engineering Manager concurrence. (incorrect, 10 psig is CSAS actuation, Engineering Manager not correct)

B 5.5 psig with the Nuclear Plant Supervisor concurrence. (incorrect, 5.5 pressure to high, NPS not correct)

C 5 psig with Technical Support Center concurrence. (correct)

D. 3.5 psig with Recovery Manager concurrence. (incorrect, pressure to low, requires TSC concurrance)

Question Level: 1
Question Source: New
Exam: SRO
K/A: 026.A2.08
Importance: 3.7
References: 1-EOP-03 Loss of Coolant Accident

Question 126

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 one of the following is the correct response of the 1BB Battery charger's voltage and amps?

	Voltage	Amps
A.	decrease	decrease
B.	increase	remain the same
C.	remain the same	increase
D.	remain the same	remain the same

A. decrease, amps will decrease.
(incorrect, voltage will remain the same, amps will increase)

B. increase, amps will remain the same
(incorrect, voltage will remain the same, amps will increase)

C. **remain the same, amps will increase.**
(correct)

D. remain the same, amps will remain the same.
(incorrect, amps will increase)

Question level: 1
Question Source: New
Exam: SRO (on SRO test but does not meet NRC SRO test criteria)
K/A:063K1.03
Importance: 3.5
References: OP 1-0960020 125V DC Class 1E Power System Normal Operation

Question 127

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.

A. all CEA's fully inserted
(incorrect, no indication of CEA position)

B. maximum of 1 CEA not fully inserted
(incorrect, no indication of CEA position)

C. startup rate negative or zero.
(correct, SRO lesson plan 0902704 'EOP Overview' and discussion with Assistant Ops Supervisor indicated knowledge of meeting safety functions is expected for SRO's)

D. emergency boration in progress.
(incorrect, no charging pumps available, but procedure directs emergency boration after power restored)

Question level: 1
Question Source: New
Exam: SRO
K/A:014A2.02
Importance: 3.6
References: 1-EOP-10 Station Blackout

Question 128

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.

A. The iodine removal system is inoperable. but not required until Mode 2. (incorrect, system required in Mode 3 with pressure >1750 psia)

B. With the 2B iodine removal pump operable, the iodine removal system is considered operable. (incorrect, both pumps required to be operable)

C. The iodine removal system can be declared operable when the 2A Diesel Generator is run for operability check. (incorrect, both pumps required to be operable.)

D. The iodine removal system can be declared operable when the 2A iodine removal pump is returned to service. (correct, SRO lesson plan 0902723 and discussion with Assistant Ops Supervisor indicated this is expected knowledge for SRO's)

Question Level: 2
Question Source: New
Exam: SRO
K/A: 027.G2.1.12
Importance: 4.0
References: ADM. 0010120 Conduct of Operations, Technical Specifications 3.6.2.2

FINAL SUBMITTAL

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

FEBRUARY 7 - 11, 2000

ES-401-3 - PWR SRO Exam Outline
ES-401-4 - PWR RO Exam Outline
ES-401-5 - Generic Knowledge & Abilities Outline
ES-201-2 - Exam Outline Quality Checklist

ES-401 PWR SRO Examination Outline Form ES-401-3
Facility: St. Lucie (00-301) Date of Exam: 2/7-9-00 Exam Level:SRO

Tier	Group	K/A Category Points											Point Total
		K 1	K 2	K 3	K 4	K 5	K 6	A 1	A 2	A 3	A 4	G *	
1. Emergency & Abnormal Plant Evolutions	1	4	5	2	▨	▨	▨	4	5	▨	▨	4	24
	2	1	2	3	▨	▨	▨	2	4	▨	▨	4	16
	3	1			▨	▨	▨	1		▨	▨	1	3
	Tier Totals	6	7	5	▨	▨	▨	7	9	▨	▨	9	43
2. Plant Systems	1	1	1	2	2	2	2	2	1	2	3	1	19
	2	2	1	2	1	2	1	2	1	2	2	1	17
	3	1		1			1			1			4
	Tier Totals	4	2	5	3	4	4	4	2	5	5	2	40

3. Generic Knowledge and Abilities	Cat 1	Cat 2	Cat 3	Cat 4	17
	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. Enter the tier totals for each category in the table above.

ES-401 St. Lucie (00-301) Date of Exam: 2/7-9-00
Emergency and Abnormal Plant Evolutions - Tier 1/Group 1

PWR SRO Examination Outline

Form ES-401-3

E/APE # / Name / Safety Function	K 1	K 2	K 3	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	3.3	B
000003 Dropped Control Rod / I		X					AK2.05 - Interrelations between dropped rod and CR power supplies	2.8	B
000005 Inoperable/Stuck Control Rod / I						X	G2.4.11 - Knowledge of abnormal condition procedures	3.6	S
000011 Large Break LOCA / III				X			EA1.03 - Ability to monitor the securing of RCPs as it applies to LBLOCA	4.0	B
000015/17 RCP Malfunctions / IV		X			X		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			X			X	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				X			AA1.16 - Ability to monitor Tavg meters during EB	3.2	B
000026 Loss of Component Cooling Water / VIII					X		A2.01 - ability to interpret location of CCW leak	3.5	B
000029 Anticipated Transient w/o Scram / I	X						EK1.01 - Knowledge of operational imlications of reactor nucleonics and thermodynamics during an ATWS	3.1	B
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	B
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	B
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	B
000067 Plant Fire On-site / IX						X	G2.4.27 - Knowledge of Fire in the Plant procedures	3.5	B
000068 (BW/A06) Control Room Evac. / VIII				X			AA1.28 - Ability to monitor pressurizer pressure during control room evac.	4.0	B
000069 (W/E14) Loss of CTMT Integrity / V		X					AK2.03 - Knowledge of interrelations between loss of integrity and containment airlocks	2.9	B
000074 (W/E06&E07) Inad. Core Cooling / IV	X						EK1.03 - Knowledge of processes of removing decay heat from the core.	4.9	B
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 St. Lucie (00-301) Date of Exam: 2/7-9-00 PWR SRO Examination Outline Form ES-401-3
Emergency and Abnormal Plant Evolutions - Tier 1/Group 2

E/APE # / Name / Safety Function	K1	K2	K 3	A 1	A 2	G	K/A Topic(s)	Imp.	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	B
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	B
000025 Loss of RHR System / IV		X					AK2.02 - Knowledge of interrelation between loss of RHR and LPSI pump	3.2	B
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		X					Ak2.01 - Knowledge of power supplies at it applies to loss of SR NI	3.1	B
000033 Loss of Intermediate Range NI / VII							N/A for St. Lucie. No Intermediate range NI's	N/A	N/A
000037 Steam Generator Tube Leak / III			X				AK3.08 - Knowledge of the reason for securing RCPs during a SGTL	4.3	B
000038 Steam Generator Tube Rupture / III				X			EA1.39 - Ability to operate feed and bleed as it applies to SGTR	3.7	B
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	B
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	B
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
K/A Category Point Totals:	1	2	3	2	4	4	Group Point Total:		16

ES-401 St. Lucie (00-301) Date of Exam: 2/7-9-00 PWR SRO Examination Outline Form ES-401-3

Emergency and Abnormal Plant Evolutions - Tier 1/Group 3

E/APE # / Name / Safety Function	K 1	K 2	K 3	A 1	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	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	B
CE/A16 Excess RCS Leakage / II						X	G2.1.12 - Ability to apply Tech Specs for a system	4.0	S
K/A Category Point Totals:	1			1		1	Group Point Total:		3

ES-401 St. Lucie (00-301) Date of Exam: 2/7-9-00 PWR SRO Examination Outline Form ES-401-3

Plant Systems - Tier 2/Group 1

System # / Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	K/A Topic(s)	Imp.	Exam
001 Control Rod Drive						X						K6.03 - Knowledge of effect of loss of TCBs	4.2	B
003 Reactor Coolant Pump		X										K2.01 - Knowledge of RCP power supplies	3.1	B
004 Chemical and Volume Control			X									K3.07 - Knowledge of CVCS malfunction effect on PZR level and pressure	4.1	B
013 Engineered Safety Features Actuation				X						X		K4.05 - Knowledge of spray actuation reset A4.03 - Ability to monitor ESFAS initiation	4.2 4.7	B B
014 Rod Position Indication								X				A2.02 – Loss of power to the RPSI	3.6	S
015 Nuclear Instrumentation					X				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	B
022 Containment Cooling							X					A1.01 - ability to monitor changes in containment temperature associated with operation of CCS	3.7	B
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	B
059 Main Feedwater				X					X			K4.18 - Knowledge of automatic reduction of FW on plant trip A3.06 - Ability to monitor feedwater isolation	3.0 3.3	B B
061 Auxiliary/Emergency Feedwater							X					A1.01 - Ability to predict changes in S/G levels	4.2	B
063 DC Electrical Distribution	X											K1-03 – Battery charger and battery	3.5	S
068 Liquid Radwaste	X											K1.07 - Knowledge of sources liquid wastes to LRS	2.9	B
071 Waste Gas Disposal			X									K3.04 - Knowledge of loss or malfunction of WGS will have on ventilation systems	2.9	B
072 Area Radiation Monitoring										X		A4.03 - Ability to operate check source for operability	3.1	B
K/A Category Point Totals:	2	1	2	2	1	2	2	2	2	2	1	Group Point Total:		19

ES-401 St. Lucie (00-301) Date of Exam: 2/7-9-00 PWR SRO Examination Outline Form ES-401-3
Plant Systems - Tier 2/Group 2

System # / Name	K 1	K 2	K 3	K 4	K 5	K 6	A 1	A 2	A 3	A 4	G	K/A Topic(s)	Imp.	Exam
002 Reactor Coolant									X			A3.01 - Ability to monitor auto operation of RCS leakage detection system	3.9	B
006 Emergency Core Cooling										X		A4.07- Ability to manually operate ECCS pumps and valves	4.4	B
010 Pressurizer Pressure Control							X					A1.01 - Ability to predict changes in RCS and PZR boron conc. when operating PCS	2.9	B
011 Pressurizer Level Control						X						K6.03 - Knowledge of relationship between PZR level and heater control circuit	3.3	B
012 Reactor Protection					X							K5.02 - Knowledge of operational implications of power density	3.3	B
027 Containment Iodine Removal											X	G2.1.12 – Ability to Apply TS to a system	4.0	S
028 Hydrogen Recombiner and Purge Control					X							K5.03 - Knowledge / sources of H2 in containment	3.6	B
029 Containment Purge	X											K1.03 - Knowledge of relationship between CPS and Engineered Safeguards	3.8	B
033 Spent Fuel Pool Cooling	X											K1.02 - Knowledge of relationship between RHRS and SFPCS	2.7	B
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			X									K3.05 - Knowledge /MRSS malfunction on RCS	3.7	B
055 Condenser Air Removal			X									K3.01 - Knowledge / loss of CARS on condenser	2.7	B
062 AC Electrical Distribution				X								A2.04 – Ability / impact of de-energizing a bus	3.4	B
064 Emergency Diesel Generator							X					A1.08 - Ability / maintain minimum load on EDG to prevent motoring	3.4	B
073 Process Radiation Monitoring										X		A4.01 - Ability / monitor effluent release	3.9	B
075 Circulating Water		X										K2.03 - Knowledge / bus power supplies to SWS	2.7	B
079 Station Air														
086 Fire Protection									X			A3.02 - Ability / monitor actuation of FPS	3.3	B
103 Containment														
K/A Category Point Totals:	2	1	2	1	2	1	2	1	2	2	1	Group Point Total:		17

ES-401 St. Lucie (00-301) Date of Exam: 2/7-9-00 PWR SRO Examination Outline Form ES-401-3
Plant Systems - Tier 2/Group 3

System # / Name	K 1	K 2	K 3	K 4	K 5	K 6	A 1	A 2	A 3	A 4	G	K/A Topic(s)	Imp.	Exam
005 Residual Heat Removal	X											K1.04 - Knowledge / Interrelations between RHRS and CVCS	3.1	B
007 Pressurizer Relief/Quench Tank														
008 Component Cooling Water			X									K3.03 - Knowledge / loss of CCW effect on RCPs	4.2	B
041 Steam Dump/Turbine Bypass Control						X						K6.03 - Knowledge / controllers and positioners	2.9	B
045 Main Turbine Generator														
076 Service Water									X			A3.02 - Ability / monitor auto operation of SWS regarding emergency heat loads	3.7	B
078 Instrument Air														
K/A Category Point Totals:	1		1			1			1			Group Point Total:		4

ES-401 PWR RO Examination Outline Form ES-401-4
Facility: St. Lucie (00-301) Date of Exam: 2/7-9-00 Exam Level: RO

Tier	Group	K/A Category Points											Point Total
		K 1	K 2	K 3	K 4	K 5	K 6	A 1	A 2	A 3	A 4	G *	
1. Emergency & Abnormal Plant Evolutions	1	2	4	3	▨	▨	▨	3	2	▨	▨	2	16
	2	3	3	3	▨	▨	▨	3	3	▨	▨	2	17
	3	1			▨	▨	▨	1		▨	▨	1	3
	Tier Totals	6	7	6	▨	▨	▨	7	5	▨	▨	5	36
2. Plant Systems	1	3	2	2	2	3	2	2	1	2	3	1	23
	2	2	2	2	2	1	1	2	2	2	2	2	20
	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 Knowledge and Abilities					Cat 1		Cat 2		Cat 3		Cat 4		13
					4		3		3		3		

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. Enter the tier totals for each category in the table above.

ES-401 St. Lucie (00-301) Date of Exam: 2/7-9-00 PWR RO Examination Outline Form ES-401-4
Emergency and Abnormal Plant Evolutions - Tier 1/Group 1

E/APE # / Name / Safety Function	K 1	K 2	K 3	A 1	A 2	G	K/A Topic(s)	Imp.	Exam
000005 Inoperable/Stuck Control Rod / I									
000015/17 RCP Malfunctions / IV		X					K2.07 - Interrelations between RCP malfunctions and RCP seals	2.9	B
BW/E09; CE/A13; W/E09&E10 Natural Circ. / IV			X				AK3.2 - Knowledge of Natural Circulation procedures	2.9	B
000024 Emergency Boration / I				X			AA1.16 - Ability to monitor Tavg meters during EB	3.3	B
000026 Loss of Component Cooling Water / VIII					X		A2.01 - ability to interpret location of CCW leak	2.9	B
000027 Pressurizer Pressure Control System Malfunction / III						X	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	B
CE/A11; W/E08 RCS Overcooling - PTS / IV		X					AK1.2 - Knowledge of procedures associated with RCS overcooling	3.0	B
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	B
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	B
000067 Plant Fire On-site / IX						X	G2.4.27 - Knowledge of Fire in the Plant procedures	3.0	B
000068 (BW/A06) Control Room Evac. / VIII				X			AA1.28 - Ability to monitor pressurizer pressure during control room evac.	3.8	B
000069 (W/E14) Loss of CTMT Integrity / V		X					AK2.03 - Knowledge of interrelations between loss of integrity and containment airlocks	2.8	B
000074 (W/E06&E07) Inad. Core Cooling / IV	X						EK1.03 - Knowledge of processes of removing decay heat from the core.	4.5	B
000076 High Reactor Coolant Activity / IX		X					AK2.01 - Knowledge of interrelations between high RCS activity and process monitors	2.6	B
K/A Category Totals:	2	4	3	3	2	2	Group Point Total:		16

ES-401 ST. Lucie (00-301) Date of Exam: 2/7-9-00 PWR RO Examination Outline Form ES-401-4
Emergency and Abnormal Plant Evolutions - Tier 1/Group 2

E/APE # / Name / Safety Function	K1	K2	K3	A1	A2	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	B
000003 Dropped Control Rod / I		X					AK2.05 - Interrelations between dropped rod and CR power supplies	2.5	B
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	3.3	B
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					X		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	B
000025 Loss of RHR System / IV		X					AK2.02 - Knowledge of interrelation between loss of RHR and LPSI pump	3.2	B
000029 Anticipated Transient w/o Scram / I	X						EK1.01 - Knowledge of operational imlications of reactor nucleonics and thermodynamics during an ATWS	2.8	B
000032 Loss of Source Range NI / VII		X					Ak2.01 - Knowledge of power supplies at it applies to loss of SR NI	2.7	B
000037 Steam Generator Tube Leak / III			X				AK3.08 - Knowledge of the reason for securing RCPs during a SGTL	4.1	B
000038 Steam Generator Tube Rupture / III				X			EA1.39 - Ability to operate feed and bleed as it applies to SGTR	3.6	B
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	B
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	B
CE/E09 Functional Recovery			X				EA2.2 - Facilities heat removal systems during FR	3.7	B
K/A Category Point Totals:	3	3	3	3	3	2	Group Point Total:		17

ES-401 St. Lucie (00-301) Date of Exam: 2/7-9-00 PWR RO Examination Outline Form ES-401-4
Emergency and Abnormal Plant Evolutions - Tier 1/Group 3

E/APE # / Name / Safety Function	K 1	K 2	K 3	A 1	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	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	B
000065 Loss of Instrument Air / VIII									
CE/A16 Excess RCS Leakage / II						X	G2.2.12 - Knowledge of surveillance procedures	3.0	R
K/A Category Point Totals:	1			1		1	Group Point Total:		3

ES-401 St. Lucie (00-301) Date of Exam: 2/7-9-00 PWR RO Examination Outline Form ES-401-4
Plant Systems - Tier 2/Group 1

System # / Name	K 1	K 2	K 3	K 4	K 5	K 6	A 1	A 2	A 3	A 4	G	K/A Topic(s)	Imp.	Exam
001 Control Rod Drive	X					X						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				X						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	B
071 Waste Gas Disposal			X									K3.04 - Knowledge of loss or malfunction of WGS will have on ventilation systems	2.7	B
072 Area Radiation Monitoring										X		A4.03 - Ability to operate check source for operability	3.1	B
K/A Category Point Totals:	3	2	2	2	3	2	2	1	2	3	1	Group Point Total:		23

ES-401 St. Lucie (00-301) Date of Exam: 2/7-9-00 PWR RO Examination Outline Form ES-401-4
Plant Systems - Tier 2/Group 2

System # / Name	K1	K2	K3	K4	K5	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	B
010 Pressurizer Pressure Control							X					A1.01 - Ability to predict changes in RCS and PZR boron conc. when operating PCS	2.8	B
011 Pressurizer Level Control						X						K6.03 - Knowledge of relationship between PZR level and heater control circuit	2.9	B
012 Reactor Protection					X							K5.02 - Knowledge of operational implications of power density	3.1	B
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	B
033 Spent Fuel Pool Cooling	X											K1.02 - Knowledge of relationship between RHRS and SFPCS	2.5	B
035 Steam Generator											X	G2.4.11 - Knowledge of abnormal conditions procedures	3.3	R
039 Main and Reheat Steam			X									K3.05 - Knowledge /MRSS malfunction on RCS	3.6	B
055 Condenser Air Removal			X									K3.01 - Knowledge / loss of CARS on condenser	2.5	B
062 AC Electrical Distribution								X				A2.04 - Ability / impact of de-energizing a bus	3.1	B
063 DC Electrical Distribution				X								K4.04 - Knowledge / DC bus designed trips	2.6	R
064 Emergency Diesel Generator							X					A1.08 - Ability / maintain minimum load on EDG to prevent motoring	3.1	B
073 Process Radiation Monitoring										X		A4.01 - Ability / monitor effluent release	3.9	B
075 Circulating Water		X										K2.03 - Knowledge / bus power supplies to SWS	2.6	B
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	B
K/A Category Point Totals:	2	2	2	2	1	1	2	2	2	2	2	Group Point Total:		20

ES-401 St. Lucie (00-301) Date of Exam: 2/7-9-00 PWR RO Examination Outline Form ES-401-4
Plant Systems - Tier 2/Group 3

System # / Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	K/A Topic(s)	Imp.	Exam
005 Residual Heat Removal	X											K1.04 - Knowledge / Interrelations between RHRS and CVCS	2.9	B
007 Pressurizer Relief/Quench Tank														
008 Component Cooling Water			X									K3.03 - Knowledge / loss of CCW effect on RCPs	4.1	B
027 Containment Iodine Removal														
028 Hydrogen Recombiner and Purge Control					X							K5.03 - Knowledge / sources of H2 in containment	2.9	B
034 Fuel Handling Equipment														
041 Steam Dump/Turbine Bypass Control						X						K6.03 - Knowledge / controllers and positioners	2.7	B
045 Main Turbine Generator								X				A2.17 - Ability / predict impacts of DEH malfunction	2.7	R
076 Service Water									X			A3.02 - Ability / monitor auto operation of SWS regarding emergency heat loads	3.7	B
078 Instrument Air										X		A4.01 - Ability to monitor instrument air in the control room	3.1	R
103 Containment											X	G2.1.7 - ability to make operational judgements based on operating characteristics and instrument interpretation	3.7	R
K/A Category Point Totals:	1		1		1	1		1	1	1	1	Group Point Total:		8

ES-401 Generic Knowledge and Abilities Outline (Tier 3) Form ES-401-5
Facility: St. Lucie (00-301) Date of Exam: 2/7-9-00 Exam Level: SRO

Category	K/A #	Topic	Imp.	Exam
Conduct of Operations	2.1.13	Knowledge of facility requirements for controlling vital access	2.9	S
	2.1.22	Ability to determine Mode of Operation	3.3	S
	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	B
	2.1.3	Knowledge of Shift Turnover practices	3.4	B
	Total			
Equipment Control	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
	2.2.3	Knowledge between differences in Units	3.3	B
	2.2.12	Knowledge of surveillance procedures	3.4	B
	Total			
Radiation Control	2.3.2	Knowledge of facility ALARA program	2.9	B
	2.3.1	Knowledge of 10CFR20 and related facility requirements	3.0	S
	2.3.4	Knowledge of exposure limits	3.1	B
	2.3.1	Knowledge of 10CFR20 and related facility requirements	3.0	B
	Total			
Emergency Procedures and Plan	2.4.26	Knowledge of facility fire protection requirements (fire brigade)	3.3	S
	2.4.41	Knowledge of the EAL thresholds and classifications	4.1	S
	2.4.3	Ability to identify post-accident instrumentation	3.8	B
	2.4.19	Knowledge of EOP layout, symbols and icons	3.7	B
	Total			17
Tier 1 Target Point Total ~~(RO~~/SRO)				~~10~~/17

ES-401 Generic Knowledge and Abilities Outline (Tier 3) Form ES-401-5
Facility: St. Lucie (00-301) Date of Exam: 2/7-9-00 Exam Level: RO

Category	K/A #	Topic	Imp.	Exam
Conduct of Operations	2.1.1	Knowledge of Conduct of Operations	3.7	R
	2.1.29	Knowledge of how to conduct and verify valve lineups	3.4	B
	2.1.3	Knowledge of Shift Turnover practices	3.0	R
	2.1.3	Knowledge of Shift Turnover practices	3.0	B
	Total			
Equipment Control	2.2.3	Knowledge between differences in Units	3.1	B
	2.2.13	Knowledge of clearance and tagging procedures	3.6	R
	2.2.12	Knowledge of surveillance procedures	3.0	B
	Total			
Radiation Control	2.3.4	Knowledge of exposure limits	2.5	B
	2.3.1	Knowledge of 10 CFR 20 and facility related requirements	2.6	B
	2.3.2	Knowledge of facility ALARA program	2.5	B
	Total			
Emergency Procedures and Plan	2.4.3	Ability to identify post-accident instrumentation	3.5	B
	2.4.19	Knowledge of EOP layout, symbols and icons	2.7	B
	2.4.29	Knowledge of the emergency plan	2.6	R
	Total			13
Tier 1 Target Point Total (RO/~~SRO~~)				13/~~17~~

Examination Outline
Quality Checklist

Form ES-201-2

Facility: St. Lucie (00-301)

Date of Examination: 2-10-00

Item	Task Description	Initials a	Initials b*	Initials c
1. WRITTEN	a. Verify that the outline(s) fit(s) the appropriate model per ES-401.	TM	L	
	b. Assess whether the outline was systematically prepared and whether all knowledge and ability categories are appropriately sampled.	TM	L	
	c. Assess whether the outline over-emphasizes any systems, evolutions, or generic topics.	TM	L	
	d. Assess whether the repetition from previous examination outlines is excessive.	TM	L	
2. SIM	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.	TM	L	
	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.	TM	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.	TM	L	
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.	TM	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.	TM	L	
	c. Verify that the required administrative topics are covered, with emphasis on performance-based activities.	TM	L	
	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.	TM	L	
4. GENERAL	a. Assess whether plant-specific priorities (including PRA and IPE insights) are covered in the appropriate exam section.	TM	L	
	b. Assess whether the 10 CFR 55.41/43 and 55.45 sampling is appropriate.	TM	L	
	c. Ensure that K/A importance ratings (except for plant-specific priorities) are at least 2.5.	TM	L	
	d. Check for duplication and overlap among exam sections.	TM	L	
	e. Check the entire exam for balance of coverage.	TM	L	
	f. Assess whether the exam fits the appropriate job level (RO or SRO).	TM	L	

	Printed Name / Signature	Date
a. Author	TIM BOLANDEN / Tmm /	11-24-99
b. Facility Reviewer(*)	Ron Lauver /	11-24-99
c. Chief Examiner	D.C. Payne /	12/3/99
d. NRC Supervisor	G.T. Hopper /	2/3/00

(*) Not applicable for NRC-developed examinations.

FINAL SUBMITTAL

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

FEBRUARY 7 - 11, 2000

NUREG-1021 - ES-501

FINAL AS GIVEN
OPERATOR ACTIONS

F.1.g - FORM ES-D-2
OPERATOR ACTIONS

Rec'd 12/13/99

Below indicate the lineup and roles of the Candidates and Standin's.

Scenario 1	Scenario 1	Scenario 2
SRO-U (G. Loudakis)	SRO-U (R. Bashwinner)	SRO-I (J. Hessling)
Board RCO (C. Oliver)	Board RCO (J. Hessling)	Board RCO (Stand-In 1)
BOP RCO (Stand-In 1)	BOP RCO (Stand-In 2)	BOP RCO (C. Oliver)

Enclosed are the corrected copies of the Written exam sample plans with headers of St. Lucie (00-301) etc. The sample plans reflect your comments and we also Identified the following error:

On SRO Tier 2 Grp. 2: 062 K4.04 This is an error because: 062 is AC electrical and K4.04 was Knowledge of DC bus designated trips. Didn't make sense so we changed K4.04 to A2.04: Ability / impact of de-energizing a bus. This also resulted in the same K/A, same Tier/Group for the RO sample plan to change to 'Both' question from a RO only question.

Scenario outlines included to reflect some minor changes due to validation on 12/4/99.

I have also included the Transient and Event Checklists to reflect each candidate (RCO, SRO-I, SRO-U1, SRO-U2)

V/R

Facility: St. Lucie 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-RO 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

Op-Test No.: 1 Scenario No.: 1 Event No.: 1 Page 2 of 12

Event Description: Power decrease from 100% to 90%

Time	Position	Applicant's Actions or Behavior
	BOP	Refers to appropriate procedure for decrease of turbine and reactor power: NOP-2-0030125, "Turbine Shutdown - Full Load to Zero Load"
		Operates DEH to decrease turbine load
		Monitors secondary parameters during power change
	RO	Places pressurizer on recirc IAW NOP-2-0030123, "Reactor Operating Guidelines during Steady State and Load Changes"
		Starts second Charging Pump IAW 2-NOP-02.02, "Charging and Letdown."
		Operates CVCS and BCC to decrease RCS temperature IAW 2-NOP-02.24, "Boron Concentration Control."
		Operates control rods to maintain ASI at 100% value
		Remains cognizant of RCS parameters during power increase
	SRO	Performs shift brief prior to power decrease
		Directs RO to place pressurizer on recirc and start additional charging pump
		Directs RO to maintain ASI at 100% value
		Directs RO to decrease RCS temperature by CVCS addition
		Directs BOP to decrease turbine power by DEH
		Notifies System of impending power decrease

Op-Test No.: 1 Scenario No.: 1 Event No.: 2 Page 3 of 13

Event Description: DEH power supply failure, turbine control swaps to manual **(Examiner must cue trigger at 98.5%)**

Time	Position	Applicant's Actions or Behavior
	BOP	Recognizes DEH in manual control, loss of control power.
		Reduce turbine power using DEH in manual using ONP2-22.03 DEH Off-Normal procedure
		Recognizes 2B heater high amps and low flow alarms
		Manually trips 2B heater drain pump on high amps if not already tripped
		Communicates with RO as to when turbine power must be decreased
	RO	Recognizes RCS temperature is decreasing, turbine power not automatically decreasing, mismatch developing.
		Recognizes DEH in manual control
		Recognizes 2B heater drain pump is tripped
		Communicates with BOP as to when turbine power must be decreased to remain constant with RCS Tavg
		Borates RCS to reduce temperature, Inserts CEAs for rapid temperature control if required.
	SRO	Recognizes DEH in manual control, Implements DEH Off-Normal Procedure . ONP 2-22.03
		Contact I&C for assistance with Turbine DEH condition
		Directs BOP to continue with power reduction in manual DEH control
		Recognizes 2B heater high amps and low flow alarms
		Directs BOP to manually trip 2B heater drain pump
		Directs RO and BOP to perform a rapid downpower due to the 2B heater drain pump trip to 90% power. (Rapid downpower may not be necessary to prevent trip on low S/G level.
		Recognizes the turbine stopped, boration still in progress. Direct termination of Boration.

Op-Test No.: 1 Scenario No.: 1 Event No.: 3

Event Description: PT-1100X setpoint (selected pressurizer pressure controller) drifts high, **(Examiner must cue trigger)**

Time	Position	Applicant's Actions or Behavior
	RO	Recognizes PT-1100X setpoint drifting high or actual pressurizer pressure increasing
		Swaps to operable alternate channel (PIC-1100Y) (May place Spray Controller HIC-1100 in manual to stop event)
		Recognizes and reports Entry into DNB Tech Spec LCO Action statement T.S. 3.2.5 P ¾ 2-14 (<2225 psi)
		Places HIC-1100 in manual
		Restores pressurizer pressure to normal value (2250 psia)
		(if time allows) Resets, Restores Pressurizer Heaters and returns HIC-1100 to Automatic Control.
		Secures dilution (optional)
	BOP	Recognizes PT-1100X setpoint drifting high or actual pressurizer pressure increasing
		Refers to ONOP 2-0120035, "Pressurizer Pressure and Level"
		Secures turbine increase (optional)
		Assists RO in monitoring RCS parameters

Op-Test No.: 1 Scenario No.: 1 Event No.: 3 Page 5 of 12

Event Description: PT-1100X setpoint (selected pressurizer pressure controller) drifts high.

Time	Position	Applicant's Actions or Behavior
	SRO	Recognizes PT-1100X setpoint drifting high or actual pressurizer pressure increasing
		Directs RO to swap pressure channels to PIC-1100Y
		Directs RO to take manual control of pressurizer pressure by placing HIC-1100 in manual and increasing spray flow
		Directs RO and BOP to stop power decrease (optional, if not already done)
		Refers to ONOP 2-0120035, "Pressurizer Pressure and Level"
		Recognizes and Reviews Entry into DNB Tech Spec LCO Action statement T.S. 3.2.5 P ¾ 2-14(<2225 psi)
		Directs RO to restore pressurizer pressure to normal value (2250 psia)
		Notifies I&C or RMS to report pressure channel failures
		Notifies Plant Management

Op-Test No.: 1 Scenario No.: 1 Event No.: 4 Page 6 of 12

Event Description: LT-9011(2A S/G LT Develops Noise Signal causing the valve to cutoff feedwater flow)

Time	Position	Applicant's Actions or Behavior
	BOP	Recognize LT-9011 is malfunctioning, or 2A steam generator level is Decreasing.
		Transfer FIC-9011 to manual and control 2A steam generator level manually
		Stops turbine increase (optional if not already done)
		Restores 2A steam generator level to normal value (60-70% NR)
	RO	Recognize LT-9011 is malfunctioning or decreasing 2A steam generator level
		Refers to ONOP 2-0700030, Main Feedwater
		Stops dilution (optional if not already done)
		Monitors plant parameters during transient
	SRO	Recognize LT-9011 is malfunctioning or decreasing 2A steam generator level
		Directs BOP to take manual control of 2A steam generator level
		Refers to ONOP 2-0700030, Main Feedwater
		Directs RO and BOP to stop power decrease (optional, if not already done)
		Directs BOP to restore 2A steam generator level to normal value (60-70% NR)
		Notifies I&C or RMS of level channel failure
		Notifies Plant Management

Op-Test No.: 1 Scenario No.: 1 Event No.: 5 Page 7 of 12

Event Description: Reference leg for LT-1110X ruptures (common leg failure)
(Examiner must cue trigger)

Time	Position	Applicant's Actions or Behavior
	RO	Recognizes common leg failure by the following indications: LT-1110 X fails high, PT-1100X fails low, reactor cavity leakage increases.
		Notifies SRO of increasing reactor cavity leakage, and decreasing Pressurizer pressure.
		Starts a third charging pump as RCS leakage increases. May take manual control of letdown. (pressure affected more than level, 3rd pump start may not occur)
		Isolates letdown as RCS leakage increases
		Operates CVCS and control rods to decrease reactor power and temperature as directed by SRO
	BOP	Recognizes common leg failure by the following indications: LT-1110 X fails high, PT-1100X fails low, reactor cavity leakage increases.
		Refers to ONOP 2-0120035, "Pressurizer Pressure and Level"
		Refers to 2-ONP-22.01, "Rapid Downpower"
		Operates DEH in Manual to reduce turbine power
		Manually trips reactor and turbine when pressurizer level can no longer be maintained
		Refers to "RCS Leakage ONP" for guidance if time allows.

Op-Test No.: 1 Scenario No.: 1 Event No.: 5 Page 8 of 12

Event Description: Reference leg for LT-1110X ruptures (common leg failure)

Time	Position	Applicant's Actions or Behavior
	SRO	Recognizes common leg failure by the following indications: LT-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.

Op-Test No.: 1 Scenario No.: 1 Event No.: 6 Page 9 of 12

Event Description: Small break LOCA, Loss of Offsite Power on reactor trip

Time	Position	Applicant's Actions or Behavior
	RO	Manually trips the reactor when pressurizer pressure can no longer be maintained
		Perform systematic board walkdown
		Perform Standard Post Trip actions (2-EOP-1)
		Report all safety function status to SRO
		Verifies B train SI actuation
		Performs a plant cooldown and depressurization when directed by SRO
	<u>Critical Task</u>	Recover HPSI flow to the core for inventory control.
	BOP	Manually trips the reactor and turbine when pressurizer level can no longer be maintained
		Perform systematic board walkdown
		Perform Standard Post Trip actions (2-EOP-1)
		Report all safety function status to SRO
		Performs safety function status checks for 2-EOP-3 (If STA is unavailable)
		Verifies SI flow per 2-EOP-99, Figure 2
		Notifies NPO to restore instrument air per 2-EOP-99, Appendix H
		Open ADVs Manually to provide heat removal flowpath due to loss of SBCS. (reduce pressure below SG SRV lift pressure)

Op-Test No.: 1 Scenario No.: 1 Event No.: 6 Page 10 of 12

Event Description: Small break LOCA, Loss of Offsite Power on reactor trip

Time	Position	Applicant's Actions or Behavior
	SRO	Directs RO and BOP to manually trip reactor and turbine when pressurizer level can no longer be maintained
		Directs RO and BOP in the performance of 2-EOP-1
		Performs shift brief and directs entry into 2-EOP-03, "Loss of Coolant Accident," (EOP-15 acceptable if recognized early that No HPSI is available)
		Directs BOP or STA to perform safety function status checks for 2-EOP-3
		Directs RO to perform a plant cooldown and depressurization
		Contacts Chemistry to perform steam generator samples
		Directs BOP to contact NPO and restore instrument air
		Directs verification of 2-EOP-99, Figure 2 (SI flow)

Op-Test No.: 1 Scenario No.: 1 Event No.: 7 Page 11 of 12

Event Description: 2B HPSI pump becomes air bound when started on SIAS, loss of all High Pressure Safety Injection
(Examiner must cue trigger) When called to investigate HPSI pp. SNPO must communicate to crew 'pump is very quiet and no discharge pressure'

Time	Position	Applicant's Actions or Behavior
	RO	Recognizes 2B HPSI pump amps fluctuating and no flow
		Stops 2B HPSI pump
		Notifies SRO that there is currently no SI flow
		Monitors plant parameters and continues cooldown and depressurization
	Critical Task	Recover HPSI flow to the core for inventory control.
	BOP	Recognizes no HPSI flow
		Contacts SNPO to investigate
		Performs safety function status checks for 2-EOP-3 or EOP-15 (If STA is unavailable)
		Reports to SRO that multiple safety functions are not being met (RCS inventory control and RCS pressure control)
		Assists RO with maintenance of safety functions as directed by SRO
		Notifies SNPO to vent 2B HPSI pump
	Critical Task	Starts 2B HPSI pump after vent to establish SI flow for one train per 2-EOP-99 Figure 2

Op-Test No.: 1 Scenario No.: 1 Event No.: 7

Event Description: 2B HPSI pump becomes air bound 10 minutes after SIAS, loss of all High Pressure Safety Injection

Time	Position	Applicant's Actions or Behavior
	SRO	Recognizes 2B HPSI pump amps fluctuating and no flow
		Directs RO to stop 2B HPSI pump
		Contacts Mechanical Maintenance to investigate (air bound) 2B HPSI pump
		Directs entry into 2-EOP-15, "Functional Recovery" if HPSI flow is not restored within 15 minutes of loss
	Critical Task	Directs outside operator to vent 2B HPSI pump when notified the pump is air bound
		Termination point: 2B HPSI pump is vented and running and SI flow per 2-EOP-99, Figure 2 is met.
		NOTE: SRO must identify Safety Function not met and take aggressive action to regain ECCS flow to meet Safety Function.

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.

Facility: St. Lucie Scenario No.: 2 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 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	2	I-RO	HIC-1100 (pressurizer spray controller) input fails high
4	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)
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	C	Loss of instrument air on reactor trip, Loss of CCW to RCPs, all 4 must be secured in 10 minutes
9	7	C	2C Auxiliary Feedwater pump trips 10 minutes after AFAS

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

Op-Test No.:1 Scenario No.: 2 Event No.: 1 Page 2 of 10

Event Description: PCV-8801 (Steam bypass control valve) drifts open
(Examiner 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 reactor power
		Directs NPO to manually isolate PCV-8801
	RO	Recognizes reactor power increasing
		Recognizes RCS temperature decreasing
		Assists BOP in investigation of event
		Monitors plant parameters while transient in progress
	SRO	Recognizes reactor power increasing (may exceed T.S.
		Recognizes RCS temperature decreasing
		Directs BOP to reduce reactor power by operation of DEH
		Directs the isolation of PCV-8801
		Notifies I&C or RMS of the event
		Notifies Management of the event

Op-Test No.: 1 Scenario No.: 2 Event No.: 2 Page 3 of 10

Event Description: Power decrease from 100% to 45% to remove 2B Mn. Feedwater PP. **IF Operator (as Operations Manager), inform SRO to downpower to remove 2B Main Feedwater Pump from service due to increasing oil leakage.**

Time	Position	Applicant's Actions or Behavior
	BOP	Refers to appropriate procedure for decrease of turbine and reactor power: NOP-2-0030125, "Turbine Shutdown - Full Load to Zero Load"
		Operates DEH to decrease turbine load
		Monitors secondary parameters during power change
	RO	Places pressurizer on recirc IAW NOP-2-0030123, "Reactor Operating Guidelines during Steady State and Load Changes"
		Starts second Charging Pump
		Operates CVCS to decrease RCS temperature
		Operates control rods to maintain ASI to curve
		Remains cognizant of RCS parameters during power increase
	SRO	Performs shift brief prior to power decrease
		Directs RO to place pressurizer on recirc and start additional charging pump
		Directs RO to maintain ASI to curve
		Directs RO to decrease RCS temperature by CVCS addition
		Directs BOP to decrease turbine power by DEH
		Notifies System of impending power decrease

Op-Test No.:1 Scenario No.: 2 Event No.: 3 Page 4 of 10

Event Description: HIC-1100 (pressurizer spray controller) input fails high
(Examiner must cue trigger)

Time	Position	Applicant's Actions or Behavior
	RO	Recognizes RCS pressure decreasing (if alarm comes in first, use of annunciator summary)
		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 sprays
		Restores RCS pressure to normal value (2250 psia)
		Stops boration (optional)
	BOP	Refers to ONOP 2-0120035, "Pressurizer Pressure and Level"
		Monitors plant parameters during transient
		Stops turbine decrease (optional)
	SRO	Recognizes HIC-1100 has failed high
		Refers to ONOP 2-0120035, "Pressurizer Pressure and Level"
		Directs RO to control pressurizer pressure by manual control of heaters and sprays
		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

Op-Test No.: 1 Scenario No.: 2 Event No.: 4 Page 5 of 10

Event Description: LCV-2110P (pressurizer level control valve) fails open. V2515 Hi-Temp interlock is disabled to ensure Letdown will not automatically isolate if hi-temp setpoint is reached. (should be transparent) **(Examiner must cue trigger)**

Time	Position	Applicant's Actions or Behavior
	RO	Recognizes letdown flow increasing (if annunciator comes in, use of the annunciator summary)
		Identifies LCV-2110 open
		Recognizes High Letdown Flow. Pressurizer level lowering
		Manually Isolates Letdown and secures charging
		Secures boration (if not already done)
		Monitors plant parameters after transient occurs
	BOP	Recognizes loss of Letdown and Charging
		Refers to 2-ONP-02.03, "Charging and Letdown"
		Secures turbine decrease (if not already done)
		Assists RO in monitoring plant parameters after transient occurs

Op-Test No.:1 Scenario No.: 2 Event No.: 4

Event Description: LCV-2110P (pressurizer level control valve) fails open. V2515 Hi-Temp interlock is disabled to ensure Letdown will not automatically isolate if hi-temp setpoint is reached. (should be transparent) **(Examiner must cue trigger)**

Time	Position	Applicant's Actions or Behavior
	SRO	Recognizes loss of Letdown and Charging
		Refers to 2-ONP-02.03, "Charging and Letdown"
		Directs RO and BOP to secure power decrease (if not already done)
		Notifies I&C Supervisor
		Notifies plant management

Op-Test No.:1 Scenario No.: 2 Event No.: 5 Page 7 of 10

Event Description: Restoration of charging and letdown

Time	Position	Applicant's Actions or Behavior
	BOP	Restores charging and letdown IAW 2-ONP-02.03, "Charging and Letdown"
	RO	Monitors plant parameters while restoration of charging and letdown is taking place
	SRO	Works with BOP as procedure reader or in a position of oversight while restoration of charging and letdown is taking place

Op-Test No.:1	Scenario No.: 2 Event No.: 6	Page 8 of 10

Event Description: PT-10-8 (condenser vacuum pressure transmitter) sensing line failure, loss of condenser vacuum **(Examiner must cue trigger)**

Time	Position	Applicant's Actions or Behavior
	BOP	Recognizes condenser vacuum is decreasing (if annunciator comes in, use of the annunciator summary)
		Operates DEH to perform rapid downpower as directed by SRO
		Notifies SRO of actual condenser backpressure values during execution of rapid downpower.
		Ensures condenser backpressure does not exceed 5.5" HG with unit above 30% power.
		Trips reactor and turbine when condenser backpressure reaches 5.5" HG.
	RO	Recognizes condenser vacuum is decreasing
		Operates CVCS to perform rapid downpwer as directed by SRO
		Monitors plant parameters with transient in progress
		Trips reactor when condenser backpressure reaches 5.5" HG
	SRO	Recognizes condenser vacuum is decreasing
		Refers to ONOP 2-0610031, "Loss of Condenser Vacuum"
		Directs RO and BOP to perform a rapid downpower IAW 2-ONP-22.01," Rapid Downpower"
		Remains cognizant of condenser backpressure values during transient
		Ensures condenser backpressure does not exceed 5.5" HG with unit above 30% power
		Directs RO and BOP to trip the reactor and turbine when condenser backpressure reaches 5.5" HG

Op-Test No.:1 Scenario No.: 2 Event No.: 7 Page 9 of 10

Event Description: 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, Main Feed isolation valves fail to close on AFAS/MSIS. Complete Loss of Instrument Air due to rupture of Turbine Header. Loss of Instrument Air causes loss of CCW to running RCPs

Time	Position	Applicant's Actions or Behavior
	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 2C pump Trips
		Contact NPO to investigate 2C AFW pump trip
		Emergency Borate per ONP 2-ONP-2.02 if directed
		Stop 1 RCP prior to 500 ºF Tc
	Critical Task	Stop all RCPs 10 minutes after Loss of all CCW
	Critical Task	Stabilize RCS temperature after 2A Steam Generator 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-EOP-5, "Excess Steam Demand or 2-EOP-15, "Functional Recovery" (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"
		Recognize no AFW flow to either steam generator
	Critical Task	Contact NPO to crosstie the A and B auxiliary feedwater headers **OR** reestablish flow with 2C AFW pump
		Isolates 2A Steam Generator IAW 2-EOP-99, Appendix R

Op-Test No.:1 Scenario No.: 2 Event No.: 7 Page 10 of 10

Event Description: 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, Main Feed isolation valves fail to close on AFAS/MSIS. Complete Loss of Instrument Air due to rupture of Turbine Header. Loss of Instrument Air causes loss of CCW to running RCPs

Time	Position	Applicant's Actions or Behavior
	SRO	Directs RO and BOP to perform systematic board walkdown
		Directs the performance of 2-EOP-1
		Directs 1 RCP stopped prior to 500 ºF Tc.
		Direct Emergency Boration per ONP 2-ONP-2.02
		Directs all RCPs stopped 10 minutes after Loss of all CCW
		Directs entry into 2-EOP-5, Excess Steam Demand"
		Directs RO to throttle AFAS after actuation
		Directs BOP to perform safety function status checks for 2-EOP-5 (if STA is unavailable)
		Directs RO to stabilize RCS temperature and pressure after 2A Steam Generator blows dry
		Recognizes loss of instrument air
		Notifies HP to perform secondary surveys due to loss of sampling capability (loss of I/A)
		Recognizes loss of 2C AFW pump
		Directs BOP to carry out actions of 2-NOP-09.02, "Auxiliary Feedwater"
	Critical Task	Directs BOP to crosstie the A and B auxiliary feedwater headers **OR** reestablish flow using 2C AFW pump
		Directs entry into 2-EOP-15, "Functional Recovery" upon loss of feedwater (optional; feed must be restored within 15 minutes)
		Directs BOP to isolate 2A Steam Generator IAW 2-EOP-99, Appendix R
		Termination Point: AFW recovered, 2A S/G isolated, RCS temperature and pressure is stable.

