TURKEY POINT PLANT

1999 NRC EXAM

OPERATING EXAM

PART C

SIMULATOR SCENARIOS

DISTRIBUTION CODE
A070

INITIAL SUBMITTAL TP99-301

Facility: Turkey Point Nuclear Plant **Scenario No.:** 1 **Op-Test No.:** PTN Group XVIII

Examiners: _____ **Operators:** _____

Objectives: To evaluate the applicants' ability to use off-normal procedures for PZR pressure control channel PT-3-445 failing high followed by an unisolable leaking PZR PORV requiring a load reduction. Evaluate ability of operators to recognize & respond to a turbine first stage impulse pressure channel failing low. Emergency Operating Procedure use will be evaluated following the reactor trip for C S/G main steam line break inside Containment, failure of the main turbine to trip, 3B MSIV fails open, and a loss of all auxiliary and standby feedwater requiring RCS bleed and feed due to loss of secondary heat sink.

Initial Conditions: 100% power, EOL

Turnover: Maintain 100% power steady state operation. Condenser steam dumps are in steam pressure control due to a problem with the Tavg input which is under I&C investigation. LT-3-498 & A AFW pump are both OOS for corrective maintenance. B AFW pump is aligned to train 2 and C AFW pump is aligned to train 1. No surveillance tests are in progress.

Event No.	Malf. No.	Event Type*	Event Description
1	TFH1TU45 = T	I (SRO) I (RO)	PT-3-445 fails high (PORV-3-456 closure required). K/A 027AA2.15 (3.7/4.0) cannot take credit for sim)
2	TVHV456 = 0.7 / 30 sec ramp TFH2906F = T conditional on IMH231C	C (SRO) C (RO)	PZR PORV-3-456 develops a leak and MOV-3-535 fails to close. K/A 010A2.03 (4.1/4.2)
3	N/A	N (SRO/BOP) R (RO)	Power reduction to hot standby. K/A 2.1.23 (3.9/4.0)
4	TFS1MAML = T	I (SRO) I (BOP)	PT-3-447 fails low. K/A 016A2.01 (3.0/3.1)
5	TVSBVL15 = 0.2/ 300 sec ramp TFU10005 = T TFSVVX6C = T	M (ALL)	3C S/G main steam line break resulting in reactor trip with failure of main turbine trip and 3B MSIV failing open. K/A 040AA1.01 (4.6/4.6), 040AA1.13 (4.2/4.2)
6	TFFXOILB = T TAFF07=0.0	C (SRO) C (BOP)	Failure of the train 2 (B) AFW pump to automatically start and inability to align train 1 AFW steam supply from an intact S/G. K/A 061A2.04 (3.4/3.8)
7	from events 5 & 6	M (ALL)	Loss of secondary heat sink with bleed & feed required. K/A WE05EA1.1 (4.1/4.0)

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

FLORIDA POWER AND LIGHT

TURKEY POINT NUCLEAR POWER PLANT

GROUP XVIII RO/SRO NRC INITIAL LICENSE EXAM

SIMULATOR EVALUATION SCENARIO EXERCISE GUIDE

PROGRAM:	RO/SRO Initial License Training
EXERCISE GUIDE:	XVIII NRC 1
DESCRIPTION:	Main Steam Line Break (Inside Containment) / Loss of All Feedwater
LENGTH:	90 minutes
AUTHOR:	G. M. Blinde
REVISION DATE:	04/27/99

REVIEWED BY: Bretton 6-11-99
Facility Reviewer Date

APPROVED BY: _____
NRC Chief Examiner Date

EVALUATION SCENARIO OBJECTIVES

TERMINAL OBJECTIVE: During normal and abnormal plant conditions, the Shift Operating Crew will perform control room operations in accordance with (IAW) approved plant procedures ensuring that the health and safety of the public is protected and the integrity of the plant maintained.

ENABLING OBJECTIVES:

1. Given specific plant conditions, plant procedures, and a shift turnover, respond to the following events IAW approved plant procedures:
   a. PT-3-445 failure high
   b. Unisolable PZR PORV leak
   c. Power reduction due to PZR leak
   d. PT-3-447 failure low
   e. Main steam line break
   f. Reactor trip with main turbine trip & 3B MSIV failures
   g. Loss of all auxiliary feed
   h. Loss of secondary heat sink with RCS bleed & feed

2. Given abnormal plant conditions, mitigate the adverse consequences of the following events IAW approved plant procedures:
   a. Identify abnormalities while assessing actual system response with respect to predicted system response.
   b. Investigate the cause and effect of abnormalities in system performance.
   c. Implement applicable procedures.
   d. Perform immediate actions from memory.

3. Given abnormal plant conditions, implement the applicable on-site and off-site reports and notifications IAW approved plant procedures.

4. Given normal and abnormal plant conditions, using the following principles for operational effectiveness as they apply to all operators, conduct plant operations IAW approved plant procedures:
   a. Plant and control room communication.
   b. Plant/Control Board monitoring.
   c. Plant/Control Board manipulation.
   d. Operational problem solving.
   e. Use of OPs/ONOPs and Technical Specifications.
   f. Use of EOPs IAW EOP Rules of Usage.
   g. Annunciator recognition and response.
   h. Written communications/logs.
   i. ALARA awareness.

EVALUATION SCENARIO OBJECTIVES (cont'd)

5. Given normal and abnormal plant conditions, using the following principles for operational effectiveness as they apply to the Assistant Nuclear Plant Supervisor (ANPS), conduct plant operations IAW approved plant procedures:

   a. Team performance management.
   b. Problem solving.
   c. Decision analysis.
   d. Action planning.
   e. Self-checking.

6. During abnormal and emergency events, the shift operating crew shall apply techniques of teamwork and self-checking IAW established work practices and operating guidelines.

EVALUATION SCENARIO DESCRIPTION

Initial Conditions: Mode 1, 574 degrees F

Turnover: Maintain 100% power steady state operation. Condenser steam dumps are in steam pressure control due to a problem with the Tavg input which is under I&C investigation. LT-3-498 & A AFW pump are both OOS for corrective maintenance. B AFW pump is aligned to train 2 and C AFW pump is aligned to train 1. No surveillance tests are in progress.

Synopsis: Shortly after shift turnover, PT-3-445 fails high causing PZR PORV PCV-3-456 to automatically open. Operators respond per 3-ONOP-041.5 by manually closing the opened PORV. Following stabilization of plant conditions (or completion of 3-ONOP-041.5 at evaluator discretion), that same PORV (PCV-3-456) develops a leak. Operators respond by attempting to close MOV-3-535 which trips on breaker overload leaving the leak unisolated. The crew re-enters 3-ONOP-041.5, evaluates Tech Specs and determines a plant shutdown is needed due to the unisolable PZR steam space leak (rate at Ops management direction). After a 5% power reduction (or as determined by the evaluator), PT-3-447 fails low. The resulting automatic rod insertion requires the operator to take rod control to manual per 3-ONOP-028. Once Technical Specifications have been consulted and the crew briefed on the effects of the failure, a steam break occurs on the 3C steam generator inside containment. The crew responds per 3-EOP-E-0 and addresses a failure of the main turbine to trip and a failure of the B AFW pump to start causing a loss of all auxiliary feed water (A AFW pump OOS, B AFW pump failed, C AFW pump aligned to the faulted steam generator for steam supply). Additionally, 3B MSIV fails to close manually from the console switch or in response to Main Steam Isolation Signal on high Containment pressure. Transition to 3-EOP-FR-H.1 is made in response to low steam generator levels (3B MSIV & turbine trip failures combined) with a loss of all AFW. Steam generator levels are sufficiently low to require RCS bleed and feed initiation. The exercise is concluded upon establishment of adequate RCS heat removal by bleed & feed (3-EOP-FR-H.1 step 24) or at the evaluator's discretion. The event is classified after scenario completion as a site area emergency per 0-EPIP-20101, Enclosure 1, category 5.

Event Summary:

EVENT #	DESCRIPTION
1	PT-3-445 fails high
2	PZR PORV-3-456 leak / MOV-3-535 overload trip
3	Power reduction
4	PT-3-447 fails low
5	3C S/G main steam line break/reactor trip/turbine trip & 3B MSIV failures
6	Loss of all auxiliary feed water (train 2 AFW pump start failure/AFSS-3-007 stuck shut)
7	Loss of secondary heat sink (bleed & feed required)

Crew Critical Steps:

EVENT #	DESCRIPTION
5	1. Manually actuate steam line isolation (buttons or MSIV switches) prior to orange path on subcriticality or integrity or transition to 3-EOP-ECA-2.1 (whichever occurs first) (applicable only after main steam line isolation step is read).
7	1. When required, initiate RCS bleed and feed so that the RCS depressurizes sufficiently for HHSI injection flow to occur.

Individual Critical Steps:

The bolded individual actions listed under the respective positions (RCO, ANPS, etc.) are for use during evaluations to identify steps that are critical to the individual position.

EVALUATION SCENARIO PRE-EXERCISE BRIEFING

1. **Review the following with students:**
   a. Primary responsibility of the student is to operate the simulator as if it were the actual plant.
   b. The evaluators will observe teamwork skills, communication, and the crew's ability to safely operate the plant during the simulator examination. This includes individual & crew performance.
   c. If you recognize an incorrect decision, response, answer, analysis, action, or interpretation by another crew member but fail to correct it, then the evaluator may assume that you agree with the incorrect item.
   d. The crew should keep a rough log during each scenario sufficient to complete necessary formal log entries.
   e. The simulator instructor facility operator will perform all of the functions of personnel needed outside the control room area.
   f. Before the examination begins, crew members may perform a control board walkdown for up to 10 minutes.
2. **The following are initial conditions for this exam** (in shift turnover package, but may be covered verbally if needed):
   a. Time in core life - EOL
   b. Reactor power and power history - 100% steady state
   c. Turbine status - online
   d. Boron concentration - 51 ppm
   e. Temperature - 574 degrees F
   f. Pressure - 2235 psig
   g. Xenon - Equilibrium for 100% power.
   h. Core cooling - forced
   i. Tech. Spec. LCO(s) in effect
      - 3.7.1.2 Action 3 (30 days); A AFW pump bearing failure
   j. Clearances in effect - A AFW pump
   k. Significant problems/abnormalities - Condenser steam dumps in steam pressure (manual) control due to Tavg input problem. I&C investigating. C AFW pump aligned to train 1. LT-3-498 OOS; LT-3-496 selected for 3C S/G level control.
   l. Evolutions/maintenance for the coming shift - Maintain 100% power steady state operation.
   m. Units 1 and 2 status - unit 1 online; unit 2 s/d
   n. Unit 4 status - mode 5 on RHR
3. **Ensure students understand examination schedule** and that a break will be necessary between scenarios to allow simulator initial condition setup. **Cover exam security rules** to be observed by students both during and after the exam IAW the latest revision of AG-017 or NUREG-1021 as applicable.
4. **Before the examination begins, make crew position assignments and allow students to ask any questions concerning the administration of the test.**

EXPECTED OPERATOR ACTIONS

EVENT: 1

BRIEF DESCRIPTION: Pressure transmitter PT-3-445 fails high. This opens PORV PCV-3-456, decreasing pressure. The operator diagnoses the failed channel and closes the PORV / block valve control switch(es), stopping the decrease in pressure. The plant is stabilized, and PT-3-445 is declared OOS.

INDICATIONS:
1. PT-3-445 failed high
2. PORV PCV-3-456 opens automatically
3. RCS pressure decreases
4. Annunciator A-4/1, PORV/SAFETY OPEN

POSITION	EXPECTED ACTIONS
BOP	1. Assists RCO as directed by ANPS
RCO	1. Recognizes PZR pressure control problem; informs ANPS
	2. Verifies PZR pressure control loop not failed - NO
	a. Checks PT-3-444 not failed.
	b. Recognizes PT-3-445 failed high.
ANOP 041.5	**c. Closes PZR PORV PCV-3-456 and/or block valve MOV-3-535**
	3. Verifies PZR PORVs closed
	4. Verifies PZR spray valves closed
	5. Verifies PZR safety valves closed
	6. Checks PZR pressure stable/increasing
	7. Checks PZR pressure above normal - NO
	8. Checks PZR pressure low/decreasing
	9. Maintains PZR pressure greater than 2000 psig
	10. Verifies PZR heaters operable
	11. Checks if PZR PORV is leaking - NO
	12. Checks if leaking safety is decreasing pressure - NO
	13. Determines if RCS leak is decreasing pressure - NO
	14. Checks if PZR pressure decreasing - NO
	15. Checks RCS pressure stable
	16. Checks if auto pressure control can be established
	17. Establishes auto pressure control
	18. Keeps ANPS informed of plant status
ANPS	1. Coordinates and directs performance of 3-ONOP-041.5
	2. Reviews Technical Specifications
	3. Ensures I&C notified
	4. Keeps NPS informed of plant status

EXPECTED OPERATOR ACTIONS

EVENT: 2

BRIEF DESCRIPTION: A pressurizer PORV begins to leak reducing RCS pressure. 3-ONOP-041.5 is entered, but the associated block MOV trips on overload before the leak is isolated. Tech Specs are referenced and the decision made to shut down.

INDICATIONS:
1. Annunciator A-9/2, PZR CONTROL HI/LO PRESS
2. Annunciator A-4/1, PORV/SAFETY OPEN
3. Annunciator A-7/2, PZR PORV HI TEMP
4. RCS/PZR pressure decreasing
5. PZR PORV acoustic monitor flow indicators lit

POSITION	EXPECTED ACTIONS
BOP	1. Verifies PZR PORV leaking by monitoring acoustic flow indicators 2. Informs ANPS of plant status (CO)
RCO	1. **Recognizes PZR PORV leaking and notifies ANPS** 2. **Performs actions of 3-ONOP-041.5 as directed by ANPS** a. Checks PT-3-444/445 not failed (445 failed but previously addressed) b. Checks PZR PORVs, safeties & spray valves closed c. **Identifies leaking PZR PORV,** attempts to manually close block valve and **reports loss of block valve position indication to ANPS** d. Determines PZR press < normal / decreasing e. **Maintains PZR press > 2000 psig with PZR heaters ON** - determines PZR press low but stable f. Determines PORV is leaking and not isolated g. Determines PZR safeties are not leaking 3. Informs ANPS of plant status (CO)
ANPS	1. **Directs response to PZR safety leak per 3-ONOP-041.5** a. Directs MOV-3-535 closure & response to ensuing overload trip including direction to locally reclose MOV-3-535 breaker (will not reclose) b. **Ensures all PZR htrs on to keep press >2000 psig** c. Directs STA to perform RCS leak rate d. Concludes PZR pressure low/stable and >2000 psig due to unisolable leaking PZR PORV 2. **Reviews T.S. 3.4.4 & 3.2.5 and determines action for leaking PORV can not be met requiring s/d to HSD** (also DNB T.S. requires press >2200 psig in 2 hrs or power < 5% in following 4 hours) 3. Informs NPS of plant status & requests electrical maintenance support with block MOV bkr

EXPECTED OPERATOR ACTIONS

EVENT: 3

BRIEF DESCRIPTION: With reactor power initially at 100% power, a power reduction to Hot Standby is commenced in response to an unisolable PZR PORV leak.

INDICATIONS: 1. NPS/Ops Management direction

which? criteria? EXPECTATIONS

POSITION	EXPECTED ACTIONS
BOP	1. Reduces turbine load IAW 3-ONOP-100 or 3-GOP-103
	which? a. Maintains Tref within 3°F of Tavg if rods in manual (1°F if rods in auto)
	b. Monitors gland seal steam pressure & directs local adjustment of supply/spillover as needed
	2. Performs secondary plant shutdown generator-load-dependent activities IAW 3-ONOP-100 or 3-GOP-103
	3. Performs activities as directed by ANPS
	a. Inhibits MIMS if in service is it in service/will it be?
	b. Notifies Chemistry of need to sample RCS if reactor power reduced > 15% will it be?
	4. Keeps ANPS informed of plant status
RCO	1. Reduces reactor power IAW 3-ONOP-100 or 3-GOP-103
	a. Calculates reactivity addition needed for power reduction
	b. Borates at rate directed by ANPS
	c. Energizes PZR backup heaters
	d. Coordinates with BOP to maintain Tref within 3°F of Tavg if rods in manual (1°F if rods in auto)
	e. Observes AFD limitations
	f. Starts additional charging pump
	2. Keeps ANPS informed of plant status
ANPS	1. Coordinates power reduction activities of RCO & BOP
	2. Performs other activities IAW 3-ONOP-100 or 3-GOP-103
	a. Evaluates Xe changes and directs boration rate changes as necessary
	3. Notifies System Dispatcher of load reduction
	4. Keeps NPS informed of plant status

EXPECTED OPERATOR ACTIONS

EVENT: 4

BRIEF DESCRIPTION: First stage pressure transmitter PT-3-447 fails low. The crew recognizes the failure, selects PT-3-446 for control, and regains control of S/G level. The channel is declared OOS and compensatory actions taken per 3-ONOP-049.1.

INDICATIONS:

1. Failure low of PI-3-447 (VPA)
2. Control rods insert (if in auto rod control)
3. S/G levels decrease
4. Annunciators C-7/1(2)(3), SG A(B)(C) STEAMLINE HI FLOW
5. Annunciator C-8/3, STEAM DUMP ARMED/ACTUATED
6. Annunciator B-4/4, TAVG/TAVG-TREF DEVIATION

POSITION	EXPECTED ACTIONS
BOP	1. Recognizes failure of PT-3-447 and responds as directed by ANPS a. Compares to other turb 1st stage impulse PT's b. Verifies no off-normal conditions on related indications 2. Notifies ANPS of failure 3. Takes manual control of S/G level if necessary
RCO	1. **Selects manual rod control (if in auto) in response to inward rod movement** (may refer to 3-ONOP-028) TIME ? 2. Selects PT-3-446 as controlling channel 3. Informs ANPS of plant status
ANPS	1. Directs stabilization of plant conditions. May suspend load reduction to perform actions of 3-ONOP-049.1 <u>or</u> may continue load reduction and trip bistables later. 2. Directs compensatory action per 3-ONOP-049.1 a. Verifies related instrument status b. Determines which bistables to trip and effects on plant of tripping bistables. Provides this info to RCO/BOP for guidance. c. Directs bypass of inputs to AMSAC 4. Notifies NPS of plant status 5. Ensures Tech. Spec. 3.3.1/2 requirements met Verification Step? 6. Ensures I&C notification of PT-3-447 failure and directs initiation of PWO.

EXPECTED OPERATOR ACTIONS

EVENT: 5 & 6

BRIEF DESCRIPTION: In response to a 3C S/G steam break inside Containment, reactor trip and SI occur. Operators perform actions of 3-EOP-E-0. The auto & manual turbine trip fails. When MSIVs are closed/verified closed, 3B MSIV fails open. No AFW flow exists (no pumps available: A OOS, B start fail, C aligned to faulted S/G). Transition to FR-H.1 is made.

INDICATIONS:
1. Reactor trip & SI directed or actuates
2. Turbine stop valves & 3B MSIV remain open
3. GCBs do not open
4. 3B & C S/G Pressures dropping
5. Containment temperature & pressure rising
6. No AFW flow & AFW pump speeds at/near zero

CREW CRITICAL STEPS:
1. **Manually actuate steam line isolation (buttons or MSIV switches) prior to orange path on subcriticality or integrity or transition to 3-EOP-ECA-2.1 (whichever occurs first) (applicable only after main steam line isolation step is read).**

POSITION	EXPECTED ACTIONS
BOP	1. **Performs immediate actions in response to reactor trip with turbine trip failure per 3-EOP-E-0:** a. **Verifies all turbine stop valves closed - NO** 1) Manually trips turbine/verifies trip - NO **2) Closes MSIVs/bypass valves - 3B fails open** b. Verifies MSR purge steam & steam stop MOVs closed with timing cam @ zero c. **Verifies open Mid/East GCBs - NO** why? **1) Manually opens Mid/East GCBs** (may also open exciter field breaker) 2. Performs other 3-EOP-E-0 immediate actions: a. Verifies power to 3A/B/D 4kV buses and 3A/B/C/D/H 480V load centers. 3. **Performs 3-EOP-E-0 prompt actions at ANPS direction:** a. Verifies feedwater isolation b. **Verifies AFW pumps running - NO** 1) Manually open valves to start 2 AFW pumps 2) **Determines NO AFW pumps available (A OOS, B start fail & C steam supply from faulted S/G).** Dispatches local operators to check B AFW pump.

EXPECTED OPERATOR ACTIONS (cont'd)

EVENT: 5 & 6 (cont'd)

POSITION	**EXPECTED ACTIONS**
BOP (cont'd)	c. Verifies proper ICW operation ok d. Checks if main steamlines should be isolated (already isolated in IOAs) - 3B MSIV still open Verify Tag e. Verifies all EDGs running 4. Performs subsequent actions of 3-EOP-E-0 as directed by ANPS a. Directs SNPO to place PAHMS in service b. Verifies proper AFW alignment and flow - NO 1) Checks S/G NR level >6%[32%] - NO 2) Verifies AFW flow > 390 gpm - NO 3) Manually starts pumps / directs ANPO/NPO valve realignment as directed by ANPS to get AFW > 390 gpm - NO 5. Keeps ANPS informed of plant status
RCO	1. Performs immediate actions in response to reactor trip per 3-EOP-E-0 a. Verifies reactor tripped b. Checks if SI actuated/required - YES 1) If not automatically actuated, manually actuates SI & phase A as required by SI setpoint, PZR level or RCS subcooling c. Recognizes loss of subcooling and trips RCPs (if applicable) 2. **Performs prompt actions of 3-EOP-E-0** a. Verifies containment isolation phase A b. Verifies SI pumps running c. Verifies proper CCW system operation d. Verifies containment cooling e. Verifies containment and control room ventilation isolation f. Verifies containment spray & phase B isolation actuated if hi-hi CNMT pressure **g. Trips all RCPs as required by phase B** h. Verifies SI valve amber lights bright 3. Recognizes loss of subcooling and trips RCPs per 3-EOP-E-0 (if applicable) 4. Performs subsequent actions of 3-EOP-E-0 as directed by ANPS a. Resets & realigns SI b. Verifies SI flow 5. Notifies ANPS of safety injection and cause 6. Keeps ANPS informed of plant status

EXPECTED OPERATOR ACTIONS (cont'd)

EVENT: 5 & 6 (cont'd)

POSITION	EXPECTED ACTIONS
ANPS	1. **Directs response to reactor trip and failure of auto/manual turbine trip per 3-EOP-E-0** a. Verification of reactor trip b. **Response to auto/manual turbine trip failure -** **1) ensures closure of 3A & 3C MSIVs** **2) notes 3B MSIV failure to close and directs field operator investigation into problem** **3) ensures mid/east GCBs opened** (may direct exciter field breaker opening) c. Determination of electric plant status d. Manual SI/phase A e. Monitors foldout page items including direction to RCO to stop all RCPs if subcooling lost **f. Directs trip of RCPs if phase B actuates** g. Verifies at least 2 AFW pumps running - NO 1) Directs BOP/RCO to have ANPO/NPO check the failed train 2 (B) AFW pump. 2) Directs BOP/RCO to have ANPO/NPO open 3-10-007 to align train 2 steam to train 1 (C) AFW pump. h. Directs other prompt actions i. **Response to loss of AFW flow & determination that no AFW pumps available.** 1) Evaluates field operator reports to determine no AFW pumps available **2) Directs transition to 3-EOP-FR-H.1** j. Directs other subsequent actions 2. Informs NPS of plant status

EXPECTED OPERATOR ACTIONS

EVENT: 7

BRIEF DESCRIPTION: Feedwater flow (both main & AFW) has been completely lost following a 3C S/G main steam break in Containment. Plant conditions require entry into 3-EOP-FR-H.1. RCPs are stopped and feed and bleed is initiated (3C S/G faulted/dry & 3B S/G inventory lost thru failed MSIV to turbine which failed to trip).

INDICATIONS:
1. All steam generators less than 6[32]% level
2. Less than 390 gpm AFW flow
3. Wide range S/G levels decreasing (<22% on 3B & 3C S/Gs)

CREW CRITICAL STEPS:
1. **When required, initiate RCS bleed and feed so that the RCS depressurizes sufficiently for HHSI injection flow to occur.**

POSITION	EXPECTED ACTIONS
BOP	1. Performs actions of 3-EOP-FR-H.1 for RCS bleed & feed when secondary heat sink lost as directed by ANPS a. Resets CIS ΦA b. Verifies E-0 immediate and prompt actions c. Directs PAHMS placed in service per 3-OP-094 d. Checks charging pumps aligned to offsite power e. Attempts to restore secondary heat sink f. Aligns equipment for hot standby conditions g. Checks if EDGs shold be stopped h. Checks for adequate secondary heat sink
RCO	1. Performs actions of 3-EOP-FR-H.1 to restore feed flow as directed by ANPS a. Checks if secondary heat sink is required b. Stops all RCPs (should be stopped already) 2. **Performs actions of 3-EOP-FR-H.1 for RCS feed & bleed when secondary heat sink lost as directed by ANPS** a. Actuates manual SI and CIS ΦA b. Verifies RCPs all stopped c. Verifies RCS feed path d. **Establishes RCS bleed path - PORVs/block valves open** (leaking PORV will open & failed block MOV never closed, so both PORV flow paths available) e. Verifies instrument air to containment f. Verifies adequate RCS bleed path

EXPECTED OPERATOR ACTIONS (cont'd)

EVENT: 7 (cont'd)

POSITION	EXPECTED ACTIONS
ANPS	1. Directs performance of 3-EOP-FR-H.1 including RCS bleed and feed 2. Informs NPS of status of plant 3. Classifies the event as a SITE AREA EMERGENCY per 0-EPIP-20101

SIMULATOR INSTRUCTOR FACILITY OPERATING INSTRUCTIONS

I. **SETUP**

A. Reset to IC-6.

B. Load scenario 35.

C. Following switch check, unfreeze the simulator and realign plant equipment as necessary such that condenser steam dumps are in steam pressure control, and LT-3-498 & A AFW pump are out of service. Place MIMS in service.

D. Perform the following
1. Realign C AFW pump to train 1 & isolate A AFW pump (parameter controller composite trigger A AFW P).
2. Place the condenser steam dump control selector switch to MANUAL.
3. Take LT-3-498 out of service as follows:
   a. Ensure 3C S/G level control inputs are selected to LT-3-496.
   b. Fail LT-3-498 (touch SYS MAT->STEAM GENERATOR & MAIN STEAM->STEAM GENERATOR->L-495->LT-498-> TRANSMITTER LOSS OF POWER->set TFF1MACP=T).
4. Enter the following failures:
   a. Turbine trip failure (parameter controller direct trigger TFU10005=T).
   b. B AFW pump loss of governor oil (touch SYS MAT-> FEEDWATER->AUX F/W STEAM->IDA->GOV-B OIL LOSS FAILURE->set TFFXOILB=T).
   c. 3B MSIV failure to close (touch SYS MAT->STEAM GENERATOR & MAIN STEAM->MAIN STEAM->POV2605-> VALVE FAIL AS IS->set TFSVVX6C=T).

E. Delete all conditional events from Parameter Controller Event Summary **except** those indicated on the Parameter Controller Event Summary pages in this exercise guide. Direct events may deleted at instructor discretion.

F. Place turnover sheet on RCO desk.

G. Clearance information tags - A AFWP.

H. Information tags - Steam Dump Control Mode Selector Switch to MANUAL. Also move train 1 label from A AFW pump tachometer to C AFW pump tachometer beneath ann. panel X. Place a brown dot on LT-3-498.

SIMULATOR INSTRUCTOR FACILITY OPERATING INSTRUCTIONS (cont'd)

II. CONDUCTING THE EXAMINATION:

A. Unfreeze the simulator and begin the exam.

B. **PT-3-445 Fails High (event 1).**

1. **Initiation:** Shortly after turnover, actuate PT-3-445 failure high (parameter controller direct trigger TFH1TU45=T).

2. **Response:** Respond as NPS/NWE/I&C. As NPS/NWE, state that a work request will be generated and I&C will be notified. As I&C, reply that a planner will intiate a work package for troubleshooting & repair.

C. **PZR PORV-3-456 Leak / MOV-3-535 Overload Trip (event 2).**

1. **Initiation:** After completion of 3-ONOP-041.5, enter the MOV-3-535 overload trip conditional then actuate the PZR PORV-3-456 leak (touch PRESSURIZER LEVEL->MOV535->THERMAL OVERLOAD-> set TFH2906F=T conditional on IMH231C->RECALL->PORV456->LEAK BY ->set TVHV456=0.7/30 sec ramp). The leak is sized at 25-30 gpm to slowly reduce pressure to < 2200 psig.

2. **Response:** Once the leaking PORV has been identified, the RCO should attempt to close the associated block MOV which will trip on overload as it starts to close. When asked as NPO/NWE to check out the MOV-3-535 breaker on 3B MCC, wait 1-3 minutes and report that the area around the breaker smells faintly like burnt insulation. If directed to attempt to close the breaker, delay action until after pressure < 2200 psig and reduce PORV-3-456 leakage to 15 gpm by setting TVHV456=0.036/60 sec ramp. (This leak rate will keep the acoustic monitor LEDs lit while allowing all PZR heaters to keep up with the effects of the leak without returning pressure to normal.) Then tell the crew that the switch won't stay in the ON position and the burnt insulation smell just got stronger. Respond as electrical maintenance when directed to investigate the breaker and respond after 5-7 minutes that the breaker internals appear burnt. Also state that the 3B MCC will have to be deenergized and a Containment entry performed to allow a complete damage evaluation and subsequent repair of the MOV and its breaker. Acknowledge load dispatcher/plant management notifications of the required load reduction.

SIMULATOR INSTRUCTOR FACILITY OPERATING INSTRUCTIONS (cont'd)

D. **Power Reduction (event 3).**

1. **Initiation:** In response to event 2, the Operations Manager directs that an ONOP-100 shutdown be performed due to the inability to restore normal PZR pressure from the PORV leak.

2. **Response:** Condenser tube leak response and initiation of load reduction is covered in event 2. Acknowledge notification as Chemistry of the need to sample the RCS in response to a 15% power change. Respond as field operator in response to notification of stopping secondary pumps and if requested to manually control gland seal steam pressure.

E. **PT-3-447 Fails Low (event 4).**

1. **Initiation:** After a 5% power reduction (or at lead examiner direction) ensure that rod control is in AUTO, then actuate PT-3-447 failure (parameter controller direct trigger TFSMAML=T).

2. **Response:** Respond as NPS, NWE or I&C to notification of PT-3-447 failure. As NPS/NWE state that a work request will be generated and I&C will be notified of the failure. As I&C, reply that a planner will intiate a work package for troubleshooting & repair. Respond as NPO/NWE when directed to bypass AMSAC power 2 inputs by acknowledging the order, waiting 3-5 minutes, then bypassing the requested inputs (touch SYS MAT ->REACTOR->EAGLE21/AMSAC->AMSAC->PROCESSOR A&B NORMAL/BYPASS switches->set TCL4P2BA=T & TCL4P2BB=T->SYSTEM RESET). Report completion to the crew.

F. **3C S/G Main Steam Line Break / Reactor Trip / Turbine Trip & 3B MSIV Failures (event 5)**

1. **Initiation:** Once the crew has been briefed on the effects of the PT-3-447 failure, actuate the 3C S/G steam break in Containment (touch SYS MAT->STEAM GENERATOR & MAIN STEAM->MAIN STEAM->CONT LIQ & VENT PROCESS leak node for C steam line->LEAK INTO CONTAINMENT ->set TVSBVL15=0.2 on 300 sec ramp). Turbine trip, 3B MSIV & B AFW pump failures and A AFW pump OOS are entered during setup.

2. **Response:** When dispatched as field operator to check the B AFW pump, wait three minutes and tell crew that it appears that there is an oil leak on the governor and that there is oil spilled on the West end of the pump/pedestal. When asked to align train 2 steam to the C AFW pump, wait 2-4 minutes and state that the stem snapped on valve AFSS-3-007 and that the valve is stuck shut.

SIMULATOR INSTRUCTOR FACILITY OPERATING INSTRUCTIONS (cont'd)

F. **3C S/G Main Steam Line Break / Reactor Trip / Turbine Trip & 3B MSIV Failures (event 5 cont'd)**

2. **Response (cont'd):** If asked as maintenance about the status of the A AFW pump, state that pump end is disassembled with the impeller removed and bearings being replaced - ETR 3 days. Respond as maintenance if asked to investigate the B AFW pump governor oil leak and the AFSS-3-007 valve stem failure. Neither of these problems will be fixed during the scenario. Respond as SNPO to place PAHMs in service per 3-OP-094 (parameter controller trigger composite "PAHM"). After approximately 15 minutes inform the crew that PAHM is aligned. Respond as NPO to place unloaded EDGs in standby per 3-OP-023.

G. **Loss of all Auxiliary Feedwater (event 6)**

1. **Initiation:** See event 5.

2. **Response:** See event 5.

H. **Loss of Secondary Heat Sink (bleed & feed required) (event 7).**

1. **Initiation:** A result of events 5 & 6 and the scenario setup, this event entered by procedural transition from 3-EOP-E-0 to 3-EOP-FR-H.1 (adverse containment with loss of all AFW). The 3B MSIV & turbine trip failures combine to reduce wide range level to < 22% in this (as well as the faulted 3C S/G) requiring performance of feed & bleed per 3-EOP-FR-H.1 step 2 CAUTION.

2. **Response:** Consistent with event 5.

III. TERMINATION CRITERIA:

A. Upon establishment of RCS bleed & feed (step 24 of 3-EOP-FR-H.1), **OR**

B. At the discretion of the evaluator.

PARAMETER CONTROLLER FILE:

COM-POS-ITE	CDB LABEL	VALUE	CONDITIONAL	TIME DELAY	RAMP	DESCRIPTION
N	TFS1MAML	T	-	-	-	PT-3-447 (turb 1st stg imp press ch IV) fails low
N	TFH1TU45	T	-	-	-	PT-3-445 (PZR press control channel) fails high
N	TFU10005	T	-	-	-	Turbine trip fails - auto & manual
Y	**"PAHM"**	-	-	-	-	**Places H2 Monitor in Service**
-	TAC2V02A	1.0	-	0:30	-	Opens PAHM-002A
-	TAC2V02B	1.0	-	1:30	-	Opens PAHM-002B
-	TAAAV21	1.0	-	-	-	Opens HV-1
-	TAAAV22	1.0	-	-	-	Opens HV-3
-	TACA005	0.0	-	-	-	Closes MPAS-005
Y	**"A AFW P"**	-	-	-	-	**Removes A AFW pump from service & aligns C AFW pump to train 1**
-	TFFXCGVA	T	-	-	-	Fails A AFW pump governor closed
-	TFFXCTTA	T	-	-	-	Fails A AFW pump T&T valve (MOV6459A) closed
-	TAFK142	0.0	-	-	-	Closes 3-142 (A AFW pump dischg to train 1)
-	TAFK342	1.0	-	-	-	Opens 3-342 (C AFW pump dischg to train 1)
-	TAFK003	0.0	-	-	-	Closes AFPD-003 (C AFW pump dischg to train 2)
-	TAFF01C	0.0	-	-	-	Closes AFSS-001 (C AFW pump train 2 stm supply)
-	TAFF3082	0.0	-	-	-	Closes 3-082A (A AFW pump train 1 stm supply)
-	TAFF3086	1.0	-	-	-	Opens 3-086A (C AFW pump train 1 stm supply)
-	TAFF4082	0.0	-	-	-	Closes 4-082A (A AFW pump U4 train 1 stm supply)
-	TAFF4086	1.0	-	-	-	Opens 4-086A (C AFW pump U4 train 1 stm supply)

EVALUATION SCENARIO REFERENCES

Reference List:

PROCEDURE #	PROCEDURE TITLE
3-GOP-103	Power Operation to Hot Standby
3-OP-094	Containment Post-Accident Monitoring
3-ARP-097.CR	Control Room Annunciator Response
3-ONOP-028	Reactor Control System Malfunction
3-ONOP-041.5	Pressurizer Pressure Control Malfunction
3-ONOP-049.1	Deviation or Failure of Safety Related or Reactor Protection Channels
3-ONOP-071.1	Secondary Chemistry Deviation from Limits
3-ONOP-100	Fast Load Reduction
3-EOP-E-0	Reactor Trip or Safety Injection
3-EOP-FR-H.1	Response to Loss of Secondary Heat Sink
0-EPIP-20101	Duties of the Emergency Coordinator
	PTN Technical Specifications
	Plant Curve Book

EVALUATION SCENARIO CONTENT SUMMARY

1. Total Number of Malfunctions: 7

2. Malfunctions Occurring During EOP Performance: 2

   1. Turbine trip failure
   2. 3B MSIV failure

3. Abnormal Events: 3

   1. PT-3-445 fails high
   2. PORV-3-456 leak & MOV-3-535 failure to close
   3. PT-3-447 fails low

4. Major Transients: 2

   1. 3C S/G Steam Break in Containment
   2. Loss of secondary heat sink (B AFW start failure)

5. EOPs Used: 1

6. EOP Contingencies Entered: 1

7. Simulator Run Time: 90 minutes

8. EOP Run Time: 45 minutes

9. Crew Critical Tasks: 2

Facility: Turkey Point Nuclear Plant **Scenario No.:** 2 **Op-Test No.:** PTN Group XVIII

Examiners: _____ **Operators:** _____

Objectives: To evaluate the applicants' ability to reduce load from 35% power with the objective of taking the unit off-line per off-normal plant procedures. Evaluate use of off-normal procedures for S/G blowdown PRM R-19 failing high with an S/G blowdown FCV failing to automatically close, a S/G tube leak, and an Intermediate Range hi flux trip bistable not resetting. Emergency Operating Procedure use will be evaluated for a S/G tube rupture with an associated main steam line safety valve failed open.

Initial Conditions: 35% power, MOL

Turnover: Plant shutdown is in progress to allow emergent repair to a leaking main turbine control oil line. The previous crew has stabilized power with S/G level control in automatic for shift turnover. Condenser steam dumps are in steam pressure control due to a problem with the Tavg input, and LT-3-498 & A AFW pump are both OOS for corrective maintenance. No surveillance tests are in progress. B AFW pump is aligned to train 2 and C AFW pump is aligned to train 1. Shift orders are to reduce power from 35%, remove the unit from service, and remain in Mode 2 while the leaking main turbine control oil line is repaired.

Event No.	Malf. No.	Event Type*	Event Description
1	TFCMM2H4=T TFSWV8AA=T TFSWV8AA=F conditional on IAS278A LT0.1	I (SRO) I (BOP)	Steam Generator Blowdown PRM R-3-19 fails high with failure of the 3A Steam Generator Blowdown FCV to automatically close. K/A 068A2.04 (3.3/3.3) & 073A2.02 (2.7/3.2) ~~no not configure~~
2	TVHHSGA=0.01 on 1:00 ramp increasing to 0.06 on a 3:00 ramp	C (ALL)	3A Steam Generator Tube Leak. K/A 037AA2.13 (4.1/4.3)
3	N/A	N(SRO/BOP) R(RO)	Reduce power from 35%. K/A 2.1.23 (3.9/4.0)
4	TFN16AA=T	I (SRO) I (RO)	Intermediate Range hi flux trip bistable does not reset. K/A 033AA2.09 (3.4/3.7)
5	TVHHSGA=0.5 conditional on L2:CRXAO	M (ALL)	3A Steam Generator Tube Rupture. K/A 038EA2.02 (4.5/4.8)
6	TVSVV43D=1.0 on 2:00 ramp then TVSVV43A=T	C (ALL)	Main steam line safety valve develops leak and then fails open on ruptured steam generator. K/A 038EA1.32 (4.6/4.7) & 038EA2.14 (3.3/4.6) cannot take credit RR

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

FLORIDA POWER AND LIGHT

TURKEY POINT NUCLEAR POWER PLANT

GROUP XVIII RO/SRO NRC INITIAL LICENSE EXAM

SIMULATOR EVALUATION SCENARIO EXERCISE GUIDE

PROGRAM:	RO/SRO Initial License Training
EXERCISE GUIDE:	XVIII NRC 2
DESCRIPTION:	Faulted/Ruptured Steam Generator
LENGTH:	90 minutes
AUTHOR:	G. M. Blinde
REVISION DATE:	04/29/99

REVIEWED BY: Bretton 6-11-99
Facility Reviewer Date

APPROVED BY: _____
NRC Chief Examiner Date

EVALUATION SCENARIO OBJECTIVES

TERMINAL OBJECTIVE: During normal and abnormal plant conditions, the Shift Operating Crew will perform control room operations in accordance with (IAW) approved plant procedures ensuring that the health and safety of the public is protected and the integrity of the plant maintained.

ENABLING OBJECTIVES:

1. Given specific plant conditions, plant procedures, and a shift turnover, respond to the following events IAW approved plant procedures:
   a. PRM R-3-19 failure high
   b. Steam generator tube leak
   c. Power reduction due to S/G tube leak
   d. Intermediate range hi flux trip bistable reset failure
   e. Steam generator tube rupture
   f. Main steam line safety valve fails open on ruptured S/G
   h. Faulted/Ruptured steam generator

2. Given abnormal plant conditions, mitigate the adverse consequences of the following events IAW approved plant procedures:
   a. Identify abnormalities while assessing actual system response with respect to predicted system response.
   b. Investigate the cause and effect of abnormalities in system performance.
   c. Implement applicable procedures.
   d. Perform immediate actions from memory.

3. Given abnormal plant conditions, implement the applicable on-site and off-site reports and notifications IAW approved plant procedures.

4. Given normal and abnormal plant conditions, using the following principles for operational effectiveness as they apply to all operators, conduct plant operations IAW approved plant procedures:
   a. Plant and control room communication.
   b. Plant/Control Board monitoring.
   c. Plant/Control Board manipulation.
   d. Operational problem solving.
   e. Use of OPs/ONOPs and Technical Specifications.
   f. Use of EOPs IAW EOP Rules of Usage.
   g. Annunciator recognition and response.
   h. Written communications/logs.
   i. ALARA awareness.

EVALUATION SCENARIO OBJECTIVES (cont'd)

5. Given normal and abnormal plant conditions, using the following principles for operational effectiveness as they apply to the Assistant Nuclear Plant Supervisor (ANPS), conduct plant operations IAW approved plant procedures:

   a. Team performance management.
   b. Problem solving.
   c. Decision analysis.
   d. Action planning.
   e. Self-checking.

6. During abnormal and emergency events, the shift operating crew shall apply techniques of teamwork and self-checking IAW established work practices and operating guidelines.

EVALUATION SCENARIO DESCRIPTION

Initial Conditions: Mode 1, 554 degrees F

Turnover: Plant shutdown is in progress to allow emergent repair to a leaking main turbine control oil line. The previous crew has stabilized power with S/G level control in automatic for shift turnover. Condenser steam dumps are in steam pressure control due to a problem with the Tavg input which is under I&C investigation. LT-3-498 & A AFW pump are both OOS for corrective maintenance. B AFW pump is aligned to train 2 and C AFW pump is aligned to train 1. No surveillance tests are in progress. Shift orders are to reduce power from 35%, remove the unit from service, and remain in Mode 2 while the main turbine control oil line is repaired.

Synopsis: Shortly after shift turnover, R-3-19 fails high. Operators respond per 3-ONOP-067 and manually close the 3A S/G blowdown FCV (FCV-3-6278A) which failed to respond to the R-3-19 high alarm. Following completion of 3-ONOP-067, a tube leak develops on 3A S/G. Initial identification of the leak is by PRM R-3-15. Operators again respond per 3-ONOP-067 to the S/G tube leak (rate > Tech. Spec. limits) by continuing the plant shutdown to hot standby per 3-GOP-103. The tube leak rate grows until 3-ONOP-100 is entered for fast load reduction. As power is reduced below the Intermediate Range high flux trip setpoint, operators should notice that the N35 hi flux bistable did not reset. Operators respond by taking Intermediate Range N35 channel out of service per 3-ONOP-059.7. If the N35 failure is not noticed prior to going below P-10, the reactor will automatically trip. Once N35 trip is bypassed, the crew continues to take the unit off line. In response to the turbine trip, the 3A S/G tube leak rapidly grows into a tube rupture requiring safety injection (and reactor trip if one has not already occurred). The crew responds per 3-EOP-E-0. As the ruptured S/G fills and pressure increases, an associated main steam line safety begins to leak and eventually fails open creating a steam break on the ruptured steam generator to atmosphere. Transition is made from 3-EOP-E-0 to 3-EOP-E-2 to 3-EOP-E-3. When directed by 3-EOP-E-3, the crew transitions to 3-EOP-ECA-3.1 and addresses the faulted/ruptured 3A S/G. The exercise is concluded upon commencement of RCS cooldown <100°F/hr (3-EOP-ECA-3.1 step 14) or at the evaluator's discretion. The event is classified after scenario completion as an alert per 0-EPIP-20101, Enclosure 1, categories 2 & 3.

Event summary:

EVENT #	DESCRIPTION
1	R-3-19 fails high/FCV-3-6278A auto close failure
2	3A steam generator tube leak
3	Power reduction from 35%
4	IR N35 hi flux trip bistable fails to reset
5	3A steam generator tube rupture
6	RV-3-1402 fails open (3A S/G faulted/ruptured)

Crew Critical Steps:

EVENT #	DESCRIPTION
6	1. Isolate feedwater flow into the ruptured S/G prior to transitioning to 3-EOP-ECA-3.1. 2. Cool down RCS at highest rate achievable but less than 100°F/hr in all RCS cold legs.

Individual Critical Steps:

The bolded individual actions listed under the respective positions (RCO, ANPS, etc.) are for use during evaluations to identify steps that are critical to the individual position.

EVALUATION SCENARIO PRE-EXERCISE BRIEFING

1. **Review the following with students:**
   a. Primary responsibility of the student is to operate the simulator as if it were the actual plant.
   b. The evaluators will observe teamwork skills, communication, and the crew's ability to safely operate the plant during the simulator examination. This includes individual & crew performance.
   c. If you recognize an incorrect decision, response, answer, analysis, action, or interpretation by another crew member but fail to correct it, then the evaluator may assume that you agree with the incorrect item.
   d. The crew should keep a rough log during each scenario sufficient to complete necessary formal log entries.
   e. The simulator instructor facility operator will perform all of the functions of personnel needed outside the control room area.
   f. Before the examination begins, crew members may perform a control board walkdown for up to 10 minutes.
2. **The following are initial conditions for this exam** (in shift turnover package, but may be covered verbally if needed):
   a. Time in core life - MOL
   b. Reactor power & power history - 35%; downpower in progress
   c. Turbine status - online
   d. Boron concentration - 1074 ppm
   e. Temperature - 554 degrees F
   f. Pressure - 2235 psig
   g. Xenon - Increasing due to power reduction from 100% power.
   h. Core cooling - forced
   i. Tech. Spec. LCO(s) in effect
      - 3.7.1.2 Action 3 (30 days); A AFW pump bearing failure
   j. Clearances in effect - A AFW pump
   k. Significant problems/abnormalities - Condenser steam dumps in manual control due to Tavg input problem. I&C investigating. C AFW pump realigned to train 1. Leak on main turbine control oil line. LT-3-498 OOS; LT-3-496 selected for 3C S/G level control.
   l. Evolutions/maintenance for the coming shift - Continue downpower, remove unit from service & remain in mode 2 while repairing the main turbine control oil line.
   m. Units 1 and 2 status - unit 1 online; unit 2 s/d
   n. Unit 4 status - mode 5 on RHR
3. **Ensure students understand examination schedule** and that a break will be necessary between scenarios to allow simulator initial condition setup. **Cover exam security rules** to be observed by students both during and after the exam IAW the latest revision of AG-017 or NUREG-1021 as applicable.
4. **Before the examination begins, make crew position assignments and allow students to ask any questions concerning the administration of the test.**

EXPECTED OPERATOR ACTIONS

EVENT: 1

BRIEF DESCRIPTION: PRMS R-3-19 fails high. Blowdown automatically isolates with the exception of FCV-3-6278A which must be closed manually. The crew responds per 3-ONOP-067. No other radiation monitors show abnormal radiation, and Chemistry/HP are notified for confirmatory readings. R-3-19 is declared OOS.

INDICATIONS:

1. H-1/4 PRMS HI RADIATION
2. Full upscale reading on PRMS R-3-19
3. No abnormal readings on other radiation monitors
4. FCV-3-6278A indicates open

POSITION	EXPECTED ACTIONS
BOP	1. Checks high alarm on PRMS channels - R-3-19 high 2. **Verifies automatic actions (3-ONOP-067 foldout page)** a. Verifies blowdown FCVs close. **Identifies FCV-3-6278A auto close failure and manually closes valve.** b. Blowdown tank to canal LCV closed c. Calls Chemistry/NPO to verify chemistry cold lab sample sink S/G sample flow stopped 3. Checks affected PRMS alarm valid a. Checks readout > setpoint (failed high) b. Checks channel operable - NO c. Checks for source check response - NO d. contacts HP/Chemistry to validate alarm e. Checks fail indicator - ON 4. Checks for PRMS channel failure - YES - R-3-19 5. Checks if SPING/DAM-1 alarming - NO 6. Identifies no leaking S/G exists 7. Informs ANPS of plant status
RCO	1. Monitors affected plant parameters 2. Monitors primary-to-secondary leak rate (none exists) 3. Informs ANPS of plant status
ANPS	1. Directs response to R-3-19 failed high per 3-ONOP-067 2. Verifies no other indications exist of S/G tube leakage or unmonitored effluent release 3. Notifies NWE/I&C of failed PRMS R-3-19 4. Informs NPS of plant status

EXPECTED OPERATOR ACTIONS

EVENT: 2

BRIEF DESCRIPTION: Tube leakage develops on 3A steam generator. PRMS R-3-15 increases and alarms (R-3-19 OOS). Leakage continues to increase. Leakrate determination reveals greater than Tech Spec leakage. Shutdown continues. Leakage increases further, requiring additional charging flow to maintain pressurizer level. Conditions are met for declaration of an Unusual Event.

INDICATIONS:
1. PRMS R-3-15 alarming
2. Annunciator H-1/4, PRMS HI RADIATION
3. Increased charging flow to maintain PZR level

POSITION	EXPECTED ACTIONS
BOP	1. Notes S/G tube leakage 2. Checks for valid PRMS R-3-15 alarm (3-ONOP-067) a. Checks readout above alarm setpoint b. Press FAIL/TEST pushbuttons on R-3-15 c. Source check R-3-15 d. Determines R-3-15 not failed 3. Monitors affected plant parameters a. Determines PZR level can be maintained stable 4. Identifies leaking S/G a. Notifies Chemistry to sample for S/G leak rate determination and check DAM-1 b. Notifies Health Physics for MSL and SJAE surveys 5. Continues shutdown as directed 6. Directs isolation of AFW MOV when leaking S/G identified 7. Informs ANPS of plant status
RCO	1. Directs/performs leak rate calculation/estimate 2. Starts charging pumps and reduces letdown as necessary to maintain pressurizer level 3. Continues reactor shutdown as directed 4. Informs ANPS of plant status
ANPS	1. Coordinates S/G tube leakage response per 3-ONOP-067 2. Informs NPS of plant status (UNUSUAL EVENT per 0-EPIP-20101 now applies) 3. Directs STA perform leak rate calculation 4. Determines S/G tube leakage is > Tech Spec limits 5. Directs continuation of plant shutdown

EXPECTED OPERATOR ACTIONS

EVENT: 3

BRIEF DESCRIPTION: Plant shutdown (from 35% power) is required per 3-GOP-103. Transition may be made to 3-ONOP-100 due to growing leak rate.

INDICATIONS: 1. Conditions require plant shutdown

POSITION	EXPECTED ACTIONS
BOP	1. Performs 3-GOP-103/3-ONOP-100 as directed by ANPS: a. Reduces turbine load b. Monitors condenser steam dump operation c. Stops remaining HD pump at 300 MW d. Stops one condensate pump at 275 MW e. Opens turbine drain valves at 150 MW f. Verifies MSRs removed from service at 110 MW g. Transfers plant loads to S/U xfmr at 50-100 MW h. Reduces load to approx. 15% power, then shifts feedwater control to manual/FRV bypasses i. When P-7 clears, verifies at power trips blocked, then trips turbine and verifies MSR timing valves closed j. Maintains RCS Tavg stable at 547°F using atmospheric/condenser steam dumps as directed 2. Informs RCO and ANPS of plant status
RCO	1. Performs 3-GOP-103/3-ONOP-100 as directed by ANPS: a. Reduces power at rate determined by ANPS via boration/control rods while coordinating w/BOP b. Maintains control rods > RIL c. Maintains Tref within 3°F of Tavg d. Starts additional charging pumps as necessary e. Energizes PZR backup heaters f. Ensures rods taken to manual at 110 MW (15%) g. Verifies IRNI/PRNI low range trips reset prior to going below 15% power - NO (see next event) h. Reduces power below P-7 and maintains there with rods/boration i. With power <5% & stable plant, opens RTBs. 2. Informs BOP and ANPS of plant status
ANPS	1. Coordinates plant shutdown per 3-GOP-103/3-ONOP-100 2. Determines ramp rate for power reduction 3. Informs NPS & System Dispatcher of plant status

EXPECTED OPERATOR ACTIONS

EVENT: 4

BRIEF DESCRIPTION: Intermediate range NI N-35 hi flux trip bistable fails to reset during a power reduction below 15%. Operators respond by stabilizing the plant and removing the instrument from service per 3-ONOP-059.7 (and 3-ONOP-100 if in effect).

INDICATIONS: 1. IR N35 hi flux trip bistable status light remains illuminated below 15% reactor power.

POSITION	EXPECTED ACTIONS
BOP	1. Assists RCO as directed by NPS 2. **Takes N-35 out of service per 3-ONOP-059.7 (or 3-ONOP-100 if in effect) at ANPS direction:** a. **Places level trip switch on N-35 drawer in BYPASS position** b. Ensures NIS recorder channel selector switch is set to N-36.
RCO	1. **Recognizes N-35 hi flux trip bistable failure to reset below 15% power and reports this to ANPS** 2. Keeps ANPS informed of plant status
ANPS	1. **Coordinates performance of 3-ONOP-059.7 (or 3-ONOP-100 if in effect)(3-ONOP-059.7 performed along with 3-ONOP-100 if in effect; steps may be delayed during important parts of 3-ONOP-100)** 2. Notifies I&C/NWE that N-35 hi flux trip bistable has failed to reset with power < 15% 3. Evaluates required Tech Spec 3.3.1 actions (may be delayed if 3-ONOP-100 in effect) 4. Keeps NPS informed as to plant status

EXPECTED OPERATOR ACTIONS

EVENT: 5

BRIEF DESCRIPTION: In response to plant conditions, the reactor has been tripped. A safety injection occurs due to a rupture on 3A S/G. Operator actions are verified / performed per 3-EOP-E-0. As the ruptured S/G fills with coolant from the RCS, S/G pressure rises. Main steam line safety RV-3-1402 begins leaking and then fails open.

INDICATIONS:
1. Reactor trip directed or actuates
2. Rod bottom lights on
2. RTBs and bypass breakers open
3. Safety injection annunciator(s)
4. Rising level in 3A S/G with feed isolated
6. Rising pressure in 3A S/G until RV-3-1402 leaks/opens followed by lowering pressure
7. Indication of steam flow on 3A S/G

CREW CRITICAL STEPS: SEE EVENT 6

POSITION	EXPECTED ACTIONS
BOP	1. Performs immediate actions per 3-EOP-E-0 a. Verifies turbine trip b. Verifies power to 3A/B/D 4kV buses. **2. Performs 3-EOP-E-0 foldout page action as directed** **a. Isolates AFW flow to 3A S/G** b. Maintains intact S/G total feed flow >390 gpm 3. Performs prompt actions of 3-EOP-E-0 a. Verifies feedwater isolation b. Verifies AFW pumps running c. Verifies proper ICW operation d. Checks if main steam lines should be isolated e. Verifies EDGs all running 4. Performs 3-EOP-E-0 subsequent actions as directed a. Directs SNPO to place PAHMS in service b. Verifies proper AFW alignment and flow **c. Checks RCS cold leg temperatures stable - NO** 1) Limits total feed flow to 390 gpm until at least one S/G NR level > 6[32]% **2) Determines excessive steam flow** and may either close the 3A MSIV (may close all MSIVs) or leave it open due to SGTR d. Performs MSLB diagnostics 5. Informs ANPS of plant status

EXPECTED OPERATOR ACTIONS (cont'd)

EVENT: 5 (cont'd)

POSITION	EXPECTED ACTIONS
RCO	1. **Performs immediate actions per 3-EOP-E-0** a. Verifies reactor tripped b. **Checks if SI actuated/required. If not already auto actuated, manually actuates SI/phase A if required by PZR level or RCS subcooling.** 2. **Performs 3-EOP-E-0 foldout page actions as directed** a. **Recognizes loss of subcooling and trips RCPs (if applicable)** 3. Performs prompt actions of 3-EOP-E-0 a. Verifies containment isolation phase A b. Verifies SI pumps running c. Verifies proper CCW system operation d. Verifies containment cooling e. Verifies containment and control room ventilation isolation f. Verifies containment spray not required g. Verifies SI valve amber lights bright 4. Performs 3-EOP-E-0 subsequent actions as directed a. Resets & realigns SI system b. Verifies SI flow c. Checks RCP seal cooling d. Checks RCP cooling e. Checks letdown/PORVs/spray valves closed 5. Notifies ANPS of safety injection and cause 6. Informs ANPS of plant status
ANPS	1. **Directs response to reactor trip/SI per 3-EOP-E-0** a. Obtains verification of reactor trip b. Determines electric plant status c. **Directs manual SI/phase A if required and not already automatically actuated.** d. **Monitors foldout page items** 1) **Directs stop all RCPs if subcooling lost** 2) **Directs isolation of feed to 3A S/G** 3) Directs BOP to maintain 390 gpm total AFW flow until one S/G NR level > 6[32]% e. Directs prompt actions f. **Directs subsequent actions** 1) **Determines RCS cold leg temperature dropping** and may either direct closure of the 3A MSIV (E-2 guidance) or leave it open (E-3 guidance) (may have all MSIVs closed) 2. **Transitions to 3-EOP-E-2 or appropriate FRP** 3. Informs NPS of plant status

EXPECTED OPERATOR ACTIONS

EVENT: 6

BRIEF DESCRIPTION: A steam generator has an unisolable fault / rupture. Procedure 3-EOP-E-2 is executed, the steam generator is isolated, and transition made to 3-EOP-E-3. Since affected S/G pressure is < 390 psig, the crew transitions to 3-EOP-ECA-3.1 and commences a controlled RCS cooldown.

INDICATIONS:
1. Ruptured/faulted S/G depressurizing or at stable low pressure due to influx of RCS liquid
2. Steam flow indicated on the ruptured/faulted S/G

CREW CRITICAL STEPS:
1. **Isolate feedwater flow into the ruptured S/G before transitioning to 3-EOP-ECA-3.1.**
2. **Cooldown RCS at highest rate achievable but less than 100°F/hr in all RCS cold legs.**

POSITION	EXPECTED ACTIONS

BOP

1. **Performs actions of 3-EOP-E-2 as directed**
   a. Checks MSIV and bypass on faulted S/G closed
   b. Checks if any S/G not faulted
   c. Identifies faulted S/G (3A)
   d. **Isolates faulted S/G**
      1) **Isolates main feed & AFW**
      2) Verifies SI reset & steam to AFW trains 1&2
      3) **Sends ANPO/NPO/NWE to open bkr 4D01-28 & locally close MOV-3-1403**
      4) Verifies CV-3-1606 closed
      5) Verifies blowdown & sample line isolation
   e. Checks CST level
   f. **Performs SGTR diagnostic**
2. **Performs actions of 3-EOP-E-3 as directed**
   a. Verifies fault/rupt S/G identified (3A)
   b. Verifies CV-3-1606 control set @ 1060 psig & closed < 1060 psig
   c. Leaves 3A S/G feed isolated unless req'd for c/d
   d. Verifies MOV-3-1403 deenergized & closed (E-2)
   e. Isolates misc flowpaths from 3A S/G
   f. Verifies 3A S/G MSIV & bypass closed (event 6)
   g. Checks 3B & 3C S/Gs not faulted
   h. Maintains 3B & 3C S/G levels 15[32]% - 50%
   i. Verifies all 4kV buses on offsite power
   j. Verifies 3A S/G isolated from 3B & 3C S/Gs
   k. **Checks 3A S/G press > 390 psig - NO - (requires transition to 3-EOP-ECA-3.1)**

EXPECTED OPERATOR ACTIONS (cont'd)

EVENT: 6 (cont'd)

POSITION	EXPECTED ACTIONS
BOP (cont'd)	**3. Performs actions of 3-EOP-ECA-3.1 as directed** a. Verifies all 4kV buses on offsite power b. Checks 3A S/G level > 20[32]% c. Directs local verification of Aux. Bldg. radiation shield door closure d. Provides requested inputs for plant status eval e. Checks 3B & 3C S/Gs not faulted f. Maintains 3B & 3C S/G levels 15[32]%-50% **g. Commences <100°F/hr c/d using 3B & 3C S/Gs** 4. Informs ANPS of plant status
RCO	**1. Performs actions of 3-EOP-E-3 as directed** **a. Checks if RCPs should be stopped (step 1 or foldout page item at ANPS direction)** b. Verifies MOV-3-1427 B/D sample valves closed c. Checks PORVs and block valves e. Verifies SI reset & resets Phase A/B isolation f. Verifies instrument air to containment g. Checks if RHR pumps should be stopped **2. Performs actions of 3-EOP-ECA-3.1 as directed** a. Repeats SI/ϕA/ϕB reset & IA to cnmt verification b. Verifies PZR backup group heater lockouts reset c. Checks if Cont. Spray (never actuated) & RHR pumps (stopped previously) should be stopped d. Provides requested inputs for plant status eval e. Establishes maximum charging flow **f. Coordinates with BOP to establish <100°F/hr c/d** 3. Informs ANPS of plant status
ANPS	**1. Directs performance of 3-EOP-E-2** **a. Verifies faulted SG isolated** **1) Directs main feed & AFW isolation** **2) Verifies local MOV-3-1403 depower & closure** **b. Transitions to 3-EOP-E-3 or appropriate FRP** **2. Directs fault/rupture S/G response per 3-EOP-E-3** **a. Monitors foldout page items including direction to RCO to stop all RCPs if subcooling lost** **b. Transitions to 3-EOP-ECA-3.1 or appropriate FRP** **3. Directs fault/rupture S/G response per 3-EOP-ECA-3.1** **a. Coordinates establishment of a <100°F/hr c/d** **4. Classifies event as an ALERT per 0-EPIP-20101** 5. Informs NPS of plant status

SIMULATOR INSTRUCTOR FACILITY OPERATING INSTRUCTIONS

I. **SETUP**

A. Reset to IC-26,

B. Load scenario 55

C. Following switch check, unfreeze the simulator and realign plant equipment as necessary such that condenser steam dumps are in steam pressure control with LT-3-498 & A AFW pump are out of service. Place MIMS in service.

D. Perform the following
1. Realign C AFW pump to train 1 & isolate A AFW pump (parameter controller composite trigger AFW OOS).
2. Place condenser steam dump control selector switch to MANUAL.
3. Take LT-3-498 out of service as follows:
   a. Ensure 3C S/G level control inputs are selected to LT-3-496.
   b. Fail LT-3-498 (touch SYS MAT->STEAM GENERATOR & MAIN STEAM->STEAM GENERATOR->L-495->LT-498-> TRANSMITTER LOSS OF POWER->set TFF1MACP=T).
4. Insert FCV-3-6278A auto close failure. Touch SYS MAT ->STEAM GENERATOR & MAIN STEAM->STEAM GENERATOR BLOWDOWN->FCV-6278A->FAIL AS IS->set TFSWV8AA=T and then =F conditional on IAS278A LT 0.08.
5. Fail IR high flux bistable as is. Touch SYS MAT-> REACTOR->INCORE/EXCORE DETECTORS->NIS BISTABLES-> REACTOR TRIP B/S N35->ALM #1 RLY FAIL AS IS-> TFN16AA=T.

E. Delete all conditional events from Parameter Controller Event Summary **except** those indicated on the Parameter Controller Event Summary pages in this exercise guide. Direct events may deleted at instructor discretion. Delete MOV-1404 & MOV-1405 items from parameter controller composite AFW STM.

F. Place turnover sheet on RCO desk.

G. Clearance information tags-A AFW pump.

H. Information tags-Steam Dump Control Mode Selector Switch to MANUAL; brown dot on LT-3-498.

II. **CONDUCTING THE EXAMINATION:**

A. Unfreeze the simulator and begin the exam.

SIMULATOR INSTRUCTOR FACILITY OPERATING INSTRUCTIONS (cont'd)

B. **R-3-19 Fails High/FCV-3-6278A Auto Close Failure (event 1)**

1. **Initiation:** Shortly after turnover, actuate R-3-19 failure high (touch SYS MAT->STEAM GENERATOR & MAIN STEAM->STEAM GENERATOR BLOWDOWN-> R ->RAD TRANSMITTER FAIL HI->TFCMM2H4=T). FCV-3-6278A auto close failure is part of the scenario setup.

2. **Response:** Respond as Chemistry/NPO when directed to verify cold lab sample sink S/G sample flow stopped. Wait 2-4 minutes and report that sample flow has stopped. When asked as Chemistry/HP to verify the R-3-19 alarm: 1)respond as Chemistry that S/G sampling will begin (per NCAP-104) and gross activity checks on the samples taken before more detailed analysis is performed and 2) respond as HP that techs will be dispatched to perform SJAE & secondary piping surveys. After 8-10 minutes reply as Chemistry & HP that preliminary indication show no signs of radioactivity. Respond as NPS, NWE or I&C to notification of R-3-19 and FCV-3-6278A failures. As NPS/NWE state that work requests will be generated and I&C will be notified of the failure. As I&C, reply that a planner will initiate work packages for troubleshooting & repair.

C. **3A Steam Generator Tube Leak (event 2).**

1. **Initiation:** After completion of 3-ONOP-067, actuate the 10 gpm steam generator tube leak (touch SYS MAT->STEAM GENERATOR & MAIN STEAM->STEAM GENERATOR->SG A leak node from RCS HYD->S/G TUBE RUPTURE->TVHHSGA=0.01/1:00 ramp). R-3-15 will go into alarm shortly thereafter requiring crew response. When the decision to shutdown is made, increase leak rate to 60 gpm over 5 minutes by setting TVHHSGA=0.06/5:00 ramp then =0.50 conditional on L2:CRXAO for events 5 & 6.

2. **Response:** When asked as Chemistry/HP to verify the R-3-15 alarm: 1)respond as Chemistry that S/G will be resampled for gross activity check & tube leak rate determination and 2) respond as HP that additional surveys of SJAE & secondary piping will be performed. After 5-7 minutes, as HP report that activity has been detected in the vicinity of the SJAE discharge and the surrounding turbine deck area will be posted as a Contamination Area. Request a PA announcement that unnecessary personnel should stand clear of the area. After 10-12 minutes, report as Chemistry that activity has been detected on the 3A S/G sample and a leak rate determination has begun.

SIMULATOR INSTRUCTOR FACILITY OPERATING INSTRUCTIONS (cont'd)

C. **3A Steam Generator Tube Leak (event 2 cont'd).**

2. **Response (cont'd):** Acknowledge as the field operator when directed to deenergize & close MOV-3-1403. After 1-3 minutes, open breaker 4D01-28 and locally close the MOV (parameter controller composite trigger AFW STM modified per setup),then 3-5 minutes afterwards, report completion to the crew.
Acknowledge load dispatcher/plant management notifications of the required load reduction.

D. **Power Reduction from 35% (event 3).**

1. **Initiation:** This is done by the crew in response to event 2.

2. **Response:** S/G tube leak response and initiation of load reduction is covered in event 2. Acknowledge notification as Chemistry of the need to sample the RCS in response to a 15% power change. Respond as field operator in response to notification of stopping secondary pumps and if requested to manually control gland seal steam pressure. If asked, respond as NPO that a copy of 3-OSP-089 has been obtained.

E. **IR N35 Hi Flux Trip Bistable Fails to Reset (event 4).**

1. **Initiation:** Part of scenario setup. Should be seen by operators as power goes below 15%.

2. **Response:** Respond as NPS, NWE or I&C to notification of IR N35 hi flux trip bistable reset failure. As NPS/NWE state that a work request will be generated and I&C will be notified of the failure. As I&C, reply that a planner will intiate a work package for troubleshooting & repair.
Acknowledge notification as NPS/system dispatcher that the load reduction is on hold until the failed trip is bypassed.

F. **3A Steam Generator Tube Rupture (event 5)**

1. **Initiation:** When the reactor is tripped, the 3A S/G tube rupture actuates (set up in event 2). As soon as the prompt actions of 3-EOP-E-0 are complete, actuate the failure open of RV-3-1402 by touching SYS MAT->STEAM GENERATOR & MAIN STEAM-> MAIN STEAM->RV-3-1402->LEAK BY->set TVSVV43D=1.0/2:00 ramp->RV-3-1402->FAIL OPEN->set TVSVV43A=T/2:00 delay.

SIMULATOR INSTRUCTOR FACILITY OPERATING INSTRUCTIONS (cont'd)

F. **3A Steam Generator Tube Rupture (event 5 cont'd)**

2. **Response:** Respond as SNPO to place PAHMs in service per 3-OP-094 (parameter controller trigger composite "PAHM"). After approximately 15 minutes inform the crew that PAHM is aligned. Respond as NPO to place unloaded EDGs in standby per 3-OP-023. Acknowledge any notifications to Chemistry/HP/NPS that the S/G tube leak has escalated into a tube rupture.
When directed to investigate the steam leak, after 1-3 minutes tell the crew that a 3A S/G safety appears to have failed open and HP has roped off the unit 3 main steam platform and turbine deck downwind of it.

G. **RV-3-1402 Fails Open (3A S/G Faulted/Ruptured) (event 6)**

1. **Initiation:** See event 5.

2. **Response:** See event 2 instructions to deenergize/close MOV-3-1403 if not already done. For this and other local field operations in the contaminated area, ask the crew if it is absolutely necessary (ALARA concerns). If the crew persists in their request, slow the response to allow taking appropriate HP precautionary measures (dressout, surveys, HP support, decontamination, etc.). If asked as NPO to align auxiliary steam from unit 4, remind the crew that unit 4 is in mode 5. If directed to align steam from unit 1, wait 5 minutes then tell the crew that valve 3-10-060 is stuck closed. All responses should be consistent with event 5.
In ECA-3.1, the SNPO will be asked to reset the group 3A backup PZR heater lockout relay. After 2-4 minutes, touch SYS MAT-> REACTOR COOLANT SYSTEM->PRESSURIZER->P444->386PH->RESET-> TCH2LRES=T and report completion to the crew. Later, the SNPO will be asked to locally verify radiation shield doors for the Containment Spray Pump & Charging Pump Rooms closed. Call back after 2-4 minutes reporting that the doors are closed. Then, HP will be asked to survey electrical penetration and pipe & valve rooms. Report 10-15 minutes later that initial surveys of those areas show nothing abnormal. Verification that PAHMS is in service may be asked for if the completion report from event 6 hasn't been made yet. PAHMS should be in service by now. As Chemistry, acknowledge the request to place PASS in service.

III. **TERMINATION CRITERIA:**

A. Upon establishment of RCS cooldown (step 14 of 3-EOP-ECA-3.1), <u>OR</u>

B. At the discretion of the evaluator.

PARAMETER CONTROLLER FILE:

COM-POS-ITE	CDB LABEL	VALUE	CONDITIONAL	TIME DELAY	RAMP	DESCRIPTION
Y	**AFW STM**	-	-	-	-	**Deenergize & close MOV-3-1403**
-	TFFXC03	T	-	0:30	-	Fails MOV-3-1403 closed
-	TCF5MB28	F	-	-	-	Opens breaker 4D01-28
Y	**PAHM**	-	-	-	-	**Places PAHM in service**
-	TAC2V02A	1.0	-	-	0:30	Opens PAHM-002A
-	TAC2V02B	1.0	-	-	0:30	Opens PAHM-002B
-	TAAAV21	1.0	-	-	0:45	Opens HV-1
-	TAAAV22	1.0	-	-	0:45	Opens HV-3
Y	**AFW OOS**	-	-	-	-	**Takes A AFW pump OOS; aligns C AFW pump to train 1**
-	TFFXCGVA	T	-	-	-	Fails A AFW pump governor valve closed
-	TFFXCTTA	T	-	-	-	Fails A AFW pump T&T valve (MOV-6459A) closed
-	TAFK142	0.0	-	-	-	Closes A AFW pump train 1 dischg valve (3-142)
-	TAFK342	1.0	-	-	-	Opens C AFW pump train 2 dischg valve (3-342)
-	TAFK003	0.0	-	-	-	Closes C AFW pump train 2 dischg valve (AFPD-003)
-	TAFF01C	0.0	-	-	-	Closes C AFW pump train 2 steam supply (AFSS-001C)
-	TAFF3082	0.0	-	-	-	Closes A AFW pump train 1 steam supply (3-082A)
-	TAFF3086	1.0	-	-	-	Opens C AFW pump train 1 steam supply (3-086A)
-	TAFF4086	1.0	-	-	-	Opens C AFW pump U4 train 1 steam supply (4-086A)

EVALUATION SCENARIO REFERENCES

Reference List:

PROCEDURE #	PROCEDURE TITLE
3-GOP-103	Power Operation to Hot Standby
3-OP-094	Containment Post-Accident Monitoring
3-ARP-097.CR	Control Room Annunciator Response
3-ONOP-049.1	Deviation or Failure of Safety Related or Reactor Protection Channels
3-ONOP-059.7	Intermediate Range Nuclear Instrumentation Malfunction
3-ONOP-067	Radioactive Effluent Release
3-EOP-E-0	Reactor Trip or Safety Injection
3-EOP-E-2	Faulted Steam Generator Isolation
3-EOP-E-3	Steam Generator Tube Rupture
3-EOP-ECA-3.1	SGTR with Loss of Reactor Coolant - Subcooled Recovery Desired
0-EPIP-20101	Duties of the Emergency Coordinator
	PTN Technical Specifications
	Plant Curve Book

EVALUATION SCENARIO CONTENT SUMMARY

1.	Total Number of Malfunctions:	6
2.	Malfunctions Occurring During EOP Performance:	1
	1. RV-3-1402 fails open (faulted/ruptured S/G)	
3.	Abnormal Events:	3
	1. R-3-19 fails high 2. FCV-3-6278A fails to automatically close 3. IR high flux bistable does not reset	
4.	Major Transients:	2
	1. Main turbine high vibration / reactor trip 2. 3C S/G Steam Generator tube leak / rupture	
5.	EOPs Used:	2
6.	EOP Contingencies Entered:	1
7.	Simulator Run Time:	90 minutes
8.	EOP Run Time:	45 minutes
9.	Crew Critical Tasks:	2

Facility: Turkey Point Nuclear Plant **Scenario No.:** 3 **Op-Test No.:** PTN Group XVIII

Examiners: _____ **Operators:** _____

Objectives: To evaluate the applicants' ability to reduce load from 100% power per normal plant procedure. Evaluate ability of operators to recognize & respond to failure of PT-3-145 low causing PCV-3-145 to fail closed, failure of the controlling 3B S/G feed flow channel low and a sequential failure of both main feed pumps. Emergency Operating Procedure use will be evaluated for a failure of the reactor to automatically trip followed by a S/G tube rupture with complications during RCS depressurization.

Initial Conditions: 100% power, BOL

Turnover: Power reduction from 100% power is required to comply with T.S. 3.7.1.1 due to 3C S/G RV-3-1412 being declared OOS following review of testing documentation from the recent refueling outage. 3B EDG is OOS for corrective maintenance on the governor. FT-3-476 is OOS for calibration. Shift orders are to reduce power from 100% to 50% to comply with Technical Specifications for RV-3-1412 OOS.

Event No.	Malf. No.	Event Type*	Event Description
1	N/A	N (SRO/BOP) R (RO)	Reduce power from 100%. K/A 2.1.23 (3.9/4.0)
2	TFB1L5 = T TFB1PCH5=T	I (SRO) I (RO)	Letdown PT-3-145 fails low causing PCV-3-145 to fail closed. K/A 004A2.07 (3.4/3.7)
3	TFF1M86L=T	I (SRO) I (BOP)	FT-3-486 (controlling 3B S/G feed flow channel) fails low resulting in need for manual control of associated FRV. K/A 035A2.04 (3.6/3.8)
4	TVFABP1A= 1.0 2 min ramp TFFVP1B=T	C (ALL)	Sequential loss of both main feed pumps. K/A 054AA2.02 (4.1/4.4)
5	TFL2XASE=T TFL2XBSE=T TFL4AF=T	M (ALL)	Loss of main feed with failure of reactor to automatically trip. K/A 029EA1.14 (4.2/3.9)
6	TVHHSGC= 0.35 30sec ramp	M (ALL)	Steam Generator Tube Rupture. K/A 038 EA2.02 (4.5/4.8)
7	TFHV55CO=T & TFH244GH=T or TFHV456O=T / TFHV55AO=T	C (SRO) C (RO)	Normal spray valve / PZR PORV sticks open during RCS depressurization. K/A 038EA1.04 (4.3/4.1) cannot take credit for

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

FLORIDA POWER AND LIGHT

TURKEY POINT NUCLEAR POWER PLANT

GROUP XVIII RO/SRO NRC INITIAL LICENSE EXAM

SIMULATOR EVALUATION SCENARIO EXERCISE GUIDE

PROGRAM:	RO/SRO Initial License Training
EXERCISE GUIDE:	XVIII NRC 3
DESCRIPTION:	Loss of Main Feedwater / Steam Generator Tube Rupture
LENGTH:	90 minutes
AUTHOR:	G. M. Blinde
REVISION DATE:	05/05/99

REVIEWED BY: Bretton 6-11-99
Facility Reviewer Date

APPROVED BY: _____
NRC Chief Examiner Date

EVALUATION SCENARIO OBJECTIVES

TERMINAL OBJECTIVE: During normal and abnormal plant conditions, the Shift Operating Crew will perform control room operations in accordance with (IAW) approved plant procedures ensuring that the health and safety of the public is protected and the integrity of the plant maintained.

ENABLING OBJECTIVES:

1. Given specific plant conditions, plant procedures, and a shift turnover, respond to the following events IAW approved plant procedures:
   a. Power reduction from 100%
   b. PT-3-145 failure low (loss of letdown)
   c. FT-3-486 failure low (manual FRV control)
   d. Loss of main feed
   e. Reactor trip failure
   f. Steam generator tube rupture
   g. RCS cooldown & loss of depressurization control

2. Given abnormal plant conditions, mitigate the adverse consequences of the following events IAW approved plant procedures:
   a. Identify abnormalities while assessing actual system response with respect to predicted system response.
   b. Investigate the cause and effect of abnormalities in system performance.
   c. Implement applicable procedures.
   d. Perform immediate actions from memory.

3. Given abnormal plant conditions, implement the applicable on-site and off-site reports and notifications IAW approved plant procedures.

4. Given normal and abnormal plant conditions, using the following principles for operational effectiveness as they apply to all operators, conduct plant operations IAW approved plant procedures:
   a. Plant and control room communication.
   b. Plant/Control Board monitoring.
   c. Plant/Control Board manipulation.
   d. Operational problem solving.
   e. Use of OPs/ONOPs and Technical Specifications.
   f. Use of EOPs IAW EOP Rules of Usage.
   g. Annunciator recognition and response.
   h. Written communications/logs.
   i. ALARA awareness.

EVALUATION SCENARIO OBJECTIVES (cont'd)

5. Given normal and abnormal plant conditions, using the following principles for operational effectiveness as they apply to the Assistant Nuclear Plant Supervisor (ANPS), conduct plant operations IAW approved plant procedures:

   a. Team performance management.
   b. Problem solving.
   c. Decision analysis.
   d. Action planning.
   e. Self-checking.

6. During abnormal and emergency events, the shift operating crew shall apply techniques of teamwork and self-checking IAW established work practices and operating guidelines.

EVALUATION SCENARIO DESCRIPTION

Initial Conditions: Mode 1, 574 degrees F

Turnover: Power reduction from 100% to 50% power is required due to 3C S/G safety valve RV-3-1412 declared OOS (per T.S. 3.7.1.1) due to errors found during review of testing documentation from the recent refueling outage. 3B EDG is OOS for corrective governor maintenance. FT-3-476 is OOS for calibration. No surveillance tests are in progress.

Synopsis: After a 5% power reduction (or at lead examiner direction) PT-3-145 fails low causing letdown PCV-3-145 to automatically close. Operators respond per 3-ARP-097.CR for annunciators A-5/5 & 6. After discovering PCV-3-145 is failed closed, the crew locally controls letdown pressure using bypass valve 3-309C. Following restoration of CVCS letdown, FT-3-486 fails low. The crew must take manual control of 3B S/G feed flow. Once the plant is stabilized, 3B S/G level control returned to automatic, Technical Specifications consulted and the crew briefed on the effects of the failure, a sequential loss of both main feed pumps occurs. The crew responds per 3-EOP-E-0 and addresses a failure of the reactor to automatically trip. Transition to 3-EOP-FR-S.1 is made in response to the failure of reactor trip breakers to open either automatically or manually. Since AMSAC does not actuate, the reactor trips when the MG set input & output breakers are locally opened. In response to the trip, a tube ruptures on the 3C S/G. After finishing 3-EOP-FR-S.1 (during which an SI occurs due to the SGTR), the crew transitions to 3-EOP-E-0 and then to 3-EOP-E-3. Once the RCS depressurization has begun using a normal spray/PZR PORV, the opened valve sticks open. This requires tripping the running RCP for normal spray or closure of the PORV block valve if a PZR PORV was used to avoid entry into 3-EOP-ECA-3.1. The exercise is concluded upon establishment of increasing RCS pressure (3-EOP-E-3 step 26) or at the evaluator's discretion. The event is classified after scenario completion as an alert per 0-EPIP-20101, Enclosure 1, category 2.

Event summary:

EVENT #	DESCRIPTION
1	Power reduction from 100%
2	PT-3-145 fails low (PCV-3-145 fails closed)
3	FT-3-486 fails low (manual FRV control)
4	Sequential loss of both feed pumps
5	Loss of main feed / reactor fails to trip
6	Steam generator tube rupture
7	RCS cooldown & loss of depressurization control

Crew Critical Steps:

EVENT #	DESCRIPTION
5	1. Insert negative reactivity into the core by one of the following methods prior to completing 3-EOP-FR-S.1 step 4: de-energizing CRDM MG sets, inserting RCCAs, or establishing emergency boration flow.
7	1. Isolate feedwater flow into and steam flow out of a ruptured S/G prior to transitioning to 3-EOP-ECA-3.1. 2. Perform 3-EOP-E-3 cooldown and maintain temperature to meet following criteria: temperature is not too high to maintain required subcooling nor causes a severe challenge to subcriticality CSF.

Individual Critical Steps:

The bolded individual actions listed under the respective positions (RCO, ANPS, etc.) are for use during evaluations to identify steps that are critical to the individual position.

EVALUATION SCENARIO PRE-EXERCISE BRIEFING

1. **Review the following with students:**
   a. Primary responsibility of the student is to operate the simulator as if it were the actual plant.
   b. The evaluators will observe teamwork skills, communication, and the crew's ability to safely operate the plant during the simulator examination. This includes individual & crew performance.
   c. If you recognize an incorrect decision, response, answer, analysis, action, or interpretation by another crew member but fail to correct it, then the evaluator may assume that you agree with the incorrect item.
   d. The crew should keep a rough log during each scenario sufficient to complete necessary formal log entries.
   e. The simulator instructor facility operator will perform all of the functions of personnel needed outside the control room area.
   f. Before the examination begins, crew members may perform a control board walkdown for up to 10 minutes.
2. **The following are initial conditions for this exam** (in shift turnover package, but may be covered verbally if needed):
   a. Time in core life - BOL
   b. Reactor power and power history - 100% steady state
   c. Turbine status - online
   d. Boron concentration - 1298 ppm
   e. Temperature - 574 degrees F
   f. Pressure - 2235 psig
   g. Xenon - Equilibrium for 100% power.
   h. Core cooling - forced
   i. Tech. Spec. LCO(s) in effect
      - 3.3.1 Action 6 (bistables tripped); FT-3-476 OOS for cal
      - 3.7.1.1 Action b (4 hrs); RV-3-1412 OOS (3C S/G safety)
      - 3.8.1.1 Action b (72 hrs); 3B EDG OOS (governor)
   j. Clearances in effect - 3B EDG
   k. Significant problems/abnormalities - Power reduction required for RV-3-1412 OOS.
   l. Evolutions/maintenance for the coming shift - Reduce power from 100% down to 50% this shift.
   m. Units 1 and 2 status - unit 1 online; unit 2 s/d
   n. Unit 4 status - mode 1; 100% power
3. **Ensure students understand examination schedule** and that a break will be necessary between scenarios to allow simulator initial condition setup. **Cover exam security rules** to be observed by students both during and after the exam IAW the latest revision of AG-017 or NUREG-1021 as applicable.
4. **Before the examination begins, make crew position assignments and allow students to ask any questions concerning the administration of the test.**

EXPECTED OPERATOR ACTIONS

EVENT: 1

BRIEF DESCRIPTION: With reactor power initially at 100% power, a power reduction to comply with Tech Specs for an inoperable S/G safety valve.