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.

FINAL SUBMITTAL

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

FEBRUARY 7 - 11, 2000

NUREG-1021 - ES-501 - F.1.g

FINAL AS-GIVEN JPMs FOR EACH

WALK-THROUGH TEST

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: ______________________________ Time Start ________
Name Time Finish ________

Performance Rating: Sat ______ Unsat ______

Examiner: ______________________ **Signature:** ________________
Name

Reference Material Needed:

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)

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)

Answer Key

	Column 1 values	Column 2 values	Difference
Power Defect	1390 PCM (± 10 PCM)	N/A	+1390 PCM
Xenon Worth	2427 PCM (± 25 PCM)	2703 PCM	-276 PCM
Sam/Nep Worth	754 PCM (± 10 PCM)	770 PCM	-16 PCM
Boron Worth	8514 PCM (± 50 PCM)	8881 PCM	-367 PCM
CEA Reactivity	8139 PCM (± 20 PCM)	7292 PCM	- 347 PCM
Net Reactivity			+384 PCM
Total Change in Boron			+45 PPM
ECC Boron Concentration			+1085 PPM (± 15 PPM)

CEA position at -1000 PCM (mode 2 entry)	30" on group 5
CEA position at +500 PCM	137' on group 7 (ARO)
CEA position at -500 PCM	60" on group 6

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: ______________________________ Time Start ________
Name
Time Finish ________

Performance Rating: **Question 1** Sat ______ Unsat ______
Question 2 Sat ______ Unsat ______

Examiner: ______________________ **Signature:** ________________
Name

Comments

Question #1
(Reference allowed)

The following are the schedules for three operators. Determine if overtime guidelines have been exceeded. Assume the operators were on vacation prior to reporting back to work and times reported to work are times turnover meeting started. The Overtime Limit Tracker is not available.

Operator # 1	Operator # 2	Operator # 3 (Sun./Mon.)
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	(Fri./Sat.) Sat. 2300- 0900	(Fri./Sat.) Sat. 2230- 0800
Sun. OFF	Sun. 2300-1200	Sun. 1500-2300

Question #1 Expected Response
(each scenario is worth 2 points for a total of 10 points)

Operator #1 - 3 Violations: >16 in a 24 hour period (Wed-Thurs), (**2 points**)
> 24 hrs in a 48 hr period (Tues-Wed, Wed-Thurs), (**2 points**)
<8 hrs rest Thursday morning. (**2 points**)

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

Operator #3 - 1 Violation: < 8 hrs rest on Sat and Sun (**2 points**)

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. Assume the operators were on vacation prior to reporting back to work and times reported to work are times turnover meeting started. The Overtime Limit Tracker is not available.

Operator # 1	Operator # 2	Operator # 3
Mon. 0700-1700	Mon. 1500-0300	(Sun./Mon.) 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	(Fri./Sat.) Sat. 2300-0900	(Fri./Sat.) Sat. 2230-0800
Sun. OFF	(Sat./Sun.) Sun. 2300-1200	Sun. 1500-2300

Question #2
CANDIDATE COPY

REFERENCE ALLOWED: ______ YES   X NO

(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?

REGION II
INITIAL LICENSE EXAMINATION
ADMINISTRATIVE SECTION A2
JOB PERFORMANCE MEASURE
ST. LUCIE NUCLEAR PLANT

VERIFY BAM TANK OPERABILITY

CANDIDATE ______________________________

EXAMINER ______________________________

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

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 2-0010125A, Data Sheet 4, "Verification of Boration Flow Paths"

Validation Time __15 minutes__

Candidate: ______________________ Time Start ________
Name Time Finish ________

Performance Rating: Sat ______ Unsat ______

Examiner: ______________________ **Signature:** ______________________
Name

Reference Material Needed:

OP 2-0010125A, 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.

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%	115°F	4140 ppm

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

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

- **2A BAMT MEETS VOLUMN AND CONCENTRATION REQUIREMENTS OF FIGURE 3.1-1.**
- **COMBINED 2A AND 2B BAMT 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	Temperature	Boron Concentration
2A BAMT	75%	110°F	5675 ppm
2B BAMT	92%	115°F	4140 ppm

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

REGION II
ST. LUCIE NUCLEAR PLANT
INITIAL LICENSE EXAMINATION
ADMINISTRATIVE SECTION A3
QUESTIONS

CANDIDATE ______________________________

EXAMINER ______________________________

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"

Candidate: ______________________________ Time Start __________
Name
Time Finish __________

Performance Rating: **Question 1** Sat ______ Unsat ______
Question 2 Sat ______ Unsat ______

Examiner: ______________________ **Signature:** ____________________
Name

Comments

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: ______ 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

REFERENCE ALLOWED: ______ **YES** **NO** __X__

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

What is the criteria that would require Health Physics to post an area as an "Airborne Radioactivity Area"?

ST. LUCIE PLANT UNIT NO. 2
HPS-207
CHARGING PUMPS
ELEVATION -0.5 FT.

DATE ____________

TIME ____________

MONITOR ____________

SMEARS (dpm/100cm²)

1 <1K
2 3K
3 <1K
4 <1K
5 2K
6 <1K
7
8
9
10
11
12
13
14
15
16
17
18
19
20

Remarks ____________

Reviewed ____________

S 2 OPS

DATE ____________ SYS HP

DOCT HPS-207 COMP ____________

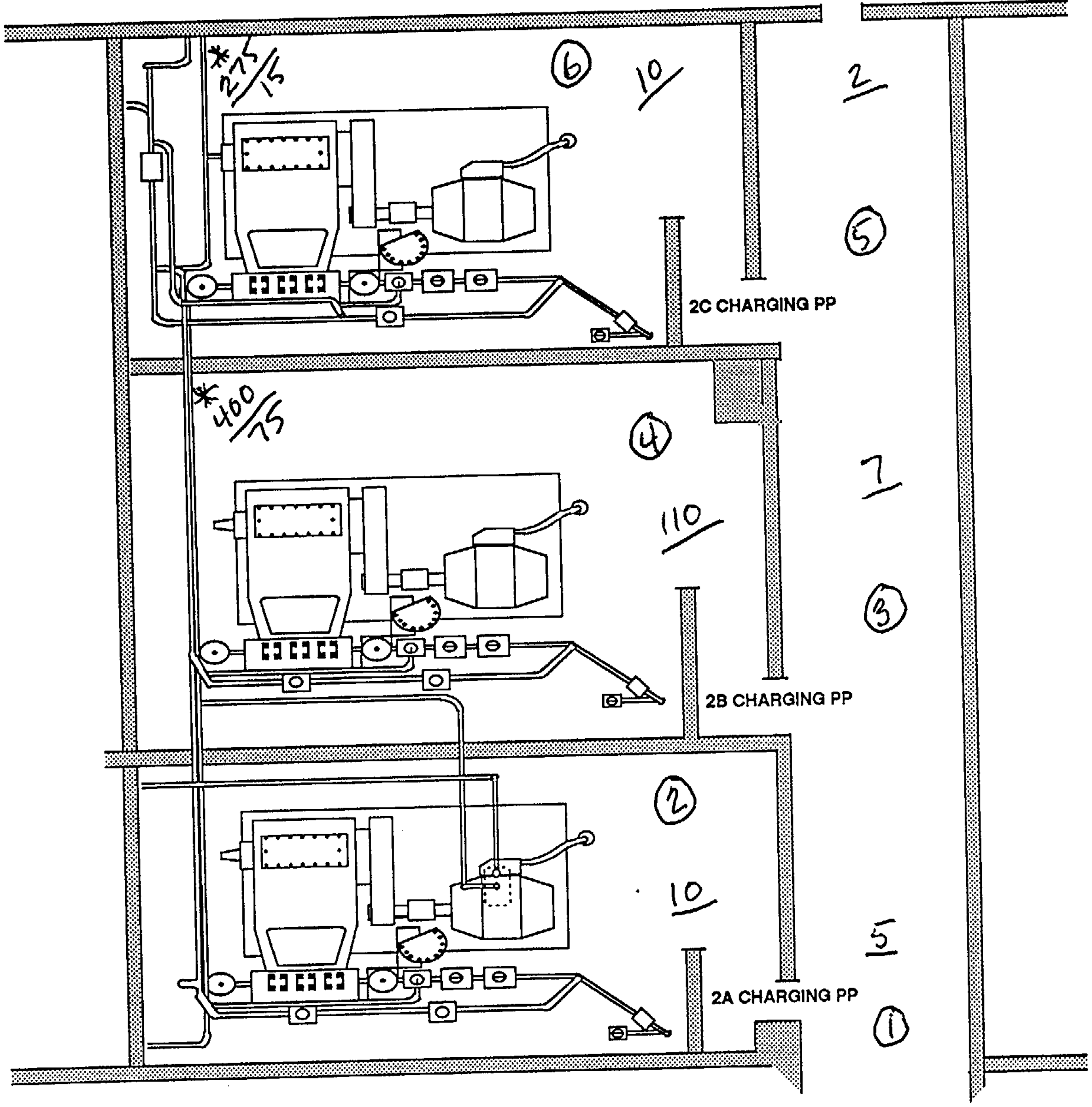
DOCN ____________ ITM ____________

AREA POSTINGS (KEY)

Contaminated Area	(C)	Radiation Area	(R)
High Rad. Area	(H)	RWP for Entry	(E)
Rad. Material Area	(M)	Gate Locked	(L)
Airborne Activity	(A)	No TLD Required	(N)
Exclusion Area	(X)	Hot Particles	(P)

ALL READINGS IN MR/HR UNLESS OTHERWISE NOTED

INST.	#	CAL DUE	BKG cpm	MDA dpm



DEPT/HP/910283

REGION II
INITIAL LICENSE EXAMINATION
ADMINISTRATIVE A4
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 #: K2.4.29 - 2.6 / 4.0

Facility JPM #: New

Task Standard: 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: ______________________________ 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 2.

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 at 9:17 am. The NPS made the E-Plan declaration at 9:33. The event was classified as a Site Area Emergency. Chemistry has not yet reported release data. All plant equipment is operable, there are no injuries and a plant cooldown is in progress.

NOTE: The following Meteorological conditions are to be given when Candidate accesses the data on ERDADS. (page 4 of this JPM has the following stand alone Met Data that can be given to the candidate. NOTE: This JPM is based on the below data, NOT the simulator ERDADS data.)

Meteorological conditions:	
Wind Speed:	**6 mph**
Wind direction:	**56°**
60 meter temp:	**86.3° F**
10 meter temp:	**87.5° F**

Initiating Cues: Complete the State of Florida Notification Form for a Site Area Emergency.

Meteorological conditions:

Wind Speed:	**6 mph**
Wind direction:	**56°**
60 meter temp:	**86.3° F**
10 meter temp:	**87.5° F**

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

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 at 9:17 am. The NPS made the E-Plan declaration at 9:33. The event was classified as a Site Area Emergency. Chemistry has not yet reported release data. All plant equipment is operable, there are no injuries and a plant cooldown is in progress.

INITIATING CUE:

Complete the State of Florida Notification Form for a Site Area Emergency

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

MAKE PROTECTIVE ACTION RECOMMENDATIONS
(SRO)

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

Task Standard: 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 due to a large break LOCA in progress.

NOTE: Below conditions are on separate pages (Page 4 and 5) to be given to the Candidate when asked for.

CET temperature is 600°F
Wind direction is 146 degrees
Wind speed is 15 mph.
60 Meter temp. 86.3 °F
10 Meter temp. 87.5 °F

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).

Plant conditions and Met. Data:

CET temperature is 600°F
Wind direction is 146 degrees
60 Meter temp. 86.3 °F
10 Meter temp. 87.5 °F
Wind speed is 15 mph.

OFFSITE DOSE READINGS FROM CHEMISTRY

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

CANDIDATE CUE SHEET

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

Initial Conditions: A General Emergency has been declared due to A large break LOCA in progress.

Initiating Cues: Make the appropriate Protective Action Recommendations for this event

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: ________________________________ Time Start __________
Name Time Finish __________

Performance Rating: Sat _______ Unsat ______________

Examiner: ________________________ **Signature:** ____________________

Tools/Equipment/ Procedures Needed:
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 complete.
- 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 ________

Step 1: Review Limits and Precautions, Check System Alignment for Testing. 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) 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:	Sat ____ Unsat ____
Step 2: Depress and hold the AB Matrix Relay Hold pushbutton and verify that the four Hold lights are lit. (step 7.5.3A) Standard: Operator depresses and holds the Matrix Relay Hold pushbutton, observes the four hold lights to be illuminated 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.	**Critical Step** Sat ____ 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 7.5.3C) Standard: Operator places the Channel Trip select switch to position 1, verifies the four AB Matrix Relay lights are OFF Cue: (RPS panel A) **Channel Trip select switch to position 1, all four white AB Matrix Relay lights not illuminated*** Comments:	**Critical Step** Sat ____ Unsat __

Step 4: Place the AB Matrix Relay Trip Select switch to position 1 and verify the following lights change status: (step 7.5.3D)
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 ____

Standard: Notify ANPS of Logic Matrix failure.
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

Cue: ANPS acknowledges failure
(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

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 5: *Back out of the RPS logic Matrix test by performing the following:*
Rotate the channel trip select switch to the OFF position
(Appendix-A, Shift Brief; Step 1.E.2.a Safe Condition 3-steps.)

Critical Step

Sat ____

Unsat ____

Standard: Operator rotates the channel trip select switch to the OFF position

Cue: (RPS panel A)
Channel trip select switch in OFF*

Comments:

Step 6: Slowly release the Matrix Hold pushbutton (Appendix-A, Shift Brief; Step 1.E.2.a Safe Condition 3-steps.) Standard: Operator releases the Matrix Hold pushbutton Cue: (RPS panel A) **Matrix Hold pushbutton released*** Comments:	**Critical Step** Sat _____ Unsat ____
Step 7: Rotate the Matrix Relay Trip select switch to the OFF position (Appendix-A, Shift Brief; Step 1.E.2.a Safe Condition 3-steps.) Standard: Operator rotates the Matrix Relay Trip select switch to the OFF position Cue: (RPS panel A) **Matrix Relay Trip select switch in OFF*** JPM can be terminated when all backout steps are complete. 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.	**Critical Step** Sat _____ Unsat ____

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 complete.
- 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.

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 __X__ Simulate _____

References: OP 2-0410021, "Safety Injection Tank Normal Operation"

Validation Time __15 minutes__ **Time Critical** __No__

Candidate: ______________________________ Time Start _________
Name Time Finish _________

Performance Rating: Sat ______ Unsat ______ Question Grade ______

Examiner: ______________________________ **Signature:** ____________________
Name

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 ________

Step 1: Prior to filling SITs, ensure makeup water is between 1720 and 2100 ppm boron (step 8.3.1) Standard: Operator verifies RWT boron concentration between 1720 and 2100 ppm by contacting Chemistry or looking at Chemistry report Cue: **(Chemistry): RWT boron is 1900 ppm*** Comments:	Sat _____ Unsat _____
Step 2: Ensure the loop SI headers are less than 1100 psig by verifying the absence of SI header high pressure annunciators (step 8.3.2) Standard: Operator observes absence of SI header high pressure annunciators Cue: (RTGB 206) **(No SI header high pressure annunciators present)*** Comments:	Sat _____ Unsat _____
Step 3: If dilution of the SI header is indicated, then recirc the header per section 8.6.2 (step 8.3.3) Standard: Operator observes no backleakage from RCS loop check valve indicated Cue: **(ANPS): No loop check valve leakage indicated*** Comments:	Sat _____ Unsat _____
Step 4: Start the 2A HPSI pump (step 8.3.4) Standard: Operator announces and starts the 2A HPSI pump by placing the control switch to START Cue: (RTGB 206) **(2A HPSI indicates red light illuminated, amps stable) *** Comments:	**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) Standard: Operator places the control switch for V3621 to the OPEN position Cue: **(V3621 indicates red light illuminated)*** Comments:	**Critical Step** Sat _____ Unsat ____
Step 6: Open HCV-3628 (SI loop check valve leakage valve) (step 8.3.6) Standard: Operator rotates controller knob to obtain full output on controller and observes red light indication Cue: **(HCV-3628 indicates red light illuminated)*** Comments:	**Critical Step** Sat _____ Unsat ____
Step 7: CAUTION: Do not exceed 700 psig on SIT loop pressure indiction Throttle open HCV-3627 (HPSI header isolation valve) (step 8.3.7) Standard: Operator throttles open HCV-3627 while observing 2A1 SIT header loop pressure and ensures not to exceed 700 psig Cue: **(HCV-3627 indicates dual indication, 2A1 SIT loop header pressure <700 psig)*** Comments:	**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 8: Monitor and maintain SIT pressure $\leq$ 565 psig (step 8.3.8) Standard: Operator monitors SIT pressure $\leq$ 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 Cue: **(Pressure < 545 psig, (V3622, V3612, V3632 and V3642 indicate red lights Illuminated, green lights illuminated after pressure decreases < 545 psig)*** Comments: (Candidate may elect to cross-tie SIT vents to equalize pressure during fill)	**Critical Step (if valves are manipulated)** Sat ____ Unsat ____
Step 9: When SIT is filled to desired level, then close HCV-3627 (step 8.3.9) Standard: Operator takes control switch for HCV-3627 to close, observes green light indication Cue: **(HCV-3627 indicates green light illuminated)*** Comments:	**Critical Step** Sat ____ Unsat ____
Step 10: Close V3621 (SIT fill and drain valve) (step 8.3.10) Standard: Operator places control switch for V3621 to CLOSED Cue: **(V3621 indicates green light illuminated)*** Comments:	**Critical Step** Sat ____ Unsat ____
Step 11: Close HCV-3628 (SI loop check valve leakage valve) (step 8.3.11) Standard: Operator rotates controller knob to obtain zero output on controller, and observes green light indicated on HCV-3628 Cue: **(HCV-3628 indicates green light illuminated)*** Comments:	**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 12: Stop 2A HPSI pump and return the control switch to AUTO (step 8.3.12) Standard: Operator places the control switch for the 2A HPSI pump to OFF and then to the AUTO position Cue: **(2A HPSI pump indicates green light illuminated, switch in mid-position)*** Comments:	**Critical Step** Sat ____ Unsat ____
Step 13: Record SIT post fill data on Data Sheet 1 (step 8.3.13) Standard: Operator records post fill data on Data Sheet 1 Cue: **(Data Sheet 1 completed)** Comments:	Sat ____ Unsat ____
Step 14: Notify Tech Staff to perform Data Sheet 25* Standard: Operator contacts Tech Staff to perform Data Sheet 25 Cue: **(Tech Staff): acknowledges the need to perform DS 25*** Terminate JPM when SIT level and pressure are within normal range and Tech Staff is notified to perform DS 25. Comments: **End of Task**	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.

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.

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 __X__ Simulate _____

References: ONOP 2-0440030, "Shutdown Cooling Off-Normal," Rev 35

Validation Time __20 minutes__ **Time Critical** __No__

Candidate: ______________________________ Time Start _________
Name Time Finish _________

Performance Rating: Sat ______ Unsat ______ Question Grade ______

Examiner: ______________________ **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 B train SDC System was secured to investigate high vibration on the 2B LPSI pump. RCS level is 35 feet and constant. 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. RCS temperature is approximately 110º F and slowly rising.

Initiating Cues: The ANPS has directed that 2A Shutdown Cooling flow be restored and RCS temperature stabilized at approximately 110 º F IAW ONOP 2-0440030, Appendix E.

Start Time ________

Step 1: Ensure V3480, V3481 and V3664 hot leg suction valves are open (step 2A page 9 of 14 Appendix E) Standard: Operator verifies V3480, V3481 and V3664 hot leg suction valves are open Cue: (RTGB 206) **V3481 and V3664 indicate red lights illuminated, V3480 indicates green light illuminated*** NOTE: Step 1 completed from initial conditions. Candidate must recognize RCS has not heated up **'EXCESSIVELY'** and level has not dropped. Must start at step 2A. Comments:	Sat ____ Unsat ____
Step 2: Open V3480 (step 2A2, indicates ensure) Standard: Operator places the keyswitch for V3480 to the Open position Cue: (RTGB 206) **V3480 indicates red light illuminated*** Comments:	**Critical Step** Sat ____ Unsat ____
Step 3: Ensure open HCV-14-3A (step 2A3) Standard: Operator verifies HCV-14-3A open Cue: (RTGB 206) **HCV-14-3A indicates red light illuminated*** Comments:	Sat ____ Unsat ____
Step 4: Open HCV-3615 and HCV-3625 (step 2A4) Standard: Operator takes control switches for HCV-3615 and HCV-3625 to Open position Cue: **HCV-3615 and HCV-3625 indicate red lights illuminated*** Comments:	**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: Close HCV-3657 (step 2A5) Standard: Operator places HCV-3657 control switch to Closed Cue: (RTGB 206) **HCV-3657 indicates green light illuminated*** Comments:	**Critical Step** Sat ____ Unsat ____
Step 6: Ensure closed V3444 (step 2A6) Standard: Operator checks closed V3444 Cue: (RTGB 206) **V3444 indicates green light illuminated*** Comments:	Sat ____ Unsat ____
Step 7: Ensure closed V3536 (step 2A7) Standard: Operator checks closed V3536 Cue: (RTGB 206) **V3536 green light illuminated*** Comments:	Sat ____ Unsat ____
Step 8: Place FCV-3306 keyswitch in the Modulate position (step 2A8) Standard: Operator places FCV-3306 keyswitch in the Modulate position or verifies switch in Modulate if already performed Cue: (RTGB 206) **FCV-3306 keyswitch in the Modulate position*** Comments:	**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 9: Close FCV-3306 (step 2A9) Standard: Operator places FCV-3306 control switch to Closed position Cue: (RTGB 206) **FCV-3306 indicates green light illuminated*** Comments:	**Critical Step** Sat ____ Unsat ____
Step 10: Ensure RCS pressure < 275 psia (step 2A10) Standard: Operator observes indications to ensure RCS pressure < 275 psia Cue: (RTGB 206) **RCS pressure indicates 270 psia*** NOTE: If candidate questions if venting of LPSI necessary, state no cavitation was observed, so venting is not needed. Comments:	Sat ____ Unsat ____
Step 11: Start the 2A LPSI pump (step 2A12) Standard: Operator places the control switch for 2A LPSI pump to Start Cue: (RTGB 206) **2A LPSI pump indicates red light illuminated, stable amps after starting surge*** Comments:	**Critical Step** Sat ____ Unsat ____
Step 12: Adjust FCV-3306 to obtain 100 to 200 gpm as indicated on FI-3322 and FI-3312 (step 2A13) 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)** Cue: (RTGB 206) **FCV-3306 positioned, flow 150 gpm*** Comments:	**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 13: When temperature stabilizes, increase flow until desired flowrate is obtained as indicated on FR-3306 (step 2A14) Standard: Operator positions control switch for FCV-3306 to open until flowrate on FR-3306 is 3000 gpm Cue: (RTGB 206) **FCV-3306 has dual indication, 3000 gpm indicated on FR-3306*** **NOTE**: If candidate asks what the 'desired' flow rate should be, examiner should ask the candidate what he/she expects the flow rate should be. 3000 GPM desired flow rate based on Tech. Spec required flow for possible boration/dilution of RCS. **NOTE**: Candidate should monitor RCS temperature while waiting to stabilize. Comments:	**Critical Step** Sat _____ Unsat ____
Step 14: Ensure open V3517, SDC HX to 2A HX valve (step 2A15) Standard: Operator observes V3517 to be in the open position Cue: (RTGB 206) **V3517 indicates red light illuminated*** Comments:	Sat _____ Unsat ____
Step 15: Throttle open HCV-3657, HCV-3615 and HCV-3625 to establish the following: FCV-3306 full closed, 2A SDC loop flow ≥ 1000 gpm, FI-3322 and FI-3312 are within 300 gom of each other (Steps 2A16 a, b and c) Standard: operator throttles open HCV-3657, HCV-3615 and HCV-3625 and verifies FCV 3306 is closed, 2A SDC loop flow ≥ 1000 gpm and loop 2A1 and 2A2 flow indications are within 300 gpm of each other Cue: (RTGB 206) **NOTE:** HCV 3615 and HCV 3625 will probably be fully open from the secured line-up. **HCV-3657, HCV-3615 and HCV-3625 indicate red lights illuminated, flow is > 1000 gpm and loop flows agree within 300 gpm*** Comments:	**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 16: Establish the desired cooldown rate and ensure 2A SDC inlet and outlet warmup rates are <20°F/minute (steps 2A16 d and e) Standard: Operator observes cooldown is established and ensures 2A SDC inlet and outlet warmup rates are <20°F/minute on TR-3351 and TR-3303W Cue: (RTGB 206) **Cooldown rate established, 2A SDC inlet and outlet heatup rates <20°F/minute*** Comments:	Sat ____ Unsat ____
Step 17: Operate the SDC system in the TOTAL flow range of 3000 to 7000 gpm and NOT to exceed 3500 gpm per train Standard: Operator observes flow rate is between 3000 and 3500 gpm Cue: (RTGB 206) **Flow rate is 3300 GPM*** Terminate JPM when flow is between 3000-5000 gpm and a controlled cooldown rate is observed. Comments: **END OF TASK**	**Critical Step** Sat ____ Unsat ____

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:

The B train SDC System was secured to investigate high vibration on the 2B LPSI pump. RCS level is 35 feet and constant. 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. RCS temperature is approximately 110 º F and slowly rising.

INITIATING CUE:

The ANPS has directed that 2A Shutdown Cooling flow be restored and RCS temperature stabilized at approximately 110 º F IAW ONOP 2-0440030, Appendix E.

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: Feed Steam Generators with the AFW System

Alternate Path: **Yes** X **No** ____

Facility JPM #: 0821077A

Task Standard: Manually actuate AFAS and feed the 2A steam generator

Preferred Evaluation Location:

Simulator X Control Room ______ In-Plant _____

Preferred Evaluation Method:

Perform X Simulate _____

References: None

Validation Time 10 minutes **Time Critical** No

Candidate: ______________________ Time Start _________
Name Time Finish _________

Performance Rating: Sat _______ Unsat _______ Question Grade _______

Examiner: ______________________ **Signature:** ____________________
Name

Tools/Equipment/ Procedures Needed:
None

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: 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 secured automatically 3 minutes ago, 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 Standard: Operator places all four AFAS initiation switches to the MANUAL position Cue: (RTGB 203) **All four AFAS initiation switches to MANUAL*** Comments:	**Critical Step** Sat _____ Unsat ____
Step 2: Valves MV-09-9, 1-SE-09-4, MV-09-11 & 1-SE-09-2 open. Standard: Operator observes MV-09-9, 1-SE-09-4 full open, MV-09-11 & 1-SE-09-2 fail to open. No flow indicated on FI-09-2A or FI-09-2C. Cue: (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*** Comments:	**Critical Step** Sat _____ Unsat ____
Step 3: Manually initiate flow to S/G 2A from the 2A OR 2C AFW Pump Standard: Operator obtains key and opens SE-09-2 to establish flowpath from 2A AFW to 2A SG **AND/OR** manually opens MV-09-11 from RTGB to establish flowpath from 2C AFW to 2A SG Cue: (RTGB 203) **NOTE**: Once MV-09-11 comes off seat, the valve will go to full flow position. Candidate must throttle to ≤ 150 GPM for 5 minutes for either flow path initiated (09-11 or 09-2). **MV-09-11 indicates red light illuminated OR SE-09-2 indicates red light illuminated*** Comments:	**Critical Step** Sat _____ Unsat ____
Step 4: Restore S/G 2A Level to 60-70% NR using 2A OR 2C AFW Pump. Standard: Operator throttles AFW flow and observes level increase in the 2A steam generator Cue: (RTGB 203) **2A steam generator level increasing*** Comments:	**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: Notify ANPS that 2A steam generator level is 60%-70% Narrow Range indication Standard: Operator notifies ANPS that 2A steam generator level is 60%-70% Narrow Range indication Cue: **ANPS acknowledges (In the interest of time, this JPM can be terminated at any time after flow is established)*** Comments: **END OF TASK**	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.

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 secured automatically 3 minutes 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).

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

Task Standard: 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 Critical** __No__

Candidate: ____________________ Time Start ________
Name 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:

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 was at 100% power, 5000 EFPH performing the CEA periodic, 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) Standard: Operator remains cognizant of power level at all times Cue: **Power level constant*** Comments:	Sat _____ Unsat ____
Step 2: Place the mode select switch in Manual Individual mode (step 1A) Standard: Operator places mode select switch in Manual Individual Cue: (RTGB 204) **Mode select switch in Manual Individual*** Comments:	**Critical Step** Sat _____ Unsat ____
Step 3: Select the affected CEA on the individual CEA selection switches (step 1B) Standard: Operator selects CEA 57 on the individual CEA selection switches Cue: (RTGB 204) **CEA 57 selected*** Comments:	**Critical Step** Sat _____ Unsat ____
Step 4: Select the group of the affected CEA on the group select switch (step 1C) Standard: Operator selects group 5 on the group select switch Cue: (RTGB 204) **Group 5 selected*** Comments:	**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: Depress and hold the CEA motion inhibit bypass pushbutton (step 1D1) Standard: Operator depresses and holds the CEA motion inhibit bypass pushbutton Cue: (RTGB 204) **Motion inhibit bypass pushbutton depressed*** **NOTE:** Candidate must recognize CEA Motion Inhibit (CMI) is in. Comments:	**Critical Step** Sat ____ Unsat ____
Step 6: Depress and release the bypass enable pushbutton (step 1D2) Standard: Operator depresses and released the bypass enable pushbutton Cue: (RTGB 204) **CMI bypass enabled*** **NOTE:** Candidate must recognize CEA NOT dropped, Step 1E is not applicable. Comments:	**Critical Step** Sat ____ Unsat ____
Step 7: Insert and withdraw the affected CEA and check for smooth operation and normal indications (step 1F) Standard: Operator inserts and withdraws CEA 57 and observes smooth operation and normal indications. Does not exceed + – 10 inches. Cue: (RTGB 204) **CEAs #9 and #10 drop to the bottom of the core*** Comments:	**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 8: Trip the reactor and turbine Standard: Operator, upon indications of 2 additional dropped CEAs, depresses the Reactor trip pushbuttons on RTGB 204 Cue: (RTGB 204) **All rods inserted*** Terminate JPM when Candidate has inserted a Manual Reactor trip and verified all CEA's inserted. Comments: **END OF TASK**	**Critical Step** Sat ____ Unsat ____

Stop Time ________

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.

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 Critical** __No__

Candidate: ______________________________ Time Start _________
Name Time Finish _________

Performance Rating: Sat _______ Unsat _______

Examiner: ______________________ **Signature:** ____________________
Name

Tools/Equipment/ Procedures Needed:
1-EOP-99, Appendix M

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 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) Standard: Operator observes the power available white light is illuminated Cue: (1A H2 recombiner panel behind RTGB 103) **White light illuminated.** Comments:	Sat ____ Unsat ____
Step 2: Place the power adjust potentiometer at 000 (step 3) Standard: Operator simulates rotating the power adjust potentiometer until the value is 000. Cue: (1A H2 recombiner panel behind RTGB 103) **Power adjust potentiometer rotated.** Comments:	**Critical Step** 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) Standard: Operator simulates placing the power on switch to the ON position and observes the red light on the switch illuminates. Cue: (1A H2 recombiner panel behind RTGB 103) **Red light illuminated.** Comments:	**Critical Step** Sat ____ Unsat ____
Step 4: Gradually turn the power adjust potentiometer to 70 KW as indicated on the power out wattmeter (step 5) 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.** Comments:	**Critical Step** Sat ____ Unsat ____

Step 5: Periodically check the temperature of the three thermocouples using the temperature channel selector switch. When temperature reaches 1250°F, then adjust the power adjust potentiometer to maintain temperature between 1250°F and 1400°F

Standard: Operator simulates selecting each temperature control channel by placing the selector switch in each position and observes temperature indication.

Cue: (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)

Comments:

END OF TASK

Critical Step

Sat _____

Unsat _____

Stop Time _________

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.

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

Task Standard: 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: ______________________________ Time Start _________
Name Time Finish _________

Performance Rating: Sat ______ Unsat ______

Examiner: ______________________ **Signature:** ____________________
Name

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 ________

Step 1: 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) Standard: 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. Cue: (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.** **NOTE: If asked about 'B' side components, no Red or Green lights lit.** Comments:	Sat ____ Unsat ____
Step 2: Ensure V3456 1A SDC HX outlet open (step 4B1) Standard: Operator observes V3456 and verifies open indication. Cue: (CRAC Panel) **Red light on, green light off for V3456.** Comments:	Sat ____ Unsat ____
Step 3: Ensure both LPSI pumps are stopped (step 4B2) Standard: Operator observes 1A and 1B LPSI pumps light indication to verify both are stopped Cue: (RTGB 106) **Green light on, red light off for 1A pump. 1B LPSI pump lights off** Comments:	Sat ____ Unsat ____

Step 4: Place FCV-3306 keyswitch in the AUTO position (step 4B3) Standard: Operator simulates placing the keyswitch for FCV-3306 in the AUTO position. Cue: (RTGB 106) **FCV-3306 in AUTO.** Comments:	**Critical Step** Sat ____ Unsat ____
Step 5: With keyswitch in AUTO, take manual control of FIC-3306 and close FCV-3306 (step 4B4) Standard: Operator simulates reducing the output of FIC-3306 to 0%. Cue: (RTGB 106) **Green light on, red light off for FCV-3306.** Comments:	**Critical Step** Sat ____ Unsat ____
Step 6: Close V3206, 1A LPSI discharge isolation (step 4C) Standard: Operator simulates placing keyswitch for V3206 to the CLOSED position. Cue: (CRAC panel) **Green light on, red light off for V3206.** Comments:	**Critical Step** Sat ____ Unsat ____
Step 7: Close V3444, 1A LPSI pump suction isolation (step 4C) Standard: Operator simulates placing the keyswitch for V3444 to the CLOSED position. Cue: (CRAC panel) **Green light on, red light off for V3444.** Comments:	**Critical Step** Sat ____ Unsat ____

Step 8: Open MV-03-1A, Shutdown Cooling warmup valve. (step 4C) Standard: Operator simulates placing the keyswitch for MV-03-1A to the OPEN position. Cue: (CRAC panel) **Red light on, green light off for MV-03-1A.** Comments:	**Critical Step** Sat ____ Unsat ____
Step 9: Open HCV-3480, SDC loop 1A suction valve (step 4C) Standard: Operator simulates placing the keyswitch for HCV-3680 in the OPEN position. Cue: (RTGB 106) **Red light on, green light off for HCV-3480.** Comments:	**Critical Step** Sat ____ Unsat ____
Step 10: Open HCV-3481, SDC loop 1A suction valve (step 4C) Standard: Operator simulates placing the keyswitch for HCV-3681 in the OPEN position. Cue: (RTGB 106) **Red light on, green light off for HCV-3481.** NOTE: Step 4D will be skipped. 1B LPSI pump will not be used. Comments:	**Critical Step** Sat ____ Unsat ____
Step 11: Close ALL LPSI header isolation valves (HCV-3615, HCV-3625, HCV-3635, HCV-3645) (step 4E) Standard: Operator simulates placing the control switches for HCV-3615, HCV-3625, HCV-3635, HCV-3645 in the CLOSED position. Cue: (RTGB 106) **Green lights on, red lights off for all LPSI header isolation valves.** Comments:	**Critical Step** Sat ____ Unsat ____

Step 12: Place HCV-3657, SDC Temp Control, keyswitch to manual (step 4F) Standard: Operator simulates placing the keyswitch for HCV-3657 to the MANUAL position. Cue: (RTGB 106) **HCV-3657 in manual.** Comments:	**Critical Step** Sat ____ Unsat ____
Step 13: Slowly open HCV-3657 using HIC-3657, SDC Temp Control, to maintain a minimum of 250 GPM on FIC-3306 (step 4G) Standard: Operator simulates adjusting HIC-3657 to obtain >250 GPM as indicated on FIC-3306. Cue: (RTGB 106) **Green and red lights on for HCV-3657, 300 GPM indicated on FIC-3306.** Comments:	**Critical Step** Sat ____ Unsat ____
Step 14: Adust the A train HPSI header valves to maintain a total hot and cold leg injection of 250 to 1500 gpm (step 4H) 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 Cue: (RTGB 106) **FT 3312, 3322, 3332, 3342 indicate 90 GPM each** Terminate the JPM when flow is balanced and indicates between 250 and 1500 gpm. Comments: **End of Task**	**Critical Step** Sat ____ Unsat ____

Stop Time ________

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.

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

Task:

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)

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:

Simulator _____ In-Plant ___X__

Evaluation Method:

Perform _____ Simulate __X___

References:

ONOP 1-0120034, Appendix A

Validation Time: 10 min. **Time Critical:** NO

Candidate: ______________________________ NAME

Time Start: ________

Time Finish: ________

Performance Rating: SAT ____ UNSAT ____ Performance Time ____

Examiner: ______________________ NAME ______________________ SIGNATURE /_______ 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.

STANDARD: Remain in compliance with H.P. precautions and recommendations.

INSTRUCTOR NOTE: This is **NOT** to be a rapid entry into the RAB.

EXAMINER'S CUE: ALL HP PRECAUTIONS AND RECOMMENDATIONS HAVE BEEN MET.

COMMENTS:

_____ SAT

_____ UNSAT

STEP 2: Close instrument air supply valve T-V18134 to HCV-14-1.

STANDARD: **CLOSE** IA valve to HCV-14-1.

EXAMINER'S CUE: T-V18134 HAS BEEN TURNED FULLY CLOCKWISE.

COMMENTS:

CRITICAL STEP

_____ SAT

_____ 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

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.",

EXAMINER'S CUE: HOSE ATTACHED FROM NITROGEN TO HCV-14-1 AIR LINE.

COMMENTS:

CRITICAL STEP

_____ SAT

_____ UNSAT

<u>STEP 4:</u> Verify HCV-14-1 has opened. <u>STANDARD:</u> **<u>VERIFY</u>** HCV OPENS **EXAMINER'S CUE: HCV HAS OPENED** <u>COMMENTS:</u>	_____ SAT _____ UNSAT
<u>STEP 5:</u> Ensure hoses are documented in accordance with AP 0010124, "Temporary System Alteration Control". <u>STANDARD:</u> **<u>VERIFY</u>** documentation of TSAs installed in AP 0010124. **EXAMINER'S CUE: TSAs DOCUMENTED.** Terminate JPM when HCV-14-1 is open and candidate has indicated the valve will be documented in the appropriate procedure. <u>COMMENTS:</u>	_____ SAT _____ UNSAT

<u>STOP TIME:</u> _____

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.

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

PERFORM THE ACTIONS OUTSIDE THE CONTROL ROOM REQUIRED TO REOPEN THE PRIMARY COOLANT SAMPLE VALVES – UNIT 2

CANDIDATE____

EXAMINER____

JOB PERFORMANCE MEASURE

Task:

Perform the Actions Outside the Control Room Required to Reopen the Primary Coolant Sample Valves – Unit 2

Alternate Path:

Facility JPM #:

0821095

K/A Rating(s):

A.03.05, (3.0)

Task Standard:

JPM is complete when V5200 and V5203 have been locally positioned to open.

Evaluation Location:

Simulator _____ In-Plant __X___

Evaluation Method:

Perform _____ Simulate __X___

References:

2-EOP-03, "Loss of Coolant Accident"

Validation Time: 15 min. **Time Critical:** No

Candidate: ________________________________
NAME

Time Start: ________
Time Finish: ________

Performance Rating: SAT ____ UNSAT ____ Performance Time ____

Examiner: ______________________ ______________________/________
NAME SIGNATURE DATE

COMMENTS

____

____

____

Tools/Equipment/Procedures Needed:

2-EOP-03, "Loss of Coolant Accident"

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:

A Loss of Coolant Accident has been diagnosed and is in progress.

Both SIAS and CIAS are present.

CCW has been realigned to the 'N" Header.

The ANPS has directed that the RCO coordinate actions with the SNPO and reopen the primary coolant sample valves to allow sampling of the reactor coolant system.

INITIATING CUES:

Perform the actions of the SNPO, under direction of the RCO, to open RCS primary coolant sample valves, V-5200 and V-5203 IAW 2-EOP-03. The ANPS has given permission to perform the procedural steps out of order so that V5200 can be opened first, followed by V5203.

START TIME: ______

STEP 2A, 3A: Locally PLACE handswitch for V5200, Hot Leg, to CLOSE STANDARD: At 2A Switchgear Room behind 2A transfer panel, **POSITION** V5200 contro switch to **CLOSED** and **INFORM** the RCO that the local control switch fo V5200 is CLOSED. **EXAMINER'S CUE:** **GREEN LIGHT ON FOR V5200. RCO ACKNOWLEDGES AND PLACES RTGB HANDSWITCH FOR V5200 TO CLOSE AND THEN RESET.** COMMENTS:	**CRITICAL STEP** _____ SAT _____ UNSAT
STEP 4A: Locally PLACE handswitch for V5200 to OPEN. STANDARD: At 2A Switchgear Room behind 2A transfer panel, **POSITION** V5200 control switch to **OPEN** . **EXAMINER'S CUE:** ***RED LIGHT ON FOR V5200.*** COMMENTS:	**CRITICAL STEP** _____ SAT _____ UNSAT
STEP 2B,3B: Locally PLACE handswitch for V5203, Hot Leg, to CLOSE. STANDARD: Outside the PASS room (19.5 RAB), **POSITION** V5203 control switch t **CLOSED** and **INFORM** the RCO that the local control switch for V5203 is CLOSED. **EXAMINER'S CUE:** ***GREEN LIGHT ON FOR V5203. RCO ACKNOWLEDGES AND PLACES RTGB HANDSWITCH FOR V5203 TO CLOSE AND THEN RESET.*** COMMENTS:	**CRITICAL STEP** _____ SAT _____ UNSAT

*****Italicized Cues Are To Be Used Only If JPM Performance Is Being Simulated.***

STEP 4B:	Locally PLACE handswitch for V5200 to OPEN.	**CRITICAL STEP**
STANDARD:	Outside the PASS room (19.5 RAB), **POSITION** V5203 control switch to **OPEN** .	_____ SAT
EXAMINER'S CUE:	***RED LIGHT ON FOR V5203.***	_____ UNSAT
COMMENTS:		
	END OF TASK	

STOP TIME: _____

Italicized Cues Are To Be Used Only If JPM Performance Is Being Simulated.

CANDIDATE CUE SHEET
(TO BE RETURNED TO EXAMINER UPON COMPLETION OF TASK)

INITIAL CONDITIONS:

A Loss of Coolant Accident has been diagnosed and is in progress.

Both SIAS and CIAS are present.

CCW has been realigned to the 'N" Header.

The ANPS has directed that the RCO coordinate actions with the SNPO and reopen the primary coolant sample valves to allow sampling of the reactor coolant system.

INITIATING CUES:

Perform the actions of the SNPO, under direction of the RCO, to open RCS primary coolant sample valves, V-5200 and V-5203 IAW 2-EOP-03. The ANPS has given permission to perform the procedural steps out of order so that V5200 can be opened first, followed by V5203.

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

MAKEUP TO THE SPENT FUEL POOL UNIT 1

CANDIDATE ______________________________

EXAMINER ______________________________

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 1-0350030, "Fuel Pool Cooling System"

Validation Time __20 minutes__ **Time Critical** __No__

Candidate: ______________________________ Time Start ________

Name Time Finish ________

Performance Rating: Sat ______ Unsat ______

Examiner: ______________________ **Signature:** ____________________

Name

Tools/Equipment/ Procedures Needed:

ONOP 1-0350030, "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 location of the leak has been identified and the leak has been terminated. 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 1-0350030, "Fuel Pool Cooling System". Chemistry reports that Fuel Pool boron concentration is 1750 ppm.

Start Time ________

<u>Step 1:</u> Stop the Fuel Pool Purification Pump. (Appendix A, step 2A) <u>Standard:</u> Operator simulates stopping the fuel pool purification pump by turning the local control switch to OFF <u>Cue:</u> (SFP purification pump room on 19.5"elevation) **Pump not rotating** NOTE: If asked, the fuel pool level annunciator is NOT out of service. <u>Comments:</u>	**Critical Step** Sat _____ Unsat ____
<u>Step 2:</u> LOCK OPEN V07104, RWT to Fuel Pool Loop isolation. (step 2B1) <u>Standard:</u> Operator simulates removing lock, opening V07104 and re-installing lock <u>Cue:</u> (At RWT) **Valve rotated counter clockwise until stop is reached and lock installed** <u>Comments:</u>	**Critical Step** Sat _____ Unsat ____
<u>Step 3:</u> LOCK CLOSE V07101, Fuel Pool IX outlet to RWT isolation. (step 2B2) <u>Standard:</u> Operator simulates removing lock, closing V07101 and re-installing lock <u>Cue:</u> (At RWT) **Valve rotated clockwise until stop is reached and lock installed** <u>Comments:</u>	**Critical Step** Sat _____ Unsat ____

Step 4: CLOSE V4220, Fuel Pool outlet to Purification pump isolation. (step 2B3)

Standard: Operator simulates closing V4220

Cue: (SFP purification pump room in corner below floor level)
Valve rotated clockwise until stop is reached

Comments:

Critical Step

Sat ____

Unsat ____

Step 5: CLOSE V4201, Fuel Pool Makeup isolation.
(step 2B4)

Standard: Operator simulates closing V4201

Cue: (SFP purification pump room in corner below floor level)
Valve rotated clockwise until stop is reached

Comments:

Critical Step

Sat ____

Unsat ____

Step 6: OPEN V4252, Fuel Pool inlet from Fuel Pool Purification IX isolation.
(step 2B5)

Standard: Operator simulates opening V4252

Cue: (SFP purification pump room in corner below floor level)
Valve rotated counter clockwise until stop is reached

Comments:

Critical Step

Sat ____

Unsat ____

Step 7: Start the SFP purification pump. (step 2C)

Standard: Operator simulates starting the SFP purification pump by placing the local control switch to START

Cue: (SFP purification room)
Pump is rotating

Comments:

Critical Step

Sat ____

Unsat ____

Step 8: 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 ____

Unsat ____

Standard: Operator simulates contacting control room to verify the status of the annunciator

Cue: **Control Room reports N-20 not in alarm**

Terminate JPM when verification of level alarm is clear.

NOTE: If step 2E is attempted to be performed, cue candidate task is complete.

Comments:

End of Task

Stop Time ________

EXAMINER QUESTION (Optional):

Question candidate on how locked valves are controlled. (1-0010123 Administrative control of locked valves and switches)

ANSWER: If valves are restored to original position as per procedure, valves are not required to be put in deviation log.

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 location of the leak has been identified and the leak has been terminated. 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 1-0350030, "Fuel Pool Cooling System". Chemistry reports that Fuel Pool boron concentration is 1750 ppm.

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

Alternate Path: **Yes** __X__ **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: ______________________________ Time Start ________
Name Time Finish ________

Performance Rating: Sat ______ Unsat ______

Examiner: ______________________________ **Signature:** ____________________
Name

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. A manual start of the 1B Diesel Generator was unsuccessful. 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 ________

Step 1: Investigate the statue of the local alarm panel at the diesel control station. If no alarms present, verify the overspeed lever has not tripped (step 1B) Standard: 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. Cue: (1B EDG room) **Alarm panel is dark, both trip latches horizontal, limit switches depressed.** Comments:	Sat ____ Unsat ____
Step 2: Ensure that the lockout relay is reset (step 1C) Standard: Operator observes position of lockout relay Operator simulates positioning the lockout relay to the RESET position Cue: (1B EDG control panel) **1.) Lockout indicates green flag** **2.) Lockout indicates red flag, engine does not start** Comments:	**Critical Step** Sat ____ Unsat ____
Step 3: If the diesel does not start, then place the engine start switch to START (step 1D) Standard: Operator simulates placing the engine start switch to START Cue: (1B EDG control panel) **Engine start switch in START, lights don't change, no engine noise.** Comments:	**Critical Step** Sat ____ Unsat ____
Step 4: If diesel still does not start, then position the following NORMAL/ISOLATE switches in the ISOLATE position: Voltage Control, Frequency Control, Start Circuit (step 1E1 a,b,c)	**Critical Step** Sat ____

Standard: Operator simulates placing Voltage Control, Frequency Control, Start Circuit in the isolate position Cue: (1B EDG control panel) **a.) Voltage Control, b.) Frequency Control, c.) Start Circuit switches in the isolate position** Comments:	Unsat ____

Step 5: Place engine control switch to START (step 1E2) Standard: Operator simulates placing the engine control switch to the START position Cue: (1B EDG control panel) **Engine control switch to start, 1B EDG starts** Comments:	**Critical Step** Sat ____ Unsat ____
Step 6: When diesel generator reaches 900 RPM, adjust voltage control and governor control switches to obtain 4160 volts and 60 hertz (step 1E3) Standard: Operator observes voltage and frequency indications and simulates adjustment to 4160 volts and 60 hertz Cue: (1B EDG control panel) **Diesel generator is at 4160 volts and 60 hertz** Comments:	Sat ____ Unsat ____
Step 7: Place the following NORMAL/ISOLATE switches back to the NORMAL position: Voltage Control, Frequency Control, Start Circuit (step 1E4) Standard: Operator simulates placing the Voltage Control, Frequency Control, Start Circuit back to the NORMAL position Cue: (1B EDG control panel) **a.) Voltage Control, b.) Frequency Control, c.) Start Circuit NORMAL/ISOLATE switches in the NORMAL position** Comments:	**Critical Step** Sat ____ Unsat ____

Step 8: Check that the diesel generator is operating normally (step 2) Standard: Operator checks EDG parameters and verifies normal operation Cue: NOTE: **If candidate does not state NORMAL parameters, ask for values. See values bottom of page.** Comments:	Sat ____ Unsat ____

Step 9: Notify RCO that diesel generator is ready to accept load and check the diesel generator to be operating normally (step 3) Standard: Operator simulates notifying the control room and observes proper operation of 1B EDG Cue: **Control room acknowledges, 1B EDG operating properly** Terminate JPM when Diesel Generator is running and all systems appear normal. Comments: **End of Task**	Sat ____ Unsat ____

Stop Time ________

The following ranges are the expected 'Normal' ranges for key Diesel Generator parameters.

Oil Pressure: 30-35 Psig Trip at 17 Psig
Water Temperature: 160-190 ºF Trip 205 ºF

Additional checks to be made:
Lubricating Oil leaks
Fuel Oil leaks
Water Leaks
Operation of radiator cooling fan/belts
Unusual noises/vibration
Governor operation

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. A manual start of the 1B Diesel Generator was unsuccessful. 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.

FINAL SUBMITTAL

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

FEBRUARY 7 - 11, 2000

FINAL RO LICENSE EXAM

REFERENCE MATERIAL

St. Lucie USNRC RO Initial License Exam Reference Material Index

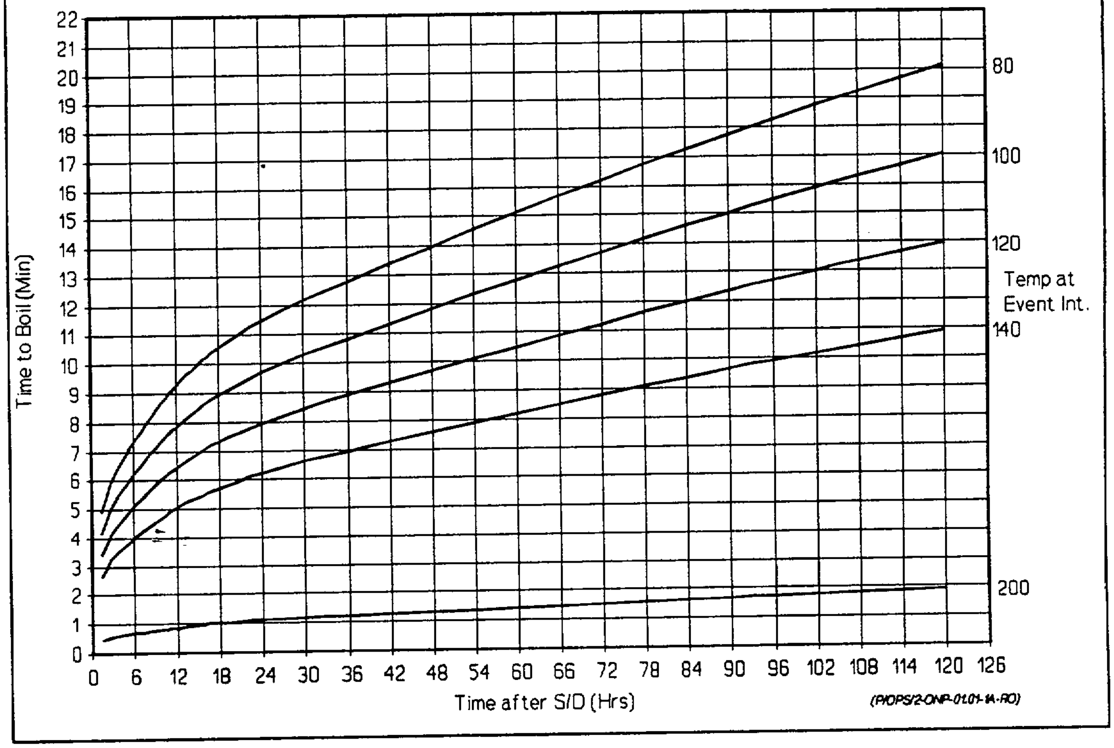
1) ONP's
    - 2-ONP-01.04 Plant Condition 4 Shutdowwn Cooling in Operation – Reduced Inventory Operation

2) NOP's
    - 1-NOP-01.02 Reactor Coolant Pump Operation
    - 1-NOP-02.24 Boron Concentration Control
    - NOP-1-0030127 Reactor Plant Cooldown-Hot Standby to Cold Shutdown

3) Plant Curves
    - Figures C-1 through C-6, Boration/Dilution Tables

FIGURE 1
TIME TO CORE BOILING

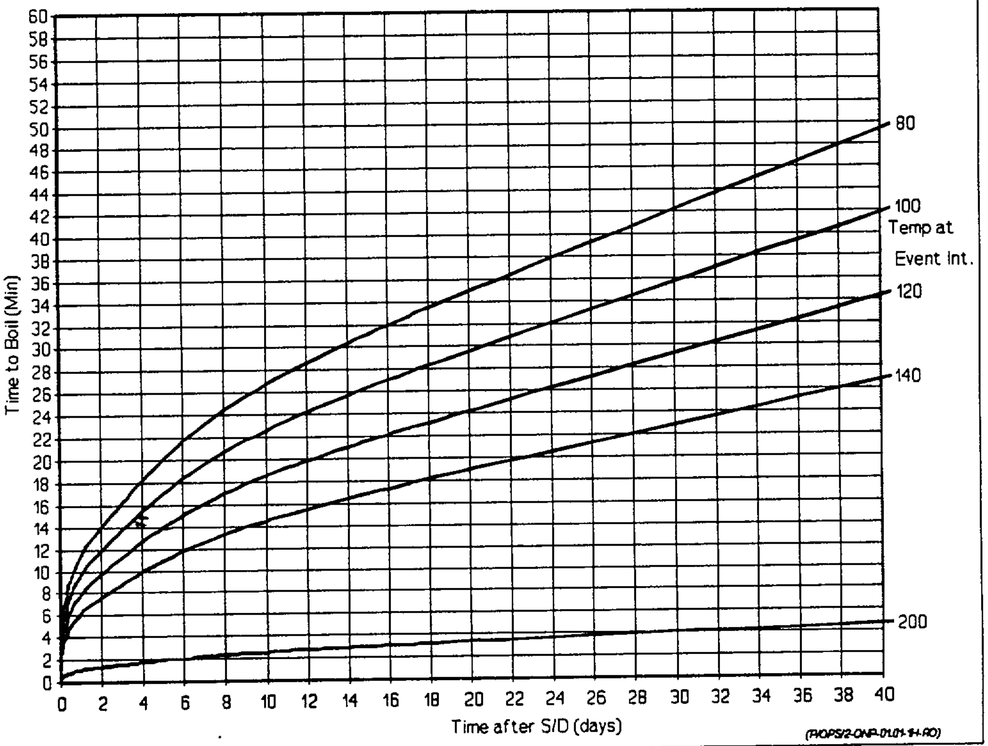
Figure 1A
TIME TO CORE BOILING, 0 TO 50 DAYS AFTER S/D RCS AT MID-LOOP



REFER TO FIGURE 1C FOR ADJUSTING TIME TO BOIL

FIGURE 1
TIME TO CORE BOILING
(Page 2 of 3)

Figure 1B
TIME TO CORE BOILING, 0 TO 40 DAYS AFTER S/D, RCS AT MID-LOOP



(P/OPS/2-ONP-0101-1H-R0)

REFER TO FIGURE 1C FOR ADJUSTING TIME TO BOIL

FIGURE 1
TIME TO CORE BOILING
(Page 3 of 3)

CORRECTION FORMULAS

1. If the Refueling Cavity level is greater than 36 feet, Then PERFORM the following equations to correct time to boil.

   A. ______________ft - 36 = _____________ft
   Cavity level - 36 = adjusted level.

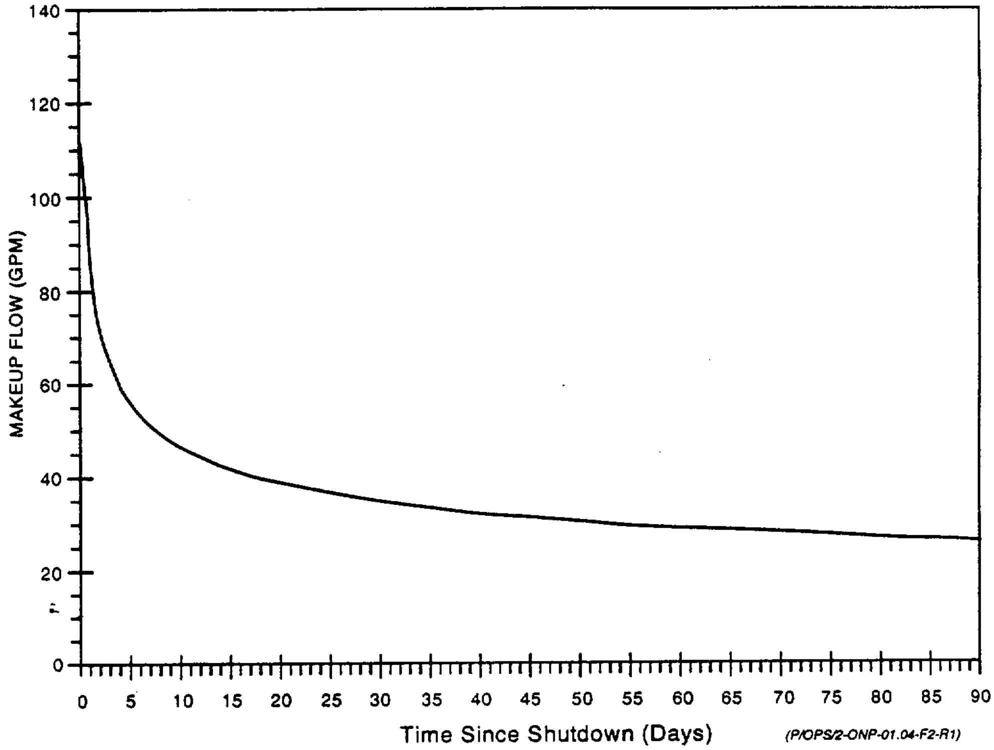
   B. {1 + [0.23] x [_______________ft]} = ____________
   {1 + [0.23] x [adjusted level]} = multiplier

   C. ______________ x ______________min = ________________min
   multiplier x time to boil from curve = corrected time to boil

2. If the core shuffle or reload has been completed, Then PERFORM the following equation to correct time to boil.

   ____________________________ x 1.35 = _______________________min
   Time to boil from curve **or** corrected time to boil from 1.C x 1.35 = corrected time to boil

FIGURE 2
FLOW TO MAKE UP FOR BOIL-OFF



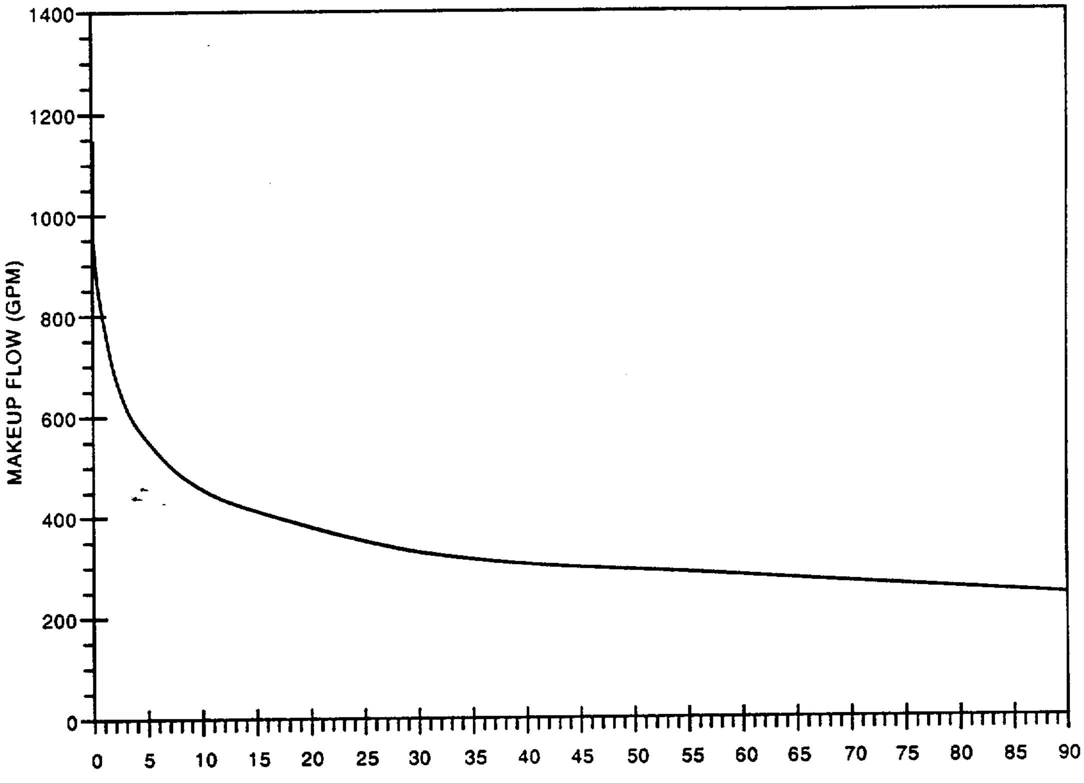
(P/OPS/2-ONP-01.04-F2-R1)

Assumptions: Power History = 100%
Makeup Water Temp. = 100°F
Boiling Point Temp. = 212°F

FIGURE 3
FLOW TO PREVENT BOILING

NOTE

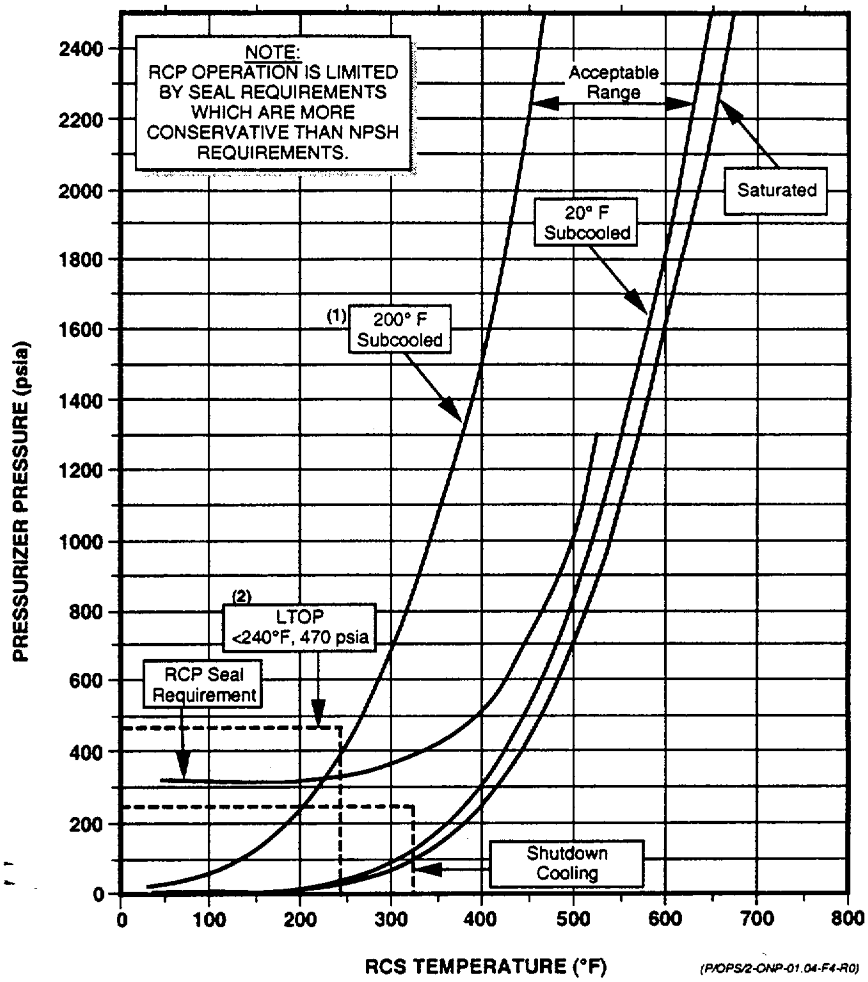
If a HPSI pump is operating aligned to the containment sump, then a minimum containment sump level of 8 FT must exist. HPSI pump flow shall be limited to 300 gpm when containment sump level is less than 20 FT.



(P/OPS/2-ONP-01.04-F3-R1)

Assumptions: Power History = 100%
Makeup Water Temp. = 100°F
Boiling Point Temp. = 212°F

FIGURE 4
TYPICAL POST ACCIDENT PRESSURE-TEMPERATURE LIMITS

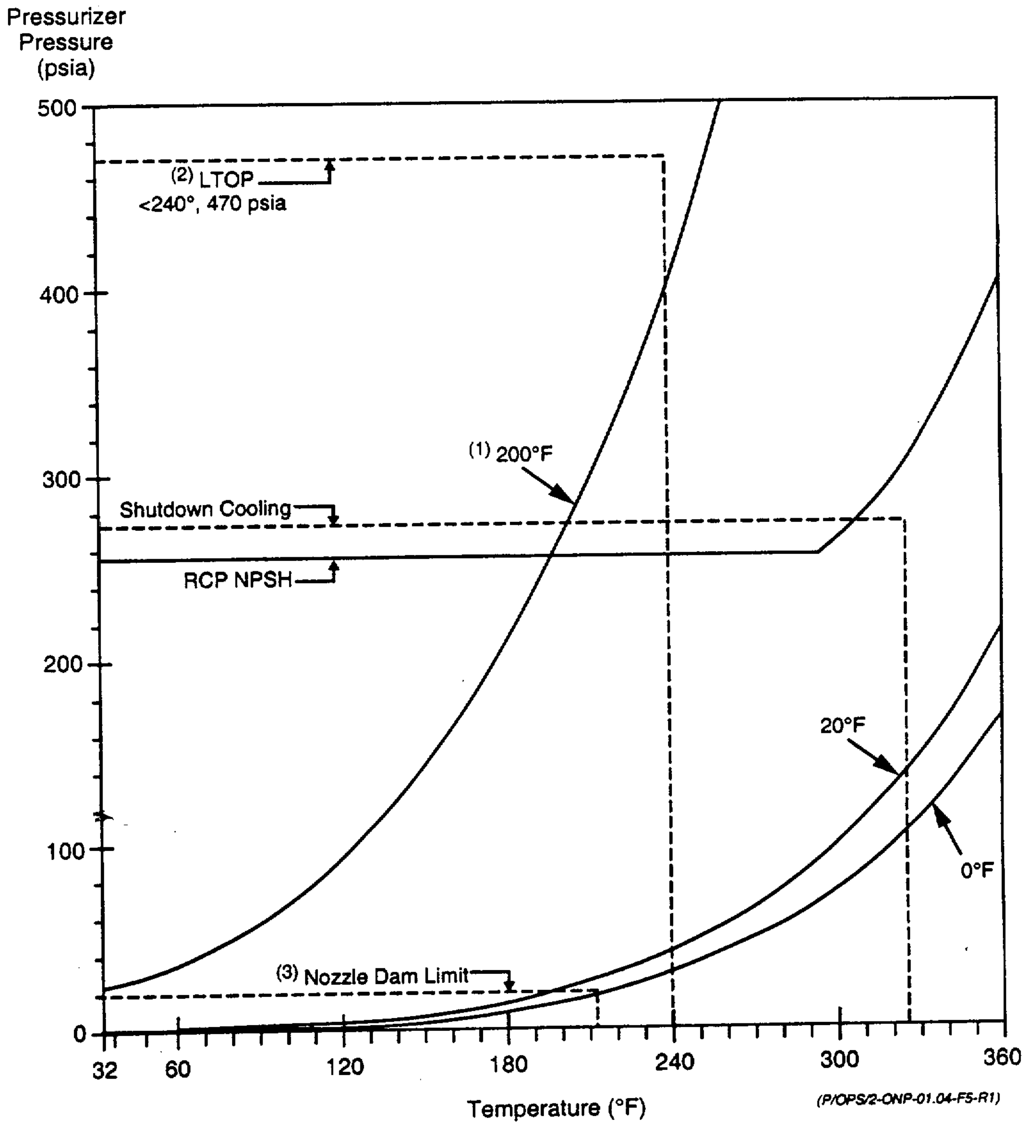


(P/OPS/2-ONP-01.04-F4-R0)

Notes:
(1) This curve supersedes the 100°F/hr. cooldown curve anytime the RCS has experienced an uncontrolled cooldown which causes RCS temperature to go below 500°F.

(2) Pressure limit is in effect when temperature in the LTOP range and RCS has pressure boundary integrity.

FIGURE 5
TYPICAL POST ACCIDENT PRESSURE-TEMPERATURE LIMITS

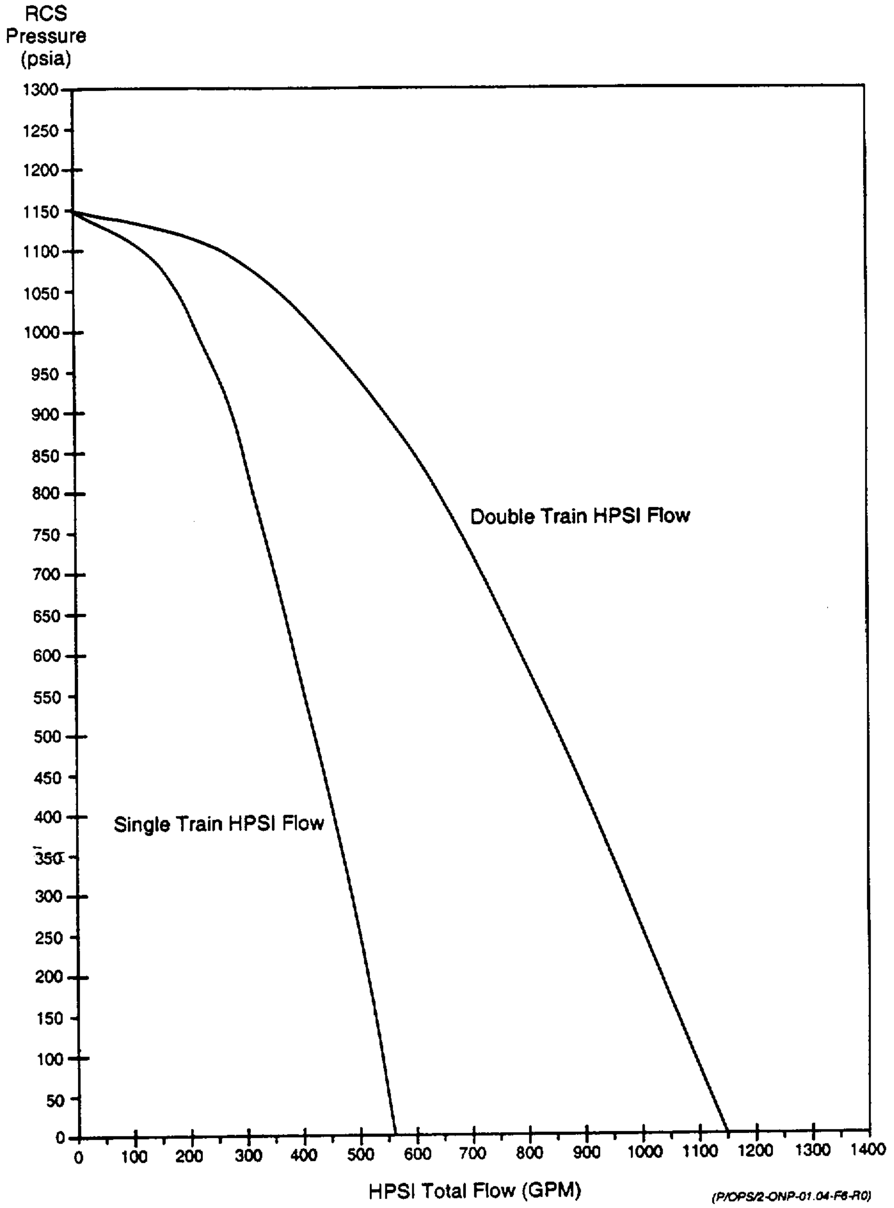


Notes:
(1) This curve supersedes the 100°F/hr. cooldown curve anytime the RCS has experienced an uncontrolled cooldown which causes RCS temperature to go below 500°F.

(2) Pressure limit is in effect when temperature is in the LTOP range and RCS has pressure boundary integrity.

(3) Maximum pressure whenever nozzle dam is installed.

FIGURE 6
TYPICAL ACCEPTABLE HPSI FLOW VS. RCS PRESSURE INJECTION MODE



(P/OPS/2-ONP-01.04-F6-R0)

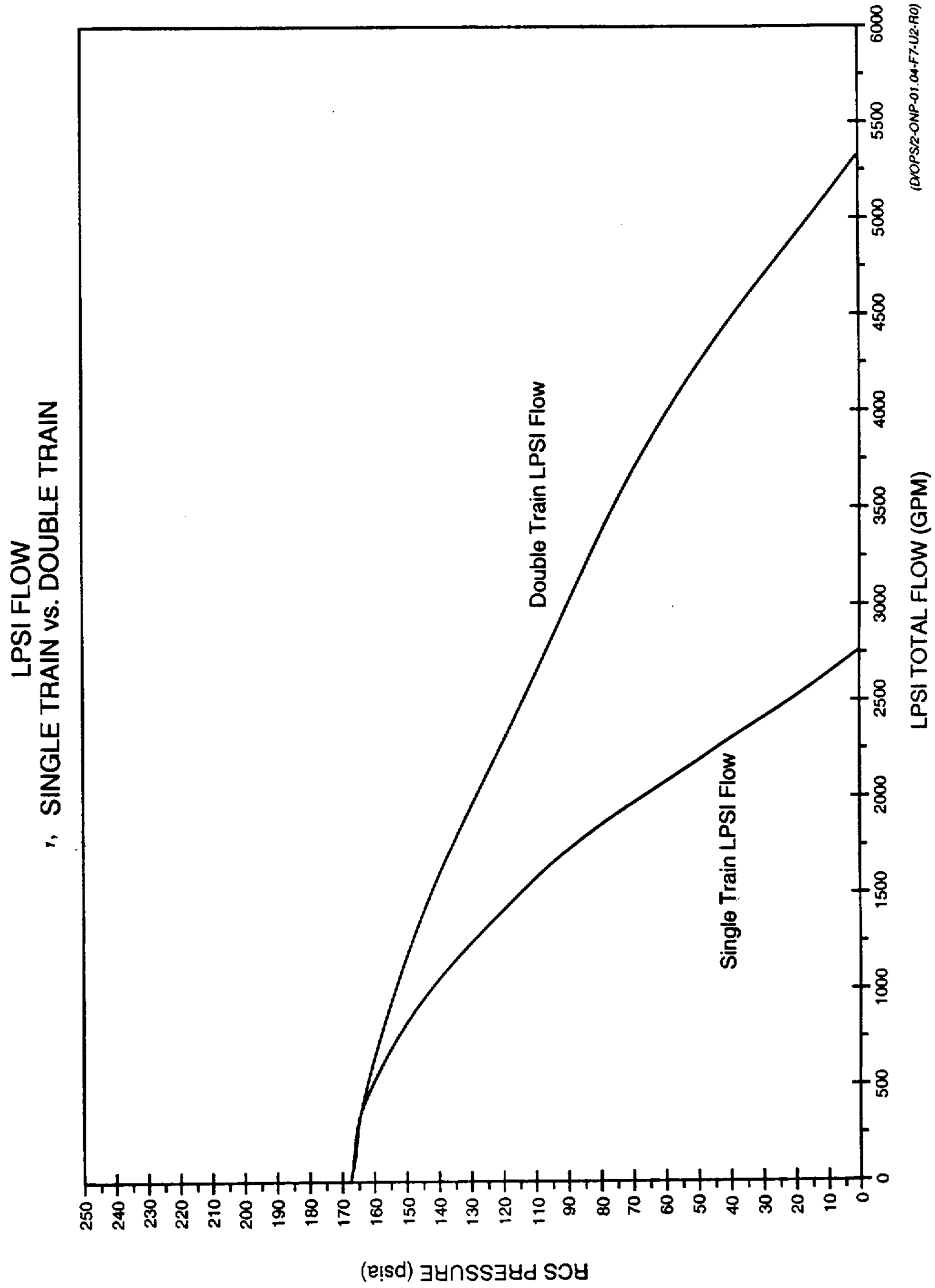
Notes:

(1) For hot and cold leg injection mode, the HPSI pump flow is divided equally between the hot and cold legs.

(2) Below SIAS pressure, Safety Injection System (SI) pump will be operating but there will be no injection flow until system pressure falls below the shutoff head of any SI pump.

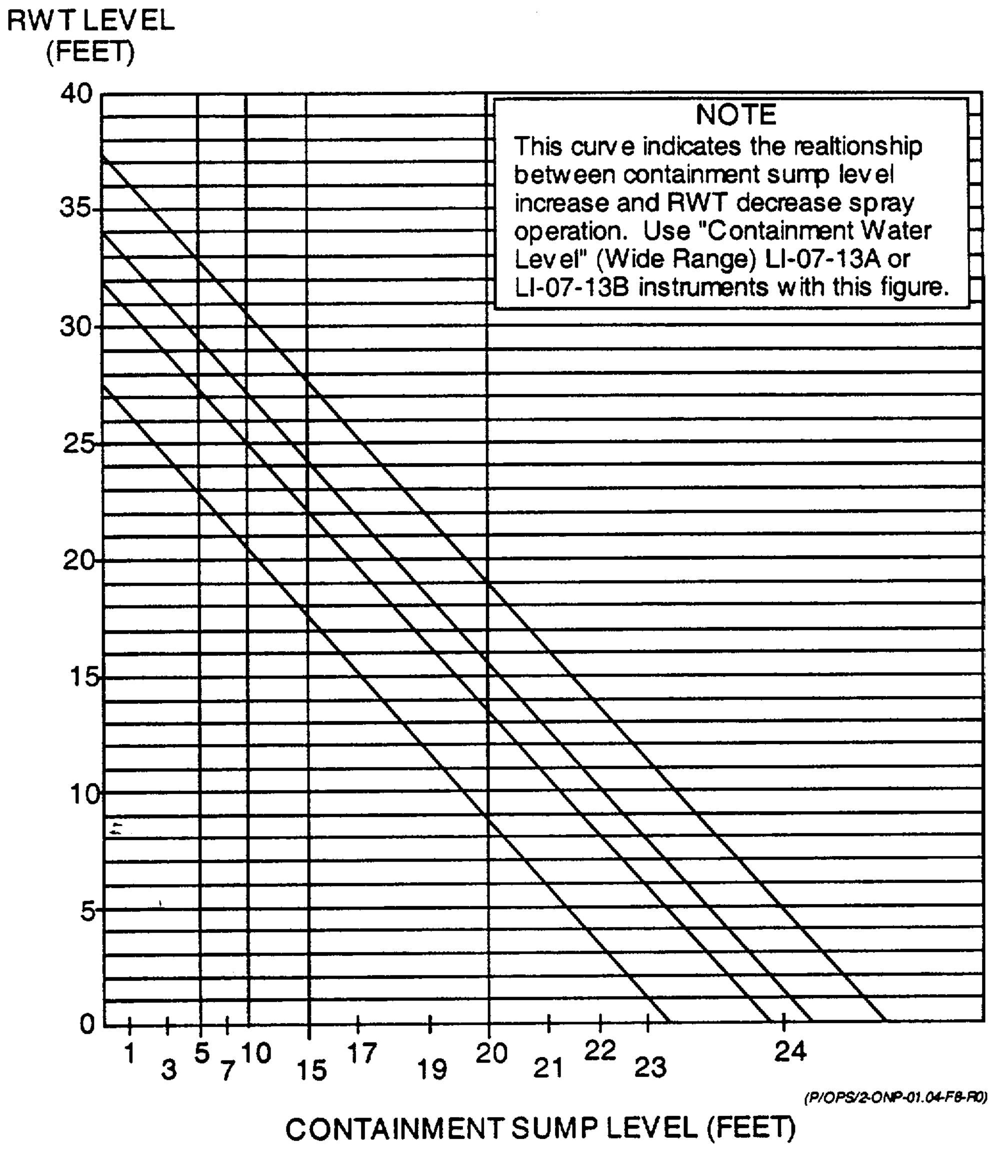
FIGURE 7

TYPICAL ACCEPTABLE LPSI FLOW VS. RCS PRESSURE INJECTION MODE⁽¹⁾



Notes: (1) For hot and cold leg injection mode, the LPSI pumps are NOT required to be operating.

FIGURE 8
RWT LEVEL VS. CONTAINMENT SUMP LEVEL

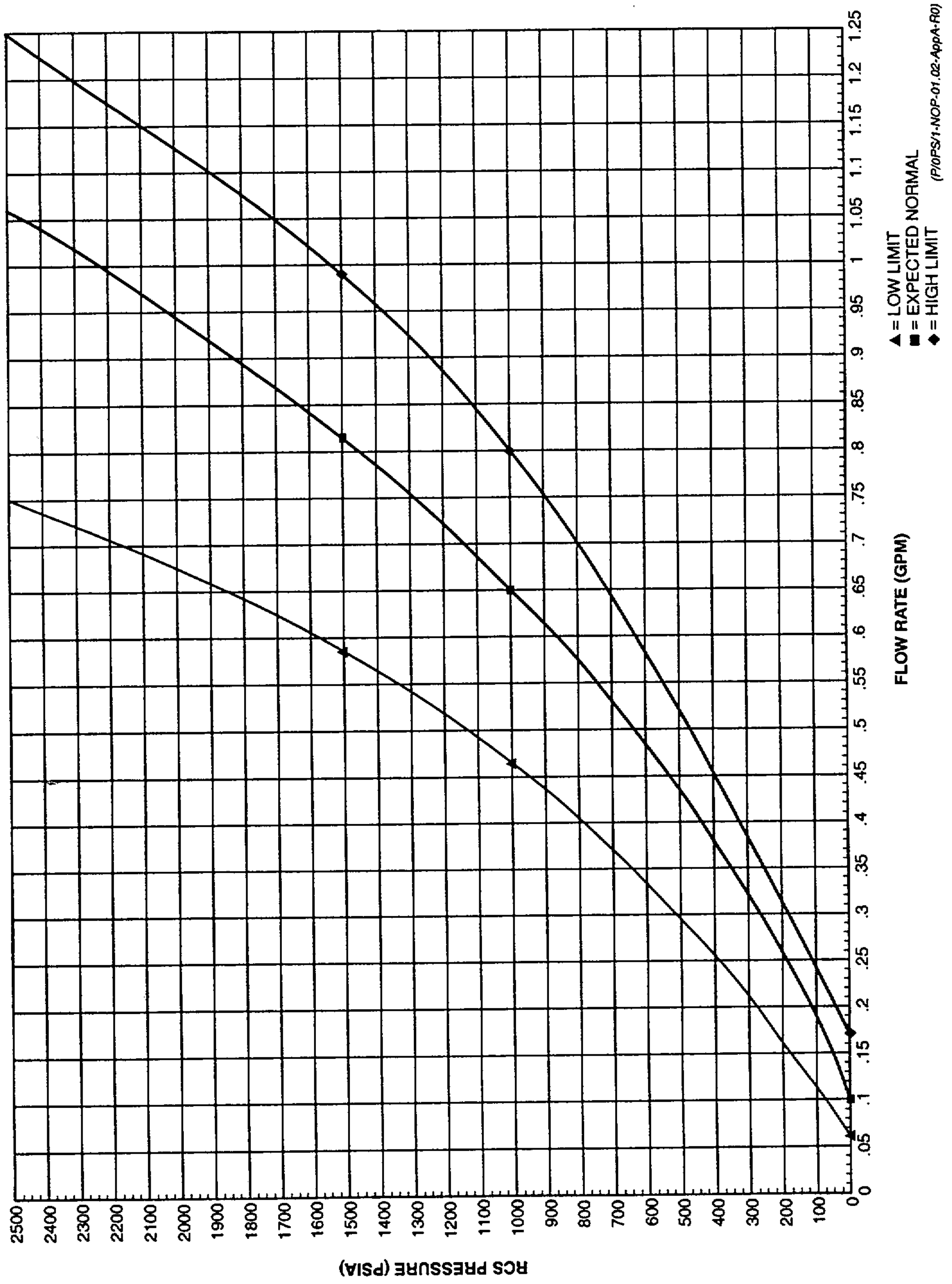


NOTE

This curve indicates the realtionship between containment sump level increase and RWT decrease spray operation. Use "Containment Water Level" (Wide Range) LI-07-13A or LI-07-13B instruments with this figure.