INDICATIONS: 1. Shift turnover

POSITION	EXPECTED ACTIONS
BOP	1. Reduces turbine load IAW 3-GOP-103 a. Maintains Tref within 3°F of Tavg if rods in manual (1°F if rods in auto) b. Monitors gland seal steam pressure & directs local adjustment of supply/spillover as needed 2. Performs secondary plant shutdown generator-load-dependent activities IAW 3-GOP-103 3. Performs activities as directed by ANPS a. Inhibits MIMS if in service b. Notifies Chemistry of need to sample RCS if reactor power reduced > 15% 4. Keeps ANPS informed of plant status
RCO	1. Reduces reactor power IAW 3-GOP-103 a. Calculates reactivity addition needed for power reduction b. Borates at rate directed by ANPS c. Energizes PZR backup heaters d. Coordinates with BOP to maintain Tref within 3°F of Tavg if rods in manual (1°F if rods in auto) e. Observes AFD limitations f. Starts additional charging pump 2. Keeps ANPS informed of plant status
ANPS	1. Coordinates power reduction activities of RCO & BOP 2. Performs other activities IAW 3-GOP-103 a. Evaluates Xe changes and directs boration rate changes as necessary 3. Keeps NPS informed of plant status

EXPECTED OPERATOR ACTIONS

EVENT: 2

BRIEF DESCRIPTION: PT-3-145 fails low, causing PCV-3-145 to fail closed. Operators note the lifting of the letdown relief, and unsuccessfully attempt to take manual control of PCV-3-145 to open the valve. It must be bypassed locally to restore letdown.

INDICATIONS:

1. Annunciator A-5/5, CVCS HP LTDN LINE HI FLOW/ PRESS
2. Annunciator A-5/6, CVCS LP LTDN LINE RELIEF HI TEMP
3. PI-3-145 reading high
4. TE-3-141, RV-3-203 tailpipe temperature high (RV-3-203 relief flow to PRT)

POSITION	EXPECTED ACTIONS
BOP	1. Assists RCO as directed by the ANPS
RCO	1. Notes failure closed of PCV-3-145
	2. Attempts to manually open PCV-3-145
	3. Directs operator to investigate PCV-3-145 locally
	4. Closes all letdown orifices
	5. Directs operator to open 3-309C (PCV-3-145 bypass) to restore letdown flowpath
	6. Verifies TI-3-141 not increasing
	7. Directs operator to locally close 3-309A to isolate PCV-3-145
	8. Re-opens letdown orifices while throttling 3-309C to restore letdown flow
	9. Verifies TI-3-141 decreasing and FI-3-150 stable
ANPS	1. Directs recovery of letdown per 3-ARP-097.CR a. Annunciators A-5/5 & A-5/6
	2. Notifies other support groups (I&C, Maintenance, etc.) of PCV-3-145 failure
	3. Maintains NPS informed regarding plant status

EXPECTED OPERATOR ACTIONS

EVENT: 3

BRIEF DESCRIPTION: A SG feedwater flow transmitter FT-3-486 (the controlling channel) fails low. The feed reg valve for 3B S/G requires manual intervention to maintain stable plant conditions. The channel is called OOS and compensatory actions are initiated per 3-ONOP-049.1.

INDICATIONS:
1. Annunciator C-5/2, SG B STEAM > FEED
2. Annunciator C-6/2, SG B LEVEL DEVIATION
3. FI-3-486 fails low flow

POSITION	EXPECTED ACTIONS
BOP	1. Recognizes failure of FT-3-486 and responds as directed by ANPS a. Compares to other SG FT's b. Verifies no off-normal conditions on other SG PT's/FT's 2. Notifies ANPS of failure **3. Takes manual control of FCV-3-488** **a. Restores balanced steam/feed flow** **b. Stabilizes SG level**
RCO	NONE
ANPS	1. Directs stabilization of plant conditions 2. Directs compensatory action per 3-ONOP-049.1 a. Verifies RCO determination of SG FT/PT status b. Determines which bistables to trip and effects on plant of tripping bistables. Provides this info to RCO/BOP for guidance. 3. Notifies NPS of plant status 4. Ensures Technical Specification requirements are met 5. Notifies I&C of FT-3-486 failure and directs initiation of PWO.

EXPECTED OPERATOR ACTIONS

EVENT: 4

BRIEF DESCRIPTION: 3A S/G Feed Pump trips/is tripped on bearing failure and a runback occurs. The operators respond to the turbine runback. During the runback, a shaft shear occurs on the 3B S/G Feed Pump. A loss of all feed flow occurs resulting in conditions requiring a reactor trip.

INDICATIONS:

1. Annunciator D-6/1, SGFP A/B MOTOR OVERLOAD TRIP
2. Annunciator D-5/4, SGFP A MOTOR BRG HI TEMP
3. Runback in progress (MW decreasing, etc.)
4. Annunciators C-5/1(2)(3), SG A(B)(C) STEAM > FEED
5. Annunciators C-6/1(2)(3), SG A(B)(C) LEVEL DEVIATION
6. Annunciators C-1/1(2)(3), SG A(B)(C) NARROW RANGE LO/LO-LO LEVEL
7. Annunciators C-1/4(5)(6), SG A(B)(C) LO-LO LEVEL TRIP
8. Annunciators C-5/4(5)(6), SG A(B)(C) LO LEVEL W/ STEAM>FEED TRIP
9. Annunciators D-5(6)/2, SGFP A(B) LO FLOW
10. Low current indicated on the 3B SGFP ammeter
11. Reduced feed flow after 3A SGFP trip. Zero feed flow indicated after 3B SGFP shaft shear.

POSITION	EXPECTED ACTIONS
BOP	1. Recognizes 3A SGFP problem and informs ANPS 2. Informs ANPS of 3A SGFP trip & turbine runback 3. Verifies runback automatic actions & secondary parameter status 4. Notes loss of feed water flow and lo amps on 3B SGFP 5. Recommends reactor trip
RCO	1. Assists BOP as directed by ANPS 2. Verifies runback automatic actions 3. Verifies primary parameters stable
ANPS	1. Coordinates and directs response per 3-ARP-097.CR and 3-ONOP-089 2. Notifies System and Duty Call Supervisor of situation 3. Informs NPS of status of plant 4. Directs troubleshooting effort on SGFPs as time permits 5. When advised of loss of 3B SGFP, directs reactor trip

EXPECTED OPERATOR ACTIONS

EVENT: 5

BRIEF DESCRIPTION: Normal feed is lost inducing a reactor trip signal. Automatic and manual reactor trips fail and actions are taken IAW FR-S.1. AMSAC fails to actuate and local breaker operation is required to trip the reactor. A S/G tube rupture has occurred or is occurring.

CREW CRITICAL STEPS: **1. Insert negative reactivity into the core by one of the following methods prior to completing 3-EOP-FR-S.1 step 4: de-energizing CRDM MG sets, inserting RCCAs, or establishing emergency boration flow.**

INDICATIONS:
1. Loss of normal feedwater
2. S/G levels/feed flows decrease rapidly
3. Reactor trip directed or actuates
4. RTBs fail to open & breaker indication goes out

POSITION	EXPECTED ACTIONS
BOP	1. Recognizes loss of normal feedwater **2. Responds to reactor trip failure per 3-EOP-FR-S.1** a. Verifies turbine trip b. Checks AFW pumps-all running **c. Assists RCO with control rod insertion & notification for NPO local RTB & MG set trip** d. Checks if turbine/generator trips have occurred e. Checks S/G levels f. Checks for uncontrolled RCS cooldown g. Verifies 3-EOP-E-0 IOAs if auto SI & Rx subcrit. 3. Informs ANPS of plant status
RCO	1. Attempts manual reactor trip **2. Responds to reactor trip failure per 3-EOP-FR-S.1** **a. Verifies reactor trip - NO - inserts control rods (BOP assists as necessary)** **b. Initiates emergency boration (if SI actuated, must reset SI for emergency boration flow)** c. Verifies RCS pressure < 2335 psig d. Verifies Containment ventilation isolated e. Checks if reactor trip has occurred - NO f. Verifies dilution paths isolated g. Verifies CETC<1200°F & reactor subcritical h. Performs BOP actions during E-0 IOA verification 3. Informs ANPS of plant status a. Identifies/reports AMSAC failure.

EXPECTED OPERATOR ACTIONS (cont'd)

EVENT: 5 (cont'd)

POSITION	**EXPECTED ACTIONS**
ANPS	1. Directs response to loss of normal feedwater/ATWS **2. Directs response to ATWS per 3-EOP-FR-S.1** **a. Ensures RCPs not tripped until reactor subcritical (even if CNMT phase B isolation)** **b. Ensures NPO notified to perform local reactor trip actions** **3. Returns to procedure and step in effect (3-EOP-E-0) or transitions to FRP if appropriate** **4. Classifies event as an ALERT (unless higher category event exists) per 0-EPIP-20101** 5. Informs NPS of plant status a. Reports AMSAC failure to NPS and/or NWE/I&C.

EXPECTED OPERATOR ACTIONS

EVENT: 6

BRIEF DESCRIPTION: In response to a loss of main feed, a reactor trip has occurred. Additionally, a 3C S/G tube rupture occurs concurrent with the reactor trip requiring an SI. Operators perform actions of 3-EOP-E-0.

INDICATIONS:
1. Reactor trip/SI directed or actuates
2. Rod bottom lights on
2. RTBs and bypass breakers open
4. Safety injection annunciator(s)
5. Safeguards equipment automatically starts

CREW CRITICAL STEPS: SEE EVENT 7

POSITION	EXPECTED ACTIONS
BOP	**1. Responds to reactor trip per 3-EOP-E-0**
	a. Verifies turbine trip
	b. Verifies power to 3A/B/D 4kV buses
	c. Recognizes uncontrolled level increase in ruptured steam generator and isolates feed to it if level > 6%
	d. Verifies feedwater isolation
	e. Verifies AFW pumps running
	f. Verifies proper ICW operation
	g. Checks if main steamlines should be isolated
	h. Verifies all EDGs running
	i. Directs SNPO to place PAHMS in service
	j. Verifies proper AFW alignment and flow
	k. Checks RCS cold leg temperatures stable
	l. Performs MSLB & SGTR diagnostics
	2. Informs ANPS of plant status

EXPECTED OPERATOR ACTIONS (cont'd)

EVENT: 6 (cont'd)

POSITION	**EXPECTED ACTIONS**
RCO	1. **Responds to reactor trip per 3-EOP-E-0** a. Verifies reactor tripped b. Checks if SI actuated/required (auto SI) c. **Recognizes loss of subcooling and trips RCPs (if applicable)** d. Verifies containment isolation phase A e. Verifies SI pumps running f. Verifies proper CCW system operation g. Verifies containment cooling h. Verifies containment and control room ventilation isolation i. Verifies containment spray not required j. Verifies SI valve amber lights bright k. Resets & realigns SI l. Verifies SI flow m. Checks RCP seal cooling n. Checks RCP cooling o. Checks letdown/PORVs/spray valves closed 2. Notifies ANPS of safety injection and cause 3. Informs ANPS of plant status
ANPS	1. **Directs response to reactor trip per 3-EOP-E-0** a. Directs immediate actions b. **Monitors foldout page items** 1) **Direction to RCO to stop all RCPs if subcooling lost** 2) **Direction to BOP to isolate feed flow to ruptured S/G if level > 6%** c. Directs prompt actions d. Directs subsequent actions 2. **Transitions to appropriate plant procedure (3-EOP-E-3 or appropriate FRP)** 3. Informs NPS of plant status

EXPECTED OPERATOR ACTIONS

EVENT: 7

BRIEF DESCRIPTION: An S/G tube rupture has occurred. The ruptured S/G atm steam dump is adjusted to 1060 psig, the S/G is verified isolated, and the RCS is cooled down & depressurized. During depressurization, the method in use fails open requiring operator action.

INDICATIONS:
1. Local steam line and/or DAM-1 monitor readings abnormal
2. Uncontrolled level increase in ruptured S/G

CREW CRITICAL STEPS:
1. **Isolate feedwater flow into and steam flow out of a ruptured S/G prior to transitioning to 3-EOP-ECA-3.1.**
2. **Perform 3-EOP-E-3 cooldown and maintain temperature to meet following criteria: temperature is not too high to maintain required subcooling nor causes a severe challenge to subcriticality CSF.**

POSITION	EXPECTED ACTIONS
BOP	1. **Performs actions of 3-EOP-E-3**
	a. Identifies ruptured S/G (3C)
	b. **Controls ruptured S/G atmospheric steam dump. Verifies closed if S/G pressure < 1060 psig.**
	c. **Checks ruptured S/G level & isolates feed if >6%**
	d. **Isolates steam from ruptured S/G to AFW pumps. Realign as necessary for two trains of AFW**
	e. **Isolates misc flowpaths from ruptured S/G**
	f. **Closes ruptured S/G MSIV & bypass**
	g. Checks if S/Gs are not faulted
	h. Maintains intact S/G levels 15-50%
	i. Resets ctmt isol phase A & B
	k. Verifies all 4kV buses energized by offsite power
	l. **Verifies ruptured S/G isolated from intact S/Gs**
	m. Checks ruptured S/G pressure > 390 psig
	n. **Performs RCS cooldown**
	1. **Determines req'd CET temp for cooldown**
	2. **Dumps steam at max rate until RCS < req'd CET temp, then stops cooldown**
	o. Checks ruptured S/G pressure stable or increasing
	2. Informs ANPS of plant status

EXPECTED OPERATOR ACTIONS (cont'd)

EVENT: 7 (cont'd)

POSITION	**EXPECTED ACTIONS**
RCO	**1. Performs actions of 3-EOP-E-3** a. Checks if RCPs should be stopped **b. Verifies S/G B/D sample isolation valves closed** c. Checks PORVs and block valves d. Verifies SI reset e. Verifies instrument air to containment f. Checks if RHR pumps should be stopped g. Establishes max charging flow h. Checks RCS subcooling greater than 50°F [230°F] **i. Depressurizes RCS to minimize break flow and refill PZR** **1. Observes RCS subcooling & PZR level limits** 2. Manually closes normal spray/PORV when RCS < ruptured S/G pressure - NO **3. Manually trips RCP/closes PORV block valve** j. Checks RCS pressure increasing 2. Informs ANPS of plant status 3. Recognizes loss of subcooling and trips RCPs per 3-EOP-E-3 (if applicable)
ANPS	**1. Directs response to ruptured S/G per 3-EOP-E-3** a. Monitors foldout page items including direction to RCO to stop all RCPs if subcooling lost **b. Identifies & isolates ruptured S/G** **c. Cools & depressurizes RCS to minimize break flow** **d. Directs tripping RCP in response to normal spray valve failing open or closure of PORV block valve in response to PORV failing open** 2. Informs NPS of plant status

SIMULATOR INSTRUCTOR FACILITY OPERATING INSTRUCTIONS

I. **SETUP**

A. Reset to IC-11.

B. Load scenario 49.

C. Following switch check, unfreeze the simulator. Realign plant equipment to allow for FT-3-476 & 3B EDG out of service. Place MIMS in service.

D. Perform the following
1. Take 3B EDG OOS as follows: SYS MAT->STANDBY POWER & SYNC->EMERGENCY DIESEL LOGIC & PROT->3AB20->BREAKER POSITION->set TAQ5B20P=3->EMERGENCY DIESEL GENERATOR 3B->SELECTOR SWITCH 3B->set TAQ5LRSB=0
2. Take FT-3-476 OOS per 3-ONOP-049.1 as follows:
   a. In rack 24, trip bistables BS-3-478-A1/A2/D.
   b. Ensure 3A S/G level control inputs do not have FT-3-476 selected.
   c. Fail FT-3-476 low (touch SYS MAT->FEEDWATER->MAIN FEEDWATER MENU->FEEDWATER REGULATOR VALVES ->F-SG1->FT-476->FAIL LOW->set TFF1M76L=T).
3. Enter the following failures:
   a. Reactor trip & AMSAC failure (touch SYS MAT->REACTOR->ROD CONTROL ROD POSITION->ROD SPEED TO LOGIC CABINET->RXB->BREAKER FAILS AS IS->set TFL2XBSE=T->RXA->BREAKER FAILS AS IS->set TFL2XASE=T->SYS MAT->REACTOR->EAGLE 21/AMSAC->AMSAC->FAIL TO ACTUATE->set TFL4AF=T).

E. Delete all conditional events from Parameter Controller Event Summary **except** those indicated on the Parameter Controller Event Summary pages in this exercise guide. Direct events may deleted at instructor discretion.

F. Place turnover sheet on RCO desk.

G. Clearance information tags-Rack 24 (FT-3-476) and 3B EDG.

H. Information tags-None

II. **CONDUCTING THE EXAMINATION:**

A. Unfreeze the simulator and begin the exam.

SIMULATOR INSTRUCTOR FACILITY OPERATING INSTRUCTIONS (cont'd)

B. **Power reduction from 100% (event 1).**

1. **Initiation:** Crew should begin in response to shift turnover. If slow to begin, call as Operations Supervisor and prompt commencement of load reduction to 50% in one hour.

2. **Response:** Acknowledge load dispatcher/plant management notifications of the required load reduction. Respond as field operator in response to notification of starting/stopping plant equipment and, if asked, to manually control gland seal steam.

C. **PT-3-145 fails low (PCV-3-145 fails closed) (event 2).**

1. **Initiation:** After a 5% power change or at lead evaluator discretion, actuate the PT-3-145 failure (touch SYS MAT-> CHEMICAL VOLUME CONTROL SYSTEM->CVCS LETDOWN->P-145-> TRANSMITTER FAIL LOW->arm TFB1L5=T->RECALL->P-145->CONTROLLER FAIL HIGH->arm TFB1PCH5=T). Pressing MAST FAIL will cause PCV-3-145 to close and PC-145 to fail high.

2. **Response:** When asked as SNPO to investigate the PCV-3-145 failure, acknowledge the order, wait 2-4 minutes, then report the valve closed with no obvious malfunctions. If asked as I&C/Mechanical to investigate PT-3-145/PCV-3-145, say that a tech will be reassigned from a lower priority project and troubleshooting will begin as soon as possible thereafter. Provide no further progress towards fixing this failure.
When asked as SNPO to bypass PCV-3-145 using 3-309C, control valve position open/closed at crew direction using SYS MAT-> CHEMICAL VOLUME CONTROL SYSTEM->CVCS LETDOWN->PCV145->LEAK BY-> set TVBVLK06 as directed by the crew (0.1 per turn ordered). When asked to isolate PCV-3-145 using 3-309A, wait 2-4 minutes, then report completion to the crew.

D. **FT-3-486 fails low (manual FRV control) (event 3).**

1. **Initiation:** As soon as letdown is restored and CVCS parameters stabilized, actuate FT-3-486 failure low by touching SYS MAT->FEEDWATER->MAIN FEEDWATER MENU->FEEDWATER REGULATOR VALVES->F-SG2->FT486->FAIL LOW->set TFF1M86L=T. This failure requires manual operation of FCV-3-488 to restore 3B S/G level to program.

2. **Response:** Respond as NPS, NWE or I&C to notification of FT-3-486 failure. As NPS/NWE state that a work request will be generated and I&C will be notified of the failure. As I&C, reply that a planner will intiate a work package for troubleshooting & repair.

SIMULATOR INSTRUCTOR FACILITY OPERATING INSTRUCTIONS (cont'd)

E. **Sequential loss of both feed pumps (event 4).**

1. **Initiation:** Once the secondary plant is stabilized with FCV-3-478 manually controlling feed to 3A S/G, actuate the bearing failure on the 3A SGFP by touching SYS MAT->FEEDWATER->MAIN FEEDWATER MENU->SGFP'S->3P1A->BEARING WEAR->set TVFABP1A=1.0/ 2:00 ramp. With the runback in progress actuate the shaft shear on 3B SGFP by touching 3P1B->SHEARED SHAFT->set TFFVP1B=T.

2. **Response:** Respond as NPO/NWE if requested to investigate the SGFPs. After 2-4 minutes, report the 3A SGFP outboard pump bearing has failed and the shaft appears to be seized. For 3B SGFP report the shaft broke between the pump and the motor.
As Mechanical maintenance, acknowledge any requests for assistance with assurance that these failures will be investigated immediately. Acknowledge any reports to the NPS/ system dispatcher that Unit 3 is going off line.

F. **Loss of main feed / reactor fails to trip (event 5)**

1. **Initiation:** The loss of main feed is from event 4 and the reactor trip & AMSAC failures are part of the initial setup.

2. **Response:** When dispatched as field operator to locally open the RTBs/bypass RTBs/MG set breakers, wait until emergency boration has been established then touch SYS MAT->REACTOR->ROD CONTROL ROD POSITION->ROD SPEED TO LOGIC CABINET->3A->LOCAL CLOSE/TRIP(MECHANICAL)->set TCE6DQ7C=F->3B->LOCAL CLOSE/TRIP (MECHANICAL)->set TCE6DQ8C=F and insert the 3C S/G tube rupture using parameter controller direct trigger TVHHSGC=0.35 on a 30 sec ramp. Respond as SNPO when asked to verify dilution paths isolated. Wait 3-5 minutes and report dilution paths isolated.

G. **Steam Generator tube rupture (event 6)**

1. **Initiation:** See event 5.

2. **Response:** Respond as SNPO to place PAHMs in service per 3-OP-094 (parameter controller trigger composite "PAHM"). After 15-18 minutes inform the crew that PAHM is aligned. Respond as NPO to place unloaded EDGs in standby per 3-OP-023.
Respond if asked as Chemistry to sample S/Gs for activity and as HP for main steam line & SJAE surveys. After 8-10 minutes, report as HP detecting activity near the unit 3 SJAE and reading 3C main steam line radiation above background with parts of the turbine deck posted as contaminated. Request the crew warn plant personnel accordingly. Report as Chemistry that a quick check of the sample from 3C S/G shows activity.

SIMULATOR INSTRUCTOR FACILITY OPERATING INSTRUCTIONS (cont'd)

H. **PZR PORV fails open during RCS depressurization (event 7).**

1. **Initiation:** As a result of event 5, a 3C S/G tube rupture is in progress. Event 6 results in transition to 3-EOP-E-3. Arm the PZR spray valve PCV-3-455A failure open (touch SYS MAT-> REACTOR COOLANT SYSTEM->PRESSURIZER->PCV455A->FAIL OPEN->arm TFHV55AO=T->P444->PC444G->CONTROLLER FAIL HIGH->arm TFH244GH =T). Following RCS cooldown, depressurization is begun. If a PORV is opened, fail it that way by touching SYS MAT->REACTOR COOLANT SYSTEM->PRESSURIZER->PORV455C(456)->FAIL OPEN->set TFHV55CO(TFHV456O)=T. If an RCP is still running and normal spray valves are used, then fail PCV-3-455A (C loop) open by pressing MAST FAIL (also fails the associated controller to 100% calling RCO attention to the failure).

2. **Response:** When directed as NPO/NWE to realign 3B S/G steam supply to train 1, wait 3-5 minutes swap AFSS-3-006/7 positions using parameter controller composite trigger 006/007. Report to the crew when complete. If directed as NPO/NWE to deenergize and locally close MOV-3-1405, wait 3-5 minutes and do so using parameter controller composite trigger 1405ISO. This may be done immediately if MOV-3-1405 is closed from the console switch or after a 3-5 minute delay if it is closed locally. When directed as NPO/NWE to realign auxiliary steam supply to unit 4, wait 3-5 minutes and do so using parameter controller composite trigger AUX STM.
HP & Chemistry reports, when requested, should be consistent with event 6 and should all support identification of the 3C S/G tube rupture.

III. **TERMINATION CRITERIA:**

A. Upon establishment of increasing RCS pressure (step 26 of 3-EOP-E-3), **OR**

B. At the discretion of the evaluator.

PARAMETER CONTROLLER FILE:

COM-POS-ITE	CDB LABEL	VALUE	CONDITIONAL	TIME DELAY	RAMP	DESCRIPTION
N	TVHHSGC	0.35	-	-	0:30	3C S/G tube rupture (350 gpm)
Y	**"006/007"**	-	-	-	-	**Swaps positions of AFSS-3-006 & 007 to align 3B S/G to train 1 AFW steam supply**
-	TAFF07	1.0	-	0:15	-	Opens AFSS-3-007
-	TAFF06	0.0	-	0:30	-	Closes AFSS-3-006
Y	**"1405 ISO"**	-	-	-	-	**Deenergizes & closes MOV-3-1405 (3C S/G AFWSS)**
-	TFFXC05	T	-	-	-	Fails MOV-3-1405 closed
-	TCF5MA27	F	FXV1405 EQ 0	-	-	Opens breaker 3D01-27 when MOV-3-1405 reaches the closed position
Y	**"PAHM"**	-	-	-	-	**Places H2 Monitor in Service**
-	TAC2V02A	1.0	-	1:00	0:30	Opens PAHM-002A
-	TAC2V02B	1.0	-	-	-	Opens PAHM-002B
-	TAAAV21	1.0	-	2:00	0:30	Opens HV-1
-	TAAAV22	1.0	-	3:00	0:30	Opens HV-3
-	TACA005	0.0	-	-	-	Closes MPAS-005
Y	**"AUX STM"**	-	-	-	-	**Realigns Aux Steam supply to Unit 4**
-	TAFF02	1.0	-	-	0:30	Opens SLWU-3-001
-	TAFF007	0.0	-	1:00	0:30	Closes 3-10-007

EVALUATION SCENARIO REFERENCES

Reference List:

PROCEDURE #	PROCEDURE TITLE
3-GOP-103	Power Operation to Hot Standby
3-OP-094	Containment Post-Accident Monitoring
3-ARP-097.CR	Control Room Annunciator Response
3-ONOP-049.1	Deviation or Failure of Safety Related or Reactor Protection Channels
3-EOP-E-0	Reactor Trip or Safety Injection
3-EOP-E-3	Steam Generator Tube Rupture
3-EOP-FR-S.1	Response to Nuclear Power Generation / ATWS
0-EPIP-20101	Duties of the Emergency Coordinator
	PTN Technical Specifications
	Plant Curve Book

EVALUATION SCENARIO CONTENT SUMMARY

1.	Total Number of Malfunctions:	7
2.	Malfunctions Occurring During EOP Performance:	2
	1. Reactor trip/AMSAC failure 2. PORV/normal spray valve fails open	
3.	Abnormal Events:	3
	1. PT-3-145 fails low 2. FT-3-486 fails low 3. 3A SGFP bearing failure	
4.	Major Transients:	2
	1. Loss of main feed (3B SGFP shaft shear) 2. 3C S/G tube rupture	
5.	EOPs Used:	2
6.	EOP Contingencies Entered:	1
7.	Simulator Run Time:	90 minutes
8.	EOP Run Time:	45 minutes
9.	Crew Critical Tasks:	3

Facility: Turkey Point Nuclear Plant **Scenario No.:** 4 **Op-Test No.:** PTN Group XVIII

Examiners: _____ **Operators:** _____

Objectives: To evaluate the applicants' ability to raise load from 60% power per normal plant procedure. Evaluate ability of operators to recognize & respond to failure of the controlling 3A S/G steam flow channel high. Evaluate use of off-normal procedures for rod control Tref failing low and an RCP thermal barrier leak (with CCW return MOV malfunction) developing into an RCP high vibration problem requiring a reactor trip. Emergency Operating Procedure use will be evaluated for a large break LOCA followed by loss of offsite power . Finally, a failure of the running RHR pump occurs resulting in a loss of emergency coolant recirculation capability and RWST outflow is reduced.

Initial Conditions: 60% power, BOL

Turnover: Return to 100% power from 60% power is in progress to meet system peak demand following 3A SGFP breaker repair. The pump has been returned to service. The previous crew has just stabilized power for shift turnover. 3B EDG is OOS for corrective maintenance on the governor. FT-3-476 is OOS for calibration. Shift orders are to raise power from 60% to 100% power.

Event No.	Malf. No.	Event Type*	Event Description
1	N/A	N (SRO/BOP) R (RO)	Raise power from 60%. K/A 2.1.23 (3.9/4.0)
2	TFS1MWEH=T	I (SRO) I (BOP)	3A S/G controlling steam flow channel (FT-3-474) fails high. K/A 035A2.04 (3.6/3.8)
3	TFL1T8FP=T	I (SRO) I (RO)	Tref (TM-3-408F) fails low. K/A 001A1.02 (3.1/3.4)
4	TVKALTBB=0.3 TFKV626A=T then =F conditional on IMK1938C TAHUVBSB=21.0/ 3:00 ramp & TAHUVBMB=6.0/ 3:00 ramp	C (ALL)	RCP thermal barrier failure with failure of MOV-3-626 to automatically close on high flow. Reactor/RCP trip is required on high RCP vibration. K/A 026AA2.01 (2.9/3.5), 015/017AA1.06 (3.1/2.9) & AA1.23 (3.1/3.2)
5	TVHHCLB=2.0 / 0:05 delay / 0:30 ramp	M (ALL)	Large break LOCA. K/A 011EA2.01 (4.2/4.7)
6	TFP1S3GC=T	M (ALL)	Loss of offsite power. K/A 056AA1.05 (3.8/3.9)
7	TVMRPBRA=1.0/ 2:00 ramp	C (SRO) C(RO)	3A RHR pump trip (loss of emergency coolant recirculation). K/A WE11EA1.1 (3.9/4.0) cannot take cont HR

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

FLORIDA POWER AND LIGHT

TURKEY POINT NUCLEAR POWER PLANT

GROUP XVIII RO/SRO NRC INITIAL LICENSE EXAM

SIMULATOR EVALUATION SCENARIO EXERCISE GUIDE

PROGRAM:	RO/SRO Initial License Training
EXERCISE GUIDE:	XVIII NRC 4
DESCRIPTION:	Large Break Loss of Coolant Accident / Loss of Offsite Power
LENGTH:	90 minutes
AUTHOR:	G. M. Blinde
REVISION DATE:	05/10/99

REVIEWED BY: Bretton 6-11-99
Facility Reviewer Date

APPROVED BY: _____
NRC Chief Examiner Date

EVALUATION SCENARIO OBJECTIVES

TERMINAL OBJECTIVE: During normal and abnormal plant conditions, the Shift Operating Crew will perform control room operations in accordance with (IAW) approved plant procedures ensuring that the health and safety of the public is protected and the integrity of the plant maintained.

ENABLING OBJECTIVES:

1. Given specific plant conditions, plant procedures, and a shift turnover, respond to the following events IAW approved plant procedures:
   a. Power increase from 60%
   b. FT-3-474 failure high (controlling channel)
   c. TM-3-408F failure low
   d. RCP themal barrier failure / MOV-3-626 auto close failure
   e. Large break LOCA
   f. Loss of offsite power
   g. 3A RHR pump trip (loss of emergency coolant recirculation)

2. Given abnormal plant conditions, mitigate the adverse consequences of the following events IAW approved plant procedures:
   a. Identify abnormalities while assessing actual system response with respect to predicted system response.
   b. Investigate the cause and effect of abnormalities in system performance.
   c. Implement applicable procedures.
   d. Perform immediate actions from memory.

3. Given abnormal plant conditions, implement the applicable on-site and off-site reports and notifications IAW approved plant procedures.

4. Given normal and abnormal plant conditions, using the following principles for operational effectiveness as they apply to all operators, conduct plant operations IAW approved plant procedures:
   a. Plant and control room communication.
   b. Plant/Control Board monitoring.
   c. Plant/Control Board manipulation.
   d. Operational problem solving.
   e. Use of OPs/ONOPs and Technical Specifications.
   f. Use of EOPs IAW EOP Rules of Usage.
   g. Annunciator recognition and response.
   h. Written communications/logs.
   i. ALARA awareness.

EVALUATION SCENARIO OBJECTIVES (cont'd)

5. Given normal and abnormal plant conditions, using the following principles for operational effectiveness as they apply to the Assistant Nuclear Plant Supervisor (ANPS), conduct plant operations IAW approved plant procedures:

   a. Team performance management.
   b. Problem solving.
   c. Decision analysis.
   d. Action planning.
   e. Self-checking.

6. During abnormal and emergency events, the shift operating crew shall apply techniques of teamwork and self-checking IAW established work practices and operating guidelines.

EVALUATION SCENARIO DESCRIPTION

Initial Conditions: Mode 1, 561 degrees F

Turnover: Power increase from 60% to 100% power is in progress following main feed pump breaker repair. The system dispatcher has asked that this power increase be expedited to deal with an expected high peak demand towards the end of dayshift. 3B EDG is OOS for corrective governor maintenance. FT-3-476 is OOS for calibration. No surveillance tests are in progress.

Synopsis: After a 5% power increase (or at lead examiner direction) the controlling steam flow channel on 3A S/G (FT-3-474) fails high causing FCV-3-478 to automatically open. Operator action is required to manually control 3A S/G level and select the other steam flow channel for level control input. The crew responds per 3-ONOP-049.1. Once the plant is stabilized, Technical Specifications are consulted and the crew briefed on the effects of the failure. Next, TM-3-408F fails low generating erroneous Tref input to rod control. If rods are in AUTO, inward rod movement occurs and operators respond per 3-ONOP-028 taking rod control to manual. Following plant stabilization, the 3B RCP thermal barrier HX experiences a large leak and MOV-3-626 fails to automatically close on high flow. The operators respond per 3-ONOP-067 and 3-ONOP-041.1. 3-ARP-097.CR may also be used as time permits prior to ONOP entry. After thermal barrier return isolation, 3B RCP shaft vibration begins to increase enough to eventually require a reactor & 3B RCP trip per 3-ONOP-041.1. When 3B RCP is tripped, the leak becomes a large break loss of coolant accident on the B RCS loop. The crew responds per 3-EOP-E-0. After SI reset, a loss of offsite power occurs. Since the 3B EDG is OOS, only the 3A 4kV bus re-energizes on the EDG. Train A safeguards loads must be manually restarted. The crew transitions to 3-EOP-FR-P.1 momentarily and then to 3-EOP-E-1. Then, the 3A RHR pump trips causing a loss of all LHSI. If RWST level gets <155,000 gallons, transition is made to 3-EOP-ES-1.3. With no RHR pumps running whether in 3-EOP-E-1 or in 3-EOP-ES-1.3 transition is made to 3-EOP-ECA-1.1. The exercise is concluded upon reduction of SI flow to minimum (3-EOP-ECA-1.1 step 17), stopping all SI flow (3-EOP-ECA-1.1 step 30) or at the evaluator's discretion. The event is classified after scenario completion as a General Emergency per 0-EPIP-20101, Enclosure 1, category 1.

Event summary:

EVENT #	DESCRIPTION
1	Power increase from 60%
2	FT-3-474 fails high (3A S/G FRV opens)
3	TM-3-408F fails low
4	3B RCP TBHX failure / MOV-3-626 auto close failure
5	Large break loss of coolant accident
6	Loss of offsite power (loss of 3B 4kV bus)
7	3A RHR pump trip (loss of emergency coolant recirc)

Crew Critical Steps:

EVENT #	DESCRIPTION
6	1. Ensure one train of safeguards is actuated and running prior to transitioning from from 3-EOP-E-0
7	1. Stop SI and RHR pumps upon reaching 60,000 gallons in the RWST 2. Make up to the RWST and minimize RWST outflow per 3-EOP-ECA-1.1

Individual Critical Steps:

The bolded individual actions listed under the respective positions (RCO, ANPS, etc.) are for use during evaluations to identify steps that are critical to the individual position.

EVALUATION SCENARIO PRE-EXERCISE BRIEFING

1. **Review the following with students:**
   a. Primary responsibility of the student is to operate the simulator as if it were the actual plant.
   b. The evaluators will observe teamwork skills, communication, and the crew's ability to safely operate the plant during the simulator examination. This includes individual & crew performance.
   c. If you recognize an incorrect decision, response, answer, analysis, action, or interpretation by another crew member but fail to correct it, then the evaluator may assume that you agree with the incorrect item.
   d. The crew should keep a rough log during each scenario sufficient to complete necessary formal log entries.
   e. The simulator instructor facility operator will perform all of the functions of personnel needed outside the control room area.
   f. Before the examination begins, crew members may perform a control board walkdown for up to 10 minutes.
2. **The following are initial conditions for this exam** (in shift turnover package, but may be covered verbally if needed):
   a. Time in core life - BOL
   b. Reactor power and power history - 100%→60% 4 hr ago
   c. Turbine status - online
   d. Boron concentration - 1390 ppm
   e. Temperature - 561 degrees F
   f. Pressure - 2235 psig
   g. Xenon - Increasing following 100%→60% downpower 4 hr ago.
   h. Core cooling - forced
   i. Tech. Spec. LCO(s) in effect
      - 3.3.1 Action 6 (bistables tripped); FT-3-476 OOS for cal
      - 3.8.1.1 Action b (72 hrs); 3B EDG OOS (governor)
   j. Clearances in effect - 3B EDG
   k. Significant problems/abnormalities - None
   l. Evolutions/maintenance for the coming shift - Return to 100% power this shift. Expedite to meet system peak.
   m. Units 1 and 2 status - unit 1 online; unit 2 s/d
   n. Unit 4 status - mode 1; 100% power
3. **Ensure students understand examination schedule** and that a break will be necessary between scenarios to allow simulator initial condition setup. **Cover exam security rules** to be observed by students both during and after the exam IAW the latest revision of AG-017 or NUREG-1021 as applicable.
4. **Before the examination begins, make crew position assignments and allow students to ask any questions concerning the administration of the test.**

EXPECTED OPERATOR ACTIONS

EVENT: 1

BRIEF DESCRIPTION: Unit is at reduced power (60%) and is directed to return to 100% power.

INDICATIONS:
1. Notification by System
2. Shift turnover

POSITION	EXPECTED ACTIONS
BOP	1. At 400 to 435 MW, starts the second feed pump per 3-OP-074 2. At 450 MW, starts the second Heater Drain pump per 3-OP-081 and verifies adequate heater drain flow 3. Maintains Tref approximately matched with Tavg during uppower 4. Keeps ANPS informed of plant status
RCO	1. Prior to exceeding 70% power, consults with Reactor Engineering concerning MTC 2. Maintains Tavg approximately matched with Tref during uppower 3. Prior to 90% power, verifies all rods within 12 steps of group step counter 4. At steady state power with Tavg within 1°F of Tref, places rods in AUTO 5. Verifies Gamma-Metric wide range power meter within 1.5% of PRNIs when rx power 98.5-100% 6. Keeps ANPS informed of plant status
ANPS	1. Coordinates and directs uppower evolution 2. Verifies MTC limits are met prior to exceeding 70% power 3. Keeps NPS informed of plant status

EXPECTED OPERATOR ACTIONS

EVENT: 2

BRIEF DESCRIPTION: 3A S/G controlling steam flow transmitter FT-3-474 fails high. The feed reg valve for 3A S/G requires manual intervention to maintain stable plant conditions. The channel is called OOS and compensatory actions are initiated per 3-ONOP-049.1.

INDICATIONS:

1. Annunciator C-5/1, S/G A STEAM > FEED
2. FI-3-474 off scale high
3. FCV-3-478 opening in AUTO
4. Increasing level in 3A S/G

POSITION EXPECTED ACTIONS

BOP

1. Recognizes failure of FT-3-474 and responds as directed by ANPS
   a. Compares to other SG FT's
   b. Verifies no off-normal conditions on other SG FT's
2. Notifies ANPS of failure
3. Takes manual control of FCV-3-478
   a. Restores balanced steam/feed flow
   b. Stabilizes SG level
4. Selects alternate SG steam FT channel for control and returns FCV-3-478 to automatic

RCO

NONE

ANPS

1. Directs stabilization of plant conditions
2. Directs compensatory action per 3-ONOP-049.1
   a. Verifies BOP determination of SG FT status
   b. Determines which bistables to trip and effects on plant of tripping bistables. Provides this info to RCO/BOP for guidance.
3. Notifies NPS of plant status
4. Ensures Technical Specification requirements are met
5. Notifies I&C of FT-3-474 failure and directs initiation of PWO

EXPECTED OPERATOR ACTIONS

EVENT: 3

BRIEF DESCRIPTION: TM-3-408F loses power. Rod control Tref program fails low. Control rods step in if in AUTO. The crew responds per 3-ARP-097.CR using 3-ONOP-028 as needed.

INDICATIONS:
1. Annunciator B-4/4, Tavg-Tref DEVIATION
2. Tavg input on Tavg-Tref recorder failed low
3. Control rods stepping in if in AUTO

POSITION EXPECTED ACTIONS

BOP
1. Assists RCO as directed by ANPS.

RCO
1. Responds to TM-3-408F failure per 3-ARP-097.CR:
   a. Checks Tavg-Tref recorder (TR-3-408) and VPA Tavg & Pimp indication
   b. Places/verifies rods in MANUAL
2. Responds to TM-3-408F failure per 3-ONOP-028 (if directed):
   a. Places rods in MANUAL & adjusts rods to maintain Tavg = Tref
   b. Verifies rod insertion limits not exceeded
   c. Checks for failure of TM-3-408F
   d. Initiates caution tag for rod control selector switch
3. Informs ANPS of plant status

ANPS
1. Directs response per 3-ARP-097.CR and uses 3-ONOP-028 as needed
2. Informs NPS of plant status
3. Initiates PWO/I&C notification of TM-3-408F failure

EXPECTED OPERATOR ACTIONS

EVENT: 4

BRIEF DESCRIPTION: 3B RCP thermal barrier HX (TBHX) fails. PRMS R-3-17A/B alarms. MOV-3-626 fails to auto close on high flow requiring manual closure. 3-ONOP-067 & 041.1 are entered (as is 3-ARP-097.CR if time permits). After MOV-3-626 closure, shaft vibration increases requiring a reactor trip.

INDICATIONS:

1. PRMS R-3-17A and B alarm
2. CCW surge tank level increases
3. Annunciator H-1/4, PRMS HI RADIATION, actuates
4. Annunciator A-1/1, RCP THERMAL BARR COOLING WATER HI FLOW, alarms (MOV-3-626 fails)
5. Annunciator A-1/2, RCP THERMAL BARR COOLING WATER HI TEMP, alarms
6. Annunciator F-1/1, RCP MOTOR/SHAFT HI VIB

POSITION EXPECTED ACTIONS

BOP

1. Performs actions as directed per 3-ONOP-067:
   a. Checks R-3-17A/B alarm valid
2. **Performs actions as directed per 3-ONOP-041.1:**
   a. In response to affected RCP thermal barrier ΔP low, verifies seal injection 6-13 gpm
   b. Recognizes/reports shaft high vibration condition (annunciator F-1/1)

RCO

1. Recognizes RCP TBHX failure & informs ANPS
2. Performs actions as directed by 3-ARP-097.CR:
   a. In response to annunciator A-1/1:
      1) Verifies/manually closes MOV-3-626
      2) Checks R-3-17A/B for increasing activity
      3) Contacts Chemistry for CCW activity sample
   b. In response to annunciator A-1/2:
      1) Checks CCW header flow & HX outlet temp.
      2) Checks R-3-17A/B increasing activity -YES- verifies seal injection & closes MOV-3-626
      3) Checks for #1 seal leakoff high flow
      4) Monitors thermal barrier ΔP, RCP temps
   c. Notifies ANPS to go to 3-ONOP-067 & 041.1
3. Performs actions as directed per 3-ONOP-067:
   a. Verifies CCWST vent closed (RCV-3-609)
   b. Requests CCW activity sample from Chemistry

EXPECTED OPERATOR ACTIONS (cont'd)

EVENT: 4 (cont'd)

POSITION	**EXPECTED ACTIONS**
RCO (cont'd)	**4. Performs actions as directed per 3-ONOP-041.1:** a. Monitors #1 seal leakoff, lower pump guide bearing, seal return & CCW supply temps. **b. If MOV-3-626 not yet closed** (3B RCP thermal barrier ΔP = 0 inches): 1) Verifies proper seal injection flow 2) Maintains thermal barrier cooling 3) Checks #1 seal leakoff flow per Encl 1 limits 4) Checks A-1/1, 1/2, 1/3 OFF - NO 5) Checks CNMT ϕB isolation not actuated & RCP seal return temp < 235°F 6) Checks R-17A/B normal - NO **7) Manually closes MOV-3-626.** **c. Verifies shaft high vibration condition** **d. Trips reactor & affected RCP when directed**
ANPS	**1. Directs mitigative actions IAW 3-ARP-097.CR, 3-ONOP-067 & 041.1** **a. Directs MOV-3-626 closure** **b. Directs reactor trip followed by affected RCP trip in response to high shaft vibration on 3B RCP (3-ONOP-041.1 foldout page).** 2. Informs NPS of plant status 3. Directs announcement to stand clear of CCW piping

EXPECTED OPERATOR ACTIONS

EVENT: 5 & 6

BRIEF DESCRIPTION: In response to plant conditions, a reactor trip & SI has occurred. Operators perform actions of 3-EOP-E-0. Just before transition to 3-EOP-E-1, a loss of offsite power occurs requiring manual restart of train A ESF loads (SI reset & 3B EDG OOS). Transition is then made to 3-EOP-E-1.

INDICATIONS:
1. Reactor trip directed or actuates
2. Rod bottom lights on and RTBs/BYBs open
4. SI alarms & ESF equipment auto starts
4. Switchyard deenergizes & only train A safety electrical distribution reenergizes (3B EDG OOS)

CREW CRITICAL STEPS:
1. **Ensure one train of safeguards is actuated and running prior to transitioning from from 3-EOP-E-0**

POSITION EXPECTED ACTIONS

BOP

1. Responds to reactor trip per 3-EOP-E-0
   a. Verifies turbine trip
   b. Verifies power to 3A/B/D 4kV buses
   c. Verifies feedwater isolation
   d. Verifies AFW pumps running
   e. Verifies proper ICW operation
   f. Checks if main steamlines should be isolated
   g. Verifies EDGs all running
   h. Directs SNPO to place PAHMS in service
   i. Verifies proper AFW alignment and flow
   j. Checks RCS cold leg temperatures stable
   k. Performs MSLB & SGTR diagnostics
2. **Performs 3-EOP-E-0 foldout page steps as directed including restoring safeguards equipment to required configuration (train A only) after the loss of offsite power.**
3. Informs ANPS of plant status

RCO

1. **Responds to reactor trip per 3-EOP-E-0**
   a. Verifies reactor tripped
   b. Checks if SI actuated/required. Manually actuates SI & phase A if required by PZR level or RCS subcooling and not yet actuated
   c. Verifies containment isolation phase A
   d. Verifies SI pumps running
   e. Verifies proper CCW system operation
   f. Verifies containment cooling
   g. Verifies containment and control room ventilation isolation

EXPECTED OPERATOR ACTIONS (cont'd)

EVENT: 5 & 6 (cont'd)

POSITION	**EXPECTED ACTIONS**
RCO (cont'd)	**h. Verifies containment spray not required - NO** 1) Verifies containment spray actuation 2) Verifies ϕB containment isolation **3) Stops all RCPs (if still running)** i. Verifies SI valve amber lights bright j. Resets SI k. Realigns SI l. Verifies SI flow m. Checks RCP seal cooling n. Checks RCP cooling o. Checks letdown/PORVs/spray valves closed p. Performs LOCA diagnostics **2. Performs 3-EOP-E-0 foldout page steps as directed:** **a. Recognizes loss of subcooling/ϕB actuation and trips RCPs per 3-EOP-E-0 (if applicable)** **b. Starts train A ESF loads as directed by the ANPS following loss of offsite power.** 3. Notifies ANPS of safety injection and cause
ANPS	**1. Directs response to reactor trip per 3-EOP-E-0** a. Obtains verification of reactor trip b. Determines electric plant status c. Directs manual SI/phase A if required **d. Monitors foldout page items:** **1) Direction to RCO to stop all RCPs if required by subcooling/ϕB actuation** **2) Following loss of offsite power, directs start of train A ESF loads.** e. Directs prompt and subsequent actions **2. Transitions to appropriate plant procedure (3-EOP-E-1 or appropriate FRP)** 3. Informs NPS as to status of plant

EXPECTED OPERATOR ACTIONS

EVENT: 7

BRIEF DESCRIPTION: A large break LOCA/LOOP has occurred. Only train A ESF is running (3B EDG OOS). Upon entry into 3-EOP-E-1, transitions are quickly made to 3-EOP-FR-P.1 and back to E-1 after which 3A RHR pump trips. If RWST level drops to 155 kgal, transition is made to 3-EOP-ES-1.3. With no RHR pumps, transition is made to 3-EOP-ECA-1.1 where SI/spray flow is reduced to a minimum.

INDICATIONS:

1. Containment radiation indications abnormal
2. Containment sump level indications abnormal
3. Safety injection actuated and injecting
4. RWST level dropping (<155kgal for EOP-ES-1.3)
5. RCS cold leg temperature (<290°F for EOP-FR-P.1)
6. Annunciator H-6/3, RHR PP A/B MOTOR OVERLOAD
7. Annunciator H-6/4, RHR PP A/B TRIP

CREW CRITICAL STEPS:

1. **Stop SI pumps upon reaching 60,000 gallons in the RWST**
2. **Make up to the RWST and minimize RWST outflow per 3-EOP-ECA-1.1**

POSITION EXPECTED ACTIONS

BOP

1. Performs actions of 3-EOP-E-1 as directed:
   a. Checks S/G fault, S/G levels & secondary rad.
   b. Resets cntmt isol. ϕA/B & verifies IA available
   c. Checks charging pump power aligned offsite - NO - power available for only two charging pumps
   d. Checks for presence of MSLB (SG pressures)
   e. Checks if EDGs should be stopped - NO
2. Assists RCO with actions of 3-EOP-ES-1.3 as directed.
3. Performs actions of 3-EOP-ECA-1.1 as directed:
   a. Maintains intact S/G levels 15-50%
   b. Assists RCO as directed
4. Informs ANPS of plant status

RCO

1. Performs actions of 3-EOP-FR-P.1 as directed:
   a. Checks RCS press>650psig -NO- RHR flow>1000gpm
2. **Performs actions of 3-EOP-E-1 as directed:**
   a. Checks PORVs and block valves
   b. Verifies SI-reset
   c. Checks if max chg flow established (2 pumps)
   d. Checks if SI should be terminated - NO
   e. Checks if containment spray should be stopped
   f. Checks if RHR pumps should be stopped - NO
   g. **Verifies cold leg recirc capability - NO**
   h. **Identifies RWST level < 155 kgal & informs ANPS**

EXPECTED OPERATOR ACTIONS (cont'd)

EVENT: 7 (cont'd)

POSITION **EXPECTED ACTIONS**

RCO (cont'd)

3. **Performs actions of 3-EOP-ES-1.3 as directed:**
   a. Verifies SI reset
   b. Takes 3B CSP to PTL (MOV-3-880B deenergized)
   c. Checks 3A HHSIP running & takes RHR pumps to PTL
   d. Verifies RHR aligned for injection
   e. Stops chg pumps if VCT m/u can not be aligned
   f. Establishes hot leg recirc capability
   g. Closes U3 HHSIP recirc to RWST valves
   h. Stops U4 HHSIPs & isolates from U3 HHSI
   i. Verifies cold leg recirc valves energized
   j. Verifies RHR alt dischg isolated
   k. Realigns RHR suction from RWST to CNMT sump
   l. Verifies CNMT recirc sump level
   m. Verifies adequate CCW for RHR cooling
   n. Starts one RHR pump - NO
4. **Performs actions of 3-EOP-ECA-1.1 as directed:**
   a. Checks cold leg recirc capability-available ※ NO
   b. Aligns makeup to the RWST
   c. Verifies only two ECCs running
   d. Checks >= one computer room chiller running
   e. Checks RWST level > 60kgal
      1) If NO, then stops running HHSI, charging and contianment spray pumps
   f. Reduces containment cooling as directed
   g. Verifies SI reset
   h. Establishes one HHSI pump running
   i. Verifies no RWST -> Sump backflow
   j. Checks RCS subcooling (approx. zero)
   k. Establishes minimum SI as directed
5. Informs ANPS of plant status

ANPS

1. Determines 3-EOP-FR-P.1 not applicable for LBLOCA
2. **Directs response to LBLOCA per 3-EOP-E-1:**
   a. Directs max charging aligned (2 pumps)
   b. Transitions from to appropriate procedure or FRP if required by red/orange path CSFST
      1) 3-EOP-ES-1.3 if RWST < 155kgal
      2) 3-EOP-ECA-1.1 due to loss of both RHR pumps
3. **Directs response to LBLOCA per 3-EOP-ES-1.3:**
   a. Determines no RHR pumps operable thus requiring transition to 3-EOP-ECA-1.1

EXPECTED OPERATOR ACTIONS (cont'd)

EVENT: 7 (cont'd)

POSITION	**EXPECTED ACTIONS**
ANPS (cont'd)	**4. Directs response to LBLOCA per 3-EOP-ECA-1.1:** **a. Directs addition of makeup to the RWST** b. Determines RCS cooldown not applicable **c. If RWST level > 60 kgal:** 1) **Reduces containment spray to minimum** 2) Verifies no backflow from RWST to sump 3) Determines RCP could not be started **4) Determines minimum SI flow (figure 1) & directs field operator action accordingly** **d. If RWST level < 60 kgal, stops all HHSI pumps, cnmt spray pumps & charging pumps** **5. Classifies event as a GENERAL EMERGENCY (RCS leakage > charging with CNMT pressure > 20 psig) per 0-EPIP-20101** 6. Informs NPS of status of unit

SIMULATOR INSTRUCTOR FACILITY OPERATING INSTRUCTIONS

I. **SETUP**

A. Reset to IC-24.

B. Load scenario 65.

C. Following switch check, unfreeze the simulator. Realign plant equipment to allow for FT-3-476 & 3B EDG out of service. Place MIMS in service.

D. Perform the following
1. Take 3B EDG OOS (parameter controller direct triggers TAQ5B20P=3 & TAQ5LRSB=0)
2. Take FT-3-476 OOS per 3-ONOP-049.1 as follows:
   a. In rack 24, trip bistables BS-3-478-A1/A2/D.
   b. Select FT-3-477 for 3A S/G level control
   c. Fail FT-3-476 low (touch SYS MAT->FEEDWATER-> MAIN FEEDWATER MENU->FEEDWATER REGULATOR VALVES ->F-SG1->FT-476->FAIL LOW->set TFF1M76L=T).
3. Enter the following failures:
   a. MOV-626 auto close failure (touch SYS MAT-> COMMON SERVICES->COMPONENT COOLING->CCW TO RCP.. ->FCV626->FAIL AS IS->set TFKV626A=T and set conditional TFKV626A=F/IMK1938C).

E. Delete all conditional events from Parameter Controller Event Summary **except** those indicated on the Parameter Controller Event Summary pages in this exercise guide. Direct events may deleted at instructor discretion.

F. Place turnover sheet on RCO desk.

G. Clearance information tags-Rack 24 (FT-3-476) and 3B EDG.

H. Information tags-None

II. **CONDUCTING THE EXAMINATION:**

A. Unfreeze the simulator and begin the exam.

B. **Power increase from 60% (event 1).**

1. **Initiation:** Crew should begin in response to shift turnover. If slow to begin, call as System Dispatcher and prompt commencement of load increase.

2. **Response:** Acknowledge load dispatcher/plant management notifications of the load increase. Respond as field operator in response to notification of starting/stopping plant equipment and as Reactor Engineering concerning MTC (reply that MTC is within limits and that power may increase above 70%).

SIMULATOR INSTRUCTOR FACILITY OPERATING INSTRUCTIONS (cont'd)

C. **FT-3-474 fails high (3A S/G FRV opens) (event 2).**

1. **Initiation:** After a 5% power change or at lead evaluator discretion, fail FT-3-474 (touch SYS MAT->STEAM GENERATOR & MAIN STEAM->MAIN STEAM->F-474->FT474-> TRANSMITTER FAIL HIGH-> set TFS1MWEH=T). This will open FCV-3-478. Manual control must be taken to stabilize 3A S/G level until FT-3-475 can be selected and 3A S/G level control returned to AUTO.

2. **Response:** As NPS/NWE state that a work request will be generated and I&C will be notified of the failure. As I&C, reply that a planner will intiate a work package for troubleshooting & repair.

D. **TM-3-408F fails low (event 3).**

1. **Initiation:** Following event 2 crew brief, with 3A S/G level stabilized and rod control in AUTO (or at lead examiner discretion), actuate TM-3-408F (rod control Tref) failure low by touching SYS MAT->REACTOR->ROD CONTROL ROD POSITION->TM408F->T REF PROGRAM POWER LOSS->set TFL1T8FP=T. This fails the rod control unit Tref input thus requiring manual rod control.

2. **Response:** Respond as NPS/NWE/I&C to notification of TM-3-408F failure. As NPS/NWE state that a work request will be generated and I&C will be notified. As I&C, reply that a planner will intiate a work package for troubleshooting/repair.

E. **3B RCP TBHX failure / MOV-3-626 auto close failure (event 4).**

1. **Initiation:** Once the plant is stabilized with manual rod control, actuate the 3B RCP TBHX leak by touching SYS MAT->COMMON SERVICES->COMPONENT COOLING-> CCW TO RCP...->LVTBB->VALVE PORT AREA->set TVKALTBB=0.3. The MOV-3-626 failure was entered in the scenario setup. When MOV-3-626 is closed, begin ramping 3B RCP shaft vibration up to the reactor trip setpoint (touch SYS MAT->REACTOR COOLANT SYSTEM-> REACTOR COOLANT PUMPS->RCP B->IDA->RCP VIBRATION S->set TAHUVBSB=21.0/3:00 ramp-> IDA->RCP VIBRATION M->set TAHUVBMB=6.0/3:00 ramp).

2. **Response:** Acknowledge requests for SNPO/NWE assistance with MOV-3-626 or verification of RCP seal injection flows. If directed, these flows may be adjusted using SYS MAT-> REACTOR COOLANT SYSTEM->REACTOR COOLANT PUMPS->CV297A(B)(C)-> VALVE PORT AREA->set TAHN97A(B)(C)=value as directed by crew. Acknowledge notification to NPS/system dispatcher of U3 trip (3-ONOP-041.1 directs reactor/3B RCP trip on high vibration). Acknowledge direction as Chemistry to sample CCW for activity (RCS inleakage). After 10-15 minutes, report CCW activity with counting in progress.

SIMULATOR INSTRUCTOR FACILITY OPERATING INSTRUCTIONS (cont'd)

E. **3B RCP TBHX failure / MOV-3-626 auto close failure (event 4 cont'd).**

2. **Response (cont'd):** As HP, direction may be received to survey CCW piping for increased radiation levels. After 8-10 minutes, report radiation above background exists on CCW piping. Request PA announcements be made for personnel to stand clear of CCW piping (if not made already).

F. **Large break loss of coolant accident (event 5)**

1. **Initiation:** When the 3B RCP is tripped in response to event 4, actuate the large break LOCA using parameter controller direct trigger TVHHCLB=2.0/5 sec delay/30 sec ramp..

2. **Response:** Respond as HP if directed to survey the main steam lines and outside containment. After 10-15 minutes, report elevated general area radiation in all areas near containment. When requested as SNPO to place PAHMs in service, report alignment completion after 10-15 minute delay (parameter controller trigger composite "PAHM").

G. **Loss of offsite power (loss of 3B 4kV bus) (event 6)**

1. **Initiation:** Just before the diagnostic steps (27-29) in 3-EOP-E-0, actuate a ground on the unit 3 startup transformer using parameter controller direct trigger TFP1S3GC=T.

2. **Response:** After losing U3 S/U xfmr, the crew may request U4 RCO realignment of U4 HHSIP suctions to U3 RWST. After 8-10 minutes, carry this out using parameter controller trigger composite "SIALIGN". If asked as U4 RCO, state that U4 is at 100% power. If asked as NPO/NWE to investigate U3 S/U xfmr, after 2-4 minutes report actuation of the ground (64) relay. If asked to reset the relay, state that it will not reset. If directed to perform Att. 2 of 3-ONOP-004.3, verify the 3AC16 & 3AC01 local blue power available lights ON. Then, 4-6 minutes later, report that breaker 3AC13 is misaligned in its cubicle and can not be fully racked in. Respond as Electrical Maintenance if asked to troubleshoot, but do not repair it.

H. **3A RHR pump trip (loss of emergency coolant recirc) (event 7).**

1. **Initiation:** Shortly after the transition from 3-EOP-E-1 to 3-EOP-FR-P.1 and back, actuate increasing bearing wear on the 3A RHR pump using SYS MAT->SAFETY SYSTEM->RHR PROCESS->P3A->RHR PP 3A->BEARING WEAR->set TVMRPBRA=1.0/2:00 ramp. This will eventually cause the pump to trip on overcurrent.

SIMULATOR INSTRUCTOR FACILITY OPERATING INSTRUCTIONS (cont'd)

H. **3A RHR pump trip (loss of emergency coolant recirc) (event 7 cont'd)**

2. **Response:** When directed as SNPO to check out the 3A RHR pump, wait 1-3 minutes and report as follows:
   - If the pump is still running, state that the pump is much noisier than usual and getting worse.
   - If the pump has tripped, state that top of the motor casing is very hot with burnt insulation smell in the room. The pump shaft will not rotate (seized) by hand.

If asked as mechanical maintenance about the status of 3B EDG, state that the governor is disassembled and could not be made ready before tomorrow dayshift at the earliest.
Respond as HP as in event 5. Surveys may be expanded to include all around containment. When directed as Chemistry to take periodic S/G activity samples request S/G sample MOV's be opened to permit this. Also acknowledge request as Chemistry to locally check DAM-1 monitor and align PASS. No secondary activity should be reported to the crew during this scenario.
LCV-3-115C is deenergized requiring local closure to allow charging pump suction from the RWST per 3-EOP-E-1 step 10(touch SYS MAT->CHEMICAL VOLUME CONTROL SYSTEM->CVCS CHARGING->MOV115C->LOCAL CLOSE/TRIP(MECH)->set TCB162MC=F-> MOV115C->FAIL CLOSE->set TFBVC62=T.
If directed as NPO/SNPO to close in cold leg recirc breakers per 3-EOP-E-1 step 17 or 3-EOP-ES-1.3 step 10, after a 1-3 minute delay, actuate parameter controller trigger composite "CLRECBKR". Note that only train A has power available. If directed, local operation of train B valves outside containment (MOV-3-862B/863B/864B only) can be accomplished using the RHR PROCESS & SI PROCESS system mimics and taking each valve to FAIL OPEN with a 3-5 minute delay per valve.
After transition to 3-EOP-ECA-1.1, respond as SNPO when directed to manipulate 3-356/365A/365B. Touch SYS MAT->CHEMICAL VOLUME CONTROL SYSTEM->CVCS MAKEUP->365B->VALVE PORT AREA->set TABM365B=1.0 (356 already closed & 365A not simulated) allowing 3-5 minutes before reporting completion. Also respond as SNPO when directed to throttle valve 3-888B for minimum SI flow from 3A HHSIP. Touch SYS MAT->SAFETY SYSTEM->SAFETY INJECTION PROC-> 888B->VALVE PORT AREA->TAMH888B=0.05 (300 gpm) initially with additional throttling (=0.025 for 200 gpm) as directed. Allow 2-4 minutes before reporting the initial valve repositioning.

III. TERMINATION CRITERIA:

A. Upon reduction of SI flow to minimum or trip of all pumps with RWST suction (step 17 or 30 of 3-EOP-ECA-1.1), **OR**

B. At the discretion of the evaluator.

PARAMETER CONTROLLER FILE:

COM-POS-ITE	CDB LABEL	VALUE	CONDITIONAL	TIME DELAY	RAMP	DESCRIPTION
N	TVHHCLB	2.0	-	0:05	0:30	Actuates LBLOCA on B RCS loop.
N	TAQ5LRSB	0	-	-	-	Takes 3B EDG LOCAL/NORMAL switch to OFF
N	TAQ5B20P	3	-	-	-	Racks out 3B EDG output breaker 3AB20
N	TFP1S3GC	T	-	-	-	Trips ground (64) relay on U3 startup xfmr
Y	**"CLRECBKR"**	-	-	-	-	**Closes cold leg recirc breakers (E-1 step 17 or ES-1.3 step 10)**
-	TCM2D06M	T	-	-	-	Closes bkr 30621 (MOV-3-866B)
-	TCM2D04M	T	-	0:15	-	Closes bkr 30605 (MOV-3-864B)
-	TCM1D03M	T	-	0:30	-	Closes bkr 30615 (MOV-3-750)
-	TCM1D10M	T	-	0:45	-	Closes bkr 30616 (MOV-3-862B)
-	TCM1D12M	T	-	1:00	-	Closes bkr 30626 (MOV-3-863B)
-	TCM1D09M	T	-		-	Closes bkr 30720 (MOV-3-862A)
-	TCM1D11M	T	-	0:15	-	Closes bkr 30726 (MOV-3-863A)
-	TCM1D04M	T	-	0:30	-	Closes bkr 30731 (MOV-3-751)
-	TCM2D05M	T	-	0:45	-	Closes bkr 30732 (MOV-3-866A)
-	TCM2D03M	T	-	1:00	-	Closes bkr 30712 (MOV-3-864A)
Y	**"SIALIGN"**	-	-	-	-	**Aligns U4 HHSI pumps suction to U3 RWST**
-	TAMH1V46	1.0	-	0:02	-	Opens valve 3-892A
-	TAMH1V41	1.0	-	0:45	-	Opens valve 3-870A
-	TAMH1V37	0.0	-	1:20	-	Closes valve 4-864C
-	TAMH4856	0.0	-	2:20	-	Closes valves 4-856A&B
Y	**"PAHM"**	-	-	-	-	**Places H2 Monitor in Service**
-	TAC2V02A	1.0	-	0:30	-	Opens PAHM-002A
-	TAC2V02B	1.0	-	1:30	-	Opens PAHM-002B
-	TAAAV21	1.0	-	-	-	Opens HV-1
-	TAAAV22	1.0	-	-	-	Opens HV-3
-	TACA005	0.0	-	-	-	Closes MPAS-005

EVALUATION SCENARIO REFERENCES

Reference List:

PROCEDURE #	PROCEDURE TITLE
3-GOP-301	Hot Standby to Power Operation
3-OP-094	Containment Post-Accident Monitoring
3-ARP-097.CR	Control Room Annunciator Response
3-ONOP-028	Reactor Control System Malfunction
3-ONOP-041.1	Reactor Coolant Pump Off-Normal
3-ONOP-049.1	Deviation or Failure of Safety Related or Reactor Protection Channels
3-ONOP-067	Radioactive Effluent Release
3-EOP-E-0	Reactor Trip or Safety Injection
3-EOP-E-1	Loss of Reactor or Secondary Coolant
3-EOP-ES-1.3	Transfer to Cold leg Recirculation
3-EOP-ECA-1.1	Loss of Emergency Coolant Recirculation
3-EOP-FR-P.1	Response to Imminent Pressurized Thermal Shock Condition
0-EPIP-20101	Duties of the Emergency Coordinator
	PTN Technical Specifications
	Plant Curve Book

EVALUATION SCENARIO CONTENT SUMMARY

1.	Total Number of Malfunctions:	7
2.	Malfunctions Occurring During EOP Performance:	1
	1. 3A RHR pump trip / loss of emergency coolant recirc	
3.	Abnormal Events:	4
	1. FT-3-474 fails high 2. TM-3-408 fails low 3. RCP thermal barrier failure 4. MOV-3-626 auto close failure	
4.	Major Transients:	2
	1. Large break loss of coolant accident 2. Loss of offsite power	
5.	EOPs Used:	2
6.	EOP Contingencies Entered:	1
7.	Simulator Run Time:	90 minutes
8.	EOP Run Time:	45 minutes
9.	Crew Critical Tasks:	3

Facility: Turkey Point Nuclear Plant **Scenario No.:** 5 **Op-Test No.:** PTN Group XVIII

Examiners: _____ **Operators:** _____

Objectives: To evaluate the applicants' ability to conduct a main generator start up and synchronization to the grid with the main turbine at 1800 RPM per normal plant procedure. Evaluate use of off-normal procedures for Pressurizer Level Channel failing low causing letdown isolation, Rod Control Urgent Failure, and condenser steam dump control pressure setpoint failing low with two steam dump valves failing open. Emergency Operating Procedure use will be evaluated for all of the MSIV's stuck open causing an uncontrolled depessurization of all steam generators and a failure of the train 1 AFW FCV to 3B S/G.

Initial Conditions: Main Turbine @ 1800 RPM, ready to start up and synchronize main generator, MOL

Turnover: Plant Startup is in progress. The previous crew has stabilized power for shift turnover with the main turbine at 1800 RPM and the main generator ready for startup and synchronization to the grid. Condenser steam dumps are in steam pressure control due to a problem with the Tavg input which is under I&C investigation. No surveillance tests are in progress. Shift orders are to place the unit on line and increase power to 100%.

Event No.	Malf. No.	Event Type*	Event Description
1	N/A	N (SRO/BOP) R (RO)	Start up the main generator, synchronize it to the grid and increase power. K/A 2.1.23 (3.9/4.0) & 062A4.07 (3.1/3.1)
2	TFH1TV60=T	I (SRO) I (RO)	Pressurizer Level Channel LT-3-460 fails low, causing letdown to isolate. K/A 011A2.11 (3.4/3.6)
3	TFL1UAL=T	C (SRO) C (RO)	Rod Control Urgent Failure. K/A 001A2.14 (3.7/3.9)
4	overrides: IAS1VSP=0 IDS191ON=T IDS191MN=T	I (SRO) I (BOP)	Pressure Setpoint (PC-3-464B) for Condenser Steam Dump control fails low, causing Steam Dumps to open. K/A 041A4.04 (2.7/2.7)
5	TFSVV93A=T & TFSVV94A=T conditional on IMS1MAN	C (SRO) C (BOP)	Two Steam Dumps stick in the open position. K/A 041A2.02 (3.6/3.9) Cannot take credit for
6	TFSVVX5A=T TFSVVX6A=T TFSVVX7A=T TFFYO17=T conditional on F5:SIAFB GT 4000	M (ALL)	Main Steam Isolation Valves are stuck open causing an uncontrolled depressurization of all Steam Generators with CV-3-2817 failing open (train 1 AFW FCV to 3B S/G). K/A WE12EA1.1 (3.8/3.8)

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

FLORIDA POWER AND LIGHT

TURKEY POINT NUCLEAR POWER PLANT

GROUP XVIII RO/SRO NRC INITIAL LICENSE EXAM

SIMULATOR EVALUATION SCENARIO EXERCISE GUIDE

PROGRAM:	RO/SRO Initial License Training
EXERCISE GUIDE:	XVIII NRC 5
DESCRIPTION:	Plant Startup / Depressurization of all Steam Generators
LENGTH:	90 minutes
AUTHOR:	G. M. Blinde
REVISION DATE:	05/19/99

REVIEWED BY: Bretton 6-11-99
Facility Reviewer Date

APPROVED BY: _____
NRC Chief Examiner Date

EVALUATION SCENARIO OBJECTIVES

TERMINAL OBJECTIVE: During normal and abnormal plant conditions, the Shift Operating Crew will perform control room operations in accordance with (IAW) approved plant procedures ensuring that the health and safety of the public is protected and the integrity of the plant maintained.

ENABLING OBJECTIVES:

1. Given specific plant conditions, plant procedures, and a shift turnover, respond to the following events IAW approved plant procedures:
   a. Startup & synchronize main generator to grid
   b. LT-3-460 failure low / letdown isolation
   c. Rod control urgent failure
   d. PC-3-464B setpoint fails low / condenser steam dumps open
   e. Two condenser steam dumps fail open
   f. Main steam isolation valves & train 1 AFW FCV fail open
   g. Uncontrolled depressurization of all steam generators

2. Given abnormal plant conditions, mitigate the adverse consequences of the following events IAW approved plant procedures:
   a. Identify abnormalities while assessing actual system response with respect to predicted system response.
   b. Investigate the cause and effect of abnormalities in system performance.
   c. Implement applicable procedures.
   d. Perform immediate actions from memory.

3. Given abnormal plant conditions, implement the applicable on-site and off-site reports and notifications IAW approved plant procedures.

4. Given normal and abnormal plant conditions, using the following principles for operational effectiveness as they apply to all operators, conduct plant operations IAW approved plant procedures:
   a. Plant and control room communication.
   b. Plant/Control Board monitoring.
   c. Plant/Control Board manipulation.
   d. Operational problem solving.
   e. Use of OPs/ONOPs and Technical Specifications.
   f. Use of EOPs IAW EOP Rules of Usage.
   g. Annunciator recognition and response.
   h. Written communications/logs.
   i. ALARA awareness.

EVALUATION SCENARIO OBJECTIVES (cont'd)

5. Given normal and abnormal plant conditions, using the following principles for operational effectiveness as they apply to the Assistant Nuclear Plant Supervisor (ANPS), conduct plant operations IAW approved plant procedures:

   a. Team performance management.
   b. Problem solving.
   c. Decision analysis.
   d. Action planning.
   e. Self-checking.

6. During abnormal and emergency events, the shift operating crew shall apply techniques of teamwork and self-checking IAW established work practices and operating guidelines.

EVALUATION SCENARIO DESCRIPTION

Initial Conditions: Mode 1, 552 degrees F, Main Turbine @ 1800 RPM

Turnover: Plant startup is in progress. The previous crew has stabilized power for shift turnover with the main turbine at 1800 RPM and the main generator ready for startup and synchronization to the grid. Procedure 3-GOP-301 is complete up through step 5.52.1. Condenser steam dumps should remain in steam pressure control due to a problem with the Tavg input which is under I&C investigation. No surveillance tests are in progress. Shift orders are to place the unit on line and increase power to 100% during the upcoming shift.

Synopsis: Shortly after shift turnover, the crew should startup the main generator per 3-GOP-301 beginning at step 5.52.2. Once steam generator level control has been placed in automatic, PZR level channel LT-3-460 fails low causing letdown isolation. The crew responds using 3-ONOP-041.6 & 049.1. The crew is briefed regarding effects of the failure and Technical Specifications evaluated. Once letdown is placed back in service, on the next manual rod movement a rod control urgent failure occurs. The crew responds using 3-ARP-097.CR (annunciator B-9/4) and 3-ONOP-028. Following stabilization of plant conditions (or at evaluator discretion), the condenser steam dump control steam pressure setpoint (PC-3-464B) fails low causing all four dump valves to open. The crew takes manual control of the condenser steam dump controller, but two of the dump valves stick open. The steam dump controls are failed ON and in MANUAL control mode. The increase in steam demand with a loss of rod control will require operator recognition, but provide insufficient time for manual actions up to and including reactor/turbine trip. Following the plant trip, operators respond using 3-EOP-E-0 and attempt to isolate steam flow to the condenser in an effort to limit RCS cooldown. None of the main steam isolation valves (MSIVs) will close causing a depressurization of all steam generators to the condenser. CV-3-2817 (train 1 AFW FCV to 3B S/G) fails open and must be locally isolated. The crew transitions from 3-EOP-E-0 to 3-EOP-E-2 and finally to 3-EOP-ECA-2.1. 3-EOP-FR-P.1 may also be entered depending on plant conditions. The scenario ends following SI termination in either 3-EOP-ECA-2.1 step 18, 3-EOP-FR-P.1 step 12 or at the evaluator's discretion. The event is classified after scenario completion as an unusual event per 0-EPIP-20101, Enclosure 1, category 3.

Event summary:

EVENT #	DESCRIPTION
1	Startup main generator & synchronize to grid
2	LT-3-460 fails low (letdown isolation)
3	Rod control urgent failure
4	PC-3-464B setpoint fails low (condenser steam dumps open)
5	Two condenser steam dumps stick open(reactor trip/SI) with AFW FCV failure
6	Main steam isolation valves fail open / Uncontrolled depressurization of all steam generators

Crew Critical Steps:

EVENT #	DESCRIPTION
6	1. 3-EOP-ECA-2.1: Reduce AFW to not less than 25 gpm per S/G prior to reaching integrity orange path. 3-EOP-FR-P.1 (orange): Control AFW flow in order to minimize cooldown prior to reaching red path on FR-P.1. 2. 3-EOP-FR-P.1 (orange): Terminate SI flow to prevent red path on FR-P.1. 3-EOP-FR-P.1 (red): Terminate SI flow to control RCS pressure and temperature before the end of the scenario.

Individual Critical Steps:

The bolded individual actions listed under the respective positions (RCO, ANPS, etc.) are for use during evaluations to identify steps that are critical to the individual position.

EVALUATION SCENARIO PRE-EXERCISE BRIEFING

1. **Review the following with students:**
   a. Primary responsibility of the student is to operate the simulator as if it were the actual plant.
   b. The evaluators will observe teamwork skills, communication, and the crew's ability to safely operate the plant during the simulator examination. This includes individual & crew performance.
   c. If you recognize an incorrect decision, response, answer, analysis, action, or interpretation by another crew member but fail to correct it, then the evaluator may assume that you agree with the incorrect item.
   d. The crew should keep a rough log during each scenario sufficient to complete necessary formal log entries.
   e. The simulator instructor facility operator will perform all of the functions of personnel needed outside the control room area.
   f. Before the examination begins, crew members may perform a control board walkdown for up to 10 minutes.
2. **The following are initial conditions for this exam** (in shift turnover package, but may be covered verbally if needed):
   a. Time in core life - MOL
   b. Reactor power and power history - 6%, plant s/u
   c. Turbine status - 1800 RPM; ready for main generator s/u
   d. Boron concentration - 1328 ppm
   e. Temperature - 552 degrees F
   f. Pressure - 2235 psig
   g. Xenon - startup from Xe free.
   h. Core cooling - forced
   i. Tech. Spec. LCO(s) in effect - none
   j. Clearances in effect - none
   k. Significant problems/abnormalities - Condenser steam dumps should remain in steam pressure (manual) control due to Tavg input problem. I&C investigating.
   l. Evolutions/maintenance for the coming shift - Place plant on line and increase power to 100%.
   m. Units 1 and 2 status - unit 1 online; unit 2 s/d
   n. Unit 4 status - mode 5 on RHR
3. **Ensure students understand examination schedule** and that a break will be necessary between scenarios to allow simulator initial condition setup. **Cover exam security rules** to be observed by students both during and after the exam IAW the latest revision of AG-017 or NUREG-1021 as applicable.
4. **Before the examination begins, make crew position assignments and allow students to ask any questions concerning the administration of the test.**

EXPECTED OPERATOR ACTIONS

EVENT: 1

BRIEF DESCRIPTION: Place generator on line and increase load IAW 3-GOP-301.

INDICATIONS: 1. Shift turnover

CREW CRITICAL STEPS: NONE

POSITION	EXPECTED ACTIONS
BOP	1. Operates atmospheric steam dumps per 3-GOP-301 Enclosure 2
	2. Places voltage regulator in service
	3. Synchronizes generator to grid
	4. Increases turbine load to 40 MWe
	5. Throttles atmospheric dumps as needed to maintain Tavg matched with Tref
	6. Closes Mid Bus GCB
	7. Adjusts generator MVARs as required
	8. Places gen core monitor in service
	9. Verifies SGFP turbine runback defeated
	10. Aligns blowdown for ops per 3-OP-071
	11. Commences MSR purge per 3-OP-072.1 @ 70MW
	12. Places atmospheric steam dumps (or condenser steam dumps if used for startup) in auto
	13. Transfers feedwater control to auto @ 10-20% power
	14. Transfers station loads to aux transformer @ 130MW
	15. Keeps ANPS informed of plant status
RCO	1. Blocks intermediate range and power range low range high flux trips > P-10 (10% power)
	2. Notifies Chemistry RCS sampling required
	3. Continues power increase using control rods and/or dilution to maintain Tavg and Tref matched
	4. Keeps ANPS informed of plant status
ANPS	1. Coordinates generator startup and load increase per 3-GOP-301
	2. Keeps NPS informed of plant status

EXPECTED OPERATOR ACTIONS

EVENT: 2

BRIEF DESCRIPTION: A failure low of LT-3-460 occurs. Actions are carried out IAW 3-ONOP-041.6 and 049.1.

INDICATIONS:
1. Annunciator A-8/4, PZR LO-LO LEVEL ALERT
2. LT-3-460 fails low
3. Letdown isolates
4. PZR heaters deenergize

CREW CRITICAL STEPS: NONE

POSITION EXPECTED ACTIONS

BOP
1. Assists in restoration of letdown as directed

RCO
1. Recognizes LT-3-460 failure and responds as directed:
   a. Compares to other PZR LTs
   b. Verifies no off-normal conditions on LT-3-459/461
2. Notifies ANPS of failure
3. Performs immediate actions of 3-ONOP-041.6:
   a. Checks pressurizer level indicators and selects channel I/III for PZR level control
   b. Checks pressurizer level following program per 3-ONOP-041.6 Enclosure 1 or place LC-3-459F /individual charging pump controllers in manual.
4. Performs subsequent actions of 3-ONOP-041.6 as directed by ANPS:
   a. Ensures LR-3-459 selected to channel I or III
   b. Restores letdown
   c. Restores normal pressurizer heater control
   d. Maintains pressurizer level on program per 3-ONOP-041.6 Enclosure 1

ANPS
1. Directs compensatory action IAW 3-ONOP-041.6/049.1
   a. Verifies RCO determination of PZR LT status
   b. Determines which bistables to trip and effects on plant of tripping bistables. Provides this info for RCO/BOP guidance. (Tripping bistables may be delayed due to plant startup in progress).
2. Notifies NPS of LT-3-460 status
3. Ensures I&C notification and PWO initiation
4. Determines Technical Specification required action to trip bistables within 1 hr.

EXPECTED OPERATOR ACTIONS

EVENT: 3

BRIEF DESCRIPTION: While attempting to move control rods in manual, a rod control logic cabinet urgent failure occurs. This stops all rod movement and results in a loss of rod control. 3-ARP-097.CR is referenced and the NPO/NWE dispatched to check the rod control cabinets for alarms. I&C is contacted to troubleshoot the problem.

INDICATIONS:
1. Control rod movement stops
2. Loss of rod control from the console
3. Annunciator B-9/4, ROD CONTROL URGENT FAILURE

CREW CRITICAL STEPS: NONE

POSITION	EXPECTED ACTIONS
BOP	1. Stops load change activities 2. Coordinates with RCO and changes turbine load to maintain Tavg near Tref 3. Performs actions to support the RCO as directed
RCO	1. Recognizes loss of rod control with urgent failure alarm and reports this to the ANPS 2. Stops load change activities 3. References 3-ARP-097.CR/3-ONOP-028 and performs actions for urgent failure a. Directs NPO/NWE to check for alarms on rod control cabinets in 3B MCC room b. Places rods in manual (if not already selected) c. Coordinates with BOP and borates/dilutes to maintain Tavg near Tref d. Does not withdraw and avoids inserting rods 4. Informs ANPS of plant status
ANPS	1. Supervises BOP/RCO implementation of 3-ARP-097.CR and 3-ONOP-028 in response to urgent failure a. Ensures Tavg kept near Tref and boration/dilution/turbine load controlled properly b. Ensures no rod withdrawal and insertion avoided 2. Informs NPS & Reactor Engineering of immovable RCCs 3. Directs I&C to troubleshoot urgent failure 4. Directs NWE to prepare PWO and coordinate repair activities with I&C 5. Refers to Tech Specs 6. Directs load decrease to continue using turbine load and boration

EXPECTED OPERATOR ACTIONS

EVENT: 4

BRIEF DESCRIPTION: PC-3-464B condenser steam dump pressure control setpoint fails low. In steam pressure control, all four condenser steam dumps open. The sudden increase in steam demand with rods not movable (urgent failure) results in a rapid plant cooldown decreasing RCS temperature and pressure. The operator attempts to manually close the condenser steam dumps however two of the valves will not respond and fully open. Steam dump controls are failed ON and in MANUAL mode. An automatic reactor trip/SI is likely due to the speed of the transient.

INDICATIONS:

1. Loss of megawatts
2. Steam dump valve open indication
3. Increasing reactor power
4. Increasing steam flow on all steam lines
5. Annunciator B-4/4, TAVG/TAVG-TREF DEVIATION
6. Annunciator B-4/5, RCS HI/LO TAVG

POSITION	EXPECTED ACTIONS
BOP	1. Recognizes steam dump valve open indication & elevated steam flow on all S/Gs 2. Checks for possible steam dump malfunction. Takes manual control of steam dumps and closes valves (steam dump control failed in ON & MANUAL). 3. **Recognizes failure of two steam dump valves to close** 4. Informs ANPS regarding plant status
RCO	1. **Trips reactor when directed** (time unlikely to permit manual action) 2. Keeps ANPS informed of plant status
ANPS	1. **Directs reactor trip following steam dump failure per 3-ONOP-028 IOA CAUTION** (time unlikely to permit manual action) 2. Directs I&C/mechanical maintenance investigation and troubleshooting of steam dump malfunctions 3. Keeps NPS informed of plant status

EXPECTED OPERATOR ACTIONS

EVENT: 5

BRIEF DESCRIPTION: In response to plant conditions, a reactor trip has occurred. Operators perform immediate actions of 3-EOP-E-0. A safety injection occurs due to uncontrolled depressurization of all SGs through two failed open condenser steam dump valves. Immediate operator actions are verified. Manual Main Steam Isolation is attempted. CV-3-2817 (train 1 AFW FCV to 3B S/G) fails open.