(P/OPS/2-ONP-01.04-F8-R0)

APPENDIX A
RCP SEAL LEAKOFF FLOW RATE VS RCS PRESSURE
(Page 1 of 1)

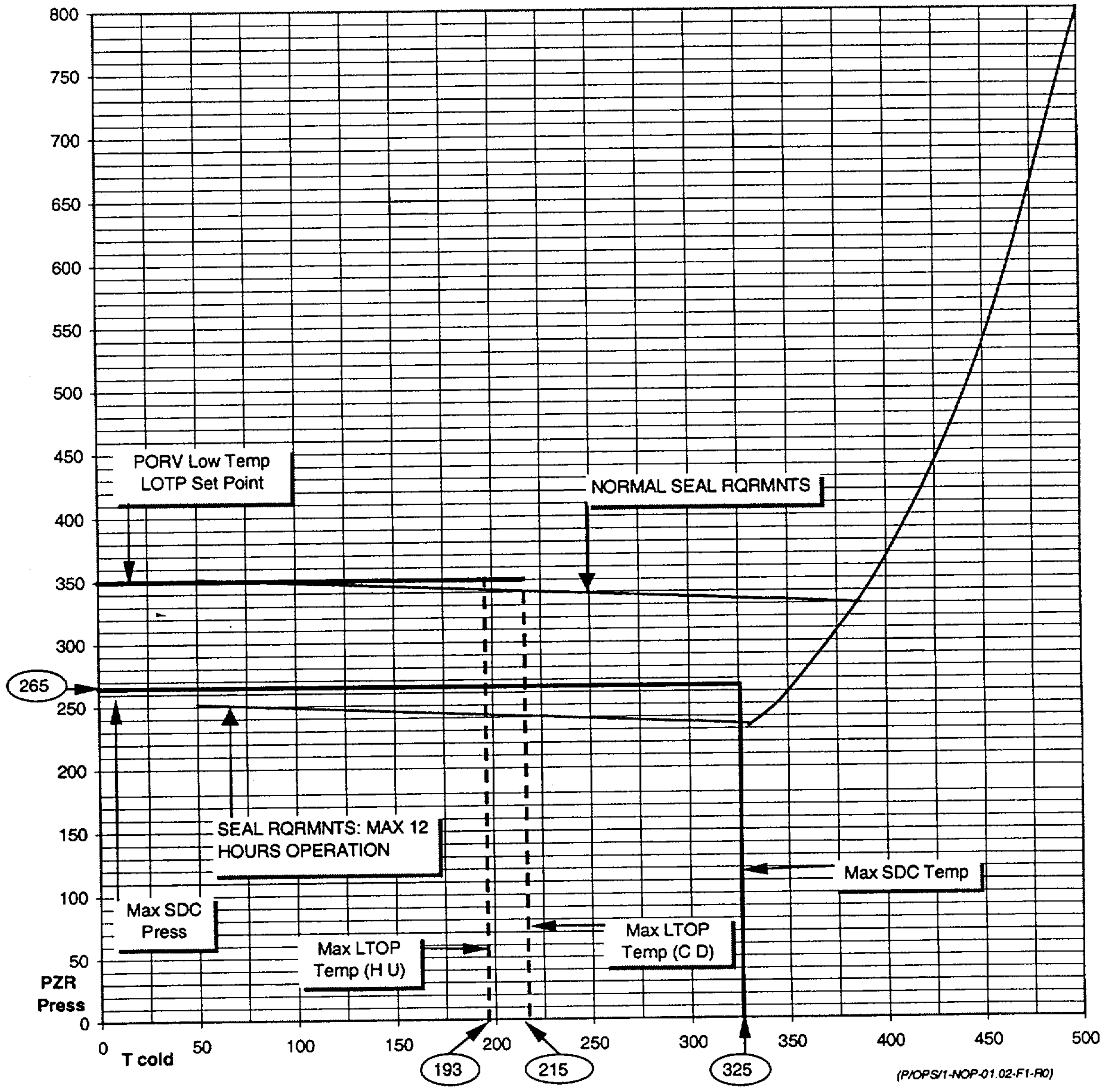


Note: Flow rate instrumentation may be unreliable below 0.7 GPM

END OF APPENDIX A

APPENDIX B
MINIMUM RCS PRESSURE FOR RCP OPERATION
(Page 1 of 8)

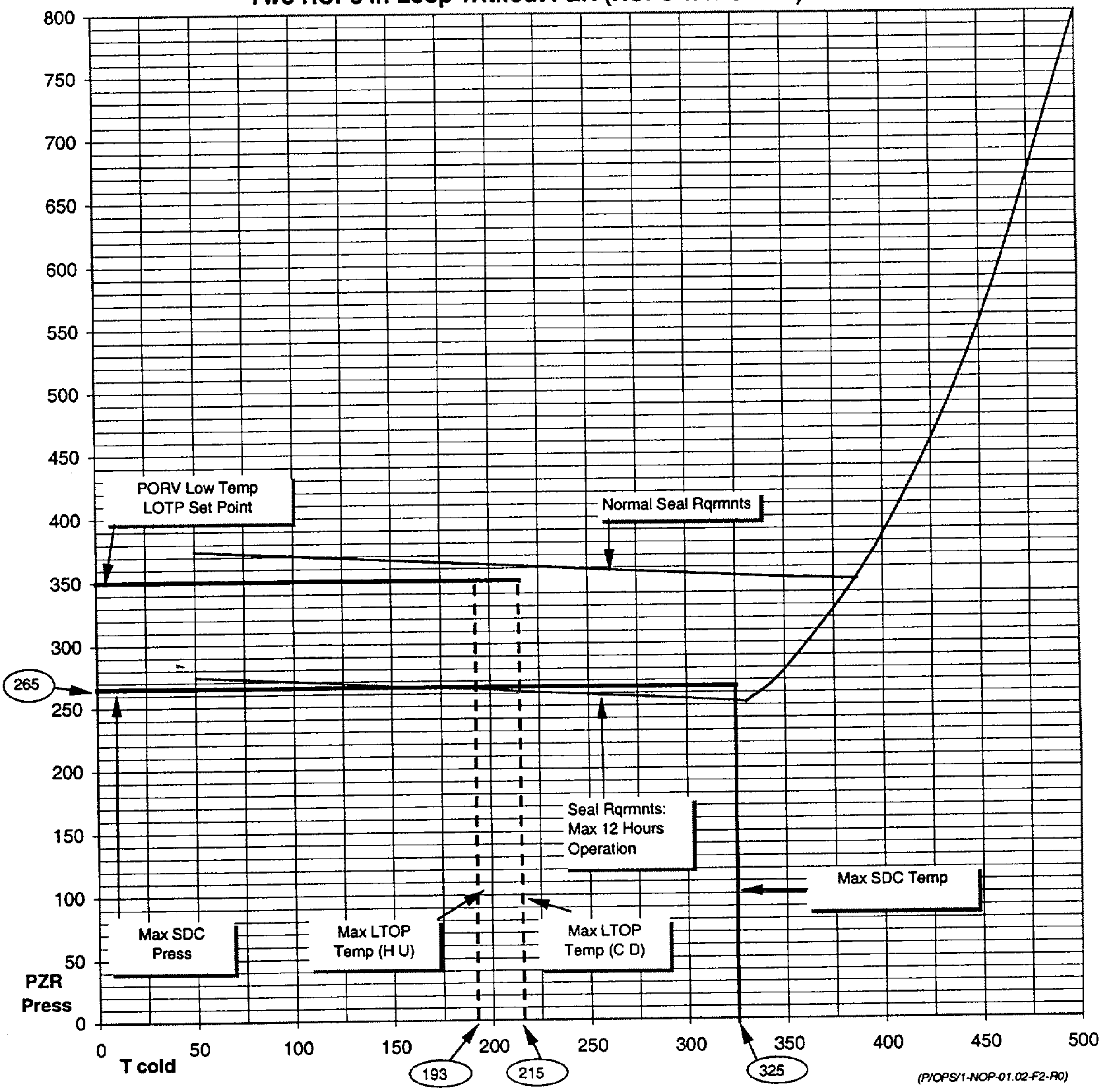
FIGURE 1
Two RCPs in Loop With Pzr (RCPs 1B1 & 1B2)



(P/OPS/1-NOP-01.02-F1-R0)

APPENDIX B
MINIMUM RCS PRESSURE FOR RCP OPERATION
(Page 2 of 8)

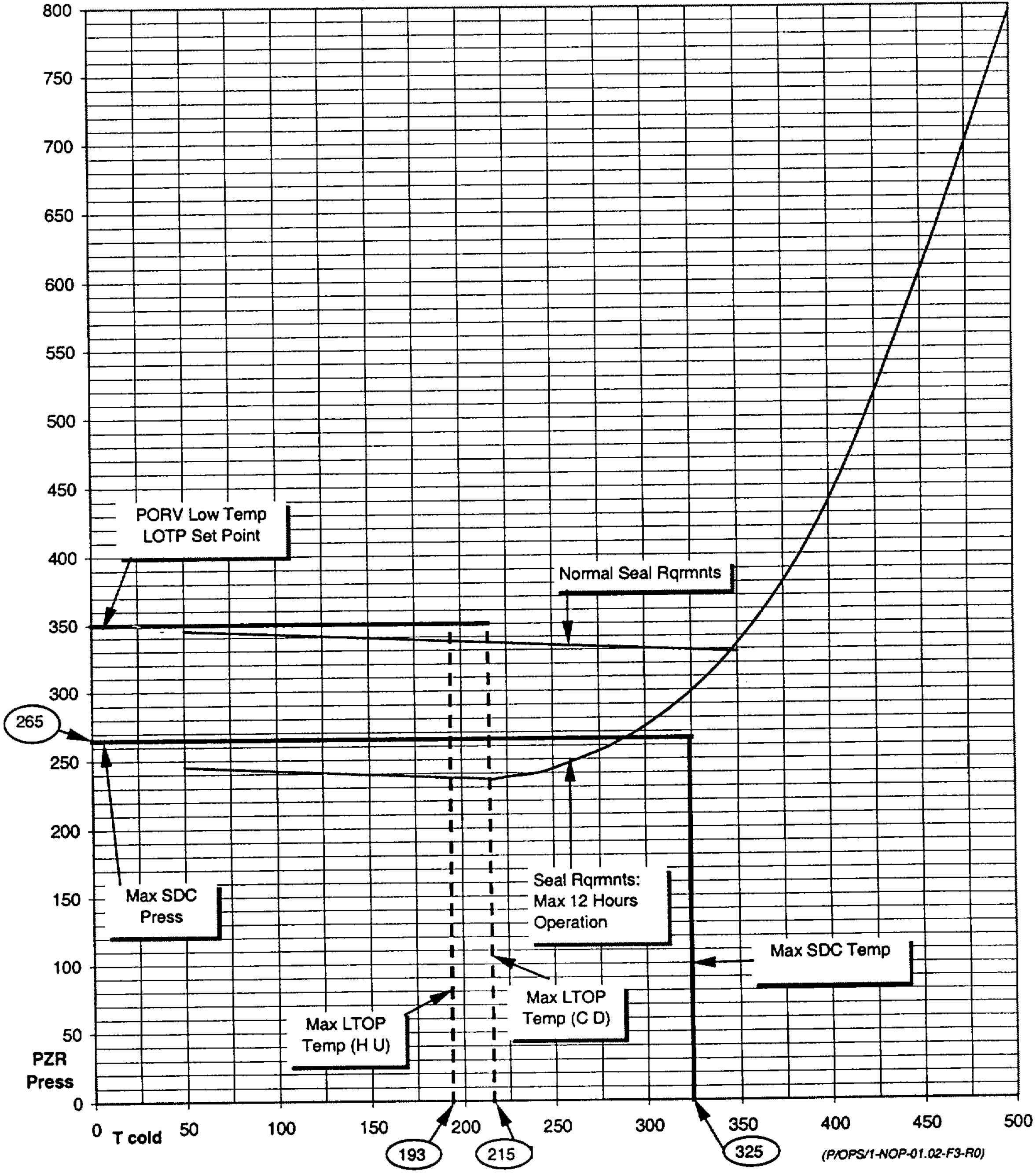
FIGURE 2
Two RCPs in Loop Without PZR (RCPs 1A1 & 1A2)



(P/OPS/1-NOP-01.02-F2-R0)

APPENDIX B
MINIMUM RCS PRESSURE FOR RCP OPERATION
(Page 3 of 8)

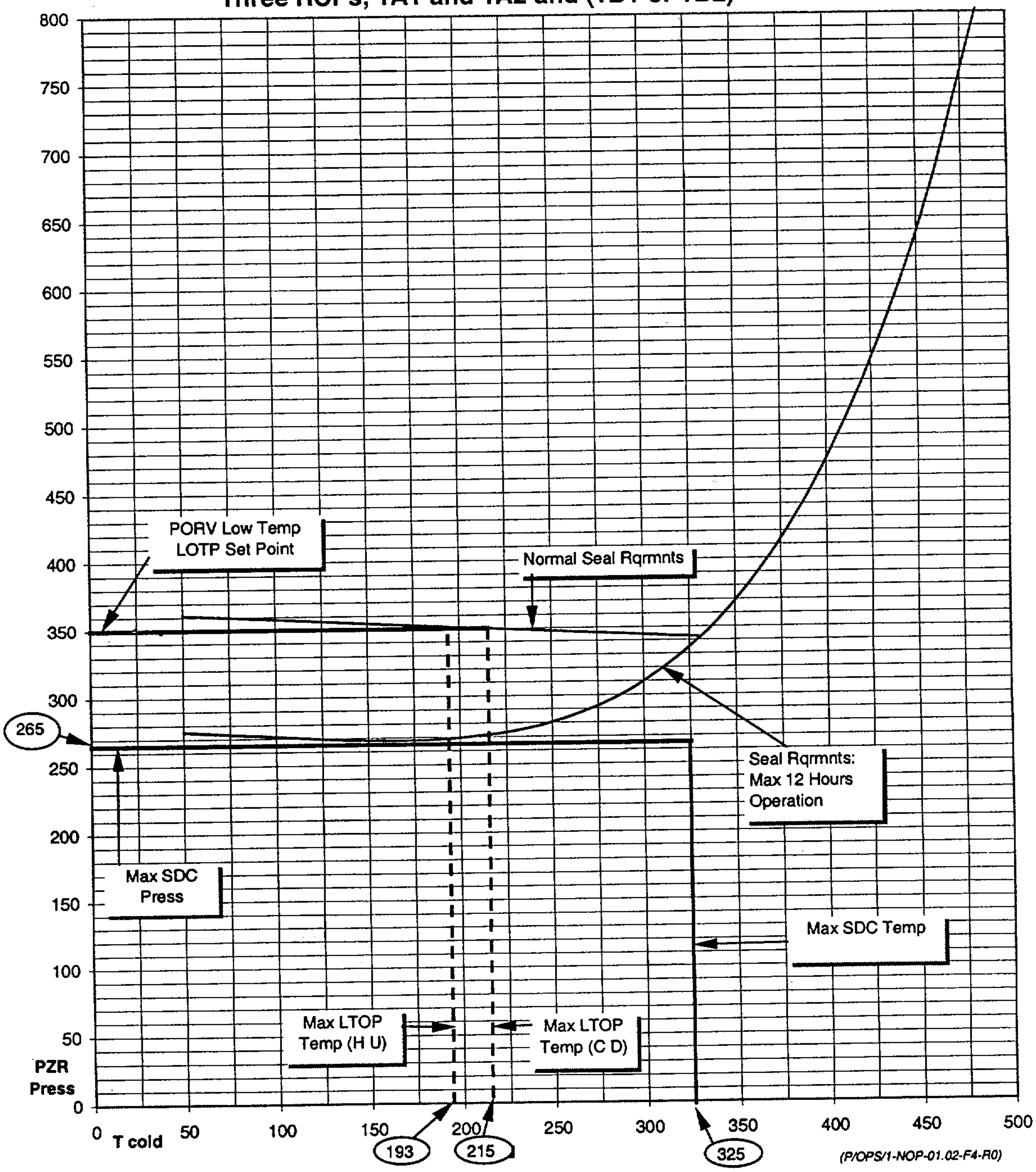
FIGURE 3
Three RCPs, 1B1 and 1B2 and (1A1 or 1A2)



(P/OPS/1-NOP-01.02-F3-R0)

APPENDIX B
MINIMUM RCS PRESSURE FOR RCP OPERATION
(Page 4 of 8)

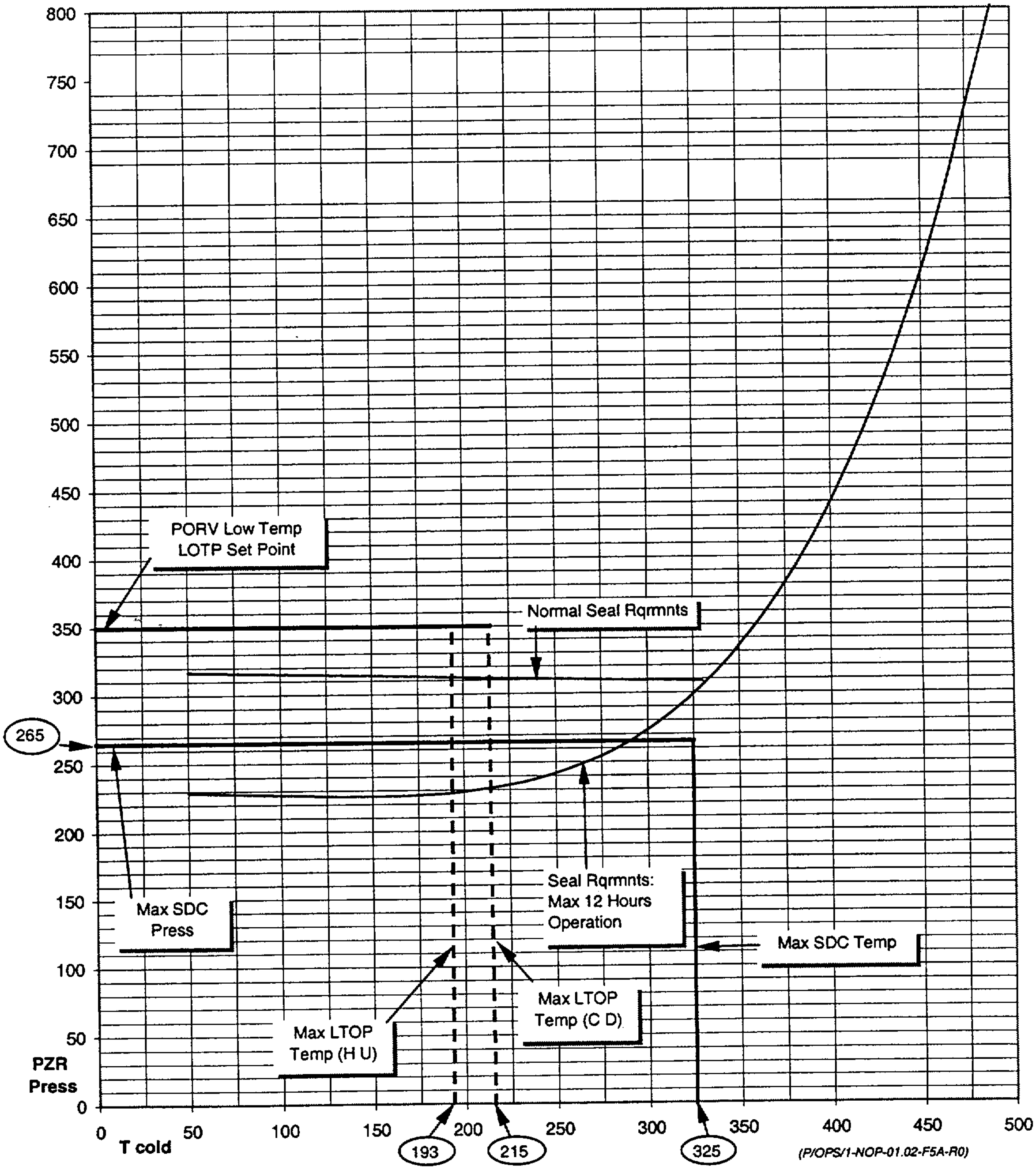
FIGURE 4
Three RCPs, 1A1 and 1A2 and (1B1 or 1B2)



(P/OPS/1-NOP-01.02-F4-R0)

APPENDIX B
MINIMUM RCS PRESSURE FOR RCP OPERATION
(Page 5 of 8)

FIGURE 5A
Any 2 RCPs In Opposite Loops

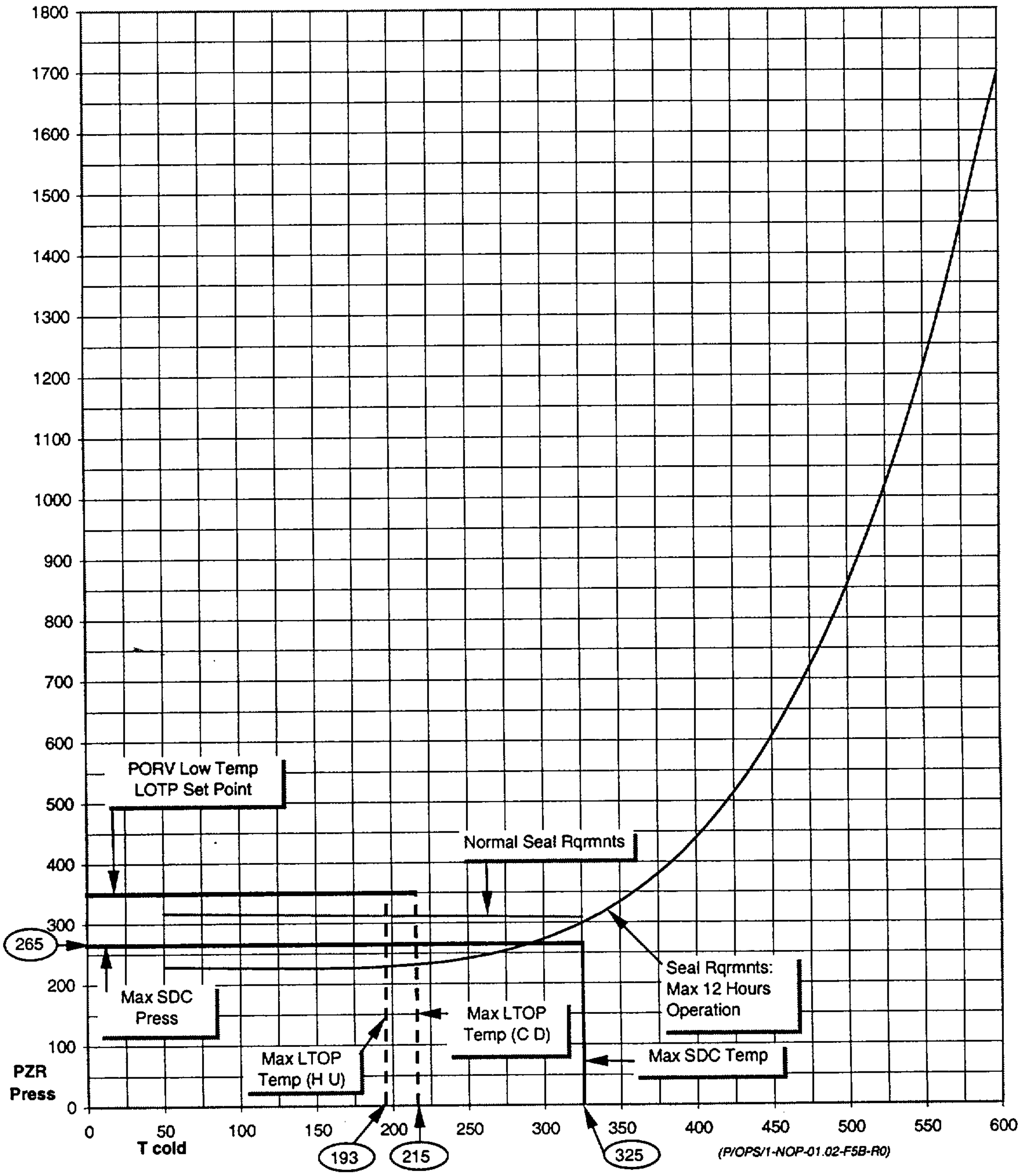


(P/OPS/1-NOP-01.02-F5A-R0)

REVISION NO.:	PROCEDURE TITLE:	PAGE:
1	REACTOR COOLANT PUMP OPERATION	45 of 49
PROCEDURE NO.:		
1-NOP-01.02	ST. LUCIE UNIT 1	

APPENDIX B
MINIMUM RCS PRESSURE FOR RCP OPERATION
(Page 6 of 8)

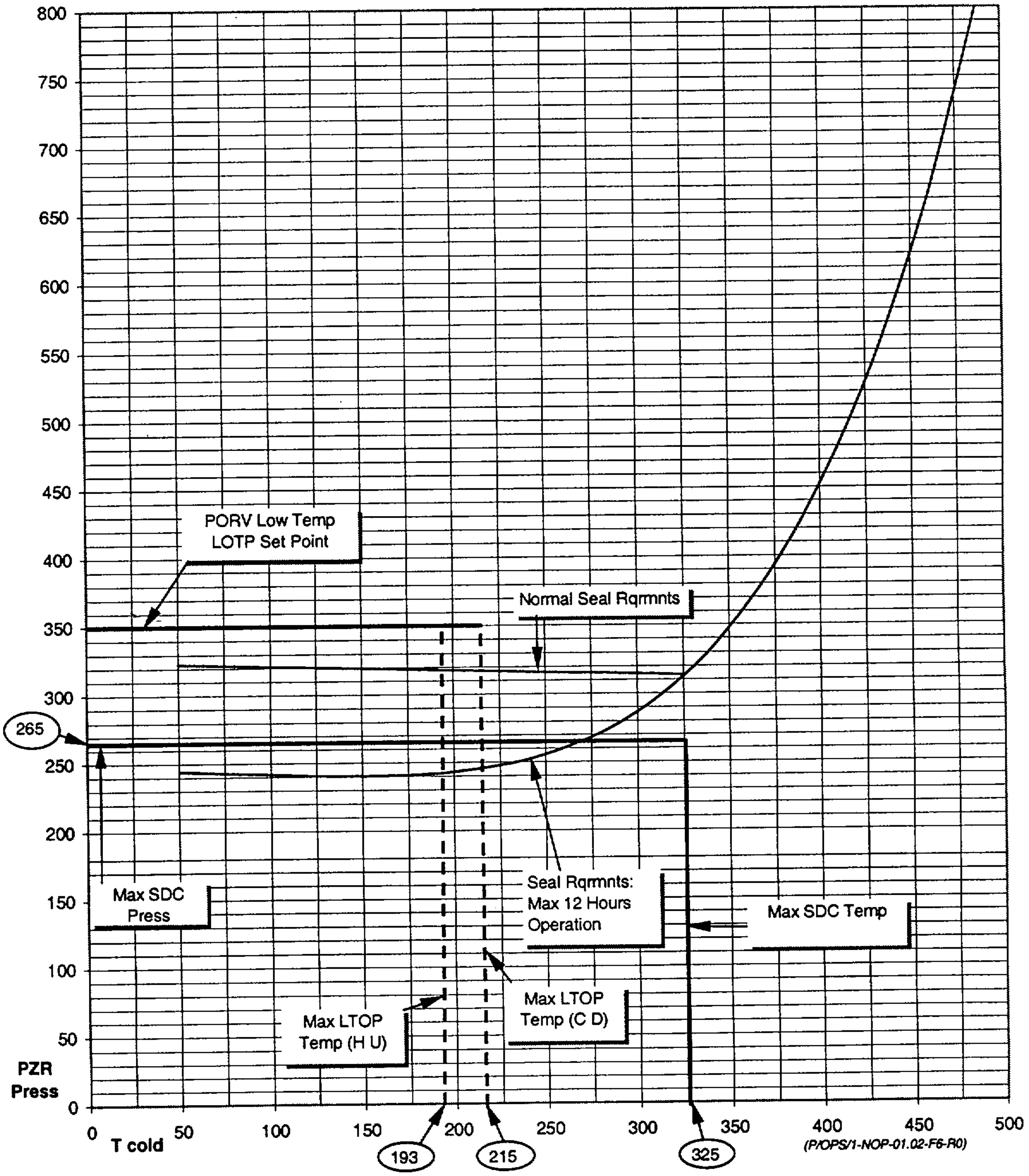
FIGURE 5B
Any 2 RCPs In Opposite Loops



(P/OPS/1-NOP-01.02-F5B-R0)

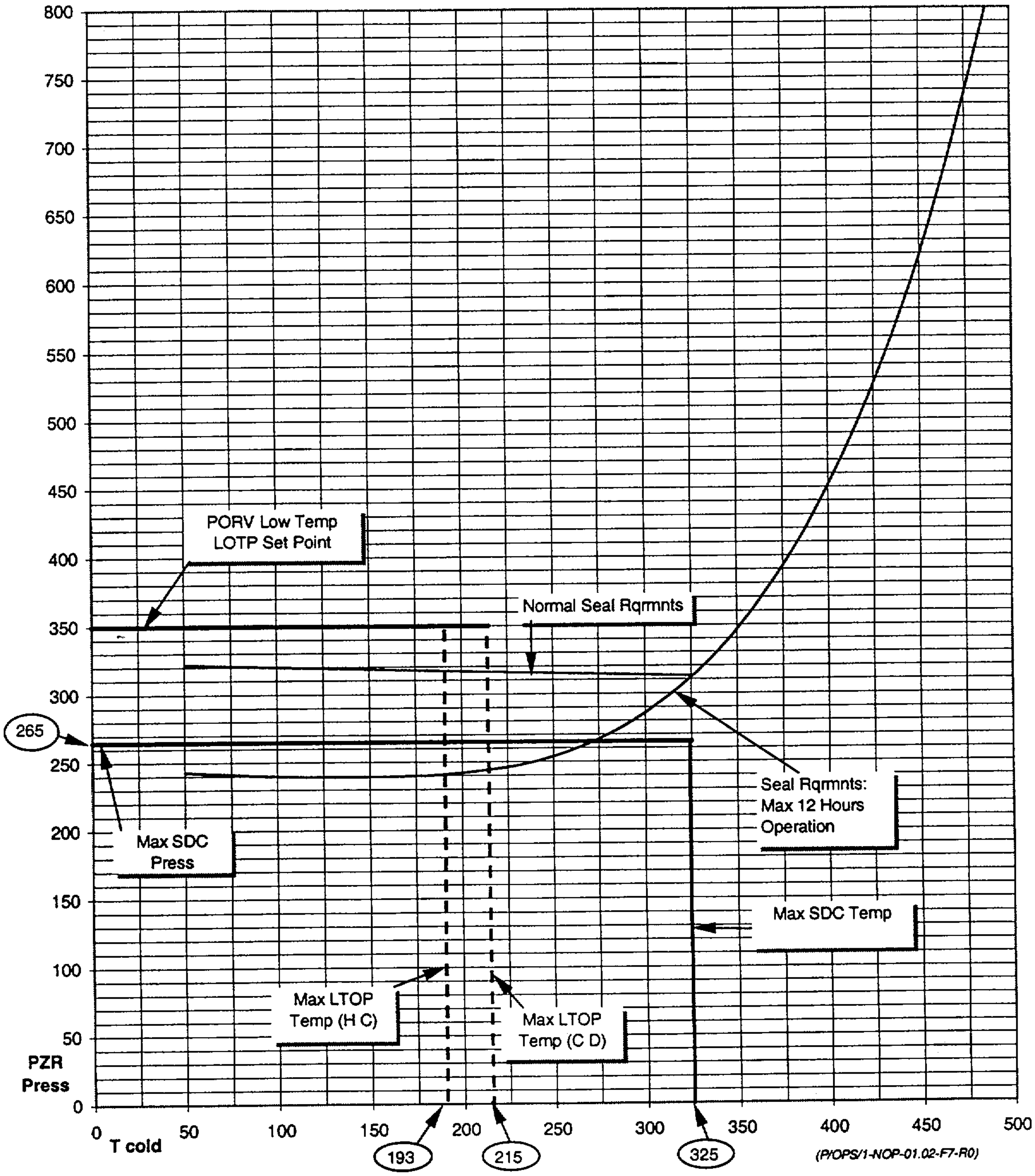
APPENDIX B
MINIMUM RCS PRESSURE FOR RCP OPERATION
(Page 7 of 8)

FIGURE 6
One RCP (1A1 or 1A2)



APPENDIX B
MINIMUM RCS PRESSURE FOR RCP OPERATION
(Page 8 of 8)

FIGURE 7
One RCP (1B1 or 1B2)



(P/OPS/1-NOP-01.02-F7-R0)

APPENDIX C
RCP ELECTRICAL ALIGNMENT
(Page 1 of 1)

COMPONENT ID	COMPONENT DESCRIPTION	POSITION	PERF INITIAL
	RTGB SWITCH POSITIONS		
[redacted]	1A1-A RCP Oil Lift Pump	OFF	
[redacted]	1A1-B RCP Oil Lift Pump	OFF	
[redacted]	1A2-A RCP Oil Lift Pump	OFF	
[redacted]	1A2-B RCP Oil Lift Pump	OFF	
[redacted]	1B1-A RCP Oil Lift Pump	OFF	
[redacted]	1B1-B RCP Oil Lift Pump	OFF	
[redacted]	1B2-A RCP Oil Lift Pump	OFF	
[redacted]	1B2-B RCP Oil Lift Pump	OFF	
	480V MCC 1A5		
1-41201	1A1-A RCP Oil Lift Pump	ON	
1-41216	1B1-B RCP Oil Lift Pump	ON	
	480 V MCC 1B5		
1-42019	1A1-B RCP Oil Lift Pump	ON	
1-42001	1B1-A RCP Oil Lift Pump	ON	
	480V MCC 1A6		
1-41322	1A2-B RCP Oil Lift Pump	ON	
1-41318	1B2-A RCP Oil Lift Pump	ON	
	480V MCC 1B6		
1-42127	1A2-A RCP Oil Lift Pump	ON	
1-42118	1B2-B RCP Oil Lift Pump	ON	

END OF APPENDIX C

APPENDIX D
RCP SEAL PRESSURE TEST GAUGES
(Page 1 of 1)

TEST GAUGE LOCATION	INSTALLED (√)	PERF INITIALS
PT-1151, 1A1 RCP Middle Seal Cavity Press		
PT-1152, 1A1 RCP Upper Seal Cavity Press		
PT-1153, 1A1 RCP Controlled Bleedoff Press		
PT-1161, 1A2 RCP Middle Seal Cavity Press		
PT-1162, 1A2 RCP Upper Seal Cavity Press		
PT-1163, 1A2 RCP Controlled Bleedoff Press		
PT-1171, 1B1 RCP Middle Seal Cavity Press		
PT-1172, 1B1 RCP Upper Seal Cavity Press		
PT-1173, 1B1 RCP Controlled Bleedoff Press		
PT-1181, 1B2 RCP Middle Seal Cavity Press		
PT-1182, 1B2 RCP Upper Seal Cavity Press		
PT-1183, 1B2 RCP Controlled Bleedoff Press		

END OF APPENDIX D

FPL

ST. LUCIE UNIT 1

NORMAL OPERATING PROCEDURE

SAFETY RELATED

Procedure No.
1-NOP-02.24

Current Revision No.
2

Effective Date
11/01/99

Title:

BORON CONCENTRATION CONTROL

Responsible Department: **OPERATIONS**

REVISION SUMMARY:

Revision 2 – Added note to blowdown BAMT transmitter while transferring content to the RWT and added a spot for RCO to record totalizer number. (Carlos Diaz, 08/09/99)

Revision 1 – Deleted the statement that AUTO is the preferred mode.
(Adam Scales, 05/04/99)

Revision 0 – *This procedure was previously issued as 1-0250020.* Added CR 98-1016, 1A Boric Acid Makeup Pump Trip, (PM98-08-069). Corrected drawing numbers to P&ID 8770-G-078 Sheets 120B, 121A and 121B. The Prerequisites section lists all the system procedures required to perform Boron Concentration Control. Added a sign off for each prerequisite. The System Valve alignment and Heat Tracing is now in procedure 1-NOP-02.23. Added a precaution for stopping a BAM Pump with the Makeup Mode Selector switch in any position other than MANUAL which may cause the pump breaker to trip. Added a precaution for stopping a BAM Pump with the Makeup Mode Selector switch in any position other than MANUAL which may cause the pump breaker to trip. Automatic Mode of Operation is now the preferred mode of operating the Boron Concentration Control System. An RCS inventory balance should be performed if an unexpected automatic make up occurs. If other sections are performed where the Makeup Mode Selector switch is NOT in AUTO, the Makeup Mode Selector switch should be returned to AUTO per Section 6.1. BAMT recirc can only be performed in MANUAL. (C. Simpkins, 02/12/99)

AND

Removed Manual Blend to VTC from Section 6.1. Added multiple sign-offs to Sections 6.2 to 6.6. (Charlie Simpkins, 02/17/99)

Revision	FRG Review Date	Approved By	Approval Date
0	02/11 & 02/17/99	R. G. West Plant General Manager	02/17/99
Revision	FRG Review Date	Approved By	Approval Date
2	N/A	N/A Plant General Manager	N/A
		C. Ladd Designated Approver	08/09/99

S_1_OPS
DATE
DOCT PROCEDURE
DOCN 1-NOP-02.24
SYS
COM COMPLETED
ITM 2

TABLE OF CONTENTS

6.0 INSTRUCTIONS

INITIAL

NOTE

- Blend Ratio = BAMT Concentration divided by RCS Concentration minus one.

$$\frac{BAMT}{RCS} - 1 \quad (PMW\ to\ Boric\ Acid)$$

- Makeup from Boron Concentration Control System can be directed to either the VCT (for long term effects, in any mode of operation) or the Charging Pump suction (for short term effects, in the MANUAL or Borate modes of operation).

6.1 Aligning for Automatic Mode of Operation

1. ENSURE Section 3.0, Prerequisites, is completed at least once per shift.
2. ENSURE Section 4.0, Precautions / Limitations, has been reviewed at least once per shift.
3. CALCULATE the proper blend ratio using the most recent chemistry samples of the 1A or 1B BAMT and the RCS.
4. ADJUST FRC-2210Y, Boric Acid Flow, to correspond to the calculated blend ratio.

NOTE

The scale on FRC-2210X MUST be increased by a factor of 10 to determine actual flow. (6 is actually 60 gpm)

5. ADJUST FRC-2210X, Primary Water Makeup Flow, to correspond to the calculated blend ratio.
6. ENSURE the BAMT used in the blend ratio calculation is selected on the Boric Acid Pump Selector switch.
7. ENSURE at least one Primary Makeup Water Pump is running.

CAUTION

¶1 Stopping either BAM pump with the Makeup Mode Selector switch in any position other than MANUAL could cause the pump breaker to trip.

8. PLACE the Makeup Mode Selector switch in AUTO.

6.1 Aligning for Automatic Mode of Operation (continued) INITIAL

9. ENSURE the VCT level is NOT generating an auto makeup signal. ______

10. ENSURE the following components are aligned as follows:

    A. FRC-2210Y, Boric Acid Flow, in AUTO. ______

    B. FRC-2210X, Primary Water Makeup Flow, in AUTO. ______

    C. FCV-2210Y, Boric Acid Valve, in AUTO. ______

    D. FCV-2210X, Reactor Makeup, in AUTO. ______

    E. V-2512, Reactor Makeup Water Stop Vlv, in AUTO. ______

    F. FCV-2161, Boric Acid Make-up Isol, in OPEN. ______

11. ENSURE the BAMT used in the blend ratio calculation has its associated Boric Acid Pump control switch in AUTO. ______

> **NOTE**
>
> The VCT will now automatically makeup between 40% and 55% level at the selected blend concentration.

12. VERIFY no automatic actions occurred. ______

13. If an automatic blend occurs, Then STOP the blend and INVESTIGATE. ______

14. If an automatic blend occurs due to rapidly changing plant conditions where a manual makeup can NOT be performed, Then PERFORM the following:

    A. CHECK the boronometer for an undesirable change in boron concentration. ______

    B. If a change is noticed indicating a mismatch between the blend and RCS concentrations, Then READJUST FRC-2210Y and FRC-2210X to compensate for the mismatch. ______

    C. ENSURE the automatic blend occurs as designed and stops at the correct VCT level. ______

6.1 Aligning for Automatic Mode of Operation (continued) <u>INITIAL</u>

15. §$_1$ RECORD on Data Sheet 1, Boration/Dilution Log, the number of gallons of Primary Makeup water added as indicated on FQI-2210X, Water Flow Totalizer.

16. §$_1$ RECORD on Data Sheet 1, Boration/Dilution Log, the number of gallons of Boric Acid added as indicated on FQI-2210Y, Boric Acid Totalizer.

17. <u>If</u> an automatic blend occurs that is NOT expected, <u>Then</u> PERFORM an RCS inventory balance in accordance with Data Sheet 1 of OP 1-0010125A, Surveillance Data Sheets.

18. Section 6.1 is complete, ANPS review.

END OF SECTION 6.1

6.2 Aligning for Borate Mode of Operation

INITIAL

NOTE

Makeup from Boron Concentration Control System can be directed to either the VCT (for long term effects, in any mode of operation) or the Charging Pump suction (for short term effects, in the MANUAL or Borate modes of operation).

1. ENSURE Section 3.0, Prerequisites, is completed at least once per shift. _____ _____ _____
2. ENSURE Section 4.0, Precautions / Limitations, has been reviewed at least once per shift. _____ _____ _____
3. DETERMINE the RCS boron concentration from the most recent Chemistry sample analysis. _____ _____ _____
4. If the chemistry sample for the RCS is NOT available, Then USE the boronometer reading. _____ _____ _____
5. CONSULT PSL plant curves and nomographs to determine the number of gallons of Boric Acid to be added. _____ _____ _____
6. CHECK BAM Tank levels to determine which tank will be used for makeup. _____ _____ _____
7. SELECT the desired BAM Tank with BAM Pump Selector switch. _____ _____ _____
8. ENTER the number of gallons to be added into FQIS-2210Y, BA Batch Integrator. _____ _____ _____
9. ADJUST FRC-2210Y, Boric Acid Flow, to the desired flowrate. _____ _____ _____
10. PLACE FCV-2161, Boric Acid Make-up Isol, in OPEN. _____ _____ _____
11. PLACE V2512, Reactor Makeup Water Stop Vlv, in OPEN, if borating to the VCT. _____ _____ _____
12. PLACE V2525, Boron Load Control Valve, in OPEN, if borating to the Charging Pump suction. _____ _____ _____
13. PLACE the Makeup Mode Selector switch to BORATE. _____ _____ _____

6.2 Aligning for Borate Mode of Operation (continued) INITIAL

14. OBSERVE BAM Pump start and flow on FRC-2201Y. ____ ____ ____

15. When the boration is complete, Then ENSURE V2512, Reactor Makeup Water Stop Vlv, Control Switch is in AUTO or CLOSED. ____ ____ ____

16. When the boration is complete, Then ENSURE V2525, Boron Load Control Valve, is CLOSED. ____ ____ ____

> **CAUTION**
>
> ¶1 Stopping either BAM pump with the Makeup Mode Selector switch in any position other than MANUAL could cause the pump breaker to trip.

17. PLACE the Makeup Mode Selector switch to MANUAL. ____ ____ ____

18. PLACE the selected Boric Acid Pump Control switch to STOP. ____ ____ ____

19. PLACE the selected Boric Acid Pump Control switch back to AUTO. ____ ____ ____

20. PLACE the Makeup Mode Selector switch to AUTO. ____ ____ ____

21. ENSURE no Automatic actions occur. ____ ____ ____

22. ENSURE the desired Reactivity change occurs. ____ ____ ____

23. §1 RECORD on Data Sheet 1, Boration/Dilution Log, the number of gallons of Boric Acid added as indicated on FQI-2210Y, Boric Acid Totalizer. ____ ____ ____

24. If additional Borations are desired, or if the expected changes to Tave, or Boron concentration are NOT achieved, Then REPEAT Steps 6.2.1 through 6.2.23. ____ ____ ____

25. Section 6.2 is complete, ANPS review. ____

END OF SECTION 6.2

6.3 Aligning for Dilute Mode of Operation

<u>INITIAL</u>

1. ENSURE Section 3.0, Prerequisites, is completed at least once per shift. ______ ______ ______
2. ENSURE Section 4.0, Precautions / Limitations, has been reviewed at least once per shift. ______ ______ ______
3. DETERMINE the RCS boron concentration from the most recent chemistry sample analysis. ______ ______ ______
4. <u>If</u> the chemistry sample for the RCS is NOT available, <u>Then</u> USE the boronometer reading. ______ ______ ______
5. CONSULT PSL plant curves and nomographs to determine the number of gallons of Primary Makeup Water to be added. ______ ______ ______
6. ENTER the number of gallons to be added into FQIS-2210X, Makeup Water Batch Integrator. ______ ______ ______
7. ADJUST FRC-2210X, Makeup Water Flow, to the desired flowrate. ______ ______ ______
8. START one Primary Makeup Water Pump if NOT running. ______ ______ ______
9. PLACE V2512, Reactor Makeup Water Stop Vlv, to OPEN. ______ ______ ______
10. PLACE Makeup Mode Selector switch in DILUTE. ______ ______ ______
11. OBSERVE flow indication on FRC-2210X, Makeup Water Flow. ______ ______ ______
12. MONITOR VCT level to ensure it does NOT fill up to the high level alarm. ______ ______ ______
13. <u>If</u> an extended dilution is desired, <u>Then</u> MATCH makeup flow with Charging flow using FRC-2201X, Primary Water Makeup Flow, to prevent over-filling of the VCT while diverting letdown. ______ ______ ______
14. <u>When</u> the dilution is complete, <u>Then</u> ENSURE V2512 Control Switch in AUTO or CLOSED. ______ ______ ______

6.3 Aligning for Dilute Mode of Operation (continued) INITIAL

15. PLACE Makeup Mode Selector switch to AUTO. ______ ______ ______

16. ENSURE NO Automatic actions occur. ______ ______ ______

17. ENSURE the desired Reactivity change occurs. ______ ______ ______

18. §1 RECORD on Data Sheet 1, Boration/Dilution Log, the number of gallons of Primary Makeup Water added as indicated on FQI-2210X, Water Flow Totalizer. ______ ______ ______

19. If additional Dilutions are desired, or if the expected changes to Tave, or Boron concentration are NOT achieved, Then REPEAT Steps 6.3.1 through 6.3.18. ______ ______ ______

20. Section 6.3 is complete, ANPS review. ______

END OF SECTION 6.3

6.4 Aligning for Manual Mode of Operation

INITIAL

NOTE

- The following formulas can be used to determine volume and blend ratio, note the current totalizer readings.
- Volume to be added = desired VCT level% - actual VCT level% X 33.8 gallons%.
- Blend Ratio = BAMT Concentration divided by RCS Concentration minus one.

$$\frac{BAMT}{RCS} - 1$$

1. ENSURE Section 3.0, Prerequisites, is completed at least once per shift. _____ _____ _____
2. ENSURE Section 4.0, Precautions / Limitations, has been reviewed at least once per shift. _____ _____ _____
3. DETERMINE the desired volume to be added to the VCT. _____ _____ _____
4. CALCULATE the proper blend ratio using the most recent chemistry boron samples of the 1A or 1B BAM Tank and the RCS. _____ _____ _____
5. If the chemistry sample for the RCS is NOT available, Then USE the boronometer reading. _____ _____ _____
6. PLACE the Makeup Mode Selector switch in MANUAL. _____ _____ _____
7. PLACE FRC-2210Y, Boric Acid Flow, to MANUAL and PERFORM the following:
   - A. ENSURE FRC-2210Ycontroller output is ZERO. _____ _____ _____
   - B. ENSURE FCV-2210Y, Boric Acid Valve, is CLOSED. _____ _____ _____
   - C. PLACE FRC-2210Y in MANUAL. _____ _____ _____

6.4 Aligning for Manual Mode of Operation (continued) INITIAL

8. PLACE FRC-2210X, Makeup Water Flow, to MANUAL <u>and</u> PERFORM the following:

   A. ENSURE FRC-2210X controller output is ZERO. ______ ______ ______

   B. ENSURE FCV-2210X, Reactor Makeup, is CLOSED. ______ ______ ______

   C. PLACE FRC-2210X in MANUAL. ______ ______ ______

9. ENSURE Primary Makeup Water Pump 1A or 1B is running. ______ ______ ______

10. ENSURE V2510 and V2511, BA Tank 1A and 1B Recirc Valves, are OPEN. ______ ______ ______

11. START 1A Boric Acid Pump if the 1A BAM Tank was used in the Blend Ratio Calculation. ______ ______ ______

12. START 1B Boric Acid Pump if the 1B BAM Tank was used in the Blend Ratio Calculation. ______ ______ ______

13. OPEN FCV-2161, Boric Acid Makeup Isol. ______ ______ ______

14. ENSURE FCV-2210Y, Boric Acid Valve, is in AUTO. ______ ______ ______

15. ENSURE FCV-2210X, Reactor Makeup, is in AUTO. ______ ______ ______

16. <u>If</u> blending to the VCT, <u>Then</u> OPEN V2512, Reactor Makeup Water Stop Vlv. ______ ______ ______

CAUTION

To preclude lifting the VCT relief valve while using V2525, do NOT allow the combined PMW and Boric Acid flowrates to exceed the running charging pump(s) capacity.

17. <u>If</u> blending to the Charging Pump suction, <u>Then</u> OPEN V2525, Boron Load Control Valve. ______ ______ ______

6.4 Aligning for Manual Mode of Operation (continued) INITIAL

18. ADJUST FRC-2210Y, Boric Acid Flow, to the calculated blend ratio for Boric Acid. _____ _____ _____

19. ADJUST FRC-2210X, Makeup Water Flow, to the calculated blend ratio for Primary Water. _____ _____ _____

> **NOTE**
>
> The addition of Boric Acid should be completed before the Primary water, so the total blend volume remaining allows for at least 30 gallons of primary water to flush out any remaining boric acid from the lines.

20. MONITOR the VCT for level increase. _____ _____ _____

21. MAINTAIN VCT pressure less than or equal to 30 psig by opening and closing V2513, VCT Vent, as needed. _____ _____ _____

22. When the desired amount of boric acid is added, Then CLOSE FCV-2210Y. _____ _____ _____

23. ENSURE FRC-2210Y is in MANUAL and REDUCE the controller output to ZERO. _____ _____ _____

> **CAUTION**
>
> ¶1 Stopping either BAM pump with the Makeup Mode Selector switch in any position other than MANUAL could cause the pump breaker to trip.