INDICATIONS:

1. Rod bottom lights on
2. RTBs and bypass breakers open
3. Safety injection annunciator(s)
4. Safeguards equipment automatically starts
5. Steam flows indicated on all SGs
6. Steam dump valve(s) indicate open
7. AFW flow indicated thru CV-3-2817

CREW CRITICAL STEPS: 1. SEE EVENT 6

POSITION EXPECTED ACTIONS

BOP

1. **Responds to reactor trip per 3-EOP-E-0**
   a. Verifies turbine trip
   b. Verifies power to 3A/B/D 4kV buses.
   c. Verifies feedwater isolation
   d. Verifies AFW pumps running
   e. Verifies proper ICW operation
   f. **If main steam line isolation is required, attempts manual closure of MSIVs**
   g. Verifies all four EDGs running
   h. Directs SNPO to place PAHMS in service
   i. **Verifies proper operation of AFW - NO - notes flow thru CV-3-2817. Coordinates local flow path isolation with NPO/NWE when directed**
   j. **Checks RCS cold leg temperatures stable - NO - minimizes AFW flow to all SGs (while maintaining > 390 gpm total flow) and attempts manual closure of MSIVs (if not attempted earlier)**
   k. **Performs MSLB diagnostics - recognizes & reports uncontrolled depressurization of all SGs**
2. Informs ANPS of plant status

EXPECTED OPERATOR ACTIONS (cont'd)

EVENT: 5 (cont'd)

POSITION **EXPECTED ACTIONS**

RCO

1. **Responds to reactor trip per 3-EOP-E-0**
   a. Verifies reactor tripped
   b. Determines SI actuated
   c. **Recognizes loss of subcooling and trips RCPs (if applicable)**
   d. Verifies containment isolation phase A
   e. Verifies SI pumps running
   f. Verifies proper CCW system operation
   g. Verifies CNMT cooling
   h. Verifies CNMT and control room vent isolation
   i. Verifies containment spray not required
   j. Verifies SI valve amber lights bright
   k. Resets SI
   l. Realigns SI
   m. Verifies SI flow
   n. Checks RCP seal cooling
   o. Checks RCP cooling
   p. Checks letdown/PORVs/spray valves closed
2. Notifies ANPS of SI and cause
3. Informs ANPS of plant status

ANPS

1. **Directs response to reactor trip per 3-EOP-E-0**
   a. Obtains verification of reactor trip
   b. Determines electric plant status
   c. Determines auto SI/phase A occurred
   d. **Directs manual attempt at main steam isolation**
   e. **Directs minimization of AFW to all S/Gs while maintaining >390 gpm total including direction to locally isolate CV-3-2817 flowpath.**
   f. **Monitors foldout page items including direction to RCO to stop RCPs if subcooling lost.**
2. **Transitions to appropriate plant procedure (3-EOP-E-2 or appropriate FRP)**
3. Informs NPS of plant status

EXPECTED OPERATOR ACTIONS

EVENT: 6

BRIEF DESCRIPTION: Uncontrolled depressurization of all SGs is in progress. The crew transitions to 3-EOP-E-2 then to 3-EOP-ECA-2.1. 3-EOP-FR-P.1 entry may be required due to c/d from SG depressurization.

INDICATIONS:
1. All SGs continuing to depressurize
2. MSIVs remain open with downstream break through failed open condenser steam dumps
3. 3-EOP-F-0 directs transition to 3-EOP-FR-P.1 due to RCS T_C < 320F with >100F c/d in last 60 min.

CREW CRITICAL STEPS:
1. **3-EOP-ECA-2.1: Reduce AFW to not less than 25 gpm per S/G prior to reaching integrity orange path. 3-EOP-FR-P.1 (orange): Control AFW flow in order to minimize c/d prior to reaching red path on FR-P.1.**
2. **3-EOP-FR-P.1 (orange): Terminate SI flow to prevent P.1 red path. 3-EOP-FR-P.1 (red): Terminate SI flow to control RCS pressure & temperature before the end of the scenario.**

POSITION	EXPECTED ACTIONS
BOP	1. **Performs actions of 3-EOP-E-2 as directed:** a. Checks status of MSIVs & bypasses b. Directs attempt to locally close MSIVs c. **Observes all SGs continue to depressurize** 2. **Performs actions of 3-EOP-ECA-2.1 as directed:** a. Checks secondary pressure boundary b. Establishes alternate FW supply & isolates steam to AFW pumps c. **Minimizes RCS c/d. Feeds @ 25gpm per S/G if c/d >100°F/hr or as needed to stabilize RCS Th)** d. Checks CST level greater than 10% e. Checks secondary radiation f. Resets CNMT Isolation Phase A and B g. Verifies IA pressure >95 psig h. Checks power to charging pumps from offsite 3. **Performs actions of 3-EOP-FR-P.1 as directed:** a. Checks RCS Tc stable or increasing b. **Minimizes cooldown from faulted S/Gs by controlling feed flow @ 25 gpm per SG** c. **If any HHSIPs running and RCS inventory / subcooling adequate, resets CNMT isolation phase A/B and verifies CNMT IA pressure >95 psig** 4. Informs ANPS of plant status

EXPECTED OPERATOR ACTIONS (cont'd)

EVENT: 6 (cont'd)

POSITION	EXPECTED ACTIONS
RCO	1. **Performs actions of 3-EOP-ECA-2.1 as directed:** a. Checks if RCPs should be stopped b. Checks PORVs and block valves c. Checks if RHR pumps should be stopped d. Checks if containment spray should be stopped e. Checks if RWST level > 155,000 gallons f. Verifies SI reset g. Verifies instrument air to CNMT h. Checks if accumulators should be isolated i. Checks if charging flow established **j. Checks for SI termination and stops HHSI & RHR pumps if applicable** 2. **Performs actions of 3-EOP-FR-P.1 as directed:** a. Checks RCS pressure for LBLOCA indication b. Checks status of PORVs & PORV block valves **c. If any HHSIPs are running and RCS inventory / subcooling adequate, resets SI, establishes charging, and stops RHR and HHSI pumps.** 3. Informs ANPS of plant status
ANPS	1. Directs performance of 3-EOP-E-2 **2. Transitions to 3-EOP-ECA-2.1** **3. Directs performance of 3-EOP-ECA-2.1 / 3-EOP-FR-P.1 (whichever applies)** **a. Directs BOP control of feed flow to minimize RCS cooldown** **b. Directs SI termination if RCS inventory / subcooling adequate & charging established** **4. Monitors foldout page items and transitions to 3-EOP-E-2 or appropriate FRP if required.** 5. Informs NPS of plant status

SIMULATOR INSTRUCTOR FACILITY OPERATING INSTRUCTIONS

I. SETUP

A. Reset to IC-20.

B. Load scenario 57.

C. Following switch check, unfreeze the simulator and ensure plant stable with annunciators locked in. Place simulator back in freeze.

D. Perform the following
   1. Place the condenser steam dump control selector switch to MANUAL.
   2. Enter the following failures:
      a. Fail all MSIVs open. Delete TVSBVL10=0.04 from Parameter Controller Composite Trigger STM HDR. Then actuate this composite trigger.
      b. Arm the following to place PAHMs in service in event 5 (touch SYS MAT->CONTAINMENT->VENTILATION &PAHMS->002A->VALVE PORT AREA->arm TAC2V02A=1.0 ->002B->VALVE PORT AREA->arm TAC2V02B=1.0-> WASTE GAS DISPOSAL->HV1->VALVE PORT AREA->arm TAAAV21=1.0->HV3->VALVE PORT AREA->arm TAAAV22= 1.0->CNTMT LIQ->CTCM->MPAS-005->VALVE PORT AREA ->arm TACA005=0.0).
      c. Fail CV-3-2817 open after AFW actuation (parameter controller composite trigger EOOS with all items deleted except TFFY017=T conditional on F5:SIAFB GT 4000).

E. Delete all conditional events from Parameter Controller Event Summary **except** those indicated on the Parameter Controller Event Summary pages in this exercise guide. Direct events may deleted at instructor discretion.

F. Place turnover sheet on RCO desk.

G. Clearance information tags - None.

H. Information tags - Steam Dump Control Mode Selector Switch to MANUAL

II. CONDUCTING THE EXAMINATION:

A. Unfreeze the simulator and begin the exam.

SIMULATOR INSTRUCTOR FACILITY OPERATING INSTRUCTIONS (cont'd)

B. **Startup Main Generator & Synchronize to Grid (event 1).**

1. **Initiation:** Per initial conditions.

2. **Response:** Respond as field operator to check out pumps/ equipment as directed. Respond as other plant departments (Chemistry, management, etc.) as required. There are no holds to go to 100% power. If operators take too long to get unit on line, prompt them as System for faster action. When asked to open valves 3-2076(2080)(2084)(2088), wait 4-6 min. and comply by touching SYS MAT->FEEDWATER HEATING->HIGH PRESS FW HEATERS & RHTR & HTR DRAIN TANKS->V2076(2080)(2084)(2088)->VALVE PORT AREA->set TAUT2077(2081)(2085)(2089)=1.0. Later when asked to locally open valves 3-2074(2078)(2082)(2086) and close those opened above, use the same system mimic page and set TAUT2075(2079)(2083)(2087)=1.0/TAUT2077(2081)(2085)(2089)=0.0.

C. **LT-3-460 Fails Low (event 2).**

1. **Initiation:** Once S/G level control has been placed in automatic, actuate the LT-3-460 failure (touch SYS MAT->REACTOR COOLANT SYSTEM->PRESSURIZER->L-460->LT460->TRANSMITTER FAIL LOW ->set TFH1TV60=T). This will cause letdown isolation without affecting PZR level control. Letdown can be restored.

2. **Response:** Respond as NPS, NWE or I&C to notification of LT-3-460 failure. As NPS/NWE state that a work request will be generated and I&C notified. As I&C, reply that a planner will intiate a work package for troubleshooting & repair.

D. **Rod Control Urgent Failure (event 3).**

1. **Initiation:** After restoration of letdown in event 2, touch SYS MAT->REACTOR->ROD CONTROL ROD POSITION->ROD SPEED TO LOGIC CABINET->LOGIC CABINET->LOGIC CABINET URGENT ALARM->set TFL1UAL=T during the next rod movement.

2. **Response:** When directed as NPO/NWE to check the unit 3 rod control logic cabinet for alarms, wait 2-4 minutes and report the logic cabinet urgent failure light is ON. Respond as NPS/ Reactor Engineering when notified that rods can not be moved. Respond as the NWE if asked to prepare a PWO and/or work with I&C. Respond as I&C if asked to investigate the cause. After 10-15 minutes, tell the crew that the problem is most likely a failed logic cabinet circuit card and troubleshooting is in progress to find out the exact cause. Do not repair this problem during the scenario. Respond as the system dispatcher when notified of the delay in power ascension.

SIMULATOR INSTRUCTOR FACILITY OPERATING INSTRUCTIONS (cont'd)

E. **PC-3-464B Fails Low (event 4).**

1. **Initiation:** After stabilization of plant conditions from event 3 (or as directed by the lead examiner) fail condenser steam dump valves CV2829 & 2830 fully open when the BOP presses the MAN pushbutton on PC-3-464B (touch SYS MAT->STEAM GENERATOR & MAIN STEAM->MAIN STEAM->MAIN STEAM PROC->CV2829 & 2830->FAIL OPEN->set TFSVV93A & TFFSVV94A=T conditional on IMS1MAN). Then fail condenser steam dump control to ON & MANUAL (touch STYL INST->A302->SBB 758->OVERRIDE->STM DUMP CONTROL->STM DUMP CONTROL ON->set IDS191ON=T->RECALL->759->OVERRIDE->STEAM DUMP TO CONDSR MODE SEL->STEAM DUMP MODE SELECT MANUAL->set IDS191MN=T) before failing the PC-3-464B pressure setpoint to zero opening all four condenser steam dumps (RECALL->OVERRIDE-> STEAM PRESS CONTROL->PC464B SETPT->set IAS1VSP=0).

2. **Response:** Respond as NPS, NWE or I&C to notification of PC-3-464B failure. As NPS/NWE state that a work request will be generated and I&C will be notified. As I&C, reply that a planner will initiate a work package for troubleshooting & repair. Respond as NPO/NWE when directed to locally investigate why the two condenser steam dump valves remained open when the controller demand was manually reduced to zero. If asked to close the manual isolation valves 3-10-023 & 024 for the failed condenser steam dumps, reply after 3-5 minutes that neither valve can be moved off of their open seats and Mechanical maintenance assistance is needed. Similarly, if directed to isolate air to the failed steam dump valves, provide feedback 3-5 minutes later that even with air isolated both valves remain full open. Acknowledge requests as Mechanical maintenance to either close the failed open steam dump valves or their associated manual isolation valves. Provide feedback after 10-15 minutes that little can be done at power to repair either steam dump. Also indicate that both manual isolation valves appear to have their packing improperly installed and are bound open. The plant must be shutdown to repair these valves.

F. **Two Condenser Steam Dumps Stick Open (Reactor Trip/SI) with AFW FCV failure (event 5)**

1. **Initiation:** From setup and event 4.

SIMULATOR INSTRUCTOR FACILITY OPERATING INSTRUCTIONS (cont'd)

F. **Two Condenser Steam Dumps Stick Open (Reactor Trip/SI) with AFW FCV failure (event 5 cont'd)**

2. **Response:** If asked as NPO/NWE to investigate the MSIV or of the train 1 AFW to 3B S/G FCV failures to close, reply after 3-5 minutes for each request that the valves are indeed failed open and can not be locally closed. Request maintenance assistance. If asked to close AFW train 1 to 3B S/G isolation valve 3-20-241, wait 1-3 minutes and touch SYS MAT->FEEDWATER-> AUX F/W FEED->241->VALVE PORT AREA->set TAFK241 =0 on a 60 second ramp. Report to crew when valve is closed.
If asked as maintenance to investigate the MSIVs failure, state that troubleshooting will begin as soon as possible. The MSIV problem will not be fixed during this scenario.
Respond as SNPO to place PAHMs in service per 3-OP-094 by pressing MAST FAIL. After approximately 15 minutes inform the crew that PAHM is aligned. Respond as NPO to place unloaded EDGs in standby per 3-OP-023.

G. **Main Steam Isolation Valves Fail Open / Uncontrolled Depressurization of All Steam Generators (event 6)**

1. **Initiation:** A result of events 4 & 5 and the scenario setup, this event entered by procedural transition from 3-EOP-E-0 to 3-EOP-E-2 and then to 3-EOP-ECA-2.1.

2. **Response:** Consistent with event 5. Provide support as required to align a feed source to the unit to allow shutting down AFW. If SSGFP desired, respond as NPO to line up pump, responding complete 3-5 minutes later (SYS MAT->FEEDWATER-> MAIN FEEDWATER MENU->FEEDWATER REGULATOR VALVES->DWDS-012-> VALVE PORT AREA->set TAFA012=0.05 initially, then =1.0 after SSGFP start). If use of B SSGFP is desired, respond as Unit 4 RCO/NPO reporting pump start 2 minutes later (from FEEDWATER REGULATOR VALVE page touch P82B->LOCAL HANDSWITCH->set TCF1P82B=T). Open the AFW MOV breakers and close the valves when requested (parameter controller trigger composite "AFW-MOV'"). Support as Chemistry for sampling (need secondary sample valves MOV-3-1425/6/7 re-opened by control room crew) and HP for surveys (no abnormal secondary radiation). Respond if necessary as SNPO for accumulator breakers (parameter controller direct trigger composite "CLOSEACC" to close accumulator breakers and trigger composite "ACCUMBKR" to re-open said breakers) and any other aux. bldg. activities (starting charging pumps, etc.). Respond as NPO for realigning aux steam (touch SYS MAT->FEEDWATER->AUX F/W STEAM->SLWU-3-001->VALVE PORT AREA->set TAFF02=1.0->007->VALVE PORT AREA-> TAFF007=0) reporting task completion 4-6 minutes later.

III. TERMINATION CRITERIA:

A. Upon SI termination (step 18 of 3-EOP-ECA-2.1 or step 12 of 3-EOP-FR-P.1), **OR**

B. At the discretion of the evaluator.

PARAMETER CONTROLLER FILE:

COM-POS-ITE	CDB LABEL	VALUE	CONDITIONAL	TIME DELAY	RAMP	DESCRIPTION
Y	**"STM HDR"**	-	-	-	-	**All MSIVs fail open** (ensure stm hdr brk deleted)
-	TFSVVX5A	T	-	-	-	3A MSIV (POV-3-2604) fails open
-	TFSVVX6A	T	-	-	-	3B MSIV (POV-3-2605) fails open
-	TFSVVX7A	T	-	-	-	3C MSIV (POV-3-2606) fails open
Y	**"ACCUMBKR"**	-	-	0:30	-	**Opens breakers for accumulator outlet valves**
-	TCM2D49M	F	-	0:30	-	Opens MOV-3-865A breaker 30532
-	TCM2D50M	F	-	1:00	-	Opens MOV-3-865B breaker 30631
-	TCM2D51M	F	-	1:30	-	Opens MOV-3-865C breaker 30733
Y	**"CLOSEACC"**	-	-	-	-	**Closes breakers for accumulator outlet valves**
-	TCM2D49M	T	-	0:30	-	Closes MOV-3-865A breaker 30532
-	TCM2D50M	T	-	0:45	-	Closes MOV-3-865B breaker 30631
-	TCM2D51M	T	-	1:00	-	Closes MOV-3-865C breaker 30733
Y	**"AFW-MOV' "**	-	-	-	-	**Opens breakers and closes AFW pump MOVs**
-	TCF5MA27	F	-	0:30	-	Opens MOV-3-1405 breaker 3D01-27
-	TCF5MB28	F	-	1:00	-	Opens MOV-3-1403 breaker 4D01-28
-	TCF5M527	F	-	1:30	-	Opens MOV-3-1404 breaker 30833
-	TFFXC05	T	-	3:00	-	Fails MOV-3-1405 closed
-	TFFXC04	T	-	4:00	-	Fails MOV-3-1404 closed
-	TFFXC03	T	-	5:00	-	Fails MOV-3-1403 closed
Y	**"EOOS"**	-	-	-	-	**Enters setup failure** (delete all but conditional)
-	TFFYO17	T	F5:SIAFB GT 4000	-	-	Fails CV-3-2817 (train 1 AFW FCV to 3B S/G) when B AFWP turbine speed > 4000 RPM.

EVALUATION SCENARIO REFERENCES

Reference List:

PROCEDURE #	PROCEDURE TITLE
3-GOP-301	Hot Standby to Power Operation
3-OP-094	Containment Post-Accident Monitoring
3-ARP-097.CR	Control Room Annunciator Response
3-ONOP-028	Reactor Control System Malfunction
3-ONOP-041.6	Pressurizer Level Control Malfunction
3-ONOP-049.1	Deviation or Failure of Safety Related or Reactor Protection Channels
3-EOP-E-0	Reactor Trip or Safety Injection
3-EOP-E-2	Faulted Steam Generator Isolation
3-EOP-ECA-2.1	Uncontrolled Depressurization of All Steam Generators
3-EOP-FR-P.1	Response to Imminent Pressurized Thermal Shock Condition
0-EPIP-20101	Duties of the Emergency Coordinator
	PTN Technical Specifications
	Plant Curve Book

EVALUATION SCENARIO CONTENT SUMMARY

1. Total Number of Malfunctions: 6

2. Malfunctions Occurring During EOP Performance: 1

   1. CV-3-2817 (train 1 AFW FCV to 3B S/G) fails open

3. Abnormal Events: 4

   1. LT-3-460 fails low (letdown isolation)
   2. Rod Control urgent failure
   3. PC-3-464B fails low (steam dumps open)
   4. Two steam dumps stick open

4. Major Transients: 1

   1. Depressurization of all Steam Generators (all MSIVs failed open)

5. EOPs Used: 1(2)

6. EOP Contingencies Entered: 1(2)

7. Simulator Run Time: 90 minutes

8. EOP Run Time: 30 minutes

9. Crew Critical Tasks: 2

Florida Power & Light Co.

Turkey Point Nuclear Plant

1999 NRC Operating Exam
Simulator Scenario
Draft Redline Copies

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Facility: Turkey Point Nuclear Plant **Scenario No.:** 1 **Op-Test No.:** PTN Group XVIII

Examiners: _____ **Operators:** _____

Objectives: To evaluate the applicants' ability to use off-normal procedures for PZR pressure control channel PT-3-445 failing high followed by an unisolable leaking PZR PORV requiring a load reduction. Evaluate ability of operators to recognize & respond to a turbine first stage impulse pressure channel failing low. Emergency Operating Procedure use will be evaluated following the reactor trip for C S/G main steam line break inside Containment, failure of the main turbine to trip, 3B MSIV fails open, and a loss of all auxiliary and standby feedwater requiring RCS bleed and feed due to loss of secondary heat sink.

Initial Conditions: 100% power, EOL

Turnover: Maintain 100% power steady state operation. Condenser steam dumps are in steam pressure control due to a problem with the Tavg input which is under I&C investigation. LT-3-498 & A AFW pump are both OOS for corrective maintenance. B AFW pump is aligned to train 2 and C AFW pump is aligned to train 1. No surveillance tests are in progress.

Event No.	Malf. No.	Event Type*	Event Description
1	TFH1TU45 = T	I (SRO) I (RO)	PT-3-445 fails high (PORV-3-456 closure required). K/A 027AA2.15 (3.7/4.0)
2	TVHV456 = 0.~~7~~ 6 / 30 sec ramp TFH2906F = T conditional on IMH231C	C (SRO) C (RO)	PZR PORV-3-456 develops a leak and MOV-3-535 fails to close. K/A 010A2.03 (4.1/4.2)
3	N/A	N (SRO/BOP) R (RO)	Power reduction to hot standby. K/A 2.1.23 (3.9/4.0)
4	TFS1MAML = T	I (SRO) I (BOP)	PT-3-447 fails low. K/A 016A2.01 (3.0/3.1)
5	TVSBVL15 = 0.2/ 300 sec ramp TFU10005 = T TFSVVX6C = T	M (ALL)	3C S/G main steam line break resulting in reactor trip with failure of main turbine trip and 3B MSIV failing open. K/A 040AA1.01 (4.6/4.6), 040AA1.13 (4.2/4.2)
~~6~~	TFFXOILB = T / TAFF07=0.0	C (SRO) ~~C (BOP)~~	Failure of the train 2 (B) AFW pump to automatically start and inability to align train 1 AFW steam supply from an intact S/G. K/A 061A2.04 (3.4/3.8)
~~7~~ 6	from events ~~5 & 6~~	M (ALL)	Loss of secondary heat sink with bleed & feed required. K/A WE05EA1.1 (4.1/4.0)

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

FLORIDA POWER AND LIGHT

TURKEY POINT NUCLEAR POWER PLANT

GROUP XVIII RO/SRO NRC INITIAL LICENSE EXAM

SIMULATOR EVALUATION SCENARIO EXERCISE GUIDE

PROGRAM:	RO/SRO Initial License Training
EXERCISE GUIDE:	XVIII NRC 1
DESCRIPTION:	Main Steam Line Break (Inside Containment) / Loss of All Feedwater
LENGTH:	90 minutes
AUTHOR:	G. M. Blinde
REVISION DATE:	04/27/99

REVIEWED BY: Bretton 6-11-99
Facility Reviewer Date

APPROVED BY: _____
NRC Chief Examiner Date

EVALUATION SCENARIO OBJECTIVES

TERMINAL OBJECTIVE: During normal and abnormal plant conditions, the Shift Operating Crew will perform control room operations in accordance with (IAW) approved plant procedures ensuring that the health and safety of the public is protected and the integrity of the plant maintained.

ENABLING OBJECTIVES:

1. Given specific plant conditions, plant procedures, and a shift turnover, respond to the following events IAW approved plant procedures:
   a. PT-3-445 failure high
   b. Unisolable PZR PORV leak
   c. Power reduction due to PZR leak
   d. PT-3-447 failure low
   e. Main steam line break
   f. Reactor trip with main turbine trip & 3B MSIV failures
   g. Loss of all auxiliary feed
   h. Loss of secondary heat sink with RCS bleed & feed

2. Given abnormal plant conditions, mitigate the adverse consequences of the following events IAW approved plant procedures:
   a. Identify abnormalities while assessing actual system response with respect to predicted system response.
   b. Investigate the cause and effect of abnormalities in system performance.
   c. Implement applicable procedures.
   d. Perform immediate actions from memory.

3. Given abnormal plant conditions, implement the applicable on-site and off-site reports and notifications IAW approved plant procedures.

4. Given normal and abnormal plant conditions, using the following principles for operational effectiveness as they apply to all operators, conduct plant operations IAW approved plant procedures:
   a. Plant and control room communication.
   b. Plant/Control Board monitoring.
   c. Plant/Control Board manipulation.
   d. Operational problem solving.
   e. Use of OPs/ONOPs and Technical Specifications.
   f. Use of EOPs IAW EOP Rules of Usage.
   g. Annunciator recognition and response.
   h. Written communications/logs.
   i. ALARA awareness.

EVALUATION SCENARIO OBJECTIVES (cont'd)

5. Given normal and abnormal plant conditions, using the following principles for operational effectiveness as they apply to the Assistant Nuclear Plant Supervisor (ANPS), conduct plant operations IAW approved plant procedures:

   a. Team performance management.
   b. Problem solving.
   c. Decision analysis.
   d. Action planning.
   e. Self-checking.

6. During abnormal and emergency events, the shift operating crew shall apply techniques of teamwork and self-checking IAW established work practices and operating guidelines.

EVALUATION SCENARIO DESCRIPTION

Initial Conditions: Mode 1, 574 degrees F

Turnover: Maintain 100% power steady state operation. Condenser steam dumps are in steam pressure control due to a problem with the Tavg input which is under I&C investigation. LT-3-498 & A AFW pump are both OOS for corrective maintenance. B AFW pump is aligned to train 2 and C AFW pump is aligned to train 1. No surveillance tests are in progress.

Synopsis: Shortly after shift turnover, PT-3-445 fails high causing PZR PORV PCV-3-456 to automatically open. Operators respond per 3-ONOP-041.5 by manually closing the opened PORV. Following stabilization of plant conditions (or completion of 3-ONOP-041.5 at evaluator discretion), that same PORV (PCV-3-456) develops a leak. Operators respond by attempting to close MOV-3-535 which trips on breaker overload leaving the leak unisolated. The crew re-enters 3-ONOP-041.5, evaluates Tech Specs and determines a plant shutdown is needed due to the unisolable PZR steam space leak (rate at Ops management direction). After a 5% power reduction (or as determined by the evaluator), PT-3-447 fails low. The resulting automatic rod insertion requires the operator to take rod control to manual per 3-ONOP-028. Once Technical Specifications have been consulted and the crew briefed on the effects of the failure, a steam break occurs on the 3C steam generator inside containment. The crew responds per 3-EOP-E-0 and addresses a failure of the main turbine to trip and a failure of the B AFW pump to start causing a loss of all auxiliary feed water (A AFW pump OOS, B AFW pump failed, C AFW pump aligned to the faulted steam generator for steam supply). Additionally, 3B MSIV fails to close manually from the console switch or in response to Main Steam Isolation Signal on high Containment pressure. Transition to 3-EOP-FR-H.1 is made in response to low steam generator levels (3B MSIV & turbine trip failures combined) with a loss of all AFW. Steam generator levels are sufficiently low to require RCS bleed and feed initiation. The exercise is concluded upon establishment of adequate RCS heat removal by bleed & feed (3-EOP-FR-H.1 step 24) or at the evaluator's discretion. The event is classified after scenario completion as a site area emergency per 0-EPIP-20101, Enclosure 1, category 5.

Event Summary:

EVENT #	DESCRIPTION
1	PT-3-445 fails high
2	PZR PORV-3-456 leak / MOV-3-535 overload trip
3	Power reduction
4	PT-3-447 fails low
5	3C S/G main steam line break/reactor trip/turbine trip & 3B MSIV failures
6	Loss of all auxiliary feed water (train 2 AFW pump start failure/AFSS-3-007 stuck shut)
7	Loss of secondary heat sink (bleed & feed required)

Crew Critical Steps:

EVENT #	DESCRIPTION
5	1. Manually actuate steam line isolation (buttons or MSIV switches) prior to orange path on subcriticality or integrity or transition to 3-EOP-ECA-2.1 (whichever occurs first) (applicable only after main steam line isolation step is read).
7	1. When required, initiate RCS bleed and feed so that the RCS depressurizes sufficiently for HHSI injection flow to occur.

Individual Critical Steps:

The bolded individual actions listed under the respective positions (RCO, ANPS, etc.) are for use during evaluations to identify steps that are critical to the individual position.

EVALUATION SCENARIO PRE-EXERCISE BRIEFING

1. **Review the following with students:**
   a. Primary responsibility of the student is to operate the simulator as if it were the actual plant.
   b. The evaluators will observe teamwork skills, communication, and the crew's ability to safely operate the plant during the simulator examination. This includes individual & crew performance.
   c. If you recognize an incorrect decision, response, answer, analysis, action, or interpretation by another crew member but fail to correct it, then the evaluator may assume that you agree with the incorrect item.
   d. The crew should keep a rough log during each scenario sufficient to complete necessary formal log entries.
   e. The simulator instructor facility operator will perform all of the functions of personnel needed outside the control room area.
   f. Before the examination begins, crew members may perform a control board walkdown for up to 10 minutes.
2. **The following are initial conditions for this exam** (in shift turnover package, but may be covered verbally if needed):
   a. Time in core life - EOL
   b. Reactor power and power history - 100% steady state
   c. Turbine status - online
   d. Boron concentration - 51 ppm
   e. Temperature - 574 degrees F
   f. Pressure - 2235 psig
   g. Xenon - Equilibrium for 100% power.
   h. Core cooling - forced
   i. Tech. Spec. LCO(s) in effect
      - 3.7.1.2 Action 3 (30 days); A AFW pump bearing failure
   j. Clearances in effect - A AFW pump
   k. Significant problems/abnormalities - Condenser steam dumps in steam pressure (manual) control due to Tavg input problem. I&C investigating. C AFW pump aligned to train 1. LT-3-498 OOS; LT-3-496 selected for 3C S/G level control.
   l. Evolutions/maintenance for the coming shift - Maintain 100% power steady state operation.
   m. Units 1 and 2 status - unit 1 online; unit 2 s/d
   n. Unit 4 status - mode 5 on RHR
3. **Ensure students understand examination schedule** and that a break will be necessary between scenarios to allow simulator initial condition setup. **Cover exam security rules** to be observed by students both during and after the exam IAW the latest revision of AG-017 or NUREG-1021 as applicable.
4. **Before the examination begins, make crew position assignments and allow students to ask any questions concerning the administration of the test.**

EXPECTED OPERATOR ACTIONS

EVENT: 1

BRIEF DESCRIPTION: Pressure transmitter PT-3-445 fails high opening PORV PCV-3-456 and decreasing pressure. The problem is diagnosed and the PORV / block valve closed stopping the pressure decrease. The plant is stabilized and PT-3-445 is declared OOS.

INDICATIONS:

1. PT-3-445 failed high
2. PORV PCV-3-456 opens automatically
3. RCS pressure decreases
4. Annunciator A-4/1, PORV/SAFETY OPEN

POSITION	TIME	EXPECTED ACTIONS
BOP		1. Assists RCO as directed by ANPS
RCO		1. Recognizes & reports PZR press control problem
		2. Verifies PZR press control loop not failed - NO
		a. Checks PT-3-444 not failed.
		b. Recognizes PT-3-445 failed high.
		c. Closes PZR PORV PCV-3-456 and/or block valve MOV-3-535
		3. Verifies PZR PORVs closed
		4. Verifies PZR spray valves closed
		5. Verifies PZR safety valves closed
		6. Checks PZR pressure stable/increasing
		7. Checks PZR pressure above normal - NO
		8. Checks PZR pressure low/decreasing
		9. Maintains PZR pressure greater than 2000 psig

EXPECTED OPERATOR ACTIONS (cont'd)

EVENT: 1 (cont'd)

POSITION	TIME	EXPECTED ACTIONS
RCO (cont'd)		10. Verifies PZR heaters operable
		11. Checks if PZR PORV is leaking - NO
		12. Checks if leaking PZR safety is reducing pressure - NO
		13. Determines if RCS leak is reducing pressure - NO
		14. Checks if PZR pressure decreasing - NO
		15. Checks RCS pressure stable
		16. Checks if auto pressure control can be established
		17. Establishes auto pressure control
		18. Keeps ANPS informed of plant status
ANPS		1. Coordinates/directs performance of 3-ONOP-041.5
		2. Reviews Technical Specifications
		3. Ensures I&C notified
		4. Keeps NPS informed of plant status

EXPECTED OPERATOR ACTIONS

EVENT: 2

BRIEF DESCRIPTION: A pressurizer PORV begins to leak reducing RCS pressure. 3-ONOP-041.5 is entered, but the associated block MOV trips on overload before the leak is isolated. Tech Specs are referenced and the decision made to shut down.

INDICATIONS:

1. Annunciator A-9/2, PZR CONTROL HI/LO PRESS
2. Annunciator A-4/1, PORV/SAFETY OPEN
3. Annunciator A-7/2, PZR PORV HI TEMP
4. RCS/PZR pressure decreasing
5. PZR PORV acoustic monitor flow indicators lit

POSITION	TIME	EXPECTED ACTIONS
BOP		1. Verifies PZR PORV leak using acoustic monitors
		2. Informs ANPS of plant status
RCO		1. **Recognizes PZR PORV leaking and notifies ANPS**
		2. **Performs 3-ONOP-041.5 actions at ANPS direction:**
		a. Checks PT-3-444/445 not failed (445 failed but previously addressed)
		b. Checks PZR PORVs/safeties/spray vlvs closed
		c. **Identifies leaking PZR PORV,** attempts to manually close block valve and **reports loss of block valve position indication to ANPS**
		d. Determines PZR press < normal / decreasing
		e. **Maintains PZR press > 2000 psig with PZR heaters ON** - finds PZR press low but stable
		f. Determines PORV is leaking and not isolated
		g. Determines PZR safeties are not leaking
		3. Informs ANPS of plant status

EXPECTED OPERATOR ACTIONS (cont'd)

EVENT: 2 (cont'd)

POSITION	TIME	EXPECTED ACTIONS
ANPS		**1. Directs PZR safety leak response per 3-ONOP-041.5**
		a. Directs MOV-3-535 closure & response to ensuing overload trip including direction to locally reclose MOV-3-535 breaker (will not reclose)
		b. Ensures all PZR htrs on to keep pressure > 2000 psig
		c. Directs STA to perform RCS leak rate
		d. Concludes PZR pressure low/stable and > 2000 psig due to unisolable leaking PZR PORV
		2. Reviews T.S. 3.4.4 & 3.2.5 and determines action for leaking PORV can not be met requiring s/d to HSD (also DNB T.S. requires press >2200 psig in 2 hrs or power < 5% in following 4 hours)
		3. Informs NPS of plant status & requests electrical maintenance support with block MOV bkr

EXPECTED OPERATOR ACTIONS

EVENT: 3

BRIEF DESCRIPTION: With reactor power initially at 100% power, a power reduction to Hot Standby is commenced in response to an unisolable PZR PORV leak.

INDICATIONS: 1. NPS/Ops Management direction

POSITION	TIME	EXPECTED ACTIONS
BOP		1. Reduces turbine load IAW 3-ONOP-100 or 3-GOP-103
		a. Maintains Tref within 3°F of Tavg if rods in manual (1°F if rods in auto)
		b. Monitors gland seal steam pressure & directs local operation of supply/spillover as req'd
		2. Performs secondary plant s/d generator-load-dependent activities IAW 3-ONOP-100 or 3-GOP-103
		3. Performs activities as directed by ANPS
		a. Inhibits MIMS if in service
		b. Notifies Chemistry of need to sample RCS if reactor power reduced > 15%
		4. Keeps ANPS informed of plant status
RCO		1. Reduces rx power IAW 3-ONOP-100 or 3-GOP-103
		a. Calculates ρ change req'd to reduce power and borates at rate directed by ANPS
		b. Energizes PZR backup heaters
		c. Coordinates w/BOP to keep Tref w/i 3°F of Tavg w/rods in manual (1°F w/rods in auto)
		d. Observes AFD limitations
		e. Starts additional charging pump
		2. Keeps ANPS informed of plant status

EXPECTED OPERATOR ACTIONS (cont'd)

EVENT: 3 (cont'd)

POSITION	TIME	EXPECTED ACTIONS
ANPS		1. Coordinates power reduction activities of RCO & BOP
		2. Performs other activities IAW 3-ONOP-100 or 3-GOP-103
		a. Evaluates Xe changes and directs boration rate changes as necessary
		3. Notifies System Dispatcher of load reduction
		4. Keeps NPS informed of plant status

EXPECTED OPERATOR ACTIONS

EVENT: 4

BRIEF DESCRIPTION: First stage pressure transmitter PT-3-447 fails low. The crew recognizes the failure, selects PT-3-446 for control, and regains control of S/G level. The channel is declared OOS and compensatory actions taken per 3-ONOP-049.1.

INDICATIONS:

1. Failure low of PI-3-447 (VPA)
2. Control rods insert (if in auto rod control)
3. S/G levels decrease
4. Annunciators C-7/1(2)(3), SG A(B)(C) STEAMLINE HI FLOW
5. Annunciator C-8/3, STEAM DUMP ARMED/ACTUATED
6. Annunciator B-4/4, TAVG/TAVG-TREF DEVIATION

POSITION	TIME	EXPECTED ACTIONS
BOP		1. Recognizes failure of PT-3-447 and responds as directed by ANPS a. Compares to other turb 1st stage impulse PT's b. Verifies no off-normal conditions on related indications 2. Notifies ANPS of failure 3. Takes manual control of S/G level if necessary
RCO		1. **Selects manual rod control (if in auto) in response to inward rod movement** (may refer to 3-ONOP-028) 2. Selects PT-3-446 as controlling channel 3. Informs ANPS of plant status

EXPECTED OPERATOR ACTIONS (cont'd)

EVENT: 4 (cont'd)

POSITION	TIME	EXPECTED ACTIONS
ANPS		1. Directs stabilization of plant conditions. May suspend load reduction to perform actions of 3-ONOP-049.1 or may continue load reduction and trip bistables later.
		2. Directs compensatory action per 3-ONOP-049.1
		a. Verifies related instrument status
		b. Determines which bistables to trip and effects on plant of tripping bistables. Provides this info to RCO/BOP for guidance.
		c. Directs bypass of inputs to AMSAC
		3. Notifies NPS of plant status
		4. Ensures Tech. Spec. 3.3.1/2 requirements met
		5. Ensures I&C notification of PT-3-447 failure and directs initiation of PWO.

EXPECTED OPERATOR ACTIONS

EVENT: 5 ~~6~~/~~6~~

BRIEF DESCRIPTION: In response to a 3C S/G steam break inside Containment, reactor trip and SI occur. Operators perform actions of 3-EOP-E-0. The auto & manual turbine trip fails. When MSIVs are closed/verified closed, 3B MSIV fails open. No AFW flow exists (no pumps available: A OOS, B start fail, C aligned to faulted S/G). Transition to FR-H.1 is made.

INDICATIONS:

1. Reactor trip & SI directed or actuates
2. Turbine stop valves & 3B MSIV remain open
3. GCBs do not open
4. 3B & C S/G Pressures dropping
5. Containment temperature & pressure rising
6. No AFW flow & AFW pump speeds at/near zero

CREW CRITICAL STEPS:

1. **Manually actuate steam line isolation (buttons or MSIV switches) prior to orange path on subcriticality or integrity or transition to 3-EOP-ECA-2.1 (whichever occurs first) (applicable only after main steam line isolation step is read).**

POSITION	TIME	EXPECTED ACTIONS
BOP		1. **Performs IOAs in response to reactor trip with turbine trip failure per 3-EOP-E-0:**
		a. **Verifies all turb. stop valves closed - NO**
		1) Manually trips turb/verifies trip - NO
		2) **Closes MSIVs/byp vlvs - 3B fails open**
		b. Verifies MSR purge steam & steam stop MOVs closed with timing cam @ zero
		c. **Verifies open Mid/East GCBs - NO**
		1) **Manually opens Mid/East GCBs** (may also open exciter field breaker)
		2. Performs other 3-EOP-E-0 immediate actions:
		a. Verifies power to 3A/B/D 4kV buses and 3A/B/C/D/H 480V load centers.

EXPECTED OPERATOR ACTIONS (cont'd)

EVENT: 5 ~~&/6~~ (cont'd)

POSITION	TIME	EXPECTED ACTIONS
BOP (cont'd)		**3. Performs 3-EOP-E-0 prompt actions at ANPS direction:**
		a. Verifies feedwater isolation
		b. Verifies AFW pumps running - NO
		1) Manually open valves to start 2 AFW pumps
		2) **Determines NO AFW pumps available (A OOS, B start fail & C steam supply from faulted S/G).** Dispatches local operators to check B AFW pump.
		c. Verifies proper ICW operation
		d. Checks if main steamlines should be isolated (already isolated in IOAs)- 3B MSIV still open
		e. Verifies all EDGs running
		4. Performs subsequent actions of 3-EOP-E-0 as directed by ANPS
		a. Directs SNPO to place PAHMS in service
		b. Verifies proper AFW alignment and flow - NO
		1) Checks S/G NR level >6%[32%] - NO
		2) Verifies AFW flow > 390 gpm - NO
		3) Manually starts pumps / directs ANPO/NPO valve realignment as directed by ANPS to get AFW > 390 gpm - NO
		5. Keeps ANPS informed of plant status

EXPECTED OPERATOR ACTIONS (cont'd)

EVENT: 5 ~~6~~ (cont'd)

POSITION	TIME	EXPECTED ACTIONS
RCO		1. Performs IOAs in response to rx trip per 3-EOP-E-0
		a. Verifies reactor tripped
		b. Checks if SI actuated/required - YES
		1) If not auto actuated, manually actuates SI & phase A as req'd by SI setpoint, PZR level or RCS subcooling
		c. Recognizes loss of subcooling and trips RCPs (if applicable)
		2. Performs prompt actions of 3-EOP-E-0
		a. Verifies containment isolation phase A
		b. Verifies SI pumps running
		c. Verifies proper CCW system operation
		d. Verifies containment cooling and containment/control room vent isolation
		e. Verifies containment spray & phase B isolation actuated if hi-hi CNMT pressure
		f. Trips all RCPs as required by phase B
		g. Verifies SI valve amber lights bright
		3. Recognizes loss of subcooling and trips RCPs per 3-EOP-E-0 (if applicable)
		4. Performs subsequent actions of 3-EOP-E-0 as directed by ANPS
		a. Resets & realigns SI then verifies SI flow
		5. Notifies ANPS of safety injection and cause
		6. Keeps ANPS informed of plant status

EXPECTED OPERATOR ACTIONS (cont'd)

EVENT: 5 ~~&~~ 6 (cont'd)

POSITION	TIME	EXPECTED ACTIONS
ANPS		1. **Directs response to reactor trip and failure of auto/manual turbine trip per 3-EOP-E-0**
		a. Verification of reactor trip
		b. Response to auto/manual turb. trip failure
		1) ensures closure of 3A & 3C MSIVs
		2) notes 3B MSIV failure to close and directs NLO investigation into problem
		3) ensures mid/east GCBs opened (may direct exciter field breaker opening)
		c. Determination of electric plant status
		d. Manual SI/phase A
		e. Monitors foldout page including direction to RCO to stop all RCPs if subcooling lost
		f. Directs trip of RCPs if phase B actuates
		g. Verifies at least 2 AFW pumps running - NO
		1) Directs local check of trn 2 (B) AFWP
		2) Directs local opening of 3-10-007 to align trn 2 stm to trn 1 (C) AFWP
		h. Response to loss of AFW flow & determination that no AFW pumps available.
		1) Evaluates field operator reports to determine no AFW pumps available
		2) Directs transition to 3-EOP-FR-H.1
		2. Informs NPS of plant status

EXPECTED OPERATOR ACTIONS

EVENT: #6

BRIEF DESCRIPTION: Feedwater flow (both main & AFW) has been completely lost following a 3C S/G main steam break in Containment. Plant conditions require entry into 3-EOP-FR-H.1. RCPs are stopped and feed and bleed is initiated (3C S/G faulted/dry & 3B S/G inventory lost thru failed MSIV to turbine which failed to trip).

INDICATIONS:
1. All steam generators less than 6[32]% level
2. Less than 390 gpm AFW flow
3. Wide range S/G levels decreasing (<22% on 3B & 3C S/Gs)

CREW CRITICAL STEPS:
1. **When required, initiate RCS bleed and feed so that the RCS depressurizes sufficiently for HHSI injection flow to occur.**

POSITION	TIME	EXPECTED ACTIONS
BOP		1. Performs actions of 3-EOP-FR-H.1 for RCS bleed & feed when secondary heat sink lost as directed by ANPS
		a. Resets CIS ΦA
		b. Verifies E-0 immediate and prompt actions
		c. Directs PAHMS placed in service per 3-OP-094
		d. Checks charging pumps aligned to offsite power
		e. Attempts to restore secondary heat sink
		f. Aligns equipment for hot standby conditions
		g. Checks if EDGs shold be stopped
		h. Checks for adequate secondary heat sink

EXPECTED OPERATOR ACTIONS (cont'd)

EVENT: 7 (cont'd)

POSITION	TIME	EXPECTED ACTIONS
RCO		1. Performs actions of 3-EOP-FR-H.1 to restore feed flow as directed by ANPS a. Checks if secondary heat sink is required b. Stops all RCPs (should be stopped already) 2. **Performs actions of 3-EOP-FR-H.1 for RCS feed & bleed when secondary heat sink lost as directed by ANPS** a. Actuates manual SI and CIS ΦA b. Verifies RCPs all stopped c. Verifies RCS feed path d. **Establishes RCS bleed path - PORVs/block valves open** (leaking PORV will open & failed block MOV never closed, so both PORV flow paths available) e. Verifies instrument air to containment f. Verifies adequate RCS bleed path
ANPS		1. **Directs performance of 3-EOP-FR-H.1 including RCS bleed and feed** 2. Informs NPS of status of plant 3. **Classifies the event as a SITE AREA EMERGENCY per 0-EPIP-20101**

SIMULATOR INSTRUCTOR FACILITY OPERATING INSTRUCTIONS

I. SETUP

A. Reset to IC-6 ~~and perform steps B-D~~ or ~~use~~ static IC-1 which includes steps C & D below ~~and perform step B~~

B. Load scenario 35.

C. Following switch check, unfreeze the simulator. ~~and realign plant equipment as necessary such that condenser steam dumps are in steam pressure control, and LT-3-498 & A AFW pump are out of service. Place MIMS in service.~~

D. Perform the following
   1. Realign C AFW pump to train 1 & isolate A AFW pump (parameter controller composite trigger A AFW P).
   2. Place the condenser steam dump control selector switch to MANUAL.
   3. Take LT-3-498 out of service as follows:
      a. Ensure 3C S/G level control inputs are selected to LT-3-496.
      b. Fail LT-3-498 (touch SYS MAT->STEAM GENERATOR & MAIN STEAM->STEAM GENERATOR->L-495->LT-498->TRANSMITTER LOSS OF POWER->set TFF1MACP=T).
   4. Enter the following failures:
      a. Turbine trip failure (parameter controller direct trigger TFU10005=T).
      b. B AFW pump loss of governor oil (touch SYS MAT->FEEDWATER->AUX F/W STEAM->IDA->GOV-B OIL LOSS FAILURE->set TFFXOILB=T).
      c. 3B MSIV failure to close (touch SYS MAT->STEAM GENERATOR & MAIN STEAM->MAIN STEAM->POV2605->VALVE FAIL AS IS->set TFSVVX6C=T).
   5. Freeze simulator

E. Delete all conditional events from Parameter Controller Event Summary **except** those indicated on the Parameter Controller Event Summary pages in this exercise guide. Direct events may deleted at instructor discretion.

F. Place turnover sheet on RCO desk.

G. Clearance information tags - A AFWP.

H. Information tags - Steam Dump Control Mode Selector Switch to MANUAL. Also move train 1 label from A AFW pump tachometer to C AFW pump tachometer beneath ann. panel X. Place a brown dot on LT-3-498. Info tag on 3C S/G level control level input to LT-3-496

I. Select 3A QSPDS to page 211 (SAT) and 3B QSPDS page 212 (RVL). Set ERDADS on the VPA ~~ERDADS~~ to TAVE/TREF (TAV) and at the RCO desk to ENVRN (ED3).

SIMULATOR INSTRUCTOR FACILITY OPERATING INSTRUCTIONS (cont'd)

II. CONDUCTING THE EXAMINATION:

A. Unfreeze the simulator and begin the exam.

B. **PT-3-445 Fails High (event 1).**

1. **Initiation:** Shortly after turnover, enter the MOV-3-535 overload trip conditional (touch PRESURIZER LEVEL->MOV535-> THERMAL OVERLOAD-> set TFH2906F=T conditional on IMH231C) then actuate PT-3-445 failure high (parameter controller direct trigger TFH1TU45=T).

2. **Response:** Respond as NPS/NWE/I&C. As NPS/NWE, state that a work request will be generated and I&C will be notified. As I&C, reply that a planner will intiate a work package for troubleshooting & repair. In the event that an attempt is made to close MOV-3-535, it will trip on overload now rather than in event 2. See event 2 for the response to MOV-3-535 failure.

C. **PZR PORV-3-456 Leak / MOV-3-535 Overload Trip (event 2).**

1. **Initiation:** After completion of 3-ONOP-041.5, actuate the PZR PORV-3-456 leak (touch PRESSURIZER LEVEL->PORV456->LEAK BY -> set TVHV456=0.07/30 sec ramp). The leak is sized at 25-30 gpm to slowly reduce pressure to < 2200 psig.

2. **Response:** Once the leaking PORV has been identified, the RCO should attempt (if not done in event 1) to close the associated block MOV which will trip on overload as it starts to close. When asked as NPO/NWE to check out the MOV-3-535 breaker on 3B MCC, wait 1-3 minutes and report that the area around the breaker smells faintly like burnt insulation. If directed to attempt to close the breaker, delay action until after pressure < 2200 psig and reduce PORV-3-456 leakage to 15 gpm by setting TVHV456=0.036/60 sec ramp. (This leak rate will keep the acoustic monitor LEDs lit while allowing all PZR heaters to keep up with the effects of the leak without returning pressure to normal.) Then tell the crew that the switch won't stay in the ON position and the burnt insulation smell just got stronger. Respond as electrical maintenance when directed to investigate the breaker and respond after 5-7 minutes that the breaker internals appear burnt. Also state that the 3B MCC will have to be deenergized and a Containment entry performed to allow a complete damage evaluation and subsequent repair of the MOV and its breaker.
Acknowledge load dispatcher/plant management notifications of the required load reduction.

SIMULATOR INSTRUCTOR FACILITY OPERATING INSTRUCTIONS (cont'd)

D. **Power Reduction (event 3).**

1. **Initiation:** In response to event 2, the Operations Manager directs that an ONOP-100 shutdown be performed due to the inability to restore normal PZR pressure from the PORV leak.

2. **Response:** ~~Condenser tube leak~~ Leaking PORV response and initiation of load reduction is covered in event 2. Acknowledge notification as Chemistry of the need to sample the RCS in response to a 15% power change. Respond as field operator in response to notification of stopping secondary pumps and if requested to manually control gland seal steam pressure.

E. **PT-3-447 Fails Low (event 4).**

1. **Initiation:** After a 5% power reduction (or at lead examiner direction) ensure that rod control is in AUTO, then actuate PT-3-447 failure (parameter controller direct trigger TFSMAML=T).

2. **Response:** Respond as NPS, NWE or I&C to notification of PT-3-447 failure. As NPS/NWE state that a work request will be generated and I&C will be notified of the failure. As I&C, reply that a planner will intiate a work package for troubleshooting & repair. Respond as NPO/NWE when directed to bypass AMSAC power 2 inputs by acknowledging the order, waiting 3-5 minutes, then bypassing the requested inputs (touch SYS MAT ->REACTOR->EAGLE21/AMSAC->AMSAC->PROCESSOR A&B NORMAL/BYPASS switches->set TCL4P2BA=T & TCL4P2BB=T->SYSTEM RESET). Report completion to the crew.

F. **3C S/G Main Steam Line Break / Reactor Trip / Turbine Trip & 3B MSIV Failures (event 5)**

1. **Initiation:** Once the crew has been briefed on the effects of the PT-3-447 failure, actuate the 3C S/G steam break in Containment (touch SYS MAT->STEAM GENERATOR & MAIN STEAM->MAIN STEAM->CONT LIQ & VENT PROCESS leak node for C steam line->LEAK INTO CONTAINMENT ->set TVSBVL15=0.2 on 300 sec ramp). Turbine trip, 3B MSIV & B AFW pump failures and A AFW pump OOS are entered during setup.

2. **Response:** When dispatched as field operator to check the B AFW pump, wait three minutes and tell crew that it appears that there is an oil leak on the governor and that there is oil spilled on the West end of the pump/pedestal. When asked to align train 2 steam to the C AFW pump, wait 2-4 minutes and state that the stem snapped on valve AFSS-3-007 and that the valve is stuck shut.

SIMULATOR INSTRUCTOR FACILITY OPERATING INSTRUCTIONS (cont'd)

F. **3C S/G Main Steam Line Break / Reactor Trip / Turbine Trip & 3B MSIV Failures (event 5 cont'd)**

2. **Response (cont'd):** If asked as maintenance about the status of the A AFW pump, state that pump end is disassembled with the impeller removed and bearings being replaced - ETR 3 days. Respond as maintenance if asked to investigate the B AFW pump governor oil leak and the AFSS-3-007 valve stem failure. Neither of these problems will be fixed during the scenario. Respond as SNPO to place PAHMs in service per 3-OP-094 (parameter controller trigger composite "PAHM"). After approximately 15 minutes inform the crew that PAHM is aligned. Respond as NPO to place unloaded EDGs in standby per 3-OP-023.

merge into event 5

G. **Loss of all Auxiliary Feedwater (event 6)**

1. **Initiation:** See event 5.

2. **Response:** See event 5.

H. **Loss of Secondary Heat Sink (bleed & feed required) (event ~~7~~ 6).**

1. **Initiation:** A result of events 5 & 6 and the scenario setup, this event entered by procedural transition from 3-EOP-E-0 to 3-EOP-FR-H.1 (adverse containment with loss of all AFW). The 3B MSIV & turbine trip failures combine to reduce wide range level to < 22% in this (as well as the faulted 3C S/G) requiring performance of feed & bleed per 3-EOP-FR-H.1 step 2 CAUTION.

2. **Response:** Consistent with event 5.

III. TERMINATION CRITERIA:

A. Upon establishment of RCS bleed & feed (step 24 of 3-EOP-FR-H.1), **OR**

B. At the discretion of the evaluator.

PARAMETER CONTROLLER FILE:

COM-POS-ITE	CDB LABEL	VALUE	CONDITIONAL	TIME DELAY	RAMP	DESCRIPTION
N	TFS1MAML	T	-	-	-	PT-3-447 (turb 1st stg imp press ch IV) fails low
N	TFH1TU45	T	-	-	-	PT-3-445 (PZR press control channel) fails high
N	TFU10005	T	-	-	-	Turbine trip fails - auto & manual
Y	**"PAHM"**	-	-	-	-	**Places H2 Monitor in Service**
-	TAC2V02A	1.0	-	0:30	-	Opens PAHM-002A
-	TAC2V02B	1.0	-	1:30	-	Opens PAHM-002B
-	TAAAV21	1.0	-	-	-	Opens HV-1
-	TAAAV22	1.0	-	-	-	Opens HV-3
-	TACA005	0.0	-	-	-	Closes MPAS-005
Y	**"A AFW P"**	-	-	-	-	**Removes A AFW pump from service & aligns C AFW pump to train 1**
-	TFFXCGVA	T	-	-	-	Fails A AFW pump governor closed
-	TFFXCTTA	T	-	-	-	Fails A AFW pump T&T valve (MOV6459A) closed
-	TAFK142	0.0	-	-	-	Closes 3-142 (A AFW pump dischg to train 1)
-	TAFK342	1.0	-	-	-	Opens 3-342 (C AFW pump dischg to train 1)
-	TAFK003	0.0	-	-	-	Closes AFPD-003 (C AFW pump dischg to train 2)
-	TAFF01C	0.0	-	-	-	Closes AFSS-001 (C AFW pump train 2 stm supply)
-	TAFF3082	0.0	-	-	-	Closes 3-082A (A AFW pump train 1 stm supply)
-	TAFF3086	1.0	-	-	-	Opens 3-086A (C AFW pump train 1 stm supply)
-	TAFF4082	0.0	-	-	-	Closes 4-082A (A AFW pump U4 train 1 stm supply)
-	TAFF4086	1.0	-	-	-	Opens 4-086A (C AFW pump U4 train 1 stm supply)

EVALUATION SCENARIO REFERENCES

Reference List:

PROCEDURE #	PROCEDURE TITLE
3-GOP-103	Power Operation to Hot Standby
3-OP-094	Containment Post-Accident Monitoring
3-ARP-097.CR	Control Room Annunciator Response
3-ONOP-028	Reactor Control System Malfunction
3-ONOP-041.5	Pressurizer Pressure Control Malfunction
3-ONOP-049.1	Deviation or Failure of Safety Related or Reactor Protection Channels
~~3-ONOP-071.1~~	~~Secondary Chemistry Deviation from Limits~~
3-ONOP-100	Fast Load Reduction
3-EOP-E-0	Reactor Trip or Safety Injection
3-EOP-FR-H.1	Response to Loss of Secondary Heat Sink
0-EPIP-20101	Duties of the Emergency Coordinator
	PTN Technical Specifications
	Plant Curve Book

EVALUATION SCENARIO CONTENT SUMMARY

1. Total Number of Malfunctions: 7

2. Malfunctions Occurring During EOP Performance: 2

   1. Turbine trip failure
   2. 3B MSIV failure

3. Abnormal Events: 3

   1. PT-3-445 fails high
   2. PORV-3-456 leak & MOV-3-535 failure to close
   3. PT-3-447 fails low

4. Major Transients: 2

   1. 3C S/G Steam Break in Containment
   2. Loss of secondary heat sink (B AFW start failure)

5. EOPs Used: 1

6. EOP Contingencies Entered: 1

7. Simulator Run Time: 90 minutes

8. EOP Run Time: 45 minutes

9. Crew Critical Tasks: 2

Facility: Turkey Point Nuclear Plant **Scenario No.:** 3 **Op-Test No.:** PTN Group XVIII

Examiners: _____ **Operators:** _____

Objectives: To evaluate the applicants' ability to reduce load from 100% power per normal plant procedure. Evaluate ability of operators to recognize & respond to failure of PT-3-145 low causing PCV-3-145 to fail closed, failure of the controlling 3B S/G feed flow channel ~~low~~ high and a sequential failure of both main feed pumps with failure of the associated FRV to trip on reactor trip. Emergency Operating Procedure use will be evaluated for a failure of the reactor to automatically trip followed by a S/G tube rupture with complications during RCS depressurization.

Initial Conditions: 100% power, BOL

Turnover: Power reduction from 100% power is required to comply with T.S. 3.7.1.1 due to 3C S/G RV-3-1412 being declared OOS following review of testing documentation from the recent refueling outage. 3B EDG is OOS for corrective maintenance on the governor. FT-3-476 is OOS for calibration. Shift orders are to reduce power from 100% to 50% to comply with Technical Specifications for RV-3-1412 OOS.

Event No.	Malf. No.	Event Type*	Event Description
1	N/A	N (SRO/BOP) R (RO)	Reduce power from 100%. K/A 2.1.23 (3.9/4.0)
2	TFB1L5 = T TFB1PCH5=T	I (SRO) I (RO)	Letdown PT-3-145 fails low causing PCV-3-145 to fail closed. K/A 004A2.07 (3.4/3.7)
3	TFF1M86~~L~~H=T	I (SRO) I (BOP)	FT-3-486 (controlling 3B S/G feed flow channel) fails ~~low~~ high resulting in need for manual control of associated FRV. K/A 035A2.04 (3.6/3.8)
4	TFU1CB2D=T TVFABP1A= 1.0 2 min ramp TFFVP1B=T	C (ALL)	Sequential loss of both main feed pumps. K/A 054AA2.02 (4.1/4.4) with turbine runback failure.
5	TFL2XASE=T TFL2XBSE=T TFL4AF=T	M (ALL)	Loss of main feed with failure of reactor to automatically trip. K/A 029EA1.14 (4.2/3.9)
6	TVHHSGC= 0.35 30sec ramp	M (ALL)	Steam Generator Tube Rupture. K/A 038 EA2.02 (4.5/4.8)
7	TFHV55CO=T & TFH244GH=T or TFHV456O=T / TFHV55AO=T	C (SRO) C (RO)	Normal spray valve / PZR PORV sticks open during RCS depressurization. K/A 038EA1.04 (4.3/4.1)

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

FLORIDA POWER AND LIGHT

TURKEY POINT NUCLEAR POWER PLANT

GROUP XVIII RO/SRO NRC INITIAL LICENSE EXAM

SIMULATOR EVALUATION SCENARIO EXERCISE GUIDE

PROGRAM:	RO/SRO Initial License Training
EXERCISE GUIDE:	XVIII NRC 3
DESCRIPTION:	Loss of Main Feedwater / Steam Generator Tube Rupture
LENGTH:	90 minutes
AUTHOR:	G. M. Blinde
REVISION DATE:	05/05/99

REVIEWED BY: Bretton 6-11-99
Facility Reviewer Date

APPROVED BY: _____
NRC Chief Examiner Date

EVALUATION SCENARIO OBJECTIVES

TERMINAL OBJECTIVE: During normal and abnormal plant conditions, the Shift Operating Crew will perform control room operations in accordance with (IAW) approved plant procedures ensuring that the health and safety of the public is protected and the integrity of the plant maintained.

ENABLING OBJECTIVES:

1. Given specific plant conditions, plant procedures, and a shift turnover, respond to the following events IAW approved plant procedures:
   a. Power reduction from 100%
   b. PT-3-145 failure low (loss of letdown)
   c. FT-3-486 failure ~~low~~ high (manual FRV control)
   d. Loss of main feed / auto turbine runback failure
   e. Reactor trip failure
   f. Steam generator tube rupture
   g. RCS cooldown & loss of depressurization control

2. Given abnormal plant conditions, mitigate the adverse consequences of the following events IAW approved plant procedures:
   a. Identify abnormalities while assessing actual system response with respect to predicted system response.
   b. Investigate the cause and effect of abnormalities in system performance.
   c. Implement applicable procedures.
   d. Perform immediate actions from memory.

3. Given abnormal plant conditions, implement the applicable on-site and off-site reports and notifications IAW approved plant procedures.

4. Given normal and abnormal plant conditions, using the following principles for operational effectiveness as they apply to all operators, conduct plant operations IAW approved plant procedures:
   a. Plant and control room communication.
   b. Plant/Control Board monitoring.
   c. Plant/Control Board manipulation.
   d. Operational problem solving.
   e. Use of OPs/ONOPs and Technical Specifications.
   f. Use of EOPs IAW EOP Rules of Usage.
   g. Annunciator recognition and response.
   h. Written communications/logs.
   i. ALARA awareness.

EVALUATION SCENARIO OBJECTIVES (cont'd)

5. Given normal and abnormal plant conditions, using the following principles for operational effectiveness as they apply to the Assistant Nuclear Plant Supervisor (ANPS), conduct plant operations IAW approved plant procedures:

   a. Team performance management.
   b. Problem solving.
   c. Decision analysis.
   d. Action planning.
   e. Self-checking.

6. During abnormal and emergency events, the shift operating crew shall apply techniques of teamwork and self-checking IAW established work practices and operating guidelines.

EVALUATION SCENARIO DESCRIPTION

Initial Conditions: Mode 1, 574 degrees F

Turnover: Power reduction from 100% to 50% power is required due to 3C S/G safety valve RV-3-1412 declared OOS (per T.S. 3.7.1.1) due to errors found during review of testing documentation from the recent refueling outage. 3B EDG is OOS for corrective governor maintenance. FT-3-476 is OOS for calibration. No surveillance tests are in progress.

Synopsis: After a 5% power reduction (or at lead examiner direction) PT-3-145 fails low causing letdown PCV-3-145 to automatically close. Operators respond per 3-ARP-097.CR for annunciators A-5/5 & 6. After discovering PCV-3-145 is failed closed, the crew locally controls letdown pressure using bypass valve 3-309C. Following restoration of CVCS letdown, FT-3-486 fails ~~low~~ high. The crew must take manual control of 3B S/G feed flow. Once the plant is stabilized, 3B S/G level control returned to automatic, Technical Specifications consulted and the crew briefed on the effects of the failure, a sequential loss of both main feed pumps occurs. The crew responds per 3-EOP-E-0 and addresses a failure of the reactor to automatically trip. Transition to 3-EOP-FR-S.1 is made in response to the failure of reactor trip breakers to open either automatically or manually. Since AMSAC does not actuate, the reactor trips when the MG set input & output breakers are locally opened. In response to the trip, a tube ruptures on the 3C S/G. After finishing 3-EOP-FR-S.1 (during which an SI occurs due to the SGTR), the crew transitions to 3-EOP-E-0 and then to 3-EOP-E-3. Once the RCS depressurization has begun using a normal spray/PZR PORV, the opened valve sticks open. This requires tripping the running RCP for normal spray or closure of the PORV block valve if a PZR PORV was used to avoid entry into 3-EOP-ECA-3.1. The exercise is concluded upon establishment of increasing RCS pressure (3-EOP-E-3 step 26) or at the evaluator's discretion. The event is classified after scenario completion as an alert per 0-EPIP-20101, Enclosure 1, category 2.

Insert auto turbine runback here.

Event summary:

EVENT #	DESCRIPTION
1	Power reduction from 100%
2	PT-3-145 fails low (PCV-3-145 fails closed)
3	FT-3-486 fails ~~low~~ high (manual FRV control)
4	Sequential loss of both feed pumps/auto turb runback failure.
5	Loss of main feed / reactor fails to trip
6	Steam generator tube rupture
7	RCS cooldown & loss of depressurization control

Crew Critical Steps:

EVENT #	DESCRIPTION
5	1. Insert negative reactivity into the core by one of the following methods prior to completing 3-EOP-FR-S.1 step 4: de-energizing CRDM MG sets, inserting RCCAs, or establishing emergency boration flow.
7	1. Isolate feedwater flow into and steam flow out of a ruptured S/G prior to transitioning to 3-EOP-ECA-3.1. 2. Perform 3-EOP-E-3 cooldown and maintain temperature to meet following criteria: temperature is not too high to maintain required subcooling nor causes a severe challenge to subcriticality CSF.

Individual Critical Steps:

The bolded individual actions listed under the respective positions (RCO, ANPS, etc.) are for use during evaluations to identify steps that are critical to the individual position.

EVALUATION SCENARIO PRE-EXERCISE BRIEFING

1. **Review the following with students:**
   a. Primary responsibility of the student is to operate the simulator as if it were the actual plant.
   b. The evaluators will observe teamwork skills, communication, and the crew's ability to safely operate the plant during the simulator examination. This includes individual & crew performance.
   c. If you recognize an incorrect decision, response, answer, analysis, action, or interpretation by another crew member but fail to correct it, then the evaluator may assume that you agree with the incorrect item.
   d. The crew should keep a rough log during each scenario sufficient to complete necessary formal log entries.
   e. The simulator instructor facility operator will perform all of the functions of personnel needed outside the control room area.
   f. Before the examination begins, crew members may perform a control board walkdown for up to 10 minutes.
2. **The following are initial conditions for this exam** (in shift turnover package, but may be covered verbally if needed):
   a. Time in core life - BOL
   b. Reactor power and power history - 100% steady state
   c. Turbine status - online
   d. Boron concentration - 1298 ppm
   e. Temperature - 574 degrees F
   f. Pressure - 2235 psig
   g. Xenon - Equilibrium for 100% power.
   h. Core cooling - forced
   i. Tech. Spec. LCO(s) in effect
      - 3.3.1 Action 6 (bistables tripped); FT-3-476 OOS for cal
      - 3.7.1.1 Action b (4 hrs); RV-3-1412 OOS (3C S/G safety)
      - 3.8.1.1 Action b (72 hrs); 3B EDG OOS (governor)
   j. Clearances in effect - 3B EDG
   k. Significant problems/abnormalities - Power reduction required for RV-3-1412 OOS.
   l. Evolutions/maintenance for the coming shift - Reduce power from 100% down to 50% this shift.
   m. Units 1 and 2 status - unit 1 online; unit 2 s/d
   n. Unit 4 status - mode 1; 100% power
3. **Ensure students understand examination schedule** and that a break will be necessary between scenarios to allow simulator initial condition setup. **Cover exam security rules** to be observed by students both during and after the exam IAW the latest revision of AG-017 or NUREG-1021 as applicable.
4. **Before the examination begins, make crew position assignments and allow students to ask any questions concerning the administration of the test.**

EXPECTED OPERATOR ACTIONS

EVENT: 1

BRIEF DESCRIPTION: With reactor power initially at 100% power, a power reduction to comply with Tech Specs for an inoperable S/G safety valve.

INDICATIONS: 1. Shift turnover

POSITION	TIME	EXPECTED ACTIONS
BOP		1. Reduces turbine load IAW 3-GOP-103
		a. Maintains Tref within 3°F of Tavg if rods in manual (1°F if rods in auto)
		b. Monitors gland seal stm press & directs local supply/spillover control as needed
		2. Performs secondary plant shutdown generator-load-dependent activities IAW 3-GOP-103
		3. Performs activities as directed by ANPS
		a. Inhibits MIMS if in service
		b. Notifies Chemistry of need to sample RCS if reactor power reduced > 15%
		4. Keeps ANPS informed of plant status
RCO		1. Reduces reactor power IAW 3-GOP-103
		a. Calculates rx change needed for downpower
		b. Borates at rate directed by ANPS per 0-OP-046
		c. Energizes PZR backup heaters
		d. Coordinates w/BOP to keep Tref < 3°F from Tavg w/rods in manual (1°F if rods in auto)
		e. Observes AFD limitations
		f. Starts additional charging pump
		2. Keeps ANPS informed of plant status

EXPECTED OPERATOR ACTIONS (cont'd)

EVENT: 1 (cont'd)

POSITION	TIME	EXPECTED ACTIONS
ANPS		1. Coordinates power reduction activities of RCO & BOP
		2. Performs other activities IAW 3-GOP-103
		a. Evaluates Xe changes and directs boration rate changes as necessary
		3. Keeps NPS informed of plant status

EXPECTED OPERATOR ACTIONS

EVENT: 2

BRIEF DESCRIPTION: PT-3-145 fails low, causing PCV-3-145 to fail closed. Operators note the lifting of the letdown relief, and unsuccessfully attempt to take manual control of PCV-3-145 to open the valve. It must be bypassed locally to restore letdown.

INDICATIONS:

1. Annunciator A-5/5, CVCS HP LTDN LINE HI FLOW/ PRESS
2. Annunciator A-5/6, CVCS LP LTDN LINE RELIEF HI TEMP
3. PI-3-145 reading high
4. TE-3-141, RV-3-203 tailpipe temperature high (RV-3-203 relief flow to PRT)

POSITION	TIME	EXPECTED ACTIONS
BOP		1. Assists RCO as directed by the ANPS
RCO		1. Notes failure closed of PCV-3-145
		2. Attempts to manually open PCV-3-145
		3. Directs operator to investigate PCV-3-145 locally
		4. Closes all letdown orifices
		5. Directs operator to open 3-309C (PCV-3-145 bypass) to restore letdown flowpath
		6. Verifies TI-3-141 not increasing
		7. Directs operator to locally close 3-309A to isolate PCV-3-145
		8. Re-opens letdown orifices while throttling 3-309C to restore letdown flow if directed by ANPS
		9. Verifies TI-3-141 decreasing and FI-3-150 stable

EXPECTED OPERATOR ACTIONS (cont'd)

EVENT: 2 (cont'd)

POSITION	TIME	EXPECTED ACTIONS
ANPS		1. Directs recovery of letdown per 3-ARP-097.CR
		a. Annunciators A-5/5 & A-5/6
		2. Notifies other support groups (I&C, Maintenance, etc.) of PCV-3-145 failure
		3. Maintains NPS informed regarding plant status

EXPECTED OPERATOR ACTIONS

EVENT: 3

BRIEF DESCRIPTION: A SG feedwater FT-3-486 (the controlling channel) fails ~~low~~ high. The 3B S/G FRV requires manual action to maintain stable plant conditions. The channel is called OOS and compensatory actions initiated per 3-ONOP-049.1.

INDICATIONS:

1. Annunciator C-5/2, SG B ~~STEAM~~ STEAM > FEED > ~~FEED~~ FEED > STEAM
2. Annunciator C-6/2, SG B LEVEL DEVIATION
3. FI-3-486 fails ~~low~~ high ~~flow~~

POSITION	TIME	EXPECTED ACTIONS
BOP		1. Recognizes failure of FT-3-486 and responds as directed by ANPS a. Compares to other SG FT's b. Verifies no off-normal conditions on other SG PT's/FT's 2. Notifies ANPS of failure 3. **Takes manual control of FCV-3-488 to restore balanced steam/feed flow and stabilize SG level**
RCO		NONE
ANPS		1. Directs stabilization of plant conditions 2. Directs compensatory action per 3-ONOP-049.1 a. Verifies SG FT/PT status determination b. Determines which bistables to trip and effects on plant of tripping bistables. Provides this info to RCO/BOP for guidance. 3. Notifies NPS of plant status 4. Ensures Tech Spec requirements are met 5. Notifies I&C of FT-3-486 failure and directs initiation of PWO.

EXPECTED OPERATOR ACTIONS

EVENT: 4

BRIEF DESCRIPTION: 3A S/G Feed Pump trips/is tripped on bearing failure and a runback fails to occurs. The operators respond ~~to the~~ by manually running back the turbine ~~runback~~. During the runback, a shaft shear occurs on the 3B S/G Feed Pump. A loss of all feed flow occurs resulting in conditions requiring a reactor trip.

INDICATIONS:

1. Annunciator D-6/1, SGFP A/B MOTOR OVERLOAD TRIP
2. Annunciator D-5/4, SGFP A MOTOR BRG HI TEMP
3. Runback in progress (MW decreasing, etc.)
4. Annunciators C-5/1(2)(3), SG A(B)(C) STEAM > FEED
5. Annunciators C-6/1(2)(3), SG A(B)(C) LEVEL DEVIATION
6. Annunciators C-1/1(2)(3), SG A(B)(C) NARROW RANGE LO/LO-LO LEVEL
7. Annunciators C-1/4(5)(6), SG A(B)(C) LO-LO LEVEL TRIP
8. Annunciators C-5/4(5)(6), SG A(B)(C) LO LEVEL W/ STEAM>FEED TRIP
9. Annunciators D-5(6)/2, SGFP A(B) LO FLOW
10. Low current indicated on the 3B SGFP ammeter
11. Reduced feed flow after 3A SGFP trip. Zero feed flow indicated after 3B SGFP shaft shear.

POSITION	TIME	EXPECTED ACTIONS
BOP		1. ~~Recognizes 3A SGFP problem and informs ANPS~~ Redundant to 6
		2. Informs ANPS of 3A SGFP trip & turbine ~~runback~~ failure
		3. Verifies ~~runback~~ 3-ONEP 089 automatic actions including manually running back turbine & ~~secondary parameter status~~
		BOLD
		4. Notes loss of feedwater flow & 3B SGFP lo amps
		5. Recommends reactor trip @ 15% SG level or loss of 2nd SGFP.
RCO		1. Assists BOP as directed by ANPS
		2. Verifies ~~runback~~ 3-ONEP 089 automatic actions
		3. Verifies primary parameters stable
		4. Trip rx @ 15% SG level or at ANPS direction

EXPECTED OPERATOR ACTIONS (cont'd)

EVENT: 4 (cont'd)

POSITION	TIME	EXPECTED ACTIONS
ANPS		1. Coordinates and directs response per 3-ARP-097.CR and 3-ONOP-089 - direction to runback turbine.
		2. Notifies System and Duty Call Supervisor of situation
		3. Informs NPS of status of plant
		4. Directs troubleshooting effort on SGFPs & auto turb runback ckt as time permits
		5. When advised of loss of 3B SGFP or SG level @ 15%, directs reactor trip

EXPECTED OPERATOR ACTIONS

EVENT: 5

BRIEF DESCRIPTION: Normal feed is lost but automatic and manual reactor trips fail and actions are taken IAW FR-S.1. AMSAC fails to actuate and the reactor must be locally tripped by breaker operation. A S/G tube rupture has occurred or is occurring.

INDICATIONS:
1. Loss of normal feedwater
2. S/G levels/feed flows decrease rapidly
3. Reactor trip directed or actuates
4. RTBs fail to open & breaker indication goes out

CREW CRITICAL STEPS:
1. **Insert negative reactivity into the core by one of the following methods prior to completing 3-EOP-FR-S.1 step 4: de-energizing CRDM MG sets, inserting RCCAs, or establishing emergency boration flow.**

POSITION	TIME	EXPECTED ACTIONS
BOP		1. Recognizes loss of normal feedwater
		2. **Responds to reactor trip fail per 3-EOP-FR-S.1**
		a. Verifies turbine trip
		b. Checks AFW pumps-all running
		c. Assists RCO w/control rod insertion & direction to NPO for local RTB/MG set trip
		d. Checks if turb/gen trips have occurred
		e. Checks S/G levels
		f. Checks for uncontrolled RCS cooldown
		g. Verifies 3-EOP-E-0 IOAs if auto SI & reactor subcritical
		3. Informs ANPS of plant status

EXPECTED OPERATOR ACTIONS (cont'd)

EVENT: 5 (cont'd)

POSITION	TIME	EXPECTED ACTIONS
RCO		1. Attempts manual reactor trip
		2. Responds to reactor trip fail per 3-EOP-FR-S.1
		a. Verifies reactor trip - NO - inserts control rods (BOP assists as necessary)
		b. Initiates emerg boration (if SI actuated, must reset SI for emerg boration flow)
		c. Verifies RCS pressure < 2335 psig
		d. Verifies Containment ventilation isolated
		e. Checks if reactor trip has occurred - NO
		g. Verifies dilution paths isolated
		h. Verifies CETC<1200°F & reactor subcritical
		i. Performs BOP actions during E-0 IOA verification
		3. Informs ANPS of plant status
		a. Identifies/reports AMSAC failure.
ANPS		1. Directs response to loss of normal FW/ATWS
		2. Directs response to ATWS per 3-EOP-FR-S.1
		a. Ensures no RCP trip until reactor subcrit. (even if CNMT phase B isolation)
		b. Ensures NPO notified to perform local reactor trip actions

EXPECTED OPERATOR ACTIONS (cont'd)

EVENT: 5 (cont'd)

POSITION	TIME	EXPECTED ACTIONS
ANPS (cont'd)		3. **Returns to procedure and step in effect (3-EOP-E-0) or transitions to FRP if appropriate**
		4. **Classifies event as an ALERT (unless higher category event exists) per 0-EPIP-20101**
		5. Informs NPS of plant status
		a. Reports AMSAC failure to NPS and/or NWE/I&C.

EXPECTED OPERATOR ACTIONS

EVENT: 6

BRIEF DESCRIPTION: In response to a loss of main feed, a reactor trip has occurred. Additionally, a 3C S/G tube rupture occurs concurrent with the reactor trip requiring an SI. Operators perform actions of 3-EOP-E-0.

INDICATIONS:
1. Reactor trip/SI directed or actuates
2. Rod bottom lights on
2. RTBs and bypass breakers open
4. Safety injection annunciator(s)
5. Safeguards equipment automatically starts

CREW CRITICAL STEPS: SEE EVENT 7

POSITION	TIME	EXPECTED ACTIONS
BOP		**1. Responds to reactor trip per 3-EOP-E-0**
		a. Verifies turbine trip
		b. Verifies power to 3A/B/D 4kV buses
		c. Recognizes uncontrolled level increase in ruptured steam generator and isolates feed to it if level > 6%
		d. Verifies feedwater isolation
		e. Verifies AFW pumps running
		f. Verifies proper ICW operation
		g. Checks if main steamlines should be isolated
		h. Verifies all EDGs running
		i. Directs SNPO to place PAHMS in service
		j. Verifies proper AFW alignment and flow
		k. Checks RCS cold leg temperatures stable
		l. Performs MSLB & SGTR diagnostics
		2. Informs ANPS of plant status

EXPECTED OPERATOR ACTIONS (cont'd)

EVENT: 6 (cont'd)

POSITION	TIME	EXPECTED ACTIONS
RCO		**1. Responds to reactor trip per 3-EOP-E-0**
		a. Verifies reactor tripped
		b. Checks if SI actuated/required (auto SI)
		c. Recognizes loss of subcooling and trips RCPs (if applicable)
		d. Verifies containment isolation phase A
		e. Verifies SI pumps running
		f. Verifies proper CCW system operation
		g. Verifies containment cooling
		h. Verifies containment and control room ventilation isolation
		i. Verifies containment spray not required
		j. Verifies SI valve amber lights bright
		k. Resets & realigns SI
		l. Verifies SI flow
		m. Checks RCP seal cooling
		n. Checks RCP cooling
		o. Checks letdown/PORVs/spray valves closed
		2. Notifies ANPS of safety injection and cause
		3. Informs ANPS of plant status

EXPECTED OPERATOR ACTIONS (cont'd)

EVENT: 6 (cont'd)

POSITION	TIME	EXPECTED ACTIONS
ANPS		**1. Directs response to reactor trip per 3-EOP-E-0**
		a. Directs immediate actions
		b. Monitors foldout page items
		1) Direction to RCO to stop all RCPs if subcooling lost
		2) Direction to BOP to isolate feed flow to ruptured S/G if level > 6%
		c. Directs prompt actions
		d. Directs subsequent actions
		2. Transitions to appropriate plant procedure (3-EOP-E-3 or appropriate FRP)
		3. Informs NPS of plant status

EXPECTED OPERATOR ACTIONS

EVENT: 7

BRIEF DESCRIPTION: An SGTR has occurred. The ruptured S/G atm steam dump is set to 1060 psig, the S/G verified isolated, and the RCS cooled down & depressurized. The depressurization method in use fails open requiring operator action.

INDICATIONS:
1. Local steam line and/or DAM-1 readings abnormal
2. Uncontrolled level increase in ruptured S/G

CREW CRITICAL STEPS:
1. **Isolate feedwater flow into and steam flow out of a ruptured S/G prior to transitioning to 3-EOP-ECA-3.1.**
2. **Perform 3-EOP-E-3 cooldown and maintain temperature to meet following criteria: temperature is not too high to maintain required subcooling nor causes a severe challenge to subcriticality CSF.**

POSITION	TIME	EXPECTED ACTIONS
BOP		**1. Performs actions of 3-EOP-E-3**
		a. Identifies ruptured S/G (3C)
		b. Controls ruptured S/G atm steam dump. Verifies closed if S/G press < 1060 psig.
		c. Isolates feed if ruptured S/G level >6%.
		d. Isolates AFWSS from ruptured S/G. Realigns for two trains of AFW if needed.
		e. Isolates misc flowpaths from ruptured S/G
		f. Closes ruptured S/G MSIV & bypass
		g. Checks if S/Gs are not faulted
		h. Maintains intact S/G levels 15-50%
		i. Resets ctmt isol phase A & B
		j. Verifies offsite power to all 4kV buses
		k. Verifies ruptured S/G isolated from intact S/Gs

EXPECTED OPERATOR ACTIONS (cont'd)

EVENT: 7 (cont'd)

POSITION	TIME	EXPECTED ACTIONS
BOP (cont'd)		l. Checks ruptured S/G pressure > 390 psig
		m. Performs RCS cooldown
		1. Determines req'd CET temp for cooldown
		2. Dumps steam at max rate until RCS < req'd CET temp, then stops cooldown
		n. Checks rupt S/G press stable or increasing
	3.	Informs ANPS of plant status
RCO	**1.**	**Performs actions of 3-EOP-E-3**
		a. Checks if RCPs should be stopped
		b. Verifies S/G B/D sample isol. valves closed
		c. Checks PORVs and block valves
		d. Verifies SI reset
		e. Verifies instrument air to containment
		f. Checks if RHR pumps should be stopped
		g. Establishes max charging flow
		h. Checks RCS subcooling > 50°F [230°F]
		i. Depressurizes RCS to minimize break flow and refill PZR
		1. Observes RCS subcooling/PZR lvl limits
		2. Manually closes normal spray/PORV when RCS < ruptured S/G pressure ✱ NO
		3. Manually trips RCP/closes PORV block MOV
		j. Checks RCS pressure increasing

EXPECTED OPERATOR ACTIONS (cont'd)

EVENT: 7 (cont'd)

POSITION	TIME	EXPECTED ACTIONS
RCO (cont'd)		2. Informs ANPS of plant status
		3. Recognizes loss of subcooling and trips RCPs per 3-EOP-E-3 (if applicable)
ANPS		**1. Directs response to ruptured S/G per 3-EOP-E-3**
		a. Monitors foldout page items including direction to RCO to stop all RCPs if subcooling lost
		b. Identifies & isolates ruptured S/G
		c. Cools & depressurizes RCS to minimize break flow
		d. Directs tripping RCP in response to normal spray valve failing open or closure of PORV block valve in response to PORV failing open
		2. Informs NPS of plant status

SIMULATOR INSTRUCTOR FACILITY OPERATING INSTRUCTIONS

I. SETUP

A. Reset to IC-11. or static IC-2 which includes steps C & D below

B. Load scenario 49.

C. Following switch check, unfreeze the simulator. ~~Realign plant equipment to allow for FT-3-476 & 3B EDG out of service. Place MIMS in service.~~

D. Perform the following
   1. Take 3B EDG OOS as follows: SYS MAT->STANDBY POWER & SYNC->EMERGENCY DIESEL LOGIC & PROT->3AB20->BREAKER POSITION->set TAQ5B20P=3->EMERGENCY DIESEL GENERATOR 3B->SELECTOR SWITCH 3B->set TAQ5LRSB=0
   2. Take FT-3-476 OOS per 3-ONOP-049.1 as follows:
      a. In rack 24, trip bistables BS-3-478-A1/A2/D.
      b. Ensure 3A S/G level control inputs do not have FT-3-476 selected.
      c. Fail FT-3-476 low (touch SYS MAT->FEEDWATER->MAIN FEEDWATER MENU->FEEDWATER REGULATOR VALVES ->F-SG1->FT-476->FAIL LOW->set TFF1M76L=T).
   3. Enter the following failures:
      a. Reactor trip & AMSAC failure (touch SYS MAT->REACTOR->ROD CONTROL ROD POSITION->ROD SPEED TO LOGIC CABINET->RXB->BREAKER FAILS AS IS->set TFL2XBSE=T->RXA->BREAKER FAILS AS IS->set TFL2XASE=T->SYS MAT->REACTOR->EAGLE 21/AMSAC->AMSAC->FAIL TO ACTUATE->set TFL4AF=T).
      b. turbine runback failure (touch SYS MAT->REACTOR->TURBINE RUNBACK SGFP RUNBACK INHIBIT->SGFP BOP GOV & 2L RUNBACK INHIBIT->TFU1LRED=T).
   4. Freeze simulator.

E. Delete all conditional events from Parameter Controller Event Summary **except** those indicated on the Parameter Controller Event Summary pages in this exercise guide. Direct events may deleted at instructor discretion.

F. Place turnover sheet on RCO desk.

G. Clearance information tags-Rack 24 (FT-3-476) and 3B EDG.

H. Information tags-None Brown dot on FT-3-476. info tag on 3A SG level control FF input to FT-3-4

I. Select 3A QSPDS to page 211 (SHT) and 3B QSPDS to page 212 (RUL). Set ERDADS on VPA to TAVE/TR (TAV) and at the RCO desk to ENVIRN (EDS).

II. CONDUCTING THE EXAMINATION:

A. Unfreeze the simulator and begin the exam.

SIMULATOR INSTRUCTOR FACILITY OPERATING INSTRUCTIONS (cont'd)

B. **Power reduction from 100% (event 1).**

1. **Initiation:** Crew should begin in response to shift turnover. If slow to begin, call as Operations Supervisor and prompt commencement of load reduction to 50% in one hour.

2. **Response:** Acknowledge load dispatcher/plant management notifications of the required load reduction. Respond as field operator in response to notification of starting/stopping plant equipment and, if asked, to manually control gland seal steam.

C. **PT-3-145 fails low (PCV-3-145 fails closed) (event 2).**

1. **Initiation:** After a 5% power change or at lead evaluator discretion, actuate the PT-3-145 failure (touch SYS MAT-> CHEMICAL VOLUME CONTROL SYSTEM->CVCS LETDOWN->P-145-> TRANSMITTER FAIL LOW->arm TFB1L5=T->RECALL->P-145->CONTROLLER FAIL HIGH->arm TFB1PCH5=T). Pressing MAST FAIL will cause PCV-3-145 to close and PC-145 to fail high.

2. **Response:** When asked as SNPO to investigate the PCV-3-145 failure, acknowledge the order, wait 2-4 minutes, then report the valve closed with no obvious malfunctions. If asked as I&C/Mechanical to investigate PT-3-145/PCV-3-145, say that a tech will be reassigned from a lower priority project and troubleshooting will begin as soon as possible thereafter. Provide no further progress towards fixing this failure.
When asked as SNPO to bypass PCV-3-145 using 3-309C, control valve position open/closed at crew direction using SYS MAT-> CHEMICAL VOLUME CONTROL SYSTEM->CVCS LETDOWN->PCV145->LEAK BY-> set TVBVLK06 as directed by the crew (0.1 per turn ordered). When asked to isolate PCV-3-145 using 3-309A, wait 2-4 minutes, then report completion to the crew.

D. **FT-3-486 fails ~~low~~ high (manual FRV control) (event 3).**

1. **Initiation:** As soon as letdown is restored and CVCS parameters stabilized, actuate FT-3-486 failure low by touching SYS MAT->FEEDWATER->MAIN FEEDWATER MENU->FEEDWATER REGULATOR VALVES->F-SG2->FT486->FAIL ~~LOW~~ HIGH->set TFF1M86~~L~~H=T. This failure requires manual operation of FCV-3-488 to restore 3B S/G level to program.

2. **Response:** Respond as NPS, NWE or I&C to notification of FT-3-486 failure. As NPS/NWE state that a work request will be generated and I&C will be notified of the failure. As I&C, reply that a planner will intiate a work package for troubleshooting & repair.

Add to setup
SYS MAT -> REACTOR ->
T LINE RUNBACKS ->
Sc > RUNBACK INHIBIT ->
SGFP BKR GOV ? 2L RUNBACK INHIBIT -> TFU 1LRRD=T

SIMULATOR INSTRUCTOR FACILITY OPERATING INSTRUCTIONS (cont'd)

E. Sequential loss of both feed pumps / auto turbine runback failure **(event 4).**

3AA03 fail as is
TFF1D1AM=T
set
TFF1D1AM=F
cond on
TMF1P1AT

1. Initiation: Once the secondary plant is stabilized with FCV-3-478 manually controlling feed to 3A S/G, actuate the bearing failure on the 3A SGFP by touching SYS MAT->FEEDWATER->MAIN FEEDWATER MENU->SGFP'S->3P1A->BEARING WEAR->set TVFABP1A=1.0/ 2:00 ramp. With the manual runback in progress actuate the shaft shear on 3B SGFP by touching 3P1B->SHEARED SHAFT->set TFFVP1B=T.

Auto turb runback in progress

2. Response: Respond as NPO/NWE if requested to investigate the SGFPs. After 2-4 minutes, report the 3A SGFP outboard pump bearing has failed and the shaft appears to be seized. For 3B SGFP report the shaft broke between the pump and the motor.
As Mechanical maintenance, acknowledge any requests for assistance with assurance that these failures will be investigated immediately. Acknowledge any reports to the NPS/ system dispatcher that Unit 3 is going off line.

F. Loss of main feed / reactor fails to trip (event 5)

1. **Initiation:** The loss of main feed is from event 4 and the reactor trip & AMSAC failures are part of the initial setup.

2. **Response:** When dispatched as field operator to locally open the RTBs/bypass RTBs/MG set breakers, wait until emergency boration has been established then touch SYS MAT->REACTOR->ROD CONTROL ROD POSITION->ROD SPEED TO LOGIC CABINET->3A->LOCAL CLOSE/TRIP(MECHANICAL)->set TCE6DQ7C=F->3B->LOCAL CLOSE/TRIP (MECHANICAL)->set TCE6DQ8C=F and insert the 3C S/G tube rupture using parameter controller direct trigger TVHHSGC=0.35 on a 30 sec ramp. Respond as SNPO when asked to verify dilution paths isolated. Wait 3-5 minutes and report dilution paths isolated.

G. Steam Generator tube rupture (event 6)

1. **Initiation:** See event 5.

2. **Response:** Respond as SNPO to place PAHMs in service per 3-OP-094 (parameter controller trigger composite "PAHM"). After 15-18 minutes inform the crew that PAHM is aligned. Respond as NPO to place unloaded EDGs in standby per 3-OP-023.
Respond if asked as Chemistry to sample S/Gs for activity and as HP for main steam line & SJAE surveys. After 8-10 minutes, report as HP detecting activity near the unit 3 SJAE and reading 3C main steam line radiation above background with parts of the turbine deck posted as contaminated. Request the crew warn plant personnel accordingly. Report as Chemistry that a quick check of the sample from 3C S/G shows activity.

SIMULATOR INSTRUCTOR FACILITY OPERATING INSTRUCTIONS (cont'd)

H. **PZR PORV fails open during RCS depressurization (event 7).**

1. **Initiation:** As a result of event 5, a 3C S/G tube rupture is in progress. Event 6 results in transition to 3-EOP-E-3. Arm the PZR spray valve PCV-3-455A failure open (touch SYS MAT-> REACTOR COOLANT SYSTEM->PRESSURIZER->PCV455A->FAIL OPEN->arm TFHV55AO=T->P444->PC444G->CONTROLLER FAIL HIGH->arm TFH244GH =T). Following RCS cooldown, depressurization is begun. If a PORV is opened, fail it that way by touching SYS MAT->REACTOR COOLANT SYSTEM->PRESSURIZER->PORV455C(456)->FAIL OPEN->set TFHV55CO(TFHV456O)=T. If an RCP is still running and normal spray valves are used, then fail PCV-3-455A (C loop) open by pressing MAST FAIL (also fails the associated controller to 100% calling RCO attention to the failure).

2. **Response:** When directed as NPO/NWE to realign 3B S/G steam supply to train 1, wait 3-5 minutes swap AFSS-3-006/7 positions using parameter controller composite trigger 006/007. Report to the crew when complete. If directed as NPO/NWE to deenergize and locally close MOV-3-1405, wait 3-5 minutes and do so using parameter controller composite trigger 1405ISO. This may be done immediately if MOV-3-1405 is closed from the console switch or after a 3-5 minute delay if it is closed locally. When directed as NPO/NWE to realign auxiliary steam supply to unit 4, wait 3-5 minutes and do so using parameter controller composite trigger AUX STM.
HP & Chemistry reports, when requested, should be consistent with event 6 and should all support identification of the 3C S/G tube rupture.

III. TERMINATION CRITERIA:

A. Upon establishment of increasing RCS pressure (step 26 of 3-EOP-E-3), **OR**

B. At the discretion of the evaluator.

PARAMETER CONTROLLER FILE:

COM-POS-ITE	CDB LABEL	VALUE	CONDITIONAL	TIME DELAY	RAMP	DESCRIPTION
N	TVHHSGC	0.35	-	-	0:30	3C S/G tube rupture (350 gpm)
Y	**"006/007"**	-	-	-	-	**Swaps positions of AFSS-3-006 & 007 to align 3B S/G to train 1 AFW steam supply**
-	TAFF07	1.0	-	0:15	-	Opens AFSS-3-007
-	TAFF06	0.0	-	0:30	-	Closes AFSS-3-006
Y	**"1405 ISO"**	-	-	-	-	**Deenergizes & closes MOV-3-1405 (3C S/G AFWSS)**
-	TFFXC05	T	-	-	-	Fails MOV-3-1405 closed
-	TCF5MA27	F	FXV1405 EQ 0	-	-	Opens breaker 3D01-27 when MOV-3-1405 reaches the closed position
Y	**"PAHM"**	-	-	-	-	**Places H2 Monitor in Service**
-	TAC2V02A	1.0	-	1:00	0:30	Opens PAHM-002A
-	TAC2V02B	1.0	-	-	-	Opens PAHM-002B
-	TAAAV21	1.0	-	2:00	0:30	Opens HV-1
-	TAAAV22	1.0	-	3:00	0:30	Opens HV-3
-	TACA005	0.0	-	-	-	Closes MPAS-005
Y	**"AUX STM"**	-	-	-	-	**Realigns Aux Steam supply to Unit 4**
-	TAFF02	1.0	-	-	0:30	Opens SLWU-3-001
-	TAFF007	0.0	-	1:00	0:30	Closes 3-10-007

EVALUATION SCENARIO REFERENCES

Reference List:

PROCEDURE #	PROCEDURE TITLE
3-GOP-103	Power Operation to Hot Standby
3-OP-094	Containment Post-Accident Monitoring
3-ARP-097.CR	Control Room Annunciator Response
3-ONOP-049.1	Deviation or Failure of Safety Related or Reactor Protection Channels
3-EOP-E-0	Reactor Trip or Safety Injection
3-EOP-E-3	Steam Generator Tube Rupture
3-EOP-FR-S.1	Response to Nuclear Power Generation / ATWS
0-EPIP-20101	Duties of the Emergency Coordinator
	PTN Technical Specifications
	Plant Curve Book
3-ONOP-089	Turbine Runback

EVALUATION SCENARIO CONTENT SUMMARY

1. Total Number of Malfunctions: ~~7~~8

2. Malfunctions Occurring During EOP Performance: 2

   1. Reactor trip/AMSAC failure
   2. PORV/normal spray valve fails open

3. Abnormal Events: ~~3~~4

   1. PT-3-145 fails low
   2. FT-3-486 fails ~~low~~ high
   3. 3A SGFP bearing failure
   4. Auto Turbine Runback failure.

4. Major Transients: 2

   1. Loss of main feed (3B SGFP shaft shear)
   2. 3C S/G tube rupture

5. EOPs Used: 2

6. EOP Contingencies Entered: 1

7. Simulator Run Time: 90 minutes

8. EOP Run Time: 45 minutes

9. Crew Critical Tasks: 3

Facility: Turkey Point Nuclear Plant **Scenario No.:** 4 **Op-Test No.:** PTN Group XVIII

Examiners: _____ **Operators:** _____

Objectives: To evaluate the applicants' ability to raise load from 60% power per normal plant procedure. Evaluate ability of operators to recognize & respond to failure of the controlling 3A S/G steam flow channel high. Evaluate use of off-normal procedures for rod control Tref failing low and an RCP thermal barrier leak (with CCW return MOV malfunction) developing into an RCP high vibration problem requiring a reactor trip. Emergency Operating Procedure use will be evaluated for a large break LOCA followed by loss of offsite power . Finally, a failure of the running RHR pump occurs resulting in a loss of emergency coolant recirculation capability and RWST outflow is reduced.

Initial Conditions: 60% power, BOL

Turnover: Return to 100% power from 60% power is in progress to meet system peak demand following 3A SGFP breaker repair. The pump has been returned to service. The previous crew has just stabilized power for shift turnover. 3B EDG is OOS for corrective maintenance on the governor. FT-3-476 is OOS for calibration. Shift orders are to raise power from 60% to 100% power.

Event No.	Malf. No.	Event Type*	Event Description
1	N/A	N (SRO/BOP) R (RO)	Raise power from 60%. K/A 2.1.23 (3.9/4.0)
2	TFS1MWEH=T	I (SRO) I (BOP)	3A S/G controlling steam flow channel (FT-3-474) fails high. K/A 035A2.04 (3.6/3.8)
3	TFL1T8FP=T	I (SRO) I (RO)	Tref (TM-3-408F) fails low. K/A 001A1.02 (3.1/3.4)
4	TVKALTBB=0.3 TFKV626A=T then =F conditional on IMK1938C TAHUVBSB=21.0/ 3:00 ramp & TAHUVBMB=6.0/ 3:00 ramp	C (ALL)	RCP thermal barrier failure with failure of MOV-3-626 to automatically close on high flow. Reactor/RCP trip is required on high RCP vibration. K/A 026AA2.01 (2.9/3.5), 015/017AA1.06 (3.1/2.9) & AA1.23 (3.1/3.2)
5	TVHHCLB=2.0 / 0:05 delay / 0:30 ramp	M (ALL)	Large break LOCA. K/A 011EA2.01 (4.2/4.7)
6	TFP1S3GC=T	M (ALL)	Loss of offsite power. K/A 056AA1.05 (3.8/3.9)
7	TVMRPBRA=1.0/ 2:00 ramp	C (SRO) C(RO)	3A RHR pump trip (loss of emergency coolant recirculation). K/A WE11EA1.1 (3.9/4.0)

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

FLORIDA POWER AND LIGHT

TURKEY POINT NUCLEAR POWER PLANT

GROUP XVIII RO/SRO NRC INITIAL LICENSE EXAM

SIMULATOR EVALUATION SCENARIO EXERCISE GUIDE

PROGRAM:	RO/SRO Initial License Training
EXERCISE GUIDE:	XVIII NRC 4
DESCRIPTION:	Large Break Loss of Coolant Accident / Loss of Offsite Power
LENGTH:	90 minutes
AUTHOR:	G. M. Blinde
REVISION DATE:	05/10/99

REVIEWED BY: Bretton 6-11-99
Facility Reviewer Date

APPROVED BY: _____
NRC Chief Examiner Date

EVALUATION SCENARIO OBJECTIVES

TERMINAL OBJECTIVE: During normal and abnormal plant conditions, the Shift Operating Crew will perform control room operations in accordance with (IAW) approved plant procedures ensuring that the health and safety of the public is protected and the integrity of the plant maintained.

ENABLING OBJECTIVES:

1. Given specific plant conditions, plant procedures, and a shift turnover, respond to the following events IAW approved plant procedures:
   a. Power increase from 60%
   b. FT-3-474 failure ~~high~~ low (controlling channel)
   c. TM-3-408F failure low
   d. RCP themal barrier failure / MOV-3-626 auto close failure
   e. Large break LOCA
   f. Loss of offsite power
   g. 3A RHR pump trip (loss of emergency coolant recirculation)

2. Given abnormal plant conditions, mitigate the adverse consequences of the following events IAW approved plant procedures:
   a. Identify abnormalities while assessing actual system response with respect to predicted system response.
   b. Investigate the cause and effect of abnormalities in system performance.
   c. Implement applicable procedures.
   d. Perform immediate actions from memory.

3. Given abnormal plant conditions, implement the applicable on-site and off-site reports and notifications IAW approved plant procedures.

4. Given normal and abnormal plant conditions, using the following principles for operational effectiveness as they apply to all operators, conduct plant operations IAW approved plant procedures:
   a. Plant and control room communication.
   b. Plant/Control Board monitoring.
   c. Plant/Control Board manipulation.
   d. Operational problem solving.
   e. Use of OPs/ONOPs and Technical Specifications.
   f. Use of EOPs IAW EOP Rules of Usage.
   g. Annunciator recognition and response.
   h. Written communications/logs.
   i. ALARA awareness.

EVALUATION SCENARIO OBJECTIVES (cont'd)

5. Given normal and abnormal plant conditions, using the following principles for operational effectiveness as they apply to the Assistant Nuclear Plant Supervisor (ANPS), conduct plant operations IAW approved plant procedures:

   a. Team performance management.
   b. Problem solving.
   c. Decision analysis.
   d. Action planning.
   e. Self-checking.

6. During abnormal and emergency events, the shift operating crew shall apply techniques of teamwork and self-checking IAW established work practices and operating guidelines.

EVALUATION SCENARIO DESCRIPTION

Initial Conditions: Mode 1, 561 degrees F

Turnover: Power increase from 60% to 100% power is in progress following main feed pump breaker repair. The system dispatcher has asked that this power increase be expedited to deal with an expected high peak demand towards the end of dayshift. 3B EDG is OOS for corrective governor maintenance. FT-3-476 is OOS for calibration. No surveillance tests are in progress.

Synopsis: After a 5% power increase (or at lead examiner direction) the controlling steam flow channel on 3A S/G (FT-3-474) fails ~~high~~ low causing FCV-3-478 to automatically ~~open~~ close. Operator action is required to manually control 3A S/G level and select the other steam flow channel for level control input. The crew responds per 3-ONOP-049.1. Once the plant is stabilized, Technical Specifications are consulted and the crew briefed on the effects of the failure. Next, TM-3-408F fails low generating erroneous Tref input to rod control. If rods are in AUTO, inward rod movement occurs and operators respond per 3-ONOP-028 taking rod control to manual. Following plant stabilization, the 3B RCP thermal barrier HX experiences a large leak and MOV-3-626 fails to automatically close on high flow. The operators respond per 3-ONOP-067 and 3-ONOP-041.1. 3-ARP-097.CR may also be used as time permits prior to ONOP entry. After thermal barrier return isolation, 3B RCP shaft vibration begins to increase enough to eventually require a reactor & 3B RCP trip per 3-ONOP-041.1. When 3B RCP is tripped, the leak becomes a large break loss of coolant accident on the B RCS loop. The crew responds per 3-EOP-E-0. After SI reset, a loss of offsite power occurs. Since the 3B EDG is OOS, only the 3A 4kV bus re-energizes on the EDG. Train A safeguards loads must be manually restarted. The crew transitions to 3-EOP-FR-P.1 momentarily and then to 3-EOP-E-1. Then, the 3A RHR pump trips causing a loss of all LHSI. If RWST level gets <155,000 gallons, transition is made to 3-EOP-ES-1.3. With no RHR pumps running whether in 3-EOP-E-1 or in 3-EOP-ES-1.3 transition is made to 3-EOP-ECA-1.1. The exercise is concluded upon reduction of SI flow to minimum (3-EOP-ECA-1.1 step 17), stopping all SI flow (3-EOP-ECA-1.1 step 30) or at the evaluator's discretion. The event is classified after scenario completion as a General Emergency per 0-EPIP-20101, Enclosure 1, category 1.

Event summary:

EVENT #	DESCRIPTION
1	Power increase from 60%
2	FT-3-474 fails ~~high~~ low (3A S/G FRV ~~opens~~ closes)
3	TM-3-408F fails low
4	3B RCP TBHX failure / MOV-3-626 auto close failure
5	Large break loss of coolant accident
6	Loss of offsite power (loss of 3B 4kV bus)
7	3A RHR pump trip (loss of emergency coolant recirc)

Crew Critical Steps:

EVENT #	DESCRIPTION
6	1. Ensure one train of safeguards is actuated and running prior to transitioning from from 3-EOP-E-0
7	1. Stop SI and RHR pumps upon reaching 60,000 gallons in the RWST 2. Make up to the RWST and minimize RWST outflow per 3-EOP-ECA-1.1

Individual Critical Steps:

The bolded individual actions listed under the respective positions (RCO, ANPS, etc.) are for use during evaluations to identify steps that are critical to the individual position.

EVALUATION SCENARIO PRE-EXERCISE BRIEFING

1. **Review the following with students:**
   a. Primary responsibility of the student is to operate the simulator as if it were the actual plant.
   b. The evaluators will observe teamwork skills, communication, and the crew's ability to safely operate the plant during the simulator examination. This includes individual & crew performance.
   c. If you recognize an incorrect decision, response, answer, analysis, action, or interpretation by another crew member but fail to correct it, then the evaluator may assume that you agree with the incorrect item.
   d. The crew should keep a rough log during each scenario sufficient to complete necessary formal log entries.
   e. The simulator instructor facility operator will perform all of the functions of personnel needed outside the control room area.
   f. Before the examination begins, crew members may perform a control board walkdown for up to 10 minutes.
2. **The following are initial conditions for this exam** (in shift turnover package, but may be covered verbally if needed):
   a. Time in core life - BOL
   b. Reactor power and power history - 100%→60% 4 hr ago
   c. Turbine status - online
   d. Boron concentration - 1390 ppm
   e. Temperature - 561 degrees F
   f. Pressure - 2235 psig
   g. Xenon - Increasing following 100%→60% downpower 4 hr ago.
   h. Core cooling - forced
   i. Tech. Spec. LCO(s) in effect
      - 3.3.1 Action 6 (bistables tripped); FT-3-476 OOS for cal
      - 3.8.1.1 Action b (72 hrs); 3B EDG OOS (governor)
   j. Clearances in effect - 3B EDG
   k. Significant problems/abnormalities - None
   l. Evolutions/maintenance for the coming shift - Return to 100% power this shift. Expedite to meet system peak.
   m. Units 1 and 2 status - unit 1 online; unit 2 s/d
   n. Unit 4 status - mode 1; 100% power
3. **Ensure students understand examination schedule** and that a break will be necessary between scenarios to allow simulator initial condition setup. **Cover exam security rules** to be observed by students both during and after the exam IAW the latest revision of AG-017 or NUREG-1021 as applicable.
4. **Before the examination begins, make crew position assignments and allow students to ask any questions concerning the administration of the test.**

EXPECTED OPERATOR ACTIONS

EVENT: 1

BRIEF DESCRIPTION: Unit is at reduced power (60%) and is directed to return to 100% power.

INDICATIONS:
1. Notification by System
2. Shift turnover

POSITION	TIME	EXPECTED ACTIONS
BOP		1. At 400-435 MW, starts the 2nd SGFP per 3-OP-074
		2. At 450 MW, starts the 2nd HDP per 3-OP-081 and verifies adequate heater drain flow
		3. Maintains Tref/Tavg approx equal during uppower
		4. Keeps ANPS informed of plant status
RCO		1. Prior to exceeding 70% power, consults with Reactor Engineering concerning MTC
		2. Maintains Tref/Tavg approx equal during uppower
		3. Prior to 90% power, verifies all rods within 12 steps of group step counter
		4. At steady state power with Tavg within 1□F of Tref, places rods in AUTO
		5. Verifies Gamma-Metric wide range power meter within 1.5% of PRNIs when rx power 98.5-100%
		6. Keeps ANPS informed of plant status
ANPS		1. Coordinates and directs uppower evolution
		2. Verifies MTC limits are met prior to exceeding 70% power
		3. Keeps NPS informed of plant status

EXPECTED OPERATOR ACTIONS

EVENT: 2

BRIEF DESCRIPTION: 3A S/G controlling steam flow FT-3-474 fails ~~high~~ low. The 3A S/G FRV requires manual action to maintain stable plant conditions. The channel is called OOS and compensatory actions are initiated per 3-ONOP-049.1.

INDICATIONS:

1. Annunciator C-5/1, S/G A STEAM > FEED
2. FI-3-474 off scale ~~high~~ low
3. FCV-3-478 ~~opening~~ closing in AUTO
4. ~~In~~Decreasing level in 3A S/G

POSITION	TIME	EXPECTED ACTIONS
BOP		1. Recognizes failure of FT-3-474 and responds as directed by ANPS a. Compares to other SG FT's and verifies no off-normal conditions on other SG FT's 2. Notifies ANPS of failure **3. Takes manual control of FCV-3-478, restores steam/feed flow balance and stabilizes SG level** 4. Selects alternate SG steam FT channel for control and returns FCV-3-478 to automatic
RCO	NONE	
ANPS		1. Directs stabilization of plant conditions 2. Directs compensatory action per 3-ONOP-049.1 a. Verifies BOP determination of SG FT status b. Determines which b/s to trip and effects on plant of tripping b/s. Provides this info to RCO/BOP for guidance. 3. Notifies NPS of plant status

EXPECTED OPERATOR ACTIONS (cont'd)

EVENT: 2 (cont'd)

POSITION	TIME	EXPECTED ACTIONS
ANPS (cont'd)		4. Ensures Tech Spec requirements are met
		5. Notifies I&C of FT-3-474 failure and directs initiation of PWO

EXPECTED OPERATOR ACTIONS

EVENT: 3

BRIEF DESCRIPTION: TM-3-408F loses power. Rod control Tref fails low. Rods step in if in AUTO. The crew responds per 3-ARP-097.CR using 3-ONOP-028 as needed.

INDICATIONS:
1. Annunciator B-4/4, Tavg-Tref DEVIATION
2. Tavg input on Tavg-Tref recorder failed low
3. Control rods stepping in if in AUTO

POSITION	TIME	EXPECTED ACTIONS
BOP		1. Assists RCO as directed by ANPS.
RCO		1. Responds to TM-3-408F failure per 3-ARP-097.CR: a. Checks Tavg-Tref recorder (TR-3-408) and VPA Tavg & Pimp indication b. Places/verifies rods in MANUAL 2. **Responds to TM-3-408F failure per 3-ONOP-028** (if directed): **a. Places rods in MANUAL & adjusts rods to maintain Tavg = Tref** b. Verifies rod insertion limits not exceeded c. Checks for failure of TM-3-408F d. Initiates caution tag for rod control selector switch 3. Informs ANPS of plant status
ANPS		1. Directs response per 3-ARP-097.CR and uses 3-ONOP-028 as needed 2. Informs NPS/I&C of TM-3-408F failure 3. Directs PWO initiation

EXPECTED OPERATOR ACTIONS

EVENT: 4

BRIEF DESCRIPTION: 3B RCP thermal barrier HX (TBHX) fails. PRMS R-3-17A/B alarms. MOV-3-626 fails to auto close on high flow requiring manual closure. 3-ONOP-067 & 041.1 are entered (as is 3-ARP-097.CR if time permits). After MOV-3-626 closure, shaft vibration increases requiring a reactor trip.

INDICATIONS:

1. PRMS R-3-17A and B alarm
2. CCW surge tank level increases
3. Annunciator H-1/4, PRMS HI RADIATION, actuates
4. Annunciator A-1/1, RCP THERMAL BARR COOLING WATER HI FLOW, alarms (MOV-3-626 fails)
5. Annunciator A-1/2, RCP THERMAL BARR COOLING WATER HI TEMP, alarms
6. Annunciator F-1/1, RCP MOTOR/SHAFT HI VIB

POSITION	TIME	EXPECTED ACTIONS
BOP		1. Performs actions as directed per 3-ONOP-067:
		a. Checks R-3-17A/B alarm valid
		2. Performs actions as directed per 3-ONOP-041.1:
		a. In response to affected RCP TBHX ΔP low, verifies seal injection 6-13 gpm
		b. Recognizes/reports shaft high vibration condition (annunciator F-1/1)

EXPECTED OPERATOR ACTIONS (cont'd)

EVENT: 4 (cont'd)

POSITION	TIME	EXPECTED ACTIONS
RCO		1. Recognizes RCP TBHX failure & informs ANPS
		2. Performs actions as directed by 3-ARP-097.CR:
		a. In response to annunciator A-1/1:
		1) Verifies/manually closes MOV-3-626
		2) Checks R-3-17A/B for increasing activity
		3) Contacts Chemistry for CCW activity sample
		b. In response to annunciator A-1/2:
		1) Checks CCW header flow & HX outlet temp.
		2) Checks R-3-17A/B increasing activity -YES- verifies seal injection & closes MOV-3-626
		3) Checks for #1 seal leakoff high flow
		4) Monitors thermal barrier ΔP, RCP temps
		c. Notifies ANPS to go to 3-ONOP-067 & 041.1
		3. Performs actions as directed per 3-ONOP-067:
		a. Verifies CCWST vent closed (RCV-3-609)
		b. Requests CCW activity sample from Chemistry

EXPECTED OPERATOR ACTIONS (cont'd)

EVENT: 4 (cont'd)

POSITION	TIME	EXPECTED ACTIONS
RCO (cont'd)		**4. Performs actions as directed per 3-ONOP-041.1:**
		a. Monitors #1 seal leakoff, lower pump guide bearing, seal return & CCW supply temps.
		b. **If MOV-3-626 not yet closed** (3B RCP thermal barrier ΔP = 0 inches):
		1) Verifies proper seal injection flow
		2) Maintains thermal barrier cooling
		3) Checks #1 seal leakoff <Encl 1 limits
		4) Checks A-1/1, 1/2, 1/3 OFF - NO
		5) Checks CNMT ϕB isolation not actuated & RCP seal return temp < 235°F
		6) Checks R-17A/B normal - NO
		7) Manually closes MOV-3-626.
		c. Verifies shaft high vibration condition
		d. Trips reactor & affected RCP when directed
ANPS		**1. Directs mitigative actions IAW 3-ARP-097.CR, 3-ONOP-067 & 041.1**
		a. Directs MOV-3-626 closure
		b. Directs reactor trip followed by 3B RCP trip due to high shaft vibration (foldout)
		2. Informs NPS of plant status
		3. Directs announcement to stand clear of CCW piping

add provision for D bus restoration from E-0 step 3 2W0 or 0W0 out.5

EXPECTED OPERATOR ACTIONS

EVENT: 5 & 6

BRIEF DESCRIPTION: In response to plant conditions, a reactor trip & SI has occurred. Operators perform actions of 3-EOP-E-0. Just before transition to 3-EOP-E-1, a loss of offsite power occurs requiring manual restart of train A ESF loads (SI reset & 3B EDG OOS). Transition is then made to 3-EOP-E-1.

INDICATIONS:

1. Reactor trip directed or actuates
2. Rod bottom lights on and RTBs/BYBs open
3. SI alarms & ESF equipment auto starts
4. Switchyard deenergizes & only train A safety electrical distribution reenergizes (3B EDG OOS)

CREW CRITICAL STEPS: 1. **Ensure one train of safeguards is actuated and running prior to transitioning from from 3-EOP-E-0**

POSITION	TIME	EXPECTED ACTIONS
BOP		1. Responds to reactor trip per 3-EOP-E-0
		a. Verifies turbine trip
		b. Verifies power to 3A/B/D 4kV buses
		c. Verifies feedwater isolation
		d. Verifies AFW pumps running
		e. Verifies proper ICW operation
		f. Checks if main stm lines should be isolated
		g. Verifies EDGs all running
		h. Directs SNPO to place PAHMS in service
		i. Verifies proper AFW alignment and flow
		j. Checks RCS cold leg temperatures stable
		k. Performs MSLB & SGTR diagnostics

EXPECTED OPERATOR ACTIONS (cont'd)

EVENT: 5 & 6 (cont'd)

POSITION	TIME	EXPECTED ACTIONS
BOP (cont'd)		**2. Performs 3-EOP-E-0 foldout steps as directed including restoring ESF equipment to required configuration (train A only) after LOOP.**
		3. Informs ANPS of plant status
RCO		**1. Responds to reactor trip per 3-EOP-E-0**
		a. Verifies reactor tripped
		b. Manually actuates SI/ΦA if required
		c. Verifies containment isolation phase A
		d. Verifies SI pumps running
		e. Verifies proper CCW system operation
		f. Verifies containment cooling
		g. Verifies Cntmt and CR ventilation isolation
		h. Verifies Cntmt spray not required - NO
		1) Verifies containment spray actuation
		2) Verifies ϕB containment isolation
		3) Stops all RCPs (if still running)
		i. Verifies SI valve amber lights bright
		j. Resets/realigns SI & verifies SI flow
		k. Checks cooling of RCPs & RCP seals
		l. Checks letdown/PORVs/spray valves closed
		m. Performs LOCA diagnostics

EXPECTED OPERATOR ACTIONS (cont'd)

EVENT: 5 & 6 (cont'd)

POSITION	TIME	EXPECTED ACTIONS
RCO (cont'd)		2. **Performs 3-EOP-E-0 foldout page steps as directed:**
		a. **Recognizes loss of subcooling/ϕB actuation and trips RCPs per 3-EOP-E-0 (if needed)**
		b. **Starts train A ESF loads as directed by the ANPS following loss of offsite power.**
		3. Notifies ANPS of safety injection and cause
ANPS		1. **Directs response to reactor trip per 3-EOP-E-0**
		a. Obtains verification of reactor trip
		b. Determines electric plant status
		c. Directs manual SI/phase A if required
		d. **Monitors foldout page items:**
		1) **Direction to RCO to stop all RCPs if required by subcooling/ϕB actuation**
		2) **Following loss of offsite power, directs start of train A ESF loads.**
		e. Directs prompt and subsequent actions
		2. **Transitions to appropriate plant procedure (3-EOP-E-1 or appropriate FRP)**
		3. Informs NPS as to status of plant

Add Z.1 steps.

EXPECTED OPERATOR ACTIONS

EVENT: 7

BRIEF DESCRIPTION: With a large break LOCA/LOOP, only train A ESF is running (3B EDG OOS). From E-0, FR-P.1 is briefly entered followed by either FR-Z.1 if needed or E-1 after which 3A RHRP trips. If RWST level < 155 kgal, ES-1.3 is entered. With no RHR pumps, ECA-1.1 is entered.

INDICATIONS:

1. Cntmt radiation & sump lvl indications abnormal
2. Safety injection actuated and injecting
3. RWST level dropping (<155kgal for EOP-ES-1.3)
4. RCS cold leg temperature (<290°F for EOP-FR-P.1)
5. Annunciator H-6/3, RHR PP A/B MOTOR OVERLOAD
6. Annunciator H-6/4, RHR PP A/B TRIP

CREW CRITICAL STEPS:

1. **Stop SI pumps upon reaching 60,000 gallons in the RWST**
2. **Make up to the RWST and minimize RWST outflow per 3-EOP-ECA-1.1**

POSITION	TIME	EXPECTED ACTIONS
BOP		1. Performs actions of 3-EOP-E-1 as directed:
		a. Checks S/G fault, S/G levels & sec. rad.
		b. Resets cntmt isol ϕA/B & verifies IA press.
		c. Checks chg pump power from offsite - NO - power available for only two chg pumps
		d. Checks for presence of MSLB (SG pressures)
		e. Checks if EDGs should be stopped - NO
		2. Assists RCO with ~~3-EOP-ES-1.3~~ EOP's as directed.
		3. ~~Performs actions of 3-EOP-ECA-1.1 as directed:~~
		~~a.~~ Maintains intact S/G levels 15-50% per 3-EOP-ECA-1.1 as directed
		~~b. Assists RCO as directed~~
		4. Informs ANPS of plant status

~~4. Performs actions of 3-EOP-FR-Z.1 (if directed) a. Checks if power available to unaffected S/G - NO b. Assists RCO per 3-EOP-FR-Z.1 (if directed) c. Assists RCO per ECA (if directed)~~

EXPECTED OPERATOR ACTIONS (cont'd)

EVENT: 7 (cont'd)

POSITION	TIME	EXPECTED ACTIONS
RCO		1. Performs actions of 3-EOP-FR-P.1 as directed:
		a. Checks RCS press > 650psig - NO - RHR flow > 1000gpm
		2. Performs actions of 3-EOP-E-1 as directed:
		a. Checks PORVs and block valves
		b. Verifies SI-reset
		c. Checks for max chg flow (2 pumps)
		d. Checks if SI should be terminated - NO
		e. Checks if cntmt spray should be stopped
		f. Checks if RHR pumps should be stopped - NO
		g. Verifies cold leg recirc capability - NO
		h. Identifies RWST lvl <155kgal & informs ANPS
		3. Performs actions of 3-EOP-ES-1.3 as directed:
		a. Verifies SI reset
		b. Takes 3B CSP to PTL; MOV-3-880B deenergized
		c. Checks 3A HHSIP running, takes RHRPs to PTL
		d. Verifies RHR aligned for injection
		e. Stops chg pumps if VCT m/u not available
		f. Establishes hot leg recirc capability
		g. Closes U3 HHSIP recirc to RWST valves
		h. Stops U4 HHSIPs & isolates from U3 HHSI

EXPECTED OPERATOR ACTIONS (cont'd)

EVENT: 7 (cont'd)

POSITION	TIME	EXPECTED ACTIONS
RCO (cont'd)		**3. Performs actions of 3-EOP-ES-1.3 as directed (cont'd):**
		i. Verifies cold leg recirc valves energized
		j. Verifies RHR alt dischg isolated
		k. Realigns RHR suction from RWST to CNMT sump
		l. Verifies CNMT recirc sump level
		m. Verifies adequate CCW for RHR cooling
		n. Starts one RHR pump - NO
		4. Performs actions of 3-EOP-ECA-1.1 as directed:
		a. Checks CL recirc capability available - NO
		b. Aligns makeup to the RWST
		c. Verifies only two ECCs running & at least one computer room chiller running
		d. If RWST level < 60kgal, then stops running HHSI, charging and containment spray pumps
		e. Reduces containment cooling as directed
		f. Verifies SI reset
		g. Establishes one HHSI pump running
		h. Verifies no RWST -> Sump backflow
		i. Checks RCS subcooling (approx. zero)
		j. Establishes minimum SI as directed
		6 ~~5~~. Informs ANPS of plant status

5. Performs actions of 3-EOP-FR-Z.1 (if directed)
a. Verifies RCPs stopped with all NCC's OFF/ISOLATED
b. Verifies CNMT Ø2/B VPB valve white lights all lit.
c. Verifies CNMT/CR Vent Isol.
d. Checks CL Recirc Capability - NO

EXPECTED OPERATOR ACTIONS (cont'd)

EVENT: 7 (cont'd)

POSITION	TIME	EXPECTED ACTIONS
ANPS		1. Determines 3-EOP-FR-P.1 n/a for LBLOCA
		2. Directs response to LBLOCA per 3-EOP-E-1:
		a. Directs max charging aligned (2 pumps)
		b. Transitions to appropriate procedure or FRP if required by red/orange path CSFST
		1) 3-EOP-FR-Z.1 if CNMT press > 20 psig
		2 ~~1~~) 3-EOP-ES-1.3 if RWST < 155kgal
		~~2) 3-EO~~
		3 ~~2~~) 3-EOP-ECA-1.1 for loss of both RHRPs
		3. If applicable, directs response to LBLOCA per 3-EOP-ES-1.3 but determines no RHR pumps operable and transition required to 3-EOP-ECA-1.1
		4. Directs response to LBLOCA per 3-EOP-ECA-1.1:
		a. Directs addition of makeup to the RWST
		b. Determines RCS cooldown not applicable
		c. If RWST level > 60 kgal:
		1) Reduces containment spray to minimum
		2) Verifies no backflow from RWST to sump & determines RCP could not be started
		3) Determines minimum SI flow (figure 1) & directs NLO action accordingly
		d. If RWST level < 60 kgal, stops all HHSI pumps, cnmt spray pumps & charging pumps
		5. Classifies event as a GENERAL EMERGENCY (RCS leak > chg w/cnmt press>20psig) per 0-EPIP-20101
		6. Informs NPS of status of unit

SIMULATOR INSTRUCTOR FACILITY OPERATING INSTRUCTIONS

I. SETUP

A. Reset to IC-24, or static IC-3 which includes steps C & D below except for setting conditional TFKV626A=F/IMK1938C.

B. Load scenario 65.

C. Following switch check, unfreeze the simulator. ~~Realign plant equipment to allow for FT-3-476 & 3B EDG out of service. Place MIMS in service.~~

D. Perform the following
   1. Take 3B EDG OOS (parameter controller direct triggers TAQ5B20P=3 & TAQ5LRSB=0)
   2. Take FT-3-476 OOS per 3-ONOP-049.1 as follows:
      a. In rack 24, trip bistables BS-3-478-A1/A2/D.
      b. Select FT-3-477 for 3A S/G level control
      c. Fail FT-3-476 low (touch SYS MAT->FEEDWATER->MAIN FEEDWATER MENU->FEEDWATER REGULATOR VALVES ->F-SG1->FT-476->FAIL LOW->set TFF1M76L=T).
   3. Enter the following failures:
      a. MOV-626 auto close failure (touch SYS MAT->COMMON SERVICES->COMPONENT COOLING->CCW TO RCP.. ->FCV626->FAIL AS IS->set TFKV626A=T and set conditional TFKV626A=F/IMK1938C).
   4. Freeze Simulator

E. Delete all conditional events from Parameter Controller Event Summary **except** those indicated on the Parameter Controller Event Summary pages in this exercise guide. Direct events may deleted at instructor discretion.

F. Place turnover sheet on RCO desk.

G. Clearance information tags-Rack 24 (FT-3-476) and 3B EDG.

H. Information tags-~~None~~ Brown dot a FT-3-476. Info tag on 3A SG level control FF input to FT-3-47

I. Select 3A @SPDS to page 211 (SAT) and 3B @SPDS to page 212 (DUL). Set ERDADS # on UPA to TAVE/TREF (TAV) and at the RCO desk to ENUZU (ED3).

II. CONDUCTING THE EXAMINATION:

A. Unfreeze the simulator and begin the exam.

B. **Power increase from 60% (event 1).**

1. **Initiation:** Crew should begin in response to shift turnover. If slow to begin, call as System Dispatcher and prompt commencement of load increase.

2. **Response:** Acknowledge load dispatcher/plant management notifications of the load increase. Respond as field operator in response to notification of starting/stopping plant equipment and as Reactor Engineering concerning MTC (reply that MTC is within limits and that power may increase above 70%).

SIMULATOR INSTRUCTOR FACILITY OPERATING INSTRUCTIONS (cont'd)

C. FT-3-474 fails ~~high~~ low (3A S/G FRV ~~opens~~ closes) (event 2).

1. **Initiation:** After a 5% power change or at lead evaluator discretion, fail FT-3-474 (touch SYS MAT->STEAM GENERATOR & MAIN STEAM->MAIN STEAM->F-474->FT474-> TRANSMITTER FAIL ~~HIGH~~ low-> set TFS1MWE~~H~~L=T). This will ~~open~~ close FCV-3-478. Manual control must be taken to stabilize 3A S/G level until FT-3-475 can be selected and 3A S/G level control returned to AUTO.

2. **Response:** As NPS/NWE state that a work request will be generated and I&C will be notified of the failure. As I&C, reply that a planner will intiate a work package for troubleshooting & repair.

D. TM-3-408F fails low (event 3).

1. **Initiation:** Following event 2 crew brief, with 3A S/G level stabilized and rod control in AUTO (or at lead examiner discretion), actuate TM-3-408F (rod control Tref) failure low by touching SYS MAT->REACTOR->ROD CONTROL ROD POSITION->TM408F->T REF PROGRAM POWER LOSS->set TFL1T8FP=T. This fails the rod control unit Tref input thus requiring manual rod control.

2. **Response:** Respond as NPS/NWE/I&C to notification of TM-3-408F failure. As NPS/NWE state that a work request will be generated and I&C will be notified. As I&C, reply that a planner will intiate a work package for troubleshooting/repair.

E. 3B RCP TBHX failure / MOV-3-626 auto close failure (event 4).

1. **Initiation:** Once the plant is stabilized with manual rod control, actuate the 3B RCP TBHX leak by touching SYS MAT->COMMON SERVICES->COMPONENT COOLING-> CCW TO RCP...->LVTBB->VALVE PORT AREA->set TVKALTBB=0.3. The MOV-3-626 failure was entered in the scenario setup. When MOV-3-626 is closed, begin ramping 3B RCP shaft vibration up to the reactor trip setpoint (touch SYS MAT->REACTOR COOLANT SYSTEM-> REACTOR COOLANT PUMPS->RCP B->IDA->RCP VIBRATION S->set TAHUVBSB=21.0/3:00 ramp-> IDA->RCP VIBRATION M->set TAHUVBMB=6.0/3:00 ramp).

2. **Response:** Acknowledge requests for SNPO/NWE assistance with MOV-3-626 or verification of RCP seal injection flows. If directed, these flows may be adjusted using SYS MAT-> REACTOR COOLANT SYSTEM->REACTOR COOLANT PUMPS->CV297A(B)(C)-> VALVE PORT AREA->set TAHN97A(B)(C)=value as directed by crew.
Acknowledge notification to NPS/system dispatcher of U3 trip (3-ONOP-041.1 directs reactor/3B RCP trip on high vibration).
Acknowledge direction as Chemistry to sample CCW for activity (RCS inleakage). After 10-15 minutes, report CCW activity with counting in progress.

SIMULATOR INSTRUCTOR FACILITY OPERATING INSTRUCTIONS (cont'd)

E. **3B RCP TBHX failure / MOV-3-626 auto close failure (event 4 cont'd).**

2. **Response (cont'd):** As HP, direction may be received to survey CCW piping for increased radiation levels. After 8-10 minutes, report radiation above background exists on CCW piping. Request PA announcements be made for personnel to stand clear of CCW piping (if not made already).

F. **Large break loss of coolant accident (event 5)**

1. **Initiation:** When the 3B RCP is tripped in response to event 4, actuate the large break LOCA using parameter controller direct trigger TVHHCLB=2.0/5 sec delay/30 sec ramp..

2. **Response:** Respond as HP if directed to survey the main steam lines and outside containment. After 10-15 minutes, report elevated general area radiation in all areas near containment. When requested as SNPO to place PAHMs in service, report alignment completion after 10-15 minute delay (parameter controller trigger composite "PAHM").

G. **Loss of offsite power (loss of 3B 4kV bus) (event 6)**

1. **Initiation:** Just before the diagnostic steps (27-29) in 3-EOP-E-0, actuate a ground on the unit 3 startup transformer using parameter controller direct trigger TFP1S3GC=T.

2. **Response:** After losing U3 S/U xfmr, the crew may request U4 RCO realignment of U4 HHSIP suctions to U3 RWST. After 8-10 minutes, carry this out using parameter controller trigger composite "SIALIGN". If asked as U4 RCO, state that U4 is at 100% power. If asked as NPO/NWE to investigate U3 S/U xfmr, after 2-4 minutes report actuation of the ground (64) relay. If asked to reset the relay, state that it will not reset.
If directed to perform Att. 2 of 3-ONOP-004.3, verify the 3AC16 & 3AC01 local blue power available lights ON. Then, 4-6 minutes later, report that breaker 3AC13 is misaligned in its cubicle and can not be fully racked in. Respond as Electrical Maintenance if asked to troubleshoot, but do not repair it.

H. **3A RHR pump trip (loss of emergency coolant recirc) (event 7).**

1. **Initiation:** ~~Shortly after the~~ Immediately after ~~transition~~ transition from 3-EOP-~~E-1~~ FR-P.1 to ~~3-EOP-FR-P.1 and back~~ then go back to 3-EOP-FR-E-1 or back to 3-EOP-E-1, actuate increasing bearing wear on the 3A RHR pump using SYS MAT->SAFETY SYSTEM->RHR PROCESS->P3A->RHR PP 3A->BEARING WEAR->set TVMRPBRA=1.0/~~2:00~~ 1:00 ramp. This will ~~eventually~~ cause the pump to trip on overcurrent.

SIMULATOR INSTRUCTOR FACILITY OPERATING INSTRUCTIONS (cont'd)

H. **3A RHR pump trip (loss of emergency coolant recirc) (event 7 cont'd)**

2. **Response:** When directed as SNPO to check out the 3A RHR pump, wait 1-3 minutes and report as follows:
- If the pump is still running, state that the pump is much noisier than usual and getting worse.
- If the pump has tripped, state that top of the motor casing is very hot with burnt insulation smell in the room. The pump shaft will not rotate (seized) by hand.

If asked as mechanical maintenance about the status of 3B EDG, state that the governor is disassembled and could not be made ready before tomorrow dayshift at the earliest.
Respond as HP as in event 5. Surveys may be expanded to include all around containment. When directed as Chemistry to take periodic S/G activity samples request S/G sample MOV's be opened to permit this. Also acknowledge request as Chemistry to locally check DAM-1 monitor and align PASS. No secondary activity should be reported to the crew during this scenario.
LCV-3-115C is deenergized requiring local closure to allow charging pump suction from the RWST per 3-EOP-E-1 step 10(touch SYS MAT->CHEMICAL VOLUME CONTROL SYSTEM->CVCS CHARGING->MOV115C->LOCAL CLOSE/TRIP(MECH)->set TCB162MC=F->MOV115C->FAIL CLOSE->set TFBVC62=T.
If directed as NPO/SNPO to close in cold leg recirc breakers per 3-EOP-E-1 step 17 or 3-EOP-ES-1.3 step 10, after a 1-3 minute delay, actuate parameter controller trigger composite "CLRECBKR". Note that only train A has power available. If directed, local operation of train B valves outside containment (MOV-3-862B/863B/864B only) can be accomplished using the RHR PROCESS & SI PROCESS system mimics and taking each valve to FAIL OPEN with a 3-5 minute delay per valve.
After transition to 3-EOP-ECA-1.1, respond as SNPO when directed to manipulate 3-356/365A/365B. Touch SYS MAT->CHEMICAL VOLUME CONTROL SYSTEM->CVCS MAKEUP->365B->VALVE PORT AREA->set TABM365B=1.0 (356 already closed & 365A not simulated) allowing 3-5 minutes before reporting completion. Also respond as SNPO when directed to throttle valve 3-888B for minimum SI flow from 3A HHSIP. Touch SYS MAT->SAFETY SYSTEM->SAFETY INJECTION PROC->888B->VALVE PORT AREA->TAMH888B=0.05 (300 gpm) initially with additional throttling (=0.025 for 200 gpm) as directed. Allow 2-4 minutes before reporting the initial valve repositioning.

III. TERMINATION CRITERIA:

A. Upon reduction of SI flow to minimum or trip of all pumps with RWST suction (step 17 or 30 of 3-EOP-ECA-1.1), **OR**

B. At the discretion of the evaluator.

PARAMETER CONTROLLER FILE:

COM-POS-ITE	CDB LABEL	VALUE	CONDITIONAL	TIME DELAY	RAMP	DESCRIPTION
N	TVHHCLB	2.0	-	0:05	0:30	Actuates LBLOCA on B RCS loop.
N	TAQ5LRSB	0	-	-	-	Takes 3B EDG LOCAL/NORMAL switch to OFF
N	TAQ5B20P	3	-	-	-	Racks out 3B EDG output breaker 3AB20
N	TFP1S3GC	T	-	-	-	Trips ground (64) relay on U3 startup xfmr
Y	**"CLRECBKR"**	-	-	-	-	**Closes cold leg recirc breakers (E-1 step 17 or ES-1.3 step 10)**
-	TCM2D06M	T	-	-	-	Closes bkr 30621 (MOV-3-866B)
-	TCM2D04M	T	-	0:15	-	Closes bkr 30605 (MOV-3-864B)
-	TCM1D03M	T	-	0:30	-	Closes bkr 30615 (MOV-3-750)
-	TCM1D10M	T	-	0:45	-	Closes bkr 30616 (MOV-3-862B)
-	TCM1D12M	T	-	1:00	-	Closes bkr 30626 (MOV-3-863B)
-	TCM1D09M	T	-		-	Closes bkr 30720 (MOV-3-862A)
-	TCM1D11M	T	-	0:15	-	Closes bkr 30726 (MOV-3-863A)
-	TCM1D04M	T	-	0:30	-	Closes bkr 30731 (MOV-3-751)
-	TCM2D05M	T	-	0:45	-	Closes bkr 30732 (MOV-3-866A)
-	TCM2D03M	T	-	1:00	-	Closes bkr 30712 (MOV-3-864A)
Y	**"SIALIGN"**	-	-	-	-	**Aligns U4 HHSI pumps suction to U3 RWST**
-	TAMH1V46	1.0	-	0:02	-	Opens valve 3-892A
-	TAMH1V41	1.0	-	0:45	-	Opens valve 3-870A
-	TAMH1V37	0.0	-	1:20	-	Closes valve 4-864C
-	TAMH4856	0.0	-	2:20	-	Closes valves 4-856A&B
Y	**"PAHM"**	-	-	-	-	**Places H2 Monitor in Service**
-	TAC2V02A	1.0	-	0:30	-	Opens PAHM-002A
-	TAC2V02B	1.0	-	1:30	-	Opens PAHM-002B
-	TAAAV21	1.0	-	-	-	Opens HV-1
-	TAAAV22	1.0	-	-	-	Opens HV-3
-	TACA005	0.0	-	-	-	Closes MPAS-005

EVALUATION SCENARIO REFERENCES

Reference List:

PROCEDURE #	PROCEDURE TITLE
3-GOP-301	Hot Standby to Power Operation
3-OP-094	Containment Post-Accident Monitoring
3-ARP-097.CR	Control Room Annunciator Response
3-ONOP-028	Reactor Control System Malfunction
3-ONOP-041.1	Reactor Coolant Pump Off-Normal
3-ONOP-049.1	Deviation or Failure of Safety Related or Reactor Protection Channels
3-ONOP-067	Radioactive Effluent Release
3-EOP-E-0	Reactor Trip or Safety Injection
3-EOP-E-1	Loss of Reactor or Secondary Coolant
3-EOP-ES-1.3	Transfer to Cold leg Recirculation
3-EOP-ECA-1.1	Loss of Emergency Coolant Recirculation
3-EOP-FR-P.1	Response to Imminent Pressurized Thermal Shock Condition
0-EPIP-20101	Duties of the Emergency Coordinator
	PTN Technical Specifications
	Plant Curve Book

3-EOP FR-Z.1 Response to High Containment Pressure.

EVALUATION SCENARIO CONTENT SUMMARY

1.	Total Number of Malfunctions:	7
2.	Malfunctions Occurring During EOP Performance:	1
	1. 3A RHR pump trip / loss of emergency coolant recirc	
3.	Abnormal Events:	4
	1. FT-3-474 fails ~~high~~ low 2. TM-3-408 fails low 3. RCP thermal barrier failure 4. MOV-3-626 auto close failure	
4.	Major Transients:	2
	1. Large break loss of coolant accident 2. Loss of offsite power	
5.	EOPs Used:	2
6.	EOP Contingencies Entered:	1
7.	Simulator Run Time:	90 minutes
8.	EOP Run Time:	45 minutes
9.	Crew Critical Tasks:	3

Facility:
Date of Exam: Exam Level: RO/SRO

Item Description	Initials a	Initials b	Initials c
1. Answer key changes and question deletions justified and documented	NA	NA	NA
2. Applicants' scores checked for addition errors (reviewers spot check > 25% of examinations)	KW	RB	D
3. Grading for all borderline cases (80% +/- 2%) reviewed in detail	NA	NA	n/a
4. All other failing examinations checked to ensure that grades are justified	NA	NA	n/a
5. Performance on missed questions checked for training deficiencies and wording problems; evaluate validity of questions missed by half or more of the applicants	KW	RB	D

	Printed Name / Signature	Date
a. Grader	Keith Vogt	9-1-99
b. Facility Reviewer(*)	Rich Bretten	9-1-99
c. NRC Chief Examiner (*)	R. Aiello	9/29/99
d. NRC Supervisor (*)	HOLLAHSTOWN	9/29/99

(*) The facility reviewer's signature is not applicable for examinations graded by the NRC; two independent NRC reviews are required.

Turkey Point (PTN) Group XVIII

Competencies	Applicant #1 RO/~~SRO-I/SRO-U~~				Applicant #2 ~~RO~~/~~SRO-I/SRO-U~~				Applicant #3 ~~RO~~/SRO-I/~~SRO-U~~			
	SCENARIO				SCENARIO				SCENARIO			
	5 ~~1~~	2	3	4	5 ~~1~~	2	3	4	5 ~~1~~	2	3	4
Understand and Interpret Annunciators and Alarms	2, 3 6				4-6				2-6			
Diagnose Events and Conditions	2, 3 6				4-6				2-6			
Understand Plant and System Response	1,2,3 6				1, 4-6				1-6			
Comply With and Use Procedures (1)	1, 2 3,6				1, 4-6				1-6			
Operate Control Boards (2)	1, 2 3,6				1, 4-6				N/A			
Communicate and Interact With the Crew	1, 2 3,6				1, 4-6				1-6			
Demonstrate Supervisory Ability (3)	N/A				N/A				1-6			
Comply With and Use Tech. Specs. (3)	N/A				N/A				2,3			

Notes:

(1) Includes Technical Specification compliance for an RO.
(2) Optional for an SRO-U.
(3) Only applicable to SROs.

Instructions:

Circle the applicant's license type and enter one or more event numbers that will allow the examiners to evaluate every applicable competency for every applicant.

Author: G.M. BLINDE
Chief Examiner: R. Avello

Turkey Point (PTN) Group XVIII

Competencies	Applicant #1 RO/~~SRO-I/SRO-U~~				Applicant #2 ~~BOP~~ ~~RO/SRO-I/SRO-U~~				Applicant #3 ~~RO~~/SRO-I/~~SRO-U~~			
	SCENARIO				SCENARIO				SCENARIO			
	1	2	3	4	1	2	3	4	1	2	3	4
Understand and Interpret Annunciators and Alarms	1,2,5,7	2,4 5,6	2,4,5 6,7	3-7	4,5 6,7	1,2 5,6	3,4 5,6	2,4 5,6	1,2,4 5,6,7	1,2,4 5,6	2-7	2-7
Diagnose Events and Conditions	1,2,5,7	2,4 5,6	2,4,5 6,7	3-7	4,5 6,7	1,2 5,6	3,4 5,6	2,4 5,6	1,2,4 5,6,7	1,2,4 5,6	2-7	2-7
Understand Plant and System Response	1,2,3 5,7	2,3 4,5 6	1,2,4 5,6,7	1, 3-7	3,4,5 6,7	1,2,3 5,6	1,3,4 5,6	1,2,4 5,6	1-7	1-6	1-7	1-7
Comply With and Use Procedures (1)	1,2,3 5,7	2,3 4,5 6	1,2,4 5,6,7	1, 3-7	3,4,5 6,7	1,2,3 5,6	1,3,4 5-6	1,2,4 5,6	1-7	1-6	1-7	1-7
Operate Control Boards (2)	1,2,3 5,7	2,3 4,5 6	1,2,4 5,6,7	1, 3-7	3,4,5 6,7	1,2,3 5,6	1,3,4 5,6	1,2,4 5,6	N/A	N/A	N/A	N/A
Communicate and Interact With the Crew	1,2,3 5,7	2,3 4,5 6	1,2,4 5,6,7	1, 3-7	3,4,5 6,7	1,2,3 5,6	1,3,4 5,6	1,2,4 5,6	1-7	1-6	1-7	1-7
Demonstrate Supervisory Ability (3)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1-7	1-6	1-7	1-7
Comply With and Use Tech. Specs. (3)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	2,4	1,2,4	3	2

Notes:

(1) Includes Technical Specification compliance for an RO.
(2) Optional for an SRO-U.
(3) Only applicable to SROs.

Instructions:

Circle the applicant's license type and enter one or more event numbers that will allow the examiners to evaluate every applicable competency for every applicant.

Author: G. M. Blinde
Chief Examiner: R. Aiello

OPERATING TEST NO.: Turkey Point (PTN) ~~XVB~~ Group XVIII

Applicant Type	Evolution Type	Minimum Number	Scenario Number 1	2	3	4	5
RO/BOP	Reactivity	1	1/0	1/0	1/0	1/0	1/0
	Normal	1	0/1	0/1	0/1	0/1	0/1
	Instrument	2	1/1	1/1	1/1	1/1	1/1
	Component	2	1/1	~~1/1~~ 2/2	2/1	2/1	1/1
	Major	1	2/2	1/1	2/2	2/2	1/1
As RO/BOP	Reactivity	1	1/0	1/0	1/0	1/0	1/0
	Normal	0	0/1	0/1	0/1	0/1	0/1
	Instrument	1	1/1	1/1	1/1	1/1	1/1
	Component	1	1/1	~~1/1~~ 2/2	2/1	2/1	1/1
	Major	1	2/2	1/1	2/2	2/2	1/1
SRO-I							
As SRO	Reactivity	0	0	0	0	0	0
	Normal	1	1	1	1	1	1
	Instrument	1	2	2	2	2	2
	Component	1	2	2	2	2	2
	Major	1	2	1	2	2	1
Not applicable SRO-U None examined	Reactivity	0					
	Normal	1					
	Instrument	1					
	Component	1					
	Major	1					

Instructions: (1) Enter the operating test number and Form ES-D-1 event numbers for each evolution type.

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

Author: G.M. BLUNDE

Chief Examiner: R Aiello

Facility: Turkey Point Date of Exam: week of 08/30/99 Scenario Numbers: 1 thru 5 / / Operating Test No.: PTN Group XVIII

QUALITATIVE ATTRIBUTES	Initials a	Initials b	Initials c
1. The initial conditions are realistic, in that some equipment and/or instrumentation may be out of service, but it does not cue the operators into expected events.	GRB	MS	D
2. The scenarios consist mostly of related events.	GRB	MS	D
3. Each event description consists of · the point in the scenario when it is to be initiated · the malfunction(s) that are entered to initiate the event · the symptoms/cues that will be visible to the crew · the expected operator actions (by shift position) · the event termination point (if applicable)	GRB	MS	D
4. No more than one non-mechanistic failure (e.g., pipe break) is incorporated into the scenario without a credible preceding incident such as a seismic event.	GRB	MS	D
5. The events are valid with regard to physics and thermodynamics.	GRB	MS	D
6. Sequencing and timing of events is reasonable, and allows the examination team to obtain complete evaluation results commensurate with the scenario objectives.	GRB	MS	D
7. If time compression techniques are used, the scenario summary clearly so indicates. Operators have sufficient time to carry out expected activities without undue time constraints. Cues are given.	GRB	MS	D
8. The simulator modeling is not altered.	GRB	MS	D
9. The scenarios have been validated. Any open simulator performance deficiencies have been evaluated to ensure that functional fidelity is maintained while running the planned scenarios.	GRB	MS	D
10. Every operator will be evaluated using at least one new or significantly modified scenario. All other scenarios have been altered in accordance with Section D.4 of ES-301.	GRB	MS	D
11. All individual operator competencies can be evaluated, as verified using Form ES-301-6 (submit the form along with the simulator scenarios).	GRB	MS	D
12. Each applicant will be significantly involved in the minimum number of transients and events specified on Form ES-301-5 (submit the form with the simulator scenarios).	GRB	MS	D
13. The level of difficulty is appropriate to support licensing decisions for each crew position.	GRB	MS	D

TARGET QUANTITATIVE ATTRIBUTES (PER SCENARIO; SEE SECTION D.4.D)	1	2	3	4	5	–	–	–
	Actual Attributes							
1. Total malfunctions (5-8)	7	6	7	7	6	GRB	MS	D
2. Malfunctions after EOP entry (1-2)	2	1	2	1	1	GRB	MS	D
3. Abnormal events (2-4)	3	3	3	4	4	GRB	MS	D
4. Major transients (1-2)	2	2	2	2	1	GRB	MS	D
5. EOPs entered/requiring substantive actions (1-2)	1	2	2	2	1	GRB	MS	D
6. EOP contingencies requiring substantive actions (0-2)	1	1	1	1	1	GRB	MS	D
7. Critical tasks (2-3)	2	2	3	3	2	GRB	MS	D

Facility: Turkey Point Date of Examination: 8/30/99 Operating Test Number: 1

	1. GENERAL CRITERIA	Initials a	Initials b	Initials c
a.	The operating test conforms with the previously approved outline; changes are consistent with sampling requirements (e.g., 10 CFR 55.45, operational importance, safety function distribution).	KW	MS	D
b.	There is no day-to-day repetition between this and other operating tests to be administered during this examination.	KW	MS	D
c.	The operating test shall not duplicate items from the applicants' audit test(s)(see Section D.1.a). (1)	KW	MS	D
d.	Overlap with the written examination and between operating test categories is within acceptable limits.	KW	MS	D
e.	It appears that the operating test will differentiate between competent and less-than-competent applicants at the designated license level.	KW	MS	D
	2. WALK-THROUGH (CATEGORY A & B) CRITERIA	–	–	–
a.	Each JPM includes the following, as applicable: · initial conditions · initiating cues · references and tools, including associated procedures · validated time limits (average time allowed for completion) and specific designation if deemed to be time critical by the facility licensee · specific performance criteria that include: - detailed expected actions with exact criteria and nomenclature - system response and other examiner cues - statements describing important observations to be made by the applicant - criteria for successful completion of the task - identification of critical steps and their associated performance standards - restrictions on the sequence of steps, if applicable	KW	MS	D
b.	The prescripted questions in Category A are predominantly open reference and meet the criteria in Attachment 1 of ES-301.	N/A	NA	N/A
c.	Repetition from operating tests used during the previous licensing examination is within acceptable limits (30% for the walk-through) and do not compromise test integrity.	KW	MS	D
d.	At least 20 percent of the JPMs on each test are new or significantly modified.	KW	MS	D
	3. SIMULATOR (CATEGORY C) CRITERIA	–	–	–
a.	The associated simulator operating tests (scenario sets) have been reviewed in accordance with Form ES-301-4 and a copy is attached.	KW	MS	D

	Printed Name / Signature	Date
a. Author	Keith C. Watts Keith C Watts	6/15/99
b. Facility Reviewer(*)	Richard C. Bretton	6-15-99
c. NRC Chief Examiner (*)	Ron Aiello	9/7/99
d. NRC Supervisor (*)	H. CHRISTOPSON	9/8/99

(*) The facility signature is not applicable for NRC-developed tests; two independent NRC reviews are required.

(1) Operating exam has been reviewed, the written will be reviewed upon final approval

Facility: Turkey Point Date of Examination: 8/30/99 Operating Test Number: 2 *

	1. GENERAL CRITERIA	Initials a	Initials b	Initials c
a.	The operating test conforms with the previously approved outline; changes are consistent with sampling requirements (e.g., 10 CFR 55.45, operational importance, safety function distribution).	KW	MB	✓
b.	There is no day-to-day repetition between this and other operating tests to be administered during this examination.	KW	MB	✓
c.	The operating test shall not duplicate items from the applicants' audit test(s)(see Section D.1.a). ①	KW	MB	✓
d.	Overlap with the written examination and between operating test categories is within acceptable limits.	KW	MB	✓
e.	It appears that the operating test will differentiate between competent and less-than-competent applicants at the designated license level.	KW	MB	✓
	2. WALK-THROUGH (CATEGORY A & B) CRITERIA	–	–	–
a.	Each JPM includes the following, as applicable: · initial conditions · initiating cues · references and tools, including associated procedures · validated time limits (average time allowed for completion) and specific designation if deemed to be time critical by the facility licensee · specific performance criteria that include: - detailed expected actions with exact criteria and nomenclature - system response and other examiner cues - statements describing important observations to be made by the applicant - criteria for successful completion of the task - identification of critical steps and their associated performance standards - restrictions on the sequence of steps, if applicable	KW	MB	✓
b.	The prescripted questions in Category A are predominantly open reference and meet the criteria in Attachment 1 of ES-301.	N/A	NA	N/A
c.	Repetition from operating tests used during the previous licensing examination is within acceptable limits (30% for the walk-through) and do not compromise test integrity.	KW	MB	✓
d.	At least 20 percent of the JPMs on each test are new or significantly modified.	KW	MB	✓
	3. SIMULATOR (CATEGORY C) CRITERIA	–	–	–
a.	The associated simulator operating tests (scenario sets) have been reviewed in accordance with Form ES-301-4 and a copy is attached.	KW	MB	✓

	Printed Name / Signature	Date
a. Author	Keith C. Vogt Keith C. Vogt	6/15/99
b. Facility Reviewer(*)	Richard C. Bretton	6-15-99
c. NRC Chief Examiner (*)	Ron Aiello	9/7/99
d. NRC Supervisor (*)	H.O. CHRISTENSEN	8/8/99

(*) The facility signature is not applicable for NRC-developed tests; two independent NRC reviews are required.

① Operating Exam has been reviewed, the written will be reviewed upon final approval

* Related to TEST TO 1

TURKEY POINT PLANT

1999 NRC EXAM

RO & SRO

WRITTEN EXAMS & ANSWER KEYS

DISTRIBUTION CODE
A070

Initial TP 99-301 Submittal - RII

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

Applicant Information

Name:	Region: II
Date:	Facility/Unit: Turkey Point/3&4
License Level: RO	Reactor Type: W
Start Time:	Finish Time:

Instructions

Use the answer sheets provided to document your answers. Staple this cover sheet on top of the answer sheets. The passing grade requires a final grade of at least 80.00 percent. Examination papers will be collected five hours after the examination starts.

Applicant Certification

All work done on this examination is my own. I have neither given nor received aid.

_____
Applicant's Signature

Results

Examination Value	100	Points
Applicant's Score	_____	Points
Applicant's Grade	_____	Percent

QUESTION: 001

The following conditions exist on Unit 3:

- The operators are responding to a misaligned D Bank, Group 2, control rod using 3-ONOP-28.1 "RCC Misalignment."

- The appropriate lift coil disconnect switches have been placed to the disconnect position.

Which ONE of the following Power Cabinets will be the source of the Urgent Failure alarm that occurs when the operator initiates rod motion?

a. 1AC

b. 1BD

c. 2AC

d. 2BD

QUESTION: 002
The following conditions exist on Unit 3.

- The "POWER BELOW P-8" status lamp is not lit.
- The 3A RCP experiences a sheared shaft.

Which ONE of the following correctly describes the applicable reactor trip logic?

The reactor will:

a. Trip due to a single RCS loop low flow signal.

b. Trip due to a single RCP breaker open signal.

c. Not trip because two RCS loops must have low flow signals.

d. Not trip because two RCPs must have breaker open signals.

QUESTION: 003

The following conditions exist on Unit 4:

- Operators are performing ES-0.2, "Natural Circulation Cooldown."
- All systems are operable except the RCPs and Channel A of QSPDS.
- The NPS determines a cooldown rate in excess of 25°F/hr is required.

Which ONE of the following describes the correct operator action?

a. Increase the cooldown rate to a rate not to exceed 60°F/hr and remain in ES-0.2.

b. Increase the cooldown rate to a rate not to exceed 100°F/hr and remain in ES-0.2.

c. Transition to ES-0.3, "Natural Circulation Cooldown with Steam Void in Vessel (With RVLMS)."

d. Transition to ES-0.4, "Natural Circulation Cooldown with Steam Void in Vessel (Without RVLMS)."

QUESTION: 004

The following event occurs while Unit 4 is in Mode 3:

- Both NIS Source Ranges indicate an unexplained increase in power.

The RCO attempts to initiate emergency boration but discovers MOV-350, Emergency Boration valve, will not open.

Which ONE of the following describes the correct operator response?

a. Direct the SNPO to open MOV-350.

b. Direct the SNPO to open 3-358, bypass around LCV-115B.

c. Open FCV-113A, FCV-113B, and direct the SNPO to open 3-356.

d. Hold closed LCV-115C and direct the NPO to open the breaker for LCV-115C.

QUESTION: 005

A total loss of CCW occurs on Unit 4 while at 100% power.

Which ONE of the following is correct?

Damage will occur quickest to the Charging pump:

a. oil pump with the Charging pump run at minimum speed.

b. oil pump with the Charging pump run at maximum speed.

c. fluid drive coupling with the Charging pump run at minimum speed.

d. fluid drive coupling with the Charging pump run at maximum speed.

QUESTION: 006

Unit 3 is in Mode 1 when operators responded to PRZ pressure transmitter, PT-445, failed high.

The following stable conditions now exist:

-	Reactor Power	80%
-	Tavg	572 °F
-	PRZ Pressure	2150 psig
-	PRZ Level	48%

Which ONE of the following is the operator response required by Technical Specifications?

a. Restore PRZ level to greater than 48%.

b. Restore PRZ pressure to greater than 2200 psig.

c. Reduce Tavg to less than 570°F.

d. Reduce Reactor Power to less than 75%.

QUESTION: 007

The following conditions exist on Unit 3:

- The unit is at 2% power.
- All MSIVs are closed.
- A steam line break occurs on the 3A S/G at the safety header.

Which ONE of the following describes the plant response?

SI will occur when:

a. Tavg decreases to 543°F.

b. containment pressure increases to 4 psig.

c. 3A S/G pressure decreases to 485 psig.

d. 3A S/G pressure decreases to 614 psig.

QUESTION: 008

Unit 4 operators have just transitioned to FR-P.1, "Response to Imminent Pressurized Thermal Shock Condition."

The following conditions exist:

- AFW is not available.
- The "A" Standby Feedwater Pump is being used to maintain S/G inventory.

Which ONE of the following indications should be used to control feed water flow?

Use changes in:

a. RCS pressure.

b. RCS temperature.

c. PRZ level.

d. S/G pressure.

QUESTION: 009

The following conditions exist on Unit 3:

- The operators have entered ONOP- 014 "Main Condenser Loss of Vacuum."
- The unit was initially at 550 MWe and 25" vacuum with vacuum slowly decreasing.
- The unit is now at 300 MWe and 24" vacuum with vacuum slowly decreasing.

Which ONE of the following is the required operator action?

a. Continue reducing MWe until vacuum stabilizes at greater than or equal to 24.5" vacuum.

b. Continue reducing MWe until vacuum stabilizes at greater than or equal to 22" vacuum.

c. Stabilize the plant and continue to investigate the cause of the low vacuum condition.

d. Trip the reactor and turbine and perform the actions of E-0, "Reactor Trip or Safety Injection."

QUESTION: 010

Unit 3 experienced a Loss of All AC Power simultaneous with a complete loss of Instrument Air.

Operators have restored power to and started the 3A Charging pump.

Which ONE of the following correctly describes the effect on CVCS?

The letdown flowpath:

a. remains open and the charging pump speed goes to minimum.

b. remains open and the charging pump speed goes to maximum.

c. isolates and the charging pump speed goes to minimum.

d. isolates and the charging pump speed goes to maximum.

QUESTION: 011

Unit 3 is in Mode 3 with the following conditions:

- A loss of a 120V Vital Instrument Panel has caused VCT level indicator LI-3-115 to indicate zero level.

- Annunciator A 4/6 "VCT HI/LO LEVEL" is in alarm.

Which ONE of the following is correct for the given conditions?

VCT Auto Makeup:

a. initiates and charging pump suction remains aligned to the VCT.

b. initiates and charging pump suction auto swaps to the RWST.

c. is disabled and charging pump suction remains aligned to the VCT.

d. is disabled and charging pump suction auto swaps to the RWST.

QUESTION: 012

The following conditions exist:

- Fire Detection Panel C39A alarms in the Control Room.
- Alarm point 41,"Train A Inverters" is activated.
- The NWE investigates and reports that the HALON system has discharged and the fire is still burning.

Which ONE of the following actions should be taken to extinguish the fire?

a. Depress the local panel emergency release "DISCHARGE" button.

b. Place the local panel "MAIN/RESERVE" switch to the RESERVE position.

c. Place the local panel "MAIN/RESERVE" switch to the MAIN position.

d. Pull the MAIN manual release lever at the Halon bottles.

QUESTION: 013

Which ONE of the following is an indication or control that is on the Unit 3 Alternate Shutdown Panel?

a. 3A EDG voltage indicator

b. RCS Loop Flow indicator

c. "C" AFW pump T&T valve control switch

d. 3A Charging pump control switch

QUESTION: 014

Which ONE of the following describes the parameter used by ECA-1.2, "LOCA Outside Containment," to determine if the break outside Containment has been isolated?

a. PRZ level

b. CET temperature

c. RCS pressure

d. RCS subcooling

QUESTION: 015

Operators are responding to an inadequate core cooling condition using FR-C.1, "Response to Inadequate Core Cooling."

Which ONE of the following is correct regarding RCP operation?

If an RCP is:

a. initially running, it should be left running until it trips by itself.

b. initially running, it should be left running until #1 seal delta P trip criteria is met.

c. not running, it should be left off until 6% [32%] level is attained in its associated S/G.

d. not running, it should be left off until 6% [32%] level is attained in any S/G.

QUESTION: 016

Operators are performing 3-ONOP-041.4, "Excessive Reactor Coolant System Activity," and have just reduced Tavg to less than 500°F as directed by the procedure.

Which ONE of the following describes the basis for reducing Tavg to less than 500°F?

a. To block SI in preparation for a controlled cooldown.

b. To allow closing the MSIVs in preparation for a controlled cooldown.

c. To prevent the release of activity in the event of a main steam line break.

d. To prevent the release of activity in the event of a steam generator tube rupture.

QUESTION: 017

The following conditions exist on Unit 3:

- The Rod Control System is in Manual.
- Control Bank C is at 225 steps.
- Control Bank D is at 97 steps.

The following event occurs:

- A Rod Control System malfunction causes continuous rod withdrawal for 10 steps. Rod motion then stops.

Which ONE of the following identifies what the RPIs for control banks C and D should indicate?

a. Bank C – 225 Bank D – 97

b. Bank C – 230 Bank D – 97

c. Bank C – 230 Bank D – 107

d. Bank C – 235 Bank D - 107

QUESTION: 018

The following conditions exist on Unit 3:

- The unit is at 100% power
- A power supply failure in rod control Power Cabinet 1AC results in one dropped rod in Control Bank A Group 1 and one dropped rod in Control Bank C Group 1.

Which ONE of the following actions is correct?

a. Manually runback the turbine.

b. Verify automatic turbine runback.

c. Enter ONOP-28.3 "Dropped RCC" and retrieve both dropped rods.

d. Trip the Reactor and go to E-0 "Reactor Trip Or Safety Injection."

QUESTION: 019

The following conditions exist on Unit 4:

- Low PRZ pressure SI has occurred.
- All 4 HHSI pumps are running.
- PRZ level is increasing.
- RCS pressure is 1450 psig and decreasing.
- HHSI cold leg flow indication (FI-943) is zero.
- PRT pressure and level are increasing.

Which ONE of the following describes the events that could have caused these conditions?

a. A PRZ PORV is open and the HHSI isolation valves, MOV-843A and MOV-843B, failed to open.

b. A PRZ PORV is open and the HHSI line downstream of the HHSI isolation valves, MOV-843A and MOV-843B, has sheared.

c. A PRZ Spray valve is open and the HHSI isolation valves, MOV-843A and MOV-843B, failed to open.

d. A PRZ Spray valve is open and the HHSI line downstream of the HHSI pumps has sheared.

QUESTION: 020

Unit 3 operators are responding to a small break LOCA.

The following conditions exist:

- RCS pressure is 1500 psig.
- CET subcooling is 38°F.
- Containment temperature is 160°F.
- Containment pressure is 10 psig.

Which ONE of the following top border (border targets) should be lit on the SPDS/ERDADS screens?

a. TRIP RCPs

b. PA

c. MSL ISOL

d. ADV CNTNMT

QUESTION: 021

A large break LOCA occurred while Unit 4 was operating at 100% power.

Which ONE of the following describes why the RCO verifies Feedwater Isolation closed the Main and Bypass FW Control valves?

The RCO is directed to verify Feedwater Isolation in response to:

a. Reactor trip.

b. SI actuation.

c. Phase A actuation.

d. Phase B actuation.

QUESTION: 022

Unit 3 operators are performing Step 16 of EOP-ES-1.2 "Post LOCA Cooldown and Depressurization."

The following conditions exist:

- One Unit 3 HHSI pump is running.
- One RHR pump is running.
- Two Charging pumps are running at maximum flow.
- Containment temperature is 178°F.
- CET subcooling is 68°F
- RCS Thot temperatures are 320°F.
- RCS pressure is 260 psig.
- No RCPs are available.
- PRZ level is stable at 30%.

Which ONE of the following describes the running HHSI/RHR pump configuration when the operators isolate the accumulators?

a. Zero HHSI pumps, One RHR pump.

b. Zero HHSI pumps, Two RHR pumps.

c. One HHSI pump, One RHR pump.

d. One HHSI pump, Two RHR pumps.

QUESTION: 023

Which ONE of the following describes a condition that would prevent successful transition to Cold Leg recirculation?

a. Only one of the RHR Pump Suction Stop valves, MOV-750 or MOV-751 can be energized.

b. Only one of the RHR Suction from RWST valves, MOV-862A or MOV-862B can be energized.

c. Containment Recirculation Sump Isolation valves MOV-860A and MOV-860B will not open.

d. Containment Recirculation Sump Isolation valves MOV-860A and MOV-861A will not open.

QUESTION: 024

The following conditions exist on Unit 3:

- The operators are performing ES-1.1, "SI Termination."
- While preparing to re-establish RCP seal return flow they verify that RCS pressure is 100 psi greater than VCT pressure.

Which ONE of the following describes the basis for the 100 psi requirement?

Less than 100 psi differential pressure could result in:

a. damage to the VCT.

b. damage to the PRT.

c. cocked RCP seals.

d. debris in the RCP seals.

QUESTION: 025

Unit 4 is in Mode 5 and all loops are filled.

The following equipment is out of service:

- RHR Loop A
- 4C ICW pump
- 4C CCW pump

Which ONE of the following will result in a loss of RHR required capability per 3-OP-050, "Residual Heat Removal System?"

A failure of the:

a. 4A EDG.

b. 4B CCW H/X.

c. 4A CCW pump.

d. 4B ICW pump

QUESTION: 026

With Unit 4 stable at 2% power, the RCO observes that the Reactor Trip Breakers have no red or green indicating lights lit on the console or on VPB.

Which ONE of the following correctly describes an event that could have caused this condition?

a. SR NIS N-31 Instrument Power fuse has blown.

b. SR NIS N-32 Control Power fuse has blown.

c. IR NIS N-35 Instrument Power fuse has blown.

d. PR NIS N-41 Control Power fuse has blown.

QUESTION: 027

The following conditions exist on Unit 3:

- Reactor power is 22% with operators performing a plant startup.
- NIS Intermediate range channel N-36 fails high.

Which ONE of the following is the correct operator response?

a. Enter E-0, "Reactor Trip or Safety Injection."

b. Place the N-36 LEVEL TRIP switch in BYPASS and continue the power ascension.

c. Place the N-36 LEVEL TRIP switch in BYPASS and reduce power below permissive P-6.

d. Place the N-36 LEVEL TRIP switch in BYPASS and reduce power below permissive P-10.

QUESTION: 028

Unit 3 operators have responded to a Steam Generator Tube Leak on the 3A S/G using 3-ONOP-067, "Radioactive Effluent Release."

- PRMS R-15, Condenser Air Ejector, reading was increasing while in Mode 1 and has alarmed.
- PRMS R-19, Blowdown Radiation, reading was increasing while in Mode 1 but has not alarmed.
- The unit is currently in Mode 3 and Attachment 3, "Steam Generator Isolation Checklist / Steam Generator A Isolation," is complete.

Which ONE of the following describes the expected response of R-15 and R-19 after performing Attachment 3?

	R-15	R-19
a.	Decreasing	Decreasing
b.	Decreasing	Stable
c.	Stable	Decreasing
d.	Stable	Stable

QUESTION: 029

Unit 4 experienced a SGTR while at 100% power.

Which ONE of the following Control Room indications does E-3, "Steam Generator Tube Rupture," use to identify which S/G is ruptured?

a. PRMS R-15, Condenser Air Ejector.

b. PRMS R-19, Steam Generator Blowdown.

c. Unexpected increase in any S/G NR level.

d. Unexpected S/G steam flow mismatch.

QUESTION: 030

Which ONE of the following describes the basis for verifying AFW flow is greater than 390 gpm following a loss of main feedwater event?

390 gpm is the minimum AFW flow required in the event:

a. an ATWS occurs.

b. only one AFW pump is running.

c. any S/G level is below 6% NR.

d. all S/G levels are below 6% NR.

QUESTION: 031

Unit 3 operators have entered FR-H.1 "Response to Loss of Secondary Heat Sink."

The following conditions exist:

- No Main Feedwater Pumps are available.
- No Auxiliary Feedwater Pumps are available.
- The RCPs are off.
- Annunciator E 2/6 "HI-HI SG LVL TURBINE TRIP/FEEDWATER ISOLATION is in alarm.
- The operators are preparing to re-establish feedwater using a Standby Steam Generator Feedwater Pump.

Which ONE of the following describes the minimum Control Room action(s) required to re-establish feed flow to the S/Gs?

Reset:

a. SI

b. Phase A

c. Feedwater Isolation

d. SI and Feedwater Isolation

QUESTION: 032

EOP-E-3, "Steam Generator Tube Rupture," directs the operator to verify the S/G Blowdown Sample Stop valves are closed within 30 minutes.

Which ONE of the following states the basis for this action?

a. Prevents a potential unmonitored release.

b. Prevents a potential loss of S/G inventory.

c. Ensures all Containment Phase 'A' isolation valves are closed.

d. Ensures S/G sample is only directed to the primary sample sink .

QUESTION: 033

Which ONE of the following describes the Immediate Operator Action(s) of 0-ONOP-066, "High Area Radiation Monitoring System Alarm," in the event Annunciator X 4/1, ARMS HI RADIATION, alarms?