24. PLACE the running BAM pump control switch to AUTO and ENSURE the pump STOPS. _____ _____ _____

25. CLOSE FCV-2161. _____ _____ _____

26. When the blend is complete, Then ENSURE V2512, Reactor Makeup Water Stop Vlv, control switch is in AUTO or CLOSED. _____ _____ _____

27. When the blend is complete, Then ENSURE V2525, Boron Load Control Valve, is CLOSED. _____ _____ _____

6.4 Aligning for Manual Mode of Operation (continued) INITIAL

28. CLOSE FCV-2210X, Reactor Makeup. ______ ______ ______

29. ENSURE FRC-2210X, Makeup Water Flow, is in MANUAL and REDUCE the controller output to ZERO. ______ ______ ______

30. §$_1$ RECORD on Data Sheet 1, Boration/Dilution Log, the number of gallons of Primary Makeup Water added as indicated on FQI-2210X, Water Flow Totalizer. ______ ______ ______

31. §$_1$ RECORD on Data Sheet 1, Boration/Dilution Log, the number of gallons of Boric Acid added as indicated on FQI-2210Y, Boric Acid Totalizer. ______ ______ ______

32. MONITOR for any abnormal change in Tave. ______ ______ ______

33. MONITOR the Boronometer for undesirable change in Boron Concentration. ______ ______ ______

34. If additional MANUAL Blends are desired, or if the expected changes to Tave or Boron concentration are NOT achieved, Then REPEAT Steps 6.4.1 through 6.4.33. ______ ______ ______

35. If it is desired to restore the Boron Concentration Control system to the AUTOMATIC Mode of Operation, Then REFER to Section 6.1 AUTOMATIC Mode of Operation. ______ ______ ______

36. Section 6.4 is complete, ANPS review. ______

END OF SECTION 6.4

6.5 Aligning for Manual Dilution

INITIAL

1. ENSURE Section 3.0, Prerequisites, is completed at least once per shift. _____ _____ _____

2. ENSURE Section 4.0, Precautions / Limitations, has been reviewed at least once per shift. _____ _____ _____

3. DETERMINE the desired volume of primary water to be added. _____ _____ _____

4. PLACE the Makeup Mode Selector switch in MANUAL. _____ _____ _____

5. ENSURE FRC-2210X, Makeup Water Flow, is in MANUAL and REDUCE the controller output to ZERO. _____ _____ _____

6. ENSURE FRC-2210Y, Boric Acid Flow, is in MANUAL and REDUCE the controller output to ZERO. _____ _____ _____

7. ENSURE FCV-2210Y, Boric Acid Valve, control switch is in CLOSE. _____ _____ _____

8. ENSURE either Primary Makeup Water Pump 1A or 1B is running. _____ _____ _____

9. PLACE FCV-2210X, Reactor Makeup, control switch is in AUTO. _____ _____ _____

10. If diluting to the VCT, Then OPEN V2512, Reactor Makeup Water Stop Vlv. _____ _____ _____

11. If diluting directly to the Charging Pump suction, Then OPEN V2525, Boron Load Control Valve. _____ _____ _____

CAUTION

To preclude lifting the VCT relief valve while using V2525, do NOT allow the combined PMW and Boric Acid flowrates to exceed the running Charging pump(s) capacity.

12. ADJUST FRC-2210X to the desired flowrate and do NOT exceed the flowrate for the number of running Charging Pumps. _____ _____ _____

6.5 Aligning for Manual Dilution (continued) INITIAL

13. MAINTAIN VCT pressure less than or equal to 30 psig by opening and closing V2513, VCT Vent, as needed. ______ ______ ______

14. If necessary to maintain the desired VCT level, Then DIVERT the letdown flow to the Waste Management System by placing V2500, VCT Divert Valve, in the WMS position. ______ ______ ______

15. When the desired VCT level is reached, Then PERFORM the following:

    A. PLACE V2500 to the AUTO position. ______ ______ ______

    B. ENSURE V2500 indicates CLOSED. ______ ______ ______

16. When the desired amount of primary water has been added, Then CLOSE FCV-2210X, Reactor Makeup. ______ ______ ______

17. When the dilution is complete, Then ENSURE V2512, Reactor Makeup Water Stop Vlv, Control Switch is in AUTO or CLOSED. ______ ______ ______

18. When the dilution is complete, Then ENSURE V2525, Boron Load Control Valve, is CLOSED. ______ ______ ______

19. ENSURE FRC-2210X, Makeup Water Flow, is in MANUAL and REDUCE the controller output to ZERO. ______ ______ ______

20. MONITOR for any abnormal change in Tave. ______ ______ ______

21. MONITOR for any undesired change in the RCS boron concentration by boronometer indication. ______ ______ ______

6.5 Aligning for Manual Dilution (continued) INITIAL

22. $\S_1$ RECORD on Data Sheet 1, Boration/Dilution Log, the number of gallons of Primary Makeup Water added as indicated on FQI-2210X, Water Flow Totalizer.

23. If additional dilutions are desired, or if the expected changes to Tave, or Boron concentration are NOT achieved, Then REPEAT Steps 6.5.1 through 6.5.22.

24. If it is desired to restore the Boron Concentration Control system to the AUTOMATIC Mode of Operation, Then REFER to Section 6.1, Automatic Mode of Operation.

25. Section 6.5 is complete, ANPS review.

END OF SECTION 6.5

6.6 Aligning for Manual Boration

INITIAL

1. ENSURE Section 3.0, Prerequisites, is completed at least once per shift.
2. ENSURE Section 4.0, Precautions / Limitations, has been reviewed at least once per shift.
3. DETERMINE the desired volume of boric acid to be added.
4. PLACE the Makeup Mode Selector switch in MANUAL.
5. PLACE FRC-2210X, Makeup Water Flow, in MANUAL and REDUCE the controller output to ZERO.
6. ENSURE FCV-2210X, Reactor Makeup, control switch is in CLOSED.
7. PLACE FRC-2210Y, Boric Acid Flow, in MANUAL and REDUCE the controller output to ZERO.
8. ENSURE FCV-2210Y, Boric Acid Valve, control switch is in CLOSED.
9. ENSURE one of the Primary Makeup Water Pumps, 1A or 1B, is running.
10. START either Boric Acid Pump 1A or 1B.
11. PLACE FCV-2210Y control switch in AUTO.
12. OPEN FCV-2161, Boric Acid Makeup Isol.
13. If borating to the VCT, Then OPEN V2512, Reactor Makeup Water Stop Vlv.
14. If borating to the Charging Pump suction, Then OPEN V2525, Boron Load Control Valve.
15. ADJUST FRC-2210Y to the desired flowrate.
16. MAINTAIN VCT pressure less than or equal to 30 psig by opening and closing V2513, VCT Vent, as needed.

6.6 Aligning for Manual Boration (continued) INITIAL

17. If necessary to maintain the desired VCT level, Then DIVERT the letdown flow to the Waste Management System by placing V2500, VCT Divert Valve, in the WMS position. ____ ____ ____

18. When the desired VCT level is reached, Then PERFORM the following:

A. PLACE V2500 to the AUTO position. ____ ____ ____

B. ENSURE V2500 indicates CLOSED. ____ ____ ____

19. When the desired amount of boric acid has been added, Then CLOSE FCV-2210Y, Boric Acid Valve. ____ ____ ____

20. CLOSE FCV-2161, Boric Acid Makeup Isol. ____ ____ ____

21. If additional Borations are desired, or if the expected changes to Tave, or Boron concentration are NOT achieved, Then REPEAT Steps 6.6.1 through 6.6.20. ____ ____ ____

CAUTION

§1 Stopping either BAM pump with the Makeup Mode Selector switch in any position other than MANUAL could cause the pump breaker to trip.

22. STOP the running Boric Acid Pump and PLACE the control switch in AUTO. ____ ____ ____

NOTE

If Plant conditions require multiple or constant borations, the following step is NOT required to be performed until conditions allow flushing of the CVCS piping following boration.

23. If flushing the CVCS piping after a boration, Then PERFORM the following:

A. PLACE FCV-2210X, Reactor Makeup, control switch in AUTO. ____ ____ ____

6.6 Aligning for Manual Boration (continued) <u>INITIAL</u>

23. (continued)

B. PLACE FRC-2210X, Makeup Water Flow, controller in MANUAL. ______ ______ ______

C. ADJUST FRC-2210X to the desired flowrate to flush the piping with at least 30 gallons of Primary Water. ______ ______ ______

D. <u>When</u> the desired amount of PMW has been added, <u>Then</u> PLACE FCV-2210X control switch in CLOSE. ______ ______ ______

E. ENSURE FRC-2210X is in MANUAL <u>and</u> REDUCE the controller output to ZERO. ______ ______ ______

24. <u>When</u> the boration is complete, <u>Then</u> ENSURE V2512, Reactor Makeup Water Stop Vlv, Control Switch is in AUTO or CLOSED. ______ ______ ______

25. <u>When</u> the boration is complete, <u>Then</u> ENSURE V2525, Boron Load Control Valve, is CLOSED. ______ ______ ______

26. ENSURE FRC-2210Y, Boric Acid Flow, is in MANUAL <u>and</u> REDUCE the controller output to ZERO. ______ ______ ______

27. MONITOR for any abnormal change in Tave. ______ ______ ______

28. MONITOR for any undesired change in the RCS boron concentration by boronometer indication. ______ ______ ______

29. §$_1$ RECORD on Data Sheet 1, Boration/Dilution Log, the number of gallons of Primary Makeup Water added as indicated on FQI-2210X, Water Flow Totalizer. ______ ______ ______

30. §$_1$ RECORD on Data Sheet 1, Boration/Dilution Log, the number of gallons of Boric Acid added as indicated on FQI-2210Y, Boric Acid Totalizer. ______ ______ ______

6.6 Aligning for Manual Boration (continued) INITIAL

31. If it is desired to restore the Boron Concentration Control System to the AUTOMATIC Mode of Operation, Then REFER to Section 6.1, Automatic Mode of Operation. _____ _____ _____

32. Section 6.6 is complete, ANPS review. _____

END OF SECTION 6.6

FPL

ST. LUCIE UNIT 1 NORMAL OPERATING PROCEDURE

SAFETY RELATED

Procedure No.
NOP-1-0030127

Current Rev. No.
19

Effective Date:
12/20/99

Title:

REACTOR PLANT COOLDOWN - HOT STANDBY TO COLD SHUTDOWN

Responsible Department: **OPERATIONS**

Revision Summary

Revision 19 - Changed location of ESFAS key locker from PGM's office to M&TE area. (David Potteroff, 12/09/99)

AND

Changed upper connection point for tygon level hose from V1438 to V1439. (Clay Anderson, 12/04/99)

Revision 18 - Changed OP 1-0110056 to 1-NOP-100.04. (C. Simpkins, 10/25/99)

AND

Changed OP 1-0410022 to 1-NOP-03.05. (Gene Boyd, 10/09/99)

AND

Changed S/G level control range from 55% - 75% to 60% - 70%. (Steve Willett, 09/27/99)

Revision 17A - Corrected Section references, procedure references and Step references. (Bob Czachor, 09/21/99)

Revision 17 - Changed reference of NOP-1-0030121 to read "the General Operating Procedures". (Gene Boyd, 08/04/99)

AND

Added acceptance criteria for pump flow and changed full flow acceptance criteria. (R. L. Womack, 07/27/99)

AND

Eliminated step to commence warm-up of SDC and re-arranged sequence of steps to incorporate improvements in H_2O_2 injection process. (Roger Weller, 07/26/99)

Revision	FRG Review Date	Approved By	Approval Date
0	04/19/96	J. Scarola Plant General Manager	04/19/96

Revision	FRG Review Date	Approved By	Approval Date
19	12/09/99	R. G. West Plant General Manager	12/09/99
		Adam Scales Designated Approver	12/04/99

S 1 OPS
DATE
DOCT PROCEDURE
DOCN NOP-1-0030127
SYS
COMP COMPLETED
ITM 19

TABLE OF CONTENTS

1.0 TITLE:

REACTOR PLANT COOLDOWN - HOT STANDBY TO COLD SHUTDOWN

2.0 PURPOSE:

This procedure provides instructions for the cooldown and depressurization of the Reactor Coolant System from Hot Standby (Mode 3) to Cold Shutdown (Mode 5).

3.0 REFERENCES:

$\S_1$ 3.1 St. Lucie Unit 1 Technical Specifications.

3.2 One or more of the following symbols may be used in this procedure:

1. § indicates a Regulatory commitment made by Technical Specifications, condition of license, audit, LER, bulletin, etc., and should NOT be revised without Facility Review Group approval.
2. ¶ indicates a management directive, vendor recommendation, plant practice or other non-regulatory commitment that should NOT be revised without consultation with the plant staff.

$\P_1$ 3.3 AP 0010134, "Component Cycles and Transients."

$\P_2$ 3.4 DBD-RCS-1, Reactor Coolant System Design Basis Document

$\S_2$ 3.5 LER-389-93-005, "High Reactor Coolant Pump vibration resulting in a controlled unit shutdown due to a cracked shaft."

$\P_3$ 3.6 8770-6237, Byron Jackson Reactor Coolant Pump Technical Manual.

$\P_4$ 3.7 FOP 87-103, "LPSI Pump Seal Failures."

$\P_5$ 3.8 IHE 93-003, "Unit 2 Shutdown due to high vibration in 2A1 RCP."

$\S_3$ 3.9 AP 0010145, "Shutdown Cooling Controls."

3.10 St. Lucie Unit 1 FUSAR, Chapter 5.

3.11 St. Lucie Unit 1 FUSAR, Section 7.4.1.7.

3.0 REFERENCES: (continued)

3.12 St. Lucie Unit 1 FUSAR, Chapter 7.3.1.1.12.

3.13 St. Lucie Unit 1 FUSAR, Section 6.3.

3.14 St. Lucie Unit 1 FUSAR, Section 9.3.

3.15 St. Lucie Unit 1 FUSAR, Chapter 10.

3.16 St. Lucie Unit 1 FUSAR, Section 15.2

3.17 FSAR Section 7.6.1.3.

3.18 NRC GL 98-02

3.19 Eng Eval PSL-ENG-SEMS-98-055, Rev. 1

¶6 3.20 CR 96-1484

§4 3.21 JPN-PSL-SENP-95-110

¶7 3.22 JPN-PSL-SENS-96-053

§5 3.23 FPL Ltr L-98-278, Generic Letter 98-02 Initial Response

¶8 3.24 CR 98-2034, Exceeding 12 Hour Operating Limit on RCPs at Low RCS Pressure.

¶9 3.25 CR 98-1694, RCP Controlled Bleedoff, (PMAI 98-12-103).

3.26 CE Calculation 9585-OPS-017, Rev 0, Minimum Required Pressurizer Pressure for RCP Operation for Post-Core Conditions.

4.0 PREREQUISITES:

INITIAL

4.1 The RCS temperature and pressure are stable in Hot Standby (Mode 3).

____
ANPS

4.2 The Charging System is available to provide makeup as RCS temperature is lowered.

____
ANPS

4.3 The Boron Concentration Control System is available to provide borated water makeup to the VCT at a concentration equal to or greater than that required by the SDM calculation.

____
ANPS

4.4 Sufficient condensate inventory exists or makeup capability is available to perform a cooldown to SDC entry conditions.

____
ANPS

5.0 PRECAUTIONS/LIMITATIONS:

§$_1$ 5.1 The following administrative RCS cooldown rate limits should be followed in order to prevent exceeding the maximum allowable cooldown rates of Technical Specifications 3.4.9.1 and 3.1.2.1:

	Administrative Limit	Technical Specification Limit
Modes 1 - 4	75°F per hour down to 200°F	100°F per hour down to 195°F
Modes 5, 6 with NO HPSI Pump operable OR The RCS pressure boundary does not exist	40°F per hour down to 150°F 20°F per hour below 150°F	75°F per hour down to 185°F 50°F per hour down to 165°F 40°F per hour down to 145°F 30°F per hour down to 125° F 20°F per hour below 125°F
Modes 5, 6 with HPSI as Boration Flow Path AND RCS pressure boundary integrity exists	20°F per hour down to 185°F 10°F per hour down to 168°F 5°F per hour down to 131°F 2°F per hour below 131°F	40°F per hour down to 194°F 30°F per hour down to 185°F 20°F per hour down to 168°F 10°F per hour down to 131°F 5°F per hour below 131°F

5.0 PRECAUTIONS/LIMITATIONS: (continued)

$\S_1$ 5.2 The RCS pressure and temperature shall be determined to be within the limits of Technical Specification 3.4.9.1 at least once every 30 minutes during cooldown.

$\P_1$ 5.3 If main or auxiliary spray actuates with less than 4 RCPs in operation, Then Appendix A of AP 0010134, "Component Cycles and Transients" shall be completed.

$\S_1$ 5.4 The flow rate of the Reactor Coolant shall be greater than 3000 GPM whenever a reduction in RCS boron concentration is being made. Refer to Technical Specification 3.1.1.3.

5.5 Hydrogen concentration in the Reactor Coolant shall be reduced to less than 5 cc/kg prior to the system being opened.

$\S_1$ 5.6 Technical Specifications 3.5.3, 3.1.2.1 and 3.1.2.3 require the following:

1. When the RCS is less than 200°F, Then the boration flow path using a HPSI Pump shall only be established if the following conditions exist:

   A. RCS pressure boundary integrity does NOT exist.

   OR

   B. NO Charging Pumps are operable.

2. If NO Charging Pumps are operable, Then all of the following conditions must also exist in order to use a HPSI pump for a boration flowpath:

   A. All Charging pumps shall be disabled.

   AND

   B. Heatup and cooldown rates are limited in accordance with Technical Specification Figure 3.1-1b.

   AND

   C. When RCS temperature is less than 115°F, Then two of the four header injection valves associated with the operable HPSI pump shall be verified closed and have their power removed.

5.0 PRECAUTIONS/LIMITATIONS: (continued)

¶$_2$ 5.7 Four RCPs shall NOT be operated simultaneously below 500°F RCS temperature due to fuel uplift considerations.

§$_1$ 5.8 The Pressurizer temperature and spray differential temperature shall be determined to be within the limits of Technical Specification 3.4.9.2 at least once every 30 minutes during cooldown.

§$_1$ 5.9 RCS temperature shall remain above 85°F whenever the Reactor Head bolts are tensioned. This is to prevent exceeding the 80°F minimum boltup limit of Technical Specification 3.4.9.1.

5.10 When the SDC system is in operation, do NOT exceed 265 PSIA Pressurizer pressure or 325°F RCS temperature.

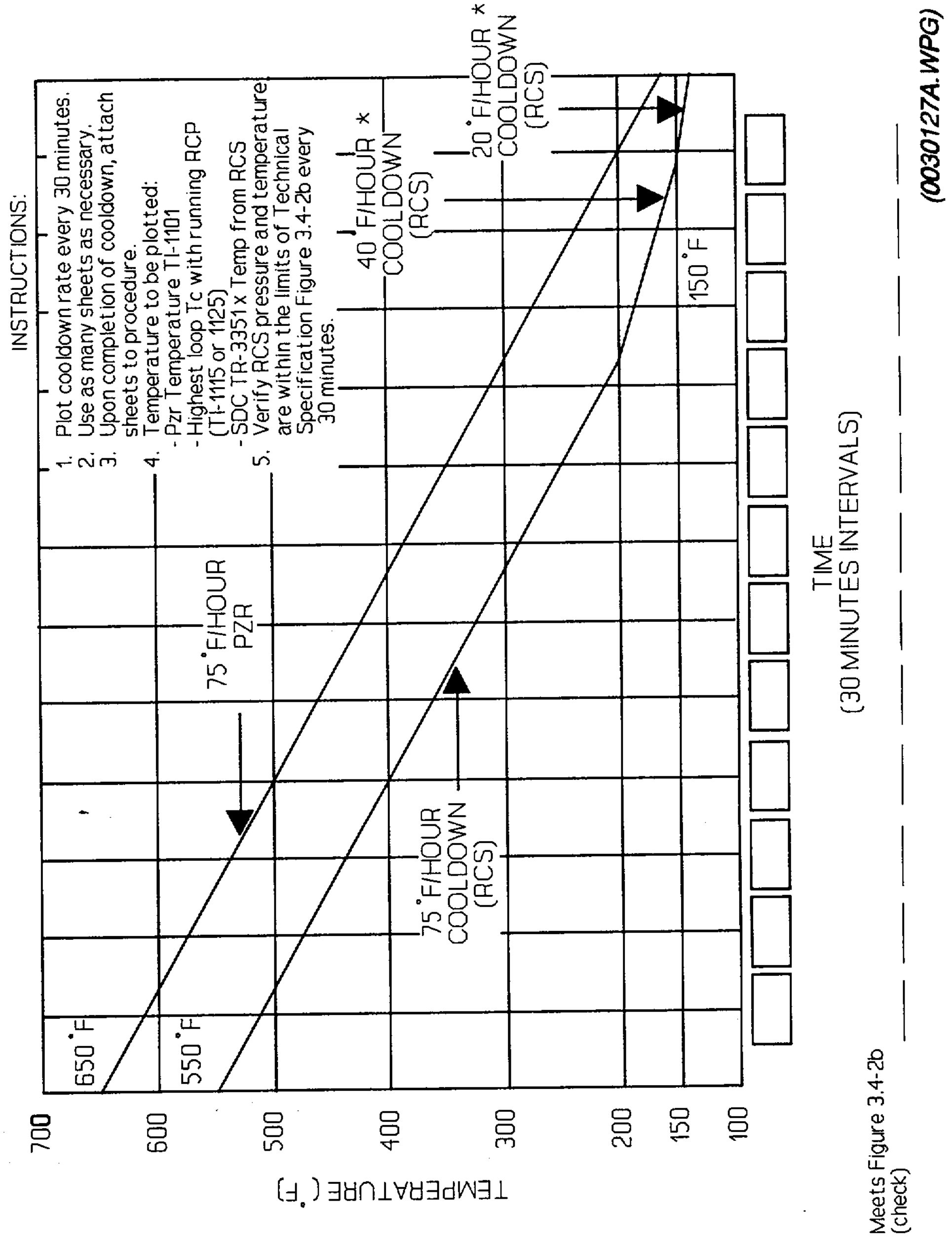
§$_2$ 5.11 Use of RCP Seal Injection is limited to Design Basis Events, and isothermal conditions experienced during RCS fill and vent.

6.0 RECORDS REQUIRED:

6.1 This procedure, with each step dispositioned, shall be maintained in the plant files in accordance with QI-17-PSL-1, "Quality Assurance Records."

6.2 Normal log entries.

DATA SHEET 3
REACTOR COOLANT SYSTEM COOLDOWN CURVE
(Page 1 of 1)



INSTRUCTIONS:

1. Plot cooldown rate every 30 minutes.
2. Use as many sheets as necessary.
3. Upon completion of cooldown, attach sheets to procedure.
4. Temperature to be plotted:
   - Pzr Temperature TI-1101
   - Highest loop Tc with running RCP (TI-1115 or 1125)
   - SDC TR-3351 x Temp from RCS
5. Verify RCS pressure and temperature are within the limits of Technical Specification Figure 3.4-2b every 30 minutes.

* Cooldown rates are **WITHOUT** a HPSI pump as boration flow path. Refer to PRECAUTIONS/LIMITATIONS Step 5.1.

END OF DATA SHEET 3

DATA SHEET 1
PRESSURIZER COOLDOWN
(Page 1 of 1)

DATE____/____/____

TIME (every 30 minutes)	Column 1 TI-1101 "Pressurizer Water Temperature"	Column 2 Spray Temperature **	Column 3 Pressurizer Pressure	* Difference Column 1 Minus Column 2	Data taken by: (Initial)

$\S_1$ * Limited to less than or equal to 350°F.

** If Main Spray is the source of Pressurizer spray, Then record the **lower** of TIA-1103, "Spray Line 1B1," or TIA-1104, "Spray Line 1B2." If Auxiliary Spray is the source of Pressurizer spray, Then record TI-2229, "Temp Outlet Regen Hx."

END OF DATA SHEET 1

DATA SHEET 2

RCS BORON CONCENTRATION DURING TEMPERATURE CHANGES

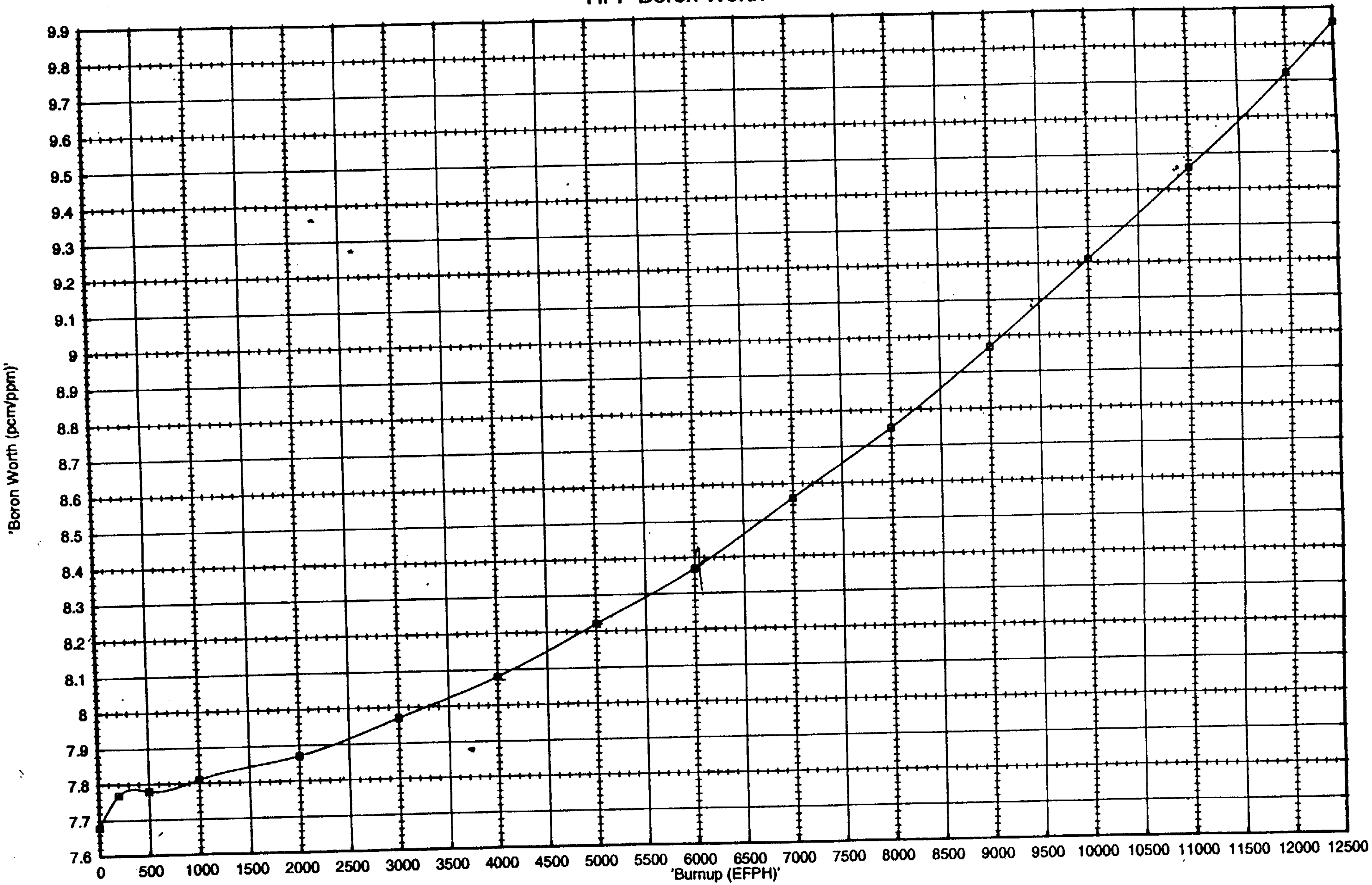
(Page 1 of 1)

DATE____/____/____

	RCS TEMP (T-cold)	RCS BORON	RCS BORON GREATER THAN REQUIRED BY SDM (Initial)
Start	____________°F	____________ppm	__________
-50°F	____________°F	____________ppm	__________
-100°F	____________°F	____________ppm	__________
-150°F	____________°F	____________ppm	__________
-200°F	____________°F	____________ppm	__________
-250°F	____________°F	____________ppm	__________
-300°F	____________°F	____________ppm	__________
-350°F	____________°F	____________ppm	__________
-400°F	____________°F	____________ppm	__________
-450°F	____________°F	____________ppm	__________

END OF DATA SHEET 2

St. Lucie Unit 2 Cycle 10
Figure C.1 HFP Revision 1
'HFP Boron Worth'

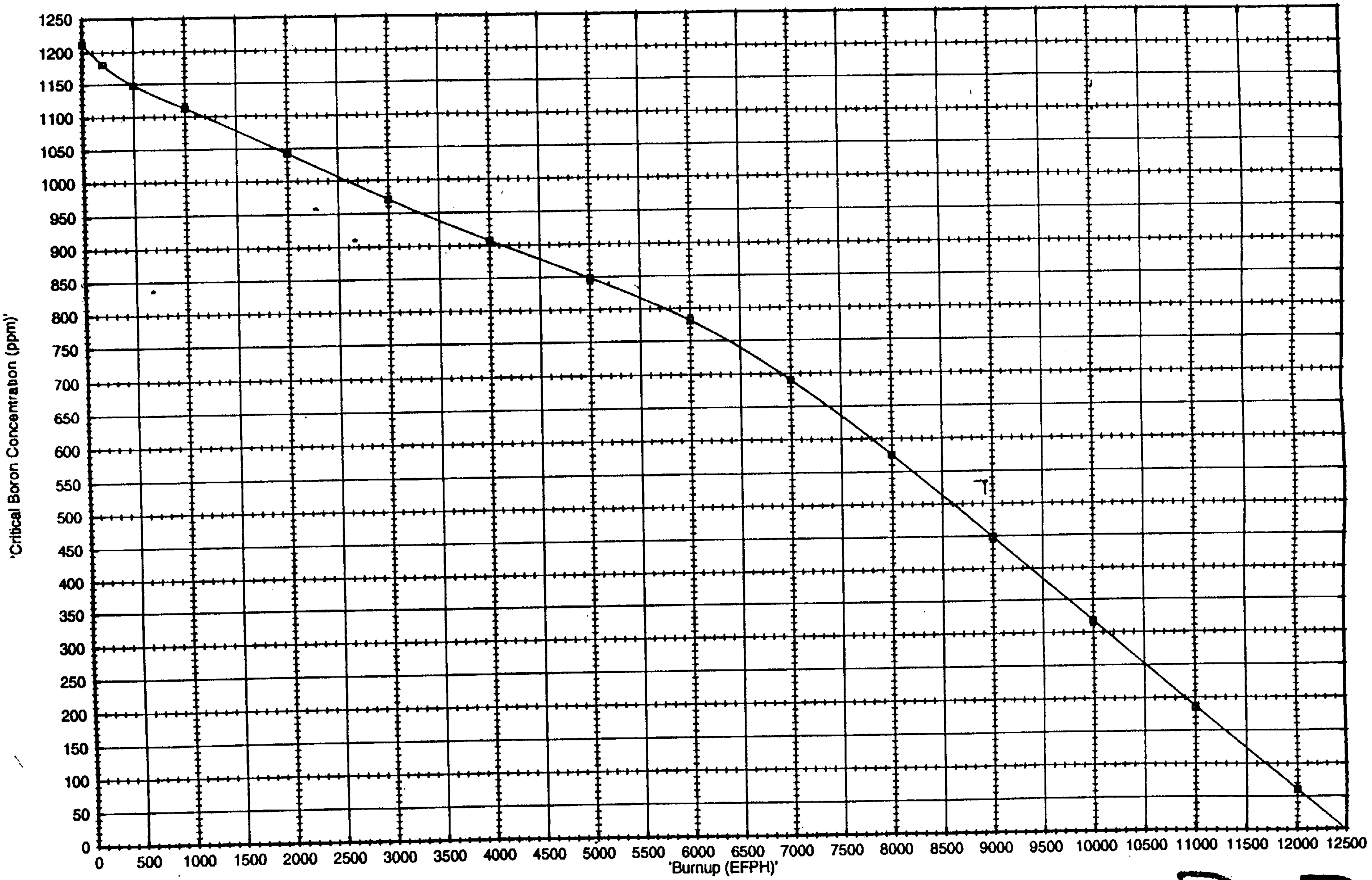


Prepared by: a.a. abaed Date 4/7/97

Date 4/17/97

Date of Update: 5/15/97

St. Lucie Unit 2 Cycle 10
Figure C.2 HFP Revision 1
'HFP Boron Concentration vs. Burnup (un–normalized)'



Prepared by: a.a. alsaed Date 4/7/97

Reviewed by: Date 4/12/97

Date of Update: 5/15/97

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FOR SIMULATOR
USE ONLY

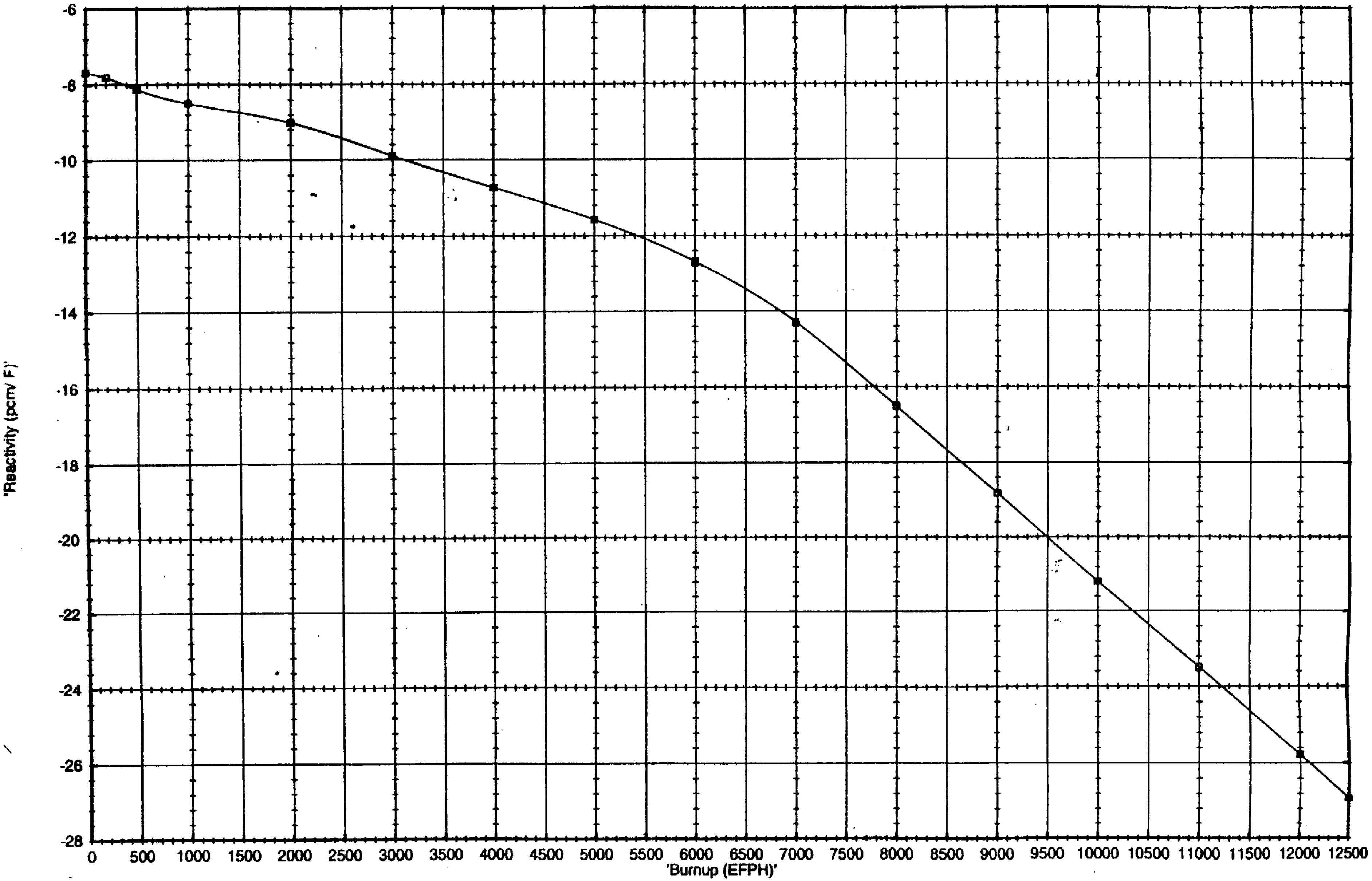
St. Lucie Plant
Unit 2 Cycle 10
Operator Information
Figure C.3

Date	EFPH	F^t_{xy} Axial Peaking	F^t_r Radial Peaking	T_q Core Tilt	Equil. Shape Index Current Value Posted on Channel D RPS (Updated as needed)	
					Date	Value
	5000	1.610	1.583	0.00490		-0.150
	5000	1.607	1.581	0.00462		-0.150
Today	5000	1.605	1.579	0.00544	Today	-0.150

Prepared by:

Reviewed by: 4/14/98

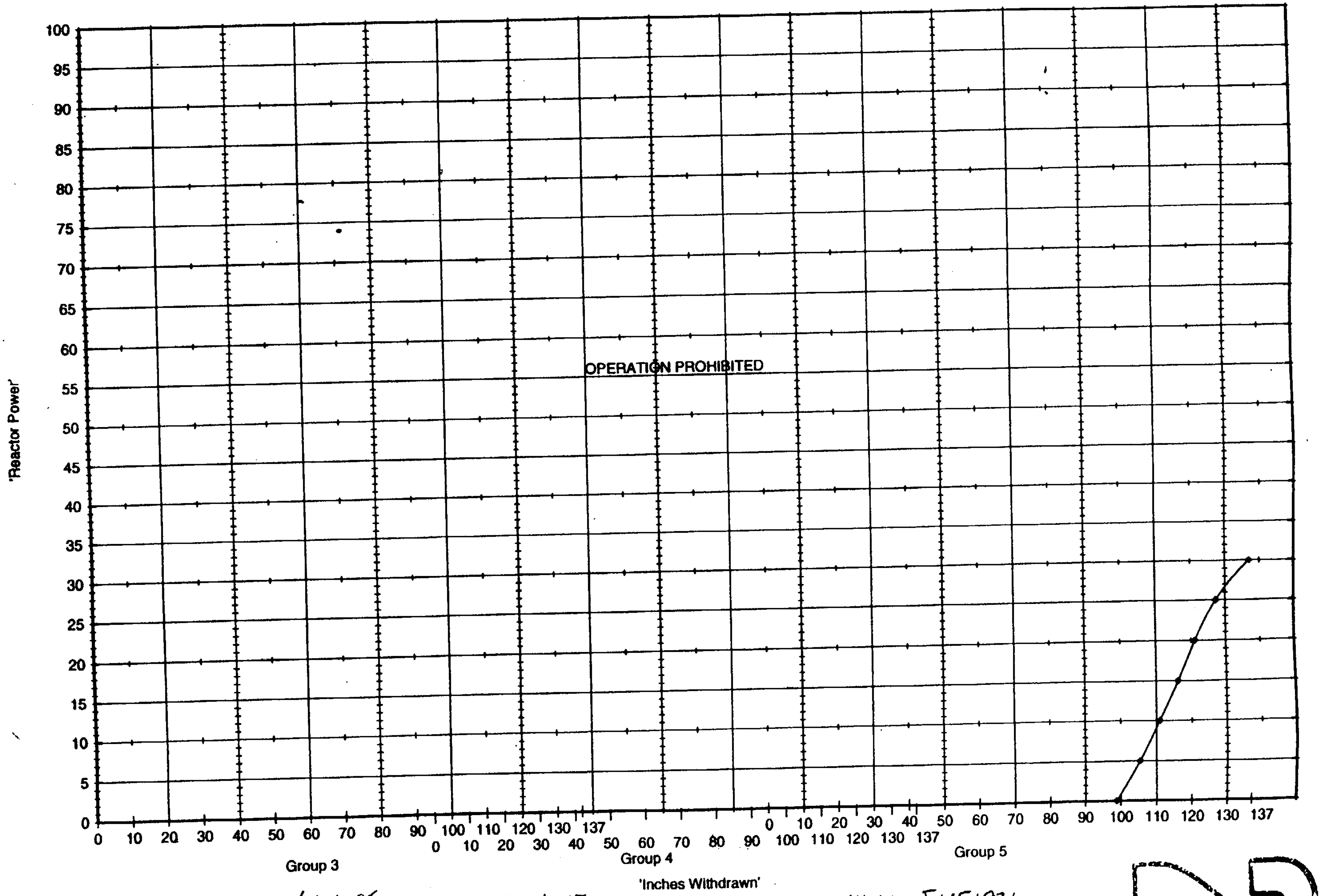
St. Lucie Unit 2 Cycle 10
Figure C.4 HFP Revision 1
'Moderator Temperature Coefficient vs. Burnup'



Prepared by: a.a. alsaed Date 4/17/97
Reviewed by: Date 4/17/97

Date of Update: 5/15/97

St. Lucie Unit 2 Cycle 10
Figure C.5 Two (2) Stuck CEAs Revision 0
'Two Stuck CEA PDIL'



Prepared by: R.P. HARRIS / R.P. Harris Date 5/14/97

Reviewed by: R.H. GAVIN / R.H. Gavin Date 5/14/97

Date of Update: 5/15/97

2

ST. LUCIE UNIT 2 CYCLE 10
FIGURE C.6 REVISION 1
BOC 70% TECH. SPEC. COMPLIANCE

THE VALUE OF THE MODERATOR TEMPERATURE COEFFICIENT (MTC) IS EXPECTED TO BE **-5.15 pcm/deg F**. THIS IS TO COMPLY WITH THE REQUIREMENT THAT MTC BE LESS POSITIVE THAN +2.0 pcm/deg F BEFORE EXCEEDING 70% POWER

Submitted by:__________ Date 5/15/97

Approved by:__________ Date 5/16/97

ST. LUCIE UNIT BORATION/DILUTION
NOP/NOT CONDITIONS

FINAL BORON CONCENTRATION

INITIAL BORON CONCENTRATION PPM

	700.	690.	680.	670.	660.	650.	640.	630.	620.	610.	600.
700.	0.	899.	1812.	2738.	3678.	4632.	5601.	6585.	7585.	8601.	9634.
690.	129.	0.	912.	1838.	2778.	3732.	4701.	5686.	6686.	7702.	8735.
680.	259.	129.	0.	926.	1866.	2820.	3789.	4773.	5773.	6790.	7823.
670.	387.	258.	129.	0.	940.	1894.	2863.	3847.	4847.	5864.	6897.
660.	516.	387.	257.	129.	0.	954.	1923.	2907.	3908.	4924.	5957.
650.	644.	515.	386.	257.	128.	0.	969.	1953.	2953.	3970.	5003.
640.	772.	643.	514.	385.	256.	128.	0.	984.	1984.	3001.	4034.
630.	900.	771.	642.	513.	384.	256.	128.	0.	1000.	2016.	3049.
620.	1028.	898.	769.	640.	512.	383.	255.	128.	0.	1016.	2049.
610.	1155.	1026.	897.	768.	639.	511.	383.	255.	127.	0.	1033.
600.	1282.	1153.	1024.	895.	766.	638.	510.	382.	254.	127.	0.

DILUTE GALLONS

BORATE GALLONS

____________________ DATE________
OPS SUPERVISOR REVIEW

BASED ON 5525 PPM MAKEUP BORON CONCENTRATION

____________________ DATE________
PREPARED BY

ST. LUCIE UNIT 2 BORATION/DILUTION
NOP/NOT CONDITIONS

FINAL BORON CONCENTRATION

INITIAL BORON CONCENTRATION PPM

	800.	790.	780.	770.	760.	750.	740.	730.	720.	710.	700.
800.	0.	786.	1582.	2389.	3206.	4034.	4873.	5723.	6585.	7459.	8346.
790.	132.	0.	796.	1603.	2420.	3247.	4086.	4937.	5799.	6673.	7560.
780.	264.	132.	0.	806.	1623.	2451.	3290.	4141.	5003.	5877.	6763.
770.	396.	263.	132.	0.	817.	1645.	2484.	3334.	4196.	5070.	5957.
760.	527.	395.	263.	131.	0.	828.	1667.	2517.	3379.	4253.	5140.
750.	658.	526.	394.	262.	131.	0.	839.	1689.	2551.	3426.	4312.
740.	789.	657.	525.	393.	262.	131.	0.	850.	1712.	2587.	3473.
730.	919.	787.	655.	524.	392.	261.	130.	0.	862.	1736.	2623.
720.	1049.	917.	785.	654.	522.	391.	261.	130.	0.	874.	1761.
710.	1179.	1047.	915.	784.	652.	521.	391.	260.	130.	0.	887.
700.	1309.	1177.	1045.	913.	782.	651.	520.	390.	260.	130.	0.

DILUTE GALLONS

BORATE GALLONS

_________________________ DATE________
OPS SUPERVISOR REVIEW

BASED ON 5525 PPM MAKEUP BORON CONCENTRATION

_________________________ DATE________
PREPARED BY

ST. LUCIE UNI ATION/DILUTION
NOP/NOT CONDITIONS

FINAL BORON CONCENTRATION

INITIAL BORON CONCENTRATION PPM

DILUTE GALLONS

	900.	890.	880.	870.	860.	850.	840.	830.	820.	810.	800.
900.	0.	698.	1405.	2119.	2841.	3572.	4312.	5061.	5818.	6585.	7361.
890.	135.	0.	706.	1421.	2143.	2874.	3614.	4362.	5120.	5887.	6663.
880.	270.	135.	0.	714.	1437.	2168.	2907.	3656.	4414.	5180.	5957.
870.	404.	269.	134.	0.	723.	1454.	2193.	2942.	3699.	4466.	5243.
860.	538.	403.	269.	134.	0.	731.	1471.	2219.	2977.	3744.	4520.
850.	672.	537.	402.	268.	134.	0.	740.	1488.	2246.	3013.	3789.
840.	806.	671.	536.	401.	267.	134.	0.	749.	1506.	2273.	3049.
830.	939.	804.	669.	535.	401.	267.	133.	0.	758.	1524.	2301.
820.	1072.	937.	802.	668.	534.	400.	266.	133.	0.	767.	1543.
810.	1205.	1070.	935.	800.	666.	532.	399.	266.	133.	0.	776.
800.	1337.	1202.	1067.	933.	799.	665.	531.	398.	265.	132.	0.