Identify the alarming channel(s) at the ARMS panel and then:

a. announce the alarm over the plant page system.

b. notify Security to restrict entry to the affected areas.

c. press the ALARM ACK pushbutton on the ARMS control panel.

d. cross-check the alarming ARMS channel(s) with PRMS channel(s) in the affected area.

QUESTION: 034

Unit 4 is at 100% power with all systems operating in automatic and all switches in their normal positions.

PRZ level transmitter LT-459 fails low.

Which ONE of the following describes the plant response?

a. Charging flow will decrease.
Letdown will isolate.

b. Charging flow will decrease.
Letdown will remain in service.

c. Charging flow will increase.
Letdown will isolate.

d. Charging flow will increase.
Letdown will remain in service.

QUESTION: 035

The following conditions exist with Unit 3 at 100% power and all systems operable:

- 3D 4KV Bus is aligned to 3B 4KV Bus.
- 3A and 3C ICW Pumps are running.

The following events occur:

- A LOOP occurs on Unit 3.
- The 3A EDG fails to start.

Which ONE of the following describes the ICW pump configuration when sequencing is complete (assume no operator response)?

a. No ICW pumps will be running.

b. Only the 3B ICW pump will be running.

c. Only the 3C ICW pump will be running.

d. The 3B and 3C ICW pumps will be running.

QUESTION: 036

Unit 4 operators have entered 0-ONOP-13, "Loss of Instrument Air" in response to Annunciator I 6/1, INST AIR SYSTEM HI TEMP/LO PRESS.

The following conditions exist:

- All available air compressors are running.
- Instrument Air pressure indicator, PI-4-1444, is 60 psig and stable.

Which ONE of the following identifies the equipment that will be affected?

Unit 4:

a. MSIVs will fail closed.

b. Feedwater Reg Valves will fail closed.

c. EDG Fuel Oil Transfer capability will be lost.

d. Train 1 AFW FCV automatic operation will be lost.

QUESTION: 037

The following conditions exist on Unit 3:

- Reactor Trip Breaker A has failed in the closed position.
- Both MG sets input and output breakers have been opened.

Which ONE of the following describes the effect on the Control Rod System Logic and Power cabinets' control power?

Control power has:

a. automatically swapped to the 3B MCC.

b. automatically swapped to its backup CVT.

c. been lost and can be manually swapped to the 3B MCC.

d. been lost and cannot be restored until the Reactor Trip Breaker is opened.

QUESTION: 038

Unit 3 is stable at 80% power with all systems in automatic when the following events occur:

- Control Rods begin to continuously insert.
- The RCO observes the following indications:

-	Tavg:	567°F	decreasing
-	Tref	570°F	stable
-	Generator Load:	650 MWe	stable

Which ONE of the following describes the correct immediate operator action?

a. Maintain rods in AUTO and if rods continue to insert, adjust turbine load to match Tavg to Tref.

b. Maintain rods in AUTO and if rods continue to insert, adjust boron concentration to match Tavg to Tref.

c. Place rods in MANUAL and if rods continue to insert, adjust turbine load to match Tavg to Tref.

d. Place rods in MANUAL and if rods continue to insert, adjust boron concentration to match Tavg to Tref.

QUESTION: 039

Which ONE of the following identifies the containment isolation signal that requires stopping all RCPs and the reason the RCPs are stopped?

a. Phase "A" MOV-626, RCP Thermal Barrier CCW Outlet, is closed resulting in a loss of RCP seal package cooling.

b. Phase "A" MOV-1417, CCW to Normal Containment Coolers, and MOV 1418, CCW from Normal Containment Coolers, are closed resulting in a loss of RCP stator winding cooling.

c. Phase "B" MOV-6386, Excess L/D and RCP Seal Return, is closed resulting in a loss of RCP seal package cooling.

d. Phase "B" MOVs 716A and 716B, RCP CCW Inlet valves, and MOV-730, RCP Bearing CCW Outlet valve are closed resulting in a loss of RCP motor bearing cooling.

QUESTION: 040

The following plant conditions exist:

- Containment Phase "A" isolation has occurred.
- The isolation signal has not yet been reset.

Which ONE of the following describes the effect this condition will have on RCP Number 1 seal leak off flow?

Number 1 seal leak off flow will:

a. decrease because VCT level has increased.

b. decrease because the backpressure has increased.

c. go to zero because RCP Seal Return to VCT valve, MOV-381, is closed.

d. go to zero because #1 Seal Leakoff Isolation valves, 303A, 303B, and 303C are closed.

QUESTION: 041

Unit 3 is in a water solid condition when an RCS pressure transient closes Loop 3C RHR Pump Suction Stop valves, MOV-750 and MOV-751.

MOV-750 and MOV-751 cannot be reopened.

Which ONE of the following describes the effect this event will have on the CVCS system after the operators have performed the Immediate Operator Actions of the applicable ONOP?

CVCS letdown line pressure upstream of PCV-145, Low Pressure Letdown Control valve, will:

a. decrease. PCV-145 will open.

b. decrease. PCV-145 will close.

c. increase. PCV-145 will open.

d. increase. PCV-145 will close.

QUESTION: 042

A reactor startup is being performed on Unit 3. The following conditions apply:

- The ECC estimated critical rod height is D bank at 110 steps.
- The initial highest source range count rate was N-31 at 250 cps.
- The current N-31 count rate is 1000 cps.
- Based on the current N-31 count rate, the 1/M plot predicts criticality at D bank, 180 steps.
- Integrated rod worth for D-110 is 490 pcm.
- Integrated rod worth for D-180 is 160 pcm.

Which ONE of the following is the correct operator response?

a. Do not continue the reactor startup. Obtain permission from the NPS to continue.

b. Do not continue the reactor startup. Obtain permission form the Reactor Supervisor to continue.

c. Continue the reactor startup. If the prediction is still D-180 after the next doubling, obtain permission from the NPS to continue.

d. Continue the reactor startup. If the prediction is still D-180 after the next doubling, obtain permission from the Reactor Supervisor to continue.

QUESTION: 043

Which ONE of the following describes the purpose of the interlocks between CVCS Letdown Isolation valve, LCV-460, and the Letdown Orifice Isolation valves, 200A, 200B, & 200C?

The interlocks prevent damage to:

a. LCV-460 upon depressurization of the letdown line.

b. CV-200A, 200B, 200C upon depressurization of the letdown line.

c. the Regenerative Heat Exchanger upon subsequent repressurization of the letdown line.

d. RV-203, Letdown Relief Valve, upon subsequent repressurization of the letdown line.

QUESTION: 044

The following conditions exist on Unit 3:

- Operators are responding to a LOCA using the EOP Network.
- 3A Sequencer has failed to respond to the SI signal.
- SI has been reset.
- Following SI reset, Containment pressure exceeds 20 psig .

Which ONE of the following describes the response of the Containment Spray Pumps (CSPs) and their discharge valves, MOV-880A and MOV-880B?

a. Neither CSP will automatically start.
Only MOV-880B will automatically open.

b. Neither CSP will automatically start.
Both MOVs will automatically open.

c. Only 3B CSP will automatically start.
Only MOV-880B will automatically open.

d. Only 3B CSP will automatically start.
Both MOVs will automatically open.

QUESTION: 045

The following conditions exist on Unit 3:

- Reactor power is stable at 10^{-8} amps.
- "PRZ Pressure Control Channel" PT-444 fails high.

Assuming no operator action, which ONE of the following describes the response of the plant to this condition?

a. The reactor will trip when PRZ pressure increases to 2385 psig.

b. PRZ pressure will stabilize at approximately 2000 psig .

c. The reactor will trip when PRZ pressure decreases to 1835 psig.

d. SI actuation will occur when PRZ pressure decreases to 1730 psig.

QUESTION: 046

Unit 3 is stable at 98% power. Reactor Engineering has performed QPTR calculations using a full core flux map and core exit thermocouples. Both calculations reveal the QPTR value is 1.03.

Which ONE of the following describes the required operator response?

Reduce NIS power to less than:

a. 97% within 2 hours.

b. 95% within 2 hours.

c. 91% within 2 hours.

d. 89% within 2 hours.

QUESTION: 047

Immediately after operators have stabilized Unit 3 following a power reduction, Annunciators B 8/1, ROD BANK A/B/C/D LO LIMIT and B 8/2, ROD BANK A/B/C/D EXTRA LO LIMIT, alarm.

Which ONE of the following describes the effect on axial flux distribution and the correct immediate operator response to restore rods above the insertion limit?

	CORE FLUX CONCENTRATION	RESPONSE
a.	Lower Half of Core	Borate using normal boration
b.	Lower Half of Core	Borate using emergency boration
c.	Upper Half of Core	Borate using normal boration
d.	Upper Half of Core	Borate using emergency boration

QUESTION: 048

Unit 3 operators are responding to a spurious SI signal and are attempting to determine if SI termination criteria are met. The ANPS directs the RCO to check subcooling on QSPDS.

QSPDS displays the following:

SATURATION MARGIN

	DEG F	PSI
UPPER HEAD	48	633
RCS (MIN)	36	438
CET	28	340

Assuming other SI Termination Criteria are satisfied, which ONE of the following is correct?

The RCO should declare SI Termination Criteria are:

a. not met after observing the RCS (MIN) value.

b. not met after observing the CET value.

c. met after observing the RCS (MIN) value.

d. met after observing the CET value.

QUESTION: 049

A large break LOCA occurs on Unit 3 while the 3B Sequencer is inoperable.

Which ONE of the following describes an effect on the Unit 3 containment?

Containment pressure will be higher because only the:

a. 3A ECC will autostart.

b. 3C ECC will autostart.

c. 3A and 3C ECCs will autostart.

d. 3B and 3C ECCs will autostart.

QUESTION: 050

The following conditions exist on Unit 3 while at 100% power:

- The 3B ECC is out of service.
- A large break LOCA occurs.
- After verifying two ECCs are operating, one ECC trips due to overcurrent and cannot be restarted.

Which ONE of the following identifies the maximum time allowed to restore a second ECC to operation to ensure equipment environmental qualifications are maintained?

a. 8 hours

b. 10 hours

c. 12 hours

d. 24 hours

QUESTION: 051

Unit 3 is operating at 70% power with all systems operable except the 3C Condensate pump which has its breaker racked out.

The 3A Condensate pump breaker trips open.

Which ONE of the following describes the correct operator response?

Perform the actions of:

a. ONOP-089, "Turbine Runback."

b. ONOP-100, "Fast Load Reduction."

c. GOP-103, "Power Operation to Hot Standby."

d. E-0, "Reactor Trip or Safety Injection."

QUESTION: 052

Unit 3 is operating at 100% power when the controlling S/G pressure transmitter fails low on the 3A S/G.

Which ONE of the following describes the effect this will have on the controlling indicated steam flow and the initial 3A FW Control Valve, FCV-478, response?

Indicated steam flow will:

a. decrease. The FCV will open.

b. decrease. The FCV will close.

c. increase. The FCV will open.

d. increase. The FCV will close.

QUESTION: 053

Unit 3 is operating at 100% power when valve CV-2011, "LP HEATERS BYPASS," fails open.

Which ONE of the following describes the effect on reactor power and the correct operator response?

Reactor power will:

a. increase. Borate the RCS.

b. increase. Reduce turbine load.

c. decrease. Dilute the RCS.

d. decrease. Raise turbine load.

QUESTION: 054

With Unit 3 initially at 100% power and all systems in normal alignment, the 3C S/G experiences a main steam line break inside Containment.

Which ONE of the following describes the effect this accident will have on the AFW system?

a. Train 1 AFW will be lost until the operators open AFSS-3-007.

b. Train 1 AFW will be lost until the operators close AFSS-3-006.

c. Train 2 AFW will be lost until the operators open AFSS-3-007.

d. Train 2 AFW will be lost until the operators close AFSS-3-006.

QUESTION: 055

Which ONE of the following would result in dual train AFW flow for both Units?

Bus Stripping on:

a. 3A 4KV Bus and 4A 4KV Bus.

b. 3A 4KV Bus and 4B 4KV Bus

c. 3B 4KV Bus and 4A 4KV Bus

d. 3B 4KV Bus and 4B 4KV Bus

QUESTION 056

Unit 3 operators have entered ES-1.1, "SI Termination," and are preparing to start a Main Feedwater pump and secure AFW.

The following conditions exist:

- "A" AFW pump is running.
- "B" and "C" AFW pumps are stopped and aligned for auto start.
- The NWE locally starts the 3A Main Feed pump.
- The BOP fails to "red flag" the 3A Main Feed pump control switch semaphore.

Which ONE of the following describes the effect of the BOP's failure to red flag the 3A Main Feed pump control switch semaphore?

a. "B" and "C" AFW pumps will automatically start.

b. AFW pump automatic start capability will be degraded.

c. The 3A Main Feed pump will not trip from an SI signal.

d. The 3A Main Feed pump will automatically trip in 50 seconds.

QUESTION: 057

The following conditions exist on Unit 3:

- The unit was at 100% power.
- A spurious SI occurs.
- The operators are responding per the EOP network and have just transitioned to EOP-ES-1.1, "SI Termination."
- Annunciator A 7/1, PRT HI/LO LEVEL HI PRESS/TEMP, alarms.

Assuming all systems function as designed, which ONE of the following describes the probable cause of this alarm?

a. A PRZ PORV has lifted.

b. CVCS Low Pressure relief valve, RV-209, has lifted.

c. RHR Header to Loops relief valve, RV-706, has lifted.

d. RCP #1 Seal Leakoff relief valve, RV-382, has lifted.

QUESTION: 058

Operators are investigating an abnormal increase in countrate on PRMS radiation monitor R-14, PLANT VENT, when they discover pressure in Gas Decay Tank (GDT) #4 is decreasing.

No planned GDT releases are in progress and the Gas Decay Tank Discharge Valve, RCV-014, is closed.

After verifying all valve alignments are correct, which ONE of the following describes the correct operator response?

Direct the SNPO to:

a. transfer the contents of GDT #4 to another GDT.

b. verify both Auxiliary Building Exhaust fans are running.

c. stop all running Waste Gas compressors.

d. start an additional Waste Gas compressor.

QUESTION: 059

The Control Room Normal Air Intake radiation monitor, RAI-6642, alarms.

Which ONE of the following describes the damper response of the Control Building Ventilation System?

a. Ventilation Inlet dampers, D-1A and D-1B - CLOSE.
East and West Inlet dampers, D-2 and D-3 - OPEN.
Control Room Recirc. dampers, D-11A and D-11B - OPEN.

b. Ventilation Inlet dampers, D-1A and D-1B - OPEN.
East and West Inlet dampers, D-2 and D-3 - CLOSE.
Control Room Recirc. dampers, D-11A and D-11B - OPEN.

c. Ventilation Inlet dampers, D-1A and D-1B - CLOSE.
East and West Inlet dampers, D-2 and D-3 - OPEN.
Control Room Recirc. dampers, D-11A and D-11B - CLOSE.

d. Ventilation Inlet dampers, D-1A and D-1B - OPEN.
East and West Inlet dampers, D-2 and D-3 - CLOSE.
Control Room Recirc. dampers, D-11A and D-11B - CLOSE.

QUESTION: 060

Unit 3 is at 50% power with the 3C Charging pump out of service.

The RCO notes the following Control Room indications:

- Annunciator G 1/2, "CHARGING PUMP HI SPEED" alarms.
- The only running Charging pump (3A) is in Auto with 100% output demanded.
- PRZ level is 33% and decreasing.

Which ONE of the following describes the required procedural response?

a. Isolate letdown. If PRZ level continues to decrease, then start the 3B Charging pump and maximize charging flow.

b. Isolate letdown. If PRZ level continues to decrease, then trip the reactor and turbine and transition to E-0, "Reactor Trip or Safety Injection."

c. Start the 3B Charging pump and maximize charging flow. If PRZ level continues to decrease, then isolate letdown.

d. Start the 3B Charging pump and maximize charging flow. If PRZ level continues to decrease, then trip the reactor and turbine and transition to E-0, "Reactor Trip or Safety Injection."

QUESTION: 061

Operators are responding to a large break LOCA. They are currently aligning the ECCS system for Hot Leg recirculation. Step 10 of ES-1.4, "Transfer to Hot Leg Recirculation," directs the operators to start the second RHR pump.

Which ONE of the following describes why the operators are directed to start the second RHR pump?

Starting the second RHR pump allows the operators to:

a. start a second HHSI pump to increase hot leg injection flow.

b. direct flow simultaneously to the cold legs and to the suction of the HHSI pump.

c. align alternate hot leg recirculation using RHR Recirculation Isolation valve, 741A.

d. align alternate hot leg recirculation using Alternate Low Head Injection valve, MOV-872.

QUESTION: 062

Unit 3 is in Mode 5 when RCS loop pressure transmitter, PT-405, fails high.

Which ONE of the following identifies the effect of this failure on:

1) PRZ PORV – 455C and PORV – 456

2) Loop 3C RHR Pump Suction Stop Valves, MOV-750 and MOV-751?

	PORV-455C	PORV-456	MOV-750	MOV-751
a.	OPENS	NONE	NONE	CLOSES
b.	OPENS	NONE	CLOSES	NONE
c.	NONE	OPENS	NONE	CLOSES
d.	NONE	OPENS	CLOSES	NONE

QUESTION: 063

During operation at reduced power the following conditions exist:

- Tavg is 560°F.
- PRZ level is 45%.
- PRZ pressure is 2230 psig.

Which ONE of the following describes the PRZ heater status the RCO should verify?

a. Control Group – On.
Backup Groups – On.

b. Control Group – On.
Backup Groups – Off.

c. Control Group – Off.
Backup Groups – On.

d. Control Group – Off.
Backup Groups – Off.

QUESTION: 064

Which ONE of the following identifies the protection provided by the OTΔT reactor trip signal and the condition that would cause the OTΔT setpoint to decrease?

	Protection	Condition
a.	DNB	Tavg increasing
b.	DNB	PRZ Pressure increasing
c.	Excessive Power Density	Tavg increasing
d.	Excessive Power Density	PRZ Pressure increasing

QUESTION: 065

Unit 3 is at 100% power and Annunciator B 9/3, SHUTDOWN ROD OFF TOP/DEVIATION is not operational.

Which ONE of the following describes the action that operators must take at least once every 4 hours?

Verify RPIs and Step Counters agree within:

a. 2 steps.

b. 12 steps.

c. 18 steps.

d. 24 steps.

QUESTION: 066

Unit 3 is operating at 100% power with all systems in their normal configuration, when the Tavg Median Signal Selector, TM-408, fails low.

Which ONE of the following describes the plant response?

a. Control rods will not move. Charging pump speed will increase.

b. Control rods will not move. Charging pump speed will decrease.

c. Control Rods will step in. Charging pump speed will increase.

d. Control rods will step in. Charging pump speed will decrease.

QUESTION: 067

Unit 3 experienced a large break LOCA. Operators have responded with the EOP network and have completed the actions of ES-1.3, "Transfer to Cold Leg Recirculation." Containment temperature has decreased to 140°F.

Which ONE of the following describes the correct Containment Spray Pump (CSP) alignment?

a. 1 CSP running with its suction aligned directly to the Containment Recirc. sump.

b. 1 CSP running with its suction aligned to the Containment Recirc. sump via the RHR pump discharge.

c. 2 CSPs running with their suctions aligned directly to the Containment Recirc. sump.

d. 2 CSPs running with their suctions aligned to the Containment Recirc. sump via the RHR pump discharge.

QUESTION: 068

A Containment Purge is in progress per 0-OP-053, "Containment Purge System."

Which ONE of the following is the minimum number of Normal Containment Coolers that must be in service to ensure proper operation of Containment Radiation Monitors, R-11 and R-12?

a. One

b. Two

c. Three

d. Four

QUESTION: 069

The following refueling conditions exist on Unit 4:

- Core off-load is in progress.
- A reactor vessel refueling cavity seal failure occurs.

Assuming no operator action, which ONE of the following describes the effect on fuel assemblies in the SFP?

Fuel assemblies in the SFP will be:

a. completely uncovered.

b. partially uncovered.

c. covered with a few feet of water above them.

d. covered with SFP water remaining at its normal level.

QUESTION: 070

Which ONE of the following describes the advantages of using ES-3.1, "Post-SGTR Cooldown Using Backfill," as compared to ES-3.2, "Post-SGTR Cooldown Using Blowdown," or ES-3.3, "Post-SGTR Cooldown Using Steam Dump"?

ES-3.1, "Post-SGTR Cooldown Using Backfill":

a. minimizes radiological releases and is the fastest method to cool the RCS.

b. minimizes radiological releases and facilitates processing of contaminated water.

c. maximizes inventory in the RCS and is the fastest method to cool the RCS.

d. maximizes inventory in the RCS and facilitates processing of contaminated water.

QUESTION: 071

The following conditions exist on Unit 3:

- The unit is in Mode 3 with Tavg at 545°F.
- The Steam Dump to Condenser (SDTC) system Mode Selector switch is in the MAN position.
- PT-464, Steam Header Pressure, fails high.

Which ONE of the following describes the effect on the SDTC system?

a. Only 2 valves will open and will remain open.

b. Only 2 valves will open and then close when Tavg decreases to 543°F.

c. All 4 valves will open and will remain open.

d. All 4 valves will open and then close when Tavg decreases to 543°F.

QUESTION: 072

Which ONE of the following identifies the first PRMS detector that should respond to a SGTR and the effect on the detector?

a. Condenser Air Ejector Monitor, R-15. R-15 will be automatically isolated.

b. Condenser Air Ejector Monitor, R-15. R-15 will not be automatically isolated.

c. Steam Generator Blowdown Sample Monitor, R-19. R-19 will be automatically isolated.

d. Steam Generator Blowdown Sample Monitor, R-19. R-19 will not be automatically isolated.

QUESTION: 073

Unit 3 is at 100% power with its Startup Transformer out of service when an automatic reactor trip occurs.

- The 3A EDG starts and repowers the 3A 4KV Bus.
- The 3B EDG locks out and cannot be restarted.

The Unit 3 ANPS directs the BOP to use 3-ONOP-004.3, "Loss of 3B 4KV Bus," to restore power to the 3B 4KV Bus.

Which ONE of the following describes how power will be restored to the 3B 4KV Bus?

Power will be restored to the 3B 4KV Bus from the:

a. 3A 4KV Bus.

b. Unit 4 Startup Transformer.

c. 3C 4KV Bus.

d. Station Blackout Tie Line.

QUESTION: 074

The following occurs while Unit 3 is in Mode 1:

- DC Bus 3D23 loses power.

Which ONE of the following operator actions are correct?

a. Shutdown the unit using GOP-103, "Power Operation to Hot Standby." After the unit is stable in Mode 3, then perform ONOP-003.5, "Loss of DC Buses 3D23 and 3D23A(3B)."

b. Shutdown the unit using GOP-103, "Power Operation to Hot Standby and perform ONOP-003.5, "Loss of DC Buses 3D23 and D23A(3B)," concurrently with the actions of GOP-103.

c. Verify the reactor is tripped using E-0, "Reactor Trip or Safety Injection." When the unit is stable, then perform ONOP-003.5, "Loss of DC Buses 3D23 and D23A(3B)."

d. Verify the reactor is tripped using E-0, "Reactor Trip or Safety Injection," and perform ONOP-003.5, "Loss of DC Buses 3D23 and D23A(3B)," concurrently with the Immediate Actions of E-0.

QUESTION: 075

Unit 3 is operating at 100% power with all systems in normal alignment. 3A EDG is being run for surveillance purposes and is presently tied to the 3A 4KV Bus.

The following events occur:

- A main generator lockout occurs.
- Startup transformer breaker, 3AA05, fails to close and is mechanically bound.
- 3A Reactor Coolant Pump breaker, 3AA01, fails to automatically open.

Which ONE of the following describes the required operator response?

a. Manually open EDG breaker 3AA20, strip the 3A 4KV Bus using 3-ONOP-004.2, "Loss of 3A 4KV Bus," and manually close breaker 3AA20.

b. Manually open EDG breaker 3AA20, strip the 3A 4KV Bus using 3-ONOP-004.2, "Loss of 3A 4KV Bus," and verify breaker 3AA20 automatically closes.

c. Verify EDG breaker 3AA20 automatically opens, strip the 3A 4KV Bus using 3-ONOP-004.2, "Loss of 3A 4KV Bus," and manually close breaker 3AA20.

d. Verify EDG breaker 3AA20 automatically opens, strip the 3A 4KV Bus using 3-ONOP-004.2, "Loss of 3A 4KV Bus," and verify breaker 3AA20 automatically closes.

QUESTION: 076

Unit 3 is at 100% power when PRMS R-3-20, Reactor Coolant Letdown, radiation monitor alarms. HP investigates and surveys the area in the Pipe and Valve Room.

The HP Supervisor reports the presence of a Hot Spot that is reading 400 mr/hr at 2 feet from the source.

Which ONE of the following identifies the distance from the source at which the measured dose rate will be 100 mr/hr?

a. 4 feet

b. 6 feet

c. 8 feet

d. 10 feet

QUESTION: 077

Unit 3 was operating at 100% power when the following events occurred:

- A Loss of Off Site Power (LOOP)
- The 3A1 Circulating Water Pump breaker did not open.
- All other systems responded as designed.

Which ONE of the following describes the effect on the 3A EDG breaker and 3A Sequencer?

	3A EDG Breaker	3A Sequencer
a.	Remains OPEN	Sequences
b.	Remains OPEN	Does Not Sequence
c.	Automatically CLOSES	Sequences
d.	Automatically CLOSES	Does Not Sequence

QUESTION: 078

Units 3 and 4 are at 100% power when the following events occur:

- A loss of instrument air has occurred on both units.
- 3CM, 3CD, 4CM, and 4CD instrument air compressors are all inoperable.
- The NPO has been directed to open the four inch Service Air Supply to Unit 3/Unit 4 Tie Valve.
- The NPO reports that the four inch Service Air Supply valve cannot be opened.

Which ONE of the following describes the correct operator response?

Open the:

a. Service Air Supply valve from Units 1 & 2.

b. Instrument Air Supply valve from Units 1 & 2.

c. Breathing Air Supply cross-tie valve.

d. two inch Service Air Supply to Unit 3/Unit 4 tie valve.

QUESTION: 079

Both units are at 100% power when a leak occurs in the Main Fire Loop. Loop pressure decreases continuously.

Which ONE of the following identifies the first pump to auto start?

a. The standby Jockey pump

b. The standby Service Water pump

c. The Electric Fire pump

d. The Diesel Engine Driven Fire pump

QUESTION: 080

The following conditions exist on Unit 3:

- The unit has been shut down at Beginning-Of-Life for equipment repairs.
- PRZ level is being maintained at 30%.
- RCS temperature is 140°F.

The following events occur 10 days after the shutdown:

- The running RHR pump trips and neither RHR pump can be restarted.
- Operators are unable to establish any other method of RCS cooling.

Which ONE of the following identifies the time closest to when the RCS will enter Mode 4?

a. 12 minutes

b. 35 minutes

c. 42 minutes

d. 50 minutes

QUESTION: 081

Unit 4 is operating at 100% power with all systems in automatic and all plant parameters at their normal values. Pressurizer PORV, PCV-455C, fails partially open.

Which ONE of the following identifies the approximate maximum expected temperature of the steam entering the PRT if the PRT pressure does not exceed 45 psig?

a. 228°F

b. 250°F

c. 275°F

d. 290°F

QUESTION: 082

Which ONE of the following describes the effect of a loss of instrument air on the ECC CCW valves?

A loss of instrument air will cause the ECC:

a. outlet valves to fail open.
outlet bypass valves to fail open.

b. outlet valves to fail open.
outlet bypass valves to fail closed.

c. outlet valves to fail closed.
outlet bypass valves to fail open.

d. outlet valves to fail closed.
outlet bypass valves to fail closed.

QUESTION: 083

The 3A Emergency Containment Filter fan has been automatically started by the sequencer.

Which ONE of the following conditions will automatically open the solenoid valves SV-3-2905 and SV-3-2906 to supply water to the 3A ECF charcoal filters?

a. Containment temperature greater than 180°F.

b. Containment pressure greater than 20 psig.

c. Charcoal filter temperature greater than 325°F.

d. Charcoal filter low air flow.

QUESTION: 084

A reactor and turbine trip occurs on Unit 3 while at 25% power.

Which ONE of the following describes the response of the Steam Dump to Condenser (SDTC) system?

a. Only 2 SDTC valves will arm.
The SDTC system will reduce Tavg to no-load Tavg.

b. Only 2 SDTC valves will arm.
The SDTC system will reduce Tavg to within 5°F of Tref.

c. All 4 SDTC valves will arm.
The SDTC system will reduce Tavg to no-load Tavg.

d. All 4 SDTC valves will arm.
The SDTC system will reduce Tavg to within 5°F of Tref.

QUESTION: 085

Unit 3 was at 80% power when the 3B Main Feed Pump breaker trips open.

Which ONE of the following describes the plant response?

a. A cyclic governor runback to 60% power will occur.

b. A cyclic governor runback to 45% power will occur.

c. A continuous load limit and governor runback to 60% power will occur.

d. A continuous load limit and governor runback to 45% power will occur.

QUESTION: 086

Unit 3 was operating at 100% with all systems in normal alignment. An SI signal occurs. All systems function as designed.

After sequencing is complete, which ONE of the following describes the number of CCW load(s) attached to the CCW System as it relates to the CCW "Rule of Five"?

a. One CCW load

b. Two CCW loads

c. Three CCW loads

d. Four CCW loads

QUESTION: 087

Which ONE of the following is an interlock that must be satisfied to allow opening the Containment personnel air lock outside door while in Mode 1?

a. The personnel airlock inside door equalizing valve must be open.

b. The personnel airlock outside door equalizing valve must be open.

c. Atmospheric pressure must be greater than 1.0 psig above airlock pressure.

d. Containment pressure must be greater than 1.0 psig above airlock pressure.

QUESTION: 088

Which ONE of the following individuals must be notified by the RCO with Administrative Duties (3rd RCO) before leaving the Control Room?

a. The RCO with Unit Duty

b. The NWE

c. The ANPS

d. The NPS

QUESTION: 089

The following conditions exist on Unit 4:

- The operators are performing E-3, "Steam Generator Tube Rupture," in response to a SGTR in the 4A S/G.
- CVCS letdown has been re-established.
- Containment conditions are normal.
- All RCPs are secured.
- PRZ level is 30%.
- 4A S/G level is increasing.

Which ONE of the following RCO actions is correct?

a. Turn On PRZ Heaters.

b. Decrease RCS Charging Flow.

c. Depressurize the RCS using Normal Spray.

d. Depressurize the RCS using Auxiliary Spray.

QUESTION: 090

Which ONE of the following is correct?

The purpose of the RCP anti-reverse-rotation device is to:

a. prevent damage to the RCP seal package when starting the RCP.

b. prevent damage to the RCP motor bearings when starting the RCP.

c. limit the reverse flow in an idle RCS loop if another RCP is already running.

d. limit the starting current on start of an idle RCP if another RCP is already running.

QUESTION: 091

Which ONE of the following correctly identifies the location and the valve failure mode, when isolating instrument air to FCV-3-114A, Primary Water to Blender valve?

	LOCATION	FAILURE MODE
a.	BAST Room	Open
b.	BAST Room	Closed
c.	Charging Pump Room	Open
d.	Charging Pump Room	Closed

QUESTION: 092

The following conditions exist on Unit 4:

- The unit is in Mode 3.
- The reactor trip breakers are closed.
- RCS Tavg is 548°F.
- RCS pressure is 2235 psig.
- A dilution to obtain the calculated critical boron concentration is in progress.

Which ONE of the following is allowed per 4-GOP-301, "Hot Standby to Power Operation"?

a. Testing of the AFW pumps

b. Stopping of an operating RCP

c. Withdrawal of the Shutdown Rods

d. Energization of the PRZ backup heaters

QUESTION: 093

Which ONE of the following is correct for the Base Continuous Power Ratings for the Unit 3 and Unit 4 Emergency Diesel Generators?

	Unit 3 EDGs	Unit 4 EDGs
a.	2500 KW	2874 KW
b.	2500 KW	2750 KW
c.	2874 KW	2750 KW
d.	2750 KW	2500 KW

QUESTION: 094

Which ONE of the following exposures exceeds an FPL PTN guideline per 0-ADM-600, "Radiation Protection Manual?"

a. 3 rems/yr Total Effective Dose Equivalent

b. 5 rems/yr Lens Dose Equivalent

c. 20 rems/yr Total Organ Dose Equivalent

d 20 rems/yr Shallow Dose Equivalent to the skin

QUESTION: 095

Which ONE of the following is correct when using a frisker for determining the radioactivity of an object?

a. The selector switch must be on the X1 (times one) scale and background can be no greater than 300 cpm.

b. The selector switch must be on the times X100 (times 100) scale and background can be no greater than 300 cpm.

c. The selector switch must be on the X1 (times one) scale and background must be no greater than 500 cpm.

d. The selector switch must be in the X100 (times 100) scale and background must be no greater than 500 cpm.

QUESTION: 096

The following conditions exist on Unit 3 while on RHR:

- RCS temperature is 300°F.
- RCS pressure momentarily spikes to 550 psig.

The RCO took the following actions:

- Verified the amber and blue lights for MOV-750 and MOV-751, Loop C RHR Pump Suction Stop Valves, were lit.
- Depressed and released the override pushbuttons to open MOV-750 and MOV-751.
- Determined that MOV-750 and MOV-751 continued to stroke closed.

Which ONE of the following describes why MOV-750 and MOV-751 continued to stroke closed?

a. The OMS mode selector switches are in the "Normal" position.

b. The MOVs must stroke to the fully closed position before they will reopen.

c. RCS pressure was too high when the override pushbuttons were depressed.

d. The override pushbuttons need to be held in the depressed position until the yellow lights go out.

QUESTION: 097

SI has occurred on Unit 3. After exiting E-0, "Reactor Trip of Safety Injection," the following conditions relative to the Critical Safety Functions are observed:

Subcriticality: NIS power ranges are all 2%.
NIS intermediate ranges' SUR are both +0.2 DPM.

Core Cooling: Six highest CETs read 720°F.

Heat Sink:

	3A S/G	3B S/G	3C S/G
NR level:	4%	5%	3%
AFW flow:	125 gpm	125 gpm	125 gpm

Containment: Containment pressure is 10 psig.
Containment Recirculation Sump level is 450 inches.
Containment conditions are not adverse.

All other status trees indicate only green or yellow paths.

Which ONE of the following identifies the first procedure to enter?

a. FR-S.1, "Response to Nuclear Power Generation/ATWS"

b. FR-C.1, "Response to Inadequate Core Cooling"

c. FR-H.1, "Response to Loss of Secondary Heat Sink"

d. FR-Z.1, "Response to High Containment Pressure"

QUESTION: 098

Which ONE of the following individuals may authorize de-escalation from a Site Area Emergency E-Plan classification?

a. Plant Manager

b. Recovery Manager

c. Emergency Coordinator

d. Emergency Control Officer.

QUESTION: 099

The following events occur on Unit 3:

- The unit experiences a spurious SI signal.
- Startup Transformer breaker 3AA05 fails to close.
- All other systems respond as designed.

Which ONE of the following identifies the Sequencer Trouble annunciator(s) that will alarm when the operators reset SI?

a. Sequencer 3A only.

b. Sequencer 3A and 3B only.

c. Sequencer 3B, 4A and 4B only.

d. Sequencer 3A, 3B, 4A and 4B.

QUESTION: 100

Unit 3 operators are performing the Immediate Operator Actions of E-0 "Reactor Trip or Safety Injection."

The following conditions exist:

- 3A 4KV bus is energized.
- 3B 4KV bus is de-energized.
- 3D 4KV bus is aligned to 3B 4KV bus.
- 3C ICW and 3C CCW pump breakers are open.

Which ONE of the following is the correct operator action?

Verify D bus lockout indicating light is:

a. flashing. Align D bus to A bus by opening the B bus supply breakers, then closing the A bus supply breakers.

b. flashing. Align D bus to A bus by closing the A bus breakers, then opening the B bus breakers.

c. lit (not flashing). Align D bus to A bus by closing the A bus supply breakers, then opening the B bus supply breakers.

d. lit (not flashing). Align D bus to A bus by opening the B bus supply breakers, then closing the A bus supply breakers.

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RO OPEN REFERENCES

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
15	**Try To Start One RCP:**	
	a. Start Oil Lift Pump.	
	b. **WHEN** 2 minute oil lift pressure time delay is satisfied, **THEN** verify Permissive to start light - ON	
	c. Start one RCP	c. Perform the following: 1) Verify natural circulation. Refer to ATTACHMENT 1. **IF** natural circulation cannot be verified, **THEN** increase dumping steam. 2) Go to Step 16.
	d. **WHEN** RCP has been running greater than 1 minute, **THEN** stop oil lift pump	
16	**Check High-Head SI Pumps - ANY RUNNING**	Perform one of the following: a. **IF** RHR pump running in SI mode **THEN** go to Step 28. b. **IF** RHR pump **NOT** running in SI mode, **THEN** go to Step 20.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

17 **Check If One High-Head SI Pump Should Be Stopped:**

a. Determine required RCS subcooling from table:

CHARGING PUMP STATUS	RCS SUBCOOLING (°F) - BASED ON CORE EXIT TCs			
	ANY RCP RUNNING		NO RCP RUNNING	
	ONE HIGH-HEAD PUMP RUNNING	TWO HIGH-HEAD PUMPS RUNNING	ONE HIGH-HEAD PUMP RUNNING	TWO HIGH-HEAD PUMPS RUNNING
NONE RUNNING	DO NOT STOP HIGH-HEAD SI PUMP	69°F[304°F]	DO NOT STOP HIGH-HEAD SI PUMP	80°F[304°F]
ONE RUNNING	375°F[377°F]	64°F[301°F]	374°F[376°F]	74°F[301°F]
TWO RUNNING	351°F[374°F]	60°F[298°F]	349°F[374°F]	70°F[298°F]
THREE RUNNING	316°F[371°F]	57°F[296°F]	315°F[371°F]	66°F[296°F]

b. Check RCS subcooling based on core exit TCs - GREATER THAN REQUIRED SUBCOOLING

b. Perform the following:

1) **IF** RCS hot leg temperature greater than 325°F, **THEN** go to Step 28.

2) **IF** RCS hot leg temperature less than 325°F, **THEN** perform the following:

a) **IF** no RHR pumps are running, **THEN** start one RHR pump.

b) **IF** neither RHR pump can be started, **THEN** go to Step 28.

c. Check PRZ level - GREATER THAN 23%[50%]

c. Perform the following:

1) DO NOT STOP HIGH-HEAD SI PUMP.

2) OBSERVE CAUTION PRIOR TO STEP 10 and return to Step 10.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

NOTE

After stopping any high-head SI pump, RCS pressure shall be allowed to stabilize or increase before stopping another pump.

18 **Stop One High-Head SI Pump**

19 **Return To Step 16**

20 **Check If Charging Flow Should Be Controlled To Maintain PRZ Level:**

a. Check RHR pumps - NONE RUNNING IN SI MODE — a. Go to Step 28.

b. Control charging flow to maintain PRZ level

CAUTION

If RCP seal cooling from seal injection and thermal barrier CCW flow has previously been lost, the affected RCP(s) shall not be started prior to a status evaluation.

21 **Check RCPs - ALL STOPPED**

Perform the following:

a. Stop all but one RCP.

b. OBSERVE CAUTION PRIOR TO STEP 26 and go to Step 26.

22 **Check Plant Conditions For Starting Desired RCP:**

a. Verify the A or B 4KV bus - ENERGIZED FROM STARTUP TRANSFORMER

b. Verify number one seal ΔP - GREATER THAN 200 PSID

c. Verify thermal barrier ΔP - GREATER THAN 0 INCHES OF WATER

d. Verify proper number one seal leak-off flow - GREATER THAN 0.8 GPM

Perform the following:

1. Verify natural circulation. Refer to ATTACHMENT 1. **IF** natural circulation cannot be verified, **THEN** increase dumpin steam.

2. Go to Step 26.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

CAUTION

CCW System load requirements SHALL NOT be exceeded.

23 **Establish Proper CCW System Alignment For RCP Operation:**

a. CCW pumps - ONLY TWO RUNNING

a. Perform the following:

1) **IF** all CCW pumps are running, **THEN** stop and plac in standby 3C CCW pump.

2) **IF** one CCW pump is running **AND** 3 CCW Heat Exchangers are in service, **THEN** start one of the standby CCW pump

b. CCW Heat Exchangers - THREE IN SERVICE

b. Perform the following:

1) Stop and place in Standby all EXCEPT ONE running CCW pump.

2) **IF** MOV-3-749A **AND** MOV-3-749 are OPEN, **THEN** Stop and place in Pull-To-Lock all EXCEPT one running CCW pump

3) Go to Step 23c.

c. Check CCW from RHR Heat Exchangers
- AT LEAST ONE CLOSED

- MOV-3-749A
- MOV-3-749B

c. Perform the following:

1) Isolate one Emergency Containment Cooler by placing one ECC Control Switch in STOP.

2) **IF** unable to isolate one EC **THEN** Stop ALL RCP's **AND** verify Natural Circulation using ATTACHMENT 1. **THEN** go to Step 26.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
24	**Establish Proper CCW Valve Alignment For RCP Operation:**	
	a. Check RCP Thermal Barrier CCW Outlet, MOV-3-626 - OPEN	a. Perform the following: 1) IF CCW radiation levels ar normal, THEN manually open MOV-3-626. 2) IF MOV-3-626 can NOT be manually opened, THEN dire operator to slowly open MOV-3-626 locally.
	b. Verify the following valves - OPEN • MOV-3-716A, RCP CCW Inlet • MOV-3-716B, RCP CCW Inlet • MOV-3-730, RCP Bearing CCW Outlet	b. Manually open valves. IF MOVs can NOT be manually opened, THEN direct operator to open MOVs locally.
	c. Open CCW To Normal Containment Cooler valves • MOV-3-1417 • MOV-3-1418	c. Perform the following: 1) Verify natural circulation Refer to ATTACHMENT 1. IF natural circulation cannot be verified, THEN increase dumping steam. 2) Go to Step 26.
	d. Reset and start normal containment coolers	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
	NOTE *If possible, RCPs B or C shall be run to provide normal PRZ spray, RCP A will not provide adequate spray flow.*	
25	**Try To Start One RCP:**	
	a. Start Oil Lift Pump	
	b. **WHEN** 2 minute oil lift pressure time delay is satisfied, **THEN** verify Permissive to start light - ON	
	c. Start one RCP	c. Perform the following: 1) Verify natural circulation. Refer to ATTACHMENT 1. **IF** natural circulation cannot be verified, **THEN** increase dumping steam. 2) Go to Step 26.
	d. **WHEN** RCP has been running greater than 1 minute, **THEN** stop oil lift pump	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

CAUTION

Voiding may occur in the RCS during RCS depressurization. This will result in a rapidly increasing PRZ level.

26	**Depressurize RCS To Minimize RCS Break Flow:**	
	a. Use normal PRZ spray	a. Use one PRZ PORV. **IF** no PORV available, **THEN** use auxiliary spray.
	b. Check the A and B 4KV buses - ENERGIZED BY OFFSITE POWER	b. Verify adequate diesel capacit to energize all PRZ heaters (450 KW for each backup heate group). **IF** adequate diesel capacity is **NOT** available, **TH** locally open individual heate breakers until PRZ heater loa is within diesel capacity. Refer to ATTACHMENT 2. for component KW load rating.
	c. Turn on PRZ heaters as necessary to stop depressurization	
	d. Depressurize RCS until either of the following conditions satisfied: * PRZ level - GREATER THAN 71%[50%] **OR** * RCS subcooling based on core exit TCs - LESS THAN 40°F[220°F]	
27	**Verify Adequate Shutdown Margin:**	
	a. Sample RCS for boron	
	b. Shutdown margin - ADEQUATE	b. Borate to establish adequate shutdown margin.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
28	**Verify SI Flow Not Required:**	
	a. RCS subcooling based on core exit TCs - GREATER THAN 30°F[210°F]	a. Manually start SI pumps to restore RCS subcooling and go to Step 29.
	b. PRZ level - GREATER THAN 12%[50%]	b. Perform the following: 1) Manually start SI pumps to restore PRZ level. 2) OBSERVE CAUTION PRIOR TO STEP 10 and return to Step 10.
29	**Check If SI Accumulators Should Be Isolated:**	
	a. RCS subcooling based on core exit TCs - GREATER THAN 30°F[210°F]	a. Perform one of the following: 1) <u>IF</u> at least two RCS hot le temperatures less than 340°F, <u>THEN</u> go to Step 29c 2) <u>IF</u> at least two RCS hot le temperatures <u>NOT</u> less than 340°F, <u>THEN</u> go to Step 30.
	b. PRZ level - GREATER THAN 12%[50%]	b. OBSERVE CAUTION PRIOR TO STEP 10 and return to Step 10
	c. Locally unlock and close the following breakers: • 30532 for MOV-3-865A • 30631 for MOV-3-865B • 30733 for MOV-3-865C	
	d. Close all SI Accumulator Discharge MOVs • MOV-3-865A • MOV-3-865B • MOV-3-865C	d. Direct operator to vent any unisolated accumulators using 3-OP-064, SAFETY INJECTION ACCUMULATORS
	e. Locally open and lock the following breakers: • 30532 for MOV-3-865A • 30631 for MOV-3-865B • 30733 for MOV-3-865C	

3/4.2.4 QUADRANT POWER TILT RATIO

LIMITING CONDITION FOR OPERATION

3.2.4 The QUADRANT POWER TILT RATIO shall not exceed 1.02.

APPLICABILITY: MODE 1, above 50% of RATED THERMAL POWER*.

ACTION:

a. With the QUADRANT POWER TILT RATIO determined to exceed 1.02 but less than or equal to 1.09:

1. Calculate the QUADRANT POWER TILT RATIO at least once per hour until either:

a) The QUADRANT POWER TILT RATIO is reduced to within its limit, or

b) THERMAL POWER is reduced to less than 50% of RATED THERMAL POWER.

2. Within 2 hours either:

a) Reduce the QUADRANT POWER TILT RATIO to within its limit, or

b) Reduce THERMAL POWER at least 3% from RATED THERMAL POWER for each 1% of indicated QUADRANT POWER TILT RATIO in excess of 1 and similarly reduce the Power Range Neutron Flux-High Trip Setpoints within the next 4 hours.

3. Verify that the QUADRANT POWER TILT RATIO is within its limit within 24 hours after exceeding the limit or reduce THERMAL POWER to less than 50% of RATED THERMAL POWER within the next 2 hours and reduce the Power Range Neutron Flux-High Trip Setpoints to less than or equal to 55% of RATED THERMAL POWER within the next 4 hours; and

4. Identify and correct the cause of the out-of-limit condition prior to increasing THERMAL POWER; subsequent POWER OPERATION above 50% of RATED THERMAL POWER may proceed provided that the QUADRANT POWER TILT RATIO is verified within its limit at least once per hour for 12 hours or until verified acceptable at 95% or greater RATED THERMAL POWER.

*See Special Test Exceptions Specification 3.10.2.

LIMITING CONDITION FOR OPERATION (Continued)

ACTION (Continued)

b. With the QUADRANT POWER TILT RATIO determined to exceed 1.09 due to misalignment of either a shutdown or control rod:

1. Calculate the QUADRANT POWER TILT RATIO at least once per hour until either:

a) The QUADRANT POWER TILT RATIO is reduced to within its limit, or

b) THERMAL POWER is reduced to less than 50% of RATED THERMAL POWER.

2. Reduce THERMAL POWER at least 3% from RATED THERMAL POWER for each 1% of indicated QUADRANT POWER TILT RATIO in excess of 1, within 30 minutes;

3. Verify that the QUADRANT POWER TILT RATIO is within its limit within 2 hours after exceeding the limit or reduce THERMAL POWER to less than 50% of RATED THERMAL POWER within the next 2 hours and reduce the Power Range Neutron Flux-High Trip Setpoints to less than or equal to 55% of RATED THERMAL POWER within the next 4 hours; and

4. Identify and correct the cause of the out-of-limit condition prior to increasing THERMAL POWER; subsequent POWER OPERATION above 50% of RATED THERMAL POWER may proceed provided that the QUADRANT POWER TILT RATIO is verified within its limit at least once per hour for 12 hours or until verified acceptable at 95% or greater RATED THERMAL POWER.

c. With the QUADRANT POWER TILT RATIO determined to exceed 1.09 due to causes other than the misalignment of either a shutdown or control rod:

1. Calculate the QUADRANT POWER TILT RATIO at least once per hour until either:

a) The QUADRANT POWER TILT RATIO is reduced to within its limit, or

b) THERMAL POWER is reduced to less than 50% of RATED THERMAL POWER.

LIMITING CONDITION FOR OPERATION (Continued)

ACTION (Continued)

2. Reduce THERMAL POWER to less than 50% of RATED THERMAL POWER within 2 hours and reduce the Power Range Neutron Flux-High Trip Setpoints to less than or equal to 55% of RATED THERMAL POWER within the next 4 hours; and

3. Identify and correct the cause of the out-of-limit condition prior to increasing THERMAL POWER; subsequent POWER OPERATION above 50% of RATED THERMAL POWER may proceed provided that the QUADRANT POWER TILT RATIO is verified within its limit at least once per hour for 12 hours or until verified at 95% or greater RATED THERMAL POWER.

d. The provisions of Specification 3.0.4 are not applicable.

SURVEILLANCE REQUIREMENTS

4.2.4.1 The QUADRANT POWER TILT RATIO shall be determined to be within the limit above 50% of RATED THERMAL POWER by:

a. Calculating the ratio at least once per 7 days when the Power Range Upper Detector High Flux Deviation and Power Range Lower Detector High Flux Deviation Alarms are OPERABLE, and

b. Calculating the ratio at least once per 12 hours during steady-state operation when either alarm is inoperable.

4.2.4.2 The QUADRANT POWER TILT RATIO shall be determined to be within the limit when above 75% of RATED THERMAL POWER with one Power Range channel inoperable by using the movable incore detectors to confirm that the normalized symmetric power distribution, obtained either from two sets of four symmetric thimble locations or full-core flux map, or by incore thermocouple map is consistent with the indicated QUADRANT POWER TILT RATIO at least once per 12 hours.

4.2.4.3 If the QUADRANT POWER TILT RATIO is not within its limit within 24 hours and the POWER DISTRIBUTION LIMITS of 3.2.2 and 3.2.3 are within their limits, a Special Report in accordance with 6.9.2 shall be submitted within 30 days including an evaluation of the cause of the discrepancy.

FIGURE 1
Page 1 of 1
TYPICAL HEAT UP RATES W/VESSEL FULL

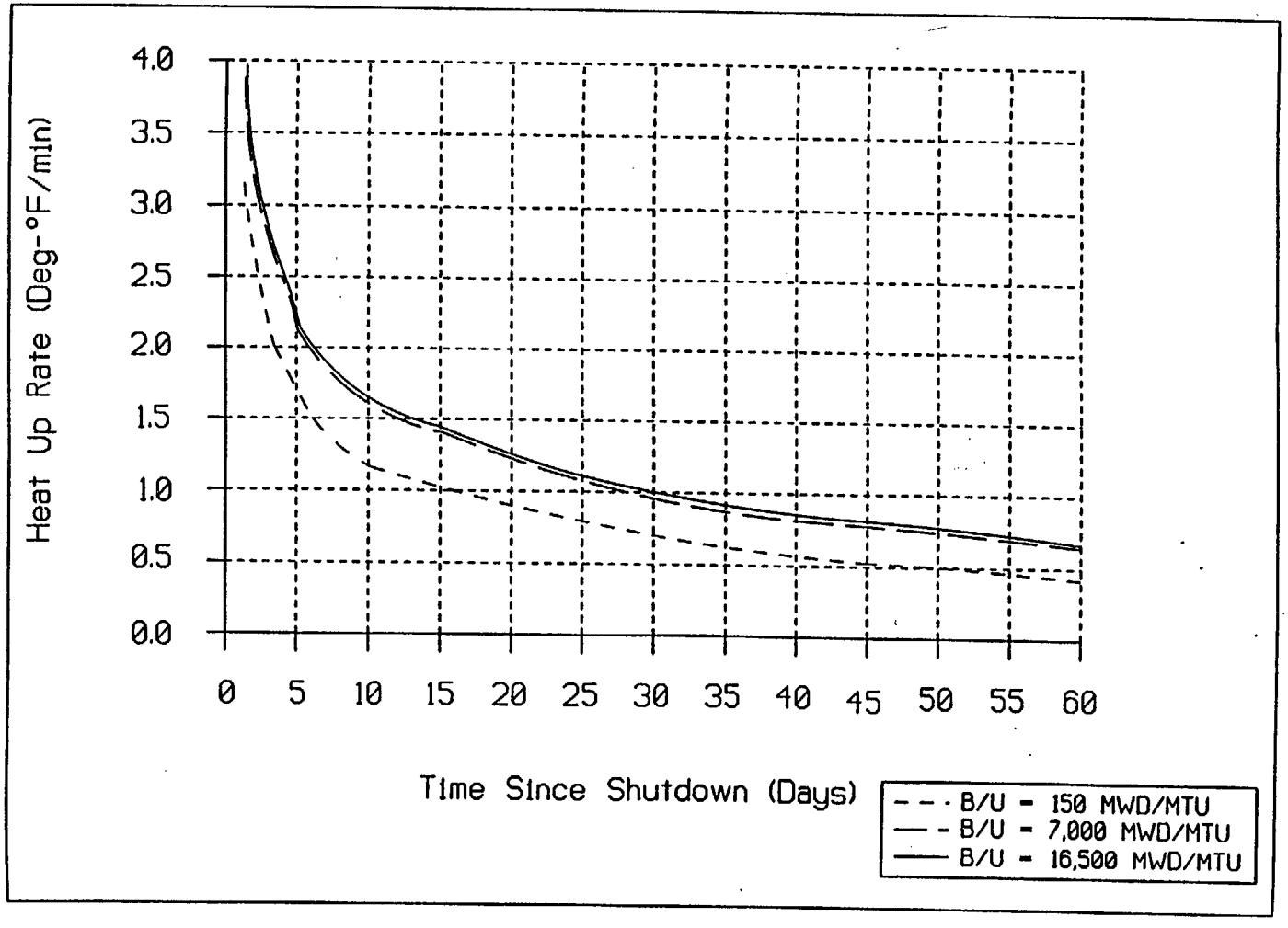


FIGURE 2
(Page 1 of 1)
TYPICAL RCS HEAT UP RATES FOR REDUCED INVENTORY

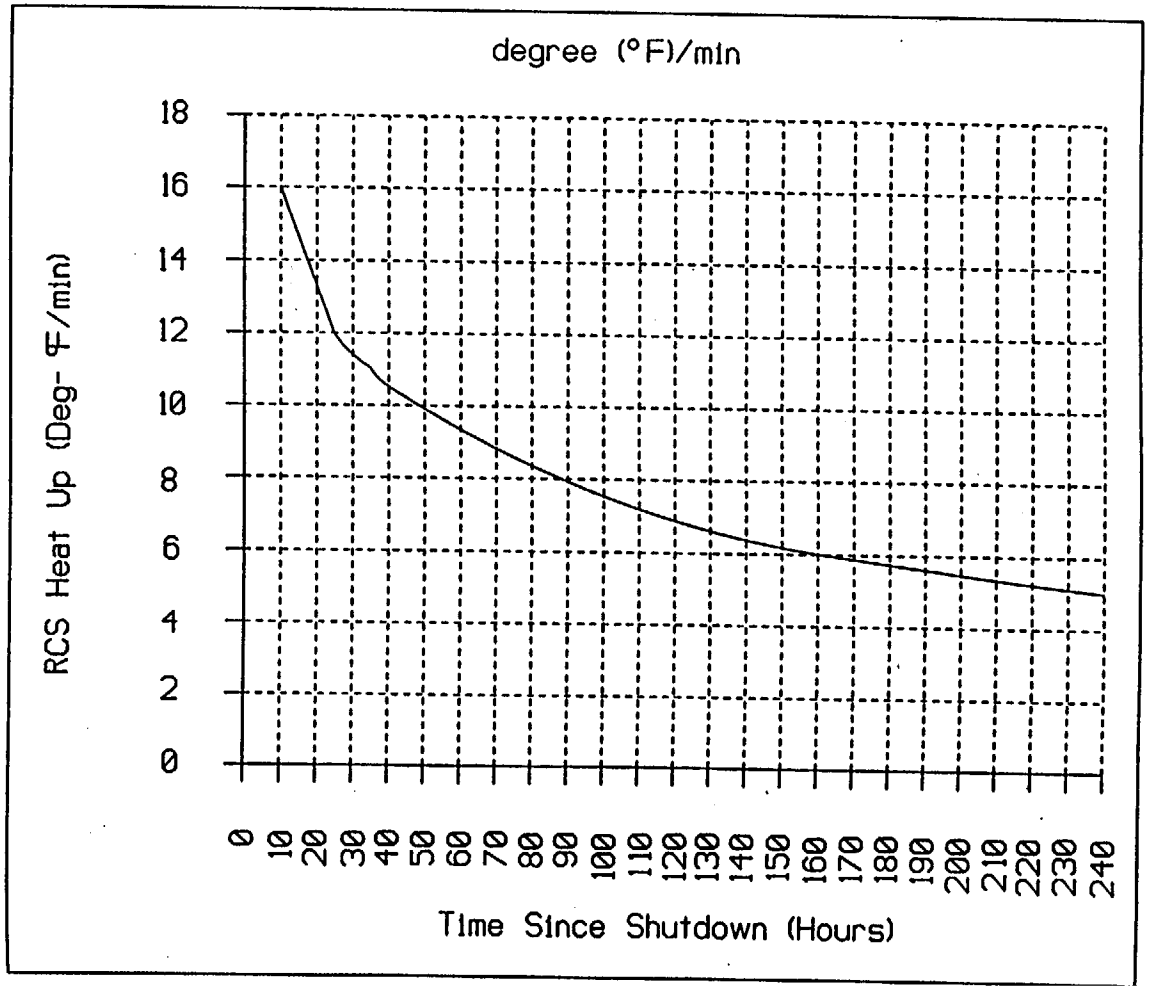


FIGURE 3
(Page 1 of 3)

TYPICAL HEAT UP RATES IN SFP W/FULL OFFLOAD

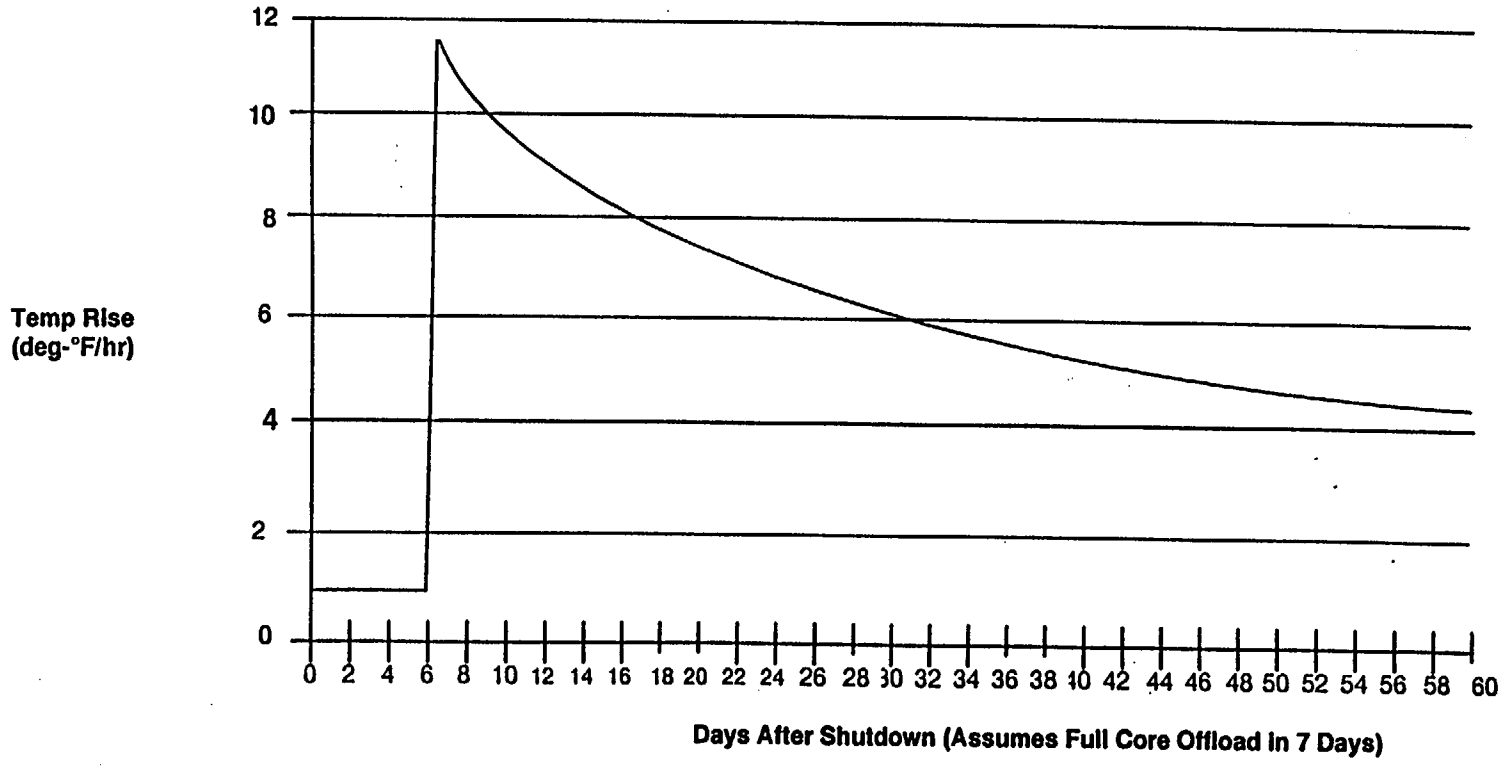


FIGURE 3
(Page 2 of 3)

TYPICAL HEAT UP RATES IN SFP W/FULL OFFLOAD

(Time to Heat Up SFP to 170°F)

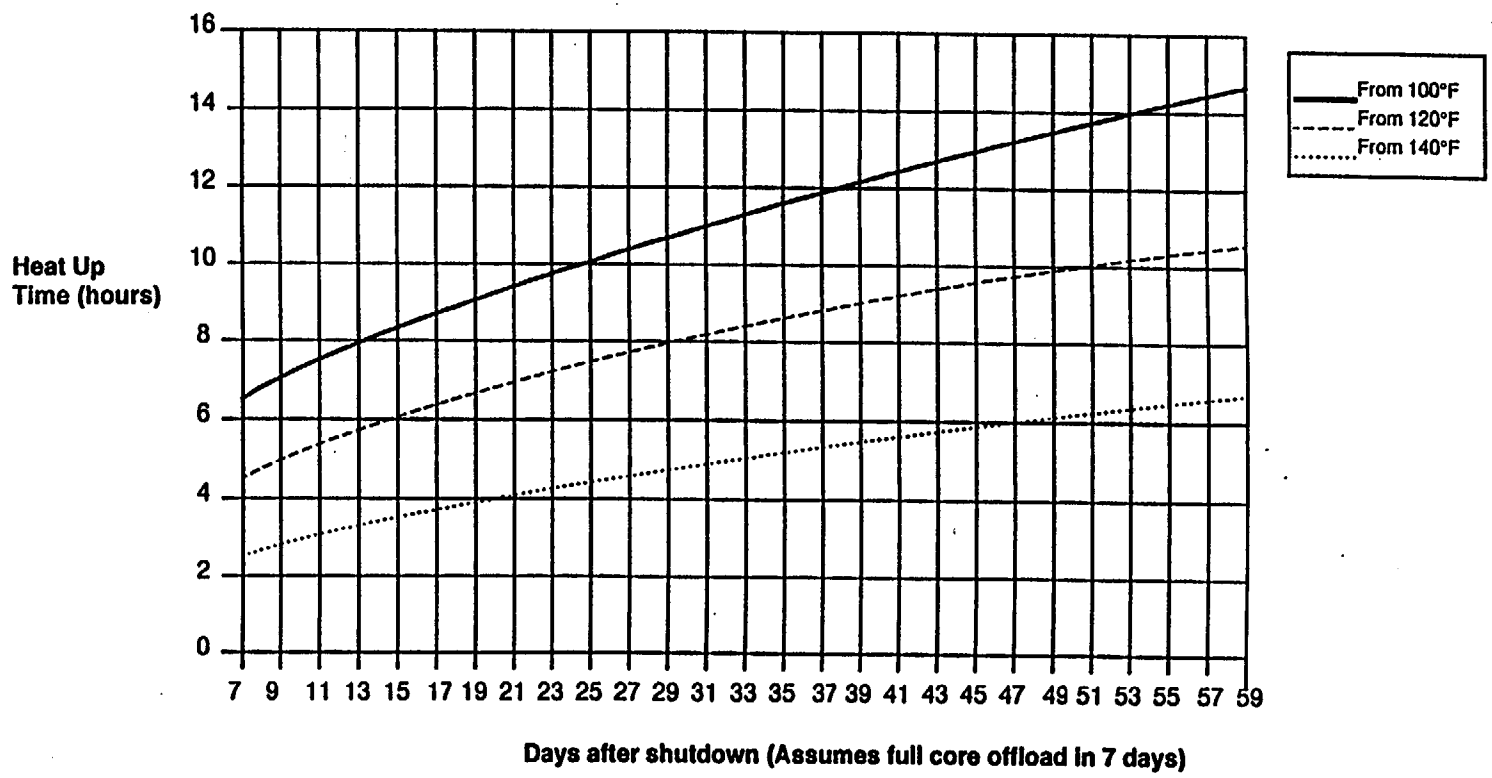
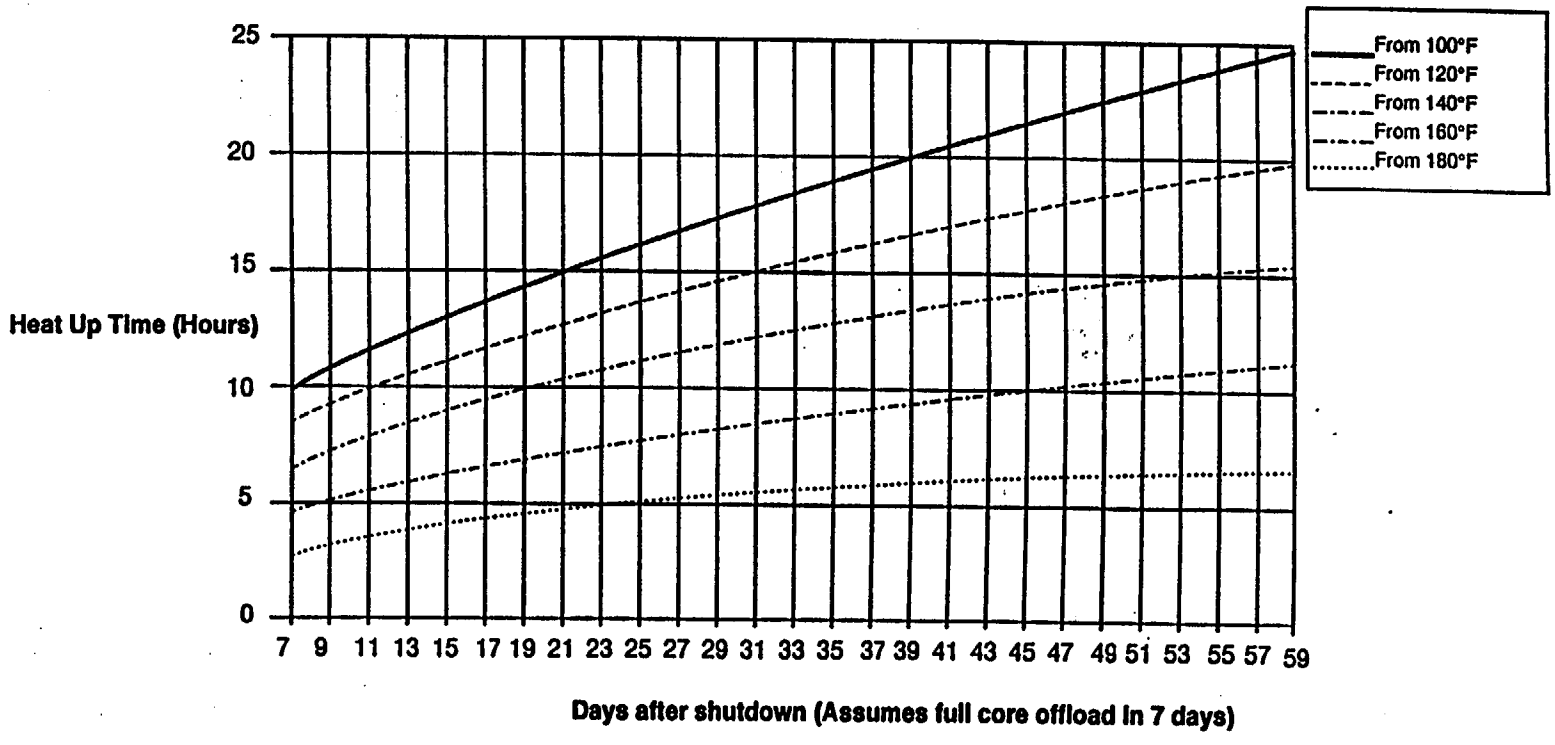


FIGURE 3
(Page 3 of 3)

TYPICAL HEAT UP RATES IN SFP W/FULL OFFLOAD

(Time to Boil SFP)



ATTACHMENT 2
(Page 1 of 1)

CONTROL OF RCS PRESSURE AND CHARGING FLOW TO MINIMIZE RCS-TO-SECONDARY LEAKAGE

CAUTION

RCS and ruptured S/G(s) pressures must be maintained less than the ruptured S/G(s) steam dump to atmosphere setpoint.

NOTES

- *This attachment may be removed from the procedure and used by the unit RCO to control RCS-to-secondary leakage during this procedure.*
- *When RCS depressurization is required, normal spray should be used whenever possible. If normal spray is NOT available and letdown is in service, auxiliary spray should be used. If normal spray and auxiliary spray are NOT available, one PRZ PORV should be used.*

PRZ LEVEL	RUPTURED S/G(S) LEVEL		
	INCREASING	DECREASING	OFFSCALE HIGH
LESS THAN 23%[50%]	• Increase RCS Charging Flow • Depressurize RCS. Refer to note prior to this table.	Increase RCS Charging Flow	• Increase RCS Charging Flow • Maintain RCS And Ruptured S/G(s) Pressures Equal
BETWEEN 23%[50%] and 50%	Depressurize RCS. Refer to note prior to this table.	Turn On PRZ Heaters	Maintain RCS And Ruptured S/G(s) Pressures Equal
BETWEEN 50% and 71%[50%]	• Depressurize RCS. Refer to note prior to this table. • Decrease RCS Charging Flow	Turn On PRZ Heaters	Maintain RCS And Ruptured S/G(s) Pressures Equal
GREATER THAN 71%[50%]	Decrease RCS Charging Flow	Turn On PRZ Heaters	Maintain RCS And Ruptured S/G(s) Pressures Equal

QUESTION: 001

The following conditions exist on Unit 3:

- The operators are responding to a misaligned D Bank, Group 2, control rod using 3-ONOP-28.1 "RCC Misalignment."

- The appropriate lift coil disconnect switches have been placed to the disconnect position.

Which ONE of the following Power Cabinets will be the source of the Urgent Failure alarm that occurs when the operator initiates rod motion?

a. 1AC

b. 1BD

c. 2AC

d. 2BD

ANSWER: 001

b.

REFERENCES:

ONOP-28.1 Note prior to Step 5.9.8, and ARP B 9/4

690210506
New
KA 000005AK2.02 (2.5/2.6) RO T1/G1 SRO T1/G1
Pg. 4.2-6
10CFR 41.7/45.7
RO Q#1 SRO Q#3
Level 1

QUESTION: 002
The following conditions exist on Unit 3.

- The "POWER BELOW P-8" status lamp is not lit.
- The 3A RCP experiences a sheared shaft.

Which ONE of the following correctly describes the applicable reactor trip logic?

The reactor will:

a. Trip due to a single RCS loop low flow signal.

b. Trip due to a single RCP breaker open signal.

c. Not trip because two RCS loops must have low flow signals.

d. Not trip because two RCPs must have breaker open signals.

ANSWER: 002

a.

REFERENCES:

Logic Diagram 5610-T-L1 Sht. 20

690216306
New
KA 000015/17AA1.16 (3.2/3.5) RO T1/G1 SRO T1/G1
Pg. 4.2-11
10CFR 41.7/45.5/45.6
RO Q#2 SRO Q#7
Level 2

QUESTION: 003

The following conditions exist on Unit 4:

- Operators are performing ES-0.2, "Natural Circulation Cooldown."
- All systems are operable except the RCPs and Channel A of QSPDS.
- The NPS determines a cooldown rate in excess of 25°F/hr is required.

Which ONE of the following describes the correct operator action?

a. Increase the cooldown rate to a rate not to exceed 60°F/hr and remain in ES-0.2.

b. Increase the cooldown rate to a rate not to exceed 100°F/hr and remain in ES-0.2.

c. Transition to ES-0.3, "Natural Circulation Cooldown with Steam Void in Vessel (With RVLMS)."

d. Transition to ES-0.4, "Natural Circulation Cooldown with Steam Void in Vessel (Without RVLMS)."

ANSWER: 003

c.

REFERENCES:

ES-0.2, NOTE before Step 17

690232401
New
KA W/E09EA2. (3.1/3.8) RO T1/G1 SRO T1/G1
Pg. 4.5-24
10CFR 43.5/45.13
RO Q#3 SRO Q#8
Level 2

QUESTION: 004

The following event occurs while Unit 4 is in Mode 3:

- Both NIS Source Ranges indicate an unexplained increase in power.

The RCO attempts to initiate emergency boration but discovers MOV-350, Emergency Boration valve, will not open.

Which ONE of the following describes the correct operator response?

a. Direct the SNPO to open MOV-350.

b. Direct the SNPO to open 3-358, bypass around LCV-115B.

c. Open FCV-113A, FCV-113B, and direct the SNPO to open 3-356.

d. Hold closed LCV-115C and direct the NPO to open the breaker for LCV-115C.

ANSWER: 004

c.

REFERENCE:

4-ONOP-046.1 step 1 RNO

690223201
New
KA 000024AK1.02 (3.6/3.9) RO T1/G1 SRO T1/G1
Pg. 4.2-14
10CFR 41.8/41.10/45.3
RO Q#4 SRO Q#9
Level 1

QUESTION: 005

A total loss of CCW occurs on Unit 4 while at 100% power.

Which ONE of the following is correct?

Damage will occur quickest to the Charging pump:

a. oil pump with the Charging pump run at minimum speed.

b. oil pump with the Charging pump run at maximum speed.

c. fluid drive coupling with the Charging pump run at minimum speed.

d. fluid drive coupling with the Charging pump run at maximum speed.

ANSWER: 005

c.

REFERENCE:

ONOP-030 Step 1 RNO, ONOP-30 Fold out page, Caution prior to step 20 of ONOP-30

690222902
New
KA 000026AA2.06 (2.8/3.1) RO T1/G1 SRO T1/G!
Pg.4.2-19
10CFR 43.5/45.13
RO Q#5 SRO Q#10
Level 1

QUESTION: 006

Unit 3 is in Mode 1 when operators responded to PRZ pressure transmitter, PT-445, failed high.

The following stable conditions now exist:

- Reactor Power 80%
- Tavg 572 °F
- PRZ Pressure 2150 psig
- PRZ Level 48%

Which ONE of the following is the operator response required by Technical Specifications?

a. Restore PRZ level to greater than 48%.

b. Restore PRZ pressure to greater than 2200 psig.

c. Reduce Tavg to less than 570°F.

d. Reduce Reactor Power to less than 75%.

ANSWER: 006

b.

REFERENCES:

Tech Spec 3.2.5. b. LCO

690252201
New
KA 000027AA2.04 (3.7/4.3) RO T1/G1 SRO T1/G2
Pg. 4.2-21
10CFR 43.5/45.13
RO Q#6 SRO Q#31
Level 1

QUESTION: 007

The following conditions exist on Unit 3:

- The unit is at 2% power.
- All MSIVs are closed.
- A steam line break occurs on the 3A S/G at the safety header.

Which ONE of the following describes the plant response?

SI will occur when:

a. Tavg decreases to 543°F.

b. containment pressure increases to 4 psig.

c. 3A S/G pressure decreases to 485 psig.

d. 3A S/G pressure decreases to 614 psig.

ANSWER: 007

c.

REFERENCES:

Logic Diagrams 5610-T-L1 Sht. 19 and 5610-T-D-18B Sht. 1

6902163006
New
KA 000040AA1.06 (4.0/4.1) RO T1/G1 SRO T1/G1
Pg. 4.3-32
10CFR 41.7/45.5/45.6
RO Q#7 SRO Q#12
Level 2

QUESTION: 008

Unit 4 operators have just transitioned to 4-EOP-FR-P.1 "Response to Imminent Pressurized Thermal Shock Condition."

The following conditions exist:

- AFW is not available.
- The A Standby Feedwater Pump is being used to maintain S/G inventory.

Which ONE of the following indications should be used to control feed water flow?

Use changes in:

a. RCS pressure.

b. RCS Δ T.

c. normal feedwater flow.

d. normal S/G level.

ANSWER: 008

d.

REFERENCES:

FR-P.1 step 2 Caution

690233601
Modified from Exam Bank Question 69023360101
KA W/E08EA1.3 (3.6/4.0) RO T1/G1 SRO T1/G1
Pg. 4.5-21
10CFR 41.7/45.5/45.6
RO Q#8 SRO Q#13
Level 2

QUESTION: 009

The following conditions exist on Unit 3:

- The operators have entered ONOP- 014 "Main Condenser Loss of Vacuum."
- The unit was initially at 550 MWe and 25" vacuum with vacuum slowly decreasing.
- The unit is now at 300 MWe and 24" vacuum with vacuum slowly decreasing.

Which ONE of the following is the required operator action?

a. Continue reducing MWe until vacuum stabilizes at greater than or equal to 24.5" vacuum.

b. Continue reducing MWe until vacuum stabilizes at greater than or equal to 22" vacuum.

c. Stabilize the plant and continue to investigate the cause of the low vacuum condition.

d. Trip the reactor and turbine and perform the actions of E-0, "Reactor Trip or Safety Injection."

ANSWER: 009

d.

REFERENCES:

ONOP-014, Enclosure 1 and ODI-CO-023

7102122004
New
KA 000051AA2.02 (3.9/4.1) RO T1/G1 SRO T1/G1
Pg. 4.2-34
10CFR 43.5/45.13
RO Q#9 SRO Q#14
Level 1

QUESTION: 010

Unit 3 experienced a Loss of All AC Power simultaneous with a complete loss of Instrument Air.

Operators have restored power to and started the 3A Charging pump.

Which ONE of the following correctly describes the effect on CVCS?

The letdown flowpath:

a. remains open and the charging pump speed goes to minimum.

b. remains open and the charging pump speed goes to maximum.

c. isolates and the charging pump speed goes to minimum.

d. isolates and the charging pump speed goes to maximum.

ANSWER: 010

d.

REFERENCE:

P&ID 5613-M-3047 Sh. 2, 0-ONOP-13 Foldout Page

690214505
New
KA 000055EA2.01 (3.4/3.7) RO T1/G1 SRO T1/G1
Pg. 4.1-15
10CFR 43.5/45.13
RO Q#10 SRO Q#15
Level 2

QUESTION: 011

Unit 3 is in Mode 3 with the following conditions:

- A loss of a 120V Vital Instrument Panel has caused VCT level indicator LI-3-115 to indicate zero level.

- Annunciator A 4/6 "VCT HI/LO LEVEL" is in alarm.

Which ONE of the following is correct for the given conditions?

VCT Auto Makeup:

a. initiates and charging pump suction remains aligned to the VCT.

b. initiates and charging pump suction auto swaps to the RWST.

c. is disabled and charging pump suction remains aligned to the VCT.

d. is disabled and charging pump suction auto swaps to the RWST.

ANSWER: 011

a.

REFERENCES:

ONOP-003.7 Enclosure 1 page 1and SD-13 Figure 19

690226003
New
KA 000057AA1.04 (3.5/3.6) RO T1/G1 SRO T1/G1
Pg. 4.2-41
10CFR 41.7/45.5/45.6
RO Q#11 SRO Q#16
Level 2

QUESTION: 012

The following conditions exist:

- Fire Detection Panel C39A alarms in the Control Room.
- Alarm point 41,"Train A Inverters" is activated.
- The NWE investigates and reports that the HALON system has discharged and the fire is still burning.

Which ONE of the following actions should be taken to extinguish the fire?

a. Depress the local panel emergency release "DISCHARGE" button.

b. Place the local panel "MAIN/RESERVE" switch to the RESERVE position.

c. Place the local panel "MAIN/RESERVE" switch to the MAIN position.

d. Pull the MAIN manual release lever at the Halon bottles.

ANSWER: 012

b.

REFERENCE:

0-ONOP-16.8 Step 5.1.6.1

690226109
New
KA 000067AA1.08 (3.4/3.7) RO T1/G1 SRO T1/G1
Pg. 4.2-52
10CFR 41.7/45.5/45.6
RO Q#12 SRO Q#19
Level 1

QUESTION: 013

Which ONE of the following is an indication or control that is on the Unit 3 Alternate Shutdown Panel?

a. 3A EDG voltage indicator

b. RCS Loop Flow indicator

c. "C" AFW pump T&T valve control switch

d. 3A Charging pump control switch

ANSWER: 013

c.

REFERENCES:

Attachment 3 from 3-OSP-300.2

690214305
Modified from Exam Bank question 69021430511
KA 000068K2.01 (3.9/4.0) RO T1/G1 SRO T1/G1
10CFR 41.7/45.7
RO Q#13 SRO Q#21
Level 1

QUESTION: 014

Which ONE of the following describes the parameter used by ECA-1.2, "LOCA Outside Containment," to determine if the break outside Containment has been isolated?

a. PRZ level

b. CET temperature

c. RCS pressure

d. RCS subcooling

ANSWER: 014

c.

REFERENCE:

ECA-1.2, Steps 2.c, 2.f,,3.a

690233303
Direct from Exam Bank: 69023330302
KA 000069AK3.01 (3.8/4.2) RO T1/G1 SRO T1/G1
pg. 4.2-57
10CFR 41.5,41.10/45.6/45.13
RO Q#14 SRO Q#22
Level 1

QUESTION: 015

Operators are responding an inadequate core cooling condition using FR-C.1, "Response to Inadequate Core Cooling."

Which ONE of the following is correct regarding RCP operation?

If an RCP is:

a. initially running, it should be left running until it trips by itself.

b. initially running, it should be left running until #1 seal delta P trip criteria is met.

c. not running, it should be left off until 6% [32%] level is attained in its associated S/G.

d. not running, it should be left off until 6% [32%] level is attained in any S/G.

ANSWER: 015

c.

REFERENCE:

FR-C.1 Step 19

690234703
New
KA 000074EK2.01 (3.6/3.8) RO T1/G1 SRO T1/G1
Pg.4.1-16
10CFR 41.7/45.7
RO Q#15 SRO Q#23
Level 2

QUESTION: 016

Operators are performing 3-ONOP-041.4, "Excessive Reactor Coolant System Activity," and have just reduced Tavg to less than 500°F as directed by the procedure.

Which ONE of the following describes the basis for reducing Tavg to less than 500°F?

a. To block SI in preparation for a controlled cooldown.

b. To allow closing the MSIVs in preparation for a controlled cooldown.

c. To prevent the release of activity in the event of a main steam line break.

d. To prevent the release of activity in the event of a steam generator tube rupture.

ANSWER: 016

d.

REFERENCES:

3-ONOP-041.4, Step 5.4 & TS 3.4.8 Basis

690222804
New
KA 000076AK3.06 (3.2/3.8) RO T1/G1 SRO T1/G1
Pg. 4.2-58
10CFR 41.5/41.10/45.6/45.13
RO Q#16 SRO Q#24
Level 1

QUESTION: 017

The following conditions exist on Unit 3:

- The Rod Control System is in Manual.
- Control Bank C is at 225 steps.
- Control Bank D is at 97 steps.

The following event occurs:

- A Rod Control System malfunction causes continuous rod withdrawal for 10 steps. Rod motion then stops.

Which ONE of the following identifies what the RPIs for control banks C and D should indicate?

a. Bank C – 225 Bank D – 97

b. Bank C – 230 Bank D – 97

c. Bank C – 230 Bank D – 107

d. Bank C – 235 Bank D - 107

ANSWER: 017

c.

REFERENCE:

SD-005, page 28. SD-006, page 22. COLR Section 2.1

690210602
New
KA 000001AK2.08 (3.1/3.0) RO T1/G2 SRO T1/G1
Pg. 4.2-3
10CFR41.7/45.7
RO Q#17 SRO Q#1
Level 3

QUESTION: 018

The following conditions exist on Unit 3:

- The unit is at 100% power
- A power supply failure in rod control Power Cabinet 1AC results in one dropped rod in Control Bank A Group 1 and one dropped rod in Control Bank C Group 1.

Which ONE of the following actions is correct?

a. Manually runback the turbine.

b. Verify automatic turbine runback.

c. Enter ONOP-28.3 "Dropped RCC" and retrieve both dropped rods.

d. Trip the Reactor and go to E-0 "Reactor Trip Or Safety Injection."

ANSWER: 018

d.