BORATE GALLONS

_________________________ DATE________
OPS SUPERVISOR REVIEW

BASED ON 5525 PPM MAKEUP BORON CONCENTRATION

_________________________ DATE________
PREPARED BY

ST. LUCIE UNIT 2 B ION/DILUTION
NOP/NOT CONDITIONS

FINAL BORON CONCENTRATION

INITIAL BORON CONCENTRATION PPM

	1000.	990.	980.	970.	960.	950.	940.	930.	920.	910.	900.
1000.	0.	628.	1263.	1904.	2551.	3206.	3867.	4536.	5211.	5894.	6585.
990.	138.	0.	635.	1276.	1923.	2578.	3239.	3908.	4583.	5266.	5957.
980.	276.	138.	0.	641.	1289.	1943.	2605.	3273.	3949.	4632.	5322.
970.	413.	275.	137.	0.	648.	1302.	1964.	2632.	3308.	3991.	4681.
960.	550.	412.	274.	137.	0.	654.	1316.	1984.	2660.	3343.	4034.
950.	687.	549.	411.	274.	137.	0.	661.	1330.	2006.	2689.	3379.
940.	823.	685.	548.	410.	273.	136.	0.	668.	1344.	2027.	2718.
930.	959.	821.	684.	546.	409.	273.	136.	0.	676.	1359.	2049.
920.	1095.	957.	820.	682.	545.	408.	272.	136.	0.	683.	1374.
910.	1231.	1093.	955.	818.	681.	544.	408.	271.	136.	0.	691.
900.	1366.	1228.	1091.	953.	816.	679.	543.	407.	271.	135.	0.

DILUTE GALLONS

BORATE GALLONS

____________________ DATE________
OPS SUPERVISOR REVIEW

BASED ON 5525 PPM MAKEUP BORON CONCENTRATION

____________________ DATE________
PREPARED BY

FINAL SUBMITTAL

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

FEBRUARY 7 - 11, 2000

FINAL SRO LICENSE EXAM

REFERENCE MATERIAL

St. Lucie USNRC SRO Initial License Exam Reference Material Index

1) EOP's
   - EOP-99

2) ONP's
   - 2-ONP-01.04 Plant Condition 4 Shutdowwn Cooling in Operation – Reduced Inventory Operation

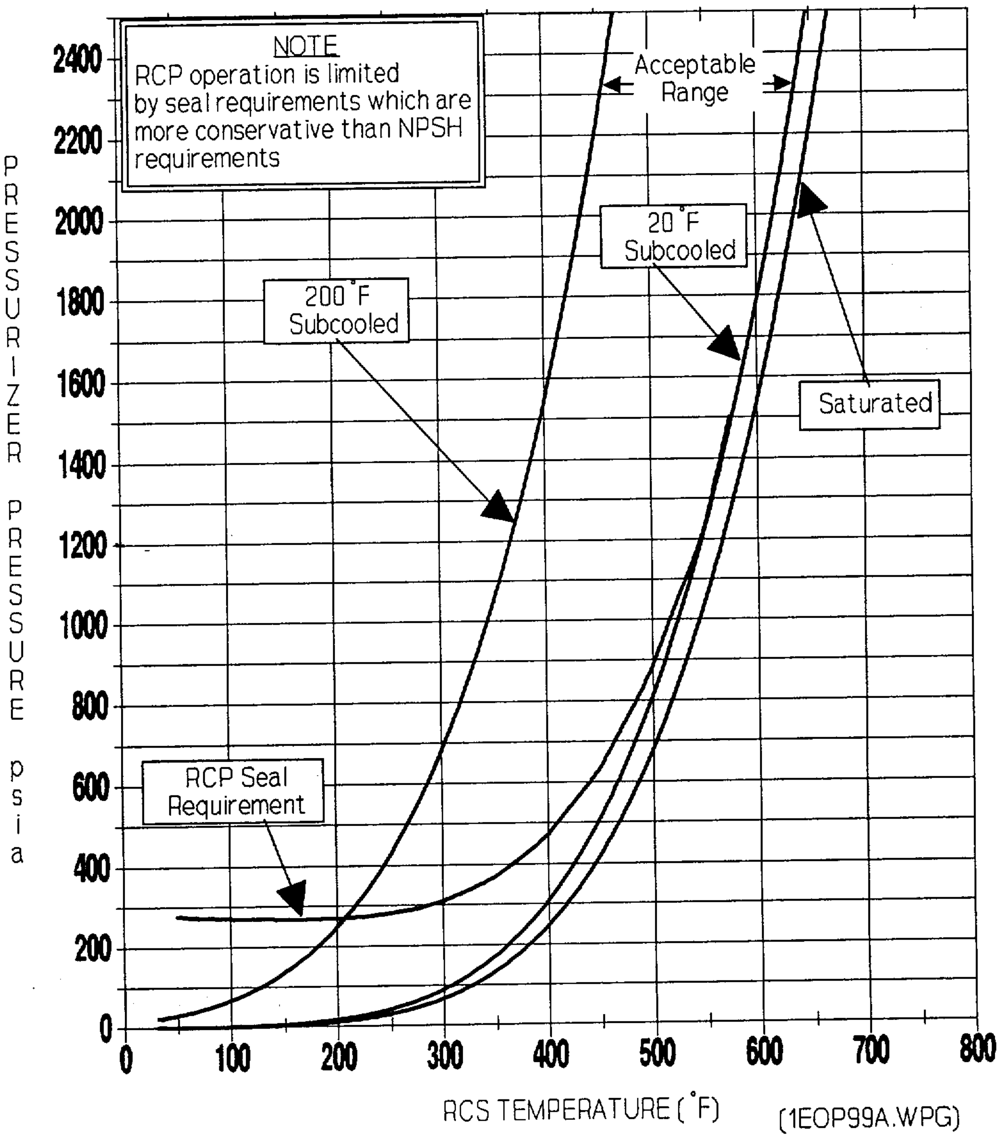
3) NOP's
   - 1-NOP-01.02 Reactor Coolant Pump Operation

4) Plant Curves
   - Figures C-1 through C-6, Boration/Dilution Tables

5) Technical Specifications
   - 3.4.7 and 3.4.8

FIGURE 1
RCS PRESSURE TEMPERATURE

CAUTION
When below the RCP Seal Requirement Curve, RCP instrumentation should be monitored for indication of pump cavitation. For minimum seal requirements, RCP operation below 250 psia should be avoided.

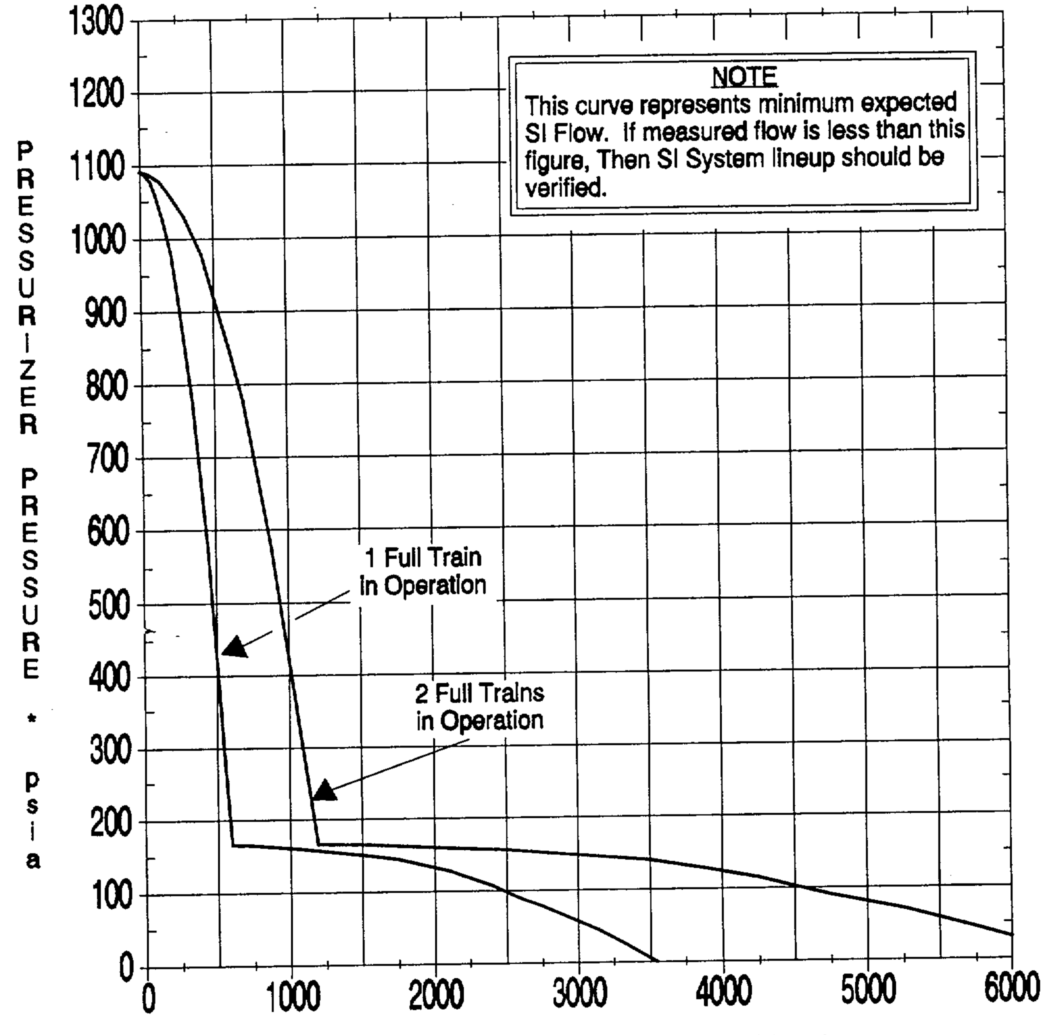


NOTE
RCP operation is limited by seal requirements which are more conservative than NPSH requirements

(1EOP99A.WPG)

REVISION NO.: 28	PROCEDURE TITLE: APPENDIXES/FIGURES/TABLES	PAGE: 123 of 155
PROCEDURE NO.: 1-EOP-99	ST. LUCIE UNIT 1	

FIGURE 2
SAFETY INJECTION FLOW VS. RCS PRESSURE



(1EOP99B.WPG)

FIGURE 3

CONDENSATE REQUIRED FOR COOLDOWN - SENSIBLE HEAT

NOTE

Condensate required by this figure should be combined with the condensate required by Figures 4 through 8, based on the number of running RCPs, to determine condensate required to cool down to SDC entry conditions.

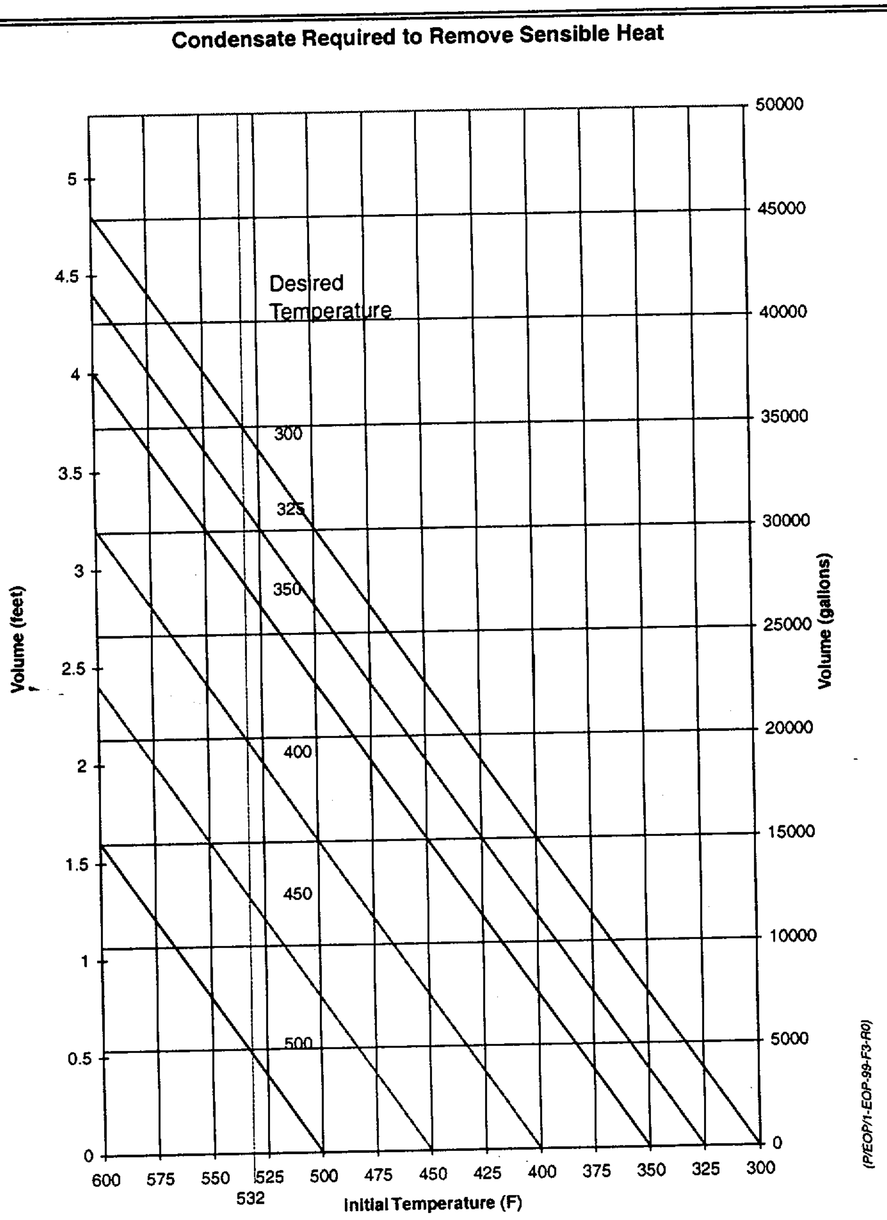
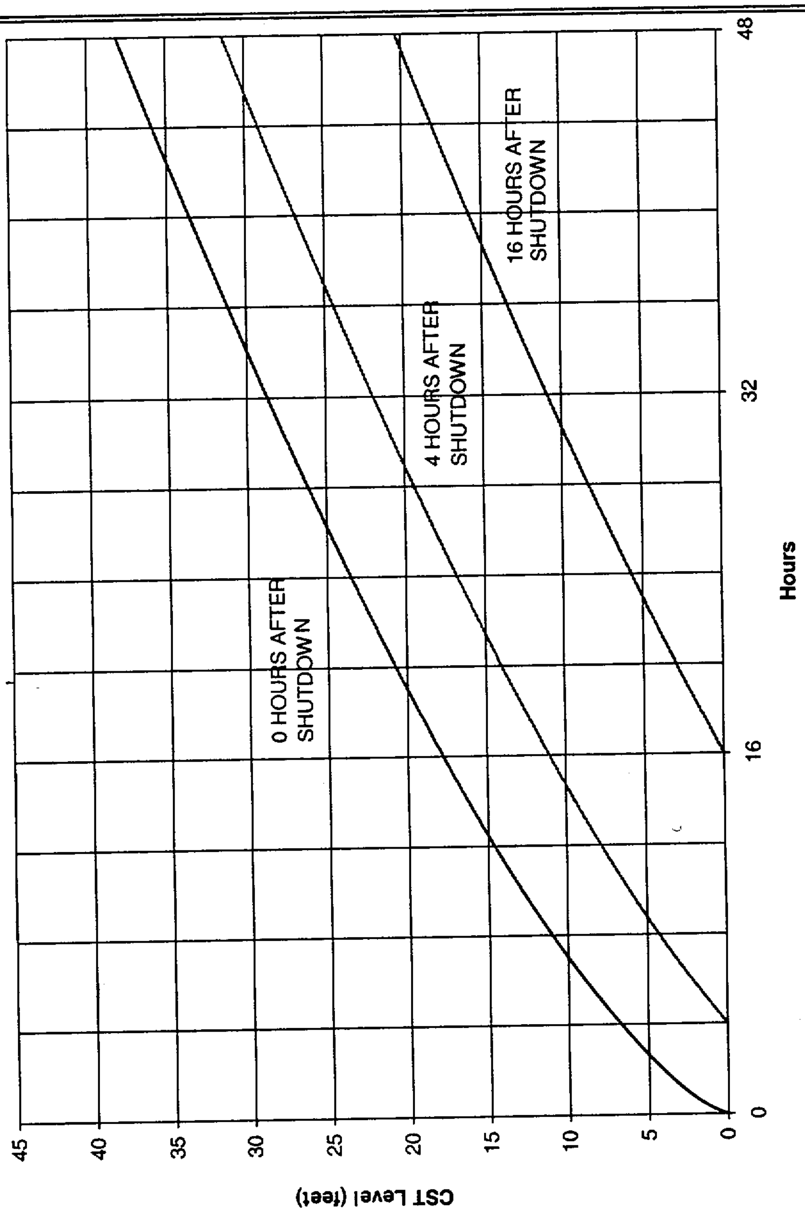


FIGURE 4

TIME UNTIL SHUTDOWN COOLING REQUIRED VS. CONDENSATE AVAILABILITY - NO RCPs RUNNING

NOTE

Condensate required by this Figure should be combined with the condensate required by Figure 3 to determine condensate required to cool down to SDC entry conditions.



(P/EOP/1-EOP-99-F4-R0)

FIGURE 5

TIME UNTIL SHUTDOWN COOLING REQUIRED VS. CONDENSATE AVAILABILITY - 1 RCPs RUNNING

> **NOTE**
>
> Condensate required by this figure should be combined with the condensate required by Figure 3 to determine condensate required to cool down to SDC entry conditions.

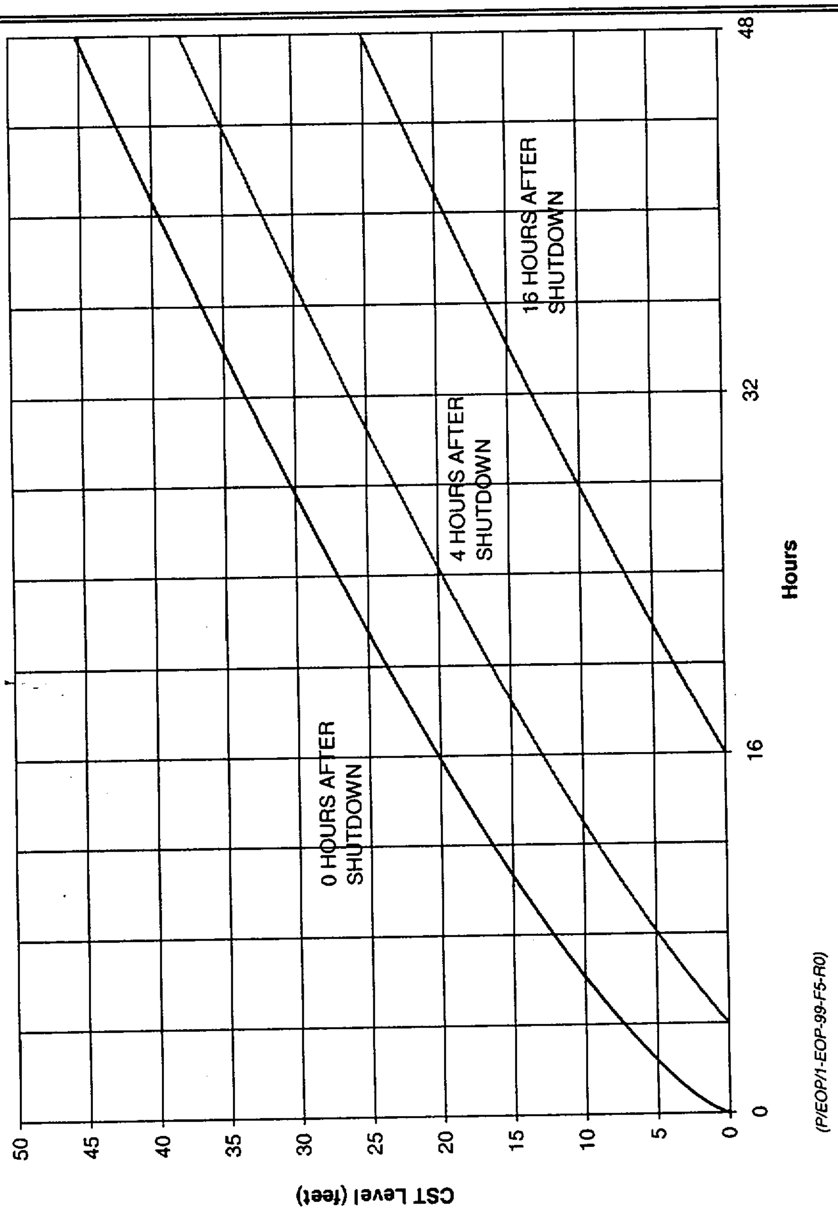
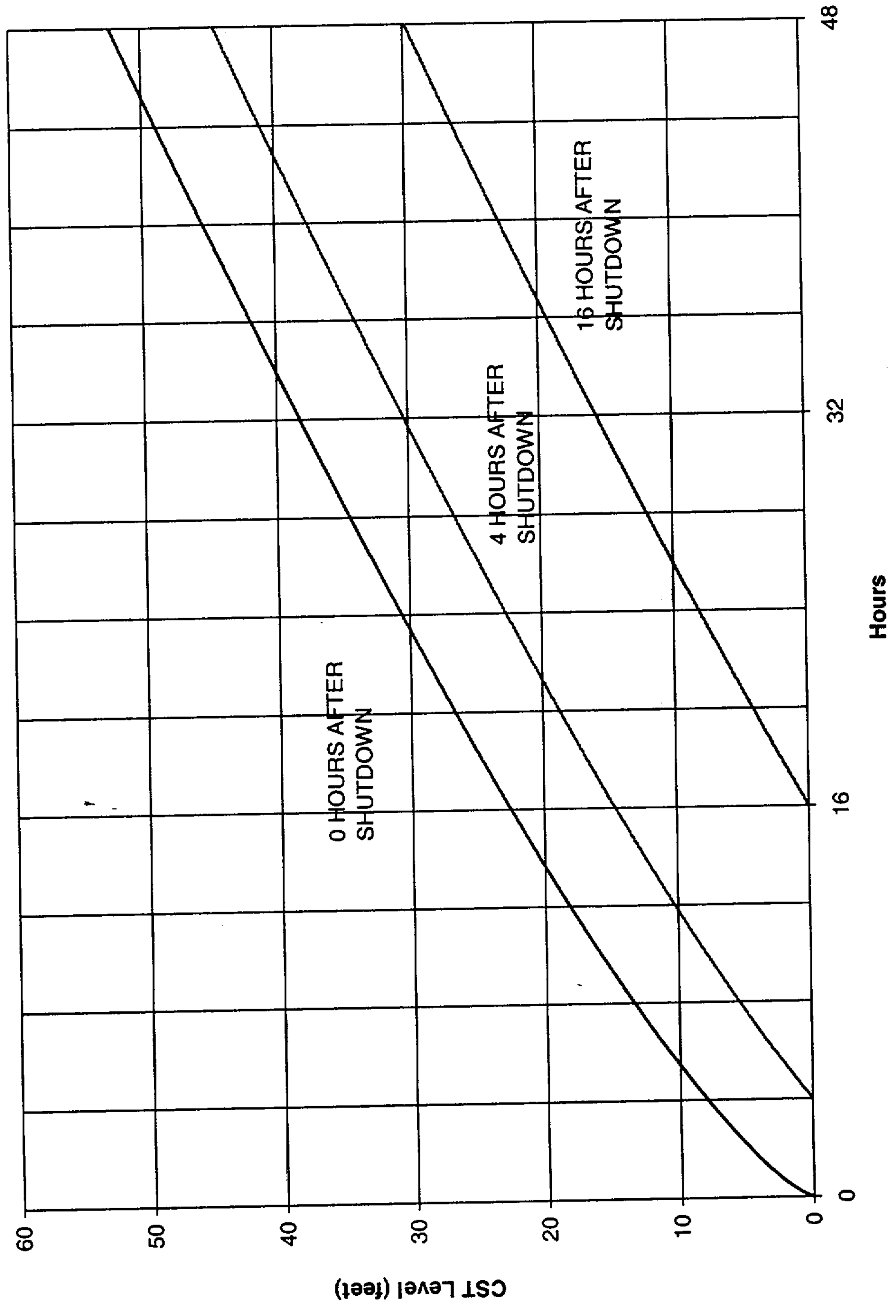


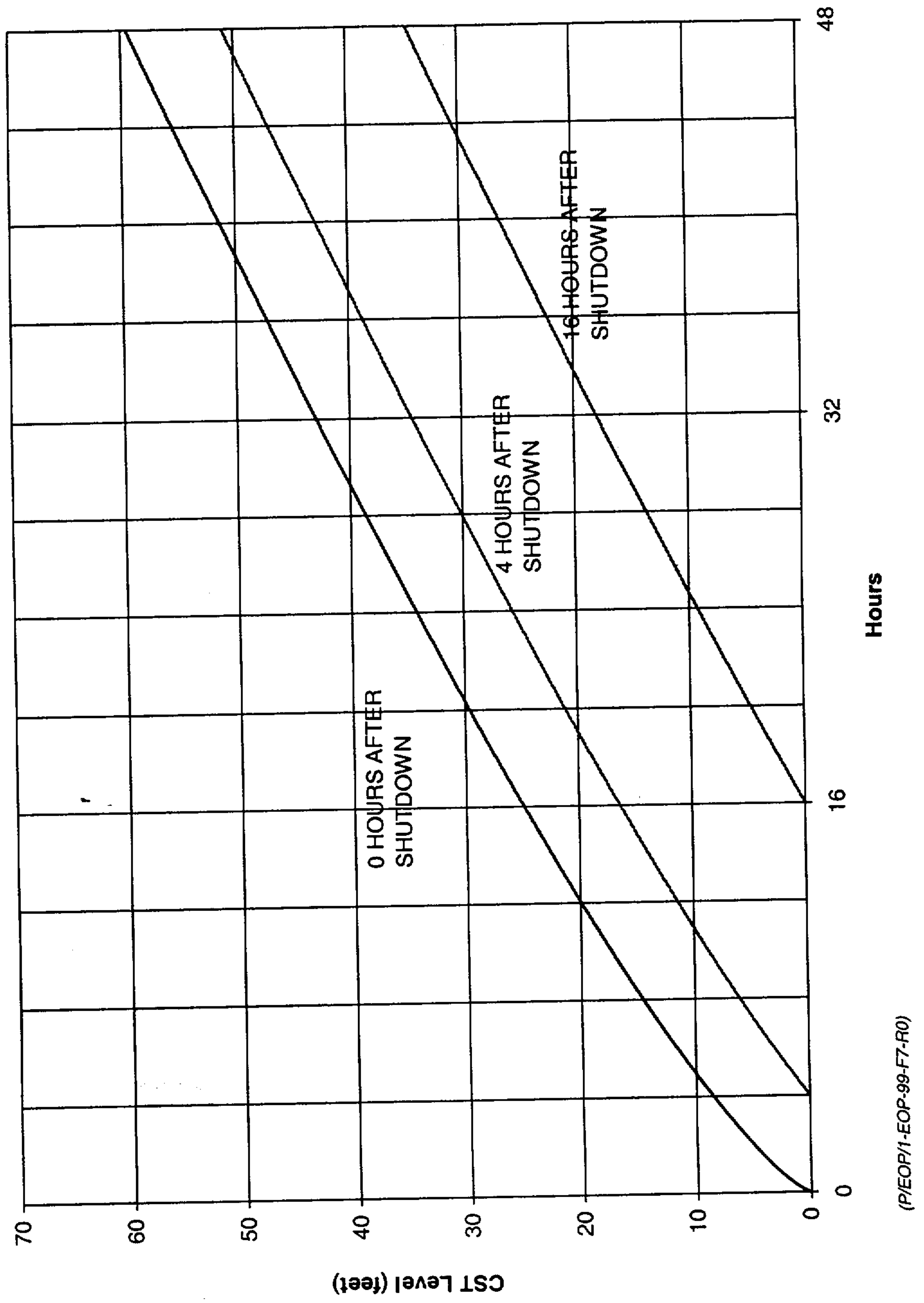
FIGURE 6

TIME UNTIL SHUTDOWN COOLING REQUIRED VS. CONDENSATE AVAILABILITY - 2 RCPs RUNNING



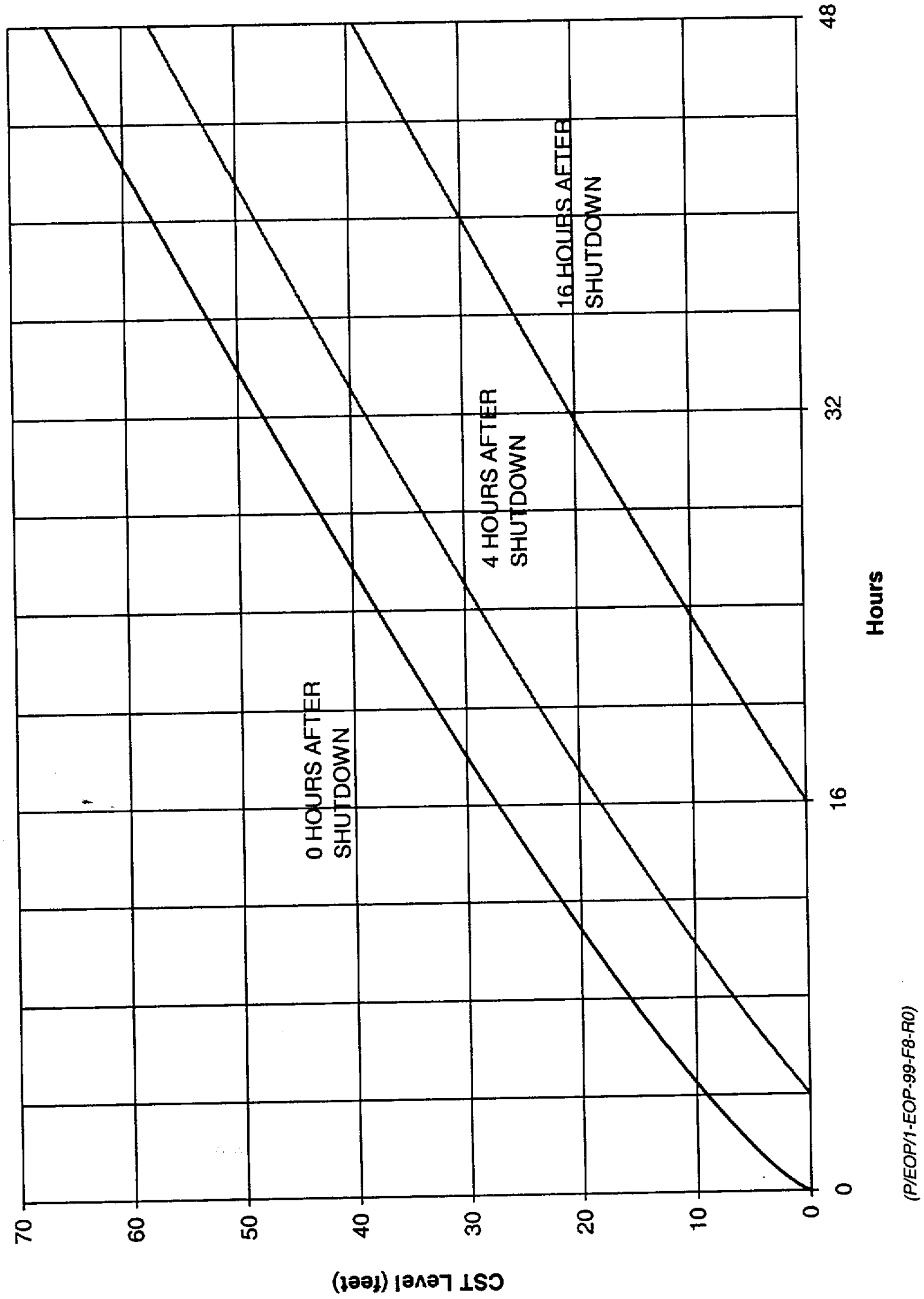
(P/EOP/1-EOP-99-F6-R0)

FIGURE 7
TIME UNTIL SHUTDOWN COOLING REQUIRED VS. CONDENSATE AVAILABILITY - 3 RCPs RUNNING



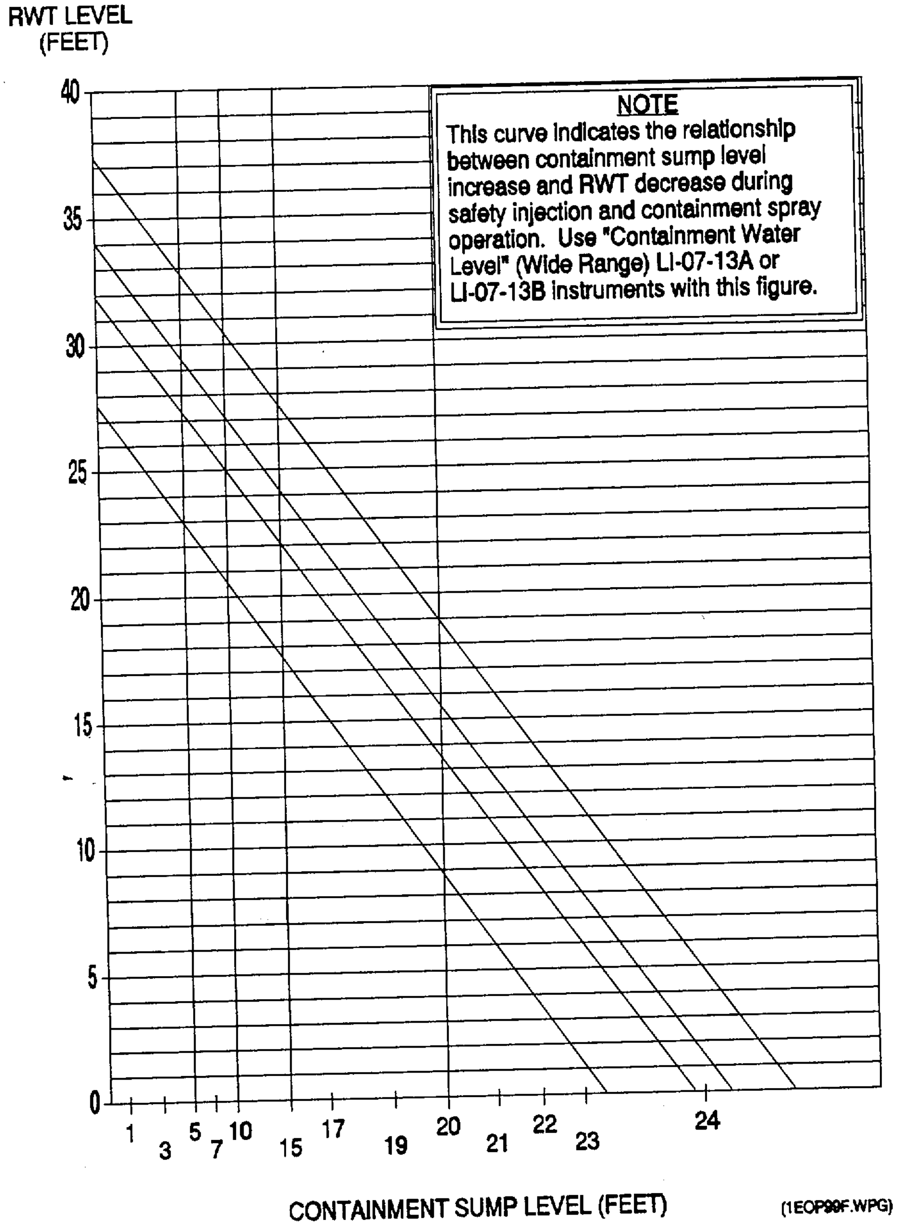
(P/EOP/1-EOP-99-F7-R0)

FIGURE 8
TIME UNTIL SHUTDOWN COOLING REQUIRED VS. CONDENSATE AVAILABILITY - 4 RCPs RUNNING



(P/EOP/1-EOP-99-F8-R0)

FIGURE 9
RWT LEVEL VS. CONTAINMENT SUMP LEVEL



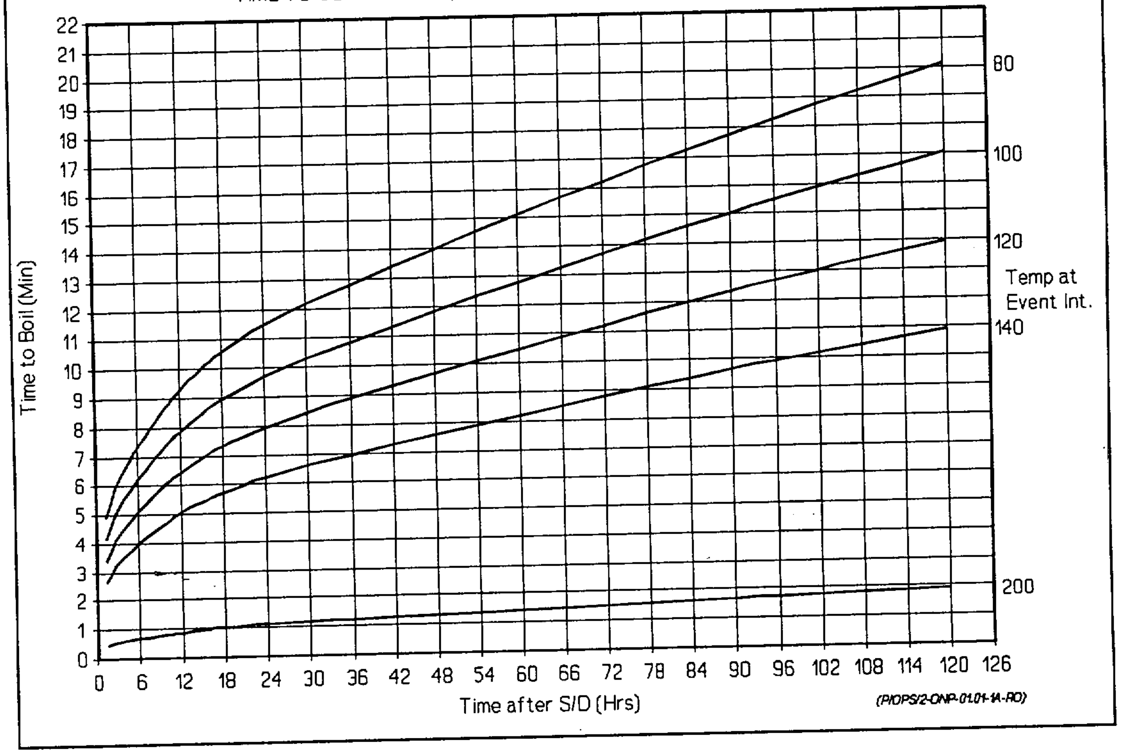
NOTE

This curve indicates the relationship between containment sump level increase and RWT decrease during safety injection and containment spray operation. Use "Containment Water Level" (Wide Range) LI-07-13A or LI-07-13B instruments with this figure.

FIGURE 1
TIME TO CORE BOILING

Figure 1A

TIME TO CORE BOILING, 0 TO 50 DAYS AFTER S/D RCS AT MID-LOOP



(P/OPS/2-ONP-01.01-1A-R0)

REFER TO FIGURE 1C FOR ADJUSTING TIME TO BOIL

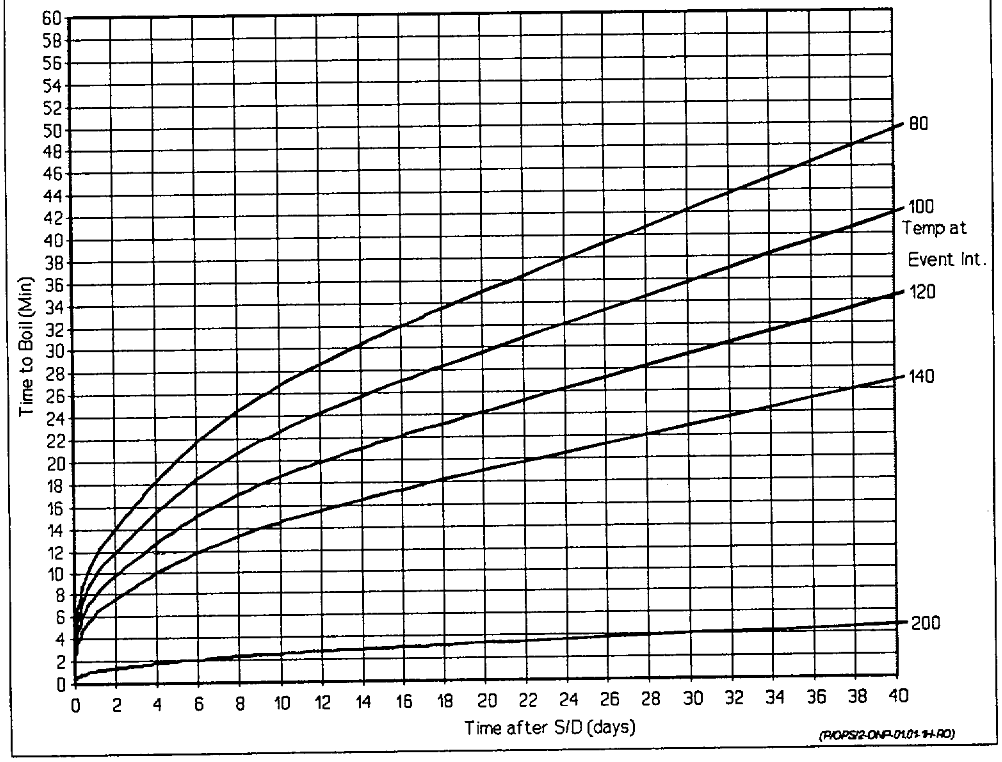
FIGURE 1

TIME TO CORE BOILING

(Page 2 of 3)

Figure 1B

TIME TO CORE BOILING, 0 TO 40 DAYS AFTER S/D, RCS AT MID-LOOP



REFER TO FIGURE 1C FOR ADJUSTING TIME TO BOIL

FIGURE 1
TIME TO CORE BOILING
(Page 3 of 3)

CORRECTION FORMULAS

1. If the Refueling Cavity level is greater than 36 feet, Then PERFORM the following equations to correct time to boil.

   A. ____________ft - 36 = ____________ft
   Cavity level - 36 = adjusted level.

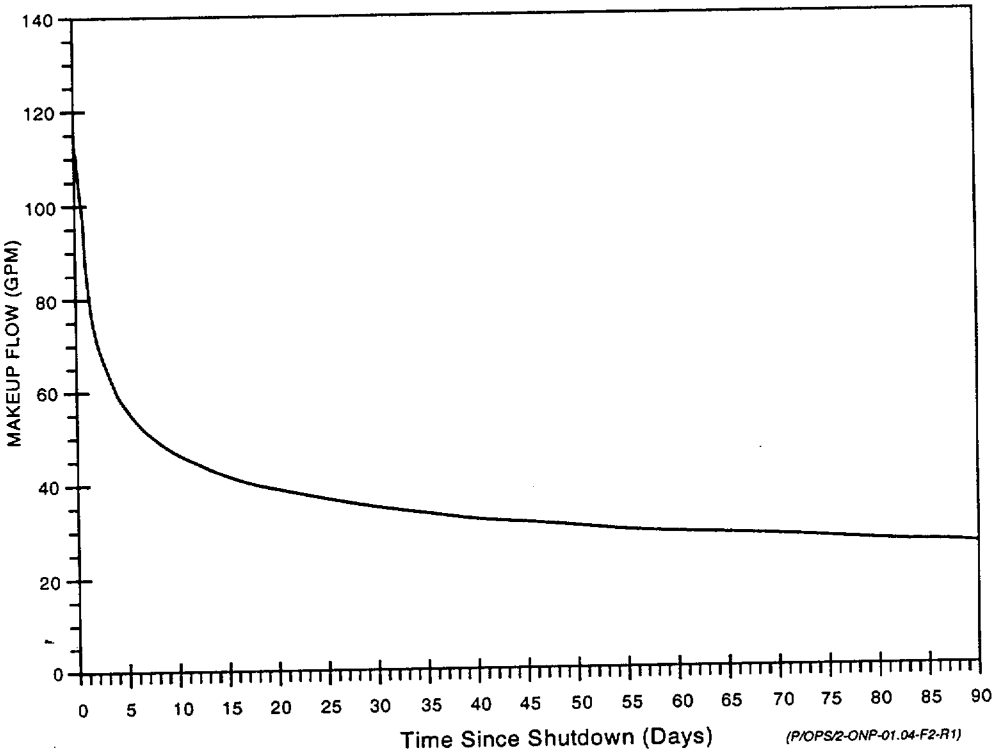
   B. {1 + [0.23] x [____________ft]} = ____________
   {1 + [0.23] x [adjusted level]} = multiplier

   C. ____________ x ____________min = ____________min
   multiplier x time to boil from curve = corrected time to boil

2. If the core shuffle or reload has been completed, Then PERFORM the following equation to correct time to boil.

   ______________________ x 1.35 = ______________________min
   Time to boil from curve **or** corrected time to boil from 1.C x 1.35 = corrected time to boil

FIGURE 2
FLOW TO MAKE UP FOR BOIL-OFF

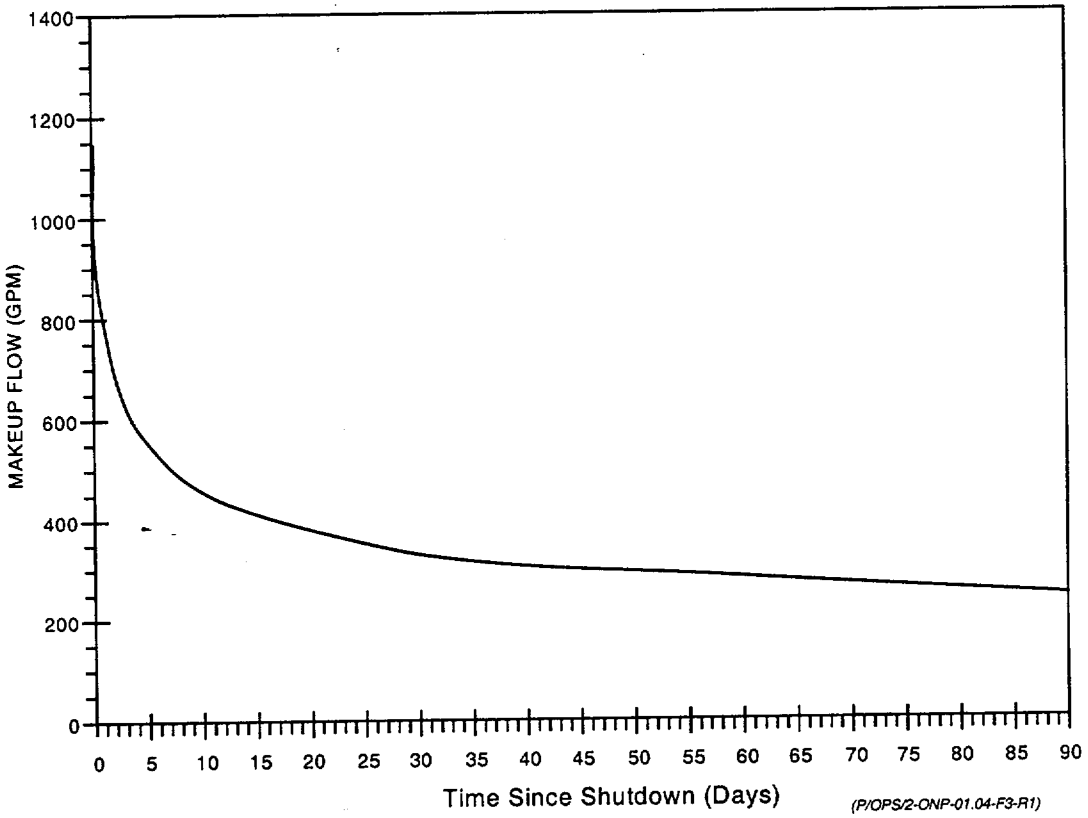


(P/OPS/2-ONP-01.04-F2-R1)

Assumptions: Power History = 100%
Makeup Water Temp. = 100°F
Boiling Point Temp. = 212°F

FIGURE 3
FLOW TO PREVENT BOILING

> NOTE
>
> If a HPSI pump is operating aligned to the containment sump, then a minimum containment sump level of 8 FT must exist. HPSI pump flow shall be limited to 300 gpm when containment sump level is less than 20 FT.