REFERENCES:

ONOP-28.3 Step 1

690220704
New
KA 000003AK.05 (2.5/2.8) RO T1/G2 SRO T1/G1
Pg. 4.2-4
10CFR 41.7/45.7
RO Q#18 SRO Q#2
Level 1

QUESTION: 019

The following conditions exist on Unit 4:

- Low PRZ pressure SI has occurred.
- All 4 HHSI pumps are running.
- PRZ level is increasing.
- RCS pressure is 1450 psig and decreasing.
- HHSI cold leg flow indication (FI-943) is zero.
- PRT pressure and level are increasing.

Which ONE of the following describes the events that could have caused these conditions?

a. A PRZ PORV is open and the HHSI isolation valves, MOV-843A and MOV-843B, failed to open.

b. A PRZ PORV is open and the HHSI line downstream of the HHSI isolation valves, MOV-843A and MOV-843B, has sheared.

c. A PRZ Spray valve is open and the HHSI isolation valves, MOV-843A and MOV-843B, failed to open.

d. A PRZ Spray valve is open and the HHSI line downstream of the HHSI pumps has sheared.

ANSWER: 019

a.

REFERENCES:

Student Handout 6910918 pages 10 and 11, P&IDs 5614-M-3062 Shts. 1&2

690232104
New
KA 000008AA2.10 (3.6/3.6) RO T1/G2 SRO T1/G2
Pg. 4.2-9
10CFR 43.5/45.13
RO Q#19 SRO Q#26
Level 3

QUESTION: 020

Unit 3 operators are responding to a small break LOCA.

The following conditions exist:

- RCS pressure is 1500 psig.
- CET subcooling is 38°F.
- Containment temperature is 160°F.
- Containment pressure is 10 psig.

Which ONE of the following top border (border targets) should be lit on the SPDS/ERDADS screens?

a. TRIP RCPs

b. PA

c. MSL ISOL

d. ADV CNTNMT

ANSWER: 020

b.

REFERENCES:

SD-071 page 23

690211001
New
KA 000009EA1.10 (3.8/3.9) RO T1/G2 SRO (NA)
Pg. 4.1-5
10CFR 41.7/45.5/45.6
RO Only Q#20
Level 2

QUESTION: 021

A large break LOCA occurred while Unit 4 was operating at 100% power.

Which ONE of the following describes why the RCO verifies Feedwater Isolation closed the Main and Bypass FW Control valves?

The RCO is directed to verify Feedwater Isolation in response to:

a. Reactor trip.

b. SI actuation.

c. Phase A actuation.

d. Phase B actuation.

ANSWER: 021

b.

REFERENCE:

4 – EOP – EO, Step 5 Basis , Logic Diag. 5610-T-L1 Sh. 14

690232106
New
KA 000011EK3.02 (3.5/3.7) RO T1/G2 SRO T1/G1
Pg. 4.1-7
10CFR41.5/41.10/45.6/45.13
RO Q# 21 SRO Q# 4
Level 1

QUESTION: 022

Unit 3 operators are performing Step 16 of EOP-ES-1.2 "Post LOCA Cooldown and Depressurization."

The following conditions exist:

- One Unit 3 HHSI pump is running.
- One RHR pump is running.
- Two Charging pumps are running at maximum flow.
- Containment temperature is 178°F.
- CET subcooling is 68°F
- RCS Thot temperatures are 320°F.
- RCS pressure is 260 psig.
- No RCPs are available.
- PRZ level is stable at 30%.

Which ONE of the following describes the running HHSI/RHR pump configuration when the operators isolate the accumulators?

a. Zero HHSI pumps, One RHR pump.

b. Zero HHSI pumps, Two RHR pumps.

c. One HHSI pump, One RHR pump.

d. One HHSI pump, Two RHR pumps.

ANSWER: 022

a.

REFERENCES:
ES-1.2 Steps 16 through 29 **To be provided to candidate.**
690232904 Modified from ORQ Exam Bank Question 69023290408
KA W/E03EK1.3 (3.7/4.1)Pg. 4.5-8 RO T1/G2 SRO T1/G2
10CFR 41.7/45.5/45.6
Level 3 RO Q#22 SRO Q#28

QUESTION: 023

Which ONE of the following describes a condition that would prevent successful transition to Cold Leg recirculation?

a. Only one of the RHR Pump Suction Stop valves, MOV-750 or MOV-751 can be energized.

b. Only one of the RHR Suction from RWST valves, MOV-862A or MOV-862B can be energized.

c. Containment Recirculation Sump Isolation valves MOV-860A and MOV-860B will not open.

d. Containment Recirculation Sump Isolation valves MOV-860A and MOV-861A will not open.

ANSWER: 023

c.

REFERENCES:

SD-021 Fig. 5B, 5613-M-3050, Sht. 1.

690212105
New
KA W/E11EK1.3 (3.6/4.0) RO T1/G2 SRO T1/G2
Pg. 4.5-28
10CFR 41.8/41.10/45.3
RO Q#23 SRO Q#29
Level 2

QUESTION: 024

The following conditions exist on Unit 3:

- The operators are performing ES-1.1, "SI Termination."
- While preparing to re-establish RCP seal return flow they verify that RCS pressure is 100 psi greater than VCT pressure.

Which ONE of the following describes the basis for the 100 psi requirement?

Less than 100 psi differential pressure could result in:

a. damage to the VCT.

b. damage to the PRT.

c. cocked RCP seals.

d. debris in the RCP seals.

ANSWER: 024

d.

REFERENCE:

Basis Document Step 2

690232804
Modified from the Exam Bank: 69023280401, 1998 NRC Exam Question #24
KA W/E02EK3.3 (3.9/3.9) RO T1/G2 SRO (NA)
Pg. 4.5-5
10CFR 41.5/41.10,45.6,45.13
RO Only Q#24
Level 1

QUESTION: 025

Unit 4 is in Mode 5 and all loops are filled.

The following equipment is out of service:

- RHR Loop A
- 4C ICW pump
- 4C CCW pump

Which ONE of the following will result in a loss of RHR required capability per 3-OP-050, "Residual Heat Removal System?"

A failure of the:

a. 4A EDG.

b. 4B CCW H/X.

c. 4A CCW pump.

d. 4B ICW pump.

ANSWER: 025

d.

REFERENCES:

4-OP-050 Precautions/Limitation 4.5

690221003
New
KA 000025AK2.03 (2.7/2.7) RO T1/G2 SRO T1/G2
Pg. 4.2-16
10CFR 41.7/45.7
RO Q#25 SRO Q#30
Level 2

QUESTION: 026

With Unit 4 stable at 2% power, the RCO observes that the Reactor Trip Breakers have no red or green indicating lights lit on the console or on VPB.

Which ONE of the following correctly describes an event that could have caused this condition?

a. SR NIS N-31 Instrument Power fuse has blown.

b. SR NIS N-32 Control Power fuse has blown.

c. IR NIS N-35 Instrument Power fuse has blown.

d. PR NIS N-41 Control Power fuse has blown.

ANSWER: 026

c.

REFERENCES:

SD-004 Page 135

690216305
New
KA 000029EA2.07 (4.2/4.3) RO T1/G2 SRO T1/G1
Pg. 4.1-10
10CFR 43.5/45.13
RO Q#26 SRO Q#11
Level 3

QUESTION: 027

The following conditions exist on Unit 3:

- Reactor power is 22% with operators performing a plant startup.
- NIS Intermediate range channel N-36 fails high.

Which ONE of the following is the correct operator response?

a. Enter E-0, "Reactor Trip or Safety Injection."

b. Place the N-36 LEVEL TRIP switch in BYPASS and continue the power ascension.

c. Place the N-36 LEVEL TRIP switch in BYPASS and reduce power below permissive P-6.

d. Place the N-36 LEVEL TRIP switch in BYPASS and reduce power below permissive P-10.

ANSWER: 027

b.

REFERENCES:

ONOP-059.7 Step 5.1 and GOP-301 Caution Step 5.64.

690220604
New
KA 000033AA2.09 (3.4/3.7) RO T1/G2 SRO T1/G2
Pg. 4.2-27
10CFR 43.5/45.13
RO Q#27 SRO Q#32
Level 2

QUESTION: 028

Unit 3 operators have responded to a Steam Generator Tube Leak on the 3A S/G using 3-ONOP-067, "Radioactive Effluent Release."

- PRMS R-15, Condenser Air Ejector, reading was increasing while in Mode 1 and has alarmed.
- PRMS R-19, Blowdown Radiation, reading was increasing while in Mode 1 but has not alarmed.
- The unit is currently in Mode 3 and Attachment 3, "Steam Generator Isolation Checklist / Steam Generator A Isolation," is complete.

Which ONE of the following describes the expected response of R-15 and R-19 after performing Attachment 3?

	R-15	R-19
a.	Decreasing	Decreasing
b.	Decreasing	Stable
c.	Stable	Decreasing
d.	Stable	Stable

ANSWER: 028

a.

REFERENCES:

56130-M-3032, Sheet 1, ONOP-067, Attachment 3

690224203
New
KA 000037AA2.02 (3.4/3.9) RO T1/G2 SRO (NA)
pg. 4.2-30
10CFR 43.5/45.13
RO Only Q#28
Level 2

QUESTION: 029

Unit 4 experienced a SGTR while at 100% power.

Which ONE of the following Control Room indications does E-3, "Steam Generator Tube Rupture," use to identify which S/G is ruptured?

a. PRMS R-15, Condenser Air Ejector.

b. PRMS R-19, Steam Generator Blowdown.

c. Unexpected increase in any S/G NR level.

d. Unexpected S/G steam flow mismatch.

ANSWER: 029

c.

REFERENCE:

EOP-E-3, Step 2.c

690291901
New
KA 000038EA2.07 (4.4/4.8) RO T1/G2 SRO (NA)
Pg. 4.1-12
10CFR 43.5/45.13
RO Only Q#29
Level 1

QUESTION: 030

Which ONE of the following describes the basis for verifying AFW flow is greater than 390 gpm following a loss of main feedwater event?

390 gpm is the minimum AFW flow required in the event:

a. an ATWS occurs.

b. only one AFW pump is running.

c. any S/G level is below 6% NR.

d. all S/G levels are below 6% NR.

ANSWER: 030

d.

REFERENCE:

EOP-ES-0.1, Step 12 RNO Basis

690232304
New
KA 000054K3.04 (4.4/4.6) RO T1/G2 SRO T1/G2
10CFR 41.5/41.10/45.6/45.13)
RO Q#30 SRO Q#35
Level 1

QUESTION: 031

Unit 3 operators have entered FR-H.1 "Response to Loss of Secondary Heat Sink."

The following conditions exist:

- No Main Feedwater Pumps are available.
- No Auxiliary Feedwater Pumps are available.
- The RCPs are off.
- Annunciator E 2/6 "HI-HI SG LVL TURBINE TRIP/FEEDWATER ISOLATION is in alarm.
- The operators are preparing to re-establish feedwater using a Standby Steam Generator Feedwater Pump.

Which ONE of the following describes the minimum Control Room action(s) required to re-establish feed flow to the S/Gs?

Reset:

a. SI

b. Phase A

c. Feedwater Isolation

d. SI and Feedwater Isolation

ANSWER: 031

c.

REFERENCES:

3-ARP-097.CR E 2/6 and Logic Diag. 5610-TL1 Sht. 14

690233703
New
KA W/E05EA1.1 (4.1/4.0) RO T1/G2 SRO T1/G2
Pg. 4.5-13
10CFR 41.7/45.5/45.6
RO Q#31 SRO Q#36
Level 2

QUESTION: 032

EOP-E-3, "Steam Generator Tube Rupture," directs the operator to verify the S/G Blowdown Sample Stop valves are closed within 30 minutes.

Which ONE of the following states the basis for this action?

a. Prevents a potential unmonitored release.

b. Prevents a potential loss of S/G inventory.

c. Ensures all Containment Phase 'A' isolation valves are closed.

d. Ensures S/G sample is only directed to the primary sample sink .

ANSWER: 032

a.

REFERENCES:

EOP-E-3, Step 8 Basis

690233905
New
KA 000059AK3.04 (3.8/4.3) RO T1/G2 SRO T1/G1
Pg. 4.2-44
10CFR 41.5/41.10/45.6/45.13
RO Q#32 SRO Q#17
Level 1

QUESTION: 033

Which ONE of the following describes the Immediate Operator Action(s) of 0-ONOP-066, "High Area Radiation Monitoring System Alarm," in the event Annunciator X 4/1, ARMS HI RADIATION, alarms?

Identify the alarming channel(s) at the ARMS panel and then:

a. announce the alarm over the plant page system.

b. notify Security to restrict entry to the affected areas.

c. press the ALARM ACK pushbutton on the ARMS control panel.

d. cross-check the alarming ARMS channel(s) with PRMS channel(s) in the affected area.

ANSWER: 033

a.

REFERENCE:

ARPs X 4/1, ONOP-066 IOAs

690224602
Modified from Exam Bank: 69022460203
KA 000061G.1 (2.5/3.3) or Generic 2.1.14 RO T1/G2 SRO T1/G1
Pg. 4.2-48 or 2-2
10CFR 43.5/45.12
RO Q#33 SRO Q#38
Level 1

QUESTION: 034

Unit 4 is at 100% power with all systems operating in automatic and all switches in their normal positions.

PRZ level transmitter LT-459 fails low.

Which ONE of the following describes the plant response?

a. Charging flow will decrease.
Letdown will isolate.

b. Charging flow will decrease.
Letdown will remain in service.

c. Charging flow will increase.
Letdown will isolate.

d. Charging flow will increase.
Letdown will remain in service.

ANSWER: 034

c.

REFERENCE:

5610-T-D-15, Sheet 1

690210906
Modified from Exam Bank: 69021090014
KA 000028A2.09 (2.9/3.2) RO T1/G3 SRO T1/G3
10 CFR 43.5/45.13
RO Q#34 SRO Q#41
Level 2

QUESTION: 035

The following conditions exist with Unit 3 at 100% power and all systems operable:

- 3D 4KV Bus is aligned to 3B 4KV Bus.
- 3A and 3C ICW Pumps are running.

The following events occur:

- A LOOP occurs on Unit 3.
- The 3A EDG fails to start.

Which ONE of the following describes the ICW pump configuration when sequencing is complete (assume no operator response)?

a. No ICW pumps will be running.

b. Only the 3B ICW pump will be running.

c. Only the 3C ICW pump will be running.

d. The 3B and 3C ICW pumps will be running.

ANSWER: 035

b.

REFERENCE:

5610-T-L1, Sheets 12B, 13A & 29A

690215700
Modified from Exam Bank: 69021570008
KA 000056A2.47 (3.8/3.9) RO T1/G3 SRO T1/G3
10CFR43.5/45.13
RO Q#35 SRO Q#42
Level 2

QUESTION: 036

Unit 4 operators have entered 0-ONOP-13, "Loss of Instrument Air" in response to Annunciator I 6/1, INST AIR SYSTEM HI TEMP/LO PRESS.

The following conditions exist:

- All available air compressors are running.
- Instrument Air pressure indicator, PI-4-1444, is 60 psig and stable.

Which ONE of the following identifies the equipment that will be affected?

Unit 4:

a. MSIVs will fail closed.

b. Feedwater Reg Valves will fail closed.

c. EDG Fuel Oil Transfer capability will be lost.

d. Train 1 AFW FCV automatic operation will be lost.

ANSWER: 036

b.

REFERENCES:

ONOP-013 Foldout Page, Step 2 and ARP-097.CR

710214503
Modified from the Exam Bank: 71021450301
KA 000065AA2.01 (2.9/3.2) RO T1/G3 SRO T1/G2
Pg. 4.2-51
10CFR 43.5/45.13
RO Q#36 SRO Q#40
Level 1

QUESTION: 037

The following conditions exist on Unit 3:

- Reactor Trip Breaker A has failed in the closed position.
- Both MG sets input and output breakers have been opened.

Which ONE of the following describes the effect on the Control Rod System Logic and Power cabinets' control power?

Control power has:

a. automatically swapped to the 3B MCC.

b. automatically swapped to its backup CVT.

c. been lost and can be manually swapped to the 3B MCC.

d. been lost and cannot be restored until the Reactor Trip Breaker is opened.

ANSWER: 037

a.

REFERENCE:

Drawing 5610-T-D-12A

690210505
Modified from Exam Bank Question 69021050003
KA 001K6.03 (3.7/4.2) RO T2/G1 SRO (NA)
Pg. 3.1-8
10CFR 41.7/45.7
RO Only Q#37
Level 2

QUESTION: 038

Unit 3 is stable at 80% power with all systems in automatic when the following events occur:

- Control Rods begin to continuously insert.
- The RCO observes the following indications:

-	Tavg:	567°F	decreasing
-	Tref	570°F	stable
-	Generator Load:	650 MWe	stable

Which ONE of the following describes the correct immediate operator action?

a. Maintain rods in AUTO and if rods continue to insert, adjust turbine load to match Tavg to Tref.

b. Maintain rods in AUTO and if rods continue to insert, adjust boron concentration to match Tavg to Tref.

c. Place rods in MANUAL and if rods continue to insert, adjust turbine load to match Tavg to Tref.

d. Place rods in MANUAL and if rods continue to insert, adjust boron concentration to match Tavg to Tref.

ANSWER: 038

c.

REFERENCE:

3-ONOP-028, Step 4.3

690220701
Modified from Exam Bank: 69022070105
KA: 001G.14 (4.0/4.0) RO T2/G1 SRO T2/G1
Pg.
10CFR 41.10/43.2/45.6
RO Q#38 SRO Q#44
Level 2

QUESTION: 039

Which ONE of the following identifies the containment isolation signal that requires stopping all RCPs and the reason the RCPs are stopped?

a. Phase "A" MOV-626, RCP Thermal Barrier CCW Outlet, is closed resulting in a loss of RCP seal package cooling.

b. Phase "A" MOV-1417, CCW to Normal Containment Coolers, and MOV 1418, CCW from Normal Containment Coolers, are closed resulting in a loss of RCP stator winding cooling.

c. Phase "B" MOV-6386, Excess L/D and RCP Seal Return, is closed resulting in a loss of RCP seal package cooling.

d. Phase "B" MOVs 716A and 716B, RCP CCW Inlet valves, and MOV-730, RCP Bearing CCW Outlet valve are closed resulting in a loss of RCP motor bearing cooling.

ANSWER: 039

d.

REFERENCE:

5613-M-3030, Sheet 5
3-EOP-E-0, Step 14 Basis

690210805
Direct from the Exam Bank: 69021080502
KA 003K4.04 (2.8/3.1) RO T2/G1 SRO (NA)
10CFR 41.7
RO Only Q#39
Level 1

QUESTION: 040

The following plant conditions exist:

- Containment Phase "A" isolation has occurred.
- The isolation signal has not yet been reset.

Which ONE of the following describes the effect this condition will have on RCP Number 1 seal leak off flow?

Number 1 seal leak off flow will:

a. decrease because VCT level has increased.

b. decrease because the backpressure has increased.

c. go to zero because RCP Seal Return to VCT valve, MOV-381, is closed.

d. go to zero because #1 Seal Leakoff Isolation valves, 303A, 303B, and 303C are closed.

ANSWER: 040

b.

REFERENCE:

5613-M-3047, Sheet 3

690210806
Direct from Exam Bank: 69021080004
KA 003K6.04 (2.8/3.1) RO T2/G1 SRO T2/G1
10CFR41.7/45.5
RO Q#40 SRO Q#45
Level 2

QUESTION: 041

Unit 3 is in a water solid condition when an RCS pressure transient closes Loop 3C RHR Pump Suction Stop valves, MOV-750 and MOV-751.

MOV-750 and MOV-751 cannot be reopened.

Which ONE of the following describes the effect this event will have on the CVCS system after the operators have performed the Immediate Operator Actions of the applicable ONOP?

CVCS letdown line pressure upstream of PCV-145, Low Pressure Letdown Control valve, will:

a. decrease. PCV-145 will open.

b. decrease. PCV-145 will close.

c. increase. PCV-145 will open.

d. increase. PCV-145 will close.

ANSWER: 041

b.

REFERENCE:

5613-M-3047, Sheet 1, 5613-M-3050, Sheet 1, 3-ONOP-050, Step 3 RNO

690211305
New
KA 004A2.01 (3.8/4.2) RO T2/G1 SRO (NA)
Pg. 3.1-18
10CFR 41.5/43.5/45.3/45.5
RO Only Q#41
Level 3

QUESTION: 042

A reactor startup is being performed on Unit 3. The following conditions apply:

- The ECC estimated critical rod height is D bank at 110 steps.
- The initial highest source range count rate was N-31 at 250 cps.
- The current N-31 count rate is 1000 cps.
- Based on the current N-31 count rate, the 1/M plot predicts criticality at D bank, 180 steps.
- Integrated rod worth for D-110 is 490 pcm.
- Integrated rod worth for D-180 is 160 pcm.

Which ONE of the following is the correct operator response?

a. Do not continue the reactor startup. Obtain permission from the NPS to continue.

b. Do not continue the reactor startup. Obtain permission form the Reactor Supervisor to continue.

c. Continue the reactor startup. If the prediction is still D-180 after the next doubling, obtain permission from the NPS to continue.

d. Continue the reactor startup. If the prediction is still D-180 after the next doubling, obtain permission from the Reactor Supervisor to continue.

ANSWER: 042

c.

REFERENCE:

3-GOP-301, Step 4.27
PCB Section II, Figure 5

690240702
Direct from the ORQ Exam Bank: 69024070209-ORQ
KA 004A4.03 (2.7/3.2) RO T2/G1 SRO T2/G1
10CFR 41.7/45.5 to 45.8
RO Q#42 SRO Q#46
Level 3

QUESTION: 043

Which ONE of the following describes the purpose of the interlocks between CVCS Letdown Isolation valve, LCV-460, and the Letdown Orifice Isolation valves, 200A, 200B, & 200C?

The interlocks prevent damage to:

a. LCV-460 upon depressurization of the letdown line.

b. CV-200A, 200B, 200C upon depressurization of the letdown line.

c. the Regenerative Heat Exchanger upon subsequent repressurization of the letdown line.

d. RV-203, Letdown Relief Valve, upon subsequent repressurization of the letdown line.

ANSWER: 043

c.

REFERENCE:

SD-113, Page 21

690211302
Modified from Exam Bank: 69021130614
KA 004G.4 (2.8/2.9) RO T2/G1 SRO T2/G1
10CFR 41.7
RO Q#43 SRO Q#47
Level 1

QUESTION: 044

The following conditions exist on Unit 3:

- Operators are responding to a LOCA using the EOP Network.
- 3A Sequencer has failed to respond to the SI signal.
- SI has been reset.
- Following SI reset, Containment pressure exceeds 20 psig .

Which ONE of the following describes the response of the Containment Spray Pumps (CSPs) and their discharge valves, MOV-880A and MOV-880B?

a. Neither CSP will automatically start.
Only MOV-880B will automatically open.

b. Neither CSP will automatically start.
Both MOVs will automatically open.

c. Only 3B CSP will automatically start.
Only MOV-880B will automatically open.

d. Only 3B CSP will automatically start.
Both MOVs will automatically open.

ANSWER: 044

b.

REFERENCE:

5610-T-L1, Sheet 11. 5613-T-L1, Sheet 12B

690215706
Modified from the Exam Bank: 69021570928-ORQ
KA 013K3.03 (4.3/4.7) RO T2/G1 SRO (NA)
pg. 3.2-25
10CFR 41.7/45.6
RO Only Q#44
Level 2

QUESTION: 045

The following conditions exist on Unit 3:

- Reactor power is stable at 10^{-8} amps.
- "PRZ Pressure Control Channel" PT-444 fails high.

Assuming no operator action, which ONE of the following describes the response of the plant to this condition?

a. The reactor will trip when PRZ pressure increases to 2385 psig.

b. PRZ pressure will stabilize at approximately 2000 psig .

c. The reactor will trip when PRZ pressure decreases to 1835 psig.

d. SI actuation will occur when PRZ pressure decreases to 1730 psig.

ANSWER: 045

d.

REFERENCES:

Logic Diagrams 5610-T-L1 Sheet 11 and 5610-T-D-16B Sheet 1

690216306
Modified from Exam Bank: 69021090008
KA 013K6.01 (2.7/3.1) RO T2/G1 SRO T2/G1
Pg. 3.2-36
10CFR 41.7/43.5 to 45.8
RO Q#45 SRO Q#48
Level 2

QUESTION: 046

Unit 3 is stable at 98% power. Reactor Engineering has performed QPTR calculations using a full core flux map and core exit thermocouples. Both calculations reveal the QPTR value is 1.03.

Which ONE of the following describes the required operator response?

Reduce NIS power to less than:

a. 97% within 2 hours.

b. 95% within 2 hours.

c. 91% within 2 hours.

d. 89% within 2 hours.

ANSWER: 046

c.

REFERENCE:

3-OSP-059.10, Step 7.3
3-ONOP-059.9, Step 5.4
Tech. Specs. 3.2.4 To be provided to candidate.

710210403
Modification of ORQ# 453 (69025220301-ORQ)
KA 015K5.09 (2.5/2.9) RO T2/G1 SRO T2/G1
10CFR 41.5/45.7
RO Q#46 SRO Q#50
Level 3

QUESTION: 047

Immediately after operators have stabilized Unit 3 following a power reduction, Annunciators B 8/1, ROD BANK A/B/C/D LO LIMIT and B 8/2, ROD BANK A/B/C/D EXTRA LO LIMIT, alarm.

Which ONE of the following describes the effect on axial flux distribution and the correct immediate operator response to restore rods above the insertion limit?

	CORE FLUX CONCENTRATION	RESPONSE
a.	Lower Half of Core	Borate using normal boration
b.	Lower Half of Core	Borate using emergency boration
c.	Upper Half of Core	Borate using normal boration
d.	Upper Half of Core	Borate using emergency boration

ANSWER: 047

a.

REFERENCE:

3-ARP-097.CR, B8/1 & B 8/2
LP3500109, Control Rod Reactivity Effects, SHO Page 6-17

350210907
New
KA 015A204 (3.3/3.8) RO T2/G1 SRO T2/G1
10CFR 41.5/43.5/45.3/45.5
RO Q#47 SRO Q#51
Level 2

QUESTION: 048

Unit 3 operators are responding to a spurious SI signal and are attempting to determine if SI termination criteria are met. The ANPS directs the RCO to check subcooling on QSPDS.

QSPDS displays the following:

SATURATION MARGIN

	DEG F	PSI
UPPER HEAD	48	633
RCS (MIN)	36	438
CET	28	340

Assuming other SI Termination Criteria are satisfied, which ONE of the following is correct?

The RCO should declare SI Termination Criteria are:

a. not met after observing the RCS (MIN) value.

b. not met after observing the CET value.

c. met after observing the RCS (MIN) value.

d. met after observing the CET value.

ANSWER: 048

b.

REFERENCE: 3-EOP-E-0, Step 31a.

690210302
New
KA 017K4.01 (3.4/3.7) RO T2/G1 SRO T2/G1
pg. 3.7-11
10CFR 41.7
RO Q#48 SRO Q#52
Level 2

QUESTION: 049

A large break LOCA occurs on Unit 3 while the 3B Sequencer is inoperable.

Which ONE of the following describes an effect on the Unit 3 containment?

Containment pressure will be higher because only the:

a. 3A ECC will autostart.

b. 3C ECC will autostart.

c. 3A and 3C ECCs will autostart.

d. 3B and 3C ECCs will autostart.

ANSWER: 049

b.

REFERENCES:

Logic Diagram 5613-T-L1 Sheet 12B

690212905
New
KA 022K2.01 (3.0/3.1) RO T2/G1 SRO T2/G2
Pg. 3.5-5
10CFR 41.7
RO Q#49 SRO Q#53
Level 2

QUESTION: 050

The following conditions exist on Unit 3 while at 100% power:

- The 3B ECC is out of service.
- A large break LOCA occurs.
- After verifying two ECCs are operating, one ECC trips due to overcurrent and cannot be restarted.

Which ONE of the following identifies the maximum time allowed to restore a second ECC to operation to ensure equipment environmental qualifications are maintained?

a. 8 hours

b. 10 hours

c. 12 hours

d. 24 hours

ANSWER: 050

d.

REFERENCE:

3-EOP-E-1, Step 33 and Step 33 Basis

690232703
Modified from previous NRC Exam (08/98 RO Q# 63)
KA 022A2.01 (2.5/2.7) RO T2/G1 SRO (NA)
pg. 3.5-6
10CFR 41.5/43.5/45.3/45.13
RO Only Q#50
Level 1

QUESTION: 051

Unit 3 is operating at 70% power with all systems operable except the 3C Condensate pump which has its breaker racked out.

The 3A Condensate pump breaker trips open.

Which ONE of the following describes the correct operator response?

Perform the actions of:

a. ONOP-089, "Turbine Runback."

b. ONOP-100, "Fast Load Reduction."

c. GOP-103, "Power Operation to Hot Standby."

d. E-0, "Reactor Trip or Safety Injection."

ANSWER: 051

a.

REFERENCE:

5610-T-L1, Sheet 25a
ONOP-089, Symptoms & Entry Conditions

690224802
New
KA 056A2.04 (2.6/2.8) RO T2/G1 SRO T2/G1
10CFR 41.5/43.5/45.3/45.13
RO Q#51 SRO Q#55
Level 2

QUESTION: 052

Unit 3 is operating at 100% power when the controlling S/G pressure transmitter fails low on the 3A S/G.

Which ONE of the following describes the effect this will have on the controlling indicated steam flow and the initial 3A FW Control Valve, FCV-478, response?

Indicated steam flow will:

a. decrease. The FCV will open.

b. decrease. The FCV will close.

c. increase. The FCV will open.

d. increase. The FCV will close.

ANSWER: 052

b.

REFERENCE:

5610-T-D-17, Sheet 1. 5610-T-D-18B, Sheet 1

690212206
New
KA 059K1.04 (3.4/3.4) RO T2/G1 SRO T2/G1
pg. 3.4-41
10CFR 41.2 to 41.9/45.7 to 45.8
RO Q#52 SRO Q#56
Level 2

QUESTION: 053

Unit 3 is operating at 100% power when valve CV-2011, "LP HEATERS BYPASS," fails open.

Which ONE of the following describes the effect on reactor power and the correct operator response?

Reactor power will:

a. increase. Borate the RCS.

b. increase. Reduce turbine load.

c. decrease. Dilute the RCS.

d. decrease. Raise turbine load.

ANSWER: 053

b.

REFERENCE:

0-ADM-200, Step 5.6.8.18

690202506
New
KA 059K3.04 (3.6/3.8) RO T2/G1 SRO (NA)
pg. 3.4-41
10CFR 41.7/45
RO Only Q#53
Level 1

QUESTION: 054

With Unit 3 initially at 100% power and all systems in normal alignment, the 3C S/G experiences a main steam line break inside Containment.

Which ONE of the following describes the effect this accident will have on the AFW system?

a. Train 1 AFW will be lost until the operators open AFSS-3-007.

b. Train 1 AFW will be lost until the operators close AFSS-3-006.

c. Train 2 AFW will be lost until the operators open AFSS-3-007.

d. Train 2 AFW will be lost until the operators close AFSS-3-006.

ANSWER: 054

a.

REFERENCE:

5613-M-3075, Sheet 1

690212305
New
KA 061K1.01 (4.1/4.1) RO T2/G1 SRO T2/G1
pg. 3.4-45
10CFR 41.2 to 41.9/45.7 to 45.8
RO Q#54 SRO Q#57
Level 2

QUESTION: 055

Which ONE of the following would result in dual train AFW flow for both Units?

Bus Stripping on:

a. 3A 4KV Bus and 4A 4KV Bus.

b. 3A 4KV Bus and 4B 4KV Bus

c. 3B 4KV Bus and 4A 4KV Bus

d. 3B 4KV Bus and 4B 4KV Bus

ANSWER: 055

a.

REFERENCES:

Logic Drawing 5610-T-L1 Sht. 15

690212306
New
KA 061K4.09 (3.7/3.3) RO T2/G1 SRO (NA)
Pg. 3.4-46
10CFR 41.7
RO Only Q#55
Level 1

QUESTION 056

Unit 3 operators have entered ES-1.1, "SI Termination," and are preparing to start a Main Feedwater pump and secure AFW.

The following conditions exist:

- "A" AFW pump is running.
- "B" and "C" AFW pumps are stopped and aligned for auto start.
- The NWE locally starts the 3A Main Feed pump.
- The BOP fails to "red flag" the 3A Main Feed pump control switch semaphore.

Which ONE of the following describes the effect of the BOP's failure to red flag the 3A Main Feed pump control switch semaphore?

a. "B" and "C" AFW pumps will automatically start.

b. AFW pump automatic start capability will be degraded.

c. The 3A Main Feed pump will not trip from an SI signal.

d. The 3A Main Feed pump will automatically trip in 50 seconds.

ANSWER: 056

b.

REFERENCE:

OP-74 Step 5.1.2.13

690212306
New
KA 061A2.01 (2.5/2.6) RO T2/G1 SRO T2/G1
Pg. 3.4-47
10CFR 41.5/43.5/45.3/45.13
RO Q#56 SRO Q#58
Level 2

QUESTION: 057

The following conditions exist on Unit 3:

- The unit was at 100% power.
- A spurious SI occurs.
- The operators are responding per the EOP network and have just transitioned to EOP-ES-1.1, "SI Termination."
- Annunciator A 7/1, PRT HI/LO LEVEL HI PRESS/TEMP, alarms.

Assuming all systems function as designed, which ONE of the following describes the probable cause of this alarm?

a. A PRZ PORV has lifted.

b. CVCS Low Pressure relief valve, RV-209, has lifted.

c. RHR Header to Loops relief valve, RV-706, has lifted.

d. RCP #1 Seal Leakoff relief valve, RV-382, has lifted.

ANSWER: 057

d.

REFERENCE:

5613-M-3041, Sheet 2. 5613-M-3047, Sheet 3. ARP A 7/1

690210905
New
KA 068K1.07 (2.7/2.9) RO T2/G1 SRO T2/G1
pg. 3.9-2
10CFR 41.2 to 41.9/45.7 to 45.8
RO Q#57 SRO Q#60
Level 2

QUESTION: 058

Operators are investigating an abnormal increase in countrate on PRMS radiation monitor R-14, PLANT VENT, when they discover pressure in Gas Decay Tank (GDT) #4 is decreasing.

No planned GDT releases are in progress and the Gas Decay Tank Discharge Valve, RCV-014, is closed.

After verifying all valve alignments are correct, which ONE of the following describes the correct operator response?

Direct the SNPO to:

a. transfer the contents of GDT #4 to another GDT.

b. verify both Auxiliary Building Exhaust fans are running.

c. stop all running Waste Gas compressors.

d. start an additional Waste Gas compressor.

ANSWER: 058

a.

REFERENCE:

3-ONOP-067, Step 52f. RNO

690224204
Modified from the Exam Bank: 69022420403
KA 071K1.06 (3.1/3.1) RO T2/G1 SRO T2/G1
pg. 3.9-5
10CFR 41.2 to 41.9/45.7 to 45.8
RO Q#58 SRO Q#61
Level 1

QUESTION: 059

The Control Room Normal Air Intake radiation monitor, RAI-6642, alarms.

Which ONE of the following describes the damper response of the Control Building Ventilation System?

a. Ventilation Inlet dampers, D-1A and D-1B - CLOSE.
East and West Inlet dampers, D-2 and D-3 - OPEN.
Control Room Recirc. dampers, D-11A and D-11B - OPEN.

b. Ventilation Inlet dampers, D-1A and D-1B - OPEN.
East and West Inlet dampers, D-2 and D-3 - CLOSE.
Control Room Recirc. dampers, D-11A and D-11B - OPEN.

c. Ventilation Inlet dampers, D-1A and D-1B - CLOSE.
East and West Inlet dampers, D-2 and D-3 - OPEN.
Control Room Recirc. dampers, D-11A and D-11B - CLOSE.

d. Ventilation Inlet dampers, D-1A and D-1B - OPEN.
East and West Inlet dampers, D-2 and D-3 - CLOSE.
Control Room Recirc. dampers, D-11A and D-11B - CLOSE.

ANSWER: 059

a.

REFERENCE:

3-ONOP-067, Attachment 1. 5610-T-L1, Sheet 11

690215506
Modified from the Exam Bank: 69021680617
KA 072A3.01 (2.9/3.1) RO T2/G1 SRO T2/G1
pg. 3.7-14
10CFR 41.7/45.5)
RO Q#59 SRO Q#62
Level 1

QUESTION: 060

Unit 3 is at 50% power with the 3C Charging pump out of service.

The RCO notes the following Control Room indications:

- Annunciator G 1/2, "CHARGING PUMP HI SPEED" alarms.
- The only running Charging pump (3A) is in Auto with 100% output demanded.
- PRZ level is 33% and decreasing.

Which ONE of the following describes the required procedural response?

a. Isolate letdown. If PRZ level continues to decrease, then start the 3B Charging pump and maximize charging flow.

b. Isolate letdown. If PRZ level continues to decrease, then trip the reactor and turbine and transition to E-0, "Reactor Trip or Safety Injection."

c. Start the 3B Charging pump and maximize charging flow. If PRZ level continues to decrease, then isolate letdown.

d. Start the 3B Charging pump and maximize charging flow. If PRZ level continues to decrease, then trip the reactor and turbine and transition to E-0, "Reactor Trip or Safety Injection."

ANSWER: 060

c.

REFERENCE:

3-ONOP-041.3, Step 1

690221201
New
KA 002A2.01 (4.3/4.4) RO T2/G2 SRO T2/G2
10CFR 41.4/43.5/45.3/45.5
RO Q#60 SRO Q#67
Level 1

QUESTION: 061

Operators are responding to a large break LOCA. They are currently aligning the ECCS system for Hot Leg recirculation. Step 10 of ES-1.4, "Transfer to Hot Leg Recirculation," directs the operators to start the second RHR pump.

Which ONE of the following describes why the operators are directed to start the second RHR pump?

Starting the second RHR pump allows the operators to:

a. start a second HHSI pump to increase hot leg injection flow.

b. direct flow simultaneously to the cold legs and to the suction of the HHSI pump.

c. align alternate hot leg recirculation using RHR Recirculation Isolation valve, 741A.

d. align alternate hot leg recirculation using Alternate Low Head Injection valve, MOV-872.

ANSWER: 061

b.

REFERENCE:

EOP-ES-1.4, Step 10 Basis

690233104
New
KA 006K5.08 (2.9/3.1) RO T2/G2 SRO T2/G2
10CFR 41.5/41.7
RO Q#61 SRO Q#68
Level 1

QUESTION: 062

Unit 3 is in Mode 5 when RCS loop pressure transmitter, PT-405, fails high.

Which ONE of the following identifies the effect of this failure on:

1) PRZ PORV – 455C and PORV – 456

2) Loop 3C RHR Pump Suction Stop Valves, MOV-750 and MOV-751?

	PORV-455C	PORV-456	MOV-750	MOV-751
a.	OPENS	NONE	NONE	CLOSES
b.	OPENS	NONE	CLOSES	NONE
c.	NONE	OPENS	NONE	CLOSES
d.	NONE	OPENS	CLOSES	NONE

ANSWER: 062

a.

REFERENCE:

5610-T-D-16A, Sheet 1
5610-T-L1, Sheet 27

690210706
Modified from the Exam Bank: 69021070638 & 69022100419
KA 010K6.01 (2.7/3.1) RO T2/G2 SRO T2/G2
pg. 3.3-7
10CFR 41.7/45.7
RO Q#62 SRO Q#69
Level 2

QUESTION: 063

During operation at reduced power the following conditions exist:

- Tavg is 560°F.
- PRZ level is 45%.
- PRZ pressure is 2230 psig.

Which ONE of the following describes the PRZ heater status the RCO should verify?

a. Control Group – On.
Backup Groups – On.

b. Control Group – On.
Backup Groups – Off.

c. Control Group – Off.
Backup Groups – On.

d. Control Group – Off.
Backup Groups – Off.

ANSWER: 063

a.

REFERENCE:

5610-T-D-15, Sheet 1

690210906
New
KA 011A2.05 (3.3/3.7) RO T2/G2 SRO T2/G2
10CFR 41.5/43.5/45.3/45.5
RO Q#63 SRO Q#70
Level 3

QUESTION: 064

Which ONE of the following identifies the protection provided by the OTΔT reactor trip signal and the condition that would cause the OTΔT setpoint to decrease?

	Protection	Condition
a.	DNB	Tavg increasing
b.	DNB	PRZ Pressure increasing
c.	Excessive Power Density	Tavg increasing
d.	Excessive Power Density	PRZ Pressure increasing

ANSWER: 064

a.

REFERENCE:

Tech. Specs. Table 2.2-1 & Tech Specs. Bases page B.2-4

690216302
Modified from the Exam Bank: 69021630505
KA 012K5.01 (3.3/3.8) RO T2/G2 SRO T2/G2
pg. 3.7-3
10CFR 41.5/45.7
RO Q#64 SRO Q#71
Level 2

QUESTION: 065

Unit 3 is at 100% power and Annunciator B 9/3, SHUTDOWN ROD OFF TOP/DEVIATION is not operational.

Which ONE of the following describes the action that operators must take at least once every 4 hours?

Verify RPIs and Step Counters agree within:

a. 2 steps.

b. 12 steps.

c. 18 steps.

d. 24 steps.

ANSWER: 065

b.

REFERENCE:

3-ONOP-028.2, Step 5.9. Tech Spec 3.1.3.1 & 3.1.3.2

690252101
New
KA 014K3.02 (2.5/2.8) ROT2/G2 SRO T2/G1
pg. 3.1-21
10CFR 41.7/45.6
RO Q#65 SRO Q#49
Level 1

QUESTION: 066

Unit 3 is operating at 100% power with all systems in their normal configuration, when the Tavg Median Signal Selector, TM-408, fails low.

Which ONE of the following describes the plant response?

a. Control rods will not move. Charging pump speed will increase.

b. Control rods will not move. Charging pump speed will decrease.

c. Control Rods will step in. Charging pump speed will increase.

d. Control rods will step in. Charging pump speed will decrease.

ANSWER: 066

b.

REFERENCE:

5610-T-D-12A, Sheet 1
5610-T-D-12B, Sheet 1
5610-T-D-15, Sheet 1

690210706
New
KA 064A2.16 (3.3/3.7) RO T2/G2 SRO T2/G2
10CFR 41.5/43.5/45.3/45.13
RO Q#66 SRO Q#72
Level 2

QUESTION: 067

Unit 3 experienced a large break LOCA. Operators have responded with the EOP network and have completed the actions of ES-1.3, "Transfer to Cold Leg Recirculation." Containment temperature has decreased to 140°F.

Which ONE of the following describes the correct Containment Spray Pump (CSP) alignment?

a. 1 CSP running with its suction aligned directly to the Containment Recirc. sump.

b. 1 CSP running with its suction aligned to the Containment Recirc. sump via the RHR pump discharge.

c. 2 CSPs running with their suctions aligned directly to the Containment Recirc. sump.

d. 2 CSPs running with their suctions aligned to the Containment Recirc. sump via the RHR pump discharge.

ANSWER: 067

b.

REFERENCE:

3-EOP-ES-1.3, Steps 22 through 24

690233003
New
KA 026A1.03 (3.5/3.5) RO T2/G2 SRO T2/G1
10CFR 41.5/45.5
RO Q#67 SRO Q# 54
Level 3

QUESTION: 068

A Containment Purge is in progress per 0-OP-053, "Containment Purge System."

Which ONE of the following is the minimum number of Normal Containment Coolers that must be in service to ensure proper operation of Containment Radiation Monitors, R-11 and R-12?

a. One

b. Two

c. Three

d. Four

ANSWER: 068

a.

REFERENCE:

0-OP-053 Step 4.5

690212903
New
KA 029K1.05 (2.9/3.1) RO T2/G2 SRO (NA)
Pg. 3.8-6
10CFR 41.2 to 41.9/45.7 to 45.8
RO Only Q#68
Level 1

QUESTION: 069

The following refueling conditions exist on Unit 4:

- Core off-load is in progress.
- A reactor vessel refueling cavity seal failure occurs.

Assuming no operator action, which ONE of the following describes the effect on fuel assemblies in the SFP?

Fuel assemblies in the SFP will be:

a. completely uncovered.

b. partially uncovered.

c. covered with a few feet of water above them.

d. covered with SFP water remaining at its normal level.

ANSWER: 069

c.

REFERENCE:

SD-044, Figure 26

690214102
Modified from the Exam Bank: 69021440613
KA 033A1.01 (2.7/3.3) RO T2/G2 SRO T2/G2
10CFR 41.5/45.5
RO Q#69 SRO Q#73
Level 2

QUESTION: 070

Which ONE of the following describes the advantages of using ES-3.1, "Post-SGTR Cooldown Using Backfill," as compared to ES-3.2, "Post-SGTR Cooldown Using Blowdown," or ES-3.3, "Post-SGTR Cooldown Using Steam Dump"?

ES-3.1, "Post-SGTR Cooldown Using Backfill":

a. minimizes radiological releases and is the fastest method to cool the RCS.

b. minimizes radiological releases and facilitates processing of contaminated water.

c. maximizes inventory in the RCS and is the fastest method to cool the RCS.

d. maximizes inventory in the RCS and facilitates processing of contaminated water.

ANSWER: 070

b.

REFERENCE:

3-EOP-E-3, Step 50 Bases

690233905
Modified from the Exam Bank: 69023390529
KA 035K3.01 (4.4/4.6) RO T2/G2 SRO T2/G2
pg. 3.4-14
10CFR 41.7/45.6
RO Q#70 SRO Q#74
Level 1

QUESTION: 071

The following conditions exist on Unit 3:

- The unit is in Mode 3 with Tavg at 545°F.
- The Steam Dump to Condenser (SDTC) system Mode Selector switch is in the MAN position.
- PT-464, Steam Header Pressure, fails high.

Which ONE of the following describes the effect on the SDTC system?

a. Only 2 valves will open and will remain open.

b. Only 2 valves will open and then close when Tavg decreases to 543°F.

c. All 4 valves will open and will remain open.

d. All 4 valves will open and then close when Tavg decreases to 543°F.

ANSWER: 071

d.

REFERENCE:

5610-T-L1, Sheet 22A

690211806
Modified from the Exam Bank: 69021180010
KA 039K1.06 (3.1/3.0) RO T2/G2 SRO T2/G2
pg. 3.4-19
10CFR 41.2 TO 41.9/45.7 45.8
RO Q#71 SRO Q#75
Level 2

QUESTION: 072

Which ONE of the following identifies the first PRMS detector that should respond to a SGTR and the effect on the detector?

a. Condenser Air Ejector Monitor, R-15. R-15 will be automatically isolated.

b. Condenser Air Ejector Monitor, R-15. R-15 will not be automatically isolated.

c. Steam Generator Blowdown Sample Monitor, R-19. R-19 will be automatically isolated.

d. Steam Generator Blowdown Sample Monitor, R-19. R-19 will not be automatically isolated.

ANSWER: 072

b.

REFERENCE:

SD-068, Pages 35 through 39

690216802
New
KA 055K1.06 (2.6/2.6) RO T2/G2 SRO T2/G2
10CFR 41.2 to 41.9/45.7 to 45.8
RO Q#72 SRO Q#76
Level 1

QUESTION: 073

Unit 3 is at 100% power with its Startup Transformer out of service when an automatic reactor trip occurs.

- The 3A EDG starts and repowers the 3A 4KV Bus.
- The 3B EDG locks out and cannot be restarted.

The Unit 3 ANPS directs the BOP to use 3-ONOP-004.3, "Loss of 3B 4KV Bus," to restore power to the 3B 4KV Bus.

Which ONE of the following describes how power will be restored to the 3B 4KV Bus?

Power will be restored to the 3B 4KV Bus from the:

a. 3A 4KV Bus.

b. Unit 4 Startup Transformer.

c. 3C 4KV Bus.

d. Station Blackout Tie Line.

ANSWER: 073

c.

REFERENCE:

3-ONOP-004.3, Step 14 RNO & Attachment #2

690226303
Modified from the Exam Bank: 69022630406
KA 062A2.11 (3.7/4.1) RO T2/G2 SRO T2/G2
pg. 3.6-4
10CFR 41.5/43.5/45.3/45.13
RO Q#73 SRO Q#77
Level 2

QUESTION: 074

The following occurs while Unit 3 is in Mode 1:

- DC Bus 3D23 loses power.

Which ONE of the following operator actions are correct?

a. Shutdown the unit using GOP-103, "Power Operation to Hot Standby." After the unit is stable in Mode 3, then perform ONOP-003.5, "Loss of DC Buses 3D23 and 3D23A(3B)."

b. Shutdown the unit using GOP-103, "Power Operation to Hot Standby and perform ONOP-003.5, "Loss of DC Buses 3D23 and D23A(3B)," concurrently with the actions of GOP-103.

c. Verify the reactor is tripped using E-0, "Reactor Trip or Safety Injection." When the unit is stable, then perform ONOP-003.5, "Loss of DC Buses 3D23 and D23A(3B)."

d. Verify the reactor is tripped using E-0, "Reactor Trip or Safety Injection," and perform ONOP-003.5, "Loss of DC Buses 3D23 and D23A(3B)," concurrently with the Immediate Actions of E-0.

ANSWER: 074

c.

REFERENCE:

3-ONOP-003.5 Step 1

690225303
New
KA 063A4.01 (2.8/3.1) RO T2/G2 SRO T2/G1
10CFR 41.7/45.5 to 45.8
RO Q#74 SRO Q#59
Level 1

QUESTION: 075

Unit 3 is operating at 100% power with all systems in normal alignment. 3A EDG is being run for surveillance purposes and is presently tied to the 3A 4KV Bus.

The following events occur:

- A main generator lockout occurs.
- Startup transformer breaker, 3AA05, fails to close and is mechanically bound.
- 3A Reactor Coolant Pump breaker, 3AA01, fails to automatically open.

Which ONE of the following describes the required operator response?

a. Manually open EDG breaker 3AA20, strip the 3A 4KV Bus using 3-ONOP-004.2, "Loss of 3A 4KV Bus," and manually close breaker 3AA20.

b. Manually open EDG breaker 3AA20, strip the 3A 4KV Bus using 3-ONOP-004.2, "Loss of 3A 4KV Bus," and verify breaker 3AA20 automatically closes.

c. Verify EDG breaker 3AA20 automatically opens, strip the 3A 4KV Bus using 3-ONOP-004.2, "Loss of 3A 4KV Bus," and manually close breaker 3AA20.

d. Verify EDG breaker 3AA20 automatically opens, strip the 3A 4KV Bus using 3-ONOP-004.2, "Loss of 3A 4KV Bus," and verify breaker 3AA20 automatically closes.

ANSWER: 075

d.

REFERENCE:

3-ONOP-004.2, Step 1
5613-T-11, Sheet 9A6
690213606
New
KA 064A2.16 (3.3/3.7) RO T2/G2 SRO T2/G2
10CFR 41.5/43.5/45.3/45.13
RO Q#75 SRO Q#78
Level 2

QUESTION: 076

Unit 3 is at 100% power when PRMS R-3-20, Reactor Coolant Letdown, radiation monitor alarms. HP investigates and surveys the area in the Pipe and Valve Room.

The HP Supervisor reports the presence of a Hot Spot that is reading 400 mr/hr at 2 feet from the source.

Which ONE of the following identifies the distance from the source at which the measured dose rate will be 100 mr/hr?

a. 4 feet

b. 6 feet

c. 8 feet

d. 10 feet

ANSWER: 076

a.

REFERENCE:

LP3500042, Student Handout, Page 21
0-ADM-600, Step 4.18

350204207
New
KA 073K5.02 (2.5/3.1) RO T2/G2 SRO T2/G2
pg. 3.7-15
10CFR 41.5/45.7
RO Q#76 SRO Q#79
Level 3

QUESTION: 077

Unit 3 was operating at 100% power when the following events occurred:

- A Loss of Off Site Power (LOOP)
- The 3A1 Circulating Water Pump breaker did not open.
- All other systems responded as designed.

Which ONE of the following describes the effect on the 3A EDG breaker and 3A Sequencer?

	3A EDG Breaker	3A Sequencer
a.	Remains OPEN	Sequences
b.	Remains OPEN	Does Not Sequence
c.	Automatically CLOSES	Sequences
d.	Automatically CLOSES	Does Not Sequence

ANSWER: 077

b.

REFERENCE:

5613-T-L1, Sheet 9A6. 5613-T-L1, Sheet 12A

690215706
New
KA 075K3.07 (3.4/3.5) RO T2/G2 SRO T2/G2
pg. 3.8-15
10CFR 41.7/45.6
RO Q#77 SRO Q#80
Level 2

QUESTION: 078

Units 3 and 4 are at 100% power when the following events occur:

- A loss of instrument air has occurred on both units.
- 3CM, 3CD, 4CM, and 4CD instrument air compressors are all inoperable.
- The NPO has been directed to open the four inch Service Air Supply to Unit 3/Unit 4 Tie Valve.
- The NPO reports that the four inch Service Air Supply valve cannot be opened.

Which ONE of the following describes the correct operator response?

Open the:

a. Service Air Supply valve from Units 1 & 2.

b. Instrument Air Supply valve from Units 1 & 2.

c. Breathing Air Supply cross-tie valve.

d. two inch Service Air Supply to Unit 3/Unit 4 tie valve.

ANSWER: 078

d.

REFERENCE:

0-ONOP-013, Step 4 RNO
5610-M-3013, Sheet 1
5613-M-3013, Sheet 1

710214504
Modified from 1998 NRC Exam RO #78
KA 079K4.01 (2.9/3.2) RO T2/G2 SRO T2/G2
pg. 3.8-21
10CFR 41.7
RO Q#78 SRO Q#81
Level 1

QUESTION: 079

Both units are at 100% power when a leak occurs in the Main Fire Loop. Loop pressure decreases continuously.

Which ONE of the following identifies the first pump to auto start?

a. The standby Jockey pump

b. The standby Service Water pump

c. The Electric Fire pump

d. The Diesel Engine Driven Fire pump

ANSWER: 079

c.

REFERENCE:

SD-153 Pages 22 & 23
0-ARP-097.WTP, Page 6 & Page 8

690214306
Modified from the Exam Bank: 69021430512
KA 086A3.01 (2.9/3.3) RO T2/G2 SRO T2/G2
pg. 3.8-24
10CFR 41.7/45.5
RO Q#79 SRO Q#82
Level 2

QUESTION: 080

The following conditions exist on Unit 3:

- The unit has been shut down at Beginning-Of-Life for equipment repairs.
- PRZ level is being maintained at 30%.
- RCS temperature is 140°F.

The following events occur 10 days after the shutdown:

- The running RHR pump trips and neither RHR pump can be restarted.
- Operators are unable to establish any other method of RCS cooling.

Which ONE of the following identifies the time closest to when the RCS will enter Mode 4?

a. 12 minutes

b. 35 minutes

c. 42 minutes

d. 50 minutes

ANSWER: 080

d.

REFERENCE:

0-ADM-051, Page 31-35, Figures 1-3 To be provided to candidate.

690203206
Modified from the Exam Bank: 69020320606
KA 005K3.01 (3.9/4.0) RO T2/G3 SRO T2/G3
pg. 3.4-11
10CFR 41.7/45.6
RO Q#80 SRO Q#63
Level 3

QUESTION: 081

Unit 4 is operating at 100% power with all systems in automatic and all plant parameters at their normal values. Pressurizer PORV, PCV-455C, fails partially open.

Which ONE of the following identifies the approximate maximum expected temperature of the steam entering the PRT if the PRT pressure does not exceed 45 psig?

a. 228°F

b. 250°F

c. 275°F

d. 290°F

ANSWER: 081

d.

REFERENCE:

Steam Tables **To be provided to candidate.**
LP 3500080, Fluid Mechanics in Pumps and Piping,
SHO pages 10-67 through 10-73.
ONOP-041.5, Attachment 2

350208009
New
KA 007A1.03 (2.6/2.7) RO T2/G3 SRO (NA)
10CFR 41.5/45.5
RO Only Q#81
Level 3

QUESTION: 082

Which ONE of the following describes the effect of a loss of instrument air on the ECC CCW valves?

A loss of instrument air will cause the ECC:

a. outlet valves to fail open.
outlet bypass valves to fail open.

b. outlet valves to fail open.
outlet bypass valves to fail closed.

c. outlet valves to fail closed.
outlet bypass valves to fail open.

d. outlet valves to fail closed.
outlet bypass valves to fail closed.

ANSWER: 082

b.

REFERENCE:

5613-M-3030, Sheet 4 Notes 5 and 6

690214005
Modified from the Exam Bank: 69026740301-ORQ
KA 008A2.05 (3.3/3.5) RO T2/G3 SRO (NA)
pg. 3.8-4
10CFR 41.5/43.5/45.3/45.13
RO Only Q#82
Level 1

QUESTION: 083

The 3A Emergency Containment Filter fan has been automatically started by the sequencer.

Which ONE of the following conditions will automatically open the solenoid valves SV-3-2905 and SV-3-2906 to supply water to the 3A ECF charcoal filters?

a. Containment temperature greater than 180°F.

b. Containment pressure greater than 20 psig.

c. Charcoal filter temperature greater than 325°F.

d. Charcoal filter low air flow.

ANSWER:

d.

REFERENCE:

P&ID 5613-M-3056 Sh. 1

690212906
Modified from Exam Bank question 69021260604
KA 027A4.01 (3.3/3.3) RO T2/G3 SRO (NA)
Pg. 3.5-15
10CFR 41.5/43.5/45.3/45.13
RO Only Q#83
Level 1

QUESTION: 084

A reactor and turbine trip occurs on Unit 3 while at 25% power.

Which ONE of the following describes the response of the Steam Dump to Condenser (SDTC) system?

a. Only 2 SDTC valves will arm.
The SDTC system will reduce Tavg to no-load Tavg.

b. Only 2 SDTC valves will arm.
The SDTC system will reduce Tavg to within 5°F of Tref.

c. All 4 SDTC valves will arm.
The SDTC system will reduce Tavg to no-load Tavg.

d. All 4 SDTC valves will arm.
The SDTC system will reduce Tavg to within 5°F of Tref.

ANSWER: 084

c.

REFERENCE:

5610-T-L1, Sheet 22A

690211806
New
KA 041K4.18 (3.4/3.6) RO T2/G3 SRO T2/G3
pg. 3.4-24
10CFR 41.7
RO Q#84 SRO Q#64
Level 2

QUESTION: 085

Unit 3 was at 80% power when the 3B Main Feed Pump breaker trips open.

Which ONE of the following describes the plant response?

a. A cyclic governor runback to 60% power will occur.

b. A cyclic governor runback to 45% power will occur.

c. A continuous load limit and governor runback to 60% power will occur.

d. A continuous load limit and governor runback to 45% power will occur.

ANSWER: 085

d.

REFERENCE:

5610-T-L1, Sheet 21
3-ONOP-089, Step 3.6.1

690224803
Modified from the Exam Bank: 69022480201
KA 045K4.39 (2.8/3.0) RO T2/G3 SRO (NA)
pg. 3.4-29
10CFR 41.7
RO Only Q#85
Level 1

QUESTION: 086

Unit 3 was operating at 100% with all systems in normal alignment. An SI signal occurs. All systems function as designed.

After sequencing is complete, which ONE of the following describes the number of CCW load(s) attached to the CCW System as it relates to the CCW "Rule of Five"?

a. One CCW load

b. Two CCW loads

c. Three CCW loads

d. Four CCW loads

ANSWER: 086

b.

"A" and "C" ECCs ("B" does not auto start.)

REFERENCE:

OP-030, Step 4.30, Page 17
5613-M-3030, Sheet 4
5613-T-L1, Sheets 11 & 12A

690214005
Modified from 1998 NRC Exam – JPM # 121A Question #2
KA 076A4.04 (3.5/3.5) RO T2/G3 SRO T2/G3
pg. 3.4-51
10CFR 41.7/45.5 to 45.8
RO Q#86 SRO Q#65
Level 3

QUESTION: 087

Which ONE of the following is an interlock that must be satisfied to allow opening the Containment personnel air lock outside door while in Mode 1?

a. The personnel airlock inside door equalizing valve must be open.

b. The personnel airlock outside door equalizing valve must be open.

c. Atmospheric pressure must be greater than 1.0 psig above airlock pressure.

d. Containment pressure must be greater than 1.0 psig above airlock pressure.

ANSWER: 087

b.

REFERENCE:

OP-051 Precautions and Limitations Step 4.4

690212606
Modification of Exam Bank Question #69021260606
KA G2.1.32 (3.4/3.8) RO T2/G3 SRO (NA)
Pg. 2-4
10CFR 41.10/43.2/45.12
RO Only Q#87
Level 1

QUESTION: 088

Which ONE of the following individuals must be notified by the RCO with Administrative Duties (3rd RCO) before leaving the Control Room?

a. The RCO with Unit Duty

b. The NWE

c. The ANPS

d. The NPS

ANSWER: 088

a.

REFERENCE:

0-ADM-202 Step 5.2.5

690202201
New
KA G2.1.3 (3.0/3.4) RO GT3 SRO (NA)
Pg. 2-1
10CFR 41.10/45.13
RO Only Q#88
Level 1

QUESTION: 089

The following conditions exist on Unit 4:

- The operators are performing E-3, "Steam Generator Tube Rupture," in response to a SGTR in the 4A S/G.
- CVCS letdown has been re-established.
- Containment conditions are normal.
- All RCPs are secured.
- PRZ level is 30%.
- 4A S/G level is increasing.

Which ONE of the following RCO actions is correct?

a. Turn On PRZ Heaters.

b. Decrease RCS Charging Flow.

c. Depressurize the RCS using Normal Spray.

d. Depressurize the RCS using Auxiliary Spray.

ANSWER: 089

d.

REFERENCE:

4-EOP-E-3 Attachment 2 To be provided to candidate.

690233903
Modification of ORG Exam Bank Question #231 (69023390416)
KA G2.1.7 (3.7/4.4) RO GT3 SRO (NA)
Pg. 2-1
10CFR 43.5/45.12/45.13
RO Only Q#89
Level 2

QUESTION: 090

Which ONE of the following is correct?

The purpose of the RCP anti-reverse-rotation device is to:

a. prevent damage to the RCP seal package when starting the RCP.

b. prevent damage to the RCP motor bearings when starting the RCP.

c. limit the reverse flow in an idle RCS loop if another RCP is already running.

d. limit the starting current on start of an idle RCP if another RCP is already running.

ANSWER: 090

d.

REFERENCE:

System Description 008 page 24

690210802
Modification of Exam Bank Question 69021080202
KA G2.1.28 (3.2/3.3) RO GT3 SRO (NA)
Pg. 2-4
10CFR 41.7
RO Only Q#90
Level 1

QUESTION: 091

Which ONE of the following correctly identifies the location and the valve failure mode, when isolating instrument air to FCV-3-114A, Primary Water to Blender valve?

	LOCATION	FAILURE MODE
a.	BAST Room	Open
b.	BAST Room	Closed
c.	Charging Pump Room	Open
d.	Charging Pump Room	Closed

ANSWER: 091

d.

REFERENCE:

Logic Diagram 5610-T-D19 Sheet 1 and SD-013 (CVCS) Walkdown Guide

690223504
New
KA G2.1.30 (3.9/3.4) RO GT3 SRO (NA)
Pg. 2-4
10CFR 41.7/45.7
RO Only Q#91
Level 1

QUESTION: 092

The following conditions exist on Unit 4:

- The unit is in Mode 3.
- The reactor trip breakers are closed.
- RCS Tavg is 548°F.
- RCS pressure is 2235 psig.
- A dilution to obtain the calculated critical boron concentration is in progress.

Which ONE of the following is allowed per 4-GOP-301, "Hot Standby to Power Operation"?

a. Testing of the AFW pumps

b. Stopping of an operating RCP

c. Withdrawal of the Shutdown Rods

d. Energization of the PRZ backup heaters

ANSWER: 092

d.

REFERENCES:

4-GOP-301 steps 4.40, 4.33, 5.23 and Tech Spec 3.4.1.2

690240702
New
KA G2.2.1 (3.7/3.6) RO GT3 SRO (NA)
Pg. 2-5
10CFR 45.1
RO Only Q#92
Level 1

QUESTION: 093

Which ONE of the following is correct for the Base Continuous Power Ratings for the Unit 3 and Unit 4 Emergency Diesel Generators?

	Unit 3 EDGs	Unit 4 EDGs
a.	2500 KW	2874 KW
b.	2500 KW	2750 KW
c.	2874 KW	2750 KW
d.	2750 KW	2500 KW

ANSWER: 093

a.

REFERENCE:

System Descriptions 137 and 167 pages 69 and 99
3/4-OSP-23.1 pages 9 and 11, 3/4-OSP-23.2 pages 11 and 12

690213703
New
KA G2.2.3 (3.2/3.3) RO GT3 SRO (NA)
Pg. 2-5
10CFR 41/43/45
RO Only Q#93
Level 1

QUESTION: 094

Which ONE of the following exposures exceeds an FPL PTN guideline per 0-ADM-600, "Radiation Protection Manual?"

a. 3 rems/yr Total Effective Dose Equivalent

b. 5 rems/yr Lens Dose Equivalent

c. 20 rems/yr Total Organ Dose Equivalent

d 20 rems/yr Shallow Dose Equivalent to the skin

ANSWER: 094

a.

REFERENCE:

0-ADM-600 Attachment 1

690202010
New
KA G2.3.4 (2.5/3.1) RO GT3 SRO (NA)
Pg. 2-9
10CFR 43.4/45.10
RO Only Q#94
Level 1

QUESTION: 095

Which ONE of the following is correct when using a frisker for determining the radioactivity of an object?

a. The selector switch must be on the X1 (times one) scale and background can be no greater than 300 cpm.

b. The selector switch must be on the times X100 (times 100) scale and background can be no greater than 300 cpm.

c. The selector switch must be on the X1 (times one) scale and background must be no greater than 500 cpm.

d. The selector switch must be in the X100 (times 100) scale and background must be no greater than 500 cpm.

ANSWER: 095

a.

REFERENCE:

Pages 35 and 36 of student text 3304001

330200130
New
KA 2.3.5 (2.3/2.5) RO GT3 SRO (NA)
Pg. 2-9
10CFR 41.11/45.9
RO Only Q#95
Level 1

QUESTION: 096

The following conditions exist on Unit 3 while on RHR:

- RCS temperature is 300°F.
- RCS pressure momentarily spikes to 550 psig.

The RCO took the following actions:

- Verified the amber and blue lights for MOV-750 and MOV-751, Loop C RHR Pump Suction Stop Valves, were lit.
- Depressed and released the override pushbuttons to open MOV-750 and MOV-751.
- Determined that MOV-750 and MOV-751 continued to stroke closed.

Which ONE of the following describes why MOV-750 and MOV-751 continued to stroke closed?

a. The OMS mode selector switches are in the "Normal" position.

b. The MOVs must stroke to the fully closed position before they will reopen.

c. RCS pressure was too high when the override pushbuttons were depressed.

d. The override pushbuttons need to be held in the depressed position until the yellow lights go out.

ANSWER: 096

a.

REFERENCE:

5610-T-D-16A and OP-041.4 step 5.1.1.2
690221004
Modified from Exam Bank Question 69022100409
KA G2.4.9 (3.3/3.9) RO GT3 SRO (NA)
Pg. 2-12
10CFR 41.10/43.5/45.13
RO Only Q#96
Level 2

QUESTION: 097

SI has occurred on Unit 3. After exiting E-0, "Reactor Trip of Safety Injection," the following conditions relative to the Critical Safety Functions are observed:

Subcriticality: NIS power ranges are all 2%.
NIS intermediate ranges' SUR are both +0.2 DPM.

Core Cooling: Six highest CETs read 720°F.

Heat Sink:

	3A S/G	3B S/G	3C S/G
NR level:	4%	5%	3%
AFW flow:	125 gpm	125 gpm	125 gpm

Containment: Containment pressure is 10 psig.
Containment Recirculation Sump level is 450 inches.
Containment conditions are not adverse.

All other status trees indicate only green or yellow paths.

Which ONE of the following identifies the first procedure to enter?

a. FR-S.1, "Response to Nuclear Power Generation/ATWS"

b. FR-C.1, "Response to Inadequate Core Cooling"

c. FR-H.1, "Response to Loss of Secondary Heat Sink"

d. FR-Z.1, "Response to High Containment Pressure"

ANSWER: 097

c.

REFERENCE:

EOP-F-0, Enclosures 1, 2, 3, & 5

690235302
Direct from the Exam Bank: 69023530406
KA G2.4.21 (3.7/4.3) RO GT3 SRO (NA)
Pg.2-13
10CFR 43.5/45.12
RO Only Q#97
Level 3

QUESTION: 098

Which ONE of the following individuals may authorize de-escalation from a Site Area Emergency E-Plan classification?

a. Plant Manager

b. Recovery Manager

c. Emergency Coordinator

d. Emergency Control Officer.

ANSWER: 098

b.

REFERENCE:

EPIP-20101 Caution step 5.5.1.2.b

32020806
Modification of Exam Bank Question 32020030201
KA G2.4.29 (2.6/4.0) RO GT3 SRO (NA)
Pg. 2-14
10CFR 43.5/45.11
RO Only Q#98
Level 1

QUESTION: 099

The following events occur on Unit 3:

- The unit experiences a spurious SI signal.
- Startup Transformer breaker 3AA05 fails to close.
- All other systems respond as designed.

Which ONE of the following identifies the Sequencer Trouble annunciator(s) that will alarm when the operators reset SI?

a. Sequencer 3A only.

b. Sequencer 3A and 3B only.

c. Sequencer 3B, 4A and 4B only.

d. Sequencer 3A, 3B, 4A and 4B.

ANSWER: 099

c.

REFERENCES:

ARP-097.CR X1/3, X1/4, X9/3, X9/4

690269602
Modified from ORQ 69026960201
KA G2.4.46 (3.5/3.6) RO GT3 SRO (NA)
10CFR 43.5/45.3/45.12
RO Only Q#99
Level 2

QUESTION: 100

Unit 3 operators are performing the Immediate Operator Actions of E-0 "Reactor Trip or Safety Injection."

The following conditions exist:

- 3A 4KV bus is energized.
- 3B 4KV bus is de-energized.
- 3D 4KV bus is aligned to 3B 4KV bus.
- 3C ICW and 3C CCW pump breakers are open.

Which ONE of the following is the correct operator action?

Verify D bus lockout indicating light is:

a. flashing. Align D bus to A bus by opening the B bus supply breakers, then closing the A bus supply breakers.

b. flashing. Align D bus to A bus by closing the A bus breakers, then opening the B bus breakers.

c. lit (not flashing). Align D bus to A bus by closing the A bus supply breakers, then opening the B bus supply breakers.

d. lit (not flashing). Align D bus to A bus by opening the B bus supply breakers, then closing the A bus supply breakers.

ANSWER: 100

d.

REFERENCES:

E-0 step 3b RNO and step 5 of ONOP-004.5

690232102
New
KA G2.4.49 (4.0/4.0) RO GT3 SRO (NA)
Pg. 2-16
10CFR 41.10/43.2/45.6
RO Only Q#100
Level 2

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

Applicant Information

Name:	Region: II
Date:	Facility/Unit: Turkey Point/3&4
License Level: SRO	Reactor Type: W
Start Time:	Finish Time:

Instructions

Use the answer sheets provided to document your answers. Staple this cover sheet on top of the answer sheets. The passing grade requires a final grade of at least 80.00 percent. Examination papers will be collected five hours after the examination starts.

Applicant Certification

All work done on this examination is my own. I have neither given nor received aid.

_____
Applicant's Signature

Results

Examination Value	100	Points
Applicant's Score	_____	Points
Applicant's Grade	_____	Percent

QUESTION: 001

The following conditions exist on Unit 3:

- The Rod Control System is in Manual.
- Control Bank C is at 225 steps.
- Control Bank D is at 97 steps.

The following event occurs:

- A Rod Control System malfunction causes continuous rod withdrawal for 10 steps. Rod motion then stops.

Which ONE of the following identifies what the RPIs for control banks C and D should indicate?

a. Bank C – 225 Bank D – 97

b. Bank C – 230 Bank D – 97

c. Bank C – 230 Bank D – 107

d. Bank C – 235 Bank D - 107

QUESTION: 002

The following conditions exist on Unit 3:

- The unit is at 100% power
- A power supply failure in rod control Power Cabinet 1AC results in one dropped rod in Control Bank A Group 1 and one dropped rod in Control Bank C Group 1.

Which ONE of the following actions is correct?

a. Manually runback the turbine.

b. Verify automatic turbine runback.

c. Enter ONOP-28.3 "Dropped RCC" and retrieve both dropped rods.

d. Trip the Reactor and go to E-0 "Reactor Trip Or Safety Injection."

QUESTION: 003

The following conditions exist on Unit 3:

- The operators are responding to a misaligned D Bank, Group 2, control rod using 3-ONOP-28.1 "RCC Misalignment."

- The appropriate lift coil disconnect switches have been placed to the disconnect position.

Which ONE of the following Power Cabinets will be the source of the Urgent Failure alarm that occurs when the operator initiates rod motion?

a. 1AC

b. 1BD

c. 2AC

d. 2BD

QUESTION: 004

A large break LOCA occurred while Unit 4 was operating at 100% power.

Which ONE of the following describes why the RCO verifies Feedwater Isolation closed the Main and Bypass FW Control valves?

The RCO is directed to verify Feedwater Isolation in response to:

a. Reactor trip.

b. SI actuation.

c. Phase A actuation.

d. Phase B actuation.

QUESTION: 005

Operators are responding to a LOCA outside Containment using ECA-1.2, "LOCA Outside Containment."

If unable to isolate the break, which ONE of the following identifies the procedure ECA-1.2 will direct the operators to transition to?

a. E-1, "Loss of Reactor or Secondary Coolant"

b. ES-1.2, " Post LOCA Cooldown and Depressurization"

c. ES-1.3, "Transfer to Cold Leg Recirculation"

d. ECA-1.1, "Loss of Emergency Coolant Recirculation"

QUESTION: 006

Unit 4 operators have just entered E-1 "Loss of Reactor or Secondary Coolant."

The following conditions exist:

-	RCS pressure:	1525 psig.		
-	RCS CET subcooling:	70°F.		
-	PRZ level:	15%.		
-	Containment temperature:	165°F.		
-	S/G NR levels:	4A	4B	4C
		22%	0%	0%

Which ONE of the following is correct?

SI Termination Criteria is not met based on:

a. PRZ level.

b. RCS pressure.

c. S/G NR levels.

d. RCS CET Subcooling .

QUESTION: 007

The following conditions exist on Unit 3.

- The "POWER BELOW P-8" status lamp is not lit.
- The 3A RCP experiences a sheared shaft.

Which ONE of the following correctly describes the applicable reactor trip logic?

The reactor will:

a. Trip due to a single RCS loop low flow signal.

b. Trip due to a single RCP breaker open signal.

c. Not trip because two RCS loops must have low flow signals.

d. Not trip because two RCPs must have breaker open signals.

QUESTION: 008

The following conditions exist on Unit 4:

- Operators are performing ES-0.2, "Natural Circulation Cooldown."
- All systems are operable except the RCPs and Channel A of QSPDS.
- The NPS determines a cooldown rate in excess of 25°F/hr is required.

Which ONE of the following describes the correct operator action?

a. Increase the cooldown rate to a rate not to exceed 60°F/hr and remain in ES-0.2.

b. Increase the cooldown rate to a rate not to exceed 100°F/hr and remain in ES-0.2.

c. Transition to ES-0.3, "Natural Circulation Cooldown with Steam Void in Vessel (With RVLMS)."

d. Transition to ES-0.4, "Natural Circulation Cooldown with Steam Void in Vessel (Without RVLMS)."

QUESTION: 009

The following event occurs while Unit 4 is in Mode 3:

- Both NIS Source Ranges indicate an unexplained increase in power.

The RCO attempts to initiate emergency boration but discovers MOV-350, Emergency Boration valve, will not open.

Which ONE of the following describes the correct operator response?

a. Direct the SNPO to open MOV-350.

b. Direct the SNPO to open 3-358, bypass around LCV-115B.

c. Open FCV-113A, FCV-113B, and direct the SNPO to open 3-356.

d. Hold closed LCV-115C and direct the NPO to open the breaker for LCV-115C.

QUESTION: 010

A total loss of CCW occurs on Unit 4 while at 100% power.

Which ONE of the following is correct?

Damage will occur quickest to the Charging pump:

a. oil pump with the Charging pump run at minimum speed.

b. oil pump with the Charging pump run at maximum speed.

c. fluid drive coupling with the Charging pump run at minimum speed.

d. fluid drive coupling with the Charging pump run at maximum speed.

QUESTION: 011

With Unit 4 stable at 2% power, the RCO observes that the Reactor Trip Breakers have no red or green indicating lights lit on the console or on VPB.

Which ONE of the following correctly describes an event that could have caused this condition?

a. SR NIS N-31 Instrument Power fuse has blown.

b. SR NIS N-32 Control Power fuse has blown.

c. IR NIS N-35 Instrument Power fuse has blown.

d. PR NIS N-41 Control Power fuse has blown.

QUESTION: 012

The following conditions exist on Unit 3:

- The unit is at 2% power.
- All MSIVs are closed.
- A steam line break occurs on the 3A S/G at the safety header.

Which ONE of the following describes the plant response?

SI will occur when:

a. Tavg decreases to 543°F.

b. containment pressure increases to 4 psig.

c. 3A S/G pressure decreases to 485 psig.

d. 3A S/G pressure decreases to 614 psig.

QUESTION: 013

Unit 4 operators have just transitioned to FR-P.1, "Response to Imminent Pressurized Thermal Shock Condition."

The following conditions exist:

- AFW is not available.
- The "A" Standby Feedwater Pump is being used to maintain S/G inventory.

Which ONE of the following indications should be used to control feed water flow?

Use changes in:

a. RCS pressure.

b. RCS temperature.

c. PRZ level.

d. S/G pressure.

QUESTION: 014

The following conditions exist on Unit 3:

- The operators have entered ONOP- 014 "Main Condenser Loss of Vacuum."

- The unit was initially at 550 MWe and 25" vacuum with vacuum slowly decreasing.

- The unit is now at 300 MWe and 24" vacuum with vacuum slowly decreasing.

Which ONE of the following is the required operator action?

a. Continue reducing MWe until vacuum stabilizes at greater than or equal to 24.5" vacuum.

b. Continue reducing MWe until vacuum stabilizes at greater than or equal to 22" vacuum.

c. Stabilize the plant and continue to investigate the cause of the low vacuum condition.

d. Trip the reactor and turbine and perform the actions of E-0, "Reactor Trip or Safety Injection."

QUESTION: 015

Unit 3 experienced a Loss of All AC Power simultaneous with a complete loss of Instrument Air.

Operators have restored power to and started the 3A Charging pump.

Which ONE of the following correctly describes the effect on CVCS?

The letdown flowpath:

a. remains open and the charging pump speed goes to minimum.

b. remains open and the charging pump speed goes to maximum.

c. isolates and the charging pump speed goes to minimum.

d. isolates and the charging pump speed goes to maximum.

QUESTION: 016

Unit 3 is in Mode 3 with the following conditions:

- A loss of a 120V Vital Instrument Panel has caused VCT level indicator LI-3-115 to indicate zero level.
- Annunciator A 4/6 "VCT HI/LO LEVEL" is in alarm.

Which ONE of the following is correct for the given conditions?

VCT Auto Makeup:

a. initiates and charging pump suction remains aligned to the VCT.

b. initiates and charging pump suction auto swaps to the RWST.

c. is disabled and charging pump suction remains aligned to the VCT.

d. is disabled and charging pump suction auto swaps to the RWST.

QUESTION: 017

EOP-E-3, "Steam Generator Tube Rupture," directs the operator to verify the S/G Blowdown Sample Stop valves are closed within 30 minutes.

Which ONE of the following states the basis for this action?

a. Prevents a potential unmonitored release.

b. Prevents a potential loss of S/G inventory.

c. Ensures all Containment Phase 'A' isolation valves are closed.

d. Ensures S/G sample is only directed to the primary sample sink .

QUESTION: 018

Unit 3 is at 100% power with the 3C ICW Pump out of service.

Which ONE of the following describes a situation that would result in a complete loss of ICW flow to the unit?

A grass influx that completely blocks flow to the:

a. 3A1 and 3A2 Intake Wells.

b. 3B1 and 3B2 Intake Wells.

c. 3A1 and 3B1 Intake Wells.

d. 3A2 and 3B2 Intake Wells.

QUESTION: 019

The following conditions exist:

- Fire Detection Panel C39A alarms in the Control Room.
- Alarm point 41,"Train A Inverters" is activated.
- The NWE investigates and reports that the HALON system has discharged and the fire is still burning.

Which ONE of the following actions should be taken to extinguish the fire?

a. Depress the local panel emergency release "DISCHARGE" button.

b. Place the local panel "MAIN/RESERVE" switch to the RESERVE position.

c. Place the local panel "MAIN/RESERVE" switch to the MAIN position.

d. Pull the MAIN manual release lever at the Halon bottles.

QUESTION: 020

Operators evacuated the Control Room due to a fire in the Cable Spreading Room. They have achieved Safe Shutdown conditions and are maintaining the plants stable in Mode 3.

Which ONE of the following identifies the Unit 4 480V Load Centers that will be energized at this time?

a. Only A and C Load Centers

b. A, C and H Load Centers

c. Only B and D Load Centers

d. B, D and H Load Centers

QUESTION: 021

Which ONE of the following is an indication or control that is on the Unit 3 Alternate Shutdown Panel?

a. 3A EDG voltage indicator

b. RCS Loop Flow indicator

c. "C" AFW pump T&T valve control switch

d. 3A Charging pump control switch

QUESTION: 022

Which ONE of the following describes the parameter used by ECA-1.2, "LOCA Outside Containment," to determine if the break outside Containment has been isolated?

a. PRZ level

b. CET temperature

c. RCS pressure

d. RCS subcooling

QUESTION: 023

Operators are responding an inadequate core cooling condition using FR-C.1, "Response to Inadequate Core Cooling."

Which ONE of the following is correct regarding RCP operation?

If an RCP is:

a. initially running, it should be left running until it trips by itself.

b. initially running, it should be left running until #1 seal delta P trip criteria is met.

c. not running, it should be left off until 6% [32%] level is attained in its associated S/G.

d. not running, it should be left off until 6% [32%] level is attained in any S/G.

QUESTION: 024

Operators are performing 3-ONOP-041.4, "Excessive Reactor Coolant System Activity," and have just reduced Tavg to less than 500°F as directed by the procedure.

Which ONE of the following describes the basis for reducing Tavg to less than 500°F?

a. To block SI in preparation for a controlled cooldown.

b. To allow closing the MSIVs in preparation for a controlled cooldown.

c. To prevent the release of activity in the event of a main steam line break.

d. To prevent the release of activity in the event of a steam generator tube rupture.

QUESTION: 025

The following conditions exist on Unit 3:

- A reactor startup is in progress per GOP-301 "Hot Standby to Power Operations."
- The point of adding heat (POAH) has just been reached.
- 3A S/G NR level decreases to 4% but the reactor does not automatically trip.

Which ONE of the following procedures should be used to take the reactor subcritical?

a. ONOP-46.1, "Emergency Boration."

b. GOP-103, "Power Operation to Hot Standby."

c. FR-S.1, "Response to Nuclear Power Generation/ATWS."

d. E-0, "Reactor Trip or Safety Injection."

QUESTION: 026

The following conditions exist on Unit 4:

- Low PRZ pressure SI has occurred.
- All 4 HHSI pumps are running.
- PRZ level is increasing.
- RCS pressure is 1450 psig and decreasing.
- HHSI cold leg flow indication (FI-943) is zero.
- PRT pressure and level are increasing.

Which ONE of the following describes the events that could have caused these conditions?

a. A PRZ PORV is open and the HHSI isolation valves, MOV-843A and MOV-843B, failed to open.

b. A PRZ PORV is open and the HHSI line downstream of the HHSI isolation valves, MOV-843A and MOV-843B, has sheared.

c. A PRZ Spray valve is open and the HHSI isolation valves, MOV-843A and MOV-843B, failed to open.

d. A PRZ Spray valve is open and the HHSI line downstream of the HHSI pumps has sheared.

QUESTION: 027

Unit 3 operators are responding to a LOCA and have transitioned to E-1when the STA reports that RCS Cold Leg temperatures are 310°F.

Which ONE of the following describes the correct operator response?

a. Transition to FR-P.1, "Response to Imminent Pressurized Thermal Shock Condition," and perform the actions of FR-P-1 if RCS pressure is greater than 250 psig.

b. Transition to FR-P.1, "Response to Imminent Pressurized Thermal Shock Condition," and perform the actions of FR-P-1 if RCS pressure is less than 250 psig.

c. Transition to FR-P.2, "Response to Anticipated Pressurized Thermal Shock Condition," and perform the actions of FR-P-2 if RCS pressure is greater than 250 psig.

d. Transition to FR-P.2, "Response to Anticipated Pressurized Thermal Shock Condition," and perform the actions of FR-P-2 if RCS pressure is less than 250 psig.

QUESTION: 028

Unit 3 operators are performing Step 16 of EOP-ES-1.2 "Post LOCA Cooldown and Depressurization."

The following conditions exist:

- One Unit 3 HHSI pump is running.
- One RHR pump is running.
- Two Charging pumps are running at maximum flow.
- Containment temperature is 178°F.
- CET subcooling is 68°F
- RCS Thot temperatures are 320°F.
- RCS pressure is 260 psig.
- No RCPs are available.
- PRZ level is stable at 30%.

Which ONE of the following describes the running HHSI/RHR pump configuration when the operators isolate the accumulators?

a. Zero HHSI pumps, One RHR pump.

b. Zero HHSI pumps, Two RHR pumps.

c. One HHSI pump, One RHR pump.

d. One HHSI pump, Two RHR pumps.