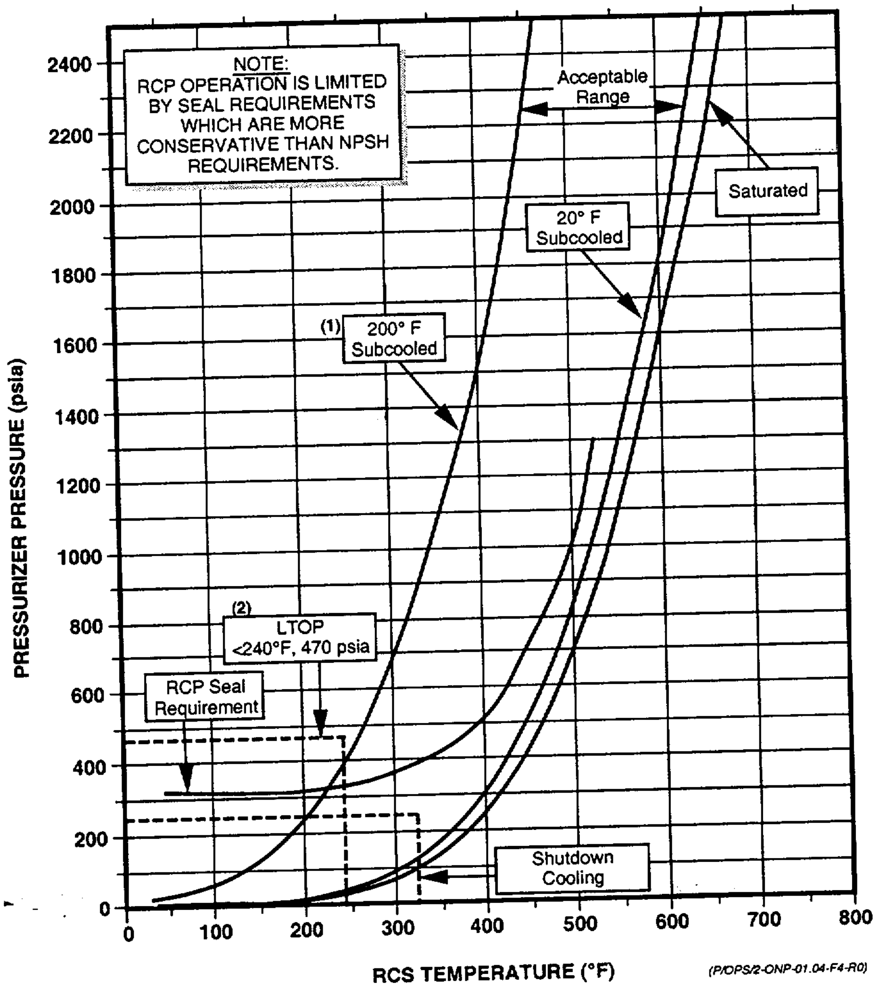


(P/OPS/2-ONP-01.04-F3-R1)

Assumptions:
Power History = 100%
Makeup Water Temp. = 100°F
Boiling Point Temp. = 212°F

FIGURE 4

TYPICAL POST ACCIDENT PRESSURE-TEMPERATURE LIMITS

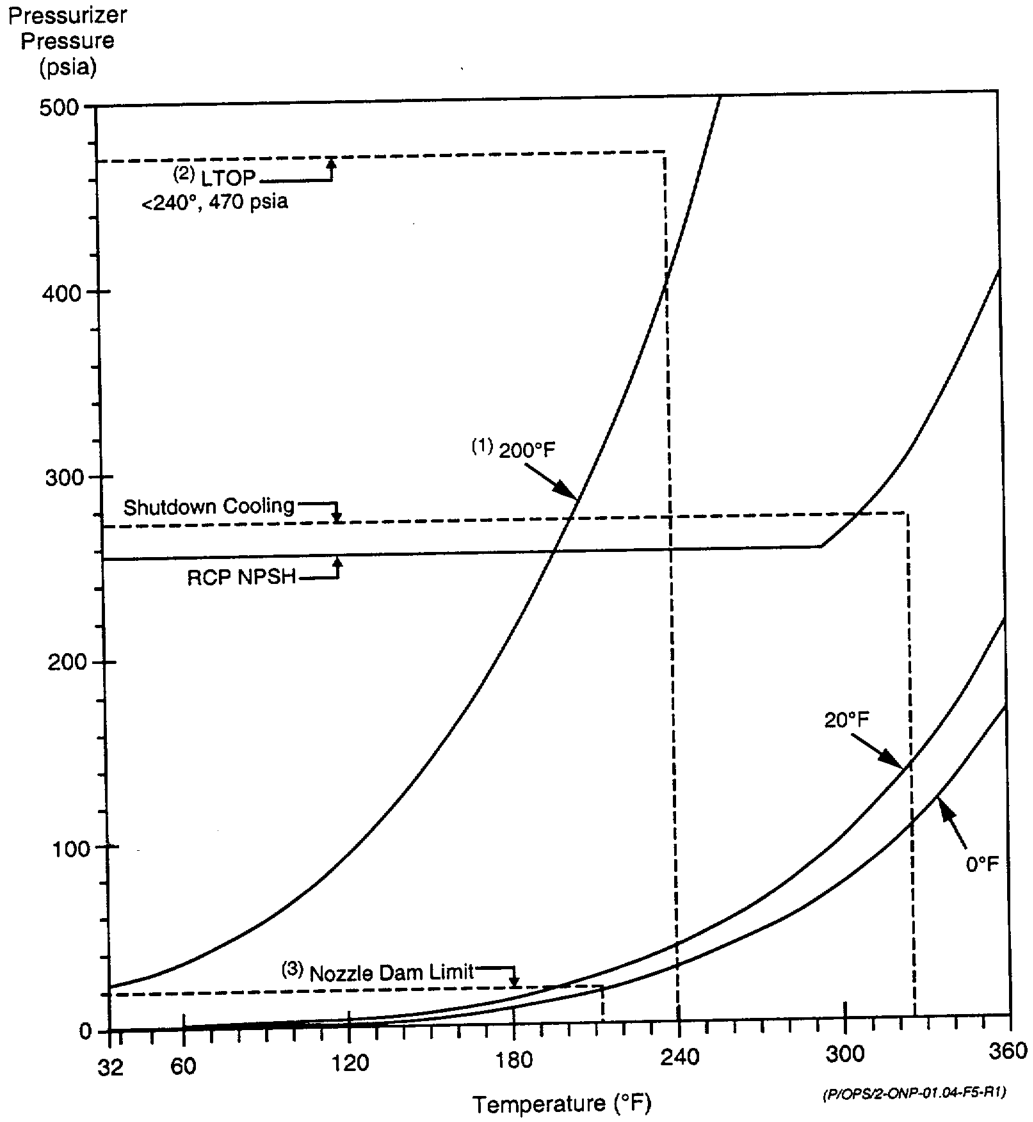


NOTE:
RCP OPERATION IS LIMITED BY SEAL REQUIREMENTS WHICH ARE MORE CONSERVATIVE THAN NPSH REQUIREMENTS.

Notes: (1) This curve supersedes the 100°F/hr. cooldown curve anytime the RCS has experienced an uncontrolled cooldown which causes RCS temperature to go below 500°F.

(2) Pressure limit is in effect when temperature in the LTOP range and RCS has pressure boundary integrity.

FIGURE 5
TYPICAL POST ACCIDENT PRESSURE-TEMPERATURE LIMITS



(P/OPS/2-ONP-01.04-F5-R1)

Notes:

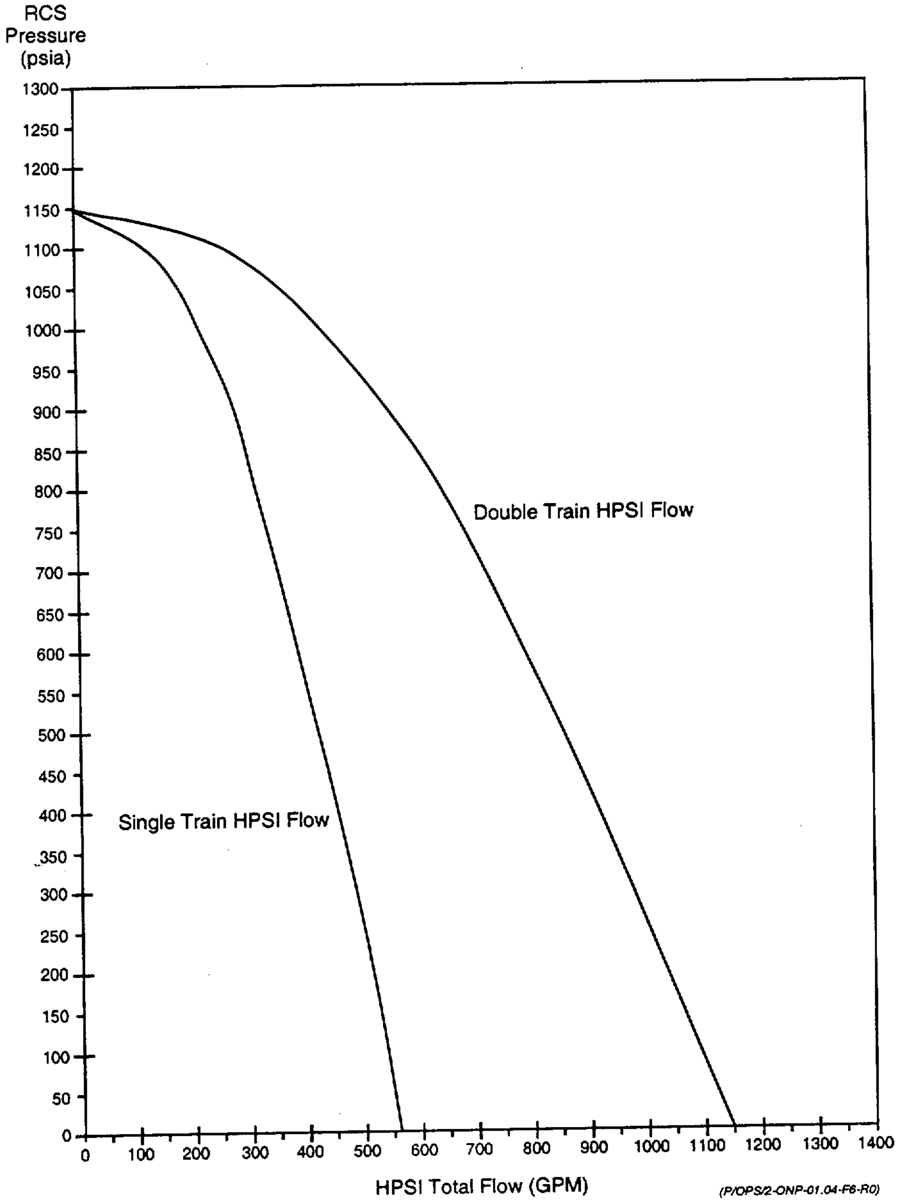
(1) This curve supersedes the 100°F/hr. cooldown curve anytime the RCS has experienced an uncontrolled cooldown which causes RCS temperature to go below 500°F.

(2) Pressure limit is in effect when temperature is in the LTOP range and RCS has pressure boundary integrity.

(3) Maximum pressure whenever nozzle dam is installed.

FIGURE 6

TYPICAL ACCEPTABLE HPSI FLOW VS. RCS PRESSURE INJECTION MODE



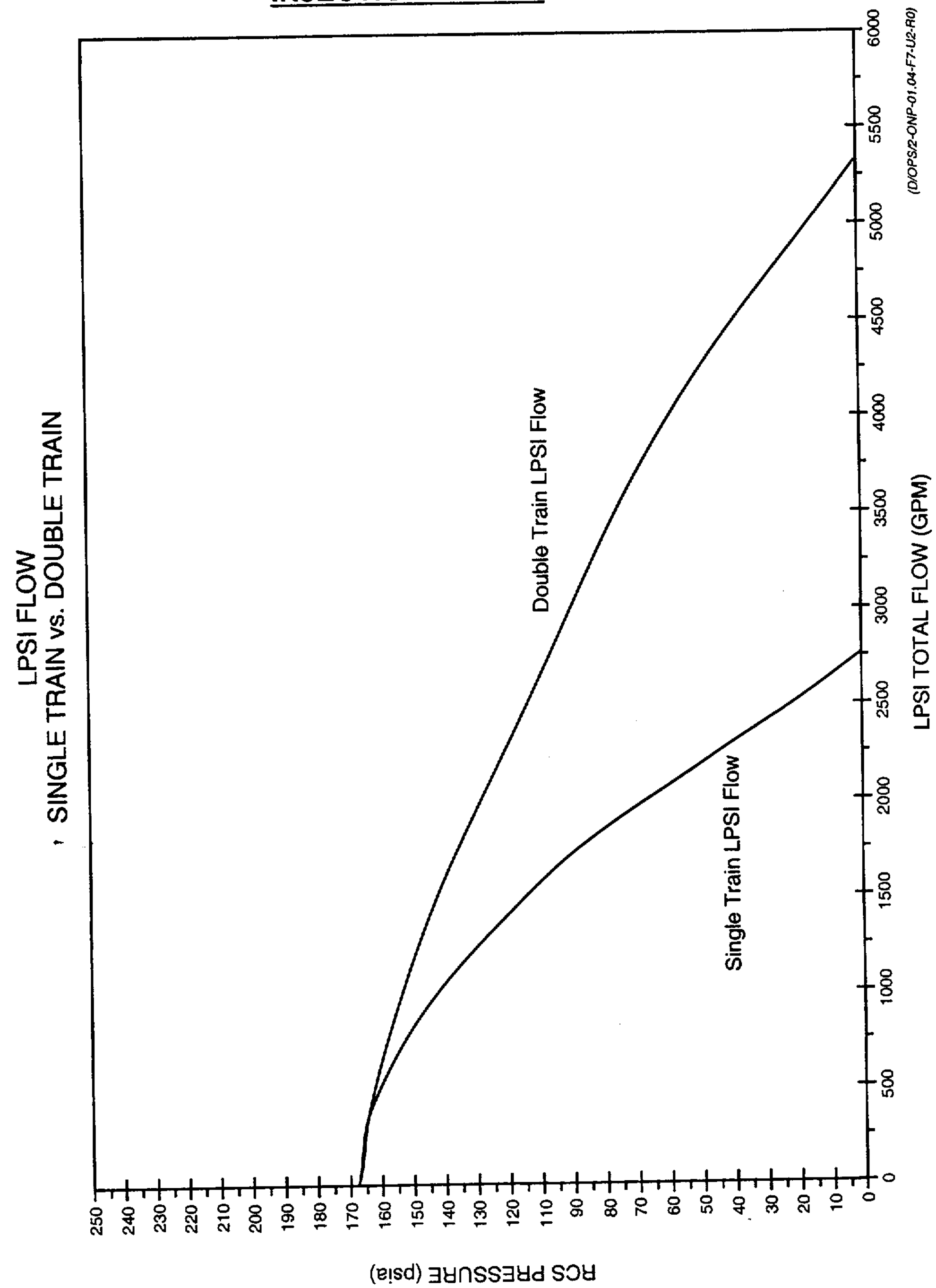
Notes:

(1) For hot and cold leg injection mode, the HPSI pump flow is divided equally between the hot and cold legs.

(2) Below SIAS pressure, Safety Injection System (SI) pump will be operating but there will be no injection flow until system pressure falls below the shutoff head of any SI pump.

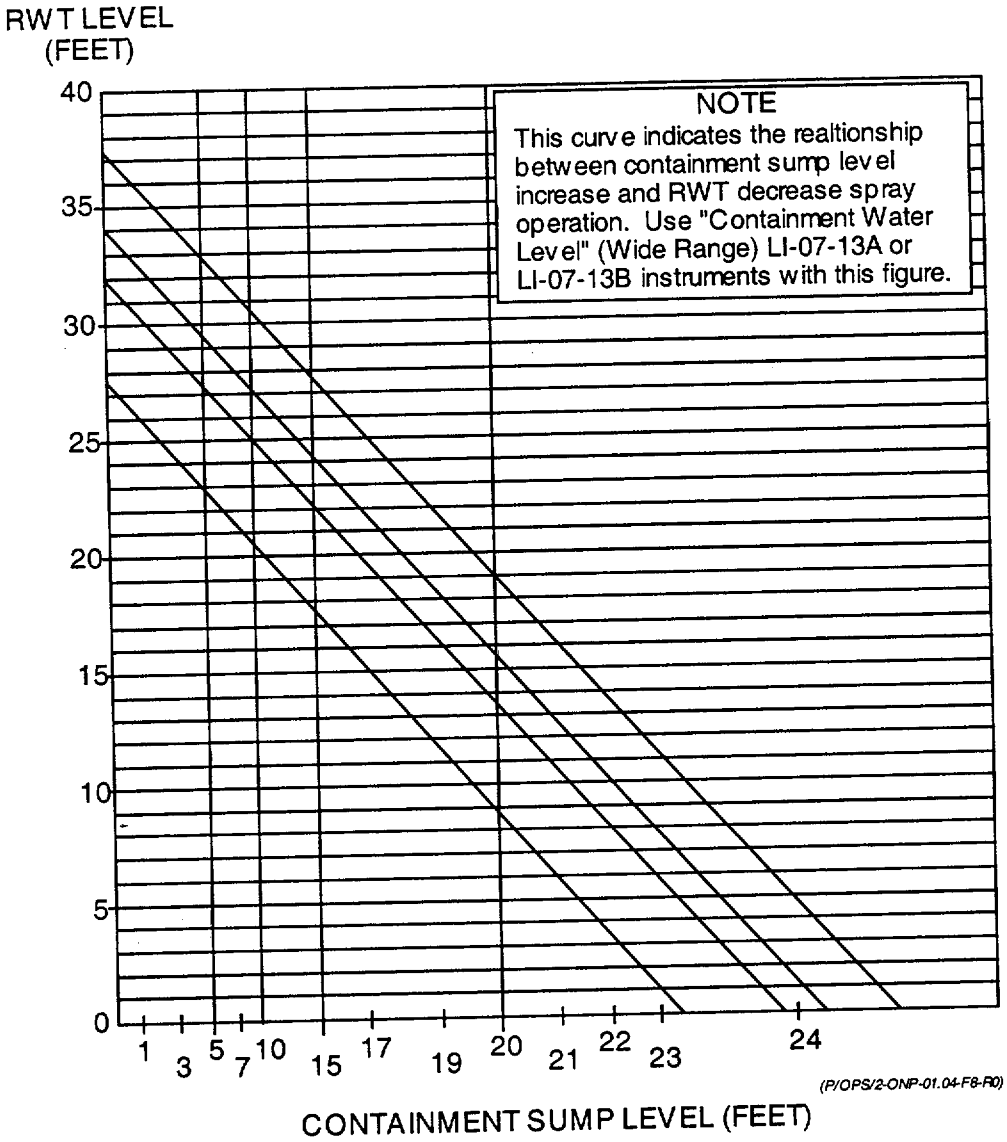
FIGURE 7

TYPICAL ACCEPTABLE LPSI FLOW VS. RCS PRESSURE INJECTION MODE(1)



Notes: (1) For hot and cold leg injection mode, the LPSI pumps are NOT required to be operating.

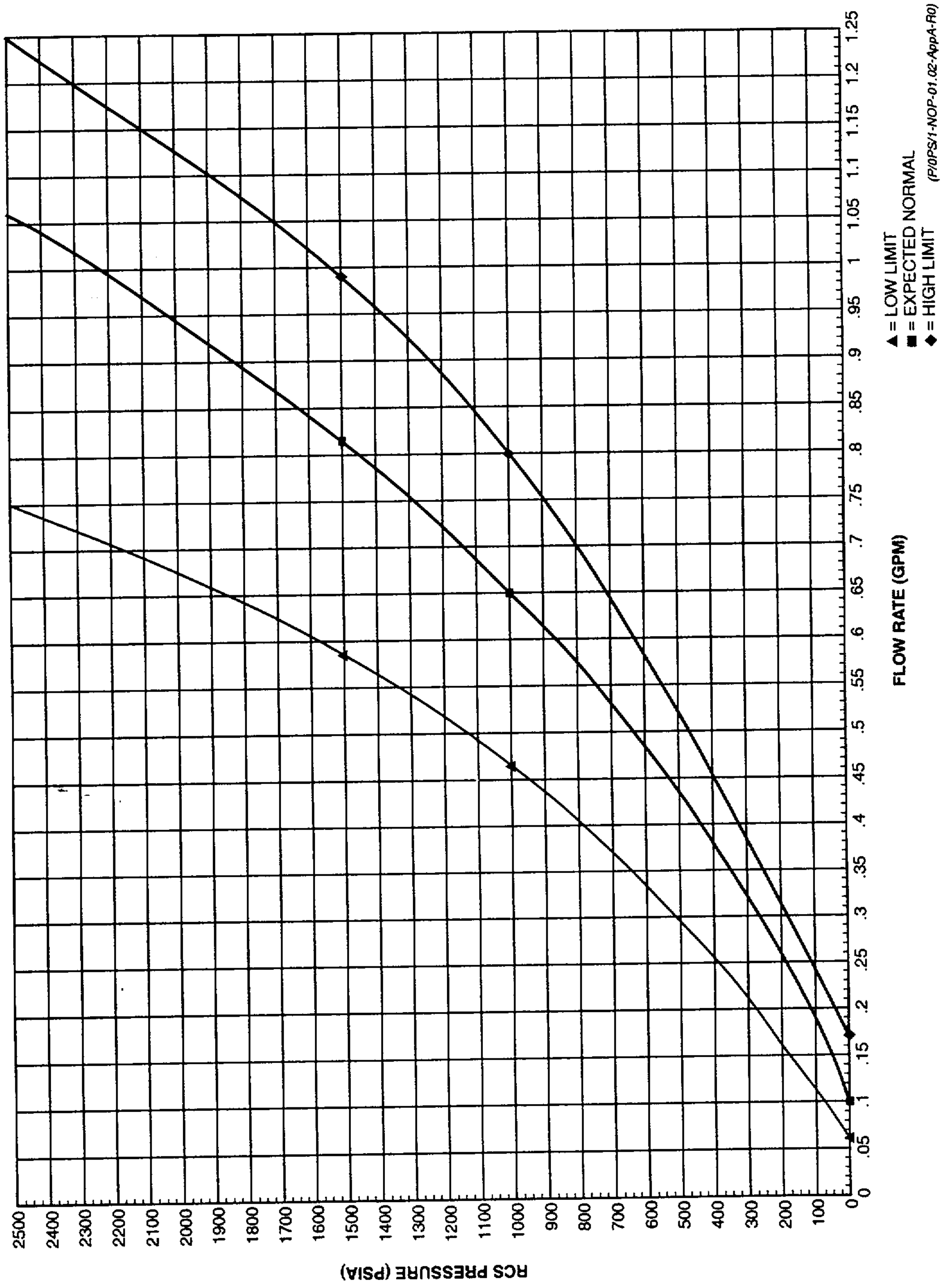
FIGURE 8
RWT LEVEL VS. CONTAINMENT SUMP LEVEL



NOTE
This curve indicates the realtionship between containment sump level increase and RWT decrease spray operation. Use "Containment Water Level" (Wide Range) LI-07-13A or LI-07-13B instruments with this figure.

(P/OPS/2-ONP-01.04-F8-R0)

APPENDIX A
RCP SEAL LEAKOFF FLOW RATE VS RCS PRESSURE
(Page 1 of 1)

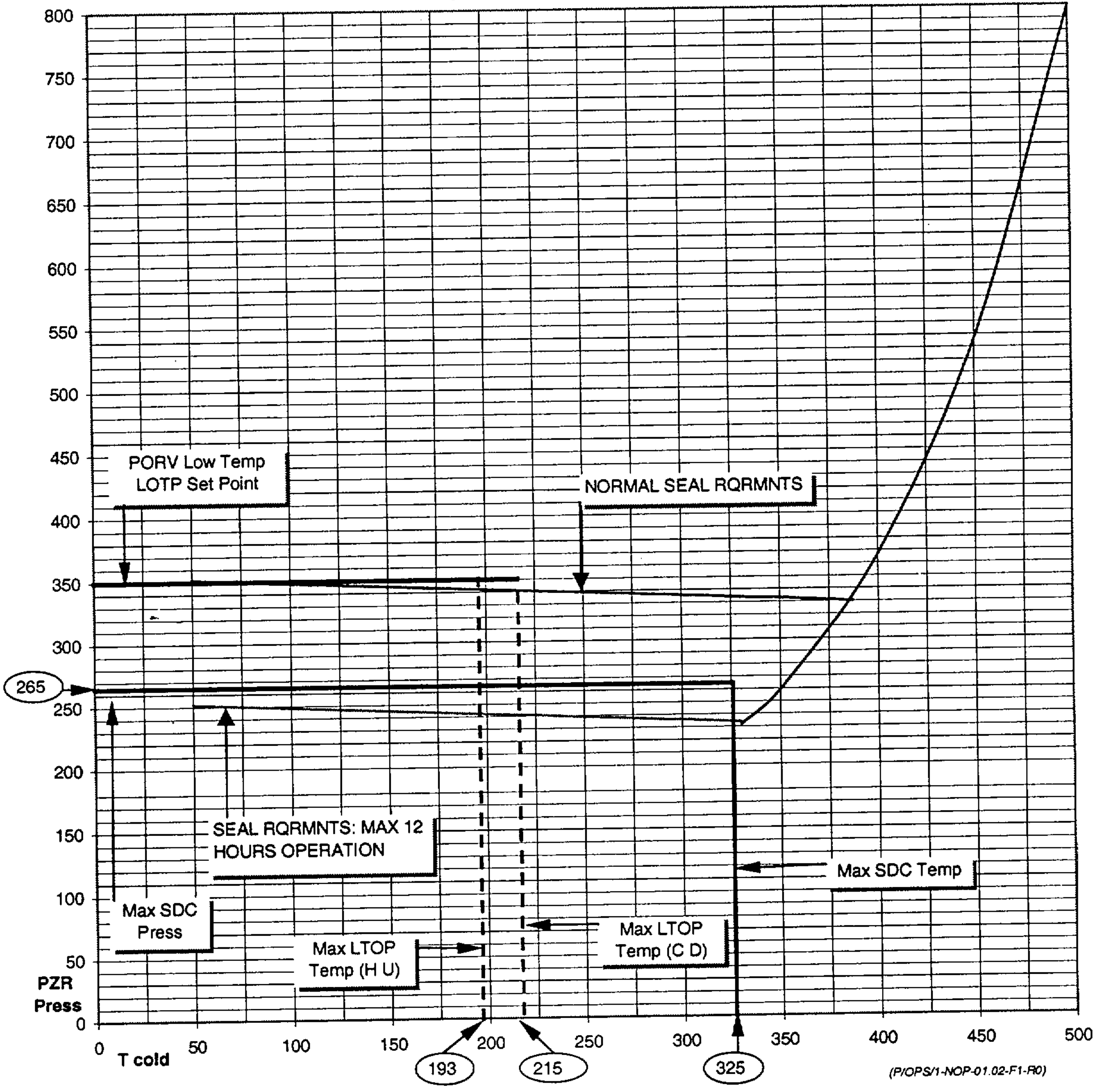


Note: Flow rate instrumentation may be unreliable below 0.7 GPM

END OF APPENDIX A

APPENDIX B
MINIMUM RCS PRESSURE FOR RCP OPERATION
(Page 1 of 8)

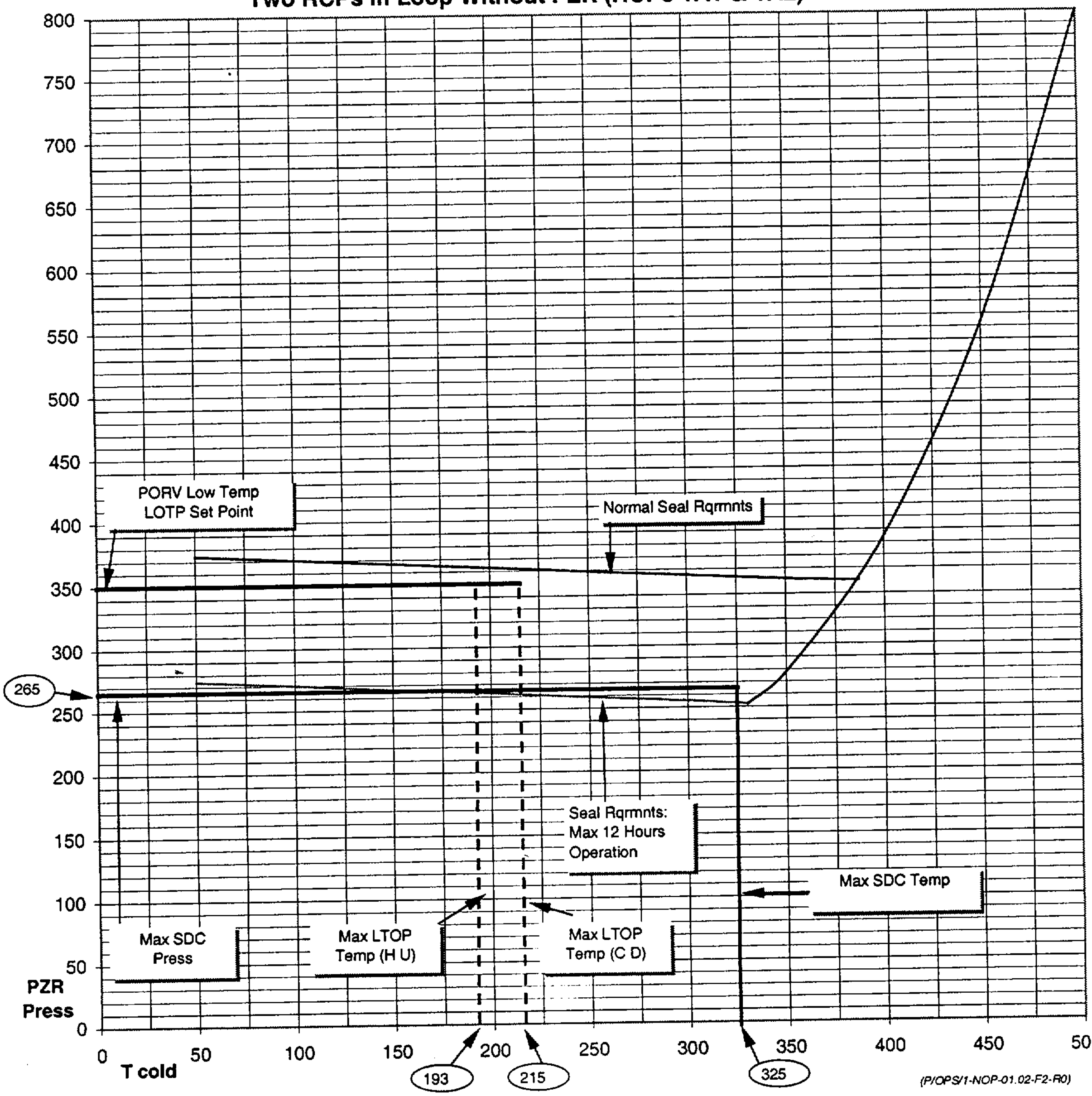
FIGURE 1
Two RCPs in Loop With Pzr (RCPs 1B1 & 1B2)



(P/OPS/1-NOP-01.02-F1-R0)

APPENDIX B
MINIMUM RCS PRESSURE FOR RCP OPERATION
(Page 2 of 8)

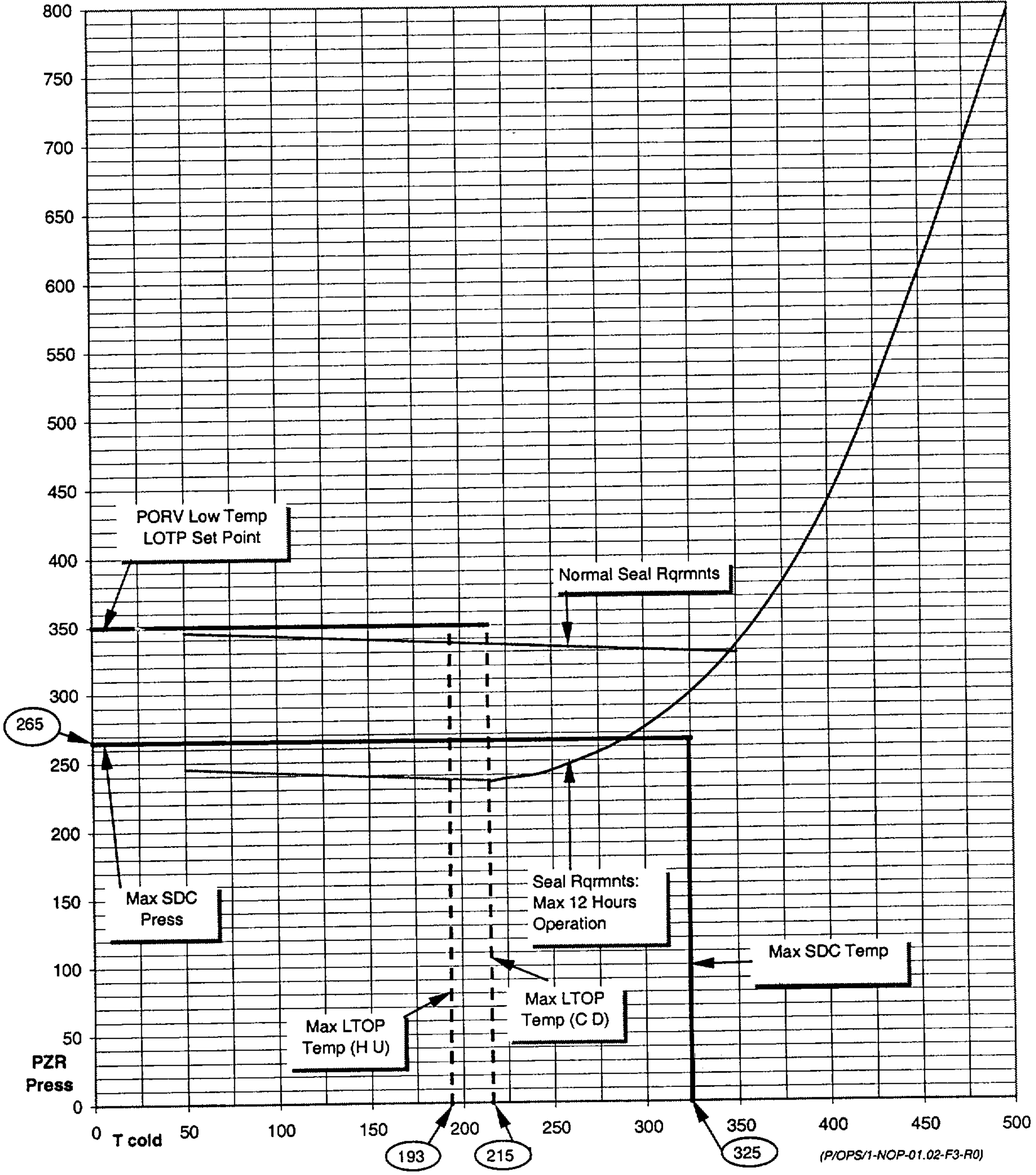
FIGURE 2
Two RCPs in Loop Without PZR (RCPs 1A1 & 1A2)



(P/OPS/1-NOP-01.02-F2-R0)

APPENDIX B
MINIMUM RCS PRESSURE FOR RCP OPERATION
(Page 3 of 8)

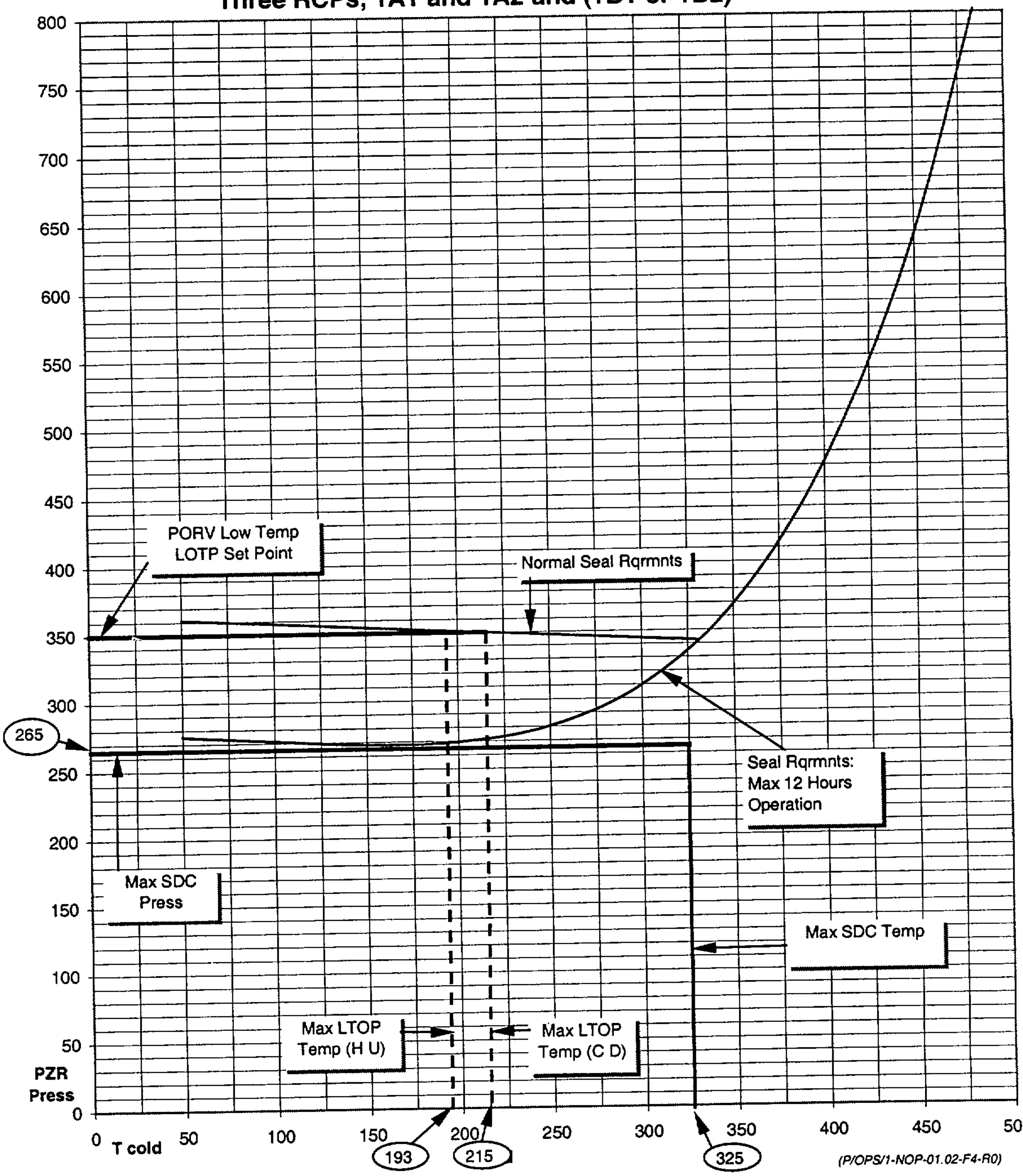
FIGURE 3
Three RCPs, 1B1 and 1B2 and (1A1 or 1A2)



(P/OPS/1-NOP-01.02-F3-R0)

APPENDIX B
MINIMUM RCS PRESSURE FOR RCP OPERATION
(Page 4 of 8)

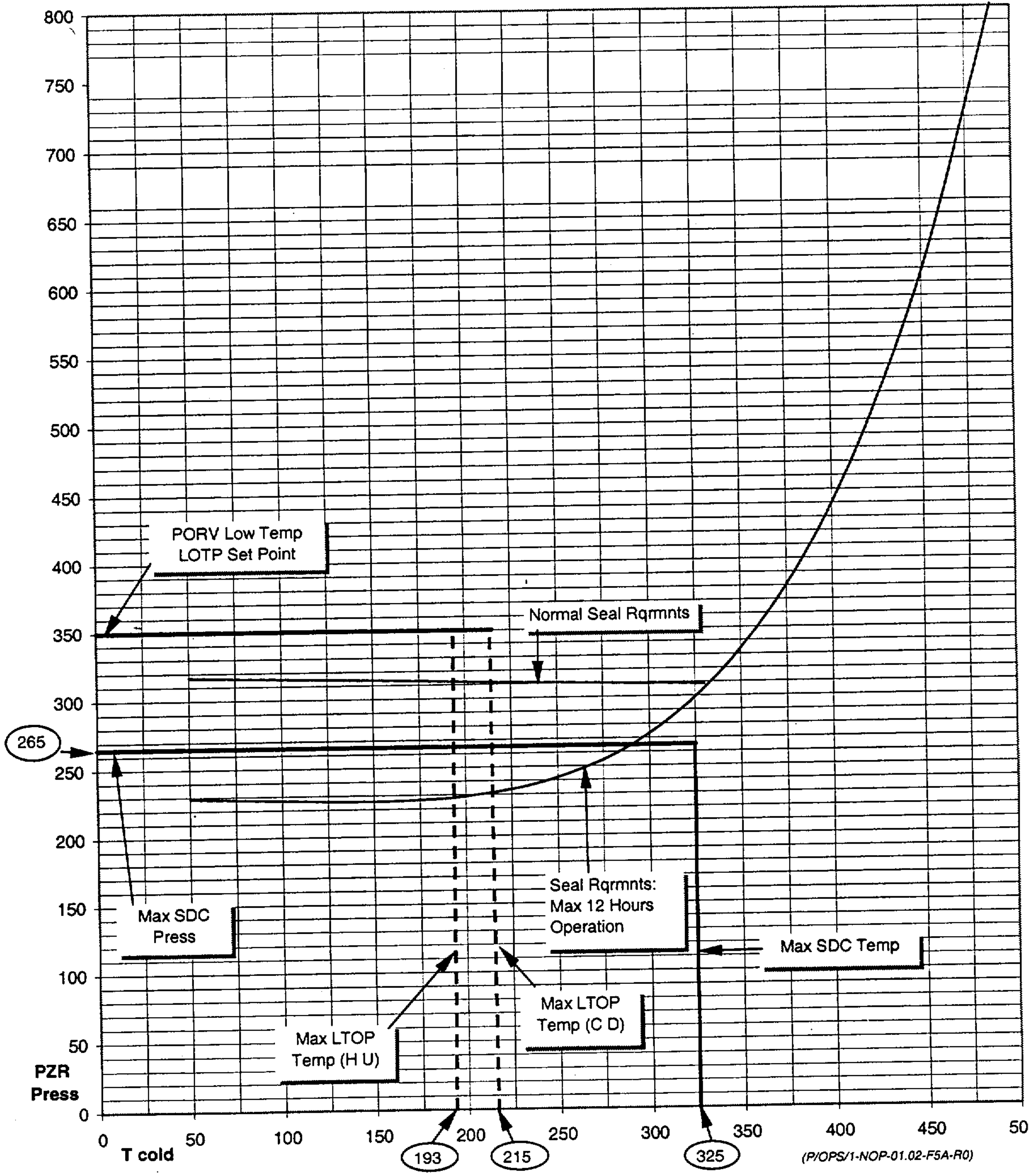
FIGURE 4
Three RCPs, 1A1 and 1A2 and (1B1 or 1B2)



(P/OPS/1-NOP-01.02-F4-R0)

APPENDIX B
MINIMUM RCS PRESSURE FOR RCP OPERATION
(Page 5 of 8)

FIGURE 5A
Any 2 RCPs In Opposite Loops

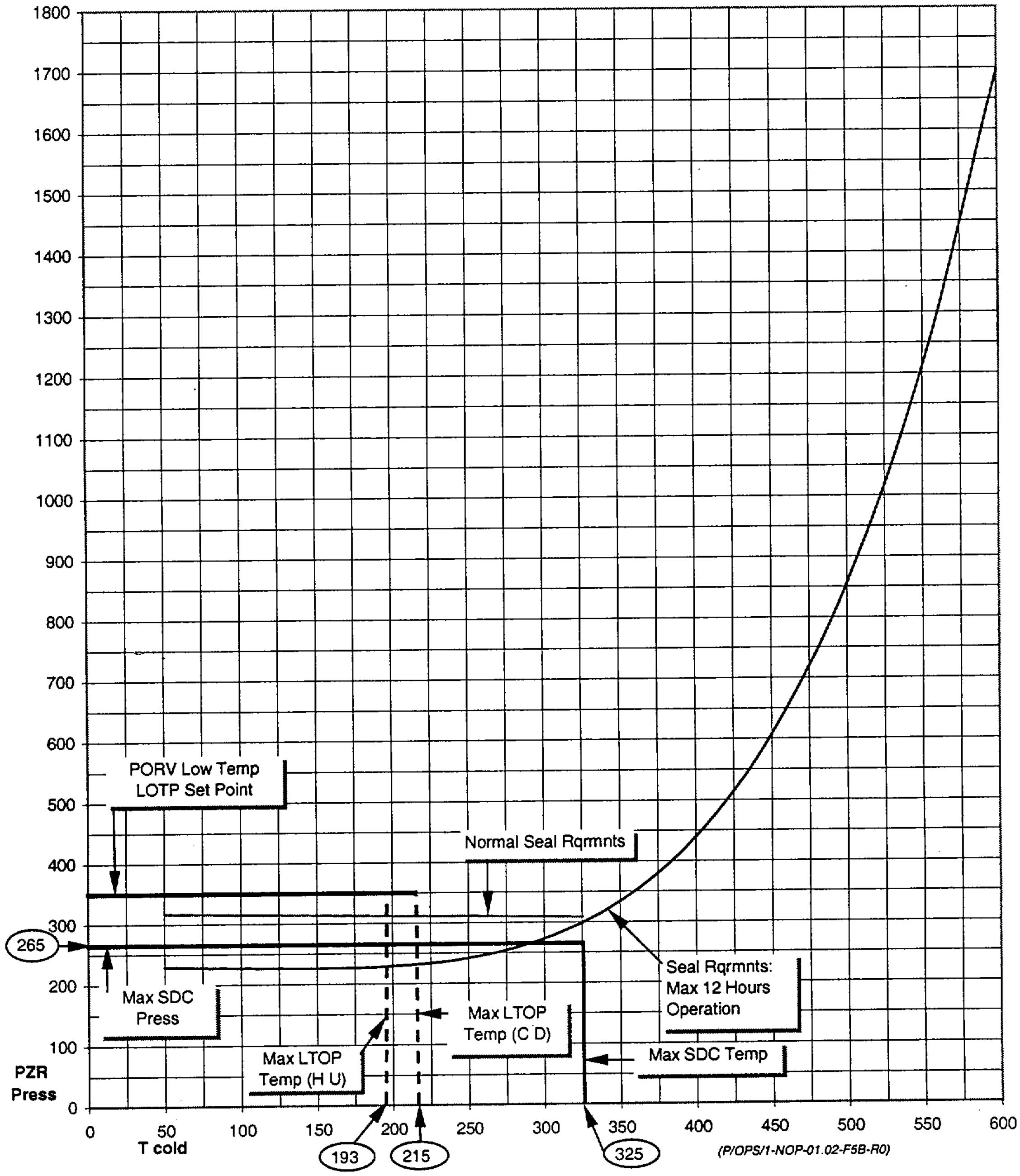


(P/OPS/1-NOP-01.02-F5A-R0)

REVISION NO.: 1	PROCEDURE TITLE: REACTOR COOLANT PUMP OPERATION	PAGE: 45 of 49
PROCEDURE NO.: 1-NOP-01.02	ST. LUCIE UNIT 1	

APPENDIX B
MINIMUM RCS PRESSURE FOR RCP OPERATION
(Page 6 of 8)

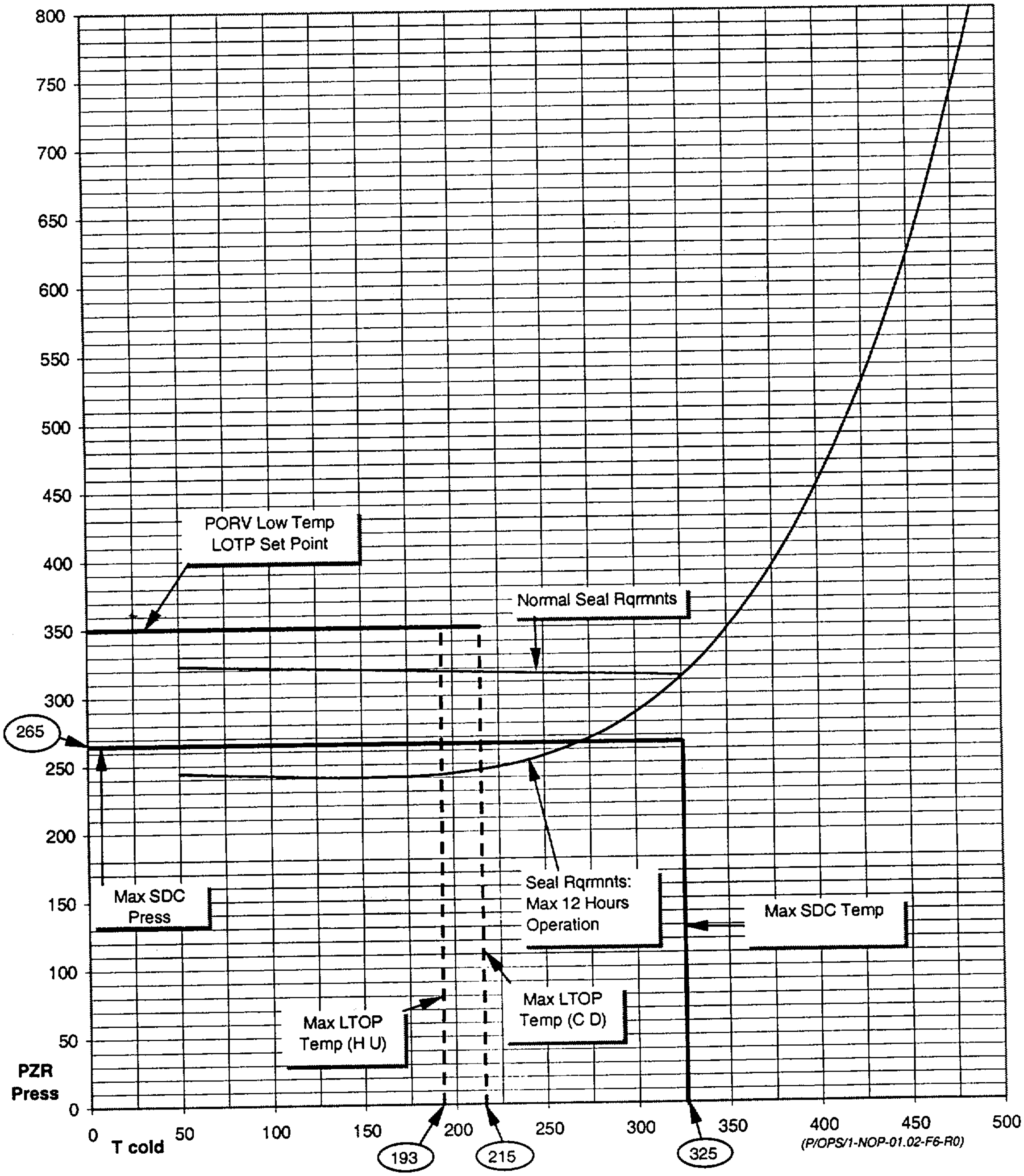
FIGURE 5B
Any 2 RCPs In Opposite Loops



REVISION NO.: 1	PROCEDURE TITLE: REACTOR COOLANT PUMP OPERATION ST. LUCIE UNIT 1	PAGE: 46 of 49
PROCEDURE NO.: 1-NOP-01.02		

APPENDIX B
MINIMUM RCS PRESSURE FOR RCP OPERATION
(Page 7 of 8)

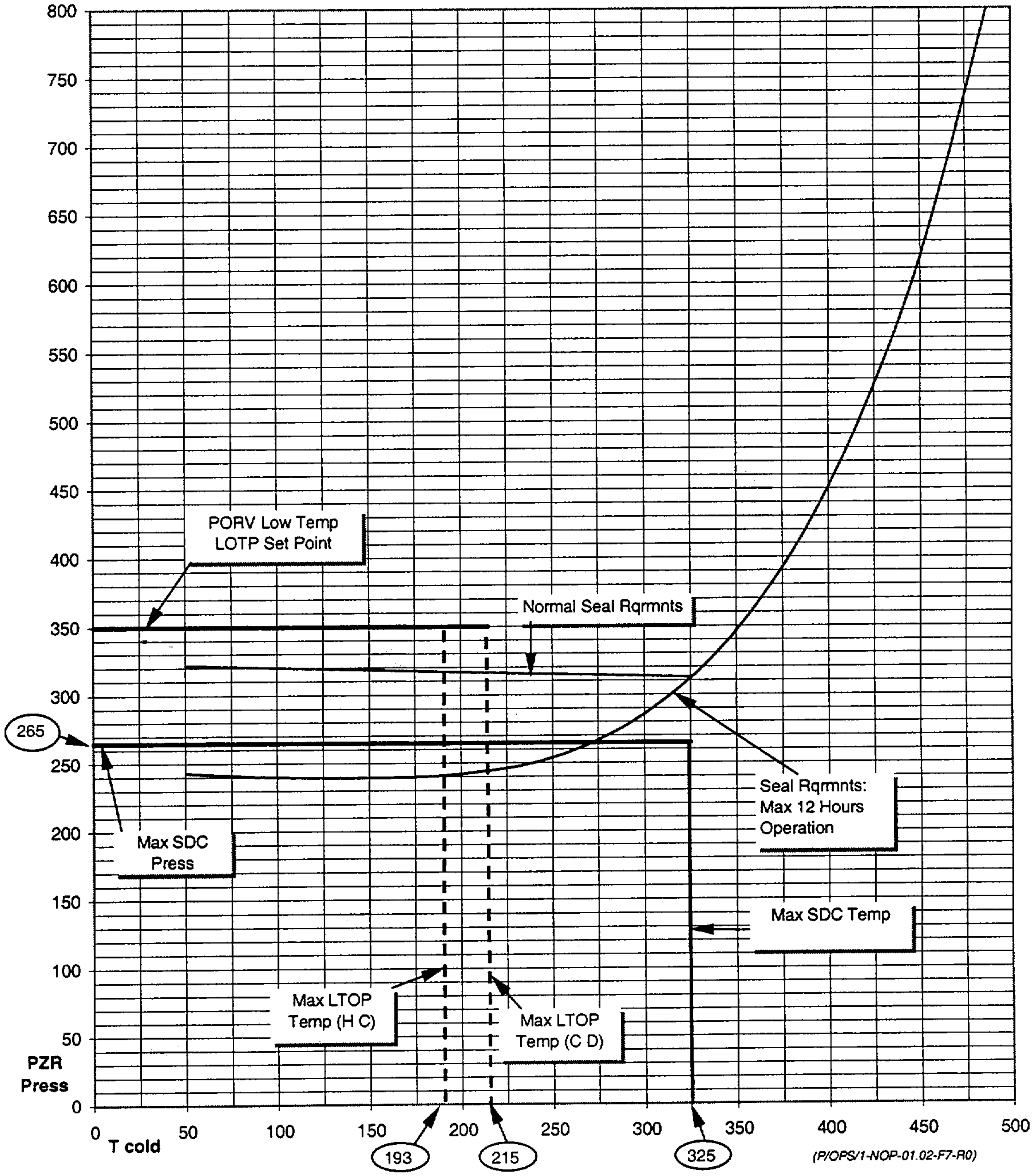
FIGURE 6
One RCP (1A1 or 1A2)



(P/OPS/1-NOP-01.02-F6-R0)

APPENDIX B
MINIMUM RCS PRESSURE FOR RCP OPERATION
(Page 8 of 8)

FIGURE 7
One RCP (1B1 or 1B2)



(P/OPS/1-NOP-01.02-F7-R0)

APPENDIX C
RCP ELECTRICAL ALIGNMENT
(Page 1 of 1)

COMPONENT ID	COMPONENT DESCRIPTION	POSITION	PERF INITIAL
	RTGB SWITCH POSITIONS		
	1A1-A RCP Oil Lift Pump	OFF	
	1A1-B RCP Oil Lift Pump	OFF	
	1A2-A RCP Oil Lift Pump'	OFF	
	1A2-B RCP Oil Lift Pump	OFF	
	1B1-A RCP Oil Lift Pump	OFF	
	1B1-B RCP Oil Lift Pump	OFF	
	1B2-A RCP Oil Lift Pump	OFF	
	1B2-B RCP Oil Lift Pump	OFF	
	480V MCC 1A5		
1-41201	1A1-A RCP Oil Lift Pump	ON	
1-41216	1B1-B RCP Oil Lift Pump	ON	
	480 V MCC 1B5		
1-42019	1A1-B RCP Oil Lift Pump	ON	
1-42001	1B1-A RCP Oil Lift Pump	ON	
	480V MCC 1A6		
1-41322	1A2-B RCP Oil Lift Pump	ON	
1-41318	1B2-A RCP Oil Lift Pump	ON	
	480V MCC 1B6		
1-42127	1A2-A RCP Oil Lift Pump	ON	
1-42118	1B2-B RCP Oil Lift Pump	ON	

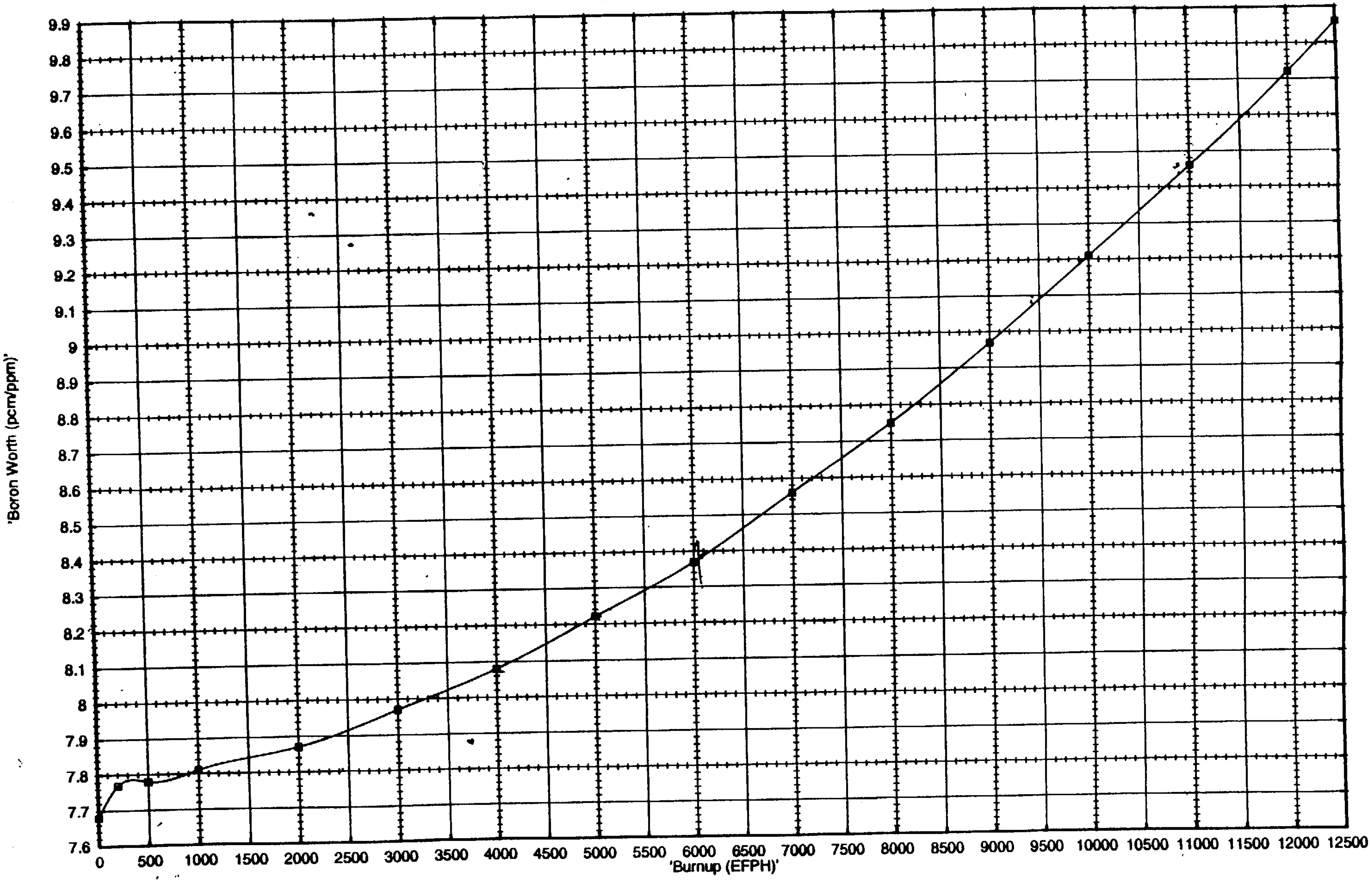
END OF APPENDIX C

APPENDIX D
RCP SEAL PRESSURE TEST GAUGES
(Page 1 of 1)

TEST GAUGE LOCATION	INSTALLED (√)	PERF INITIALS
PT-1151, 1A1 RCP Middle Seal Cavity Press		
PT-1152, 1A1 RCP Upper Seal Cavity Press		
PT-1153, 1A1 RCP Controlled Bleedoff Press		
PT-1161, 1A2 RCP Middle Seal Cavity Press		
PT-1162, 1A2 RCP Upper Seal Cavity Press		
PT-1163, 1A2 RCP Controlled Bleedoff Press		
PT-1171, 1B1 RCP Middle Seal Cavity Press		
PT-1172, 1B1 RCP Upper Seal Cavity Press		
PT-1173, 1B1 RCP Controlled Bleedoff Press		
PT-1181, 1B2 RCP Middle Seal Cavity Press		
PT-1182, 1B2 RCP Upper Seal Cavity Press		
PT-1183, 1B2 RCP Controlled Bleedoff Press		

END OF APPENDIX D

St. Lucie Unit 2 Cycle 10
Figure C.1 HFP Revision 1
'HFP Boron Worth'

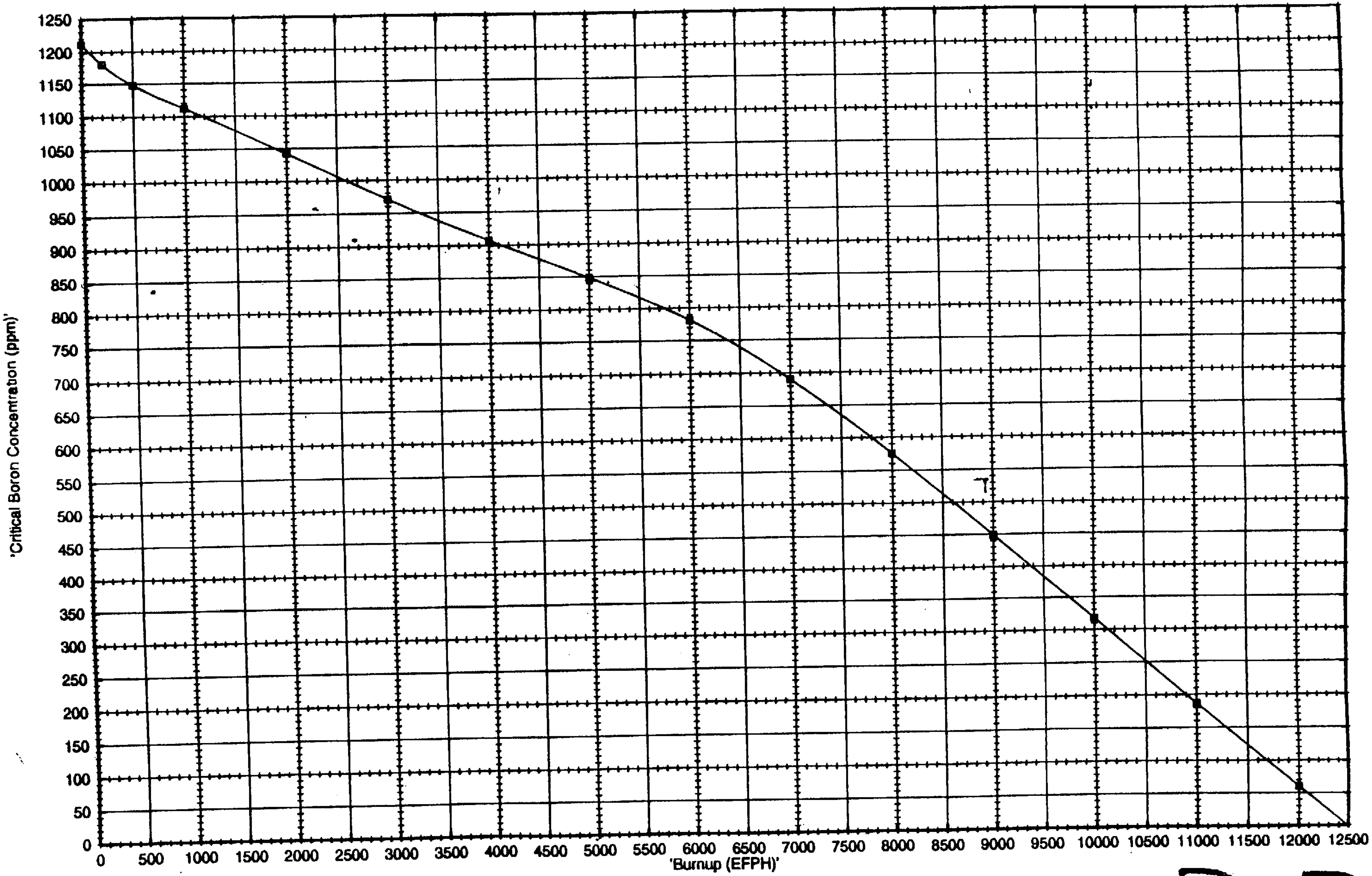


Prepared by: a.a. absaed Date 4/17/97

Reviewed by: Date 4/17/97

Date of Update: 5/15/97

St. Lucie Unit 2 Cycle 10
Figure C.2 HFP Revision 1
'HFP Boron Concentration vs. Burnup (un–normalized)'



Prepared by: ____________ Date 4/7/97

Reviewed by: ____________ Date 4/12/97

Date of Update: 5/15/97

FOR SIMULATOR
USE ONLY

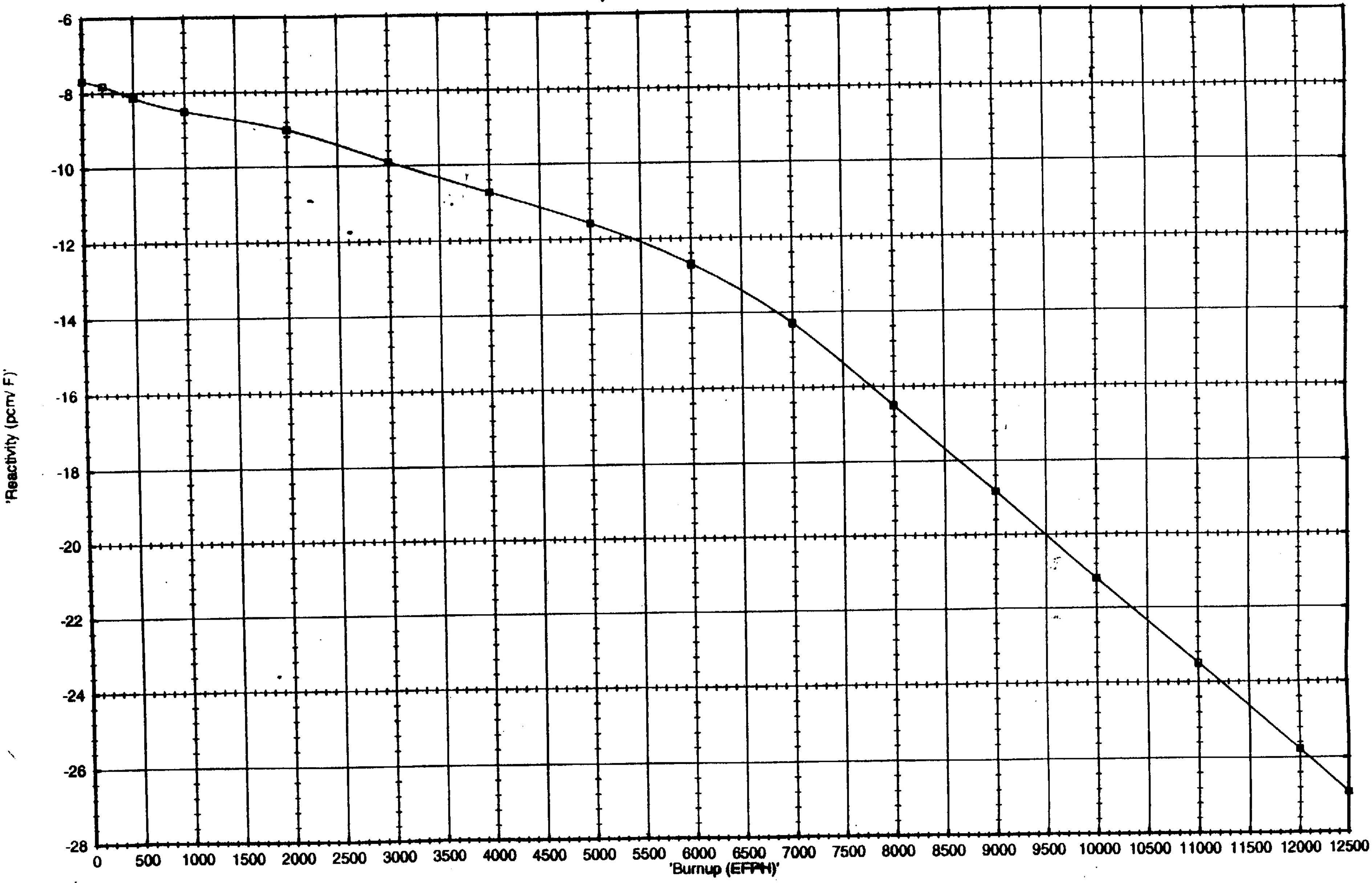
St. Lucie Plant
Unit 2 Cycle 10
Operator Information
Figure C.3

Date	EFPH	F^t_{xy} Axial Peaking	F^t_r Radial Peaking	T_q Core Tilt	Equil. Shape Index Current Value Posted on Channel D RPS (Updated as needed)	
					Date	Value
	5000	1.610	1.583	0.00490		-0.150
	5000	1.607	1.581	0.00462		-0.150
Today	5000	1.605	1.579	0.00544	Today	-0.150

Prepared by:

Reviewed by: 4/14/98

St. Lucie Unit 2 Cycle 10
Figure C.4 HFP Revision 1
'Moderator Temperature Coefficient vs. Burnup'



Prepared by: *a.a. alsaed* Date *4/17/97*

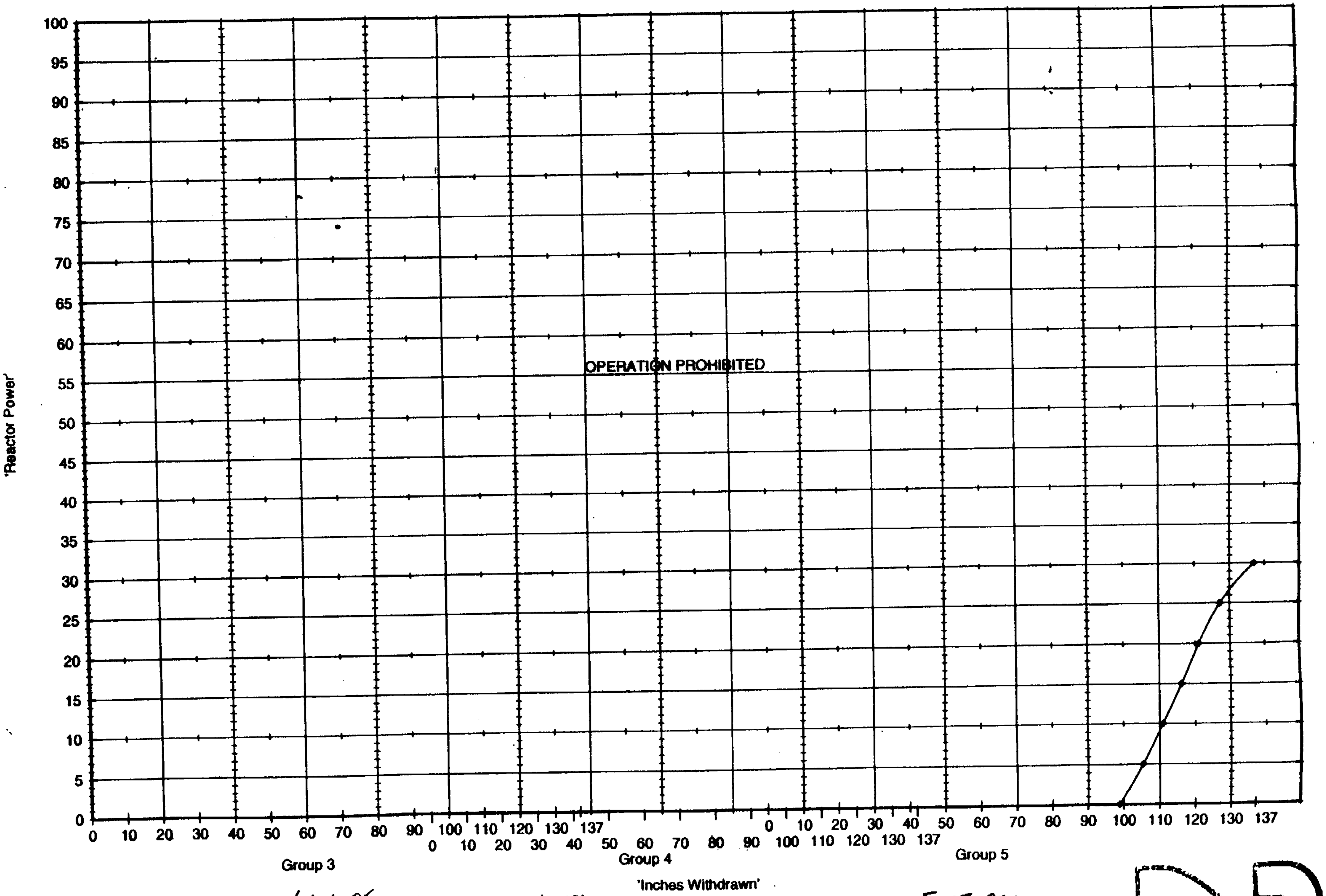
Reviewed by: Date *4/17/97*

Date of Update: *5/15/97*

St. Lucie Unit 2 Cycle 10

Figure C.5 Two (2) Stuck CEAs Revision 0

'Two Stuck CEA PDIL'



Prepared by: R.P. HARRIS / R.P. Harris Date 5/14/97

Reviewed by: R.H GAVIN / R.H Gavin Date 5/14/97

Date of Update: 5/15/97

2

ST. LUCIE UNIT 2 CYCLE 10
FIGURE C.6 REVISION 1
BOC 70% TECH. SPEC. COMPLIANCE

THE VALUE OF THE MODERATOR TEMPERATURE COEFFICIENT (MTC) IS EXPECTED TO BE **-5.15 pcm/deg F**. THIS IS TO COMPLY WITH THE REQUIREMENT THAT MTC BE LESS POSITIVE THAN +2.0 pcm/deg F BEFORE EXCEEDING 70% POWER

Submitted by:________________ Date 5/15/97

Approved by:________________ Date 5/16/97

ST. LUCIE UNIT BORATION/DILUTION
NOP/NOT CONDITIONS

FINAL BORON CONCENTRATION

INITIAL BORON CONCENTRATION PPM

	700.	690.	680.	670.	660.	650.	640.	630.	620.	610.	600.
700.	0.	899.	1812.	2738.	3678.	4632.	5601.	6585.	7585.	8601.	9634.
690.	129.	0.	912.	1838.	2778.	3732.	4701.	5686.	6686.	7702.	8735.
680.	259.	129.	0.	926.	1866	2820.	3789.	4773.	5773.	6790.	7823.
670.	387.	258.	129.	0.	940.	1894.	2863.	3847.	4847.	5864.	6897.
660.	516.	387.	257.	129.	0.	954.	1923.	2907.	3908.	4924.	5957.
650.	644.	515.	386.	257.	128.	0.	969.	1953.	2953.	3970.	5003.
640.	772.	643.	514.	385.	256.	128.	0.	984.	1984.	3001.	4034.
630.	900.	771.	642.	513.	384.	256.	128.	0.	1000.	2016.	3049.
620.	1028.	898.	769.	640.	512.	383.	255.	128.	0.	1016.	2049.
610.	1155.	1026.	897.	768.	639.	511.	383.	255.	127.	0.	1033.
600.	1282.	1153.	1024.	895.	766.	638.	510.	382.	254.	127.	0.

DILUTE GALLONS

BORATE GALLONS

______________________ DATE________

OPS SUPERVISOR REVIEW

BASED ON 5525 PPM MAKEUP BORON CONCENTRATION

______________________ DATE________

PREPARED BY

ST. LUCIE UNIT 2 BORATION/DILUTION
NOP/NOT CONDITIONS

FINAL BORON CONCENTRATION

INITIAL BORON CONCENTRATION PPM

DILUTE GALLONS

	800.	790.	780.	770.	760.	750.	740.	730.	720.	710.	700.
800.	0.	786.	1582.	2389.	3206.	4034.	4873.	5723.	6585.	7459.	8346.
790.	132.	0.	796.	1603.	2420.	3247.	4086.	4937.	5799.	6673.	7560.
780.	264.	132.	0.	806.	1623.	2451.	3290.	4141.	5003.	5877.	6763.
770.	396.	263.	132.	0.	817.	1645.	2484.	3334.	4196.	5070.	5957.
760.	527.	395.	263.	131.	0.	828.	1667.	2517.	3379.	4253.	5140.
750.	658.	526.	394.	262.	131.	0.	839.	1689.	2551.	3426.	4312.
740.	789.	657.	525.	393.	262.	131.	0.	850.	1712.	2587.	3473.
730.	919.	787.	655.	524.	392.	261.	130.	0.	862.	1736.	2623.
720.	1049.	917.	785.	654.	522.	391.	261.	130.	0.	874.	1761.
710.	1179.	1047.	915.	784.	652.	521.	391.	260.	130.	0.	887.
700.	1309.	1177.	1045.	913.	782.	651.	520.	390.	260.	130.	0.

BORATE GALLONS

_______________________ DATE________
OPS SUPERVISOR REVIEW

BASED ON 5525 PPM MAKEUP BORON CONCENTRATION

_______________________ DATE________
PREPARED BY

ST. LUCIE UNI RATION/DILUTION
NOP/NOT CONDITIONS

FINAL BORON CONCENTRATION

INITIAL BORON CONCENTRATION PPM

	900.	890.	880.	870.	860.	850.	840.	830.	820.	810.	800.
900.	0.	698.	1405.	2119.	2841.	3572.	4312.	5061.	5818.	6585.	7361.
890.	135.	0.	706.	1421.	2143.	2874.	3614.	4362.	5120.	5887.	6663.
880.	270.	135.	0.	714.	1437.	2168.	2907.	3656.	4414.	5180.	5957.
870.	404.	269.	134.	0.	723.	1454.	2193.	2942.	3699.	4466.	5243.
860.	538.	403.	269.	134.	0.	731.	1471.	2219.	2977.	3744.	4520.
850.	672.	537.	402.	268.	134.	0.	740.	1488.	2246.	3013.	3789.
840.	806.	671.	536.	401.	267.	134.	0.	749.	1506.	2273.	3049.
830.	939.	804.	669.	535.	401.	267.	133.	0.	758.	1524.	2301.
820.	1072.	937.	802.	668.	534.	400.	266.	133.	0.	767.	1543.
810.	1205.	1070.	935.	800.	666.	532.	399.	266.	133.	0.	776.
800.	1337.	1202.	1067.	933.	799.	665.	531.	398.	265.	132.	0.

DILUTE GALLONS

BORATE GALLONS

____________________ DATE________
OPS SUPERVISOR REVIEW

BASED ON 5525 PPM MAKEUP BORON CONCENTRATION

____________________ DATE________
PREPARED BY

ST. LUCIE UNIT 2 ION/DILUTION
NOP/NOT CONDITIONS

FINAL BORON CONCENTRATION

INITIAL BORON CONCENTRATION PPM

	1000.	990.	980.	970.	960.	950.	940.	930.	920.	910.	900.
1000.	0.	628.	1263.	1904.	2551.	3206.	3867.	4536.	5211.	5894.	6585.
990.	138.	0.	635.	1276.	1923.	2578.	3239.	3908.	4583.	5266.	5957.
980.	276.	138.	0.	641.	1289.	1943.	2605.	3273.	3949.	4632.	5322.
970.	413.	275.	137.	0.	648.	1302.	1964.	2632.	3308.	3991.	4681.
960.	550.	412.	274.	137.	0.	654.	1316.	1984.	2660.	3343.	4034.
950.	687.	549.	411.	274.	137.	0.	661.	1330.	2006.	2689.	3379.
940.	823.	685.	548.	410.	273.	136.	0.	668.	1344.	2027.	2718.
930.	959.	821.	684.	546.	409.	273.	136.	0.	676.	1359.	2049.
920.	1095.	957.	820.	682.	545.	408.	272.	136.	0.	683.	1374.
910.	1231.	1093.	955.	818.	681.	544.	408.	271.	136.	0.	691.
900.	1366.	1228.	1091.	953.	816.	679.	543.	407.	271.	135.	0.

DILUTE GALLONS

BORATE GALLONS

______________________________ DATE__________
OPS SUPERVISOR REVIEW

______________________________ DATE__________
PREPARED BY

BASED ON 5525 PPM MAKEUP BORON CONCENTRATION

REACTOR COOLANT SYSTEM

CHEMISTRY

LIMITING CONDITION FOR OPERATION

3.4.7 The Reactor Coolant System chemistry shall be maintained within the limits specified in Table 3.4-1.

APPLICABILITY: ALL MODES.

ACTION:

MODES 1, 2, 3 and 4

a. With any one or more chemistry parameter in excess of its Steady State Limit but within its Transient Limit, restore the parameter to within its Steady State Limit within 24 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

b. With any one or more chemistry parameter in excess of its Transient Limit, be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

MODES 5 and 6

With the concentration of either chloride or fluoride in the Reactor Coolant System in excess of its Steady State Limit for more than 24 hours or in excess of its Transient Limit, reduce the pressurizer pressure to $\leq$ 500 psia, if applicable, and perform an analysis to determine the effects of the out-of-limit condition on the structural integrity of the Reactor Coolant System; determine that the Reactor Coolant System remains acceptable for continued operations prior to increasing the pressurizer pressure above 500 psia or prior to proceeding to MODE 4.

SURVEILLANCE REQUIREMENTS

4.4.7 The Reactor Coolant System chemistry shall be determined to be within the limits by analysis of those parameters at the frequencies specified in Table 4.4-3.

TABLE 3.4-1

REACTOR COOLANT SYSTEM

CHEMISTRY LIMITS

PARAMETER	STEADY STATE LIMIT	TRANSIENT LIMIT
DISSOLVED OXYGEN	$\leq$ 0.10 ppm*	$\leq$ 1.00 ppm*
CHLORIDE	$\leq$ 0.15 ppm	$\leq$ 1.50 ppm
FLUORIDE	$\leq$ 0.10 ppm	$\leq$ 1.00 ppm

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*Limit not applicable with $T_{avg} \leq 250°F$.

TABLE 4.4-3

REACTOR COOLANT SYSTEM

CHEMISTRY LIMITS SURVEILLANCE REQUIREMENTS

PARAMETER	MINIMUM SAMPLING FREQUENCIES	MAXIMUM TIME BETWEEN SAMPLES
DISSOLVED OXYGEN	3 times per 7 days*	72 hours
CHLORIDE	3 times per 7 days	72 hours
FLUORIDE	3 times per 7 days	72 hours

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* Not required with $T_{avg} \leq 250°F$.

SPECIFIC ACTIVITY

LIMITING CONDITION FOR OPERATION

3.4.8 The specific activity of the primary coolant shall be limited to:

a. $\leq$ 1.0 µCi/gram DOSE EQUIVALENT I-131, and

b. $\leq 100/\overline{E}$ µCi/gram.

APPLICABILITY: MODES 1, 2, 3, 4 and 5.

ACTION:

MODES 1, 2 and 3*:

a. With the specific activity of the primary coolant >1.0 µCi/gram DOSE EQUIVALENT I-131 for more than 100 hours during one continuous time interval or exceeding the limit line shown on Figure 3.4-1, be in HOT STANDBY with T_{avg} <500°F within 6 hours.

b. With the specific activity of the primary coolant $>100/\overline{E}$ µCi/gram, be in HOT STANDBY with T_{avg} <500°F within 6 hours.

MODES 1, 2, 3, 4 and 5:

With the specific activity of the primary coolant >1.0 µCi/gram DOSE EQUIVALENT I-131 or $>100/\overline{E}$ µCi/gram, perform the sampling and analysis requirement of item 4 a) of Table 4.4-4 until the specific activity of the primary coolant is restored to within its limits.

SURVEILLANCE REQUIREMENTS

4.4.8 The specific activity of the primary coolant shall be determined to be within the limits by performance of the sampling and analysis program of Table 4.4-4.

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*With $T_{avg} \geq 500$°F.

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TABLE 4.4-4

PRIMARY COOLANT SPECIFIC ACTIVITY SAMPLE AND ANALYSIS PROGRAM

TYPE OF MEASUREMENT AND ANALYSIS	MINIMUM FREQUENCY	MODES IN WHICH SAMPLE AND ANALYSIS REQUIRED
1. Gross Activity Determination	3 times per 7 days with a maximum time of 72 hours between samples	1, 2, 3 and 4
2. Isotopic Analysis for DOSE EQUIVALENT I-131 Concentration	1 per 14 days	1
3. Radiochemical for $\bar{E}$ Determination	1 per 6 months	1[*]
4. Isotopic Analysis for Iodine Including I-131, I-133, and I-135	a) Once per 4 hours, whenever the DOSE EQUIVALENT I-131 exceeds 1.0 µCi/gram, and	1[#], 2[#], 3[#], 4[#] and 5[#]
	b) One sample between 2 and 6 hours following a THERMAL POWER change exceeding 15 percent of the RATED THERMAL POWER within a one hour period.	1, 2, 3

[#] Until the specific activity of the primary coolant system is restored within its limits.

[*] After at least 2 EFPD and at least 20 days since the last shutdown of longer than 48 hours.

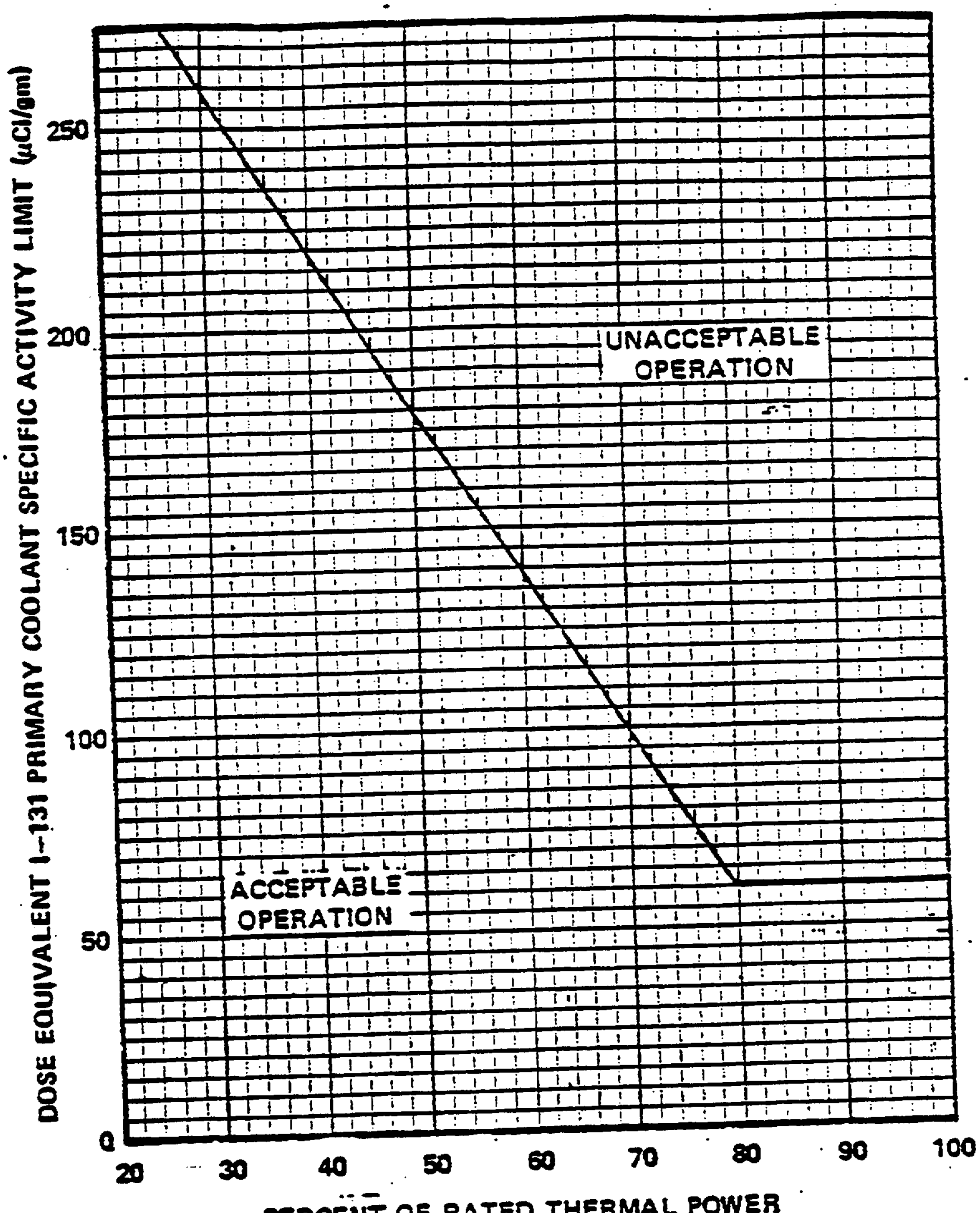

FIGURE 3.4-1

DOSE EQUIVALENT I–131 Primary Coolant Specific Activity Limit Versus Percent of RATED THERMAL POWER with the Primary Coolant Specific Activity >1.0μCi/gram Dose Equivalent I-131