QUESTION: 029

Which ONE of the following describes a condition that would prevent successful transition to Cold Leg recirculation?

a. Only one of the RHR Pump Suction Stop valves, MOV-750 or MOV-751 can be energized.

b. Only one of the RHR Suction from RWST valves, MOV-862A or MOV-862B can be energized.

c. Containment Recirculation Sump Isolation valves MOV-860A and MOV-860B will not open.

d. Containment Recirculation Sump Isolation valves MOV-860A and MOV-861A will not open.

QUESTION: 030

Unit 4 is in Mode 5 and all loops are filled.

The following equipment is out of service:

- RHR Loop A
- 4C ICW pump
- 4C CCW pump

Which ONE of the following will result in a loss of RHR required capability per 3-OP-050, "Residual Heat Removal System?"

A failure of the:

a. 4A EDG.

b. 4B CCW H/X.

c. 4A CCW pump.

d. 4B ICW pump.

QUESTION: 031

Unit 3 is in Mode 1 when operators responded to PRZ pressure transmitter, PT-445, failed high.

The following stable conditions now exist:

-	Reactor Power	80%
-	Tavg	572 °F
-	PRZ Pressure	2150 psig
-	PRZ Level	48%

Which ONE of the following is the operator response required by Technical Specifications?

a. Restore PRZ level to greater than 48%.

b. Restore PRZ pressure to greater than 2200 psig.

c. Reduce Tavg to less than 570°F.

d. Reduce Reactor Power to less than 75%.

QUESTION: 032

The following conditions exist on Unit 3:

- Reactor power is 22% with operators performing a plant startup.
- NIS Intermediate range channel N-36 fails high.

Which ONE of the following is the correct operator response?

a. Enter E-0, "Reactor Trip or Safety Injection."

b. Place the N-36 LEVEL TRIP switch in BYPASS and continue the power ascension.

c. Place the N-36 LEVEL TRIP switch in BYPASS and reduce power below permissive P-6.

d. Place the N-36 LEVEL TRIP switch in BYPASS and reduce power below permissive P-10.

QUESTION: 033

The following conditions exist:

- Unit 3 is at 100% power.
- PRMS Channel R-15 (Condenser Air Ejector monitor) has alarmed.
- At 0800, 3C S/G tube leakage is calculated to be 110 GPD.
- At 0900, 3C S/G tube leakage is calculated to be 160 GPD.

Which ONE of the following is the correct operator response?

a. Increase S/G sampling frequency and return to procedure and step in effect.

b. Place the unit in Mode 3 within 1 hour.

c. Place the unit in Mode 3 within 6 hours.

d. Trip the reactor and enter E-0 "Reactor Trip or Safety Injection."

QUESTION: 034

The following has occurred on Unit 3:

- Operators are responding to a SGTR.
- They are performing a cooldown in E-3, "Steam Generator Tube Rupture," to increase subcooling prior to RCS depressurization.
- The STA informs the crew that a Red Path exists on the Integrity Status Tree.

Which ONE of the following describes the correct operator response?

If the RCPs are:

a. running , then stop the cooldown, and continue performing E-3.

b. running, then continue the cooldown, and continue performing E-3.

c. not running, then stop the cooldown, and transition to FR-P.1.

d. not running, then continue the cooldown and continue performing E-3.

QUESTION: 035

Which ONE of the following describes the basis for verifying AFW flow is greater than 390 gpm following a loss of main feedwater event?

390 gpm is the minimum AFW flow required in the event:

a. an ATWS occurs.

b. only one AFW pump is running.

c. any S/G level is below 6% NR.

d. all S/G levels are below 6% NR.

QUESTION: 036

Unit 3 operators have entered FR-H.1 "Response to Loss of Secondary Heat Sink."

The following conditions exist:

- No Main Feedwater Pumps are available.
- No Auxiliary Feedwater Pumps are available.
- The RCPs are off.
- Annunciator E 2/6 "HI-HI SG LVL TURBINE TRIP/FEEDWATER ISOLATION is in alarm.
- The operators are preparing to re-establish feedwater using a Standby Steam Generator Feedwater Pump.

Which ONE of the following describes the minimum Control Room action(s) required to re-establish feed flow to the S/Gs?

Reset:

a. SI

b. Phase A

c. Feedwater Isolation

d. SI and Feedwater Isolation

QUESTION: 037

The following conditions exist on Unit 3:

- The unit has a normal electrical lineup.
- 3C ICW pump is running.
- A loss of the normal DC control power supply to the 3D 4KV Bus occurs.

Which ONE of the following describes the indications that would now exist on VPA for the 3C ICW pump?

a. Red light on - Normal amps

b. Green light on - No amps

c. Red and Green lights off - Normal amps

d. Red and Green lights off. - No amps

QUESTION: 038

Which ONE of the following describes the Immediate Operator Action(s) of 0-ONOP-066, "High Area Radiation Monitoring System Alarm," in the event Annunciator X 4/1, ARMS HI RADIATION, alarms?

Identify the alarming channel(s) at the ARMS panel and then:

a. announce the alarm over the plant page system.

b. notify Security to restrict entry to the affected areas.

c. press the ALARM ACK pushbutton on the ARMS control panel.

d. cross-check the alarming ARMS channel(s) with PRMS channel(s) in the affected area.

QUESTION: 039

Unit 4 operators are responding to a LOCA and have entered E-1 "Loss of Reactor or Secondary Coolant."

- The TSC is not yet operational.
- Containment temperature peaked at 200°F and has dropped to 170°F.
- Containment radiation peaked at 1.3×10^6 R/hr and has dropped to 1.2×10^5 R/hr.

Which ONE of the following is correct?

Intact S/G levels should be maintained in the NR between:

a. 6% and 32%

b. 15% and 32%

c. 15% and 50%

d. 32% and 50%

QUESTION: 040

Unit 4 operators have entered 0-ONOP-13, "Loss of Instrument Air" in response to Annunciator I 6/1, INST AIR SYSTEM HI TEMP/LO PRESS.

The following conditions exist:

- All available air compressors are running.
- Instrument Air pressure indicator, PI-4-1444, is 60 psig and stable.

Which ONE of the following identifies the equipment that will be affected?

Unit 4:

a. MSIVs will fail closed.

b. Feedwater Reg Valves will fail closed.

c. EDG Fuel Oil Transfer capability will be lost.

d. Train 1 AFW FCV automatic operation will be lost.

QUESTION: 041

Unit 4 is at 100% power with all systems operating in automatic and all switches in their normal positions.

PRZ level transmitter LT-459 fails low.

Which ONE of the following describes the plant response?

a. Charging flow will decrease.
Letdown will isolate.

b. Charging flow will decrease.
Letdown will remain in service.

c. Charging flow will increase.
Letdown will isolate.

d. Charging flow will increase.
Letdown will remain in service.

QUESTION: 042

The following conditions exist with Unit 3 at 100% power and all systems operable:

- 3D 4KV Bus is aligned to 3B 4KV Bus.
- 3A and 3C ICW Pumps are running.

The following events occur:

- A LOOP occurs on Unit 3.
- The 3A EDG fails to start.

Which ONE of the following describes the ICW pump configuration when sequencing is complete (assume no operator response)?

a. No ICW pumps will be running.

b. Only the 3B ICW pump will be running.

c. Only the 3C ICW pump will be running.

d. The 3B and 3C ICW pumps will be running.

QUESTION: 043

Unit 4 operators are performing FR-H.2 "Response to S/G Overpressure."

Current conditions are as follows:

- 4A S/G pressure is 1135 psig.
- 4A S/G level has risen to 60%.
- RCS Thot temperatures are 520°F.
- All three RCPs are running.

Which ONE of the following describes how to correctly reduce pressure in the 4A S/G?

a. Stop the 4A RCP.

b. Dump steam from the 4A S/G.

c. Dump steam from the unaffected S/Gs.

d. Reduce 4A S/G inventory using the S/G blowdown system.

QUESTION: 044

Unit 3 is stable at 80% power with all systems in automatic when the following events occur:

- Control Rods begin to continuously insert.
- The RCO observes the following indications:

-	Tavg:	567°F	decreasing
-	Tref	570°F	stable
-	Generator Load:	650 MWe	stable

Which ONE of the following describes the correct immediate operator action?

a. Maintain rods in AUTO and if rods continue to insert, adjust turbine load to match Tavg to Tref.

b. Maintain rods in AUTO and if rods continue to insert, adjust boron concentration to match Tavg to Tref.

c. Place rods in MANUAL and if rods continue to insert, adjust turbine load to match Tavg to Tref.

d. Place rods in MANUAL and if rods continue to insert, adjust boron concentration to match Tavg to Tref.

QUESTION: 045

The following plant conditions exist:

- Containment Phase "A" isolation has occurred.
- The isolation signal has not yet been reset.

Which ONE of the following describes the effect this condition will have on RCP Number 1 seal leak off flow?

Number 1 seal leak off flow will:

a. decrease because VCT level has increased.

b. decrease because the backpressure has increased.

c. go to zero because RCP Seal Return to VCT valve, MOV-381, is closed.

d. go to zero because #1 Seal Leakoff Isolation valves, 303A, 303B, and 303C are closed.

QUESTION: 046

A reactor startup is being performed on Unit 3. The following conditions apply:

- The ECC estimated critical rod height is D bank at 110 steps.
- The initial highest source range count rate was N-31 at 250 cps.
- The current N-31 count rate is 1000 cps.
- Based on the current N-31 count rate, the 1/M plot predicts criticality at D bank, 180 steps.
- Integrated rod worth for D-110 is 490 pcm.
- Integrated rod worth for D-180 is 160 pcm.

Which ONE of the following is the correct operator response?

a. Do not continue the reactor startup. Obtain permission from the NPS to continue.

b. Do not continue the reactor startup. Obtain permission form the Reactor Supervisor to continue.

c. Continue the reactor startup. If the prediction is still D-180 after the next doubling, obtain permission from the NPS to continue.

d. Continue the reactor startup. If the prediction is still D-180 after the next doubling, obtain permission from the Reactor Supervisor to continue.

QUESTION: 047

Which ONE of the following describes the purpose of the interlocks between CVCS Letdown Isolation valve, LCV-460, and the Letdown Orifice Isolation valves, 200A, 200B, & 200C?

The interlocks prevent damage to:

a. LCV-460 upon depressurization of the letdown line.

b. CV-200A, 200B, 200C upon depressurization of the letdown line.

c. the Regenerative Heat Exchanger upon subsequent repressurization of the letdown line.

d. RV-203, Letdown Relief Valve, upon subsequent repressurization of the letdown line.

QUESTION: 048

The following conditions exist on Unit 3:

- Reactor power is stable at 10^{-8} amps.
- "PRZ Pressure Control Channel" PT-444 fails high.

Assuming no operator action, which ONE of the following describes the response of the plant to this condition?

a. The reactor will trip when PRZ pressure increases to 2385 psig.

b. PRZ pressure will stabilize at approximately 2000 psig .

c. The reactor will trip when PRZ pressure decreases to 1835 psig.

d. SI actuation will occur when PRZ pressure decreases to 1730 psig.

QUESTION: 049

Unit 3 is at 100% power and Annunciator B 9/3, SHUTDOWN ROD OFF TOP/DEVIATION is not operational.

Which ONE of the following describes the action that operators must take at least once every 4 hours?

Verify RPIs and Step Counters agree within:

a. 2 steps.

b. 12 steps.

c. 18 steps.

d. 24 steps.

QUESTION: 050

Unit 3 is stable at 98% power. Reactor Engineering has performed QPTR calculations using a full core flux map and core exit thermocouples. Both calculations reveal the QPTR value is 1.03.

Which ONE of the following describes the required operator response?

Reduce NIS power to less than:

a. 97% within 2 hours.

b. 95% within 2 hours.

c. 91% within 2 hours.

d. 89% within 2 hours.

QUESTION: 051

Immediately after operators have stabilized Unit 3 following a power reduction, Annunciators B 8/1, ROD BANK A/B/C/D LO LIMIT and B 8/2, ROD BANK A/B/C/D EXTRA LO LIMIT, alarm.

Which ONE of the following describes the effect on axial flux distribution and the correct immediate operator response to restore rods above the insertion limit?

	CORE FLUX CONCENTRATION	RESPONSE
a.	Lower Half of Core	Borate using normal boration
b.	Lower Half of Core	Borate using emergency boration
c.	Upper Half of Core	Borate using normal boration
d.	Upper Half of Core	Borate using emergency boration

QUESTION: 052

Unit 3 operators are responding to a spurious SI signal and are attempting to determine if SI termination criteria are met. The ANPS directs the RCO to check subcooling on QSPDS.

QSPDS displays the following:

SATURATION MARGIN

	DEG F	PSI
UPPER HEAD	48	633
RCS (MIN)	36	438
CET	28	340

Assuming other SI Termination Criteria are satisfied, which ONE of the following is correct?

The RCO should declare SI Termination Criteria are:

a. not met after observing the RCS (MIN) value.

b. not met after observing the CET value.

c. met after observing the RCS (MIN) value.

d. met after observing the CET value.

QUESTION: 053

A large break LOCA occurs on Unit 3 while the 3B Sequencer is inoperable.

Which ONE of the following describes an effect on the Unit 3 containment?

Containment pressure will be higher because only the:

a. 3A ECC will autostart.

b. 3C ECC will autostart.

c. 3A and 3C ECCs will autostart.

d. 3B and 3C ECCs will autostart.

QUESTION: 054

Unit 3 experienced a large break LOCA. Operators have responded with the EOP network and have completed the actions of ES-1.3, "Transfer to Cold Leg Recirculation." Containment temperature has decreased to 140°F.

Which ONE of the following describes the correct Containment Spray Pump (CSP) alignment?

a. 1 CSP running with its suction aligned directly to the Containment Recirc. sump.

b. 1 CSP running with its suction aligned to the Containment Recirc. sump via the RHR pump discharge.

c. 2 CSPs running with their suctions aligned directly to the Containment Recirc. sump.

d. 2 CSPs running with their suctions aligned to the Containment Recirc. sump via the RHR pump discharge.

QUESTION: 055

Unit 3 is operating at 70% power with all systems operable except the 3C Condensate pump which has its breaker racked out.

The 3A Condensate pump breaker trips open.

Which ONE of the following describes the correct operator response?

Perform the actions of:

a. ONOP-089, "Turbine Runback."

b. ONOP-100, "Fast Load Reduction."

c. GOP-103, "Power Operation to Hot Standby."

d. E-0, "Reactor Trip or Safety Injection."

QUESTION: 056

Unit 3 is operating at 100% power when the controlling S/G pressure transmitter fails low on the 3A S/G.

Which ONE of the following describes the effect this will have on the controlling indicated steam flow and the initial 3A FW Control Valve, FCV-478, response?

Indicated steam flow will:

a. decrease. The FCV will open.

b. decrease. The FCV will close.

c. increase. The FCV will open.

d. increase. The FCV will close.

QUESTION: 057

With Unit 3 initially at 100% power and all systems in normal alignment, the 3C S/G experiences a main steam line break inside Containment.

Which ONE of the following describes the effect this accident will have on the AFW system?

a. Train 1 AFW will be lost until the operators open AFSS-3-007.

b. Train 1 AFW will be lost until the operators close AFSS-3-006.

c. Train 2 AFW will be lost until the operators open AFSS-3-007.

d. Train 2 AFW will be lost until the operators close AFSS-3-006.

QUESTION 058

Unit 3 operators have entered ES-1.1, "SI Termination," and are preparing to start a Main Feedwater pump and secure AFW.

The following conditions exist:

- "A" AFW pump is running.
- "B" and "C" AFW pumps are stopped and aligned for auto start.
- The NWE locally starts the 3A Main Feed pump.
- The BOP fails to "red flag" the 3A Main Feed pump control switch semaphore.

Which ONE of the following describes the effect of the BOP's failure to red flag the 3A Main Feed pump control switch semaphore?

a. "B" and "C" AFW pumps will automatically start.

b. AFW pump automatic start capability will be degraded.

c. The 3A Main Feed pump will not trip from an SI signal.

d. The 3A Main Feed pump will automatically trip in 50 seconds.

QUESTION: 059

The following occurs while Unit 3 is in Mode 1:

- DC Bus 3D23 loses power.

Which ONE of the following operator actions are correct?

a. Shutdown the unit using GOP-103, "Power Operation to Hot Standby." After the unit is stable in Mode 3, then perform ONOP-003.5, "Loss of DC Buses 3D23 and 3D23A(3B)."

b. Shutdown the unit using GOP-103, "Power Operation to Hot Standby and perform ONOP-003.5, "Loss of DC Buses 3D23 and D23A(3B)," concurrently with the actions of GOP-103.

c. Verify the reactor is tripped using E-0, "Reactor Trip or Safety Injection." When the unit is stable, then perform ONOP-003.5, "Loss of DC Buses 3D23 and D23A(3B)."

d. Verify the reactor is tripped using E-0, "Reactor Trip or Safety Injection," and perform ONOP-003.5, "Loss of DC Buses 3D23 and D23A(3B)," concurrently with the Immediate Actions of E-0.

QUESTION: 060

The following conditions exist on Unit 3:

- The unit was at 100% power.
- A spurious SI occurs.
- The operators are responding per the EOP network and have just transitioned to EOP-ES-1.1, "SI Termination."
- Annunciator A 7/1, PRT HI/LO LEVEL HI PRESS/TEMP, alarms.

Assuming all systems function as designed, which ONE of the following describes the probable cause of this alarm?

a. A PRZ PORV has lifted.

b. CVCS Low Pressure relief valve, RV-209, has lifted.

c. RHR Header to Loops relief valve, RV-706, has lifted.

d. RCP #1 Seal Leakoff relief valve, RV-382, has lifted.

QUESTION: 061

Operators are investigating an abnormal increase in countrate on PRMS radiation monitor R-14, PLANT VENT, when they discover pressure in Gas Decay Tank (GDT) #4 is decreasing.

No planned GDT releases are in progress and the Gas Decay Tank Discharge Valve, RCV-014, is closed.

After verifying all valve alignments are correct, which ONE of the following describes the correct operator response?

Direct the SNPO to:

a. transfer the contents of GDT #4 to another GDT.

b. verify both Auxiliary Building Exhaust fans are running.

c. stop all running Waste Gas compressors.

d. start an additional Waste Gas compressor.

QUESTION: 062

The Control Room Normal Air Intake radiation monitor, RAI-6642, alarms.

Which ONE of the following describes the damper response of the Control Building Ventilation System?

a. Ventilation Inlet dampers, D-1A and D-1B - CLOSE.
East and West Inlet dampers, D-2 and D-3 - OPEN.
Control Room Recirc. dampers, D-11A and D-11B - OPEN.

b. Ventilation Inlet dampers, D-1A and D-1B - OPEN.
East and West Inlet dampers, D-2 and D-3 - CLOSE.
Control Room Recirc. dampers, D-11A and D-11B - OPEN.

c. Ventilation Inlet dampers, D-1A and D-1B - CLOSE.
East and West Inlet dampers, D-2 and D-3 - OPEN.
Control Room Recirc. dampers, D-11A and D-11B - CLOSE.

d. Ventilation Inlet dampers, D-1A and D-1B - OPEN.
East and West Inlet dampers, D-2 and D-3 - CLOSE.
Control Room Recirc. dampers, D-11A and D-11B - CLOSE.

QUESTION: 063

The following conditions exist on Unit 3:

- The unit has been shut down at Beginning-Of-Life for equipment repairs.
- PRZ level is being maintained at 30%.
- RCS temperature is 140°F.

The following events occur 10 days after the shutdown:

- The running RHR pump trips and neither RHR pump can be restarted.
- Operators are unable to establish any other method of RCS cooling.

Which ONE of the following identifies the time closest to when the RCS will enter Mode 4?

a. 12 minutes

b. 35 minutes

c. 42 minutes

d. 50 minutes

QUESTION: 064

A reactor and turbine trip occurs on Unit 3 while at 25% power.

Which ONE of the following describes the response of the Steam Dump to Condenser (SDTC) system?

a. Only 2 SDTC valves will arm.
The SDTC system will reduce Tavg to no-load Tavg.

b. Only 2 SDTC valves will arm.
The SDTC system will reduce Tavg to within 5°F of Tref.

c. All 4 SDTC valves will arm.
The SDTC system will reduce Tavg to no-load Tavg.

d. All 4 SDTC valves will arm.
The SDTC system will reduce Tavg to within 5°F of Tref.

QUESTION: 065

Unit 3 was operating at 100% with all systems in normal alignment. An SI signal occurs. All systems function as designed.

After sequencing is complete, which ONE of the following describes the number of CCW load(s) attached to the CCW System as it relates to the CCW "Rule of Five"?

a. One CCW load

b. Two CCW loads

c. Three CCW loads

d. Four CCW loads

QUESTION: 066

The following conditions exist on Unit 3:

- The unit is in Mode 1.
- The operators have entered 0-ONOP-013 "Loss of Instrument Air."
- Instrument air pressure is 70 psig and slowly decreasing.
- All available instrument air compressors are running.

Which ONE of the following would require the unit to be tripped?

Isolating Instrument Air to the:

a. Intake area.

b. Control Room.

c. Containment Building.

d. Unit 3 Main Steam Platform.

QUESTION: 067

Unit 3 is at 50% power with the 3C Charging pump out of service.

The RCO notes the following Control Room indications:

- Annunciator G 1/2, "CHARGING PUMP HI SPEED" alarms.
- The only running Charging pump (3A) is in Auto with 100% output demanded.
- PRZ level is 33% and decreasing.

Which ONE of the following describes the required procedural response?

a. Isolate letdown. If PRZ level continues to decrease, then start the 3B Charging pump and maximize charging flow.

b. Isolate letdown. If PRZ level continues to decrease, then trip the reactor and turbine and transition to E-0, "Reactor Trip or Safety Injection."

c. Start the 3B Charging pump and maximize charging flow. If PRZ level continues to decrease, then isolate letdown.

d. Start the 3B Charging pump and maximize charging flow. If PRZ level continues to decrease, then trip the reactor and turbine and transition to E-0, "Reactor Trip or Safety Injection."

QUESTION: 068

Operators are responding to a large break LOCA. They are currently aligning the ECCS system for Hot Leg recirculation. Step 10 of ES-1.4, "Transfer to Hot Leg Recirculation," directs the operators to start the second RHR pump.

Which ONE of the following describes why the operators are directed to start the second RHR pump?

Starting the second RHR pump allows the operators to:

a. start a second HHSI pump to increase hot leg injection flow.

b. direct flow simultaneously to the cold legs and to the suction of the HHSI pump.

c. align alternate hot leg recirculation using RHR Recirculation Isolation valve, 741A.

d. align alternate hot leg recirculation using Alternate Low Head Injection valve, MOV-872.

QUESTION: 069

Unit 3 is in Mode 5 when RCS loop pressure transmitter, PT-405, fails high.

Which ONE of the following identifies the effect of this failure on:

1) PRZ PORV – 455C and PORV – 456

2) Loop 3C RHR Pump Suction Stop Valves, MOV-750 and MOV-751?

	PORV-455C	PORV-456	MOV-750	MOV-751
a.	OPENS	NONE	NONE	CLOSES
b.	OPENS	NONE	CLOSES	NONE
c.	NONE	OPENS	NONE	CLOSES
d.	NONE	OPENS	CLOSES	NONE

QUESTION: 070

During operation at reduced power the following conditions exist:

- Tavg is 560°F.
- PRZ level is 45%.
- PRZ pressure is 2230 psig.

Which ONE of the following describes the PRZ heater status the RCO should verify?

a. Control Group – On.
Backup Groups – On.

b. Control Group – On.
Backup Groups – Off.

c. Control Group – Off.
Backup Groups – On.

d. Control Group – Off.
Backup Groups – Off.

QUESTION: 071

Which ONE of the following identifies the protection provided by the OTΔT reactor trip signal and the condition that would cause the OTΔT setpoint to decrease?

	Protection	Condition
a.	DNB	Tavg increasing
b.	DNB	PRZ Pressure increasing
c.	Excessive Power Density	Tavg increasing
d.	Excessive Power Density	PRZ Pressure increasing

QUESTION: 072

Unit 3 is operating at 100% power with all systems in their normal configuration, when the Tavg Median Signal Selector, TM-408, fails low.

Which ONE of the following describes the plant response?

a. Control rods will not move. Charging pump speed will increase.

b. Control rods will not move. Charging pump speed will decrease.

c. Control Rods will step in. Charging pump speed will increase.

d. Control rods will step in. Charging pump speed will decrease.

QUESTION: 073

The following refueling conditions exist on Unit 4:

- Core off-load is in progress.
- A reactor vessel refueling cavity seal failure occurs.

Assuming no operator action, which ONE of the following describes the effect on fuel assemblies in the SFP?

Fuel assemblies in the SFP will be:

a. completely uncovered.

b. partially uncovered.

c. covered with a few feet of water above them.

d. covered with SFP water remaining at its normal level.

QUESTION: 074

Which ONE of the following describes the advantages of using ES-3.1, "Post-SGTR Cooldown Using Backfill," as compared to ES-3.2, "Post-SGTR Cooldown Using Blowdown," or ES-3.3, "Post-SGTR Cooldown Using Steam Dump"?

ES-3.1, "Post-SGTR Cooldown Using Backfill":

a. minimizes radiological releases and is the fastest method to cool the RCS.

b. minimizes radiological releases and facilitates processing of contaminated water.

c. maximizes inventory in the RCS and is the fastest method to cool the RCS.

d. maximizes inventory in the RCS and facilitates processing of contaminated water.

QUESTION: 075

The following conditions exist on Unit 3:

- The unit is in Mode 3 with Tavg at 545°F.
- The Steam Dump to Condenser (SDTC) system Mode Selector switch is in the MAN position.
- PT-464, Steam Header Pressure, fails high.

Which ONE of the following describes the effect on the SDTC system?

a. Only 2 valves will open and will remain open.

b. Only 2 valves will open and then close when Tavg decreases to 543°F.

c. All 4 valves will open and will remain open.

d. All 4 valves will open and then close when Tavg decreases to 543°F.

QUESTION: 076

Which ONE of the following identifies the first PRMS detector that should respond to a SGTR and the effect on the detector?

a. Condenser Air Ejector Monitor, R-15. R-15 will be automatically isolated.

b. Condenser Air Ejector Monitor, R-15. R-15 will not be automatically isolated.

c. Steam Generator Blowdown Sample Monitor, R-19. R-19 will be automatically isolated.

d. Steam Generator Blowdown Sample Monitor, R-19. R-19 will not be automatically isolated.

QUESTION: 077

Unit 3 is at 100% power with its Startup Transformer out of service when an automatic reactor trip occurs.

- The 3A EDG starts and repowers the 3A 4KV Bus.
- The 3B EDG locks out and cannot be restarted.

The Unit 3 ANPS directs the BOP to use 3-ONOP-004.3, "Loss of 3B 4KV Bus," to restore power to the 3B 4KV Bus.

Which ONE of the following describes how power will be restored to the 3B 4KV Bus?

Power will be restored to the 3B 4KV Bus from the:

a. 3A 4KV Bus.

b. Unit 4 Startup Transformer.

c. 3C 4KV Bus.

d. Station Blackout Tie Line.

QUESTION: 078

Unit 3 is operating at 100% power with all systems in normal alignment. 3A EDG is being run for surveillance purposes and is presently tied to the 3A 4KV Bus.

The following events occur:

- A main generator lockout occurs.
- Startup transformer breaker, 3AA05, fails to close and is mechanically bound.
- 3A Reactor Coolant Pump breaker, 3AA01, fails to automatically open.

Which ONE of the following describes the required operator response?

a. Manually open EDG breaker 3AA20, strip the 3A 4KV Bus using 3-ONOP-004.2, "Loss of 3A 4KV Bus," and manually close breaker 3AA20.

b. Manually open EDG breaker 3AA20, strip the 3A 4KV Bus using 3-ONOP-004.2, "Loss of 3A 4KV Bus," and verify breaker 3AA20 automatically closes.

c. Verify EDG breaker 3AA20 automatically opens, strip the 3A 4KV Bus using 3-ONOP-004.2, "Loss of 3A 4KV Bus," and manually close breaker 3AA20.

d. Verify EDG breaker 3AA20 automatically opens, strip the 3A 4KV Bus using 3-ONOP-004.2, "Loss of 3A 4KV Bus," and verify breaker 3AA20 automatically closes.

QUESTION: 079

Unit 3 is at 100% power when PRMS R-3-20, Reactor Coolant Letdown, radiation monitor alarms. HP investigates and surveys the area in the Pipe and Valve Room.

The HP Supervisor reports the presence of a Hot Spot that is reading 400 mr/hr at 2 feet from the source.

Which ONE of the following identifies the distance from the source at which the measured dose rate will be 100 mr/hr?

a. 4 feet

b. 6 feet

c. 8 feet

d. 10 feet

QUESTION: 080

Unit 3 was operating at 100% power when the following events occurred:

- A Loss of Off Site Power (LOOP)
- The 3A1 Circulating Water Pump breaker did not open.
- All other systems responded as designed.

Which ONE of the following describes the effect on the 3A EDG breaker and 3A Sequencer?

	3A EDG Breaker	3A Sequencer
a.	Remains OPEN	Sequences
b.	Remains OPEN	Does Not Sequence
c.	Automatically CLOSES	Sequences
d.	Automatically CLOSES	Does Not Sequence

QUESTION: 081

Units 3 and 4 are at 100% power when the following events occur:

- A loss of instrument air has occurred on both units.
- 3CM, 3CD, 4CM, and 4CD instrument air compressors are all inoperable.
- The NPO has been directed to open the four inch Service Air Supply to Unit 3/Unit 4 Tie Valve.
- The NPO reports that the four inch Service Air Supply valve cannot be opened.

Which ONE of the following describes the correct operator response?

Open the:

a. Service Air Supply valve from Units 1 & 2.

b. Instrument Air Supply valve from Units 1 & 2.

c. Breathing Air Supply cross-tie valve.

d. two inch Service Air Supply to Unit 3/Unit 4 tie valve.

QUESTION: 082

Both units are at 100% power when a leak occurs in the Main Fire Loop. Loop pressure decreases continuously.

Which ONE of the following identifies the first pump to auto start?

a. The standby Jockey pump

b. The standby Service Water pump

c. The Electric Fire pump

d. The Diesel Engine Driven Fire pump

QUESTION: 083

Unit 4 is at 100% power.

Which ONE of the following conditions, per Tech. Specs., would require action to be taken within one hour to prevent a plant shutdown?

a. RCS Tavg is 543°F.

b. RCS pressure boundary leakage is 1 gpm.

c. Containment pressure is 3.1 psig.

d. Containment temperature is 122°F.

QUESTION: 084

A large break LOCA occurred on Unit 4.

In accordance with ODI-CO-028, "Conduct of Crew Briefs," Which ONE of the following describes when a crew brief should be held during performance of the EOPs?

a. After Step 4 of E-0 is complete.

b. After Step 16 of E-0 is complete.

c. Upon transitioning from E-0.

d. Upon making the Emergency Classification.

QUESTION: 085

Which ONE of the following identifies the minimum shift manning requirements with one unit in Mode 1 and the other unit in Mode 5?

	NPS	SRO	RO	AO	STA
a.	1	2	3	3	1
b.	1	1	3	3	1
c.	1	1	3	3	0
d.	1	1	2	3	1

QUESTION: 086

Unit 4 is in Mode 3 and PRZ pressure is 2235 psig.

Which ONE of the following conditions results in HHSI Loop B hot leg check valve, 4-874B, having acceptable leakage in accordance with Tech. Specs.?

a. The currently measured leakage is 5.5 gpm.

b. The previously measured leakage was 0.5 gpm and the currently measured leakage is 3.0 gpm.

c. The previously measured leakage was 2.0 gpm and the currently measured leakage is 3.7 gpm.

d. The previously measured leakage was 4.0 gpm and the currently measured leakage is 4.4 gpm.

QUESTION: 087

Engineering is analyzing Spent Fuel Pool Heat Exchanger performance and requests the Operations Department to swap to the low SFP pump suction, from the currently configured high SFP pump suction as described in the FSAR.

Which ONE of the following describes the required action(s) to comply with Engineering's request?

a. A "One Time Only" approved OTSC is required.

b. Stationing an operator as a Human Clearance is required.

c. An approved Safety Evaluation and Temporary Procedure are required.

d. Operations Department Manager and NRC Resident approval are required.

QUESTION: 088

A Safety Evaluation has been performed on a proposed plant change and the results reveal that the margin of safety, as defined in the basis of Tech. Specs, will be reduced.

Which ONE of the following is correct regarding implementation of the proposed change?

An Unreviewed Safety Question:

a. exists.
NRC authorization is required prior to implementation.

b. exists.
NRC authorization is not required prior to implementation.

c. does not exist.
NRC authorization is required prior to implementation.

d. does not exist.
NRC authorization is not required prior to implementation.

QUESTION: 089

Unit 3 is at 100% power.

Mechanical Maintenance is planning to erect a scaffold over Redundant Safety Related Equipment to perform trouble shooting activities.

Which ONE of the following identifies the highest level of approval required for the erection of this scaffolding?

a. ANPS

b. NPS

c. Operations Supervisor

d. Operations Manager

QUESTION: 090

The following conditions exist:

- Unit 3 is in Mode 1.
- Unit 4 is in Mode 3.

Which ONE of the following correctly states the Condensate Storage Tanks system minimum indicated volume required by Technical Specifications and its basis?

	VOLUME	BASIS
a.	210,000 gal.	Provides sufficient volume to cooldown the RCS to below 350°F within 15 hours.
b.	210,000 gal.	Provides sufficient volume to maintain the RCS at Hot Standby for approximately 23 hours.
c.	420,000 gal.	Provides sufficient volume to cooldown the RCS to below 350°F within 15 hours.
d.	420,000 gal.	Provides sufficient volume to maintain the RCS at Hot Standby for approximately 23 hours.

QUESTION: 091

A spent fuel assembly is suspended from the manipulator crane when a Refueling Cavity seal failure occurs.

Which ONE of the following describes the correct manipulator operator response?

a. Insert the assembly into the upender and unlatch it.

b. Insert the assembly into the upender and leave it latched.

c. Return the assembly to the reactor core and unlatch it.

d. Return the assembly to the reactor core and leave it latched.

QUESTION: 092

Rod Control is in automatic with reactor and turbine power stable.

Which ONE of the following rod control inputs will result in control rod speed of 40 steps per minute?

Tavg greater than Tref by:

a. 2.75°F

b. 3.0°F

c. 3.25°F

d. 4.0°F

QUESTION: 093

As the NPS you have been asked to approve the attached Liquid Release Permit.

Which ONE of the following identifies why you should not approve the permit?

a. The specific activity of the tank is too high.

b. The specific activity is for the wrong tank.

c. The Σ C/EC limit has been exceeded.

d. The Administrative Release limit has been exceeded.

QUESTION: 094

Which ONE of the following conditions would prevent the use of the Post Accident Containment Vent system to purge Containment atmosphere to the in-service Gas Decay Tank (GDT), following a LOCA?

a. Containment pressure is 15 psig.

b. Containment temperature is 120°F.

c. In-service GDT Oxygen concentration is 1%.

d. In-service GDT Hydrogen concentration is 3%.

QUESTION: 095

The following conditions exist on Unit 3:

- The ANPS is reading ECA-2.1, "Uncontrolled Depressurization of All Steam Generators," step 3, "Control Feed Flow to Minimize RCS Cooldown."

- The operator observes 3B S/G pressure is now increasing.

Which ONE of the following is the correct operator action?

a. Return to step 1 of ECA-2.1.

b. Continue in ECA-2.1 from the present step.

c. Transition to E-2, "Faulted Steam Generator."

d. Transition to E-1, "Loss of Reactor or Secondary Coolant."

QUESTION: 096

Unit 4 is operating at 100% power with the 4A EDG out of service when the following sequence of events occur:

- The operators respond to an ATWS using FR-S.1, "Response to Nuclear Power Generation/ATWS."
- The reactor trips due to a loss of off-site power.
- The 4B EDG locks out and cannot be restarted.

Which ONE of the following describes the correct operator response?

a. Complete the actions of FR-S.1 and then go to ECA-0.0, "Loss of All AC Power." Power will be restored to a 4KV bus using the appropriate ONOP upon completion of ECA–0.0.

b. Complete the actions of FR-S.1 and then go to ECA-0.0, "Loss of All AC Power." Power will be restored to a 4KV bus using the appropriate ONOP while performing the actions of ECA-0.0.

c. Stop performance of FR-S.1 and immediately go to ECA-0.0, "Loss of All AC Power." Power will be restored to a 4KV bus using the appropriate ONOP upon the completion of ECA–0.0.

d. Stop performance of FR-S.1 and immediately go to ECA-0.0, "Loss of All AC Power." Power will be restored to a 4KV bus using the appropriate ONOP while performing the actions of ECA-0.0.

QUESTION: 097

Unit 3 is at 100 % power when all Unit 3 annunciators are suddenly blacked out. No reactor trip signals are generated and the plant remains at full power.

Which ONE of the following describes the correct operator response?

a. Maintain the plant stable and dispatch an operator to DC Bus 3D01.

b. Maintain the plant stable and dispatch an operator to DC Bus 3D23.

c. Trip the reactor and turbine and dispatch an operator to DC Bus 3D01.

d. Trip the reactor and turbine and dispatch an operator to DC Bus 3D23.

QUESTION: 098

Which ONE of the following would require the Emergency Coordinator to direct Chemistry personnel to perform 0-EPIP-20126, "Off-site Dose Calculations"?

a. A Site Area Emergency has been declared.

b. An Owner Controlled Area Evacuation has been implemented.

c. PRMS R-14, Plant Vent, has increased by a factor of 20.

d. Airborne radioactivity levels outside of plant buildings are 10% of DAC.

QUESTION: 099

Which ONE of the following is the minimum PARs that shall be issued for a declared General Emergency?

a. Shelter all people within a 2 mile radius from the plant and 5 miles in the down wind sectors.

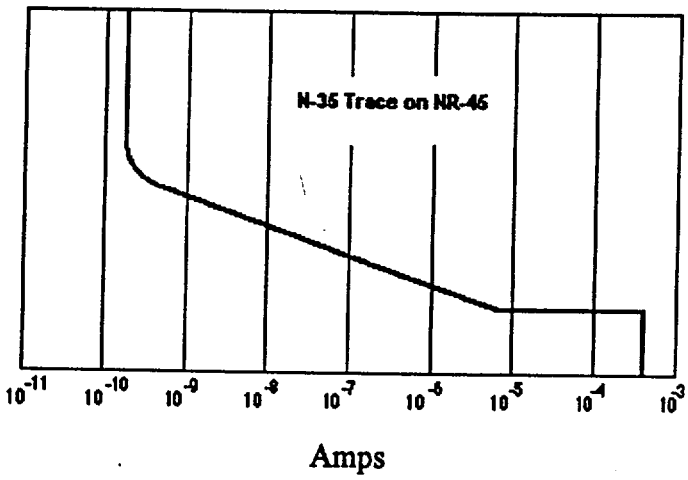
b. Shelter all people within a 2 mile radius from the plant and 10 miles in the down wind sectors.

c. Evacuate all people within a 2 mile radius from the plant and shelter all people between 2 and 5 miles in the down wind sectors.

d. Evacuate all people within a 2 mile radius from the plant and shelter all people between 2 and 10 miles in the down wind sectors.

QUESTION: 100

Unit 3 was operating at 100% power when the reactor tripped. The RCO observes the following Intermediate Range trace on NIS recorder NR-45:



Which ONE of the following statements is correct?

a. N-35 is under compensated.
The NIS Source Ranges will automatically energize.

b. N-35 is under compensated.
The NIS Source Ranges will not automatically energize.

c. N-35 is over compensated.
The NIS Source Ranges will automatically energize.

d. N-35 is over compensated.
The NIS Source Ranges will not automatically energize.

TURKEY POINT PLANT

1999 NRC EXAM

SRO OPEN REFERENCES

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VI. 0-NCOP-003, Pages 23 and 32
(A prepared Liquid Release Permit)

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
15	**Try To Start One RCP:**	
	a. Start Oil Lift Pump.	
	b. **WHEN** 2 minute oil lift pressure time delay is satisfied, **THEN** verify Permissive to start light - ON	
	c. Start one RCP	c. Perform the following: 1) Verify natural circulation. Refer to ATTACHMENT 1. **IF** natural circulation cannot be verified, **THEN** increase dumping steam. 2) Go to Step 16.
	d. **WHEN** RCP has been running greater than 1 minute, **THEN** stop oil lift pump	
16	**Check High-Head SI Pumps - ANY RUNNING**	Perform one of the following: a. **IF** RHR pump running in SI mode, **THEN** go to Step 28. b. **IF** RHR pump **NOT** running in SI mode, **THEN** go to Step 20.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

17 **Check If One High-Head SI Pump Should Be Stopped:**

a. Determine required RCS subcooling from table:

CHARGING PUMP STATUS	RCS SUBCOOLING (°F) - BASED ON CORE EXIT TCs			
	ANY RCP RUNNING		NO RCP RUNNING	
	ONE HIGH-HEAD PUMP RUNNING	TWO HIGH-HEAD PUMPS RUNNING	ONE HIGH-HEAD PUMP RUNNING	TWO HIGH-HEAD PUMPS RUNNING
NONE RUNNING	DO NOT STOP HIGH-HEAD SI PUMP	69°F[304°F]	DO NOT STOP HIGH-HEAD SI PUMP	80°F[304°F]
ONE RUNNING	375°F[377°F]	64°F[301°F]	374°F[376°F]	74°F[301°F]
TWO RUNNING	351°F[374°F]	60°F[298°F]	349°F[374°F]	70°F[298°F]
THREE RUNNING	316°F[371°F]	57°F[296°F]	315°F[371°F]	66°F[296°F]

b. Check RCS subcooling based on core exit TCs - GREATER THAN REQUIRED SUBCOOLING

b. Perform the following:

1) **IF** RCS hot leg temperatures greater than 325°F, **THEN** go to Step 28.

2) **IF** RCS hot leg temperatures less than 325°F, **THEN** perform the following:

a) **IF** no RHR pumps are running, **THEN** start one RHR pump.

b) **IF** neither RHR pump can be started, **THEN** go to Step 28.

c. Check PRZ level - GREATER THAN 23%[50%]

c. Perform the following:

1) DO NOT STOP HIGH-HEAD SI PUMP.

2) OBSERVE CAUTION PRIOR TO STEP 10 and return to Step 10.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

NOTE

After stopping any high-head SI pump, RCS pressure shall be allowed to stabilize or increase before stopping another pump.

18 **Stop One High-Head SI Pump**

19 **Return To Step 16**

20 **Check If Charging Flow Should Be Controlled To Maintain PRZ Level:**

a. Check RHR pumps - NONE RUNNING IN SI MODE — a. Go to Step 28.

b. Control charging flow to maintain PRZ level

CAUTION

If RCP seal cooling from seal injection and thermal barrier CCW flow has previously been lost, the affected RCP(s) shall not be started prior to a status evaluation.

21 **Check RCPs - ALL STOPPED** — Perform the following:

a. Stop all but one RCP.

b. OBSERVE CAUTION PRIOR TO STEP 26 and go to Step 26.

22 **Check Plant Conditions For Starting Desired RCP:** — Perform the following:

a. Verify the A or B 4KV bus - ENERGIZED FROM STARTUP TRANSFORMER

b. Verify number one seal ΔP - GREATER THAN 200 PSID

c. Verify thermal barrier ΔP - GREATER THAN 0 INCHES OF WATER

d. Verify proper number one seal leak-off flow - GREATER THAN 0.8 GPM

1. Verify natural circulation. Refer to ATTACHMENT 1. **IF** natural circulation cannot be verified, **THEN** increase dumping steam.

2. Go to Step 26.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

CAUTION

CCW System load requirements SHALL NOT be exceeded.

23 **Establish Proper CCW System Alignment For RCP Operation:**

a. CCW pumps - ONLY TWO RUNNING

a. Perform the following:

1) **IF** all CCW pumps are running, **THEN** stop and place in standby 3C CCW pump.

2) **IF** one CCW pump is running **AND** 3 CCW Heat Exchangers are in service, **THEN** start one of the standby CCW pumps.

b. CCW Heat Exchangers - THREE IN SERVICE

b. Perform the following:

1) Stop and place in Standby all EXCEPT ONE running CCW pump.

2) **IF** MOV-3-749A **AND** MOV-3-749B are OPEN, **THEN** Stop and place in Pull-To-Lock all EXCEPT one running CCW pump.

3) Go to Step 23c.

c. Check CCW from RHR Heat Exchangers
- AT LEAST ONE CLOSED

- MOV-3-749A
- MOV-3-749B

c. Perform the following:

1) Isolate one Emergency Containment Cooler by placing one ECC Control Switch in STOP.

2) **IF** unable to isolate one ECC **THEN** Stop ALL RCP's **AND** verify Natural Circulation using ATTACHMENT 1. **THEN** go to Step 26.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
24	**Establish Proper CCW Valve Alignment For RCP Operation:**	
	a. Check RCP Thermal Barrier CCW Outlet, MOV-3-626 - OPEN	a. Perform the following: 1) **IF** CCW radiation levels are normal, **THEN** manually open MOV-3-626. 2) **IF** MOV-3-626 can **NOT** be manually opened, **THEN** direct operator to slowly open MOV-3-626 locally.
	b. Verify the following valves - OPEN • MOV-3-716A, RCP CCW Inlet • MOV-3-716B, RCP CCW Inlet • MOV-3-730, RCP Bearing CCW Outlet	b. Manually open valves. **IF** MOVs can **NOT** be manually opened, **THEN** direct operator to open MOVs locally.
	c. Open CCW To Normal Containment Cooler valves • MOV-3-1417 • MOV-3-1418	c. Perform the following: 1) Verify natural circulation. Refer to ATTACHMENT 1. **IF** natural circulation cannot be verified, **THEN** increase dumping steam. 2) Go to Step 26.
	d. Reset and start normal containment coolers	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

NOTE

If possible, RCPs B or C shall be run to provide normal PRZ spray, RCP A will not provide adequate spray flow.

25 Try To Start One RCP:

a. Start Oil Lift Pump

b. **WHEN** 2 minute oil lift pressure time delay is satisfied, **THEN** verify Permissive to start light - ON

c. Start one RCP

c. Perform the following:

1) Verify natural circulation. Refer to ATTACHMENT 1. **IF** natural circulation cannot be verified, **THEN** increase dumping steam.

2) Go to Step 26.

d. **WHEN** RCP has been running greater than 1 minute, **THEN** stop oil lift pump

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

CAUTION

Voiding may occur in the RCS during RCS depressurization. This will result in a rapidly increasing PRZ level.

26 Depressurize RCS To Minimize RCS Break Flow:

a. Use normal PRZ spray

a. Use one PRZ PORV. IF no PORV available, THEN use auxiliary spray.

b. Check the A and B 4KV buses - ENERGIZED BY OFFSITE POWER

b. Verify adequate diesel capacity to energize all PRZ heaters (450 KW for each backup heater group). IF adequate diesel capacity is NOT available, THEN locally open individual heater breakers until PRZ heater load is within diesel capacity. Refer to ATTACHMENT 2, for component KW load rating.

c. Turn on PRZ heaters as necessary to stop depressurization

d. Depressurize RCS until either of the following conditions satisfied:

* PRZ level - GREATER THAN 71%[50%]

OR

* RCS subcooling based on core exit TCs - LESS THAN 40°F[220°F]

27 Verify Adequate Shutdown Margin:

a. Sample RCS for boron

b. Shutdown margin - ADEQUATE

b. Borate to establish adequate shutdown margin.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
28	**Verify SI Flow Not Required:**	
	a. RCS subcooling based on core exit TCs - GREATER THAN 30°F[210°F]	a. Manually start SI pumps to restore RCS subcooling and go to Step 29.
	b. PRZ level - GREATER THAN 12%[50%]	b. Perform the following: 1) Manually start SI pumps to restore PRZ level. 2) OBSERVE CAUTION PRIOR TO STEP 10 and return to Step 10.
29	**Check If SI Accumulators Should Be Isolated:**	
	a. RCS subcooling based on core exit TCs - GREATER THAN 30°F[210°F]	a. Perform one of the following: 1) <u>IF</u> at least two RCS hot leg temperatures less than 340°F, <u>THEN</u> go to Step 29c. 2) <u>IF</u> at least two RCS hot leg temperatures <u>NOT</u> less than 340°F, <u>THEN</u> go to Step 30.
	b. PRZ level - GREATER THAN 12%[50%]	b. OBSERVE CAUTION PRIOR TO STEP 10 and return to Step 10.
	c. Locally unlock and close the following breakers: • 30532 for MOV-3-865A • 30631 for MOV-3-865B • 30733 for MOV-3-865C	
	d. Close all SI Accumulator Discharge MOVs • MOV-3-865A • MOV-3-865B • MOV-3-865C	d. Direct operator to vent any unisolated accumulators using 3-OP-064, SAFETY INJECTION ACCUMULATORS
	e. Locally open and lock the following breakers: • 30532 for MOV-3-865A • 30631 for MOV-3-865B • 30733 for MOV-3-865C	

ATTACHMENT 5
(Page 1 of 3)

GUIDELINES FOR CONTINUED PLANT OPERATION
WITH PRIMARY-TO-SECONDARY LEAKAGE

NOTE

*This attachment is to provide guidance for continued unit operation when Primary-to-Secondary leakage has been **CONFIRMED**. These are recommendations only and are to ensure than an identified leak is isolated prior to tube failure.*

1 Determine Immediate Plant Shutdown Required:

a. Rate of S/G tube leakage has increased at a rate equal to or greater than: * 60 gpd in one hour * 2.5 gph in one hour * 0.042 gpm in one hour	a. Go to Step 2 of this Attachment
b. Place the unit in MODE 3 in 1 hour	
c. Unit in MODE 3	c. Return to Step 1a of this Attachment.
d. Return to procedure **AND** Step in effect	

ATTACHMENT 5
(Page 2 of 3)

GUIDELINES FOR CONTINUED PLANT OPERATION
WITH PRIMARY-TO-SECONDARY LEAKAGE

2 Check S/G For Action Level 2 Requirements:

a. S/G Tube leakage is confirmed to be greater than: * 150 gpd * 6.25 gph * 0.10 gpm	a. Go to Step 3 of this Attachment.
b. Perform the following: • Identify the leaking S/G(s) • Increase S/G sampling frequency to once every 15 minutes • Monitor PRMS for increasing trends	
c. Leakage in one S/G confirmed to be greater than: * 150 gpd * 6.25 gph * 0.10 gpm	c. Return to Step 1 of this Attachment.
d. Place the unit in MODE 3 within 6 hours	
e. Unit in MODE 3	e. Return to Step 1 of this Attachment.
f. Return to procedure **AND** Step in effect	

ATTACHMENT 5
(Page 3 of 3)

GUIDELINES FOR CONTINUED PLANT OPERATION
WITH PRIMARY-TO-SECONDARY LEAKAGE

3 Check S/G For Action Level 1 Requirements:

a. S/G Tube leakage is confirmed to be greater than:

* 30 to 150 gpd
* 1.25 to 6.25 gph
* 0.021 to 0.10 gpm

a. Go to Step 4 of this Attachment.

b. Perform the following:

- Identify the leaking S/G(s)
- Increase S/G sampling frequency to once every 15 minutes
- Monitor PRMS for increasing trends

c. Return to Step 1 of this Attachment

4 Determine S/G Tube Leakage:

a. Identify the leaking S/G(s)
b. Increase S/G sampling frequency to once every 15 minutes <u>OR</u> as determined by plant management
c. Monitor PRMS for increasing trends
d. Return to Step 1 of this Attachment

FINAL PAGE

3/4.2.4 QUADRANT POWER TILT RATIO

LIMITING CONDITION FOR OPERATION

3.2.4 The QUADRANT POWER TILT RATIO shall not exceed 1.02.

APPLICABILITY: MODE 1, above 50% of RATED THERMAL POWER*.

ACTION:

a. With the QUADRANT POWER TILT RATIO determined to exceed 1.02 but less than or equal to 1.09:

1. Calculate the QUADRANT POWER TILT RATIO at least once per hour until either:

a) The QUADRANT POWER TILT RATIO is reduced to within its limit, or

b) THERMAL POWER is reduced to less than 50% of RATED THERMAL POWER.

2. Within 2 hours either:

a) Reduce the QUADRANT POWER TILT RATIO to within its limit, or

b) Reduce THERMAL POWER at least 3% from RATED THERMAL POWER for each 1% of indicated QUADRANT POWER TILT RATIO in excess of 1 and similarly reduce the Power Range Neutron Flux-High Trip Setpoints within the next 4 hours.

3. Verify that the QUADRANT POWER TILT RATIO is within its limit within 24 hours after exceeding the limit or reduce THERMAL POWER to less than 50% of RATED THERMAL POWER within the next 2 hours and reduce the Power Range Neutron Flux-High Trip Setpoints to less than or equal to 55% of RATED THERMAL POWER within the next 4 hours; and

4. Identify and correct the cause of the out-of-limit condition prior to increasing THERMAL POWER; subsequent POWER OPERATION above 50% of RATED THERMAL POWER may proceed provided that the QUADRANT POWER TILT RATIO is verified within its limit at least once per hour for 12 hours or until verified acceptable at 95% or greater RATED THERMAL POWER.

*See Special Test Exceptions Specification 3.10.2.

LIMITING CONDITION FOR OPERATION (Continued)

ACTION (Continued)

b. With the QUADRANT POWER TILT RATIO determined to exceed 1.09 due to misalignment of either a shutdown or control rod:

1. Calculate the QUADRANT POWER TILT RATIO at least once per hour until either:

a) The QUADRANT POWER TILT RATIO is reduced to within its limit, or

b) THERMAL POWER is reduced to less than 50% of RATED THERMAL POWER.

2. Reduce THERMAL POWER at least 3% from RATED THERMAL POWER for each 1% of indicated QUADRANT POWER TILT RATIO in excess of 1, within 30 minutes;

3. Verify that the QUADRANT POWER TILT RATIO is within its limit within 2 hours after exceeding the limit or reduce THERMAL POWER to less than 50% of RATED THERMAL POWER within the next 2 hours and reduce the Power Range Neutron Flux-High Trip Setpoints to less than or equal to 55% of RATED THERMAL POWER within the next 4 hours; and

4. Identify and correct the cause of the out-of-limit condition prior to increasing THERMAL POWER; subsequent POWER OPERATION above 50% of RATED THERMAL POWER may proceed provided that the QUADRANT POWER TILT RATIO is verified within its limit at least once per hour for 12 hours or until verified acceptable at 95% or greater RATED THERMAL POWER.

c. With the QUADRANT POWER TILT RATIO determined to exceed 1.09 due to causes other than the misalignment of either a shutdown or control rod:

1. Calculate the QUADRANT POWER TILT RATIO at least once per hour until either:

a) The QUADRANT POWER TILT RATIO is reduced to within its limit, or

b) THERMAL POWER is reduced to less than 50% of RATED THERMAL POWER.

LIMITING CONDITION FOR OPERATION (Continued)

ACTION (Continued)

2. Reduce THERMAL POWER to less than 50% of RATED THERMAL POWER within 2 hours and reduce the Power Range Neutron Flux-High Trip Setpoints to less than or equal to 55% of RATED THERMAL POWER within the next 4 hours; and

3. Identify and correct the cause of the out-of-limit condition prior to increasing THERMAL POWER; subsequent POWER OPERATION above 50% of RATED THERMAL POWER may proceed provided that the QUADRANT POWER TILT RATIO is verified within its limit at least once per hour for 12 hours or until verified at 95% or greater RATED THERMAL POWER.

d. The provisions of Specification 3.0.4 are not applicable.

SURVEILLANCE REQUIREMENTS

4.2.4.1 The QUADRANT POWER TILT RATIO shall be determined to be within the limit above 50% of RATED THERMAL POWER by:

a. Calculating the ratio at least once per 7 days when the Power Range Upper Detector High Flux Deviation and Power Range Lower Detector High Flux Deviation Alarms are OPERABLE, and

b. Calculating the ratio at least once per 12 hours during steady-state operation when either alarm is inoperable.

4.2.4.2 The QUADRANT POWER TILT RATIO shall be determined to be within the limit when above 75% of RATED THERMAL POWER with one Power Range channel inoperable by using the movable incore detectors to confirm that the normalized symmetric power distribution, obtained either from two sets of four symmetric thimble locations or full-core flux map, or by incore thermocouple map is consistent with the indicated QUADRANT POWER TILT RATIO at least once per 12 hours.

4.2.4.3 If the QUADRANT POWER TILT RATIO is not within its limit within 24 hours and the POWER DISTRIBUTION LIMITS of 3.2.2 and 3.2.3 are within their limits, a Special Report in accordance with 6.9.2 shall be submitted within 30 days including an evaluation of the cause of the discrepancy.

FIGURE 1
Page 1 of 1
TYPICAL HEAT UP RATES W/VESSEL FULL

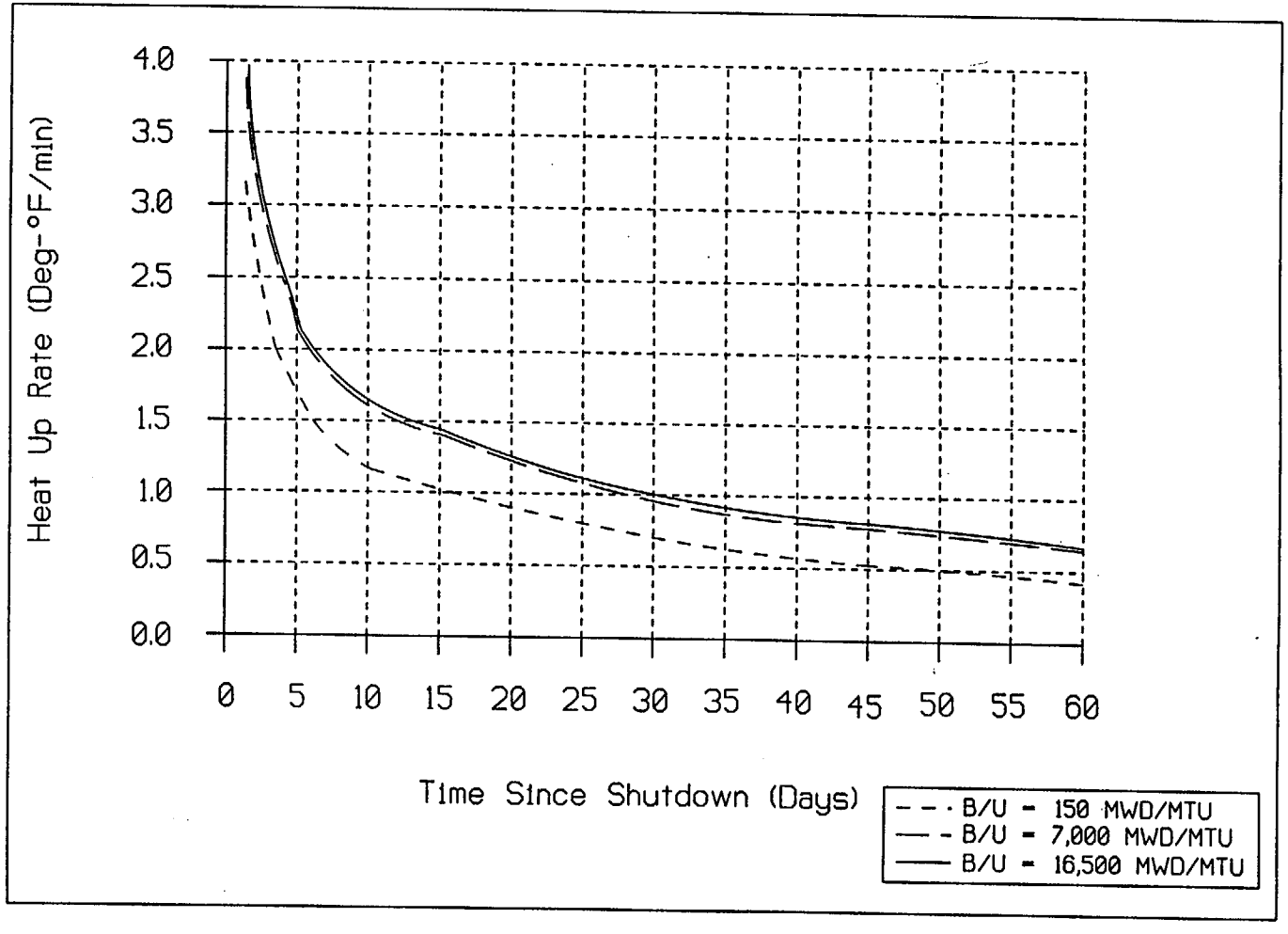


FIGURE 2
(Page 1 of 1)
TYPICAL RCS HEAT UP RATES FOR REDUCED INVENTORY

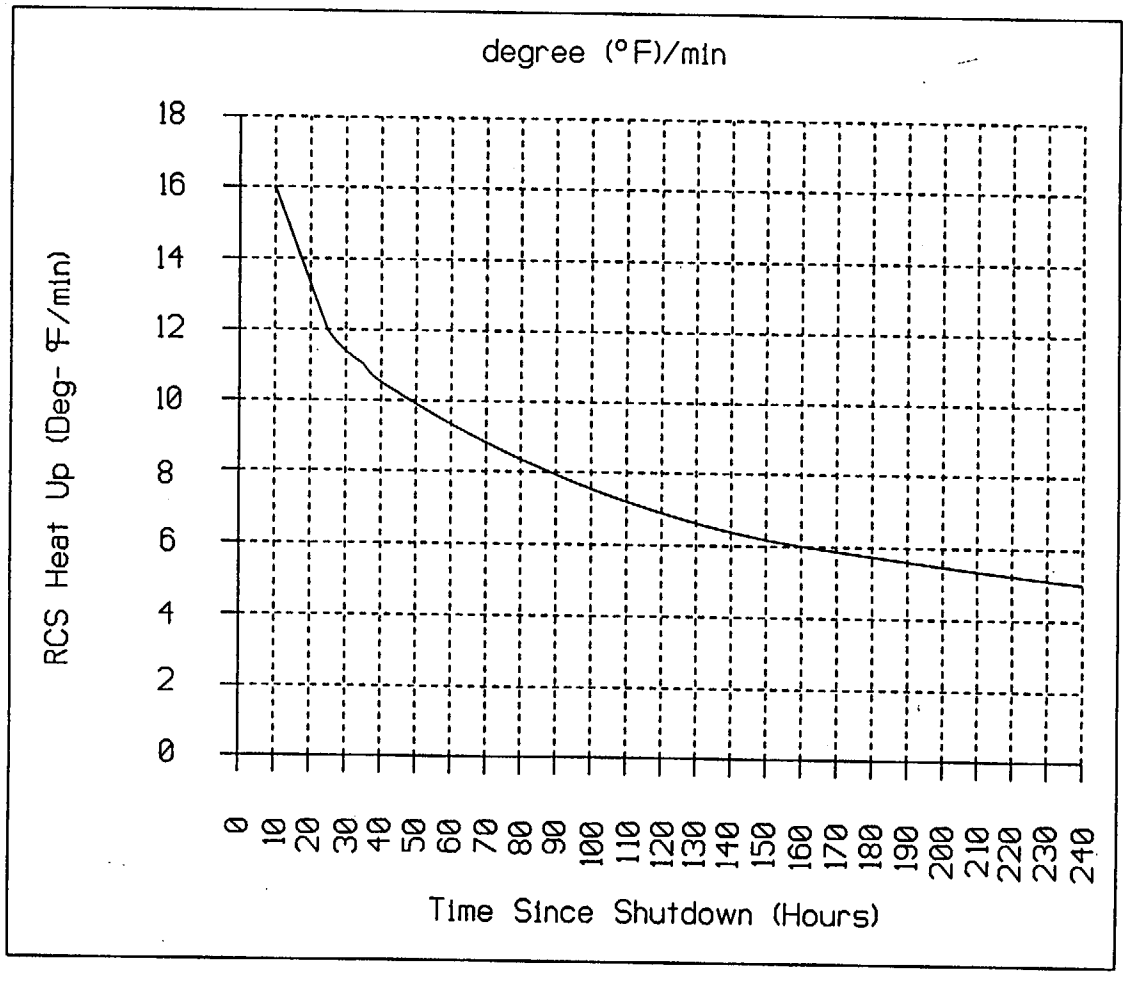


FIGURE 3
(Page 1 of 3)

TYPICAL HEAT UP RATES IN SFP W/FULL OFFLOAD

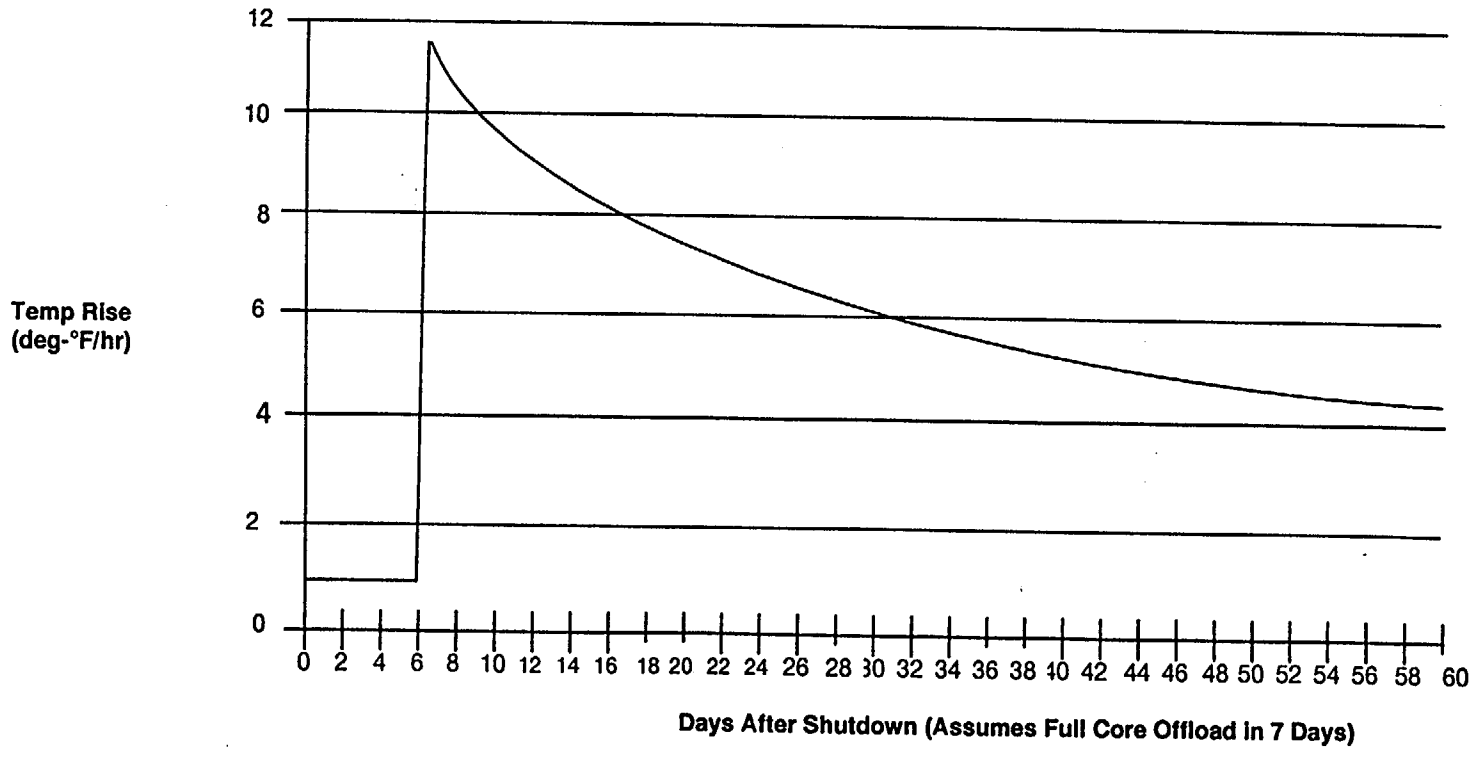


FIGURE 3
(Page 2 of 3)

TYPICAL HEAT UP RATES IN SFP W/FULL OFFLOAD

(Time to Heat Up SFP to 170°F)

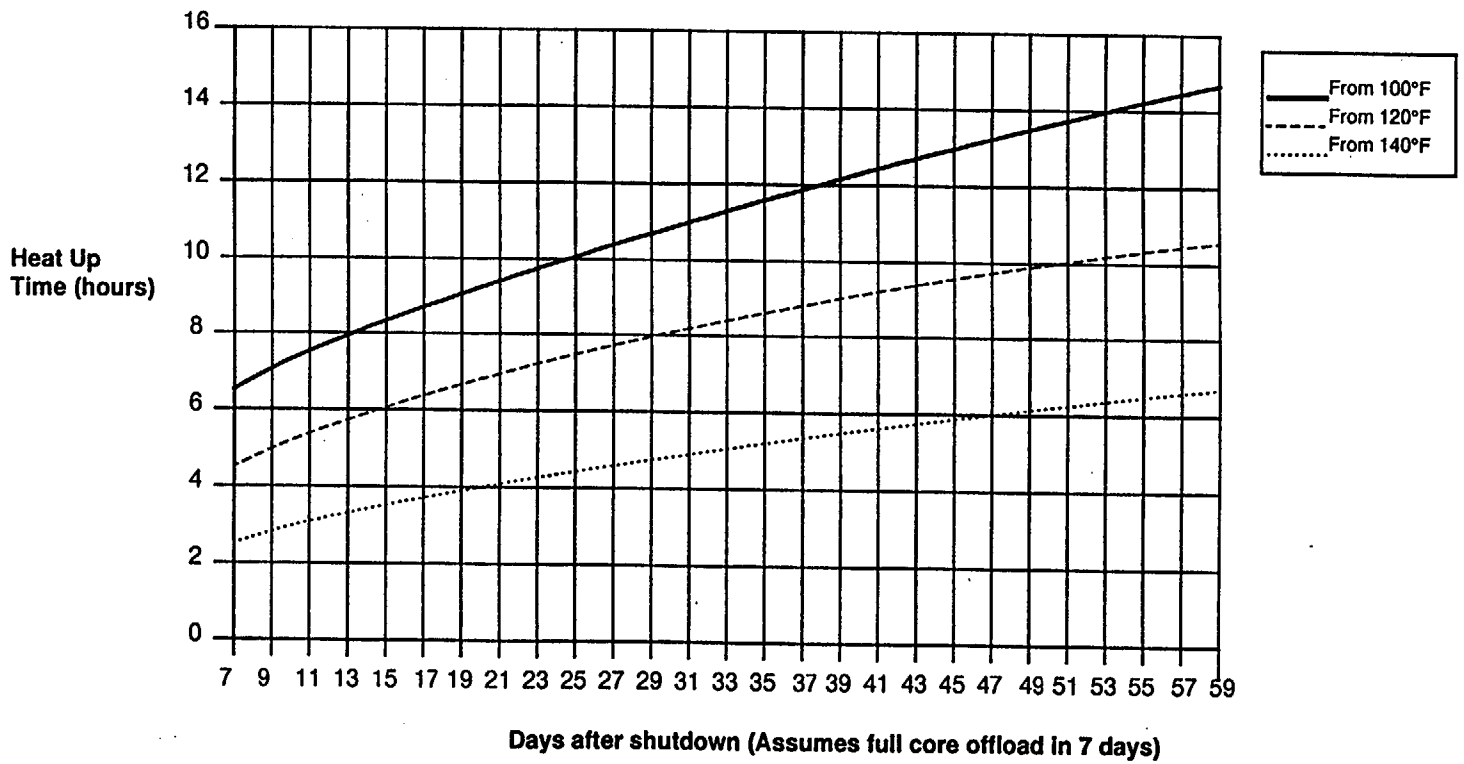
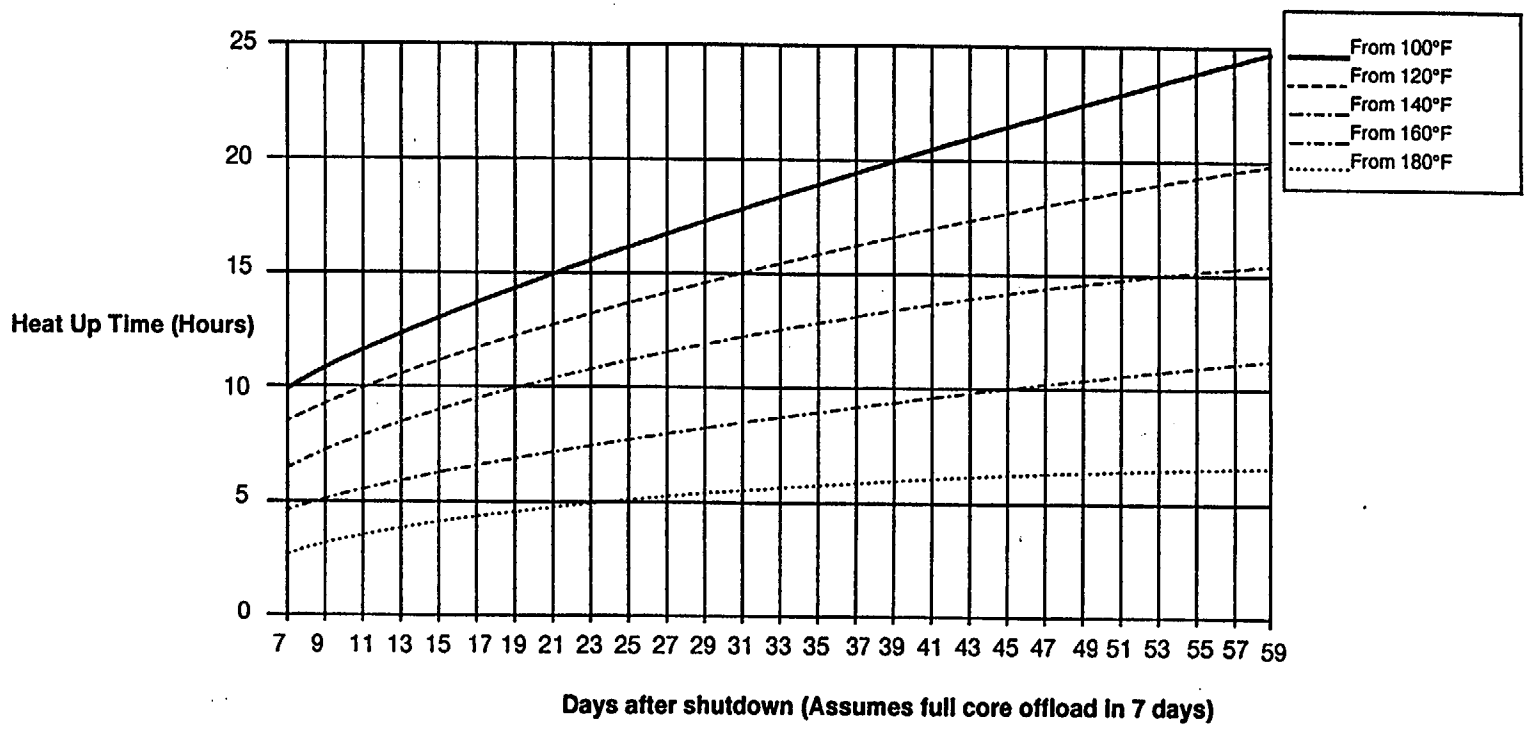


FIGURE 3
(Page 3 of 3)

TYPICAL HEAT UP RATES IN SFP W/FULL OFFLOAD

(Time to Boil SFP)



LIMITING CONDITION FOR OPERATION

3.4.6.2 Reactor Coolant System leakage shall be limited to:

a. No PRESSURE BOUNDARY LEAKAGE,

b. 1 GPM UNIDENTIFIED LEAKAGE,

c. 1 GPM total primary-to-secondary leakage through all steam generators and 500 gallons per day through any one steam generator,

d. 10 GPM IDENTIFIED LEAKAGE from the Reactor Coolant System, and

e. Leakage as specified in Table 3.4-1 up to a maximum of 5 GPM at a Reactor Coolant System pressure of 2235 ± 20 psig from any Reactor Coolant System Pressure Isolation Valve specified in Table 3.4-1.*

APPLICABILITY: MODES 1, 2, 3 and 4

ACTION:

a. With any PRESSURE BOUNDARY LEAKAGE, be in at least HOT STANDBY within 6 hours and in COLD SHUTDOWN within the following 30 hours.

b. With any Reactor Coolant System leakage greater than any one of the above limits, excluding PRESSURE BOUNDARY LEAKAGE, and leakage from Reactor Coolant System Pressure Isolation Valves, reduce the leakage rate to within limits within 4 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

c. With any Reactor Coolant System Pressure Isolation Valve leakage greater than allowed by 3.4.6.2.e above operation may continue provided:

1. Within 4 hours verify that at least two valves in each high pressure line having a non-functional valve are in, and remain in that mode corresponding to the isolated condition, i.e., manual valves shall be locked in the closed position; motor operated valves shall be placed in the closed position and power supplies deenergized. Follow applicable ACTION statement for the affected system, and

*Test pressures less than 2235 psig are allowed. Minimum differential test pressure shall not be less than 150 psid. Observed leakage shall be adjusted for the actual test pressure up to 2235 psig assuming the leakage to be directly proportional to pressure differential to the one-half power.

2. The leakage* from the remaining isolation valves in each high pressure line having a valve not meeting the criteria of Table 3.4-1, as listed in Table 3.4-1, shall be determined and recorded daily. The positions of the other valves located in the high pressure line having the leaking valve shall be recorded daily unless they are manual valves located inside containment.

Otherwise be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

d. With any Reactor Coolant System Pressure Isolation Valve leakage greater than 5 gpm, reduce leakage to below 5 gpm within 1 hour, or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

SURVEILLANCE REQUIREMENTS

4.4.6.2.1 Reactor Coolant System leakages shall be demonstrated to be within each of the above limits by:

a. Monitoring the containment atmosphere gaseous or particulate radioactivity monitor at least once per 12 hours.

b. Monitoring the containment sump level at least once per 12 hours.

c. Performance of a Reactor Coolant System water inventory balance within 12 hours after achieving steady-state operation** and at least once per 24 hours thereafter during steady-state operation, except that not more than 48 hours shall elapse between any two successive inventory balances; and

d. Monitoring the Reactor Head Flange Leakoff System at least once per 24 hours.

4.4.6.2.2 Each Reactor Coolant System Pressure Isolation Valve specified in Table 3.4-1 shall be demonstrated OPERABLE by verifying leakage* to be within its limit:

a. At least once per 18 months.

b. Prior to entering MODE 2 whenever the plant has been in COLD SHUTDOWN for 7 days or more and if leakage testing has not been performed in the previous 9 months, and

c. Prior to returning the valve to service following maintenance, repair or replacement work on the valve.

*To satisfy ALARA requirements, leakage may be measured indirectly (as from the performance of pressure indicators) if accomplished in accordance with approved procedures and supported by computations showing that the method is capable of demonstrating valve compliance with the leakage criteria.

**RCS average coolant temperature being changed by less than 5°F/hour.

LIMITING CONDITION FOR OPERATION (Continued)

d. Following valve actuation due to automatic or manual action or flow through the valve:

1. Within 24 hours by verifying valve closure, and

2. Prior to entering Mode 2 by verifying leakage rate.

The provisions of Specification 4.0.4 are not applicable for entry into MODE 3 or 4.

TABLE 3.4-1

REACTOR COOLANT SYSTEM PRESSURE ISOLATION VALVES

VALVE NUMBER		FUNCTION
Unit 3	Unit 4	High-Head Safety Injection Check Valves
3-874A	4-874A	Loop A, hot leg
3-875A	4-875A	cold leg
3-873A	4-873A	cold leg
3-874B	4-874B	Loop B, hot leg
3-875B	4-875B	cold leg
3-873B	4-873B	cold leg
3-875C	4-875C	Loop C, cold leg
3-873C	4-873C	cold leg
		Residual Heat Removal Line Check Valves
3-876A	4-876A 4-876E	Loop A, cold leg
3-876B 3-876D	4-876B 4-876D	Loop B, cold leg
3-876C 3-876E	4-876C	Loop C, cold leg
	MOV4-750 MOV4-751	Loop A, hot leg to RHR
MOV3-750 MOV3-751		Loop C, hot leg to RHR

ACCEPTABLE LEAKAGE LIMITS

1. Leakage rates less than or equal to 1.0 gpm are considered acceptable.

2. Leakage rates greater than 1.0 gpm but less than or equal to 5.0 gpm are considered acceptable provided that the latest measured rate has not exceeded the rate determined by the previous test by an amount that reduces the margin between previously measured leakage rate and the maximum permissible rate of 5.0 gpm by 50% or greater.

3. Leakage rates greater than 1.0 gpm but less than or equal to 5.0 gpm are considered unacceptable if the latest measured rate exceeded the rate determined by the previous test by an amount that reduces the margin between previously measured leakage rate and the maximum permissible rate of 5.0 gpm by 50% or greater.

4. Leakage rates greater than 5.0 gpm are considered unacceptable.

ATTACHMENT 1
(Page 1 of 1)

FLORIDA POWER AND LIGHT CO TURKEY POINT PLANT RADIOACTIVE LIQUID RELEASE PERMIT	LRP No. 130 DATE: 9-13-99

Monitor Tank: ☐ A ☒ B

Waste Monitor Tank: ☐ A ☐ B ☐ C

Volume to be Released 10,000 Gals.

Part I - Pre-Release Data and Calculations

Radiochemical Analysis - Specific Activity (Liquid)		1.350 E-4 µCi/ml
Calculated Activity to be Released		2.150 E+2 µCi
Estimated Dose for this Release		9.100 E-6 mR
Month-to-date dose prior to this Release		2.200 E-4 mR
Total Estimated Dose after this Release		2.210 E-4 mR
Adminstrative Release Limit		0.25 mR/month
Σ C/EC	Σ C/EC ≤ 1.0	0.910 E0
Dissolved Gas Activity after dilution	<2 X 10-4 µCi/ml	0.000 E0 µCi/ml
Expected R-18/19 Countrate		3.615 E+3 CPM

Part II - Limits

R-18/19 Background = CPM (2.90 E+03) R-18/19 Warning = CPM (5.20 E+03)	R-18/19 Setpoint = CPM (2.50 E+04)
Max. Release Flow Rate 100 GPM	Min. No. of CW Pumps 1
Recirc. Start Time 0800 / 9-13-99	Sample Time 1000 / 9-13-99
Recirc. Pump Disch Press 70 psig	Recirculation Pump Flowrate: N/A GPM

Notes:
Minimum 2 hr recirc. time when using 1 inch mini-recirc. on WMTs.

Part III - Authorization and Approvals:

The approval of the analysis by the Radiochemist (or designee) shall be obtained if the Specific Activity in Part 1 is greater than or equal to 1 x 10-4 µCi/ml. The Nuclear Plant Supervisor shall review and sign Attachment 6 ensuring that the tank recirculated was the same tank that was sampled and that the permit was generated for the correct tank.

Permit Prepared by	I. M. Technician	Technician
Analysis Approved by	I. M. Rad Supervisor	Radiochemistry Supervisor
Release Approved by		NPS

Part IV - Release Data

Release Performed By		
No. of Circ. Water pumps in service	Units 1 and 2	Units 3 and 4
Release Date:	Release Start Time:	Release Stop Time:
R-18 (or R-19) Readings every 15 min from the start of the release		
Recorder/Meter Readings (CPM)	Maximum	Average
Flow Rate (Estimate) GPM	Level before %	Level after %

FOR TRAINING ONLY

ATTACHMENT 6
(Page 1 of 1)

TANK RECIRCULATION AND SAMPLING VERIFICATION SHEET

I have verified that the "B" MONITOR tank was placed on recirculation at 0800 (TIME) on 9-13-99 (DATE) with a flowrate of N/A gpm [for WMT] OR a recirculation pump discharge pressure of 70 psig [for MT].

NOTE

If the WMT is on mini recirc, then a minimum 2 hr recirc is required.

OTSC 0831-96

This was verified by **all** of the following methods:

a. Valve lineup

b. Logbook entries

c. Review of applicable procedure

Senior Nuclear Plant Operator: I.M. SNPO

Date/Time: 9-13-99 / 10:00

I have sampled the "B" WMT tank in accordance with (circle one):

(0-NCZP-046.2) 0-NCZP-061.2

This tank was sampled at 10:05 (TIME) on 9-13-99 (DATE) and was verified to be recirculated one tank volume prior to sampling.

Chemistry Technician: I.M. Chem Tech.

Nuclear Plant Supervisor: _____

FINAL PAGE

★/WRS/dt/lr/dt FOR TRAINING ONLY

QUESTION: 001

The following conditions exist on Unit 3:

- The Rod Control System is in Manual.
- Control Bank C is at 225 steps.
- Control Bank D is at 97 steps.

The following event occurs:

- A Rod Control System malfunction causes continuous rod withdrawal for 10 steps. Rod motion then stops.

Which ONE of the following identifies what the RPIs for control banks C and D should indicate?

a.	Bank C – 225	Bank D – 97
b.	Bank C – 230	Bank D – 97
c.	Bank C – 230	Bank D – 107
d.	Bank C – 235	Bank D - 107

ANSWER: 001

c.

REFERENCE:

SD-005, page 28. SD-006, page 22. COLR Section 2.1

690210602
New
KA 000001AK2.08 (3.1/3.0) RO T1/G2 SRO T1/G1
Pg. 4.2-3
10CFR41.7/45.7
RO Q#17 SRO Q#1
Level 3

QUESTION: 002

The following conditions exist on Unit 3:

- The unit is at 100% power
- A power supply failure in rod control Power Cabinet 1AC results in one dropped rod in Control Bank A Group 1 and one dropped rod in Control Bank C Group 1.

Which ONE of the following actions is correct?

a. Manually runback the turbine.

b. Verify automatic turbine runback.

c. Enter ONOP-28.3 "Dropped RCC" and retrieve both dropped rods.

d. Trip the Reactor and go to E-0 "Reactor Trip Or Safety Injection."

ANSWER: 002

d.

REFERENCES:

ONOP-28.3 Step 1

690220704
New
KA 000003AK.05 (2.5/2.8) RO T1/G2 SRO T1/G1
Pg. 4.2-4
10CFR 41.7/45.7
RO Q#18 SRO Q#2
Level 1

QUESTION: 003

The following conditions exist on Unit 3:

- The operators are responding to a misaligned D Bank, Group 2, control rod using 3-ONOP-28.1 "RCC Misalignment."

- The appropriate lift coil disconnect switches have been placed to the disconnect position.

Which ONE of the following Power Cabinets will be the source of the Urgent Failure alarm that occurs when the operator initiates rod motion?

a. 1AC

b. 1BD

c. 2AC

d. 2BD

ANSWER: 003

b.

REFERENCES:

ONOP-28.1 Note prior to Step 5.9.8, and ARP B 9/4

690210506
New
KA 000005AK2.02 (2.5/2.6) RO T1/G1 SRO T1/G1
Pg. 4.2-6
10CFR 41.7/45.7
RO Q#1 SRO Q#3
Level 1

QUESTION: 004

A large break LOCA occurred while Unit 4 was operating at 100% power.

Which ONE of the following describes why the RCO verifies Feedwater Isolation closed the Main and Bypass FW Control valves?

The RCO is directed to verify Feedwater Isolation in response to:

a. Reactor trip.

b. SI actuation.

c. Phase A actuation.

d. Phase B actuation.

ANSWER: 004

b.

REFERENCE:

4 – EOP – EO, Step 5 Basis , Logic Diag. 5610-T-L1 Sh. 14

690232106
New
KA 000011EK3.02 (3.5/3.7) RO T1/G2 SRO T1/G1
Pg. 4.1-7
10CFR41.5/41.10/45.6/45.13
RO Q# 21 SRO Q# 4
Level 1

QUESTION: 005

Operators are responding to a LOCA outside Containment using ECA-1.2, "LOCA Outside Containment."

If unable to isolate the break, which ONE of the following identifies the procedure ECA-1.2 will direct the operators to transition to?

a. E-1, "Loss of Reactor or Secondary Coolant"

b. ES-1.2, " Post LOCA Cooldown and Depressurization"

c. ES-1.3, "Transfer to Cold Leg Recirculation"

d. ECA-1.1, "Loss of Emergency Coolant Recirculation"

ANSWER: 005

d.

REFERENCE:

ECA-1.2, Step 3

690233303
New
KA W/E04A2.1 (3.4/4.3) RO (NA) SRO T1/G1
pg. 4.5-10
10CFR 43.5/45.13
SRO Only Q#5
Level 1

QUESTION: 006

Unit 4 operators have just entered E-1 "Loss of Reactor or Secondary Coolant."

The following conditions exist:

-	RCS pressure:	1525 psig.		
-	RCS CET subcooling:	70°F.		
-	PRZ level:	15%.		
-	Containment temperature:	165°F.		
-	S/G NR levels:	4A	4B	4C
		22%	0%	0%

Which ONE of the following is correct?

SI Termination Criteria is not met based on:

a. PRZ level.

b. RCS pressure.

c. S/G NR levels.

d. RCS CET Subcooling .

ANSWER: 006

b.

REFERENCES:

E-1 Foldout page

690232701
Modified from Exam Bank question 69023270415
KA W/E02EA2.1 (3.3/4.2) RO (NA) SRO T1/G1
Pg. 4.5-5
10CFR 43.5/45.13
SRO Only Q#6
Level 1

QUESTION: 007

The following conditions exist on Unit 3.

- The "POWER BELOW P-8" status lamp is not lit.
- The 3A RCP experiences a sheared shaft.

Which ONE of the following correctly describes the applicable reactor trip logic?

The reactor will:

a. Trip due to a single RCS loop low flow signal.

b. Trip due to a single RCP breaker open signal.

c. Not trip because two RCS loops must have low flow signals.

d. Not trip because two RCPs must have breaker open signals.

ANSWER: 007

a.

REFERENCES:

Logic Diagram 5610-T-L1 Sht. 20

690216306
New
KA 000015/17AA1.16 (3.2/3.5) RO T1/G1 SRO T1/G1
Pg. 4.2-11
10CFR 41.7/45.5/45.6
RO Q#2 SRO Q#7
Level 2

QUESTION: 008

The following conditions exist on Unit 4:

- Operators are performing ES-0.2, "Natural Circulation Cooldown."
- All systems are operable except the RCPs and Channel A of QSPDS.
- The NPS determines a cooldown rate in excess of 25°F/hr is required.

Which ONE of the following describes the correct operator action?

a. Increase the cooldown rate to a rate not to exceed 60°F/hr and remain in ES-0.2.

b. Increase the cooldown rate to a rate not to exceed 100°F/hr and remain in ES-0.2.

c. Transition to ES-0.3, "Natural Circulation Cooldown with Steam Void in Vessel (With RVLMS)."

d. Transition to ES-0.4, "Natural Circulation Cooldown with Steam Void in Vessel (Without RVLMS)."

ANSWER: 008

c.

REFERENCES:

ES-0.2, NOTE before Step 17

690232401
New
KA W/E09EA2. (3.1/3.8) RO T1/G1 SRO T1/G1
Pg. 4.5-24
10CFR 43.5/45.13
RO Q#3 SRO Q#8
Level 2

QUESTION: 009

The following event occurs while Unit 4 is in Mode 3:

- Both NIS Source Ranges indicate an unexplained increase in power.

The RCO attempts to initiate emergency boration but discovers MOV-350, Emergency Boration valve, will not open.

Which ONE of the following describes the correct operator response?

a. Direct the SNPO to open MOV-350.

b. Direct the SNPO to open 3-358, bypass around LCV-115B.

c. Open FCV-113A, FCV-113B, and direct the SNPO to open 3-356.

d. Hold closed LCV-115C and direct the NPO to open the breaker for LCV-115C.

ANSWER: 009

c.

REFERENCE:

4-ONOP-046.1 step 1 RNO

690223201
New
KA 000024AK1.02 (3.6/3.9) RO T1/G1 SRO T1/G1
Pg. 4.2-14
10CFR 41.8/41.10/45.3
RO Q#4 SRO Q#9
Level 1

QUESTION: 010

A total loss of CCW occurs on Unit 4 while at 100% power.

Which ONE of the following is correct?

Damage will occur quickest to the Charging pump:

a. oil pump with the Charging pump run at minimum speed.

b. oil pump with the Charging pump run at maximum speed.

c. fluid drive coupling with the Charging pump run at minimum speed.

d. fluid drive coupling with the Charging pump run at maximum speed.

ANSWER: 010

c.

REFERENCE:

ONOP-030 Step 1 RNO, ONOP-30 Fold out page, Caution prior to step 20 of ONOP-30

690222902
New
KA 000026AA2.06 (2.8/3.1) RO T1/G1 SRO T1/G!
Pg.4.2-19
10CFR 43.5/45.13
RO Q#5 SRO Q#10
Level 1

QUESTION: 011

With Unit 4 stable at 2% power, the RCO observes that the Reactor Trip Breakers have no red or green indicating lights lit on the console or on VPB.

Which ONE of the following correctly describes an event that could have caused this condition?

a. SR NIS N-31 Instrument Power fuse has blown.

b. SR NIS N-32 Control Power fuse has blown.

c. IR NIS N-35 Instrument Power fuse has blown.

d. PR NIS N-41 Control Power fuse has blown.

ANSWER: 011

c.

REFERENCES:

SD-004 Page 135

690216305
New
KA 000029EA2.07 (4.2/4.3) RO T1/G2 SRO T1/G1
Pg. 4.1-10
10CFR 43.5/45.13
RO Q#26 SRO Q#11
Level 3

QUESTION: 012

The following conditions exist on Unit 3:

- The unit is at 2% power.
- All MSIVs are closed.
- A steam line break occurs on the 3A S/G at the safety header.

Which ONE of the following describes the plant response?

SI will occur when:

a. Tavg decreases to 543°F.

b. containment pressure increases to 4 psig.

c. 3A S/G pressure decreases to 485 psig.

d. 3A S/G pressure decreases to 614 psig.

ANSWER: 012

c.

REFERENCES:

Logic Diagrams 5610-T-L1 Sht. 19 and 5610-T-D-18B Sht. 1

6902163006
New
KA 000040AA1.06 (4.0/4.1) RO T1/G1 SRO T1/G1
Pg. 4.3-32
10CFR 41.7/45.5/45.6
RO Q#7 SRO Q#12
Level 2

QUESTION: 013

Unit 4 operators have just transitioned to FR-P.1, "Response to Imminent Pressurized Thermal Shock Condition."

The following conditions exist:

- AFW is not available.
- The "A" Standby Feedwater Pump is being used to maintain S/G inventory.

Which ONE of the following indications should be used to control feed water flow?

Use changes in:

a. RCS pressure.

b. RCS temperature.

c. PRZ level.

d. S/G pressure.

ANSWER: 013

b.

REFERENCES:

FR-P.1 Step 2 CAUTION

690233601
Modified from Exam Bank Question 69023360101
KA W/E08EA1.3 (3.6/4.0) RO T1/G1 SRO T1/G1
Pg. 4.5-21
10CFR 41.7/45.5/45.6
RO Q#8 SRO Q#13
Level 1

QUESTION: 014

The following conditions exist on Unit 3:

- The operators have entered ONOP- 014 "Main Condenser Loss of Vacuum."
- The unit was initially at 550 MWe and 25" vacuum with vacuum slowly decreasing.
- The unit is now at 300 MWe and 24" vacuum with vacuum slowly decreasing.

Which ONE of the following is the required operator action?

a. Continue reducing MWe until vacuum stabilizes at greater than or equal to 24.5" vacuum.

b. Continue reducing MWe until vacuum stabilizes at greater than or equal to 22" vacuum.

c. Stabilize the plant and continue to investigate the cause of the low vacuum condition.

d. Trip the reactor and turbine and perform the actions of E-0, "Reactor Trip or Safety Injection."

ANSWER: 014

d.

REFERENCES:

ONOP-014, Enclosure 1 and ODI-CO-023

7102122004
New
KA 000051AA2.02 (3.9/4.1) RO T1/G1 SRO T1/G1
Pg. 4.2-34
10CFR 43.5/45.13
RO Q#9 SRO Q#14
Level 1

QUESTION: 015

Unit 3 experienced a Loss of All AC Power simultaneous with a complete loss of Instrument Air.

Operators have restored power to and started the 3A Charging pump.

Which ONE of the following correctly describes the effect on CVCS?

The letdown flowpath:

a. remains open and the charging pump speed goes to minimum.

b. remains open and the charging pump speed goes to maximum.

c. isolates and the charging pump speed goes to minimum.

d. isolates and the charging pump speed goes to maximum.

ANSWER: 015

d.

REFERENCE:

P&ID 5613-M-3047 Sh. 2, 0-ONOP-13 Foldout Page

690214505
New
KA 000055EA2.01 (3.4/3.7) RO T1/G1 SRO T1/G1
Pg. 4.1-15
10CFR 43.5/45.13
RO Q#10 SRO Q#15
Level 2

QUESTION: 016

Unit 3 is in Mode 3 with the following conditions:

- A loss of a 120V Vital Instrument Panel has caused VCT level indicator LI-3-115 to indicate zero level.
- Annunciator A 4/6 "VCT HI/LO LEVEL" is in alarm.

Which ONE of the following is correct for the given conditions?

VCT Auto Makeup:

a. initiates and charging pump suction remains aligned to the VCT.

b. initiates and charging pump suction auto swaps to the RWST.

c. is disabled and charging pump suction remains aligned to the VCT.

d. is disabled and charging pump suction auto swaps to the RWST.

ANSWER: 016

a.

REFERENCES:

ONOP-003.7 Enclosure 1 page 1and SD-13 Figure 19

690226003
New
KA 000057AA1.04 (3.5/3.6) RO T1/G1 SRO T1/G1
Pg. 4.2-41
10CFR 41.7/45.5/45.6
RO Q#11 SRO Q#16
Level 2

QUESTION: 017

EOP-E-3, "Steam Generator Tube Rupture," directs the operator to verify the S/G Blowdown Sample Stop valves are closed within 30 minutes.

Which ONE of the following states the basis for this action?

a. Prevents a potential unmonitored release.

b. Prevents a potential loss of S/G inventory.

c. Ensures all Containment Phase 'A' isolation valves are closed.

d. Ensures S/G sample is only directed to the primary sample sink .

ANSWER: 017

a.

REFERENCES:

EOP-E-3, Step 8 Basis

690233905
New
KA 000059AK3.04 (3.8/4.3) RO T1/G2 SRO T1/G1
Pg. 4.2-44
10CFR 41.5/41.10/45.6/45.13
RO Q#32 SRO Q#17
Level 1

QUESTION: 018

Unit 3 is at 100% power with the 3C ICW Pump out of service.

Which ONE of the following describes a situation that would result in a complete loss of ICW flow to the unit?

A grass influx that completely blocks flow to the:

a. 3A1 and 3A2 Intake Wells.

b. 3B1 and 3B2 Intake Wells.

c. 3A1 and 3B1 Intake Wells.

d. 3A2 and 3B2 Intake Wells.

ANSWER: 018

a.

REFERENCE:

Figure 1 from SD-160

690215205
Modified from the Exam Bank: 69021520505
KA 000062A2.02 (2.9/3.6) RO (NA) SRO T1/G1
pg. 4.2-49
10CFR 43.5/45.13
SRO Only Q#18
Level 1

QUESTION: 019

The following conditions exist:

- Fire Detection Panel C39A alarms in the Control Room.
- Alarm point 41,"Train A Inverters" is activated.
- The NWE investigates and reports that the HALON system has discharged and the fire is still burning.

Which ONE of the following actions should be taken to extinguish the fire?

a. Depress the local panel emergency release "DISCHARGE" button.

b. Place the local panel "MAIN/RESERVE" switch to the RESERVE position.

c. Place the local panel "MAIN/RESERVE" switch to the MAIN position.

d. Pull the MAIN manual release lever at the Halon bottles.

ANSWER: 019

b.

REFERENCE:

0-ONOP-16.8 Step 5.1.6.1

690226109
New
KA 000067AA1.08 (3.4/3.7) RO T1/G1 SRO T1/G1
Pg. 4.2-52
10CFR 41.7/45.5/45.6
RO Q#12 SRO Q#19
Level 1

QUESTION: 020

Operators evacuated the Control Room due to a fire in the Cable Spreading Room. They have achieved Safe Shutdown conditions and are maintaining the plants stable in Mode 3.

Which ONE of the following identifies the Unit 4 480V Load Centers that will be energized at this time?

a. Only A and C Load Centers

b. A, C and H Load Centers

c. Only B and D Load Centers

d. B, D and H Load Centers

ANSWER: 020

c.

REFERENCE:

ONOP-105, Attachment 2, Step 3 & Attachment 5, Step 19

690225203
Modified from Exam Bank: 69022521203
KA 000067AA2.16 (3.3/4.0) RO (NA) SRO T1/G1
Pg. 4.2-53
10CFR 43.5/45.13
SRO Only Q#20
Level 2

QUESTION: 021

Which ONE of the following is an indication or control that is on the Unit 3 Alternate Shutdown Panel?

a. 3A EDG voltage indicator

b. RCS Loop Flow indicator

c. "C" AFW pump T&T valve control switch

d. 3A Charging pump control switch

ANSWER: 021

c.

REFERENCES:

Attachment 3 from 3-OSP-300.2

690214305
Modified from Exam Bank question 69021430511
KA 000068K2.01 (3.9/4.0) RO T1/G1 SRO T1/G1
10CFR 41.7/45.7
RO Q#13 SRO Q#21
Level 1

QUESTION: 022

Which ONE of the following describes the parameter used by ECA-1.2, "LOCA Outside Containment," to determine if the break outside Containment has been isolated?

a. PRZ level

b. CET temperature

c. RCS pressure

d. RCS subcooling

ANSWER: 022

c.

REFERENCE:

ECA-1.2, Steps 2.c, 2.f,,3.a

690233303
Direct from Exam Bank: 69023330302
KA 000069AK3.01 (3.8/4.2) RO T1/G1 SRO T1/G1
pg. 4.2-57
10CFR 41.5,41.10/45.6/45.13
RO Q#14 SRO Q#22
Level 1

QUESTION: 023

Operators are responding an inadequate core cooling condition using FR-C.1, "Response to Inadequate Core Cooling."

Which ONE of the following is correct regarding RCP operation?

If an RCP is:

a. initially running, it should be left running until it trips by itself.

b. initially running, it should be left running until #1 seal delta P trip criteria is met.

c. not running, it should be left off until 6% [32%] level is attained in its associated S/G.

d. not running, it should be left off until 6% [32%] level is attained in any S/G.

ANSWER: 023

c.

REFERENCE:

FR-C.1 Step 19

690234703
New
KA 000074EK2.01 (3.6/3.8) RO T1/G1 SRO T1/G1
Pg.4.1-16
10CFR 41.7/45.7
RO Q#15 SRO Q#23
Level 2

QUESTION: 024

Operators are performing 3-ONOP-041.4, "Excessive Reactor Coolant System Activity," and have just reduced Tavg to less than 500°F as directed by the procedure.

Which ONE of the following describes the basis for reducing Tavg to less than 500°F?

a. To block SI in preparation for a controlled cooldown.

b. To allow closing the MSIVs in preparation for a controlled cooldown.

c. To prevent the release of activity in the event of a main steam line break.

d. To prevent the release of activity in the event of a steam generator tube rupture.

ANSWER: 024

d.

REFERENCES:

3-ONOP-041.4, Step 5.4 & TS 3.4.8 Basis

690222804
New
KA 000076AK3.06 (3.2/3.8) RO T1/G1 SRO T1/G1
Pg. 4.2-58
10CFR 41.5/41.10/45.6/45.13
RO Q#16 SRO Q#24
Level 1

QUESTION: 025

The following conditions exist on Unit 3:

- A reactor startup is in progress per GOP-301 "Hot Standby to Power Operations."
- The point of adding heat (POAH) has just been reached.
- 3A S/G NR level decreases to 4% but the reactor does not automatically trip.

Which ONE of the following procedures should be used to take the reactor subcritical?

a. ONOP-46.1, "Emergency Boration."

b. GOP-103, "Power Operation to Hot Standby."

c. FR-S.1, "Response to Nuclear Power Generation/ATWS."

d. E-0, "Reactor Trip or Safety Injection."

ANSWER: 025

d.

REFERENCES:

E-0, Step 1 RNO and E-0 Symptoms and Entry Conditions

690232102
Modified from Exam Bank question 69023210209
KA 000007EA2.02 (4.3/4.6) RO (NA) SRO T1/G2
Pg. 4.1-2
10CFR 41.7/45.5/45.6
SRO Only Q#25
Level 2

QUESTION: 026

The following conditions exist on Unit 4:

- Low PRZ pressure SI has occurred.
- All 4 HHSI pumps are running.
- PRZ level is increasing.
- RCS pressure is 1450 psig and decreasing.
- HHSI cold leg flow indication (FI-943) is zero.
- PRT pressure and level are increasing.

Which ONE of the following describes the events that could have caused these conditions?

a. A PRZ PORV is open and the HHSI isolation valves, MOV-843A and MOV-843B, failed to open.

b. A PRZ PORV is open and the HHSI line downstream of the HHSI isolation valves, MOV-843A and MOV-843B, has sheared.

c. A PRZ Spray valve is open and the HHSI isolation valves, MOV-843A and MOV-843B, failed to open.

d. A PRZ Spray valve is open and the HHSI line downstream of the HHSI pumps has sheared.

ANSWER: 026

a.

REFERENCES:

Student Handout 6910918 pages 10 and 11, P&IDs 5614-M-3062 Shts. 1&2

690232104
New
KA 000008AA2.10 (3.6/3.6) RO T1/G2 SRO T1/G2
Pg. 4.2-9
10CFR 43.5/45.13
RO Q#19 SRO Q#26
Level 3

QUESTION: 027

Unit 3 operators are responding to a LOCA and have transitioned to E-1when the STA reports that RCS Cold Leg temperatures are 310°F.

Which ONE of the following describes the correct operator response?

a. Transition to FR-P.1, "Response to Imminent Pressurized Thermal Shock Condition," and perform the actions of FR-P-1 if RCS pressure is greater than 250 psig.

b. Transition to FR-P.1, "Response to Imminent Pressurized Thermal Shock Condition," and perform the actions of FR-P-1 if RCS pressure is less than 250 psig.

c. Transition to FR-P.2, "Response to Anticipated Pressurized Thermal Shock Condition," and perform the actions of FR-P-2 if RCS pressure is greater than 250 psig.

d. Transition to FR-P.2, "Response to Anticipated Pressurized Thermal Shock Condition," and perform the actions of FR-P-2 if RCS pressure is less than 250 psig.

ANSWER: 027

a.

REFERENCE:

EOP-F-0, Enclosure 4. FR-P.1, Step 1

690233601
New
KA 000009EA2.14 (3.8/4.4) RO (NA) SRO T1/G2
pg. 4.1-5
10CFR 43.5/45.13
SRO Only Q#27
Level 2

QUESTION: 028

Unit 3 operators are performing Step 16 of EOP-ES-1.2 "Post LOCA Cooldown and Depressurization."

The following conditions exist:

- One Unit 3 HHSI pump is running.
- One RHR pump is running.
- Two Charging pumps are running at maximum flow.
- Containment temperature is 178°F.
- CET subcooling is 68°F
- RCS Thot temperatures are 320°F.
- RCS pressure is 260 psig.
- No RCPs are available.
- PRZ level is stable at 30%.

Which ONE of the following describes the running HHSI/RHR pump configuration when the operators isolate the accumulators?

a. Zero HHSI pumps, One RHR pump.

b. Zero HHSI pumps, Two RHR pumps.

c. One HHSI pump, One RHR pump.

d. One HHSI pump, Two RHR pumps.

ANSWER: 028

a.

REFERENCES:
ES-1.2 Steps 16 through 29 **To be provided to candidate.**
690232904 Modified from ORQ Exam Bank Question 69023290408
KA W/E03EK1.3 (3.7/4.1)Pg. 4.5-8 RO T1/G2 SRO T1/G2
10CFR 41.7/45.5/45.6
Level 3 RO Q#22 SRO Q#28

QUESTION: 029

Which ONE of the following describes a condition that would prevent successful transition to Cold Leg recirculation?

a. Only one of the RHR Pump Suction Stop valves, MOV-750 or MOV-751 can be energized.

b. Only one of the RHR Suction from RWST valves, MOV-862A or MOV-862B can be energized.

c. Containment Recirculation Sump Isolation valves MOV-860A and MOV-860B will not open.

d. Containment Recirculation Sump Isolation valves MOV-860A and MOV-861A will not open.

ANSWER: 029

c.

REFERENCES:

SD-021 Fig. 5B, 5613-M-3050, Sht. 1.

690212105
New
KA W/E11EK1.3 (3.6/4.0) RO T1/G2 SRO T1/G2
Pg. 4.5-28
10CFR 41.8/41.10/45.3
RO Q#23 SRO Q#29
Level 2

QUESTION: 030

Unit 4 is in Mode 5 and all loops are filled.

The following equipment is out of service:

- RHR Loop A
- 4C ICW pump
- 4C CCW pump

Which ONE of the following will result in a loss of RHR required capability per 3-OP-050, "Residual Heat Removal System?"

A failure of the:

a. 4A EDG.

b. 4B CCW H/X.

c. 4A CCW pump.

d. 4B ICW pump.

ANSWER: 030

d.

REFERENCES:

4-OP-050 Precautions/Limitation 4.5

690221003
New
KA 000025AK2.03 (2.7/2.7) RO T1/G2 SRO T1/G2
Pg. 4.2-16
10CFR 41.7/45.7
RO Q#25 SRO Q#30
Level 2

QUESTION: 031

Unit 3 is in Mode 1 when operators responded to PRZ pressure transmitter, PT-445, failed high.

The following stable conditions now exist:

- Reactor Power 80%
- Tavg 572 °F
- PRZ Pressure 2150 psig
- PRZ Level 48%

Which ONE of the following is the operator response required by Technical Specifications?

a. Restore PRZ level to greater than 48%.

b. Restore PRZ pressure to greater than 2200 psig.

c. Reduce Tavg to less than 570°F.

d. Reduce Reactor Power to less than 75%.

ANSWER: 031

b.

REFERENCES:

Tech Spec 3.2.5. b. LCO

690252201
New
KA 000027AA2.04 (3.7/4.3) RO T1/G1 SRO T1/G2
Pg. 4.2-21
10CFR 43.5/45.13
RO Q#6 SRO Q#31
Level 1

QUESTION: 032

The following conditions exist on Unit 3:

- Reactor power is 22% with operators performing a plant startup.
- NIS Intermediate range channel N-36 fails high.

Which ONE of the following is the correct operator response?

a. Enter E-0, "Reactor Trip or Safety Injection."

b. Place the N-36 LEVEL TRIP switch in BYPASS and continue the power ascension.

c. Place the N-36 LEVEL TRIP switch in BYPASS and reduce power below permissive P-6.

d. Place the N-36 LEVEL TRIP switch in BYPASS and reduce power below permissive P-10.

ANSWER: 032

b.

REFERENCES:

ONOP-059.7 Step 5.1 and GOP-301 Caution Step 5.64.

690220604
New
KA 000033AA2.09 (3.4/3.7) RO T1/G2 SRO T1/G2
Pg. 4.2-27
10CFR 43.5/45.13
RO Q#27 SRO Q#32
Level 2

QUESTION: 033

The following conditions exist:

- Unit 3 is at 100% power.
- PRMS Channel R-15 (Condenser Air Ejector monitor) has alarmed.
- At 0800, 3C S/G tube leakage is calculated to be 110 GPD.
- At 0900, 3C S/G tube leakage is calculated to be 160 GPD.

Which ONE of the following is the correct operator response?

a. Increase S/G sampling frequency and return to procedure and step in effect.

b. Place the unit in Mode 3 within 1 hour.

c. Place the unit in Mode 3 within 6 hours.

d. Trip the reactor and enter E-0 "Reactor Trip or Safety Injection."

ANSWER: 033

c.

REFERENCES:

ONOP-067, Attachment 5 To be provided to candidate.

690224204
Modification of ORQ Exam Bank question 69022420406
KA 000037AK3.05 (3.7/4.0) RO (NA) SRO T1/G2
Pg. 4.2-29
10CFR 41.5/41.10/45.6/45.13
SRO Only Q#33
Level 3

QUESTION: 034

The following has occurred on Unit 3:

- Operators are responding to a SGTR.
- They are performing a cooldown in E-3, "Steam Generator Tube Rupture," to increase subcooling prior to RCS depressurization.
- The STA informs the crew that a Red Path exists on the Integrity Status Tree.

Which ONE of the following describes the correct operator response?

If the RCPs are:

a. running , then stop the cooldown, and continue performing E-3.

b. running, then continue the cooldown, and continue performing E-3.

c. not running, then stop the cooldown, and transition to FR-P.1.

d. not running, then continue the cooldown and continue performing E-3.

ANSWER: 034

d.

REFERENCE:

E-3, NOTE prior to Step 19

690233903
Modified from the Exam Bank: 69023390303
KA 000038EA1.33 (4.4/4.3) RO (NA) SRO T1/G2
pg. 4.1-12
10CFR 41.7/45.5/45.6
SRO Only Q#34
Level 1

QUESTION: 035

Which ONE of the following describes the basis for verifying AFW flow is greater than 390 gpm following a loss of main feedwater event?

390 gpm is the minimum AFW flow required in the event:

a. an ATWS occurs.

b. only one AFW pump is running.

c. any S/G level is below 6% NR.

d. all S/G levels are below 6% NR.

ANSWER: 035

d.

REFERENCE:

EOP-ES-0.1, Step 12 RNO Basis

690232304
New
KA 000054K3.04 (4.4/4.6) RO T1/G2 SRO T1/G2
10CFR 41.5/41.10/45.6/45.13)
RO Q#30 SRO Q#35
Level 1

QUESTION: 036

Unit 3 operators have entered FR-H.1 "Response to Loss of Secondary Heat Sink."

The following conditions exist:

- No Main Feedwater Pumps are available.
- No Auxiliary Feedwater Pumps are available.
- The RCPs are off.
- Annunciator E 2/6 "HI-HI SG LVL TURBINE TRIP/FEEDWATER ISOLATION is in alarm.
- The operators are preparing to re-establish feedwater using a Standby Steam Generator Feedwater Pump.

Which ONE of the following describes the minimum Control Room action(s) required to re-establish feed flow to the S/Gs?

Reset:

a. SI

b. Phase A

c. Feedwater Isolation

d. SI and Feedwater Isolation

ANSWER: 036

c.

REFERENCES:

3-ARP-097.CR E 2/6 and Logic Diag. 5610-TL1 Sht. 14

690233703
New
KA W/E05EA1.1 (4.1/4.0) RO T1/G2 SRO T1/G2
Pg. 4.5-13
10CFR 41.7/45.5/45.6
RO Q#31 SRO Q#36
Level 2

QUESTION: 037

The following conditions exist on Unit 3:

- The unit has a normal electrical lineup.
- 3C ICW pump is running.
- A loss of the normal DC control power supply to the 3D 4KV Bus occurs.

Which ONE of the following describes the indications that would now exist on VPA for the 3C ICW pump?

a. Red light on - Normal amps

b. Green light on - No amps

c. Red and Green lights off - Normal amps

d. Red and Green lights off. - No amps

ANSWER: 037

a.

REFERENCES:

System Description 140 pages 53 and 54, EWD 5613-E-28 sheet 98A

690213905
New
KA 000058AA2.01 (3.7/4.1) RO (NA) SRO T1/G2
Pg. 4.2-43
10CFR 43.5/45.13
SRO Only Q#37
Level 2

QUESTION: 038

Which ONE of the following describes the Immediate Operator Action(s) of 0-ONOP-066, "High Area Radiation Monitoring System Alarm," in the event Annunciator X 4/1, ARMS HI RADIATION, alarms?

Identify the alarming channel(s) at the ARMS panel and then:

a. announce the alarm over the plant page system.

b. notify Security to restrict entry to the affected areas.

c. press the ALARM ACK pushbutton on the ARMS control panel.

d. cross-check the alarming ARMS channel(s) with PRMS channel(s) in the affected area.

ANSWER: 038

a.

REFERENCE:

ARPs X 4/1, ONOP-066 IOAs

690224602
Modified from Exam Bank: 69022460203
KA 000061G.1 (2.5/3.3) or Generic 2.1.14 RO T1/G2 SRO T1/G1
Pg. 4.2-48 or 2-2
10CFR 43.5/45.12
RO Q#33 SRO Q#38
Level 1

QUESTION: 039

Unit 4 operators are responding to a LOCA and have entered E-1 "Loss of Reactor or Secondary Coolant."

- The TSC is not yet operational.
- Containment temperature peaked at 200°F and has dropped to 170°F.
- Containment radiation peaked at 1.3×10^6 R/hr and has dropped to 1.2×10^5 R/hr.

Which ONE of the following is correct?

Intact S/G levels should be maintained in the NR between:

a. 6% and 32%

b. 15% and 32%

c. 15% and 50%

d. 32% and 50%

ANSWER: 039

d.

REFERENCES:

E-1 step 3

690232703
New
KA W/E16EA2.2 (3.0/3.3) RO (NA) SRO T1/G2
Pg. 4.5-45
10CFR 43.5/45.13
SRO Only Q#39
Level 2

QUESTION: 040

Unit 4 operators have entered 0-ONOP-13, "Loss of Instrument Air" in response to Annunciator I 6/1, INST AIR SYSTEM HI TEMP/LO PRESS.

The following conditions exist:

- All available air compressors are running.
- Instrument Air pressure indicator, PI-4-1444, is 60 psig and stable.

Which ONE of the following identifies the equipment that will be affected?

Unit 4:

a. MSIVs will fail closed.

b. Feedwater Reg Valves will fail closed.

c. EDG Fuel Oil Transfer capability will be lost.

d. Train 1 AFW FCV automatic operation will be lost.

ANSWER: 040

b.

REFERENCES:

ONOP-013 Foldout Page, Step 2 and ARP-097.CR

710214503
Modified from the Exam Bank: 71021450301
KA 000065AA2.01 (2.9/3.2) RO T1/G3 SRO T1/G2
Pg. 4.2-51
10CFR 43.5/45.13
RO Q#36 SRO Q#40
Level 1

QUESTION: 041

Unit 4 is at 100% power with all systems operating in automatic and all switches in their normal positions.

PRZ level transmitter LT-459 fails low.

Which ONE of the following describes the plant response?

a. Charging flow will decrease.
Letdown will isolate.

b. Charging flow will decrease.
Letdown will remain in service.

c. Charging flow will increase.
Letdown will isolate.

d. Charging flow will increase.
Letdown will remain in service.

ANSWER: 041

c.

REFERENCE:

5610-T-D-15, Sheet 1

690210906
Modified from Exam Bank: 69021090014
KA 000028A2.09 (2.9/3.2) RO T1/G3 SRO T1/G3
10 CFR 43.5/45.13
RO Q#34 SRO Q#41
Level 2

QUESTION: 042

The following conditions exist with Unit 3 at 100% power and all systems operable:

- 3D 4KV Bus is aligned to 3B 4KV Bus.
- 3A and 3C ICW Pumps are running.

The following events occur:

- A LOOP occurs on Unit 3.
- The 3A EDG fails to start.

Which ONE of the following describes the ICW pump configuration when sequencing is complete (assume no operator response)?

a. No ICW pumps will be running.

b. Only the 3B ICW pump will be running.

c. Only the 3C ICW pump will be running.

d. The 3B and 3C ICW pumps will be running.

ANSWER: 042

b.

REFERENCE:

5610-T-L1, Sheets 12B, 13A & 29A

690215700
Modified from Exam Bank: 69021570008
KA 000056A2.47 (3.8/3.9) RO T1/G3 SRO T1/G3
10CFR43.5/45.13
RO Q#35 SRO Q#42
Level 2

QUESTION: 043

Unit 4 operators are performing FR-H.2 "Response to S/G Overpressure."

Current conditions are as follows:

- 4A S/G pressure is 1135 psig.
- 4A S/G level has risen to 60%.
- RCS Thot temperatures are 520°F.
- All three RCPs are running.

Which ONE of the following describes how to correctly reduce pressure in the 4A S/G?

a. Stop the 4A RCP.

b. Dump steam from the 4A S/G.

c. Dump steam from the unaffected S/Gs.

d. Reduce 4A S/G inventory using the S/G blowdown system.

ANSWER: 043

b.

REFERENCES:

FR-H.2 step 4

690233703
New
KA W/E13EA2.2 (3.0/3.4) RO (NA) SRO T1/G3
Pg. 4.5-36
10CFR 43.5/45.13
SRO Only Q#43
Level 2

QUESTION: 044

Unit 3 is stable at 80% power with all systems in automatic when the following events occur:

- Control Rods begin to continuously insert.
- The RCO observes the following indications:

-	Tavg:	567°F	decreasing
-	Tref	570°F	stable
-	Generator Load:	650 MWe	stable

Which ONE of the following describes the correct immediate operator action?

a. Maintain rods in AUTO and if rods continue to insert, adjust turbine load to match Tavg to Tref.

b. Maintain rods in AUTO and if rods continue to insert, adjust boron concentration to match Tavg to Tref.

c. Place rods in MANUAL and if rods continue to insert, adjust turbine load to match Tavg to Tref.

d. Place rods in MANUAL and if rods continue to insert, adjust boron concentration to match Tavg to Tref.

ANSWER: 044

c.

REFERENCE:

3-ONOP-028, Step 4.3

690220701
Modified from Exam Bank: 69022070105
KA: 001G.14 (4.0/4.0) RO T2/G1 SRO T2/G1
Pg.
10CFR 41.10/43.2/45.6
RO Q#38 SRO Q#44
Level 2

QUESTION: 045

The following plant conditions exist:

- Containment Phase "A" isolation has occurred.
- The isolation signal has not yet been reset.

Which ONE of the following describes the effect this condition will have on RCP Number 1 seal leak off flow?

Number 1 seal leak off flow will:

a. decrease because VCT level has increased.

b. decrease because the backpressure has increased.

c. go to zero because RCP Seal Return to VCT valve, MOV-381, is closed.

d. go to zero because #1 Seal Leakoff Isolation valves, 303A, 303B, and 303C are closed.

ANSWER: 045

b.

REFERENCE:

5613-M-3047, Sheet 3

690210806
Direct from Exam Bank: 69021080004
KA 003K6.04 (2.8/3.1) RO T2/G1 SRO T2/G1
10CFR41.7/45.5
RO Q#40 SRO Q#45
Level 2

QUESTION: 046

A reactor startup is being performed on Unit 3. The following conditions apply:

- The ECC estimated critical rod height is D bank at 110 steps.
- The initial highest source range count rate was N-31 at 250 cps.
- The current N-31 count rate is 1000 cps.
- Based on the current N-31 count rate, the 1/M plot predicts criticality at D bank, 180 steps.
- Integrated rod worth for D-110 is 490 pcm.
- Integrated rod worth for D-180 is 160 pcm.

Which ONE of the following is the correct operator response?

a. Do not continue the reactor startup. Obtain permission from the NPS to continue.

b. Do not continue the reactor startup. Obtain permission form the Reactor Supervisor to continue.

c. Continue the reactor startup. If the prediction is still D-180 after the next doubling, obtain permission from the NPS to continue.

d. Continue the reactor startup. If the prediction is still D-180 after the next doubling, obtain permission from the Reactor Supervisor to continue.

ANSWER: 046

c.

REFERENCE:

3-GOP-301, Step 4.27
PCB Section II, Figure 5

690240702
Direct from the ORQ Exam Bank: 69024070209-ORQ
KA 004A4.03 (2.7/3.2) RO T2/G1 SRO T2/G1
10CFR 41.7/45.5 to 45.8
RO Q#42 SRO Q#46
Level 3

QUESTION: 047

Which ONE of the following describes the purpose of the interlocks between CVCS Letdown Isolation valve, LCV-460, and the Letdown Orifice Isolation valves, 200A, 200B, & 200C?

The interlocks prevent damage to:

a. LCV-460 upon depressurization of the letdown line.

b. CV-200A, 200B, 200C upon depressurization of the letdown line.

c. the Regenerative Heat Exchanger upon subsequent repressurization of the letdown line.

d. RV-203, Letdown Relief Valve, upon subsequent repressurization of the letdown line.

ANSWER: 047

c.

REFERENCE:

SD-113, Page 21

690211302
Modified from Exam Bank: 69021130614
KA 004G.4 (2.8/2.9) RO T2/G1 SRO T2/G1
10CFR 41.7
RO Q#43 SRO Q#47
Level 1

QUESTION: 048

The following conditions exist on Unit 3:

- Reactor power is stable at 10^{-8} amps.
- "PRZ Pressure Control Channel" PT-444 fails high.

Assuming no operator action, which ONE of the following describes the response of the plant to this condition?

a. The reactor will trip when PRZ pressure increases to 2385 psig.

b. PRZ pressure will stabilize at approximately 2000 psig .

c. The reactor will trip when PRZ pressure decreases to 1835 psig.

d. SI actuation will occur when PRZ pressure decreases to 1730 psig.

ANSWER: 048

d.

REFERENCES:

Logic Diagrams 5610-T-L1 Sheet 11 and 5610-T-D-16B Sheet 1

690216306
Modified from Exam Bank: 69021090008
KA 013K6.01 (2.7/3.1) RO T2/G1 SRO T2/G1
Pg. 3.2-36
10CFR 41.7/43.5 to 45.8
RO Q#45 SRO Q#48
Level 2

QUESTION: 049

Unit 3 is at 100% power and Annunciator B 9/3, SHUTDOWN ROD OFF TOP/DEVIATION is not operational.

Which ONE of the following describes the action that operators must take at least once every 4 hours?

Verify RPIs and Step Counters agree within:

a. 2 steps.

b. 12 steps.

c. 18 steps.

d. 24 steps.

ANSWER: 049

b.

REFERENCE:

3-ONOP-028.2, Step 5.9. Tech Spec 3.1.3.1 & 3.1.3.2

690252101
New
KA 014K3.02 (2.5/2.8) ROT2/G2 SRO T2/G1
pg. 3.1-21
10CFR 41.7/45.6
RO Q#65 SRO Q#49
Level 1

QUESTION: 050

Unit 3 is stable at 98% power. Reactor Engineering has performed QPTR calculations using a full core flux map and core exit thermocouples. Both calculations reveal the QPTR value is 1.03.

Which ONE of the following describes the required operator response?

Reduce NIS power to less than:

a. 97% within 2 hours.

b. 95% within 2 hours.

c. 91% within 2 hours.

d. 89% within 2 hours.

ANSWER: 050

c.

REFERENCE:

3-OSP-059.10, Step 7.3
3-ONOP-059.9, Step 5.4
Tech. Specs. 3.2.4 To be provided to candidate.

710210403
Modification of ORQ# 453 (69025220301-ORQ)
KA 015K5.09 (2.5/2.9) RO T2/G1 SRO T2/G1
10CFR 41.5/45.7
RO Q#46 SRO Q#50
Level 3

QUESTION: 051

Immediately after operators have stabilized Unit 3 following a power reduction, Annunciators B 8/1, ROD BANK A/B/C/D LO LIMIT and B 8/2, ROD BANK A/B/C/D EXTRA LO LIMIT, alarm.

Which ONE of the following describes the effect on axial flux distribution and the correct immediate operator response to restore rods above the insertion limit?

	CORE FLUX CONCENTRATION	RESPONSE
a.	Lower Half of Core	Borate using normal boration
b.	Lower Half of Core	Borate using emergency boration
c.	Upper Half of Core	Borate using normal boration
d.	Upper Half of Core	Borate using emergency boration

ANSWER: 051

a.

REFERENCE:

3-ARP-097.CR, B8/1 & B 8/2
LP3500109, Control Rod Reactivity Effects, SHO Page 6-17

350210907
New
KA 015A204 (3.3/3.8) RO T2/G1 SRO T2/G1
10CFR 41.5/43.5/45.3/45.5
RO Q#47 SRO Q#51
Level 2

QUESTION: 052

Unit 3 operators are responding to a spurious SI signal and are attempting to determine if SI termination criteria are met. The ANPS directs the RCO to check subcooling on QSPDS.

QSPDS displays the following:

SATURATION MARGIN

	DEG F	PSI
UPPER HEAD	48	633
RCS (MIN)	36	438
CET	28	340

Assuming other SI Termination Criteria are satisfied, which ONE of the following is correct?

The RCO should declare SI Termination Criteria are:

a. not met after observing the RCS (MIN) value.

b. not met after observing the CET value.

c. met after observing the RCS (MIN) value.

d. met after observing the CET value.

ANSWER: 052

b.

REFERENCE: 3-EOP-E-0, Step 31a.

690210302
New
KA 017K4.01 (3.4/3.7) RO T2/G1 SRO T2/G1
pg. 3.7-11
10CFR 41.7
RO Q#48 SRO Q#52
Level 2

QUESTION: 053

A large break LOCA occurs on Unit 3 while the 3B Sequencer is inoperable.

Which ONE of the following describes an effect on the Unit 3 containment?

Containment pressure will be higher because only the:

a. 3A ECC will autostart.

b. 3C ECC will autostart.

c. 3A and 3C ECCs will autostart.

d. 3B and 3C ECCs will autostart.

ANSWER: 053

b.

REFERENCES:

Logic Diagram 5613-T-L1 Sheet 12B

690212905
New
KA 022K2.01 (3.0/3.1) RO T2/G1 SRO T2/G2
Pg. 3.5-5
10CFR 41.7
RO Q#49 SRO Q#53
Level 2

QUESTION: 054

Unit 3 experienced a large break LOCA. Operators have responded with the EOP network and have completed the actions of ES-1.3, "Transfer to Cold Leg Recirculation." Containment temperature has decreased to 140°F.

Which ONE of the following describes the correct Containment Spray Pump (CSP) alignment?

a. 1 CSP running with its suction aligned directly to the Containment Recirc. sump.

b. 1 CSP running with its suction aligned to the Containment Recirc. sump via the RHR pump discharge.

c. 2 CSPs running with their suctions aligned directly to the Containment Recirc. sump.

d. 2 CSPs running with their suctions aligned to the Containment Recirc. sump via the RHR pump discharge.

ANSWER: 054

b.

REFERENCE:

3-EOP-ES-1.3, Steps 22 through 24

690233003
New
KA 026A1.03 (3.5/3.5) RO T2/G2 SRO T2/G1
10CFR 41.5/45.5
RO Q#67 SRO Q# 54
Level 3

QUESTION: 055

Unit 3 is operating at 70% power with all systems operable except the 3C Condensate pump which has its breaker racked out.

The 3A Condensate pump breaker trips open.

Which ONE of the following describes the correct operator response?

Perform the actions of:

a. ONOP-089, "Turbine Runback."

b. ONOP-100, "Fast Load Reduction."

c. GOP-103, "Power Operation to Hot Standby."

d. E-0, "Reactor Trip or Safety Injection."

ANSWER: 055

a.

REFERENCE:

5610-T-L1, Sheet 25a
ONOP-089, Symptoms & Entry Conditions

690224802
New
KA 056A2.04 (2.6/2.8) RO T2/G1 SRO T2/G1
10CFR 41.5/43.5/45.3/45.13
RO Q#51 SRO Q#55
Level 2

QUESTION: 056

Unit 3 is operating at 100% power when the controlling S/G pressure transmitter fails low on the 3A S/G.

Which ONE of the following describes the effect this will have on the controlling indicated steam flow and the initial 3A FW Control Valve, FCV-478, response?

Indicated steam flow will:

a. decrease. The FCV will open.

b. decrease. The FCV will close.

c. increase. The FCV will open.

d. increase. The FCV will close.

ANSWER: 056

b.

REFERENCE:

5610-T-D-17, Sheet 1. 5610-T-D-18B, Sheet 1

690212206
New
KA 059K1.04 (3.4/3.4) RO T2/G1 SRO T2/G1
pg. 3.4-41
10CFR 41.2 to 41.9/45.7 to 45.8
RO Q#52 SRO Q#56
Level 2

QUESTION: 057

With Unit 3 initially at 100% power and all systems in normal alignment, the 3C S/G experiences a main steam line break inside Containment.

Which ONE of the following describes the effect this accident will have on the AFW system?

a. Train 1 AFW will be lost until the operators open AFSS-3-007.

b. Train 1 AFW will be lost until the operators close AFSS-3-006.

c. Train 2 AFW will be lost until the operators open AFSS-3-007.

d. Train 2 AFW will be lost until the operators close AFSS-3-006.

ANSWER: 057

a.

REFERENCE:

5613-M-3075, Sheet 1

690212305
New
KA 061K1.01 (4.1/4.1) RO T2/G1 SRO T2/G1
pg. 3.4-45
10CFR 41.2 to 41.9/45.7 to 45.8
RO Q#54 SRO Q#57
Level 2

QUESTION 058

Unit 3 operators have entered ES-1.1, "SI Termination," and are preparing to start a Main Feedwater pump and secure AFW.

The following conditions exist:

- "A" AFW pump is running.
- "B" and "C" AFW pumps are stopped and aligned for auto start.
- The NWE locally starts the 3A Main Feed pump.
- The BOP fails to "red flag" the 3A Main Feed pump control switch semaphore.

Which ONE of the following describes the effect of the BOP's failure to red flag the 3A Main Feed pump control switch semaphore?

a. "B" and "C" AFW pumps will automatically start.

b. AFW pump automatic start capability will be degraded.

c. The 3A Main Feed pump will not trip from an SI signal.

d. The 3A Main Feed pump will automatically trip in 50 seconds.

ANSWER: 058

b.

REFERENCE:

OP-74 Step 5.1.2.13

690212306
New
KA 061A2.01 (2.5/2.6) RO T2/G1 SRO T2/G1
Pg. 3.4-47
10CFR 41.5/43.5/45.3/45.13
RO Q#56 SRO Q#58
Level 2

QUESTION: 059

The following occurs while Unit 3 is in Mode 1:

- DC Bus 3D23 loses power.

Which ONE of the following operator actions are correct?

a. Shutdown the unit using GOP-103, "Power Operation to Hot Standby." After the unit is stable in Mode 3, then perform ONOP-003.5, "Loss of DC Buses 3D23 and 3D23A(3B)."

b. Shutdown the unit using GOP-103, "Power Operation to Hot Standby and perform ONOP-003.5, "Loss of DC Buses 3D23 and D23A(3B)," concurrently with the actions of GOP-103.

c. Verify the reactor is tripped using E-0, "Reactor Trip or Safety Injection." When the unit is stable, then perform ONOP-003.5, "Loss of DC Buses 3D23 and D23A(3B)."

d. Verify the reactor is tripped using E-0, "Reactor Trip or Safety Injection," and perform ONOP-003.5, "Loss of DC Buses 3D23 and D23A(3B)," concurrently with the Immediate Actions of E-0.

ANSWER 059

c.

REFERENCE:

3-ONOP-003.5 Step 1

690225303
New
KA 063A4.01 (2.8/3.1) RO T2/G2 SRO T2/G1
10CFR 41.7/45.5 to 45.8
RO Q#74 SRO Q#59
Level 1

QUESTION: 060

The following conditions exist on Unit 3:

- The unit was at 100% power.
- A spurious SI occurs.
- The operators are responding per the EOP network and have just transitioned to EOP-ES-1.1, "SI Termination."
- Annunciator A 7/1, PRT HI/LO LEVEL HI PRESS/TEMP, alarms.

Assuming all systems function as designed, which ONE of the following describes the probable cause of this alarm?

a. A PRZ PORV has lifted.

b. CVCS Low Pressure relief valve, RV-209, has lifted.

c. RHR Header to Loops relief valve, RV-706, has lifted.

d. RCP #1 Seal Leakoff relief valve, RV-382, has lifted.

ANSWER: 060

d.

REFERENCE:

5613-M-3041, Sheet 2. 5613-M-3047, Sheet 3. ARP A 7/1

690210905
New
KA 068K1.07 (2.7/2.9) RO T2/G1 SRO T2/G1
pg. 3.9-2
10CFR 41.2 to 41.9/45.7 to 45.8
RO Q#57 SRO Q#60
Level 2

QUESTION: 061

Operators are investigating an abnormal increase in countrate on PRMS radiation monitor R-14, PLANT VENT, when they discover pressure in Gas Decay Tank (GDT) #4 is decreasing.

No planned GDT releases are in progress and the Gas Decay Tank Discharge Valve, RCV-014, is closed.

After verifying all valve alignments are correct, which ONE of the following describes the correct operator response?

Direct the SNPO to:

a. transfer the contents of GDT #4 to another GDT.

b. verify both Auxiliary Building Exhaust fans are running.

c. stop all running Waste Gas compressors.

d. start an additional Waste Gas compressor.

ANSWER: 061

a.

REFERENCE:

3-ONOP-067, Step 52f. RNO

690224204
Modified from the Exam Bank: 69022420403
KA 071K1.06 (3.1/3.1) RO T2/G1 SRO T2/G1
pg. 3.9-5
10CFR 41.2 to 41.9/45.7 to 45.8
RO Q#58 SRO Q#61
Level 1

QUESTION: 062

The Control Room Normal Air Intake radiation monitor, RAI-6642, alarms.

Which ONE of the following describes the damper response of the Control Building Ventilation System?

a. Ventilation Inlet dampers, D-1A and D-1B - CLOSE.
East and West Inlet dampers, D-2 and D-3 - OPEN.
Control Room Recirc. dampers, D-11A and D-11B - OPEN.

b. Ventilation Inlet dampers, D-1A and D-1B - OPEN.
East and West Inlet dampers, D-2 and D-3 - CLOSE.
Control Room Recirc. dampers, D-11A and D-11B - OPEN.

c. Ventilation Inlet dampers, D-1A and D-1B - CLOSE.
East and West Inlet dampers, D-2 and D-3 - OPEN.
Control Room Recirc. dampers, D-11A and D-11B - CLOSE.

d. Ventilation Inlet dampers, D-1A and D-1B - OPEN.
East and West Inlet dampers, D-2 and D-3 - CLOSE.
Control Room Recirc. dampers, D-11A and D-11B - CLOSE.

ANSWER: 062

a.

REFERENCE:

3-ONOP-067, Attachment 1. 5610-T-L1, Sheet 11

690215506
Modified from the Exam Bank: 69021680617
KA 072A3.01 (2.9/3.1) RO T2/G1 SRO T2/G1
pg. 3.7-14
10CFR 41.7/45.5)
RO Q#59 SRO Q#62
Level 1

QUESTION: 063

The following conditions exist on Unit 3:

- The unit has been shut down at Beginning-Of-Life for equipment repairs.
- PRZ level is being maintained at 30%.
- RCS temperature is 140°F.

The following events occur 10 days after the shutdown:

- The running RHR pump trips and neither RHR pump can be restarted.
- Operators are unable to establish any other method of RCS cooling.

Which ONE of the following identifies the time closest to when the RCS will enter Mode 4?

a. 12 minutes

b. 35 minutes

c. 42 minutes

d. 50 minutes

ANSWER: 063

d.

REFERENCE:

0-ADM-051, Page 31-35, Figures 1-3 To be provided to candidate.

690203206
Modified from the Exam Bank: 69020320606
KA 005K3.01 (3.9/4.0) RO T2/G3 SRO T2/G3
pg. 3.4-11
10CFR 41.7/45.6
RO Q#80 SRO Q#63
Level 3

QUESTION: 064

A reactor and turbine trip occurs on Unit 3 while at 25% power.

Which ONE of the following describes the response of the Steam Dump to Condenser (SDTC) system?

a. Only 2 SDTC valves will arm.
The SDTC system will reduce Tavg to no-load Tavg.

b. Only 2 SDTC valves will arm.
The SDTC system will reduce Tavg to within 5°F of Tref.

c. All 4 SDTC valves will arm.
The SDTC system will reduce Tavg to no-load Tavg.

d. All 4 SDTC valves will arm.
The SDTC system will reduce Tavg to within 5°F of Tref.

ANSWER: 064

c.

REFERENCE:

5610-T-L1, Sheet 22A

690211806
New
KA 041K4.18 (3.4/3.6) RO T2/G3 SRO T2/G3
pg. 3.4-24
10CFR 41.7
RO Q#84 SRO Q#64
Level 2

QUESTION: 065

Unit 3 was operating at 100% with all systems in normal alignment. An SI signal occurs. All systems function as designed.

After sequencing is complete, which ONE of the following describes the number of CCW load(s) attached to the CCW System as it relates to the CCW "Rule of Five"?

a. One CCW load

b. Two CCW loads

c. Three CCW loads

d. Four CCW loads

ANSWER: 065

b.

"A" and "C" ECCs ("B" does not auto start.)

REFERENCE:

OP-030, Step 4.30, Page 17
5613-M-3030, Sheet 4
5613-T-L1, Sheets 11 & 12A

690214005
Modified from 1998 NRC Exam – JPM # 121A Question #2
KA 076A4.04 (3.5/3.5) RO T2/G3 SRO T2/G3
pg. 3.4-51
10CFR 41.7/45.5 to 45.8
RO Q#86 SRO Q#65
Level 3

QUESTION: 066

The following conditions exist on Unit 3:

- The unit is in Mode 1.
- The operators have entered 0-ONOP-013 "Loss of Instrument Air."
- Instrument air pressure is 70 psig and slowly decreasing.
- All available instrument air compressors are running.

Which ONE of the following would require the unit to be tripped?

Isolating Instrument Air to the:

a. Intake area.

b. Control Room.

c. Containment Building.

d. Unit 3 Main Steam Platform.

ANSWER: 066

c.

REFERENCE:

ONOP-013 Foldout Page

710214503
New
KA 078G.15 (G2.4.4) (4.0/4.3) RO (NA) SRO T2/G3
Pg. 2-11
10CFR 41.10/43.2/45.6
SRO Only Q#66
Level 1

QUESTION: 067

Unit 3 is at 50% power with the 3C Charging pump out of service.

The RCO notes the following Control Room indications:

- Annunciator G 1/2, "CHARGING PUMP HI SPEED" alarms.
- The only running Charging pump (3A) is in Auto with 100% output demanded.
- PRZ level is 33% and decreasing.

Which ONE of the following describes the required procedural response?

a. Isolate letdown. If PRZ level continues to decrease, then start the 3B Charging pump and maximize charging flow.

b. Isolate letdown. If PRZ level continues to decrease, then trip the reactor and turbine and transition to E-0, "Reactor Trip or Safety Injection."

c. Start the 3B Charging pump and maximize charging flow. If PRZ level continues to decrease, then isolate letdown.

d. Start the 3B Charging pump and maximize charging flow. If PRZ level continues to decrease, then trip the reactor and turbine and transition to E-0, "Reactor Trip or Safety Injection."

ANSWER: 067

c.

REFERENCE:

3-ONOP-041.3, Step 1

690221201
New
KA 002A2.01 (4.3/4.4) RO T2/G2 SRO T2/G2
10CFR 41.4/43.5/45.3/45.5
RO Q#60 SRO Q#67
Level 1

QUESTION: 068

Operators are responding to a large break LOCA. They are currently aligning the ECCS system for Hot Leg recirculation. Step 10 of ES-1.4, "Transfer to Hot Leg Recirculation," directs the operators to start the second RHR pump.

Which ONE of the following describes why the operators are directed to start the second RHR pump?

Starting the second RHR pump allows the operators to:

a. start a second HHSI pump to increase hot leg injection flow.

b. direct flow simultaneously to the cold legs and to the suction of the HHSI pump.

c. align alternate hot leg recirculation using RHR Recirculation Isolation valve, 741A.

d. align alternate hot leg recirculation using Alternate Low Head Injection valve, MOV-872.

ANSWER: 068

b.

REFERENCE:

EOP-ES-1.4, Step 10 Basis

690233104
New
KA 006K5.08 (2.9/3.1) RO T2/G2 SRO T2/G2
10CFR 41.5/41.7
RO Q#61 SRO Q#68
Level 1

QUESTION: 069

Unit 3 is in Mode 5 when RCS loop pressure transmitter, PT-405, fails high.

Which ONE of the following identifies the effect of this failure on:

1) PRZ PORV – 455C and PORV – 456

2) Loop 3C RHR Pump Suction Stop Valves, MOV-750 and MOV-751?

	PORV-455C	PORV-456	MOV-750	MOV-751
a.	OPENS	NONE	NONE	CLOSES
b.	OPENS	NONE	CLOSES	NONE
c.	NONE	OPENS	NONE	CLOSES
d.	NONE	OPENS	CLOSES	NONE

ANSWER: 069

a.

REFERENCE:

5610-T-D-16A, Sheet 1
5610-T-L1, Sheet 27

690210706
Modified from the Exam Bank: 69021070638 & 69022100419
KA 010K6.01 (2.7/3.1) RO T2/G2 SRO T2/G2
pg. 3.3-7
10CFR 41.7/45.7
RO Q#62 SRO Q#69
Level 2

QUESTION: 070

During operation at reduced power the following conditions exist:

- Tavg is 560°F.
- PRZ level is 45%.
- PRZ pressure is 2230 psig.

Which ONE of the following describes the PRZ heater status the RCO should verify?

a. Control Group – On.
Backup Groups – On.

b. Control Group – On.
Backup Groups – Off.

c. Control Group – Off.
Backup Groups – On.

d. Control Group – Off.
Backup Groups – Off.

ANSWER: 070

a.

REFERENCE:

5610-T-D-15, Sheet 1

690210906
New
KA 011A2.05 (3.3/3.7) RO T2/G2 SRO T2/G2
10CFR 41.5/43.5/45.3/45.5
RO Q#63 SRO Q#70
Level 3

QUESTION: 071

Which ONE of the following identifies the protection provided by the OTΔT reactor trip signal and the condition that would cause the OTΔT setpoint to decrease?

	Protection	Condition
a.	DNB	Tavg increasing
b.	DNB	PRZ Pressure increasing
c.	Excessive Power Density	Tavg increasing
d.	Excessive Power Density	PRZ Pressure increasing

ANSWER: 071

a.

REFERENCE:

Tech. Specs. Table 2.2-1 & Tech Specs. Bases page B.2-4

690216302
Modified from the Exam Bank: 69021630505
KA 012K5.01 (3.3/3.8) RO T2/G2 SRO T2/G2
pg. 3.7-3
10CFR 41.5/45.7
RO Q#64 SRO Q#71
Level 2

QUESTION: 072

Unit 3 is operating at 100% power with all systems in their normal configuration, when the Tavg Median Signal Selector, TM-408, fails low.

Which ONE of the following describes the plant response?

a. Control rods will not move. Charging pump speed will increase.

b. Control rods will not move. Charging pump speed will decrease.

c. Control Rods will step in. Charging pump speed will increase.

d. Control rods will step in. Charging pump speed will decrease.

ANSWER: 072

b.

REFERENCE:

5610-T-D-12A, Sheet 1
5610-T-D-12B, Sheet 1
5610-T-D-15, Sheet 1

690210706
New
KA 064A2.16 (3.3/3.7) RO T2/G2 SRO T2/G2
10CFR 41.5/43.5/45.3/45.13
RO Q#66 SRO Q#72
Level 2

QUESTION: 073

The following refueling conditions exist on Unit 4:

- Core off-load is in progress.
- A reactor vessel refueling cavity seal failure occurs.

Assuming no operator action, which ONE of the following describes the effect on fuel assemblies in the SFP?

Fuel assemblies in the SFP will be:

a. completely uncovered.

b. partially uncovered.

c. covered with a few feet of water above them.

d. covered with SFP water remaining at its normal level.

ANSWER: 073

c.

REFERENCE:

SD-044, Figure 26

690214102
Modified from the Exam Bank: 69021440613
KA 033A1.01 (2.7/3.3) RO T2/G2 SRO T2/G2
10CFR 41.5/45.5
RO Q#69 SRO Q#73
Level 2

QUESTION: 074

Which ONE of the following describes the advantages of using ES-3.1, "Post-SGTR Cooldown Using Backfill," as compared to ES-3.2, "Post-SGTR Cooldown Using Blowdown," or ES-3.3, "Post-SGTR Cooldown Using Steam Dump"?

ES-3.1, "Post-SGTR Cooldown Using Backfill":

a. minimizes radiological releases and is the fastest method to cool the RCS.

b. minimizes radiological releases and facilitates processing of contaminated water.

c. maximizes inventory in the RCS and is the fastest method to cool the RCS.

d. maximizes inventory in the RCS and facilitates processing of contaminated water.

ANSWER: 074

b.

REFERENCE:

3-EOP-E-3, Step 50 Bases

690233905
Modified from the Exam Bank: 69023390529
KA 035K3.01 (4.4/4.6) RO T2/G2 SRO T2/G2
pg. 3.4-14
10CFR 41.7/45.6
RO Q#70 SRO Q#74
Level 1

QUESTION: 075

The following conditions exist on Unit 3:

- The unit is in Mode 3 with Tavg at 545°F.
- The Steam Dump to Condenser (SDTC) system Mode Selector switch is in the MAN position.
- PT-464, Steam Header Pressure, fails high.

Which ONE of the following describes the effect on the SDTC system?

a. Only 2 valves will open and will remain open.

b. Only 2 valves will open and then close when Tavg decreases to 543°F.

c. All 4 valves will open and will remain open.

d. All 4 valves will open and then close when Tavg decreases to 543°F.

ANSWER: 075

d.

REFERENCE:

5610-T-L1, Sheet 22A

690211806
Modified from the Exam Bank: 69021180010
KA 039K1.06 (3.1/3.0) RO T2/G2 SRO T2/G2
pg. 3.4-19
10CFR 41.2 TO 41.9/45.7 45.8
RO Q#71 SRO Q#75
Level 2

QUESTION: 076

Which ONE of the following identifies the first PRMS detector that should respond to a SGTR and the effect on the detector?

a. Condenser Air Ejector Monitor, R-15. R-15 will be automatically isolated.

b. Condenser Air Ejector Monitor, R-15. R-15 will not be automatically isolated.

c. Steam Generator Blowdown Sample Monitor, R-19. R-19 will be automatically isolated.

d. Steam Generator Blowdown Sample Monitor, R-19. R-19 will not be automatically isolated.

ANSWER: 076

b.

REFERENCE:

SD-068, Pages 35 through 39

690216802
New
KA 055K1.06 (2.6/2.6) RO T2/G2 SRO T2/G2
10CFR 41.2 to 41.9/45.7 to 45.8
RO Q#72 SRO Q#76
Level 1

QUESTION: 077

Unit 3 is at 100% power with its Startup Transformer out of service when an automatic reactor trip occurs.

- The 3A EDG starts and repowers the 3A 4KV Bus.
- The 3B EDG locks out and cannot be restarted.

The Unit 3 ANPS directs the BOP to use 3-ONOP-004.3, "Loss of 3B 4KV Bus," to restore power to the 3B 4KV Bus.

Which ONE of the following describes how power will be restored to the 3B 4KV Bus?

Power will be restored to the 3B 4KV Bus from the:

a. 3A 4KV Bus.

b. Unit 4 Startup Transformer.

c. 3C 4KV Bus.

d. Station Blackout Tie Line.

ANSWER: 077

c.

REFERENCE:

3-ONOP-004.3, Step 14 RNO & Attachment #2

690226303
Modified from the Exam Bank: 69022630406
KA 062A2.11 (3.7/4.1) RO T2/G2 SRO T2/G2
pg. 3.6-4
10CFR 41.5/43.5/45.3/45.13
RO Q#73 SRO Q#77
Level 2

QUESTION: 078

Unit 3 is operating at 100% power with all systems in normal alignment. 3A EDG is being run for surveillance purposes and is presently tied to the 3A 4KV Bus.

The following events occur:

- A main generator lockout occurs.
- Startup transformer breaker, 3AA05, fails to close and is mechanically bound.
- 3A Reactor Coolant Pump breaker, 3AA01, fails to automatically open.

Which ONE of the following describes the required operator response?

a. Manually open EDG breaker 3AA20, strip the 3A 4KV Bus using 3-ONOP-004.2, "Loss of 3A 4KV Bus," and manually close breaker 3AA20.

b. Manually open EDG breaker 3AA20, strip the 3A 4KV Bus using 3-ONOP-004.2, "Loss of 3A 4KV Bus," and verify breaker 3AA20 automatically closes.

c. Verify EDG breaker 3AA20 automatically opens, strip the 3A 4KV Bus using 3-ONOP-004.2, "Loss of 3A 4KV Bus," and manually close breaker 3AA20.

d. Verify EDG breaker 3AA20 automatically opens, strip the 3A 4KV Bus using 3-ONOP-004.2, "Loss of 3A 4KV Bus," and verify breaker 3AA20 automatically closes.

ANSWER: 078

d.

REFERENCE:

3-ONOP-004.2, Step 1
5613-T-11, Sheet 9A6
690213606
New
KA 064A2.16 (3.3/3.7) RO T2/G2 SRO T2/G2
10CFR 41.5/43.5/45.3/45.13
RO Q#75 SRO Q#78
Level 2

QUESTION: 079

Unit 3 is at 100% power when PRMS R-3-20, Reactor Coolant Letdown, radiation monitor alarms. HP investigates and surveys the area in the Pipe and Valve Room.

The HP Supervisor reports the presence of a Hot Spot that is reading 400 mr/hr at 2 feet from the source.

Which ONE of the following identifies the distance from the source at which the measured dose rate will be 100 mr/hr?

a. 4 feet

b. 6 feet

c. 8 feet

d. 10 feet

ANSWER: 079

a.

REFERENCE:

LP3500042, Student Handout, Page 21
0-ADM-600, Step 4.18

350204207
New
KA 073K5.02 (2.5/3.1) RO T2/G2 SRO T2/G2
pg. 3.7-15
10CFR 41.5/45.7
RO Q#76 SRO Q#79
Level 3

QUESTION: 080

Unit 3 was operating at 100% power when the following events occurred:

- A Loss of Off Site Power (LOOP)
- The 3A1 Circulating Water Pump breaker did not open.
- All other systems responded as designed.

Which ONE of the following describes the effect on the 3A EDG breaker and 3A Sequencer?

	3A EDG Breaker	3A Sequencer
a.	Remains OPEN	Sequences
b.	Remains OPEN	Does Not Sequence
c.	Automatically CLOSES	Sequences
d.	Automatically CLOSES	Does Not Sequence

ANSWER: 080

b.

REFERENCE:

5613-T-L1, Sheet 9A6. 5613-T-L1, Sheet 12A

690215706
New
KA 075K3.07 (3.4/3.5) RO T2/G2 SRO T2/G2
pg. 3.8-15
10CFR 41.7/45.6
RO Q#77 SRO Q#80
Level 2

QUESTION: 081

Units 3 and 4 are at 100% power when the following events occur:

- A loss of instrument air has occurred on both units.
- 3CM, 3CD, 4CM, and 4CD instrument air compressors are all inoperable.
- The NPO has been directed to open the four inch Service Air Supply to Unit 3/Unit 4 Tie Valve.
- The NPO reports that the four inch Service Air Supply valve cannot be opened.

Which ONE of the following describes the correct operator response?

Open the:

a. Service Air Supply valve from Units 1 & 2.

b. Instrument Air Supply valve from Units 1 & 2.

c. Breathing Air Supply cross-tie valve.

d. two inch Service Air Supply to Unit 3/Unit 4 tie valve.

ANSWER: 081

d.

REFERENCE:

0-ONOP-013, Step 4 RNO
5610-M-3013, Sheet 1
5613-M-3013, Sheet 1

710214504
Modified from 1998 NRC Exam RO #78
KA 079K4.01 (2.9/3.2) RO T2/G2 SRO T2/G2
pg. 3.8-21
10CFR 41.7
RO Q#78 SRO Q#81
Level 1

QUESTION: 082

Both units are at 100% power when a leak occurs in the Main Fire Loop. Loop pressure decreases continuously.

Which ONE of the following identifies the first pump to auto start?

a. The standby Jockey pump

b. The standby Service Water pump

c. The Electric Fire pump

d. The Diesel Engine Driven Fire pump

ANSWER: 082

c.

REFERENCE:

SD-153 Pages 22 & 23
0-ARP-097.WTP, Page 6 & Page 8

690214306
Modified from the Exam Bank: 69021430512
KA 086A3.01 (2.9/3.3) RO T2/G2 SRO T2/G2
pg. 3.8-24
10CFR 41.7/45.5
RO Q#79 SRO Q#82
Level 2

QUESTION: 083

Unit 4 is at 100% power.

Which ONE of the following conditions, per Tech. Specs., would require action to be taken within one hour to prevent a plant shutdown?

a. RCS Tavg is 543°F.

b. RCS pressure boundary leakage is 1 gpm.

c. Containment pressure is 3.1 psig.

d. Containment temperature is 122°F.

ANSWER: 083

c.

REFERENCE:

Tech. Specs. 3.6.1.4

690252603
Modified from the Exam Bank: 69025260103
KA 103G2.1.2 (3.0/4.0) RO (NA) SRO T2/G2
pg. 2-1
10CFR 41.10/45.13
SRO Only Q#83
Level 1

QUESTION: 084

A large break LOCA occurred on Unit 4.

In accordance with ODI-CO-028, "Conduct of Crew Briefs," Which ONE of the following describes when a crew brief should be held during performance of the EOPs?

a. After Step 4 of E-0 is complete.

b. After Step 16 of E-0 is complete.

c. Upon transitioning from E-0.

d. Upon making the Emergency Classification.

ANSWER: 084

c.

REFERENCE:

ODI-CO-028, Section 5.2.3

No Objective
New
KA 2.1.6 (2.1/4.3) RO (NA) SRO GT3
pg. 2-1
10CFR 43.5/45.12/45.13
SRO Only Q#84
Level 1

QUESTION: 085

Which ONE of the following identifies the minimum shift manning requirements with one unit in Mode 1 and the other unit in Mode 5?

	NPS	SRO	RO	AO	STA
a.	1	2	3	3	1
b.	1	1	3	3	1
c.	1	1	3	3	0
d.	1	1	2	3	1

ANSWER: 085

b.

REFERENCE:

Tech. Specs. Table 6.2-1

690202504
Modified from the Exam Bank: 69020250406
KA G2.1.10 (2.7/3.9) RO (NA) SRO GT3
pg. 2-2
10CFR 43.1/45.13
SRO Only Q#85
Level 1

QUESTION: 086

Unit 4 is in Mode 3 and PRZ pressure is 2235 psig.

Which ONE of the following conditions results in HHSI Loop B hot leg check valve, 4-874B, having acceptable leakage in accordance with Tech. Specs.?

a. The currently measured leakage is 5.5 gpm.

b. The previously measured leakage was 0.5 gpm and the currently measured leakage is 3.0 gpm.

c. The previously measured leakage was 2.0 gpm and the currently measured leakage is 3.7 gpm.

d. The previously measured leakage was 4.0 gpm and the currently measured leakage is 4.4 gpm.

ANSWER: 086

d.

REFERENCE:

Tech. Specs. 3.4.6.2 **To be provided to candidate.**

690252401
Direct from the exam Bank: 69025240302-ORQ
KA G2.1.12 (2.9/4.0) RO (NA) SRO GT3
pg. 2-2
10CFR 43.2/43.5/45.3
SRO Only Q#86
Level 3

QUESTION: 087

Engineering is analyzing Spent Fuel Pool Heat Exchanger performance and requests the Operations Department to swap to the low SFP pump suction, from the currently configured high SFP pump suction as described in the FSAR.

Which ONE of the following describes the required action(s) to comply with Engineering's request?

a. A "One Time Only" approved OTSC is required.

b. Stationing an operator as a Human Clearance is required.

c. An approved Safety Evaluation and Temporary Procedure are required.

d. Operations Manager and NRC Resident approval are required.

ANSWER: 087

c.

REFERENCE:

0-ADM-102, Step 5.1.7
0-ADM-100, Figure 2
5613-M-3033, Sheet 1

420200103
New
KA G2.2.7 (2.0/3.2) RO (NA) SRO GT3
pg. 2-5
10CFR 43.3/45.13
SRO Only Q#87
Level 2

QUESTION: 088

A Safety Evaluation has been performed on a proposed plant change and the results reveal that the margin of safety, as defined in the basis of Tech. Specs, will be reduced.

Which ONE of the following is correct regarding implementation of the proposed change?

An Unreviewed Safety Question:

a. exists.
NRC authorization is required prior to implementation.

b. exists.
NRC authorization is not required prior to implementation.

c. does not exist.
NRC authorization is required prior to implementation.

d. does not exist.
NRC authorization is not required prior to implementation.

ANSWER: 088

a.

REFERENCE:

0-ADM-100, Step 4.26.1.3
0-ADM-102, Step 5.2.8.2.a (2)

690201006
New
KA G2.2.8 (1.8/3.3) RO (NA) SRO GT3
pg. 2-5
10CFR 432.3/45.13
SRO Only Q#88
Level 1

QUESTION: 089

Unit 3 is at 100% power.

Mechanical Maintenance is planning to erect a scaffold over Redundant Safety Related Equipment to perform trouble shooting activities.

Which ONE of the following identifies the highest level of approval required for the erection of this scaffolding?

a. ANPS

b. NPS

c. Operations Supervisor

d. Operations Manager

ANSWER: 089

c.

REFERENCE:

0-ADM-012 Step 3.3.2

690203502
Modified from the Exam Bank: 69020350205
KA G2.2.20 (2.3/3.3) RO (NA) SRO GT3
Pg. 2-7
10CFR 43.5/45.13
SRO Only Q#89
Level 1

QUESTION: 090

The following conditions exist:

- Unit 3 is in Mode 1.
- Unit 4 is in Mode 3.

Which ONE of the following correctly states the Condensate Storage Tanks system minimum indicated volume required by Technical Specifications and its basis?

	VOLUME	BASIS
a.	210,000 gal.	Provides sufficient volume to cooldown the RCS to below 350°F within 15 hours.
b.	210,000 gal.	Provides sufficient volume to maintain the RCS at Hot Standby for approximately 23 hours.
c.	420,000 gal.	Provides sufficient volume to cooldown the RCS to below 350°F within 15 hours.
d.	420,000 gal.	Provides sufficient volume to maintain the RCS at Hot Standby for approximately 23 hours.

ANSWER: 090

d.

REFERENCE:

Tech Spec 3.7.1.3 and Basis Document

690252702
New
KA G2.2.25 (2.5/3.7) RO (NA) SRO GT3
Pg. 2-7
10CFR 43.2
SRO Only Q#90
Level 1

QUESTION: 091

A spent fuel assembly is suspended from the manipulator crane when a Refueling Cavity seal failure occurs.

Which ONE of the following describes the correct manipulator operator response?

a. Insert the assembly into the upender and unlatch it.

b. Insert the assembly into the upender and leave it latched.

c. Return the assembly to the reactor core and unlatch it.

d. Return the assembly to the reactor core and leave it latched.

ANSWER: 091

d.

REFERENCE:

3-ONOP-033.2, Step 5.1.3

690260704
Modified from the Exam Bank: 69026070101
KA G.2.2.28 (2.6/3.5) RO (NA) SRO GT3
pg. 2-8
10CFR 43.7/45.13
SRO Only Q#91
Level 1

QUESTION: 092

Rod Control is in automatic with reactor and turbine power stable.

Which ONE of the following rod control inputs will result in control rod speed of 40 steps per minute?

Tavg greater than Tref by:

a. 2.75°F

b. 3.0°F

c. 3.25°F

d. 4.0°F

ANSWER: 092

d.

REFERENCE:

Logic Diagram 5610-T-D-12A Sheet 1

690210506
Modified from Exam Bank Question 69021050643 and STP NRC RCO 11/94
KA G2.2.33 (2.5/2.9) RO (NA) SRO GT3
Pg. 2-8
10CFR 43.6
SRO Only Q#92
Level 3

QUESTION: 093

As the NPS you have been asked to approve the attached Liquid Release Permit.

Which ONE of the following identifies why you should not approve the permit?

a. The specific activity of the tank is too high.

b. The specific activity is for the wrong tank.

c. The Σ C/EC limit has been exceeded.

d. The Administrative Release limit has been exceeded.

ANSWER: 093

b.

REFERENCE:

0-NCOP-003 pages 23 & 32 A prepared Release Permit is to be provided to candidate.

Task Standard #1 for JPM# 2061051100
Modified from 1997 NRC Exam – Admin. JPM #3
KA G2.3.6 (2.1/3.1) RO (NA) SRO GT3
pg. 2-9
10CFR 43.4/45.10
SRO Only Q#93
Level 3

QUESTION: 094

Which ONE of the following conditions would prevent the use of the Post Accident Containment Vent system to purge Containment atmosphere to the in-service Gas Decay Tank (GDT), following a LOCA?

a. Containment pressure is 15 psig.

b. Containment temperature is 120°F.

c. In-service GDT Oxygen concentration is 1%.

d. In-service GDT Hydrogen concentration is 3%.

ANSWER: 094

a.

REFERENCE:

3-EOP-E-1, Attachment #4, Step 1 & Step 15

690232702
New
KA G2.3.9 (2.5/3.4) RO (NA) SRO GT3
pg. 2-9
10CFR 43.4/45.10
SRO Only Q#94
Level 1

QUESTION: 095

The following conditions exist on Unit 3:

- The ANPS is reading ECA-2.1, "Uncontrolled Depressurization of All Steam Generators," step 3, "Control Feed Flow to Minimize RCS Cooldown."

- The operator observes 3B S/G pressure is now increasing.

Which ONE of the following is the correct operator action?

a. Return to step 1 of ECA-2.1.

b. Continue in ECA-2.1 from the present step.

c. Transition to E-2, "Faulted Steam Generator."

d. Transition to E-1, "Loss of Reactor or Secondary Coolant."

ANSWER: 095

c.

REFERENCE:

ECA-2.1 Foldout Page

690233502
Modification of Exam Bank Question 69023350302
KA G2.4.1 (4.3/4.6) RO (NA) SRO GT3
Pg. 2-11
10CFR 41.10/43.5/45.13
SRO Only Q#95
Level 1

QUESTION: 096

Unit 4 is operating at 100% power with the 4A EDG out of service when the following sequence of events occur:

- The operators respond to an ATWS using FR-S.1, "Response to Nuclear Power Generation/ATWS."
- The reactor trips due to a loss of off-site power.
- The 4B EDG locks out and cannot be restarted.

Which ONE of the following describes the correct operator response?

a. Complete the actions of FR-S.1 and then go to ECA-0.0, "Loss of All AC Power." Power will be restored to a 4KV bus using the appropriate ONOP upon completion of ECA–0.0.

b. Complete the actions of FR-S.1 and then go to ECA-0.0, "Loss of All AC Power." Power will be restored to a 4KV bus using the appropriate ONOP while performing the actions of ECA-0.0.

c. Stop performance of FR-S.1 and immediately go to ECA-0.0, "Loss of All AC Power." Power will be restored to a 4KV bus using the appropriate ONOP upon the completion of ECA–0.0.

d. Stop performance of FR-S.1 and immediately go to ECA-0.0, "Loss of All AC Power." Power will be restored to a 4KV bus using the appropriate ONOP while performing the actions of ECA-0.0.

ANSWER: 096

d.

REFERENCE:

ADM-211, Step 5.1.2, First Example following Step 5.1.3.2
ECA-0.0, Step 11 RNO

690232005
New
KA G.2.4.16 (3.0/4.0) RO (NA) SRO GT3
pg. 2-12
10CFR 41.10/43.5/45.13
SRO Only Q#96
Level 2

QUESTION: 097

Unit 3 is at 100 % power when all Unit 3 annunciators are suddenly blacked out. No reactor trip signals are generated and the plant remains at full power.

Which ONE of the following describes the correct operator response?

a. Maintain the plant stable and dispatch an operator to DC Bus 3D01.

b. Maintain the plant stable and dispatch an operator to DC Bus 3D23.

c. Trip the reactor and turbine and dispatch an operator to DC Bus 3D01.

d. Trip the reactor and turbine and dispatch an operator to DC Bus 3D23.

ANSWER: 097

a.

REFERENCE:

3-ARP-097.CR Step 5.12

690204102
New
KA G2.4.32 (3.3/3.5) RO (NA) SRO GT3
Pg. 2-14
10CFR 41.10/43.5/45.13
SRO Only Q#97
Level 1

QUESTION: 098

Which ONE of the following would require the Emergency Coordinator to direct Chemistry personnel to perform 0-EPIP-20126, "Off-site Dose Calculations"?

a. A Site Area Emergency has been declared.

b. An Owner Controlled Area Evacuation has been implemented.

c. PRMS R-14, Plant Vent, has increased by a factor of 20.

d. Airborne radioactivity levels outside of plant buildings are 10% of DAC.

ANSWER: 098

c.

REFERENCE:

0-EPIP-20101, Step 4.13, Step 5.2.3.2

320200401
New
KA G2.4.36 (2.0/2.8) RO (NA) SRO GT3
pg. 2-15
10CFR 43.5
SRO Only Q#98
Level 2

QUESTION: 099

Which ONE of the following is the minimum PARs that shall be issued for a declared General Emergency?

a. Shelter all people within a 2 mile radius from the plant and 5 miles in the down wind sectors.

b. Shelter all people within a 2 mile radius from the plant and 10 miles in the down wind sectors.

c. Evacuate all people within a 2 mile radius from the plant and shelter all people between 2 and 5 miles in the down wind sectors.

d. Evacuate all people within a 2 mile radius from the plant and shelter all people between 2 and 10 miles in the down wind sectors.

ANSWER: 099

a.

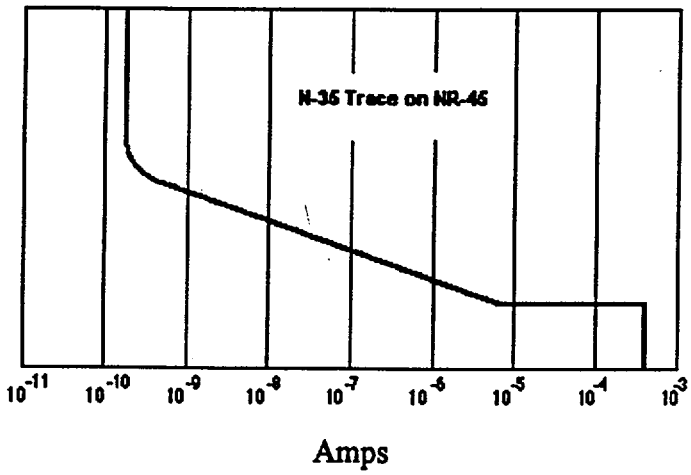
REFERENCE:

0-EPIP-20101, Step 5.1.3

320200403
Direct from the Exam Bank: 32020040302
KA G2.4.44 (2.1/4.0) RO (NA) SRO GT3
pg. 2-16
10CFR 43.5/45.11
SRO Only Q#99
Level 1

QUESTION: 100

Unit 3 was operating at 100% power when the reactor tripped. The RCO observes the following Intermediate Range trace on NIS recorder NR-45:



Which ONE of the following statements is correct?

a. N-35 is under compensated.
The NIS Source Ranges will automatically energize.

b. N-35 is under compensated.
The NIS Source Ranges will not automatically energize.

c. N-35 is over compensated.
The NIS Source Ranges will automatically energize.

d. N-35 is over compensated.
The NIS Source Ranges will not automatically energize.

ANSWER: 100

b.

REFERENCE:
SD-004, Page 126 & Figure 23
EOP-ES-0.1, Step 19 Basis
690210406
New
KA G2.4.47 (3.4/3.7) RO (NA) SRO GT3
pg. 2-16
10CFR 41.10/43.5/45.12
Level 3 SRO Only Q#100